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DEVELOPMENT OF MARINE SPATIAL PLANNING: GLOBAL PERSPECTIVES AND CHALLENGES IN BRAZIL

DESENVOLVIMENTO DO PLANEJAMENTO ESPACIAL MARINHO: PERSPECTIVAS GLOBAIS E DESAFIOS NO BRASIL

DESARROLLO DE LA PLANIFICACIÓN ESPACIAL MARINA: PERSPECTIVAS Y DESAFÍOS GLOBALES EN BRASIL

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ABSTRACT: Marine Spatial Planning (MSP) constitutes a strategic framework for ocean governance, integrating multiple uses of marine space with environmental conservation. This article examines its global evolution and critically discusses the main challenges to its implementation in Brazil, including institutional fragmentation, data scarcity, and limited social participation. Despite these constraints, the country has made progress in advancing MSP across the "Blue Amazon" through regional strategies and technical and financial support from the federal government. Marine Geography is presented as a key disciplinary field for strengthening MSP, providing theoretical and methodological foundations for more equitable and effective governance. The articulation between science, public policy, and local communities is highlighted as essential to ensuring equity, ecological effectiveness, and social inclusion. This study contributes to the refinement of public policies and underscores the relevance of MSP in addressing the complex challenges of the Anthropocene.

KEYWORDS: Marine Spatial Planning. Ocean Governance. Marine Geography. Coastal Sustainability. Environmental Policies.

RESUMO: *O Planejamento Espacial Marinho (PEM) é uma abordagem estratégica para a gestão dos oceanos, integrando múltiplos usos e a conservação ambiental. Este artigo analisa sua evolução global e discute os desafios enfrentados no Brasil, como a fragmentação institucional, a escassez de dados e a limitada participação social. Apesar desses obstáculos, o país tem avançado com a implementação do PEM na Amazônia Azul, por meio de estratégias regionais e do apoio técnico e financeiro do governo federal. A Geografia Marinha é apresentada como um campo essencial para o fortalecimento do PEM, ao oferecer subsídios teóricos e metodológicos para uma governança mais justa e eficaz. A articulação entre ciência, política e comunidades locais é destacada como fundamental para garantir equidade, eficácia ecológica e inclusão social. O estudo contribui para o aprimoramento das políticas públicas e reforça a importância do PEM diante dos desafios do Antropoceno.*

PALAVRAS-CHAVE: *Planejamento Espacial Marinho. Governança Oceânica. Geografia Marinha. Sustentabilidade Costeira. Políticas Ambientais.*

RESUMEN: *El Ordenamiento Espacial Marino (OEM) es un enfoque estratégico de gobernanza oceánica que integra los usos del espacio marítimo con la conservación ambiental. Este artículo examina su evolución global y analiza los principales desafíos para su implementación en Brasil, como la fragmentación institucional, la escasez de datos y la limitada participación social. A pesar de estas restricciones, el país ha avanzado en la aplicación del OEM en la Amazonia Azul mediante estrategias regionales y el apoyo técnico y financiero del gobierno federal. La Geografía Marina se presenta como un campo clave para fortalecer el OEM, al aportar bases teóricas y metodológicas para una gobernanza más justa y eficaz. La articulación entre ciencia, política y comunidades locales es fundamental para garantizar la equidad, la efectividad ecológica y la inclusión social. El estudio contribuye al perfeccionamiento de las políticas públicas y resalta la relevancia del OEM frente a los desafíos del Antropoceno.*

PALABRAS CLAVE: *Planificación espacial marina. Gobernanza de los Océanos. Geografía Marina. Sostenibilidad Costera. Políticas Ambientales.*

Introduction

In recent decades, the growth of human activities in marine and coastal environments has imposed new challenges on the governance of these territories, requiring more integrated and sustainable approaches. The intensification of the use of ocean resources and the multiplicity of interests involved in these spaces have resulted in conflicts, environmental degradation, and social pressures that demand more effective planning strategies. Given this, Marine Spatial Planning (MSP) emerges as a regulatory and management tool capable of reconciling the multiple uses of the sea, promoting the conservation of ecosystems, and ensuring the sustainable development of coastal and marine regions.

The concept of the PEM (Planned Management Evaluation) developed from international experiences, such as China's functional zoning, Australia's bioregional plans, and European Union legislation, becoming a globally recognized strategy for the management of ocean space. Based on principles of ecological science and international law, MSP acts in the analysis and spatial allocation of human activities, reducing conflicts and promoting integrated governance. Its adoption by several countries highlights its potential to deal with the challenges of the Anthropocene and the growing impacts of human action on the oceans.

In Brazil, the implementation of MSP is still in its initial phase and faces challenges associated with institutional fragmentation, limited integration of geospatial data, and the absence of fully consolidated normative instruments. Despite these difficulties, the country has recorded relevant advances, such as the implementation of the MSP pilot project in the South Region and the conduct of participatory processes in the Southeast and Northeast regions, currently under development. Furthermore, the North Region is in the initial phase of structuring MSP, which indicates a gradual and progressive expansion of this public policy in the national territory. These efforts are aligned with the 2030 Agenda of the United Nations (UN, 2015), especially Sustainable Development Goal 14, which highlights the need to conserve and sustainably use the oceans, seas, and marine resources.

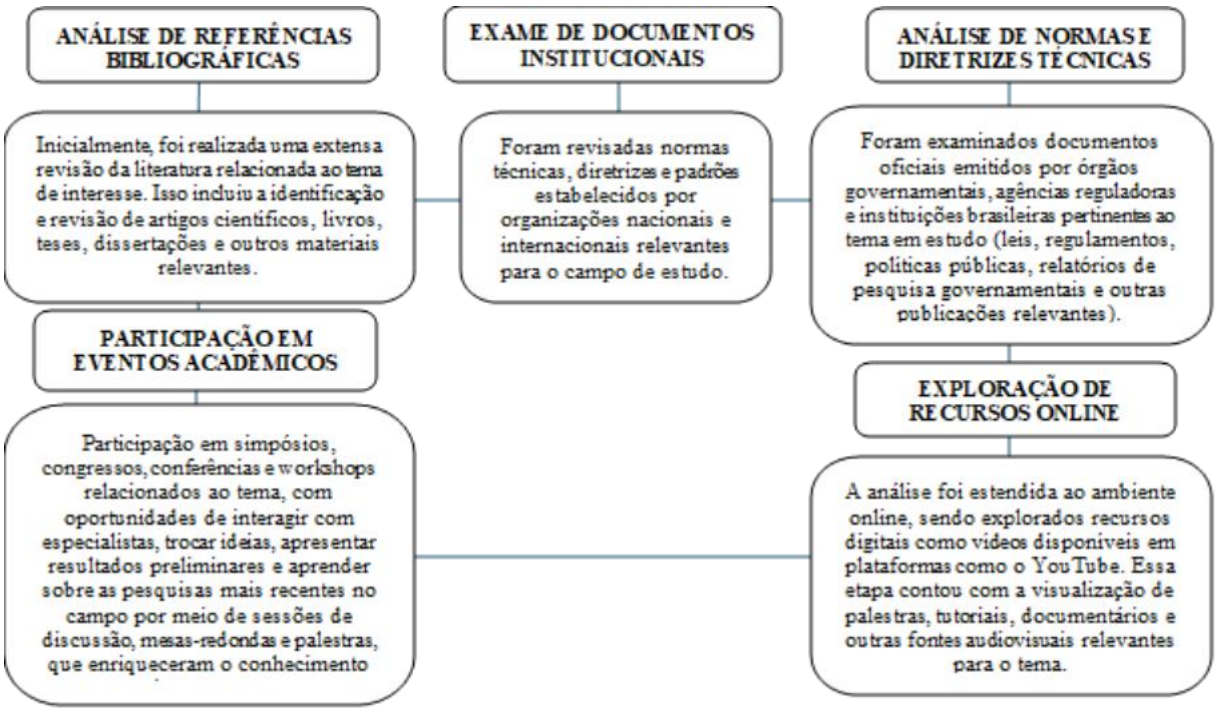
Given this, this article aims to discuss the development of MSP from a global perspective, highlighting the main international milestones and experiences, and to analyze the challenges and possibilities of its implementation in Brazil. Section 1 presents the introduction of the study, with the contextualization of the research and methodological procedures. Section 2 addresses the historical evolution of coastal and marine management, contextualizing the emergence of MSP. Section 3 details the foundations, legal frameworks, and methodological aspects of MSP, with an emphasis on global initiatives and Brazilian efforts. Section 4 presents

a critical analysis of current contradictions and challenges, proposing a reflection from the perspective of marine geography, highlighting the importance of interdisciplinary approaches for the consolidation of effective and inclusive ocean governance. In the closing, the final considerations and the references that supported this study are presented.

Methodology

The present research used a multivariate methodological approach through the analysis of specialized bibliography, government documents (coastal management instruments and strategies), technical standards and guidelines, as well as contributions from experts presented in symposia, congresses, and institutional videos available on YouTube. The combination of these sources aimed to enrich the investigation and meet the objective of presenting a holistic and in-depth understanding of the evolution of MSP in the world and in Brazil.

Figure 1 – Methodological flowchart



Source**:** Authors' elaboration.

The bibliographic analysis examined the development of Marine Spatial Planning (MSP) comprehensively, with the aim of understanding its conception and trajectory over time,

especially the way the topic has been discussed and consolidated by the scientific community on a global scale. The searches were carried out in three languages: English (*Marine Spatial Planning* – MSP), Portuguese (Planejamento Espacial Marinho – PEM; Ordenamento do Espaço Marítimo – OEM), and Spanish (*Ordenación Espacial Marina* – OEM; *Planificación Espacial Marina* – PEM).

The review used different databases and academic and technological research tools, including *Web of Science*, *SciELO*, and *Derwent Innovations Index*, accessed through the CAPES Periodical Portal via CAFe, with the application of scientometric procedures. In Chart 1, the parameters adopted for the analysis of the bibliographic collection are presented, while Table 1 gathers the sequence of descriptors and keywords used in the search platforms.

Chart 1 – Parameters for analysis of the bibliographic collection

Inclusion	Exclusion
Availability on the platform	Outside the publication languages: English, Portuguese, or Spanish
Impact factor	Articles that were repeated in the execution of the search *strings*
Most recent and updated data	Articles that were not accessible in the platform's domain

Source: Authors' elaboration.

Table 1 – Search *strings*

Search Command	No. of Materials Found	Used
Marine Spatial Planning	20	6
Marine Spatial Planning	>20.000	50
Marine Space Management	13	7
Marine Spatial Planning (Spanish)	7	3
Marine Spatial Planning (Spanish)	1	1

Source**:** Authors' elaboration.

From this, to define what would be used and what would be discarded, an initial reading of the abstracts was carried out to verify the suitability for the research. Then, the selected works were systematized in the *Zotero* software, in order to be used in the following stages of the research. When searched in English, the *string* "Marine Spatial Planning" yielded more than 20,000 results. Therefore, the analysis was performed based on the impact factor (most cited)

on the search *site* itself, resulting in 50 articles among the most cited in English and with high relevance to the topic addressed.

Evolution of Coastal and Marine Management

Understanding the importance of establishing sustainable regulations and practices in this area where human relations have intensified, with increasingly evident impacts, the first coastal area management models emerged through local strategies, back in the 1970s. These pioneering instruments, even with high relevance, most of the time treated the coastal and marine environment in a fragmented way, facing challenges in the various governance structures (Pereira; Oliveira, 2015; Polette, 2020).

The initial call for global awareness had its landmark at the United Nations Conference on the Human Environment, held in the city of Stockholm, Sweden, in 1972, which, above all, highlighted a critical situation in the face of these increasingly evident impacts worldwide. However, only at the United Nations Conference on Environment and Development (UNCED), the Earth Summit (Rio-92), did the concept of Integrated Coastal Zone Management (ICZM) consolidate itself as a proposal that emphasizes the integration of environmental, economic, social, and cultural policies for more efficient management of marine and coastal environments and resources.

ICZM is noted as the first instrument that proposes to establish a formal governance structure, with the involvement of various actors and coordinated mechanisms, aiming to promote the cooperation of integrated coastal and marine management (Eger *et al*., 2021). This initiative was consolidated during the 1990s, when the aim was to establish theoretical-methodological approaches and practical examples, in various places around the world, due to the need found there (McClanahan; Mwaguni; Muthiga, 2005; Stojanovic; Ballinger, 2009; Suman, 2022).

In general, Integrated Coastal Management (ICM) has its foundations in the 1980s, but it has developed significantly in recent decades, especially in the last 25 years, with advances in governance, environmental protection, and the integration of economic and sustainable issues in different contexts. Within the scope of ICM, several processes have helped in approaching a practical ideal of the proposed principles, such as *Ecosystem-based Management* (EBM), *Marine Protected Area* (MPA), *Integrated Coastal Zone Management* (ICZM), *and Marine*

Spatial Planning (MSP) (Ducrotoy; Furukawa, 2016; Eger *et al*., 2021).

Marine Spatial Planning (MSP)

Currently, still in evolution, land-sea integration policies are driven, above all, by global pressures, which seek to address complex problems and have demanded joint adaptation strategies (O'Hagan; Paterson; Tissier, 2020).

Table 2 presents the historical evolution, worldwide, of discussions regarding coastal environments with a sustainable bias, which served as scientific and legal benchmarks for the current systematization of what is understood as Marine Spatial Planning (MSP).

Table 2 – Scientific and legal benchmarks for MSP

No.	Scientific and legal benchmarks	Reference
1	The Marine Resources and Engineering Development Act, Public Law 89-454 (United States, 1966), created by the US Congress, has as one of its objectives to "introduce conservation methods into fishing activities and make more efficient use of marine resources".	Gullion (1968 *apud* Souto, 2021, p. 474)
2	The creation of the terms *eco-development*[4] and *ecological development* is a result of the notes from the *United Nations Conference on the Human Environment* (UNCHE), held in 1972, in the city of Stockholm (Sweden).	Sachs (1972 *apud* Oliveira; Gomes, 2015)
3	The first US coastal management law, the *Coastal Zone Management Act*, enacted in 1972, used an integrative approach between economic, environmental, and social dimensions, recognizing the influence of different anthropogenic activities, developed in coastal regions, on the health of coastal and marine environments and on the well-being of the population residing in these regions.	United States (1972)
4	*The Law of the Sea*, of 1982, resulting from the *United Nations Convention on the Law of the Sea*, held in 1958 in the United States, was launched in 1982, in Montego Bay, Jamaica, and ratified by most signatory countries in 1994. The Law of the Sea established international criteria for the delimitation of the coastal zone and other maritime areas, for the purposes of coastal, marine, and other management scopes.	United Nations (1958), United States (1982)
5	"*Marine functional zones*" were adopted in China, with marine functional zones (MFZ) that have functioned independently since they were established by the Chinese government in 1988. The MFZ is defined as "the sea area for human activities based on its geographical and ecological characteristics, natural resources, current use, and socioeconomic development needs".	Dong, Zhang and Yang (2006), Souto (2021, p. 477)
6	The National Policy for Marine Resources (PNRM), within the scope of the Interministerial Commission for Marine Resources (CIRM), instituted Law no. 7.661 and the National Coastal Management Plan (PNGC), coordinated by the Ministry of the Environment (MMA). "It was instituted with the purpose of promoting the management, in an integrated, decentralized, and participatory manner, of activities in the coastal zone, in order to contribute to improving the quality of life of its population and the protection of its natural, historical, ethnic, and cultural heritage".	Brazil (1988)
7	The 1988 Spanish Coastal Law establishes a legal framework for the protection and sustainable use of Spain's coastal zone, seeking to balance urban and economic development with environmental preservation. Its importance lies in creating restrictions on construction in vulnerable areas, regulating the use of land and marine resources, as well as promoting the conservation of beaches, dunes, and	Spain (1988)

	coastal ecosystems. The law helped to prevent uncontrolled urbanization and environmental degradation on the Spanish coasts.	
8	A growing recognition of the importance of pursuing sustainable development (formed by the tripod: economic growth, environmental conservation, and social equality) occurred in 1992, in Rio de Janeiro. Thus, this commitment was translated into Agenda 21, an action program that serves as a basis for the development of plans and programs by the signatory countries of the UNCED.	United Nations (1997)
9	The Australian government established planning regions called "*marine bioregional plans*," as preparation for the formulation and approval of the Environment Protection and Biodiversity Conservation Act 1999. Marine bioregional plans were defined to provide a framework of biophysical characteristics and marine life diversity. Another successful initiative in Marine Spatial Planning in Australia is the Great Barrier Reef Marine Park, established by the Great Barrier Reef Marine Park Act 1975.	Australia (1975, 1999), Vince (2014)
10	Efforts in Europe began in 2002 as part of the BaltCoast project, funded by the European Union (EU), involving Germany, Sweden, Estonia, Poland, Latvia, Denmark, and Finland.	Heinrichs, Schultz-Zehden and Toben (2005)
11	Belgium, Germany, and the Netherlands then became precursors of MSP in Europe by approving integrated management plans for their waters in 2005.	Ehler and Douvere (2011)

Source**:** Adapted from Costa *et al*. (2021), Gonçalves Neto *et al*. (2021), Souto (2021), and Zaucha and Gee (2019).

Ehler, Zaucha, and Gee (2019) point out that the initial MSP model has a strong connection with the marine conservation plans adopted in Australia and Canada, more specifically the Original Zoning Plan of the Great Barrier Reef Marine Park, established by the Great Barrier Reef Marine Park Act in 1975.

With a more integrated sense, *Marine Spatial Planning* (MSP) consists of a public process that seeks to analyze and allocate human activities in the ocean, with a view to reducing conflicts over distinct uses, coordinated by the Intergovernmental Oceanographic Commission (IOC). This multi-sectoral instrument with legal foundations, in practice, efficiently organizes the harmonious and sustainable use of the seas, enabling the rational use of their resources (gas exploration, mineral resources, transport and navigation, port activities, tourism, conservation and protection of marine and coastal ecosystems, military defense, and fishing), among others, that could compromise the sustainability and guarantee of their resources and uses (Ehler; Douvere, 2009).

MSP develops the collection and analysis of geospatial data to define functional zones, respecting ecological and socioeconomic criteria, through the application of geoprocessing resources, such as Geographic Information Systems (GIS), and then performing the modeling and management of maritime territories. Its implementation follows various legal instruments and public policies, addressing zoning, management plans, and inter-institutional agreements, in order to guide integrated and adaptive governance (Rassweiler *et al*., 2014; Zekić; Županović; Gundić, 2023).

In practice, MSP is based on ICM (Integrated Coastal Management) in the maritime zone, based on ecological science and international law, understanding that the ocean is a system that connects to others and that its impacts are mutual, as they are fundamental to human survival and represent about 10 to 12% of livelihoods, in addition to regulating the Earth's climate and absorbing of carbon dioxide from human activities (IPCC, 2023; Teh; Sumaila, 2013).

Thus, the governance of maritime space becomes indispensable in global sustainability agendas. In this context, the incorporation of Sustainable Development Goal 14 – *Life Below Water* – into the 2030 Agenda for Sustainable Development (UN, 2015), legitimized in 2015, stands out. This goal recognizes the management of oceans and the coastal zone as paramount, based on the interaction between science, policy, and society on a global scale.

In 2006, few countries had systematized MSP, with the focus most evident in Western Europe, where Belgium, Germany, and the Netherlands developed their first models (Ehler, 2021). The consolidation of MSP as an essential tool for ocean governance gained strength during the plenary of the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2006, when the first *workshop* on the topic was held, with representatives from 148 countries. At this event, the document One Planet, One Ocean was released, which highlighted the urgent need for a global ocean management model, reinforcing the role of MSP as a strategic instrument for marine sustainability (Santos *et al.*, 2019).

With increasingly accentuated demands and impacts, at the 2nd International Conference on MSP, organized by UNESCO and the European Union, in the city of Paris, France, in 2017, an analysis was carried out regarding the plans that had already begun. The models of the Netherlands, Namibia, Canada, Seychelles, China, and South Korea were discussed, addressing points such as conflicts between agencies, human activities, and resource exploitation, as well as limits for exploitation, represented in models and tools with approaches that helped improve MSP based on their respective experiences (Ehler, 2021; Ehler *et al*., 2017).

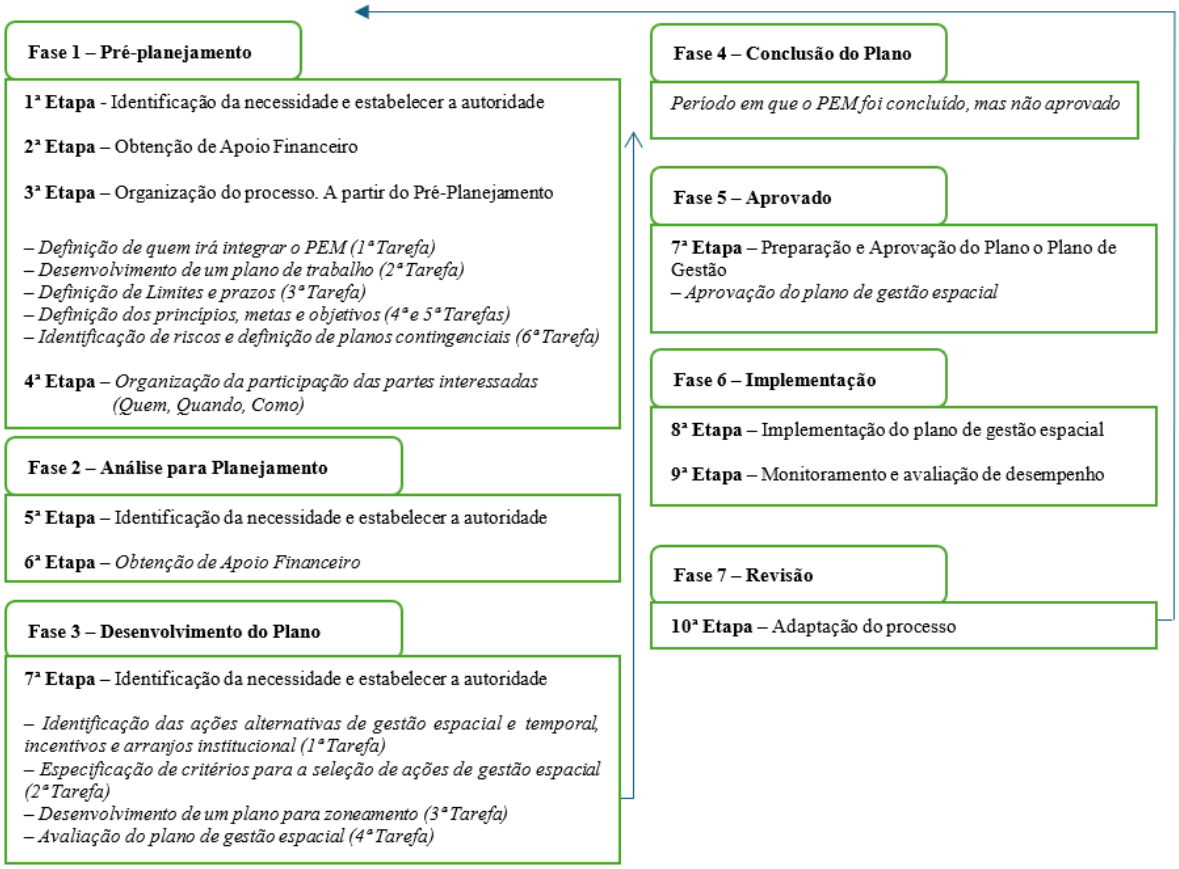
Currently, the main normative model related to MSP takes into account the experiences of several countries, through legal frameworks, documents, and scientific production resulting from global efforts and scientific cooperation, including the transfer of marine technologies. These measures have helped to fill gaps, generally left in the first phase, since, based on practical experience, they would be incorporated by the countries that would go on to implement the guidelines and recommendations. In this process, the approach to MSP as

continuous, interactive, and adaptive is evident, considering its regional specificities (Costa *et al.*, 2021; Ehler *et al.*, 2017).

Thus, MSP seeks to ground its principles in the foundations of the "blue economy," which links economic growth to inclusion and social promotion, through the improvement and guarantee of livelihoods, while respecting the sustainable environmental limits of coastal and oceanic areas (Costa *et al*., 2021; UNESCO, 2020). According to the European Commission document (Lukic *et al*., 2018), this dichotomy between sustainable development and economic development is the main challenge in implementation; however, MSP has been the main solution for dealing with such issues. Its implementation process involves a series of phases (Figure 2), which function as subsidiaries to the next steps that, in general, allow for effective development by analyzing, throughout each of them, their specific, measurable, achievable, relevant, and time-bound purposes (Ehler; Douvere, 2011).

In these verification stages, necessary corrections are identified, such as adjustments to spatial and temporal limits, use conflicts, loss of biodiversity or ecosystem services, and management failures. Based on this, efforts are made to ensure the effective implementation of the guidelines and objectives of MSP (Santos *et al.*, 2019).

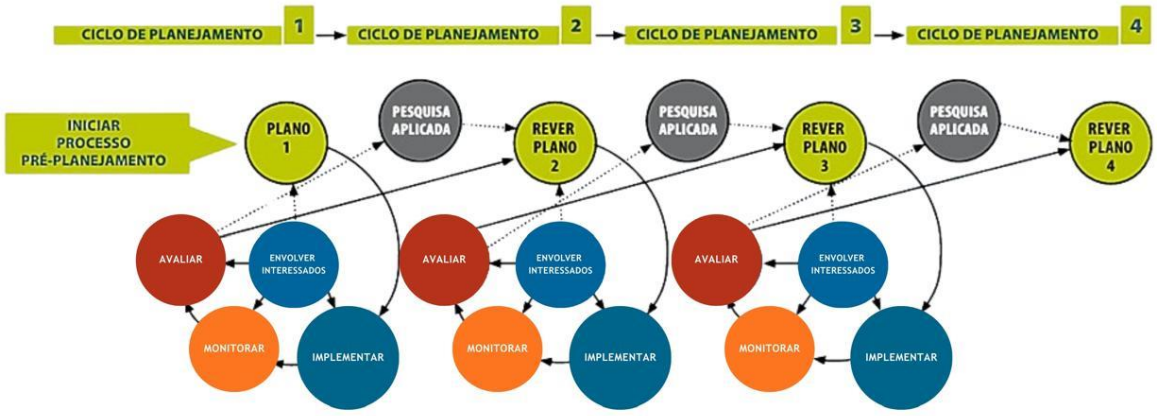
Figure 2 – Phases for the implementation of MSP



Source**:** Adapted from Ehler and Douvere (2009), Ehler *et al*. (2017), and Santos *et al.* (2019).

Although it is systematized under phases and stages, MSP is not a process that follows a linear trend, so several other stages provide feedback and are integrated into the process (Figure 3).

Figure 3 – The continuous cycle of MSP



Source**:** Ehler and Douvere (2011, p. 6).

This sequence, provided for in the MSP stages, respects a series of rites and regulations, thus establishing an efficient and balanced development of the process, capable of identifying, planning, and defining directions for the better management of marine space. The adoption of this protocol tends to present relevant information, as a clear understanding of existing or imminent problems allows not only for their identification but also for proposing effective countermeasures, through the joint action of the various authorities involved in the process (Ehler; Douvere, 2009).

Ehler and Douvere (2009) and Santos *et al.* (2019) describe this process through seven main phases, each with distinct but interconnected functions and objectives:

- **Phase 1 – Pre-planning**: This initial phase establishes the strategic basis of the process. In it, the need for the plan is identified, the responsible authority is defined, institutional support and funding are sought, and the objectives, geographic limits of the area, and main risks are delimited. Social participation is also guaranteed, establishing who participates, how, and when, which ensures legitimacy and clarity from the beginning;
- **Phase 2 – Analysis for Planning**: This is a detailed analysis of present conditions and projections for the future. In this stage, ecological, oceanographic, socioeconomic, and political data are integrated, as well as biophysical information and information on existing human activities. Based on this foundation, prospective scenarios are built that allow for anticipating trends, disputes over space use, and potential impacts on coastal and marine environments;

- **Phase 3 – Plan Development**: This phase focuses on the preparation of the management plan, structured through spatial zoning, composed of maps and regulations. It defines how marine spaces will be organized and used, indicating priority areas for different uses. Incentives and institutional arrangements are also provided, with the assignment of responsibilities among the actors involved. According to Agardy *et al.* (2011), this stage is essential to enable the implementation of the planned actions;
- **Phase 4 – Plan Conclusion**: The plan is finalized, but not yet formally approved. According to Santos *et al.* (2019), this phase is understood as a moment for adjustments, which may occur in a prolonged manner, according to the needs of the stakeholders.
- **Phase 5 – Approval**: Corresponds to the process of formal adoption of the plan by the competent authorities. This is the institutional validation of the proposed management arrangement, as highlighted by Ehler and Douvere (2009);
- **Phase 6 – Implementation**: This is the phase of concrete action, in which the plan is put into practice. Each entity involved becomes responsible for ensuring compliance with the previous stages. It is recommended that a continuous monitoring and evaluation program be instituted, ensuring that results are tracked and data are analyzed periodically (Ehler; Douvere, 2009);
- **Phase 7 – Revision**: Considered an adaptive phase, it allows for the revision of the plan based on new data, climatic alterations, political changes, or local needs. Ehler and Douvere (2011) and Santos *et al.* (2019) reinforce that this stage ensures the flexibility of the process, allowing for cyclical adjustments and replanning according to the region's dynamics.

It is worth noting that, as pointed out by Ehler and Douvere (2009), different tasks in stage 7 may correspond to different phases of MSP development: tasks 1 to 4 are included in phase 3, while task 5 is associated with phase 5. Phase 4, in turn, is not understood as an autonomous "stage" in the MSP cycle, but as an interval between stages that sometimes requires a considerable period. The terminology of step 3 may seem redundant in relation to phase 1; to avoid misinterpretations, the tasks of step 3 are identified separately, showing that they do not cover the entire range of actions of phase 1.

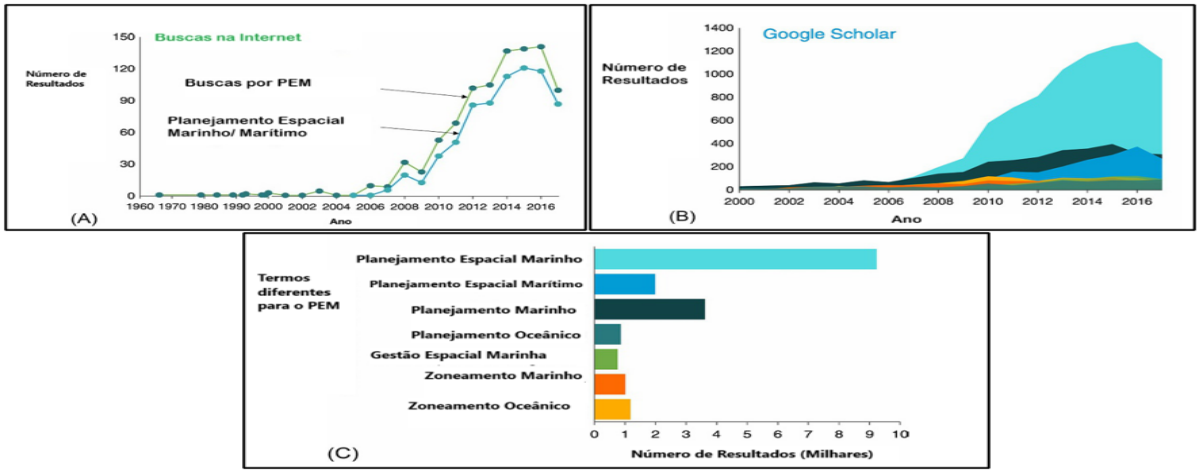
Thus, after phase 7, a new planning cycle begins, ensuring the continuity, adaptation,

and improvement of MSP, as a long-term public policy.

The development of MSP grows significantly as promoting institutions advance with real examples and, furthermore, with the dissemination of materials that not only facilitate understanding of the process but also function as guides, namely: in 2009, the IOC guide, *Marine Spatial Planning: A Step-by-Step Approach toward Ecosystem-based Management*, which helped several countries reconfigure their systems; in 2014, the *Marine Spatial Planning Evaluation Guide*, developed with the aim of helping marine planners and managers integrate and evaluate MSP; and, in 2021, the *Global MSP: International Guide on Marine Spatial Planning*, which further helped to elucidate, update, and direct the topic by integrating approaches and development, and also bringing efficient practices, encouraging managers to proceed with the process (UNESCO, 2023).

The term "MSP" gained global prominence after the holding of the *First International Workshop on Marine Spatial Planning* in 2006, the report of which was published as *Visions for a Sea Change: Report of the First International Workshop on Marine Spatial Planning* (UNESCO, 2006). Evidence of this process is the significant number of applications to the IOC event held in 2017 in Paris (Ehler; Zaucha; Gee, 2019; Olsen *et al*., 2014). This significant progress around MSP also extended to the academic environment, since Santos *et al.* (2019) demonstrate that the growing interest reached the scientific community, resulting in numerous contributions to academic production (Graph 1).

Graph 1 – Interest of the scientific community in MSP



Source: Santos *et al*. (2019, p. 572).

Academic research around the emerging field represented by MSP recorded high growth between the years 2003 and 2019 – about 44%, with a strong geographical link to the European

continent (Chalastani *et al*., 2021).

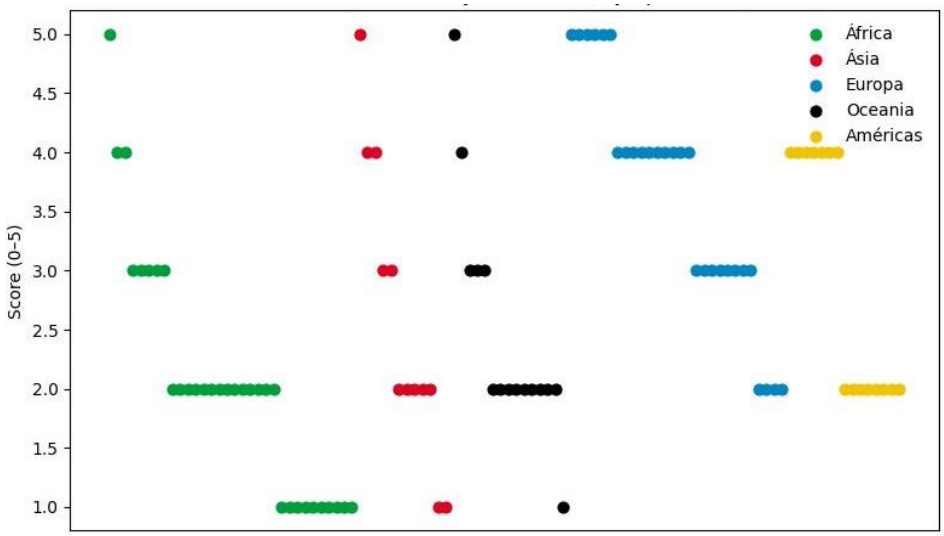
MSP has spread worldwide because it is an important analytical and political-administrative tool that helps to overcome previously perceived limits for ocean governance, becoming relevant in the current scenario due to the growing transformations resulting from human actions in the Anthropocene and global marine connections (Ehler, 2021; Ehler; Douvere, 2009).

Development of Marine Spatial Planning in the World

The increase in academic and scientific production pointed to the consolidation of MSP, evidenced by the significant growth in the number of searches and publications over the years, which reinforces the perception that, in the last two decades, several countries have been advancing in its implementation. In this context, the resolution approved within the European Union, subsequently consolidated in *Directive 2014/89/EU* (European Union, 2014)[6] of the European Parliament and of the Council, which establishes a framework for MSP in Member States with marine waters, represented a significant change in European ocean legislation and became a reference model on a global scale (Ehler, 2017). Synthetic evaluations indicate that, after about 20 years of experience, more than 75 countries have started to employ this approach as a practical tool for ecosystem-based management (Ehler, 2020).

The report *International Guide on Marine/Maritime Spatial Planning* (UNESCO, 2021) indicates that 22% of EEZs, in 20 countries, already had approved plans, while another 26 were in the approval phase and 82 had committed to the implementation of MSP. Recent studies indicate that about 80 countries are developing structured MSP initiatives, evidencing its growing diffusion and institutionalization in marine spatial planning policies (Li *et al*., 2025), as presented in Graph 2.

Graph 2 – Global Distribution of MSP until 2025



Source: Authors' elaboration.

The analytical overview synthesizes the global dynamics of MSP expansion into five degrees of maturity, which range from 1 to 5 and are organized by continent. Degree 5 corresponds to contexts in which MSP is consolidated, with established legal, institutional, and operational bases, while degree 1 indicates the absence of structured instruments or consistent information on its implementation.

In Europe, the distribution of MSP maturity levels evidences the most systematized context on a global scale, a result of its incorporation into economic development and environmental conservation strategies at the regional level. Countries of the North Sea and the Baltic, such as Denmark, Sweden, the United Kingdom, Germany, and the Netherlands, present the highest levels of maturity, with multiple planning cycles since the mid-2000s, strong integration with energy policies, especially the expansion of offshore wind, and broad regional cooperation, articulated by initiatives such as HELCOM and VASAB (Ehler, 2020; Kirkfeldt *et al.*, 2020; Li; Jay, 2020; Zaucha *et al.*, 2025).

In much of the continent, the first cycle of plans was completed under the European MSP Directive, with implementation and monitoring still in the process of institutional consolidation (Ansong; Calado; Gilliland, 2019; Kirkfeldt *et al.*, 2020; Zaucha *et al.*, 2025). In the Northeast Atlantic, pioneering countries, such as the United Kingdom and Ireland, coexist with more recent experiences, such as Portugal and Spain, reflecting different implementation paces. In the Mediterranean, Adriatic, and Black Sea, intermediate stages predominate, characterized by later entry, greater dependence on cooperation projects, and institutional and

sectoral coordination challenges, although with progressive advances in some countries. In general, the European case demonstrates a high degree of MSP institutionalization, consolidating it as a central instrument for marine spatial planning, articulating blue economy growth, regional integration, and environmental conservation.

Unlike the African continent, which has a predominance of countries at levels 1 and 2 of MSP maturity, indicating an initial stage of development, marked mainly by initiatives associated with the blue economy, ocean governance, and ecosystem projects still in consolidation. Intermediate levels are observed in countries such as South Africa, Namibia, and Angola, linked to regional initiatives such as the Benguela Current Large Marine Ecosystem (BCLME) and structured planning processes. Seychelles stands out as the only country at level 5, with a marine spatial plan covering 100% of its EEZ and considered a global benchmark, evidencing the strong heterogeneity in the stage of MSP implementation on the continent (Finke *et al.*, 2020a, 2020b; Kirkman *et al.*, 2019; Lombard *et al.*, 2019).

In Asia, there is also an uneven distribution of MSP maturity levels, reflecting different stages of institutionalization among countries. China stands out at the highest level, with a consolidated national marine functional zoning system, while Vietnam and Indonesia have advanced levels, supported by legal frameworks and national implementation processes. Most countries, however, are concentrated at intermediate and initial levels, characterized by still partial initiatives, pilot projects, or the absence of consolidated marine spatial planning structures, evidencing a regional development process that is still heterogeneous (Ashikur *et al.*, 2025; Duc *et al.*, 2023; Jattak *et al.*, 2023; Tran *et al.*, 2021; Yang; Yang; Chang, 2025).

In Oceania, the distribution of MSP maturity levels indicates a relatively structured, yet heterogeneous, framework between developed countries and small island states. Australia stands out at the highest level, being considered a pioneer in the use of marine zoning and presenting bioregional plans consolidated in a large part of its EEZ, integrated with conservation and the blue economy. New Zealand is at an advanced level, with processes oriented towards ecosystem-based management, while Kiribati, Vanuatu, and Fiji have intermediate levels, in which MSP is articulated with national ocean policies, the blue economy, and the management of use conflicts. In the small island states of the Pacific, initial or intermediate levels predominate, marked by recent initiatives, dependence on international cooperation, and a strong presence of marine protected areas and community management, often without the consolidation of a national MSP. The Solomon Islands represent the most initial level, characterized by the predominance of customary systems and the absence of formal

marine spatial planning structures (Charles; Chang, 2025; Issifu *et al.*, 2024; Singh; Linnér; Singh, 2025; Talbot-Jones *et al.*, 2025; Vince *et al.*, 2017).

In the context of the Americas, a heterogeneous picture is observed, in which small island states in the Caribbean have approved plans covering a large part of their EEZs, even with implementation challenges, while countries such as Ecuador, Canada, and Jamaica demonstrate technical and institutional advances that are still incomplete (Escandón-Panchana *et al.*, 2022; Flower *et al.*, 2020; Issifu *et al.*, 2024; Iturralde; Vera; Coronel, 2021; Johnson *et al.*, 2020; Lombard *et al.*, 2019; Mahadeo, 2022; Singh; Linnér; Singh, 2025). In contrast, Colombia, Peru, Panama, and Uruguay remain in intermediate or initial phases, characterized by pilot initiatives, consolidation of sectoral information, or institutional arrangements still under construction (Echevarría *et al.*, 2021; Iturralde; Vera; Coronel, 2021).

In prospective terms and in line with the 2030 Agenda, it is estimated that by 2030, about one-third of the world's EEZs will be covered by MSP plans or similar (Rampavila, 2025). This movement reflects the consolidation of MSP as a strategic tool for integrated ocean governance, articulating environmental conservation, economic development, and intergenerational justice.

However, the unequal distribution of technical capacities, institutional arrangements, and levels of implementation shows that the consolidation of MSP occurs asymmetrically between countries and regions, producing distinct rhythms of institutionalization and effectiveness. Among these cases, Brazil presents one of the most complex situations, due to the vast extent of its EEZ and the need for integration between sectoral policies and cross-border cooperation (UNESCO, 2021). This scenario points to the need for a more in-depth analysis of existing instruments and institutional challenges for the consolidation of Brazilian MSP, a topic addressed in the following section.

Marine Spatial Planning in Brazil

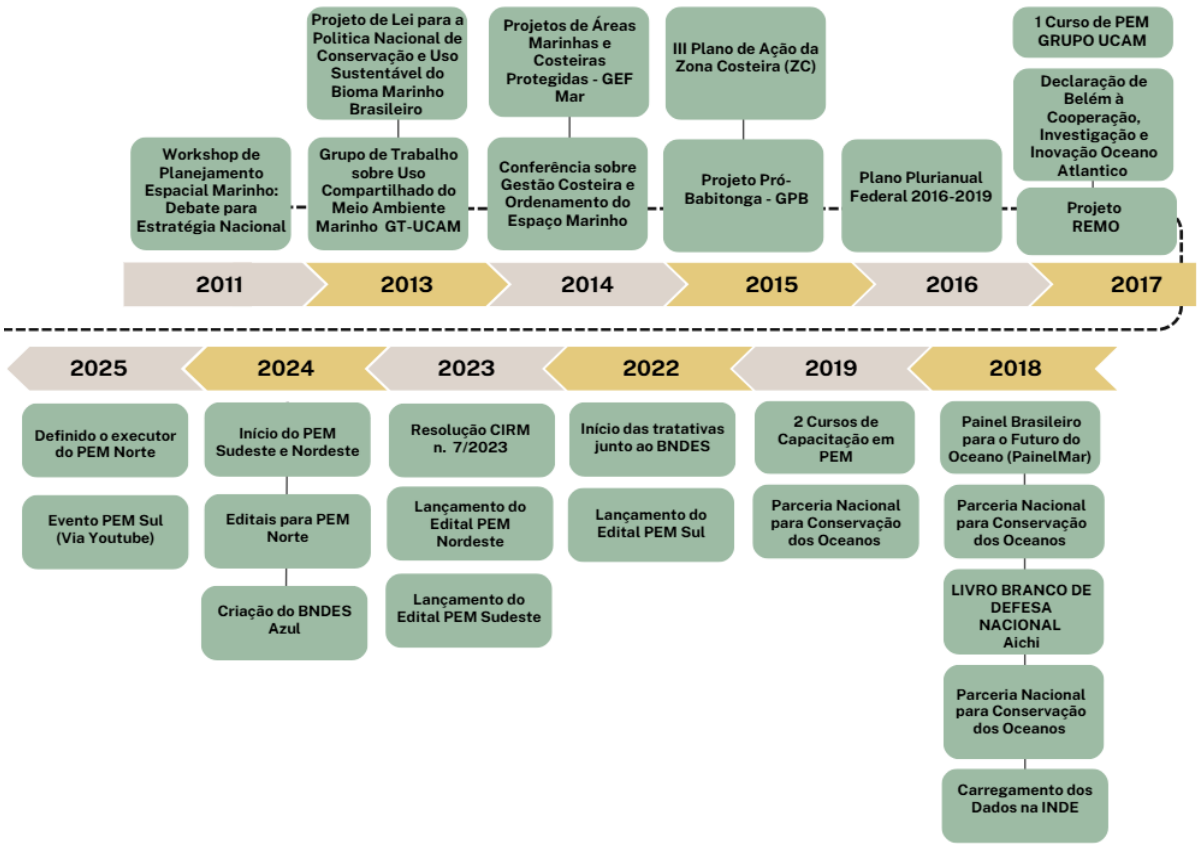
In the context prior to the formalization of MSP, Brazil already presented structural weaknesses in its normative and institutional framework aimed at ocean planning (Gonçalves; Martinez; Takahashi, 2017). The fragmentation or non-existence of regulatory and planning instruments is pointed out as the main cause of the impacts and conflicts perceived in the ocean; the overlapping of uses and interference compromise the integrity of ecosystems and marine biodiversity (Elfes *et al.*, 2014; Turra *et al.*, 2017).

These limitations had direct repercussions on strategic policies, affecting the environmental licensing of large projects, the designation and management of Marine Protected Areas (MPAs), and the integration between coastal and watershed management (Carmo, 2017; Gerhardinger *et al*., 2017; Magris; Pressey, 2018; Nicolodi *et al.*, 2018; Turra *et al*., 2017). In this scenario, instruments such as the Coastal Ecological-Economic Zoning (ZEEC) represented attempts at territorial organization.

Nicolodi *et al.* (2018) identify conceptual convergences between the ZEEC and MSP; however, although implemented in 8 of the 17 coastal states, the ZEEC proved limited in promoting integrated management, being largely restricted to the 12 nautical miles of the territorial sea. Furthermore, the lack of coordination between instruments and spheres of government produced decision-making fragmentation and, in some cases, normative overlaps, generating technical, managerial, and political conflicts (Gandra; Bonetti; Scherer, 2018; Telles, 2024).

The trajectory of MSP in Brazil, although gaining clearer operational and chronological contours from 2011 onwards, is based on the institutional robustness of the 2005 National Policy for Marine Resources (PNRM). This policy, by establishing guidelines for the sustainable use and sovereignty of the 'Territorial Sea', served as the necessary legal foundation for successive Sectoral Plans for Marine Resources (PSRM) to mature Brazilian management. Such obstacles, associated with inter-institutional coordination, database integration, social participation, and normative harmonization, configure a transition scenario still in consolidation. This complex web of evolution and challenges is summarized in Figure 4.

Figure 4 – Evolution of Marine Spatial Planning in Brazil



Source**:** Adapted from Gerhardinger *et al*. (2019).

The evolution of MSP in Brazil is not an isolated event, but the culmination of a governance process that transitions from a sectoral vision to an integrated and spatialized approach, based on the National Policy for Marine Resources (PNRM/2005).

Although the PNRM and successive Sectoral Plans for Marine Resources (PSRM) established sovereignty guidelines in the 'Blue Amazon', the operationalization of MSP as a State management instrument matured between 2011 and 2019. This period, marked by strategic negotiations between the Interministerial Commission for Marine Resources (CIRM), sectoral ministries, and UNESCO/IOC, had as a milestone the 2011 session of the Coastal Management Integration Group (GI-GERCO), which overcame initial resistance and institutionalized the debate via the Working Group on Shared Use of the Marine Environment (GT-UCAM).

Through the creation of technical subgroups and the inclusion of the theme in the Multi-Year Plan (2016-2019), the path was paved for the definitive normative transition in the X PSRM (2020-2023). This plan, by elevating MSP to a national priority, provided the ballast for CIRM Resolution No. 7/2023 and for the regional execution notices (South, Southeast,

Northeast, and North), definitively integrating spatial planning into the Defense strategy and the development of the Blue Economy (CIRM, 2023).

It is worth noting that, according to Gerhardinger *et al.* (2019), these initial negotiations, although fundamental for the design of MSP, were restricted to government organizations and technical consultants, with the primary objective of generating basic analytical knowledge. However, subsequent discussions revealed that, despite the theoretical framework of the GT-UCAM, the process faced stagnation due to the scarcity of investments and the rigidity of a highly hierarchical regulation (Magris; Pressey, 2018). This scenario of obstacles began to be overcome starting with capacity-building milestones, such as the first course held in 2017, where the essential steps for implementation were agreed upon: identification of authorities, search for financial support, organization of pre-planning, and multisectoral stakeholder involvement. Such guidelines emphasized the need for adaptive monitoring so that the plan could respond to the dynamic conditions of the marine environment (Sperle; Carvalho, 2024).

Parallel to the methodological maturation, the technical viability of MSP was boosted in 2018 by the start of data loading into the National Spatial Data Infrastructure (INDE). The initial diagnosis of this integration evidenced a critical fragmentation: although voluminous, geospatial data were dispersed among government entities, academic institutions, and research centers. The centralization of this information in the INDE Geoportal, which harmonizes bathymetry, geology, and oceanography data, became circumstantial for the systematization of MSP.

According to Almeida (2022), this integration reduces operational costs by avoiding duplication of collection, optimizing public and private efficiency in the Blue Amazon, and allowing the preparation of diagnostic maps and impact plans that consider the spatial and temporal distribution of economic uses and preservation areas. The practical consolidation of this structure occurred in 2020, with the definition of the South Region (Paraná, Santa Catarina, and Rio Grande do Sul) as the pilot project for the implementation of MSP in Brazil.

This milestone was accompanied by strategic negotiations with the National Bank for Economic and Social Development (BNDES), aiming to fill the historical gap in financial resources identified earlier. The negotiation between BNDES and the Secretariat of the Interministerial Commission for Marine Resources (SECIRM) aimed not only to finance the technical and operational studies of the pilot region but to institute a replicable model of governance and funding for the other regions of the country (BNDES, 2022; Carvalho, 2023), closing the cycle between the normative guideline and field execution.

In 2026, MSP in Brazil is experiencing its moment of greatest executive capillarity. The process has ceased to be just a multilateral intention (assumed at the 2017 Ocean Conference) to become a State policy formalized by Decree No. 12.491, of June 5, 2025 (Brazil, 2025), which instituted MSP nationwide. The coordination of the process is exercised by the Interministerial Commission for Marine Resources (CIRM), through its Executive Committee (CE-PEM). Governance was recently updated by CIRM Resolution No. 7/2025, which expanded the committee's composition to include 21 bodies, ranging from ministries to regulatory agencies, ensuring the multisectoral nature of the planning (CIRM, 2025).

Table 3 details the analytical development of the project, the regions in stages, and the preliminary results according to official publications from the Brazilian Navy (SECIRM), MMA, and BNDES.

Table 3 – *Status* by Region

Region	Status in 2026	Executor/Consortium	Official Observations
South	Final Phase (Diagnosis/Prognosis)	Pilot Project (BNDES/SECIRM)	Started in 2024. It is the country's methodological laboratory.
Southeast	In Active Execution	Sudeste Azul Consortium (FGV/EnvironPact)	Covers 82% of the blue economy (Oil, Gas, and Ports).
Northeast	In Execution/Data Collection	Support from FUNBIO/MMA	Officially launched in May 2025.
North	Start of Implementation	Led by FGV (2026 Contract)	Focus on the Amazon river mouth and environmental sensitivities.

Source: Authors' elaboration.

South Region: The Methodological Laboratory

Started in 2024, the South Region served as a pilot project for the validation of national metrics. Under the execution of the company Codex Remote, the project received an investment of R$ 7 million (non-reimbursable) with an expected duration of 36 months:

- *Executive Phases:* The schedule was divided into: (I) integration of dispersed data; (II) identification of potential uses; and (III) application of analytical intelligence for zoning inference (BNDES, 2024).
- *Results (2025-2026):* The Planning Management Units (UGP) and the preliminary diagnosis of conflicts between port infrastructure and artisanal fishing were

consolidated (MMA, 2025).

Southeast Region: Economic Density and Use Conflicts

The Southeast Region concentrates 80% of the Brazilian blue economy. The project is operated by the Sudeste Azul Consortium (FGV and EnvironPact), with a contribution of R$ 12 million:

- *Analytical Focus*: The coexistence between hydrocarbon exploration and the implementation of offshore wind farms. In 2025, primary data collection and state seminars were completed, advancing to the modeling of future use scenarios (FGV, 2025).

Northeast Region: Conservation and Tourism

Unlike the previous regions, the Northeast uses FUNBIO as a central financial mechanism. Technical execution is the responsibility of the Norte-Rio-Grandense Foundation for Research and Culture (FUNPEC).

North Region: The Equatorial Margin Frontier

The North Region represents the most complex challenge due to high biological productivity (EBSA):

- *Current Status (2026):* After the selection process initiated by BNDES FEP Call No. 1/2025, the executing consortium began the technical survey phase in the first half of 2026 (BNDES, 2025). The central objective is the mapping of the Amazon river mouth and the balance between the new energy exploration frontier and local biodiversity.

The Academic Contribution to the Implementation of MSP in Brazil and Research and Innovation in the Decade of Ocean Science

The contemporary landscape of global ocean governance was significantly influenced by the *World Ocean Assessment* (WOA) report, published in 2017. This technical document

provided the empirical basis for the urgency of multilateral actions aimed at the sustainable management of marine resources, culminating in the structuring of Sustainable Development Goal 14 (SDG 14) of the 2030 Agenda (UN, 2015). The implementation of these goals requires a multidimensional approach, ranging from the mitigation of transboundary pollution and ocean acidification to the conservation of 10% of marine areas and the strengthening of international law via UNCLOS (IPEA, 2019).

1. **Reduce marine pollution (14.1):** decrease ocean pollution, especially that originating from land-based activities, such as plastic waste and chemical pollutants;
2. **Sustainably manage marine and coastal ecosystems (14.2):** protect and restore ecosystems, such as coral reefs, mangroves, and seagrass beds;
3. **Reduce ocean acidification (14.3):** minimize impacts of acidification caused by increased CO2, promoting scientific research and mitigation actions;
4. **Regulate fishing and eliminate predatory practices (14.4):** end overfishing and destructive practices, ensuring healthy fish stocks;
5. **Conserve 10% of coastal and marine areas (14.5):** create and expand marine protected areas (MPAs) by 2030;
6. **Prohibit harmful fishing subsidies (14.6):** eliminate subsidies that encourage predatory and illegal practices, promoting sustainable fishing;
7. **Increase economic benefits for developing countries (14.7):** support the sustainable development of coastal nations, especially Small Island Developing States (SIDS);
8. **Improve scientific knowledge and marine technology (14.A):** invest in research, technology, and innovation for ocean conservation;
9. **Ensure access for artisanal fishers (14.B):** protect the rights of small-scale fishers and ensure equitable access to marine resources;
10. **Implement international law for ocean conservation (14.C):** strengthen ocean governance by implementing international treaties, such as the United Nations Convention on the Law of the Sea (UNCLOS).

In this context, Polejack *et al.* (2025) highlight the importance of ocean science diplomacy as a tool to promote international cooperation and the balance between global scientific capabilities, especially in developing countries, during the Decade of Ocean Science. Thus, one notes the agglutination of common objectives and interests with the MSP, which,

recently, is also coordinated by the Interministerial Commission for Sea Resources (CIRM) and the Ministry of the Environment and Climate Change (MMA), which, through the Secretariat of Coastal Management and Marine Spatial Planning, is one of those responsible for coordinating and implementing integrated strategies for the sustainable management of the Brazilian coastal zone and marine space. Scherer and Nicolodi (2021) reinforce that the integration between ocean science and governance, as in the case of the MSP, is essential to address socioeconomic and environmental challenges, promoting the sustainable use of marine resources.

Within the strategic scope of this secretariat, initiatives such as Pró-Manguezal, Pró-Coral, and the National Strategy for a Plastic-Free Ocean have been consolidated. Such actions ratified Brazil's environmental geopolitical prominence, especially during the BRICS and G20 presidencies, where the country led marine conservation measures. In this sense, Polejack *et al.* (2025) point out that scientific diplomacy in the Atlantic has strengthened this regional leadership, promoting strategic partnerships for the sustainable use of the oceans and elevating the country as a mediator between technical knowledge and global governance.

The hosting of COP 30, in Pará, consolidated this commitment by positioning Brazil at the center of global climate dialogues. The event's summary highlights the integration of the Amazonian agenda into the "Blue Amazon," ensuring that decarbonization included the protection of coastal ecosystems. These multilateral knowledge transfer maneuvers were vital for ocean innovation, demonstrating that multidimensional governance is inseparable from integrated global strategies. Thus, COP 30 acted as a catalyst for international cooperation, which is essential to address the challenges identified in the WOA and SDG 14.

Given this scenario, Brazil has much to gain from international cooperation on ocean-related issues, expanding the possibilities for scientific and academic exchange, new demands and calls for proposals, and support and cooperation for research. These strategic partnerships are necessary for the MSP and Integrated Coastal Management and are essential for bringing society closer to engagement and the dissemination of knowledge. Polejack *et al.* (2025) emphasize that ocean science, combined with diplomacy, can promote the inclusion of traditional communities and dialogue with international actors for more equitable and sustainable governance. From this perspective, it is necessary to seek, in the knowledge of the traditional communities that live in these environments and who, notably, learn and develop adaptation techniques, resilience and mitigation in the face of ongoing transformations; traditional knowledge, combined with science, can offer new models of creative strategies that contemplate a sustainable, fair, and viable economy to meet social challenges.

Innovation and technological development, integrated with the traditional knowledge of indigenous peoples, quilombolas, fishermen, shellfish gatherers, and gypsies, enable an improvement in

the sector's production processes and the supply chain in general, meeting demands and moving alongside global climate policies, in order to encourage scientific research, marine conservation, and sustainable development. Current demands point to an exponential knowledge gap regarding the country's coastal and marine environment, which makes it impossible for these managerial and regulatory decisions to be made, but reinforces the joint action of civil society, the private sector, and the government through the CIRM. Promoting the MSP process in a country of continental dimensions like Brazil is, without a doubt, a challenge that requires multilateral efforts and cooperation across various instances, bodies, and society in general. Polejack *et al.* (2025) reinforce that the Decade of Ocean Science offers a timely framework to overcome these gaps, seeking to promote research and capacity building on a large scale.

Good marine and coastal socio-environmental practices should be taken as an auxiliary parameter in combating pollution, ensuring the long-term protection, restoration, and resilience of marine ecosystems and species, in addition to serving as an important mechanism for action in the face of intensifying climate change (Santos *et al.*, 2024). In this scenario, the MSP emerges as the vector for mobilizing the Brazilian community. To this end, its procedural rite must be didactic and widely accessible to all social actors involved, from policymakers and private sector investors to, primarily, traditional communities and indigenous peoples, whose ways of life depend directly on the integrity of these biomes.

This accessibility, of a continuous nature, ensures the right to knowledge and the capacity for adaptation. Its benefits consolidate legal certainty for investments and generate tangible economic advantages through employment and income, provided that decision-making is based on precautionary principles and respects the socio-environmental singularities of each region. Thus, permanent exchange between managers, academia, civil society, and holders of traditional knowledge becomes fundamental, ensuring that the MSP is, in fact, an inclusive and sovereign instrument of governance.

The analysis of the effectiveness of this procedural rite reveals that the participation of communities, although institutionally provided for, faces the challenge of information asymmetry and ocean literacy. Between August and October 2025, according to the project's official execution calendar, the holding of sectoral workshops and the data validation stages represented critical moments for defining interests and resolving spatial conflicts. During these sessions, the recovery and refinement of maps of critical habitats and ecosystem services were essential to give visibility to traditional uses that are often omitted in purely technocratic surveys. However, it is observed that real community involvement in these workshops depends

on the State's ability to translate complex data into understandable cartography. The 2025 experience demonstrated that, where there was prior integration between academia and local knowledge, systemic service maps ceased to be mere biophysical representations to become instruments for defending territorial rights, ensuring that the definition of areas of economic interest does not occur to the detriment of the ecological and social resilience of coastal zones.

In this sense, one must consider, throughout the process, the effective participation of Coastal Management (GERCO), which has a historical base of action in coastal management up to 12 NM, expanding the possibility of collaboration and creation of management strategies. This relationship not only helps in the context of avoiding dualities, re-analyses, or clashes of regulatory and methodological instruments, but it rescues the initiatives and policies made within the scope of coastal management, which deals with coastal communities at detailed scales and has a long history of community participation and data systematization regarding them (Scherer; Nicolodi, 2021); the integration of GERCO with MSP can strengthen coastal governance, promoting a participatory and inclusive approach that respects the needs of local communities.

Contradictions and Challenges in Marine Space Management: A Critical Geographic Perspective

The main criticisms surrounding the implementation process of Marine Spatial Planning are related to issues such as equity, ecological effectiveness, and social participation. They are inherent to any territorial planning process, but result in tensions between economy, environment, and society, highlighting conflicts between different scales and interests (Apine; Stojanovic, 2024; Gorjanc; Stojanovic; Warren, 2024).

The MSP process is complex and seeks to balance economic, environmental, and social interests in the sustainable use of the oceans. The main criticisms of MSP, as highlighted, revolve around equity, ecological effectiveness, and social participation. Below, it is exemplified how these points can be considered in the process, based on the contributions of Apine and Stojanovic (2024) and Gorjanc, Stojanovic, and Warren (2024).

- **Equity**: An MSP process that prioritizes equity must ensure the fair distribution of benefits and costs associated with the use of marine resources. For example, in a hypothetical case of marine zoning for aquaculture, the process can include policies that

ensure the access of traditional coastal communities to fishing areas, avoiding their exclusion by large companies. Apine and Stojanovic (2024) argue that equity in MSP requires the integration of perspectives from marginalized communities, such as artisanal fishers, to mitigate socioeconomic inequalities. This can be implemented through access quotas or financial compensation, ensuring that vulnerable groups are not disproportionately affected;

- **Ecological Effectiveness**: Ecological effectiveness in MSP involves the creation of conservation zones that protect marine ecosystems without compromising biodiversity. For example, when planning a marine protected area (MPA), the process can include the identification of critical habitats, such as coral reefs, based on robust scientific data. Gorjanc, Stojanovic, and Warren (2024) highlight that ecological effectiveness depends on the application of adaptive management models, which adjust protection zones as new scientific evidence emerges. A practical example would be the implementation of temporary exclusion zones to allow for the recovery of fish stocks, monitored by biodiversity indicators;
- **Social Participation**: Social participation is essential to legitimize MSP and reduce conflicts. A participatory process can include public consultations and workshops with stakeholders, such as NGOs, scientists, industry, and local communities, to co-construct the zoning plan. Apine and Stojanovic (2024) emphasize that social participation must be inclusive and continuous, using digital and in-person platforms to engage diverse groups. For example, in an MSP project, the creation of advisory committees with representatives from different sectors can ensure that minority voices are heard, promoting transparency and acceptance of the plan.

These examples illustrate how MSP can address equity, ecological effectiveness, and social participation, aligning with the recommendations of Apine and Stojanovic (2024) and Gorjanc, Stojanovic, and Warren (2024). The integration of these principles is fundamental to mitigate tensions and promote sustainability in the use of marine resources, preventing planning from becoming merely a bureaucratic facilitator for hegemonic sectors.

An ineffective process runs the risk of prioritizing corporate interests under a neoliberal agenda, transmuting maritime space into an asset for intensive resource exploitation or the installation of *offshore* structures, with an exclusive focus on sectoral developmentalist objectives (Jones; Lieberknecht; Qiu, 2016). Regarding the asymmetry in the distribution of

benefits generated by the application of these spatial planning instruments, Harvey (2005) warns that such logic tends to favor capital accumulation by large enterprises. In the process, the concession of extensive marine areas to the private sector ends up promoting the enclosure of the sea (*ocean grabbing*), severely limiting the access and subsistence of fishers and traditional communities.

This logic has led to the overvaluation of the economic potentials of marine space, which ends up diverting attention from central axes of MSP, such as addressing climate change and promoting ocean health. Santos (1996) argues that globalization imposes a logic of *verticalities*, characterized by flows of external decisions and interests that prioritize economic efficiency and the immediate exploitation of the territory. According to the author, this technical and instrumental rationality disarticulates *horizontalities* - local ways of life and the solidarity-based use of the territory - compromising the sustainability of life and the organic integration of communities with their space, since the territory begins to be used as a resource at the service of global actors and not as the place of collective existence.

These issues have proven to be one of the vulnerable parts of the MSP implementation process; the formation of initial trials regarding MSP brings up issues such as scale and reduced, or in some cases disregarded, traditional participation. In order to overcome this and propose fair planning, communication and awareness about ocean culture must be ensured in diverse spheres of society, materializing, beyond the spatial reality, at different scales, the processes surrounding uses, activities, symbologies, and techniques (Telles, 2024).

These measures dialogue with issues pertinent to marine geography, which deals with the occupation of coastal environments, as well as alterations and factors that affect the intensity and spatial distribution of phenomena related to coastal geomorphology, impacts on their ecosystems, mapping of ocean pollutants, conservation of marine ecosystems, basin management, resources and services provided by the ocean, flood events, as well as research in monitoring and disseminating knowledge about coastal and marine environments (Lins-de-Barros, 2024; Neves; Muehe, 2008).

In this sense, marine geography can expand its relevance, in the scientific community and in the context of MSP, assisting in decision-making, between the generation of knowledge and the governance of the marine territory and its parcels (ocean and coast), and in the dialogue with traditional communities. Therefore, marine geography possesses valuable theoretical contributions to be leveraged, since the analytical systematization pertinent to this science allows geographers a methodological enrichment in relation to MSP, acting in a

multidimensional and operational scope in the cultural, social, economic, and political dimensions of the process (Telles, 2018).

Final considerations

MSP is configured as an essential resource for the sustainable governance of coastal and oceanic spaces, offering an integrated approach capable of reconciling multiple uses, promoting environmental conservation, and fostering inclusive economic development. This study highlighted how MSP developed globally, based on consolidated experiences in countries such as Australia, Canada, China, and members of the European Union, which served as a reference for the structuring of normative, methodological, and technical frameworks, now disseminated in various regions of the world.

The historical and conceptual analysis demonstrated that MSP is not limited to a single model, but is configured as a continuous, adaptive, and territorialized process, whose effectiveness depends on the articulation between science, politics, society, and technology. In this sense, advances in the use of geospatial tools, the importance of scientific production, and the protagonism of scientific diplomacy stand out as key elements for the consolidation of marine plans that are consistent and responsive to regional specificities.

In the Brazilian context, a trajectory marked by important institutional advances was observed, such as regional pilot projects, the structuring of shared databases, and interministerial action. However, significant challenges persist, such as the fragmentation of policies, the absence of integrated governance, and the need for greater social participation, especially of traditional communities and historically marginalized sectors. Overcoming these barriers requires robust political commitment and the strengthening of participatory and inclusive mechanisms.

From the perspective of marine geography, this article also sought to shed light on the importance of territorial scales and sociocultural dimensions in the construction of fairer and more effective marine spatial planning. The incorporation of critical and interdisciplinary approaches allows for a broader understanding of the conflicts, tensions, and possibilities that involve the uses of the sea and the coastal zone, reinforcing the need for management models that value local knowledge, socio-environmental justice, and the resilience of marine ecosystems.

Finally, it is reinforced that studies like this are fundamental to deepen the debate on MSP, both in Brazil and in the international scenario. By systematizing advances, obstacles, and perspectives, it contributes to the improvement of public policies aimed at the ordering of marine space, the strengthening of ocean governance, and the promotion of sustainability. Faced with the transformations of the Anthropocene and the urgency of global climate agendas, MSP represents a strategic opportunity for articulation between science, society, and the State, in favor of a fairer, more resilient, and sustainable oceanic future.

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