



PLASMAR

Bases para la planificación sostenible de
áreas marinas en la Macaronesia

Activity 2.1.1. c&d;
Good Environmental Status &
Maritime Activities

TECHNICAL REPORT

PLASMAR Consortium



PROYECTO COFINANCIADO
POR LA UNIÓN EUROPEA
Investigación
e innovación



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1 Introduction

PLASMAR project aims at the definition and proposal of robust scientific methodologies in support of Maritime Spatial Planning (MSP) and Blue Growth in the three archipelagos included in the Macaronesian Region, searching for smart solutions to harmonize Blue Growth development of diverse maritime sectors and the conservation of its natural marine heritage.

This study uses the framework established by **Marine Strategy Framework Directive 2008/56/EC (MSFD)**, **on Good Environmental Status (GES)**, to analyze what are the significant risks and environmental issues associated with the **offshore wind sector, maritime transport, fisheries and aquaculture**.

Within Activity 2.1.1 c&d has been delivered **three objectives**:

1. Identify **relevant environmental issues**, reviewing scientific and technical reports, per each identified maritime activity (documented with analyses delivered by task 2.1.1a). These reviews were following EU environmental legislation framework - Marine Strategy Framework Directive, using Good Environmental Status as a check list -that consist of 11 quality descriptors divided in 37 criteria elements (MSFD/GES)
2. **Develop framework for EIA** for each identified maritime activity based on EU environmental legislation framework - MSFD/GES; Apply to case of the Macaronesian Region, following the progress of previous and current PLASMAR activities.
3. **Establish base for the development of the zoning method** - that will be used in 2.1.2 Pilot Zoning – identification of areas for Blue Growth applying ecosystem approach. Identified criteria elements form MSFD/GES checklist will identify and provide significance of parameters needed for maritime sectors environmental suitability zoning.

During the project were delivered following activities:

1. Blue Growth & Good Environmental Status - PLASMAR open workshop - MaPSIS 2017
2. Analysis of the Aquaculture Industry in the Macaronesia under MSFD (2017)
3. Internal PLASMAR Workshop on Good Environmental Status & Aquaculture (2018)
4. Analysis of the Off-shore Wind Industry in the Macaronesia under MSFD
5. Analysis of the fisheries industry in the Macaronesia under MSFD
6. Analysis of the maritime transport in the Macaronesia under MSFD
7. Analysis of the sand extraction in Macaronesia under MSFD

These activities are briefly described and provided links into to individual reports or publications.

2 Partners involved

- Universidad de Las Palmas de Gran Canaria (Activity coordinator);
- Gestión del Medio Rural de Canarias, S.A.U;
- Direção Regional dos Assuntos do Mar;

- Agência Regional para o Desenvolvimento da Investigação, Tecnologia e Inovação;
- Secretaria Regional do Ambiente e dos Recursos Naturais;
- Dublin Institute of Technology.



3 Results

3.1 Analyses of maritime sectors under MSFD

3.1.1 Blue Growth & Good Environmental Status - PLASMAR open workshop - MaPSIS 2017

Within the framework of the EcoAqua project, an international Conference dealing with *Maritime Spatial Planning, Ecosystem Approach and Supporting Information Systems* (MaPSIS) was held from 24-28 April, in Las Palmas de Gran Canaria. The main goal of MaPSIS 2017 was to bring an open forum for researchers, policy and decision makers, professionals and other stakeholders involved in the European Marine Strategy Framework Directive, Maritime spatial planning, Marine environment, Marine policies and Maritime open data access. In this sense, the conference scope was to show the state of the art and offer the proper arena for exchange of information and scientific discussions in the above mentioned topics, with special focus in the seas around the European Outermost Regions.



Figure 1 - PLASMAR open workshop was held at the University of Las Palmas Rectorate forecourt area during the MaPSIS conference

Five separate workshops were held as part of the MaPSIS event, with active participation of the conference attendants in a lively atmosphere, which resulted in a pro-active and constructive attitude towards the specific challenges presented in each workshop. PLASMAR project partners delivered workshop with title “Blue Growth vs Good Environmental Status - PLASMAR open workshop”. During workshop introduction is briefly explained PLASMAR project goals and planned activities.

The objective of the workshop was to analyse the relationship between specific maritime sectors (aquaculture, transport, tourism, fisheries and renewable energies) and the application of the 11 qualitative descriptors that determine the good environmental status (GES) according to the MSFD.

- Workshop report with detail results is available:
<https://docs.google.com/document/d/1B7xtQhu5xAlk1eZnT5ukdj8a4tuBxfFW5P/PcjKyYzFE/edit>

3.1.2 Analysis of the Aquaculture Industry in the Macaronesia under MSFD.



Figure 2 - Poster with illustration for the analyses of Aquaculture.

In the Macaronesia Islands, particularly for Canaries and Madeira, marine aquaculture is a fast-growing industry, with most fish farms established offshore. Over the project PLASMAR - Setting the bases for Sustainable Maritime Spatial Planning in Macaronesia (Interreg POMAC 2014-2020) participated by working groups of Madeira, Canaries and Azores, the ARDITI team (Madeira) took over the challenge of the analysis of aquaculture in these outermost regions in the frame of the Marine Strategy Framework Directive on Good Environmental Status - MSFD/GES. Out of 11 criteria and 42 descriptors of GES, we have identified just 5 major descriptors of potential high environmental impact for the activity, all with broader extent than the operative maritime area. Notwithstanding the above, in 4 out of 5 descriptors there are solutions to avoid, prevent, reduce or offset the pressure, and for all of them there are presently impact mitigation measures and monitoring methods. The initial goal was achieved, allowing to identify relevant environmental issues of aquaculture development in the Macaronesia Islands and to establish a framework for environmental impact assessment. The analysis and results of the work are available in the report Png-Gonzalez L., Andrade C., Abramic A., Nogueira N. 2019. Analysis of the aquaculture industry in Macaronesia under MSFD. Report prepared as part of PLASMAR Project (co-financed by ERDF as part of POMAC 2014-2020). 53 pp. Available at: <https://acedacris.ulpgc.es/handle/10553/55195>

Workshop

As part of the PLASMAR project, two members of the partner Regional Agency for the Development of Research, Technology and Innovation (ARDITI) from Madeira (Portugal) visited the University Institute ECOAQUA (IU-ECOQUA) between 19-23 March 2018 at Gran Canaria (Canary Islands, Spain) for the progress of the coordinated action on the assessment of GES & Aquaculture (defined as project task 211c&d. This task had been initiated during MaPSIS 2017 Conference PLASMAR Open workshop on “Blue Growth & GES”. The Expert’s Workshop had been programmed in accordance with the Coordinator of the PLASMAR project as an optimal opportunity to add to that project task the support, expertise and inputs from scientists belonging to the Aquaculture Research Group and to the Biodiversity and Conservation Research Group, both part of the IU-ECOQUA.

A dynamic and participatory workshop session entitled "Good Environmental Status & Aquaculture", was developed on Wednesday of 21st March at the IU-ECOQUA facilities in the Marine Technological Science Park, Taliarte (Gran Canaria). In addition to the workshop session, time was allocated to the project task review, mainly between the two visitors (ARDITI members) and the staff assigned to the PLASMAR project in the IU-ECOQUA. The main discussion included identification of key issues to be solved (identifying significant quality descriptors and criteria for aquaculture), major clarifications to be obtained from experts, preparation of materials, analyses of main workshop outcomes, and also to further expert consultations if required.

As a result, experts from ARDITI and IU-ECOQUA delivered a detailed review of the Aquaculture interaction with marine environment, based on Good Environmental Status (GES) quality descriptors defined by the Marine Strategy Framework Directive 2008/56/EC and Commission Decision 2017/848/EU.

The detail report is available:

https://drive.google.com/file/d/1ru4PacLglwVx4OugrXuKF_YmiAVweaqf/view?usp=sharing%20

3.1.3 Analysis of the Offshore Wind Industry in Macaronesia under MSFD

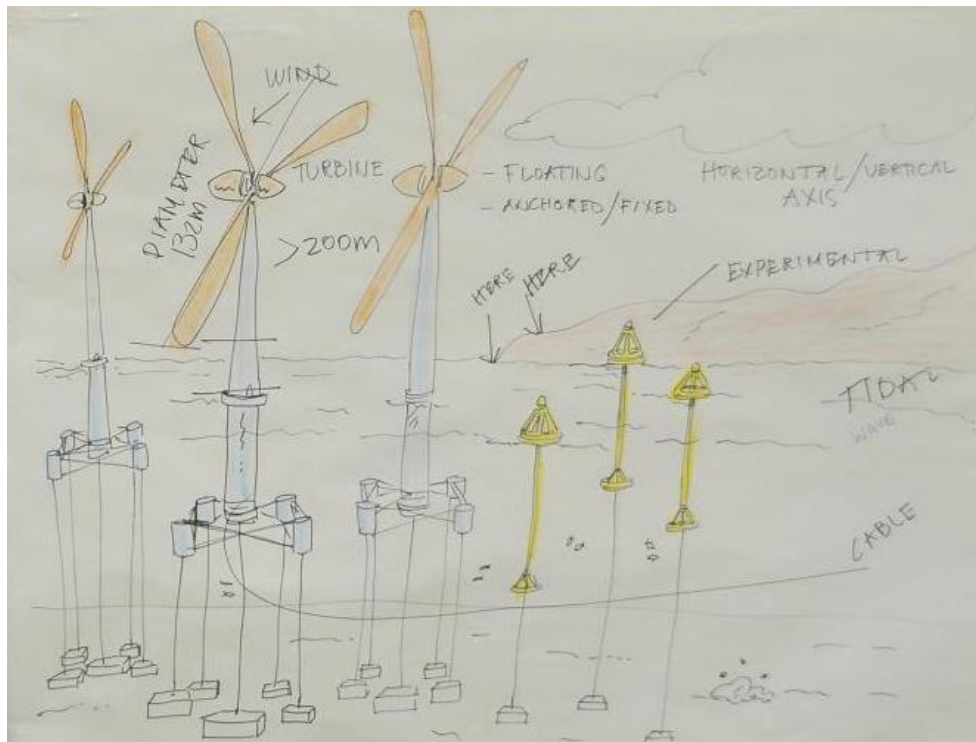


Figure 3 - Poster with illustration for the analyses of Renewable energies

We have followed 11 quality descriptors, and related 42 criteria elements to deliver a detailed review of scientific and technical reports related to the offshore wind sector. The reviews included the results of revised reports setting out the potential environmental problems / issues that can be expected during the construction phase, during the OWF operational phase, as well as the decommissioning phase. Additionally, the outputs of a specific workshop conducted in 2017 (as part of the EU EcoAqua ERA-Chair project), when only 11 quality descriptors were considered, was incorporated as first approach to OWF and MSP. Additionally, experts on environmental impact assessment and offshore wind engineering experts were consulted to clarify specific topics. Therefore, for each environmental issue identified, the spatial extent of environmental impact was analysed, (engineering) solutions for the environmental pressures identified, and mitigation for specific impacts established. Finally, we attempted to identify the most efficient techniques for monitoring, that can provide robust information about the OWF practices and whether or not, these exceed sustainable limits on marine environment.

Within this study we delivered a checklist, following the GES framework, that provides information about what types of impacts can be expected, what environmental issues can be avoided and what measures can be implemented to mitigate those impacts.

The results of this study include valuable information for the Environmental Impact Assessment (EIA) process, listing topics that should be elaborated within the Environmental Impact Study (delivered by promoter) and included in the Environmental Impact Decision.

The GES checklist for OWF is developed within the PLASMAR project, as part of the multi-component methodology, developed and applied for a MSP zoning process. This study covers environmental components - parameters for the multi-parameter analysis for zoning of offshore wind sector. Applying results and the related zoning method with

appropriate data will allow the identification of potential areas for OWF development with the lowest likely environmental impact.

The detail report is available on the PLAMSAR web page, in the Products section, technical reports, with name:

[Analysis of the Offshore Wind Industry in Macaronesia under MSFD.](#)

<http://hdl.handle.net/10553/56280>



3.1.4 Analysis of the professional fishing sector in Macaronesia under MSFD



Figure 4 - Poster with illustration for the analyses of Fisheries

A detailed bibliographic review was carried out to assess the positive or negative effects that fishing has on the descriptors included in the Marine Strategy Framework Directive. The impacts that fishing has on marine ecosystems and biological communities are many and varied, in time and space. For this reason, we focused the review on the impacts that could be associated with the technical characteristics of the fishing fleets that operate off the archipelagos of the Canary Islands, Madeira and Azores, their fishing gears and their target species.

Based on the information consulted, it was determined what types of impacts could be expected, their spatial extent and the mitigation measures that could be implemented. Likewise, possible monitoring methods were proposed whose application would be feasible in the archipelagos. The descriptors that are most affected are those related to biodiversity (D1), commercially-exploited species (D3), food-webs (D4), sea-floor integrity (D6) and marine litter (D10). The impacts of fishing on the other descriptors are either indirect or has not been quantified due to the lack of information, therefore it is recommended that new studies be carried out to fill these gaps in the future.

This study will complement those carried out for the rest of the activities, in order to perform a multiparameter analysis that allows establishing a marine spatial planning in the Macaronesian region under an ecosystem approach.

The detailed report is available on the PLASMAR web page, in the Products section, technical reports, with name:

[Analysis of the professional fishing sector in Macaronesia under MSFD.](#)

<http://hdl.handle.net/10553/56367>

3.1.5 Analysis of the maritime transport sector in Macaronesia under MSFD



Figure 5 - oster with illustration for the analyses of Transport.

The target of this report is the identification of relevant environmental issues, but also possible solutions related to the maritime transport in the Biogeographical Region of the Macaronesia under Marine Framework Strategy Directive perspective.

A detailed bibliographic detailed review of scientific and technical reports was carried out to assess the positive or negative effects or impacts that maritime transport can provoke. Therefore, for each environmental issue identified, the spatial extent of environmental impact was analysed, solutions for the environmental pressures identified, and mitigation for specific impacts established. In the end, was identified if exist some monitoring method available.

Within this study was developed a checklist, following the GES framework, that provides information about what types of impacts can be expected, what environmental issues can be avoided and what measures can be implemented to mitigate those impacts.

The descriptors that are most affected are those related to biodiversity (D1), non-indigenous species(D2), marine litter (D10) and energy, including underwater noise (D11).

This study will complement those carried out for the rest of the activities, in order to perform a multiparameter analysis that allows establishing a marine spatial planning in the Macaronesian region under an ecosystem approach.

3.1.6 Analysis of the sand extraction sector in Macaronesia under MSFD

Understanding the impacts of the extraction of marine aggregates on seabed requires knowledge about the resilience of the affected physical and biological features of the ecosystem. The recovery of seabed habitats from dredging depends on the dynamics of the sediment in and around the extraction areas, the distribution of the biological communities as well as on the extension of the exploited areas.

Marine sand and gravel are primarily extracted through the action of either trailers or static suction hopper dredgers. Specifically, the potential damages of the extraction is site-specific and linkable to a number of factors such as dredging method or intensity, local hydrodynamics, sediment grain size, bottom topography and bio-ecological parameters of the affected community. Dredging operations changes the seabed integrity through removal of seabed sediments and biota components, increases the turbidity, due to the formation of sediment plumes, smothering flora and fauna through deposition of fine sediment, releases of nutrients and chemicals to the water column and a locally increase on the underwater noise.

It is expected that the direct removal of surface aggregate sediments and the non-selective extraction of associated flora and fauna may result in a local decrease of species diversity, abundance and biomass. Impacts can either affect areas within and around the dredging site and habitat quality, as well as ecosystem functioning throughout wider areas. Removal of aggregates has an immediate and obvious impact on living communities in the active dredge zones whether these comprise coarse material dominated by long-lived epifauna. Changing of the composition of seabed deposits has, however, a wider and potentially long lasting impact on marine biotopes.

Physical and biological recovery from aggregate dredging is considered achieved when dredged tracks, scours or dips are no longer detectable and when sediment composition and biological community structure are significantly not different from pre-dredge conditions or from adjacent reference non-exploited sites. Dredging disturbance of the sediments can release contaminants into the water column, which has the potential to change chemical properties of the sediments, and reduce the water quality for a period of time after the dredging activities have ceased, once suspended contaminants can become available to marine organisms, and potentially accumulate up the food chain.

Dredgers may still be regarded as just noisy ships, and as such, in terms of acoustic energy deposited into marine environment in a given time, they are still much less noisy than other sources of anthropogenic noise such as marine piling and geophysical surveying.

In Madeira and Azores archipelagos, this exploitation activity, which supports mainly the construction industry, has developed since the late 1990s.

Based on preliminary data, it is considered that the current levels of dredging for sand in the Azores present a low impact on the seabed structure, given the small-scale of the activity and the high resilience of the ecosystem (no differences were detected between exploited areas and reference sites). Thus, based on this preliminary study, it is concluded that sand extraction seems not to be currently affecting negatively the Good Environmental Status of the seabed around the islands. Nevertheless, the activity will be continuously monitored under the MSFD monitoring programs.

In Atlantic Spanish waters and at the Canary Islands, the Spanish Ministry of Agriculture, Food and Environment, uses marine sand deposits for beach nourishment only.

References:

ICES. 2016. Effects of extraction of marine sediments on the marine environment 2005–2011. ICES Cooperative Research Report No. 330. 206 pp. Series

Gonçalves, João M.; Silva, Mariana; Simões, Júlia & Medeiros, Ricardo. 2019. Relatório técnico final das campanhas de monitorização dos fundos marinhos arenosos subtidais dos Açores. Report prepared by Fundação Gaspar Frutuoso, University of the Azores, delivered to the Regional Directorate for Sea Affairs (DRAM), Secretariat for the Sea, Science and Technology, Regional Government of the Azores, under the 25/DRAM/2018 service provision contract, PLASMAR project (co-financed by ERDF as part of POMAC 2014- 2020)

4 Added value

Three papers in development, but not submitted till now: We expect at least one paper will be submitted till end of the project.

