PORTODIMARE

geo**POR**tal of **TO**ols & **D**ata for sustaInable **M**anagement of co**A**stal and ma**R**ine **E**nvironment (ADRION205)

DT2.8.1 Geoportal maintenance and transferability plan

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List of abbreviations

AIS	Automatic Identification System
AIR	Adriatic-Ionian Region
API	Application Programming Interface
AZA	Supporting Allocated Zone to Aquaculture identification
CEA	Cumulative Effects Assessment
DG MARE	Directorate-General for Maritime Affairs and Fisheries
EUSAIR	European Union Strategy for the Adriatic and Ionian Region
GAIR	Geoportal of Adriatic-Ionian Region
GIS	Geographic Information System
ICZM	Integrated Coastal Zone Management
MCDA	Multi-Criteria Decision Analysis
M&SG	The GAIR management and support group
MoU	Memorandum of Understanding
MSEG	Maritime Policy Member State Experts Group
MSF	Medium Scale Fishery Footprint
MSP	Maritime Spatial Planning
MUC	Module on Maritime Use Synergy and Conflict Analysis
MUSC	Maritime Use Synergy and Conflict Analysis Tool
NGO	Non Governmental Organization
OGC	Open Geospatial Consortium
SMCE	Spatial Multi-Criteria Evaluation
SSF	Small Scale Fishery Footprint
UNEP/MAP	United Nations Environment Programme / Mediterranean Action Plan
VMS	Vessel Monitoring System

1. Introduction and objectives

The main output of the PORTODIMARE project is the Geoportal of Adriatic-Ionian Region – GAIR. Project partners from Bosnia and Herzegovina, Italy, Slovenia, Croatia and Greece tested the use of the GAIR and its modules in six testing sites. The testing included the integrated analysis of coast/sea uses and environmental conditions and the development of plans and recommendations for the planning and management processes, all according to ICZM/MSP principles. Such plans have aim to significantly support the future development of national maritime spatial plans (including their transnational dimension) as foreseen in Directive 2014/89/EU in the 4 EU Countries of the Adriatic-Ionian Region and the implementation and further development to EUSAIR Action Plan.

PORTODIMARE project is expected to bring benefits in national but also transnational and macro-regional planning and management of coastal and marine spaces. However, how to deploy project results to other regions, administrative units and target groups and finally how project results can influence policies and behaviours still face a myriad of hurdles.

How to maintain the GAIR datasets and tools in time and how to transfer the use of the GAIR to other regions and target groups is the main objective of this document.

The initial chapters of the report present the background of the PORTODIMARE project, the GAIR and its modules. Two key chapters elaborate how the GAIR will be further extended and maintained and how the GAIR will be transferred out of the PORTODIMARE partnership so to become a central portal for ICZM/MSP in the AIR but also promoted in other Mediterranean sub-regions and other EU regional seas.

The GAIR's maintenance and further development is elaborated through the key resources needed to be mobilised after the project: the GAIR hosting and administration, the GAIR maintenance, further software development, additional data provision and strengthening the GAIR community network.

Transferability plan defines activities aiming at transfer/promotion of the GAIR to the decision makers, stakeholders and wide public. Transfer activities are planned for all project partners' countries - six out of eight AIR countries. Additionally, activities are planned on the level of Adriatic and Ionian Region through the participation in activities of ADRION EU programme and EU Strategy for the Adriatic and Ionian Region (EUSAIR). To further promote and transfer the GAIR to other regional seas, the Mediterranean and further to other European areas and initiatives, various platforms/systems will be approached and involved for demonstration of the GAIR contributions to the MSP processes.

To ensure the GAIR's maintenance, further development and transfer to other stakeholders, the GAIR management and support group (M&SG) is proposed, composed of interested project partners but open to other interested parties. The main task of the GAIR support group is to lead and support proposed activities in the Geoportal maintenance and transferability plan.

2. About the PORTODIMARE project

There is a necessity for transnational integrated and efficient planning and management of coastal and marine spaces at the macro-regional level such as the Adriatic-Ionian Region. The rationale for it lies in fact that there is a strong competition for coastal and marine space by various human activities. Furthermore, climate change effects and both natural and man-made hazards, impact the coastal and marine environment, its resources and ecosystems. The Adriatic and the Ionian Seas are even more vulnerable to these threats because of their shallowness and semi-enclosed nature. Planning and management activities should be able to create synergies, secure sustainable growth and avoid potential conflicts while also allowing the preservation of coastal and marine ecosystems for upcoming generations. Such an objective requires fit for purpose knowledge and tools.

The main output of the PORTODIMARE project is the Geoportal of Adriatic-Ionian Region (GAIR), a common platform for data, information and decision support tools focused on coastal and marine areas of the Adriatic-Ionian Region. It is in full compliance with the UNEP/MAP Integrated Coastal Zone Management (ICZM) Protocol in the Mediterranean and the EU Directive on Maritime Spatial Planning (MSP) and therefore with their principles and policies and supports the implementation of the EUSAIR Action Plan. The GAIR integrates and further develops existing databases, portals and tools that were developed within the previous EU projects. In such a way, most of the available knowledge and resources are efficiently organized and accessible through a single virtual space that will support coordinated, regionally/transnationally coherent and transparent decision-making processes.

In all the phases of its creation, the GAIR uses and supports transnational cooperation. The project prepared a series of modules used for analytical purposes, mainly to provide information for coastal and marine planning. The GAIR is based on a free and open-source software approach. Modules runs can be based on geospatial layers that are already incorporated in the GAIR and also on multiple geospatial layers that can be uploaded by users. The results of each module run are available within the GAIR, thus allowing sharing knowledge within the community.

The use of the GAIR and its seven modules was tested in six pilot sites in five countries: Bosnia and Herzegovina, Croatia, Greece, Italy and Slovenia. The PORTODIMARE GAIR aims at becoming a daily working tool for decision makers, public and private managers, practitioners, marine scientists and stakeholders in general in the Adriatic-Ionian Region.

The PORTODIMARE project includes the following activities: preparation, management, implementation, and communication of the GAIR. The implementation is divided in two parts: the first part encompasses a definition and implementation of the architecture and main components of the GAIR - the GAIR's modules; the second part encompasses efforts on the coordination of the training, the testing activities and the elaboration of the GAIR Practical Guide and Action plans for the countries and GAIR maintenance and transferability plan.

The former one is elaborated in this document. It describes the maintenance of the Geoportal datasets and modules in time and a vision how the GAIR will be further extended within its pilot area and in the country but also how the GAIR will be transferred to other Mediterranean sub-regions and other EU regional seas.

3. The GAIR: geoportal and its modules

The GAIR follows the MSP implementation process and implements multiple modules that will enable integrated and sectorial geospatial modelling. Each of the seven modules has single or multiple objectives, performing a particular analysis of coast/sea uses and environmental conditions. The GAIR's modules are spatially scalable, being applicable on local, regional, and on the scale of the Adriatic-Ionian Region. The GAIR is targeting a multi-level community, ranging from students, general public, research/academics, sectorial actors, planners, and decision-makers. The results of each module run are available within the GAIR, thus allowing sharing knowledge within the community.

The GAIR's modules are the following:

1. Maritime Use Synergy and Conflict Analysis Tool (MUSC)
2. Cumulative Effects Assessment (CEA)
3. Supporting Allocated Zone to Aquaculture (AZA) identification
4. Particle/conservative contaminants dispersion
5. Coastal Oil Spill Vulnerability Assessment
6. Small Scale Fishery (SSF) Footprint
7. Medium Scale Fishery (MSF) Footprint and Cumulative Effects Assessment on SSF and MSF

The GAIR contains data coming from different sources, which include links to existing data already published or accessible through standard OGC web services, geographical datasets that partners have uploaded directly through the Geoportal interface, and geographical datasets that are part of past projects.

The GAIR is based on the open-source GeoNode platform. Different user profiles with different, hierarchically organized privileges are defined within the GAIR. The authentication layer supports a single sign-on mechanism and is equipped with security precautions, such as automatic password expiring after 180 days.

The GAIR's system architecture consists of five main components:

- Resource Layer (database management systems and facilities to store datasets, information, metadata, and other resources);
- Module Engines (for performing module/tool analysis);
- Task Manager middleware (for orchestrating the GAIR's tasks and processes);
- Web services and API (for publishing the API and for the web services interaction with resources); and
- The Geoportal (graphical user interface, tools to search, visualize, explore, and analyse resources, and also for downloading geospatial layers, maps, and PORTODIMARE model outputs). The Geoportal graphical user interface is shown on the Figure 1.

The following chapter presents a short description of each GAIR's module together with an example of its use and results from the testing sites.

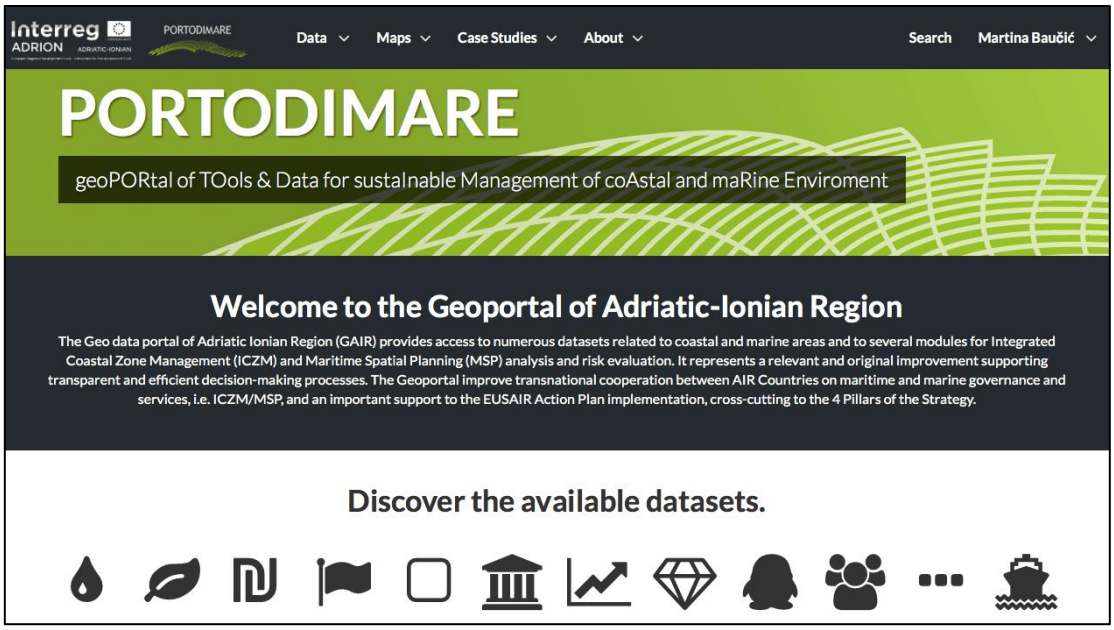

Figure 1: GAIR graphical user interface – home page

3.1. The GAIR modules

The GAIR's modules Interfaces are input forms with different components and options that can be defined, or are map-based. Interfaces for the output of each module are map-based, where the main part of the interface is a map on which the output layer is loaded (Figure 2). Other results, like graphs and links to reports, are shown in a side panel.

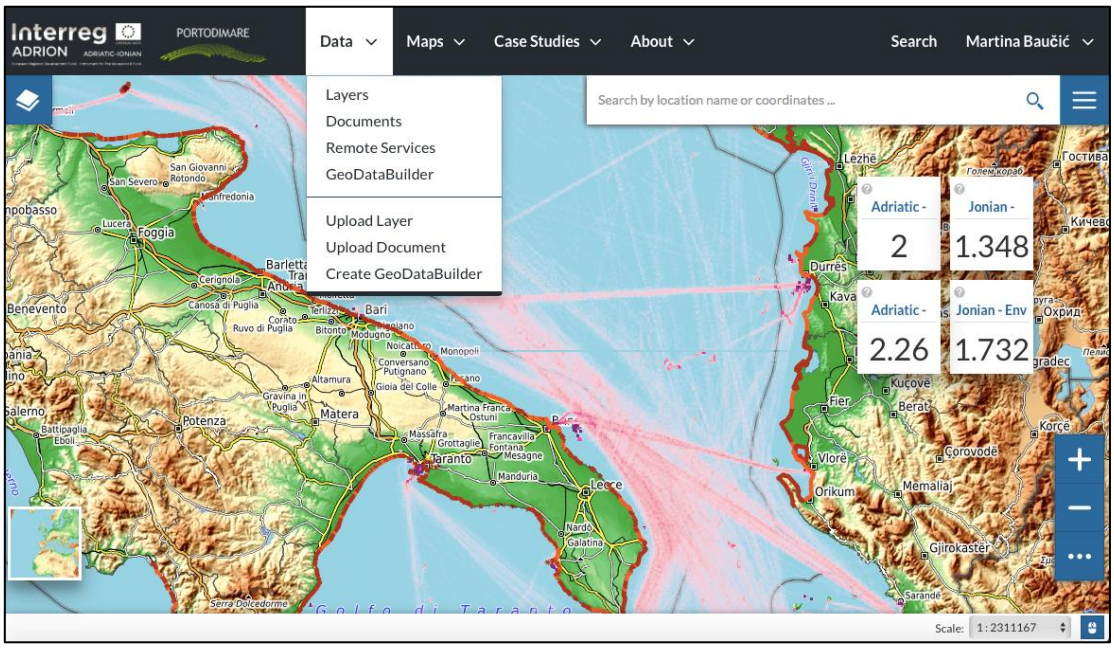

Figure 2: The GAIR's map-based graphical user interface – module page

3.1.1. Module: Maritime Use Synergy and Conflict Analysis Tool (MUSC)

Because of the strong human influence on the Adriatic-Ionian sea region, geospatial tools that are enabling the analysis of the multi-sector interactions are needed to support Blue Growth and planning strategies and scenarios for conflict mitigation (Depellegrin et al., 2018). This tool allows the assessment and mapping of maritime use conflicts (constraints that are creating disadvantages to maritime activities) and synergies (multi-use potential).

Planners and planning teams, decision-makers, environmental agencies, and research institutions can use MUSC. Module inputs are the study area boundary and raster layers about human activities. Module outputs are one spatial raster layer and one summary graph and table.

3.1.2. Module: Cumulative Effects Assessment (CEA)

To reach ecological targets in the Adriatic-Ionian Sea region, sustainability goals can only be reached through smart and efficient allocation of the sea space. Geospatial tools supported by the Cumulative Effects Assessment (CEA) can help decision-makers in sea space to choose from different planning options and drive ecosystem-based management (Menegon et al., 2018). CEA is a tool for analysing and mapping the effects of single or multiple human activities on the sea space.

Planners and planning teams, decision-makers, environmental agencies, and research institutions can use this module. Module inputs are the study area boundary, 15 spatial raster datasets about human activities, and 6-10 spatial raster datasets about environmental components. Module outputs are three spatial raster datasets and four summary graphs and tables.

3.1.3. Module: Supporting Allocated Zone to Aquaculture (AZA) identification

EU Blue Growth initiative identified aquaculture as one of the key sectors with high potential for sustainable jobs and growth. This module implements the Spatial Multi-Criteria Evaluation (SMCE) methodology for identifying Allocated Zones to Aquaculture (AZA), i.e. marine areas where the development of aquaculture has priority before other uses.

This module is intended for public authorities, current operators, and investors. Module inputs are the user-defined location or area on the map, the optimal growth model, and about 10-30 geospatial remotely sensed and site-specific datasets about constraints, socio-economic and environmental data. Outputs are three geospatial layers (criteria map, constraints, and suitability map), four raw datasets, and one report.

3.1.4. Module: Particle/conservative contaminants dispersion

This module is a tool that can be used to calculate the area of influence of a source of contamination by simulating the dispersion of particles. Users can select location, intensity, and inner behaviour of the particles. It is also possible to characterize the particles by a decay time, life duration, and sinking velocity (Ghezzo et al., 2018).

Planners and planning teams, decision-makers, environmental agencies, and research institutions can use this module. Module inputs are the user-defined location or area on the map and hydrodynamic field

model targeted for the area of interest and/or season. Outputs are dispersion simulation, influence area map, and summary report warnings and information about reliability of the results.

3.1.5. Module: Coastal Oil Spill Vulnerability Assessment

One of the biggest risk factor in the Adriatic-Ionian Sea is represented by the transit of the tanker ships that are carrying hydrocarbons and toxic substances. The pollution of the coastline caused by the spilling of the substances that are being transported would cause environmental and economic damage (Caputo & Natrella, 2018). This module can perform oil spill simulations in any area of the Adriatic-Ionian Sea to understand the risk scenarios and conduct a risk assessment.

The module is intended for institutions that deal with the management policies of economic, commercial, or tourism activities in the Adriatic-Ionian Region, emergency management institutions, and citizens and students. Inputs are a user-defined area of interest, geospatial layers about coastal vulnerability, a simplified hydrodynamic field, and data about ships and weather. Module outputs are 3-5 geospatial layers, one animation of oil spill simulation, and 1-5 plots with statistical analysis.

3.1.6. Module: Small Scale Fishery (SSF) Footprint

Most of the professional fishing vessels are not equipped with location monitoring systems (VMS – Vessel Monitoring System or AIS – Automatic Identification System) so it is not possible to map their footprints using those systems (Kavadas et al., 2018). The module for Small Scale Fishery (SSF) Footprint implements an MCDA (Multi-Criterial Decision Analysis) to assess and map fisheries' spatial footprint for SSF and a tool for their visualization.

Users of this module can be fishery managers, scientists, spatial planning managers, and scientific groups. Inputs are up to nine geospatial layers and weights assigned by the user or by default. Outputs are two geospatial layers and a summary report.

3.1.7. Module: Medium Scale Fishery (MSF) Footprint and Cumulative Effects Assessment on SSF and MSF

This module implements a tool for visualization of fisheries' spatial footprint for MSF, including trawlers, and purse seines. It also includes the estimation of the cumulative additive fishing pressure index (SSF+MSF). Medium scale fisheries are, unlike the small-scale fisheries, usually equipped with VMS and AIS monitoring systems that allow mapping their footprints. In cases where VMS and/or AIS are not available for all spatial and temporal scales, GIS-MCDA based approach is employed.

This module is intended for fishery managers, researchers, spatial planning managers, and scientific groups. As input, the module uses up to 10 geospatial layers that are already stored in the GAIR. Outputs are three geospatial layers, summary reports, and raw data.

3.2. The GAIR – a tool supporting ICZM/MSP processes

The GAIR is a tool supporting the MSP processes including land-sea interactions analysis. What are the MSP's requirement and steps the GAIR supports? Namely, the GAIR Resource layer ensures the use and organisation of data across the borders and stakeholders, the Module engines provide analytical tools for land-sea interactions' analysis and other analytical tasks such as modelling and development of scenarios, and the Geoportal facilitates stakeholders participation and trans-boundary cooperation (Figure 3). Regarding the MSP steps, the table below points out the supporting functions of the GAIR for each MSP step.

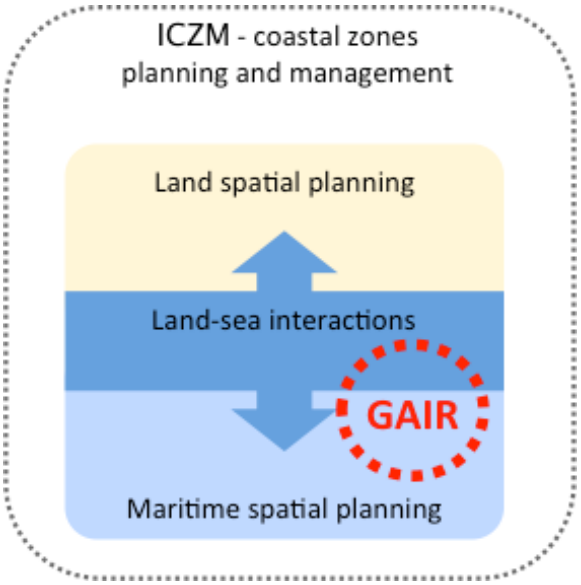

Figure 3. GAIR's support in managing coastal and maritime spaces

MSP steps	**The GAIR's support**
1. Starting the process and getting organized	Resource layer (data collection and management – OGC services and data import functions)
2. Assessing the context and defining a vision	Geoportal (visualizing data on maps, tables and charts)
3. Analysing existing conditions	Module engines (various spatial analysis)
4. Analysing future conditions	Module engines (various spatial analysis)
5. Identifying key issues	Geoportal (visualizing data on maps, tables and charts)

6a. Design phase - Elaboration of MSP plans	Module engines (various spatial analysis) Geoportal (visualizing data on maps, tables and charts)
6b. Design phase - Strategic Environmental Assessment	Module engines (various spatial analysis) Geoportal (visualizing data on maps, tables and charts)
7. Adopting the plan and organizing the implementation	Resource layer (OGC web services and data export functions) Geoportal (visualizing data on maps, tables and charts)
8. Implementing, monitoring and evaluating the plan	Resource layer (data management, OGC web services) Module engines (various spatial analysis) Geoportal (visualizing data on maps, tables and charts)
9. Cross-step activity: stakeholder consultation	Geoportal (visualizing data on maps, tables and charts)

4. The GAIR Maintenance

The GAIR as an open tool supporting various phases of MSP has a potential to play an important role in future implementation of EUSAIR and other policies in the AIR. The prerequisite for that is the GAIR should be maintained and further developed beyond the timeframe of the project. This chapter provides a plan for the GAIR key components maintenance.

The key resources needed to be mobilised after the project are the following:

1. Hosting and administrating GAIR software and data;
2. Maintaining GAIR software, data and metadata;
3. GAIR further development (functionalities, modules, user-friendly interfaces, etc.);
4. Additional data provision and update/upgrade;
5. Increase the GAIR community network.

The key resource 1 - the GAIR hosting and administration, ask for centralized approach and thus should be provided by an institution. The key resources 2, 3, 4 and 5 – the GAIR maintenance, further development, data provision and community network, require a collaborative approach and thus it is proposed to establish **the GAIR management and support group (M&SG)** that will provide support to the GAIR beyond the duration of the project. It is envisaged that GAIR M&SG is composed of interested project partners but open to other interested parties as well. Description of the GAIR M&SG role in the GAIR maintenance and transfer is given in the following paragraphs and chapters.

Providing education/training for the stakeholders using the GAIR and ensuring transfer/promotion of the GAIR to the decision makers, stakeholders and wide public are all issues covered by the Transferability plan given in the next Chapter.

4.1. Hosting and administrating the GAIR

Hosting and administrating the GAIR as web application considers providing hardware (server), telecommunication (internet connection) and system administration (backup, upgrade of operating and security software, web domain registration etc.). Additionally, the GAIR users and their rights should be administrated as well as the GAIR software installation and upgrading, security maintenance, data backup, and the GAIR operation/processes monitoring.

During the project, hosting and administrating of the GAIR is provided by the Project partner Regione Emilia-Romagna, Direzione Generale Cura del Territorio e dell'Ambiente (RER_DG CTA).

For the long-term maintenance, this role could be taken over by the institution on behalf of all AIR countries. To achieve this, the following activities are proposed to be performed by the GAIR M&SG:

1. To survey potential institutions and approach them by the letter;
2. To propose a new project and apply for funds such as ADRION Programme;
3. To prepare the GAIR software, data and documentation to be easily migrated to any other hosting institution.

4.2. Maintaining the GAIR software, data and metadata

The GAIR software maintenance includes software engineering tasks after the project including security maintenance, modification of software and correction of faults and improvement of performance. Also, it includes providing help service for reporting the faults and supporting users in using the GAIR. Additionally, the maintenance service includes help in correcting/updating data and metadata already included in the GAIR.

On the contrary, the data and metadata maintenance includes the quality improvement of both data and metadata, the error detection and correction and the improvement of spatial representation (e.g. cartographic styles).

In short-term period, maintaining the GAIR software, data and metadata will be provided by the lead partner Emilia-Romagna, Direzione Generale Cura del Territorio e dell'Ambiente (RER_DG CTA).

For long-term maintenance of the GAIR software, data and metadata, the GAIR management and support group (M&SG) will be established, composed of interested project partners but open to other interested parties. The main tasks of the GAIR support group will be to provide support by consultation, help desk activities, etc. A brief proposal of activities follows.

1. To moderate the collaborative software repository and the issue tracking system (ITS) where bugs and improvement proposals are collected, categorized and prioritized. Both collaborative software repository and ITS will be published online by the end of the project.
2. To manage the GAIR and modules documentation, correcting documentation errors, improving unclear or incomplete parts and incorporating new examples and use cases.
3. To manage the data and metadata. This task includes correcting inaccuracies or errors or filling the gaps on metadata, removing/cleaning up invalid or corrupted layers (e.g. layer manually uploaded by the users), managing the ownership or the layer permissions, adding/improving the layer styles.
4. To activate collaborations/agreements with regional, national and international data providers (e.g. EMODNet, Copernicus).

4.3. The GAIR further development (functionalities, modules, user-friendly interfaces, etc.)

GAIR and the integrated modules provide valuable features to support MSP processes. However, some functions described in Deliverable T1.4.1 (GAIR system and architecture design) were not fully developed and implemented due to a number of constraints. In addition, a continuous development of the GAIR system has to be planned over the next years, in order to address futures needs and requirements (e.g. add and improve the basic functionalities and the interactive Graphical User Interfaces, incorporate additional MSP-related modules, integrate new data from external services – e.g. EMODnet).

The GAIR management and support group (M&SG) will support the long-term development and improvement of the GAIR system. A brief list of expected developments follows:

1. Integrate a Content Management System (CMS) allowing GAIR administrators and "editor" users to collaboratively create new web contents; this will facilitate involvement of new users and maintenance the GAIR contents up-to-date.
2. Integrate a web analytics application (e.g. Matomo) for measuring, analysing and reporting information on GAIR platform and modules usage. Such tool will facilitate traffic and usage patterns monitoring and, consequently, will allow improving the security and the GAIR performance and will better direct future development.
3. Support the basic localization for the Adriatic and Ionian countries (Italian, Slovenian, Croatian, Bosnian, Montenegrin and Greek). That will facilitate stakeholders' engagement and the adoption of the GAIR to support national and local MSP process.
4. Improve usability of the interfaces, especially regarding modules.
5. Improve the GeoDataBuilder app to support additional map algebra operators (e.g. log-transformation), and to support security constraints, limits and filters (e.g. to avoid processing invalid or malicious expression, to avoid exceeding of execution time or memory limits).
6. Automatize and document the installation and deployment process to better support development and transferability.

In addition to the expected developments the M&SG will establish and manage a formal process for collect, evaluate, develop and implement GAIR Improvement Proposals (GAIRIPS). The process should encourage the involvement of GAIR community network especially in proposing new functionalities and support the evaluation process.

4.4. Additional data provision and update / upgrade

The GAIR contains both data important for understanding and analysing MSP-related topics at the AIR level, and data used for testing the modules in specific areas.

This data comes from different sources, some of them external to the project consortium, some internal; in either the cases, data will have to be maintained, updated or amended, depending on the evolution of the real world features they represent. In addition to data already existing in the GAIR, new data are continuously collected in the area, and new sources of data might (hopefully) join the portal to increase the information available. Thus, a vision and some procedures for the update of data in the GAIR have to be put in place to allow an up-to-date provision of geospatial information in the AIR.

In particular, further data should be envisaged to be included in the GAIR to enable module running and analysis performing for other cases, both local and at larger scales.

To facilitate the use of the GAIR in AIR countries, the already collected data at national or local level should ideally be available for use and reuse free of charge and under clear data policies and standard (possibly open) licenses.

One of the main activities to support this, is to identify national agencies providing data. In case that data is not available under an open license (such as ODbL CC-BY, CC-BY-SA, CC0), agreements for data use within the GAIR should be proposed.

Of fundamental importance is the metadata accompanying the datasets available through the GAIR. Metadata has to be compliant with current standards and tailored to the specific MSP-related needs.

Along with the INSPIRE directive, most of the countries have established National Spatial Data infrastructure and National Contact Points, therefore representing the first subject/body to be contacted. Other sources of information are current and future national, regional and European projects and initiatives, collecting and dissemination MSP-relevant data. Finally, stakeholders in the MSP domain are valuable contributors to marine and maritime knowledge and should be also involved in these procedures of data update.

Tools like formal agreements, collaboration protocols and exchange practises should be encouraged and activated to allow a continuous and profitable exchange and update of information.

Identified regional/national/local agencies and data sources together with planned activities are listed in the Table below.

Area /Country	**Spatial Data Infrastructure/source of data**	**Data or infrastructure owner/responsible/contact point**	**Activities foreseen**
Europe	EMODnet	EC-DG MARE	Invitation letter Signing agreement
Europe	European Atlas of the Seas	EEA	Invitation letter Signing agreement
Mediterranean	MEDTRENDS – The Mediterranean Sea trends, threats and recommendations (http://www.medtrends.org)	WWF Mediterranean (http://www.medtrends.org/)	Invitation letter Signing agreement
Mediterranean	Ministry of the Environment, Land and Sea of Italy (IMELS); UN Environment MAP; PAP/RAC; Emilia Romagna Region; Autonomous Region of Sardinia; Tuscany Region	Med-IAMER – Integrated Actions to Mitigate Environmental Risks in the Mediterranean Sea (http://www.camp-italy.org)	Invitation letter Signing agreement
Mediterranean	Med-IAMER – Integrated Actions to Mitigate Environmental Risks in the Mediterranean Sea	MED Programme – European Territorial Cooperation 2007-2013	Invitation letter Signing agreement

	(http://www.medmaritimeprojects.eu/section/med-iamer)		
Bosnia & Herzegovina	National Geoportal (https://www.katastar.ba/podaci)	Federal Administration for Geodetic and Property-Legal Affairs (http://www.fgu.com.ba/hr/naslovna.html)	Invitation letter Signing agreement
Croatia	NIPP (http://geoportal.nipp.hr) ISPU (https://ispu.mgipu.hr) Geoportal (https://geoportal.dgu.hr) Bioportal (http://www.bioportal.hr/gis/)	National Spatial Data Infrastructure, contact point: The State Geodetic Administration, infonipp@dgu.hr	Invitation letter Signing agreement
Greece	National Geoportal (https://geodata.gov.gr/en/)	GEODATA.gov.gr info@geodata.gov.gr	Invitation letter Signing agreement
Italy	National Geoportal for MSP (SID) (https://www.sid.mit.gov.it/)	Ministry of Infrastructures and Transports (MSP Competent Authority)	Invitation letter Signing agreement
Montenegro	Integrated Coastal Zone Management Program of Montenegro (CAMP MNE) (http://www.geoportal.mrt.gov.me)	Ministry of Sustainable Development and Tourism (https://www.mrt.gov.me/ministarstvo)	Invitation letter Signing agreement
Slovenia	Slovenian Geoportal (http://www.geoportal.gov.si/eng/about-portal/) Portal prostor https://www.e-prostor.gov.si	Surveying and Mapping Authority of the Republic of Slovenia. gurs@assist.si	Invitation letter Signing agreement

4.5. Increase GAIR community network

Fostering the establishment of a broader community of users (e.g. planners, MSP stakeholders), data providers, scientists, ICT experts and developers represents a strategic and urgent goal of the M&SG. In a long-term perspective the GAIR Community Network (GAIRCN) will substitute the PORTODIMARE partnership established during the project for ensuring the GAIR maintenance in the next years, making GAIR a central portal for ICZM/MSP in the Adriatic and Ionian region and supporting GAIR transferability to other sea region.

The GAIRCN should aim to:

1. Identify issues on functionalities and usability
2. Propose improvements to platform and modules
3. Contribute to software documentation
4. Contribute to create demonstrative use cases and examples

As the GAIR is developed as open source software (license GPL v3.0[1]), the code and documentation will be published on an online software repository (e.g. GitHub, GitLab) by the end of the project and that will facilitate the establishment of the GAIRCN.

Thus it's proposed to adopt:

1. An online software community tool (e.g. GitHub, GitLab) as core application to support the GAIRCN. That include the following functionalities:
    - distributed version-control system for tracking changes in source code during software development;
    - web pages and wiki pages to publish GAIR and module documentation, support the GAIR Improvement Proposals process and present the GAIR gallery of use cases;
    - issues-tracking system to collect bug, defects, errors etc;
    - task manager to plan and progress monitoring of milestones, tasks, etc.
2. A set of mailing lists dedicated to different group of users (e.g. M&SG members, developers, GAIR users).

In addition, it is proposed to organize a set of webinars aimed to different user categories (e.g. Planners and MSP practitioners, GIS experts, scientists) to disseminate GAIR and module functionalities.

[1] GPL 3.0 https://www.gnu.org/licenses/gpl-3.0.html

5. Transferability plan

The PORTODIMARE project is expected to bring benefits in national but also transnational and macro-regional planning and management of coastal and marine spaces. However, how to deploy project results to other regions, administrative units and target groups and finally how project results can influence policies and behaviours still face a myriad of hurdles. The success of innovative technologies is not only dependent upon the technical characteristics, but also on supportive social, political and economic context (OECD, 2015). What is needed to GAIR, as a new developed technological product, to be disseminated into a society? GAIR needs to achieve compliance with country-relevant institutions as well as to be considered desirable by relevant actors in order to get adequate resources.

The transferability plan presented here aims at further use of the PORTODIMARE project's results within the AIR but also in other Mediterranean sub-regions and other EU regional seas. Proposed steps include various activities to be performed including steps towards signing Agreements or Memorandums of Use with relevant institutions.

The methodological approach is based on the following:

- Identification of the potential future GAIR users – to be approached;
- Identification of existing programmes, projects and organisations - to be used as channels to approach the users such as ADRION EU programme; and
- Identification of transfer activities – to be performed.

By combining these three, the transferability plan steps are derived.

Considering the GAIR as a tool supporting various activities, the potential future GAIR's users are grouped as the following:

- GAIR introduced in the MSP process by **the spatial planning authorities** from national, regional and local level;
- GAIR used by **the spatial planning experts** as a tool supporting them in performing MSP activities;
- GAIR recognised by **the stakeholders performing or planning activities on sea** as a valid tool for planning and resolving conflicts;
- GAIR used by **the environmental agencies** as a valid tool helping in sea protection;
- GAIR used by **the institutions managing coastal areas and seas** such as coastal municipalities, port authorities and civil protection institutions;
- GAIR used by **the research and students' community** for further development and dissemination of the sea planning needs;
- GAIR recognised by **the public** as a tool enabling public participation and transparent planning process.

Planned activities for transferability will use existing programmes, projects and organisations as channels to approach potential future users. The main organisations involved in coastal and maritime planning or representing the main GAIR user groups in the AIR countries are identified for each project partner country in the following chapters. The ADRION EU programme and EUSAIR is planned as communication channel for the AIR as a whole and for other regional seas and Mediterranean in particular, the EU MSP Platform and Barcelona Convention UNEP/MAP system.

The main transfer activities to be performed are as follows:

- Letters - sending brochures/ project web page/GAIR online presentation;
- Meetings/presentations of the GAIR;
- Posting information and links on web pages of other programmes, projects and organisations;
- Presentations on conferences/workshops;
- Providing documentation on open source code for further development;
- Steps towards signing Agreements/MoU (Creation of template agreement/MoU, sending Letter/Organising meeting);

5.1. Transferability plan within EUSAIR and the AIR countries

Within the AIR countries, the transferability plan defines activities for all project partners' countries - six out of eight AIR countries (subchapters 5.1.2. – 5.1.7). Additionally, activities are planned on the level of Adriatic and Ionian Region through the participation in activities of ADRION EU programme and EU Strategy for the Adriatic and Ionian Region (EUSAIR).

Detailed activity plans follow.

5.1.1. ADRION EU programme and EUSAIR

The transferability plan aims at two main achievements:

a) To transfer/promote the GAIR within ADRION EU programme, so new projects in the region will use and update it; and

b) To provide political support through the role of EUSAIR.

There are activities already done through the project and future planned activities. All are summarised in the Tables below.

Activities – already done by the project partners	**Year**
Article about Interreg ADRION PORTODIMARE project published in regional newspaper "Glas Istre" (the Voice of Istria).	2018
Informative poster for PORTODIMARE project produced by Veneto Region, Soil Protection Directorate – Integrated Water Service and Water Protection Unit.	2018
Informative poster for PORTODIMARE project, produced by PP6 – Institute for Physical Planning Region of Istria.	2018
The International Conference on Integrated Coastal Management (ICZM) and Marine Spatial Planning (MSP), organized by the PORTODIMARE project funded within the EU Interreg ADRION Transnational Cooperation Program, held 14-15 November 2018, Budva, Montenegro.	2018

The educational poster was displayed at the ADRION Programme stand during the ADRION Annual Event and 4th EUSAIR Forum that was held on 6, 7 and 8 May in Budva, Montenegro.	2019
PORTODIMARE project presented on the open days of EU funds Rijeka – Croatia, on June 29th 2019.	2019
Workshop "Managing transboundary impacts in priority areas", held on 31st May in Herceg Novi – Montenegro.	2019
On the World Ocean Day (June 7th), underwater photographs taken during the mapping of marine habitats within the project PORTODIMARE were displayed at poster exhibition organised by the University of Pula.	2020
Future projects promoted at and accepted by the EUSAIR (three pilot area in the AIR region)	2019-ongoing
Capitalization activities – three meetings of projects PORTODIMARE, HARMONIA and IPRECO projects	2019-ongoing
Project presented to the public via media during Session I: MSP, ICZM and Land and Sea Interaction within EUSAIR	2018
Project presented to the public via media during Session II: Geoportal and decision-support tools as result of Portodimare project	2018
Project presented to the public via media during Session III: Examples from practise and demonstration projects	2018

Activities – future planned
Presentation on Annual EUSAIR forum
Presentations on Mediterranean Coast and Macro-regional Strategies Week 2020, Slovenia, 14–25 September 2020
Offering open online course intended for future use of the GAIR in ADRION EU projects (through the ADRION EU and EUSAIR web pages)
Generation of open source code for further development of the GAIR in future ADRION EU projects (through the ADRION EU and EUSAIR web pages)
Steps towards signing Agreements/MoU (Creation of template agreement/MoU, sending Letter/Organising meeting);

5.1.2. Bosnia & Herzegovina

User groups	Project, programmes, institutions	Activities
Spatial planning authorities	Federal Ministries of Spatial Planning	Planning at the FBIH level
	Cantonal Ministries of Spatial Planning	Planning at the Canton level
	Municipality level	Urban plan
Spatial planning experts	No information	/
Stakeholders performing activities on sea	Captaincy NEUM	Ongoing activities
Environmental agencies	Environmental Protection Agency	Ongoing activities
Institutions managing coastal areas and seas	Adriatic Sea Agency	Ongoing activities in coastal areas and seas
Research and students' community	University in Sarajevo	Research and development
	University in Mostar	
Public	NGO	Ongoing activities

5.1.3. Croatia

User groups	Project, programmes, institutions	Activities
Spatial planning authorities	Ministry of Construction and Physical Planning - State Institute for Spatial Development	Letters - sending brochures/ project web page/GAIR online presentation Meetings/presentations of the GAIR Proposing Agreements/MoU
	Ministry of Environmental Protection and Energy - State Institute for Nature Protection	Letters - sending brochures/ project web page/GAIR online presentation Meetings/presentations of the GAIR Proposing Agreements/MoU
	Counties Institutes for Physical Planning (Primorje-Gorski Kotar County, Zadar County, Lika-Senj County, Šibenik-Knin County, Split-Dalmatia County, Dubrovnik-Neretva County)	Letters - sending brochures/ project web page/GAIR online presentation Presentation on yearly meeting of counties institutes for physical planning Posting information and links on their web pages Offering open online course
Spatial planning experts	Croatian Chamber of Chartered Architecture Engineers	Posting information and links on their web pages Offering open online course
Stakeholders performing activities on sea	Counties Port Authorities	Letters - sending brochures/ project web page/GAIR online presentation Offering open online course
Environmental agencies	The Environmental Protection and Energy Efficiency Fund	Letters - sending brochures/ project web page/GAIR online presentation Offering open online course
Institutions managing coastal areas and seas	Counties offices for maritime domain	Letters - sending brochures/ project web page/GAIR online presentation Offering open online course
	City/Municipal offices for spatial planning	Letters - sending brochures/ project web page/GAIR online presentation

		Offering open online course
Research and students' community	University of Rijeka, Zadar, Split and Dubrovnik	Letters - sending brochures/ project web page/GAIR online presentation Posting information and links on their web pages Offering open online course Providing documentation on open source code for further development
Public	NGOs	Letters - sending brochures/ project web page/GAIR online presentation Posting information and links on their web pages Offering open online course
	Publishing news in printed and electronic media	Letters - sending brochures/ project web page/GAIR online presentation Posting information and links on their web pages

5.1.4. Greece

The PORTODIMARE Geoportal may constitute an important tool to institutions dealing with spatial analysis, decision-making, or even dissemination/communication efforts related to maritime spatial planning issues. An example of such institutions in Greece is provided below.

User groups	**Project, programmes, institutions**
Spatial planning authorities	Ministry for the Environment and Energy
	Ministry of Rural Development and Food
	Ministry of Tourism
	Ministry of Shipping and Islands Policy
	Ministry of Development
Spatial planning experts	Hellenic Centre for Marine Research
	Department of Planning & Regional Development, University of Thessaly
	School of Spatial Planning and Development, Aristotle University of Thessaloniki

Stakeholders performing activities on sea	Small Scale Fishery Associations
	Panhellenic Union of owners of Medium Scale Fishery Vessels
	Association of Greek Seafood Producers
Environmental agencies	WWF Greece
Institutions managing coastal areas and seas	Region of Ionian Islands – R.I.I.
	Region of Western Greece – R.W.G.

5.1.5. Italy

GAIR has a great potential to be used to implement ICZM-MSP in Italy at different scales and involving different actors. Ongoing and future planned activities to promote such developments are listed below.

User groups	Project, programmes, institutions	Potential Activities	Project partners involvement
Spatial planning authorities	Ministry of Infrastructure and Transport Other Ministries participating in the National Technical Committee on MSP Adriatic-Ionian Regions participating in the National Technical Committee on MSP	Posting communication on GAIR features, uses, updates Meetings/presentations on the GAIR Offering dedicated webinars and online courses Offering dynamic and interoperational interaction with national and regional geoportals on ICZM-MSP Offering data and tools supporting national plan preparation and implementation GAIR in support of participatory processes and stakeholder engagement Proposing Agreements/MoU	RER, CORILA and all Italian partners
Spatial planning experts	Public and private planners	Posting communication on GAIR features, uses, updates Offering dedicated webinars and online courses Offering data and tools supporting local or specific planning demands and activities	RER, CORILA

Stakeholders performing activities on sea	Port Authorities, Sectoral Organisations/Associations, NGOs (e.g. Legambiente, WWF), National Blue Economy Cluster (BIG), private stakeholders (e.g. ENI, Fincantieri, Enel Greenpower)	Posting communication on GAIR features, uses, updates Offering dedicated webinars and online courses Offering data and tools supporting local or specific planning demands and activities	RER, CORILA and all Italian partners
Environmental agencies	ISPRA, Regional Environmental Agencies (ARPAs)	Posting communication on GAIR features, uses, updates Meetings/presentations on the GAIR Offering dedicated webinars and online courses Offering data and tools supporting local or specific planning demands and activities GAIR in support of participatory processes and stakeholder engagement Proposing Agreements/MoU	RER, CORILA and all Italian partners
Institutions managing coastal areas and seas	Adriatic-Ionian Regions: Departments dealing with marine and maritime affairs City/Municipal offices for spatial planning and marine/coastal uses	Posting communication on GAIR features, uses, updates Meetings/presentations on the GAIR Offering dedicated webinars and online courses Offering data and tools supporting local or specific planning demands and activities GAIR in support of participatory processes and stakeholder engagement Proposing Agreements/MoU	RER, CORILA and all Italian partners
Research and students' community	Research Institutions (e.g. OGS, INGV, SZN, ENEA) and Universities (e.g. Trieste, Bologna,	Posting communication on GAIR features, uses, updates Offering dedicated webinars and online courses	RER, CORILA

	Venice, Ancona, Pescara, Bari, Lecce, Rome)	Offering data and tools supporting training activities Providing documentation on open source code and assistance for further development	
Public	NGOs at local level	Posting communication on GAIR features, uses, updates Meetings/presentations on the GAIR	RER, CORILA and all Italian partners
	Media		

5.1.6. Montenegro

User groups	**Project, programmes, institutions**	**Activities**	**Project partners involvement**
Spatial planning authorities	Ministry of Sustainable Development and Tourism of Montenegro	Developing plans	Supply of baseline data and information
Spatial planning experts	Local experts dealing with spatial, planning and urban design	Consulting services for developing plans and programmes	Supply of baseline data and information
Stakeholders performing activities on sea	Ministry of Agriculture and Rural Development	Development of mariculture, fisheries, different programmes and plans	Supply of baseline data and information
	Maritime Safety Administration	Control at the sea Development of different programmes and plans	Supply of baseline data and information
Environmental agencies	Environmental Protection Agency of Montenegro	Environmental monitoring Consolidating data on the state of the environment Proclamation of Marine Protected Areas	Supply of baseline data and information Management of Marine Protected Areas
Institutions managing coastal areas and seas	Public Enterprise for Coastal Zone Management of Montenegro	Development of programmes and plans (Atlas of Montenegrin beaches)	Using as baseline for planning

Research and students' community	University of Montenegro – Institute of Marine Biology	Science research on the sea Provide data for Geoportal	Update information and data on the Geoportal
Public	NGOs and civil society	Different activities on the sea (fisheries, agriculture, marine litter cleaning, sources of pollution)	Supply of baseline data and information

5.1.7. Slovenia

The possible future use of the GAIR in Slovenia is in the following areas:

- Preparation of MSP and monitoring of its implementation,
- Environmental reports under the Strategic Environmental Assessment procedure,
- Cross-border cooperation on issues, like riverine pollution, oil spills, fishery resources management,
- Management of the system of coastal and marine protected areas;
- Awareness raising about the maritime and marine issues and opportunities offered by MSP for a transparent and participated process of planning and management the sea space.

User groups	**Project, programmes, institutions**	**Activities**	**Project partners involvement**
Spatial planning authorities	Monitoring of MSP implementation Future updates of MSP Transparent assessment of possible development options	Various analyses with Portodimare tools	Presentation of GAIR and tools to Competent authority Testing of Portodimare tools (MUC, CEA, AZA)
Spatial planning experts	Preparation of Maritime Spatial Plans Preparation of focused analysis in the MSP preparation process Support to the analysis and management of important cross-border issues, like riverine pollution, oil spills, fishery resources management.	Various analyses with Portodimare tools	Presentation of GAIR and Portodimare tools to experts, involved in MSP preparation

Stakeholders performing activities on sea	Monitoring of management plans Overview of the environmental and socio-economic situation in the area, supporting informed interactions with other sectors and the public Opportunities for sustainable development, including synergies with other sectors	Various analyses with Portodimare tools	Presentation of GAIR and Portodimare tools to experts – Members of the Sea and Coast group
Environmental agencies	Preparation of Environmental reports under the Strategic Environmental Assessment procedure	Various analyses with Portodimare tools	Presentation of GAIR and Portodimare tools to experts, involved in preparation of MSP related Environmental report under the Strategic Environmental Assessment procedure
Institutions managing coastal areas and seas	Definition and management of the system of coastal and marine protected areas Monitoring of management plans (for example in the framework of Marine Strategy Framework, Natura 2000, Water Framework Directive)	Uploading monitoring data Various analyses with Portodimare tools	Presentation of GAIR and Portodimare tools to experts – Members of the Sea and Coast group
Research and students' community	Overview of the environmental and socio-economic situation in the AI macroregion Promotion and public presentation of data derived from research	Promotional activities: scientific articles, presentation on science events, conferences Various analyses with Portodimare tools	Presentation of GAIR and tools Regular promotional activities

Public	Awareness raising about the maritime and marine issues and opportunities offered by MSP for a transparent and participated process of planning and management the sea space	Web portals, articles for general public, brochures	Regular promotional activities

5.2. Transferability plan within other European regional seas and the Mediterranean

To further promote and transfer the GAIR to other regional seas, the Mediterranean and further to other European areas and initiatives, various platforms/systems can be approached and involved for demonstration of the GAIR contributions to the MSP processes. The following list contains relevant examples that should be considered as priorities, while others could be added and integrated throughout the process of future transferability initiatives:

- EU MSP Platform,DG MARE – MSEG, Technical Working Group on Data for MSP;
- Barcelona Convention UNEP/MAP system;
- DG-MARE EASME Project MSP-MED;
- European-level initiatives: EMODNET, EEA – Wise Marine, Copernicus CMEMS;
- HELCOM, OSPAR, ICES, and other similar initiatives outside the Mediterranean.

The approaches are listed in the table below.

EU MSP Platform, DG MARE – MSEG Technical Working Group on Data for MSP	Presentations on CommOCEAN 2020, 30.11.2020 - 02.12.2020, Sopot, Poland
	Entering the GAIR information into The EU MSP Practices database (methodology and tool category)
	Offering open online course (webinar) intended for future use of the GAIR in EU projects (through the EU MSP Platform events)
	Presentation of GAIR features and functionalities at MSEG meetings for exchange and capitalization at EU level

UNEP/MAP system	Letters - sending brochures/ project web page/GAIR online presentation
	Presentations at National Focal Points meeting, Cop meetings etc.
	Offering open online course (webinar) intended for future use of the GAIR
DG-MARE EASME Project MSP-MED	Participation to events organised by the MSP-MED project to present GAIR solutions at the Mediterranean scale
EMODNET, EEA – Wise Marine, Copernicus CMEMS	Participation to events organised by EMODNET, EEA – Wise Marine, Copernicus CMEMS to present GAIR solutions at the European scale
	Possible creation of a partnership between EMODNET, EEA – Wise Marine, Copernicus CMEMS and GAIR (option: through M&SG)
	Planning common participation to projects, calls and funds opportunities
	Exploring collaboration on technical advancements, e.g. on the following: • development/implementation of standard services API to data analysis; • protocols of alert or automatic update when new data/services are updated/uploaded in the two platforms.
HELCOM, OSPAR, ICES, and other similar initiatives outside the Mediterranean	Participation to events organised by HELCOM, OSPAR, ICES to present GAIR solutions in other European regions
	Possible creation of a partnership between HELCOM, OSPAR, ICES and GAIR (option: through M&SG)
	Exploring collaboration on technical advancements, e.g. on the following: • development/implementation of standard services API to data analysis; • protocols of alert or automatic update when new data/services are updated/uploaded in the two platforms.

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