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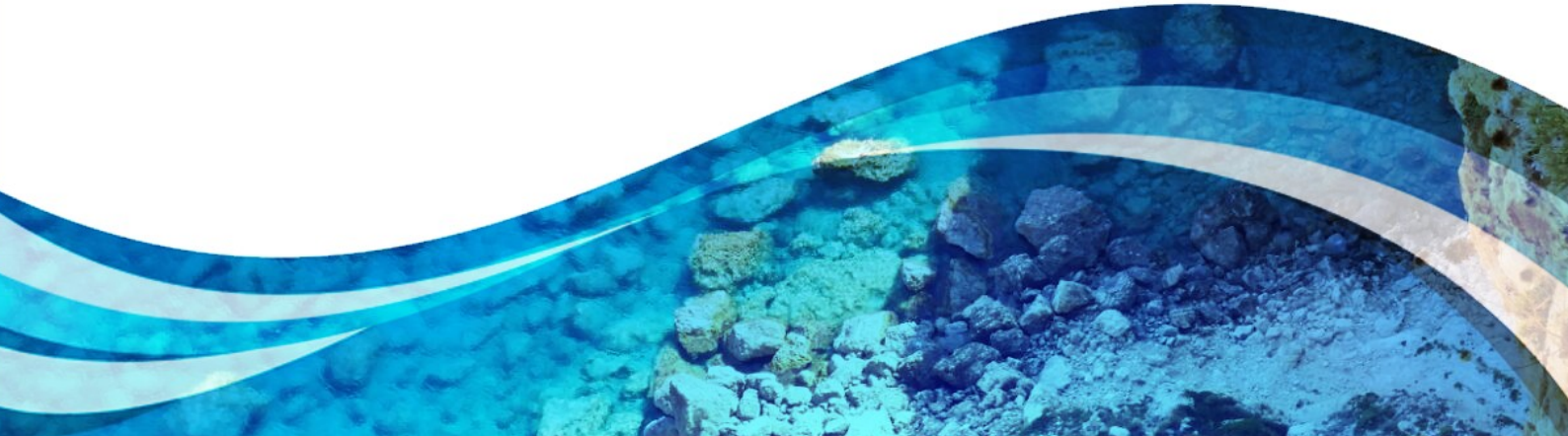

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CONTENTS

Executive summary / Abstract

Many EU-funded projects have been exploring ways to construct interoperable approaches to support open-data policies. However, a gap that BLUEMED is trying to bridge is the need to find practical ways to guide potential users through the maze of data that are increasingly becoming available. Attention is paid to the totally different needs that distinct communities have in accessing data. These needs range from the access to raw data (as in the case of scientific communities) to the access to products of variable degrees of elaboration and complexity. BLUEMED aims at defining guides to the potential users of all the marine-related data and products in support to economic growth of the region.

The foreseen vision is the possibility to use the Mediterranean area and its scientific and stakeholders community as a physical and economic/social environment where launching an innovative policy and practice on data sharing and reuse across different communities beyond the Academia.

One of the key aspects in open data is that entire data sets can be re-used for purposes that are totally new and different from the purposes for which data have been originally acquired.

This document represents a baseline analysis of the main issues related to data policies and accessibility and defines guidelines and a roadmap plan of stakeholder involvement, collection of information and its analysis.

Scope

This deliverable 3.5 “Data Policies and Accessibility Assessment” refers to the Task 3.3 “Data Policies Accessibility” of the CSA BLUEMED. It is the first step of a process that has the aim to review and analyse policies and accessibility for marine and maritime data in the Mediterranean, to foster its discovery, access and reuse.

The deliverable 3.5 will be followed by other activities and specifically by a second deliverable, D3.6 “Data policies and accessibility Plan”, foreseen for the month 38 of the project, containing recommendations and proposals of actions on data and how those actions should be addressed in the SRIA Implementation Plan.

This document represents a baseline analysis of the main issues related to data policies and accessibility and defines guidelines and a roadmap plan of stakeholder involvement, collection of information and its analysis.

1 Introduction

Many EU-funded projects have been exploring ways to construct interoperable approaches to support open-data policies. However, a gap that BLUEMED is trying to bridge is the need to find practical ways to guide potential users through the maze of data that are increasingly becoming available. Attention is paid to the totally different needs that distinct communities have in accessing data. These needs range from the access to raw data (as in the case of scientific communities) to the access to products of variable degrees of elaboration and complexity. BLUEMED aims at defining guides to the potential users of all the marine-related data and products in support to economic growth of the region.

The foreseen vision is the possibility to use the Mediterranean area and its scientific and stakeholders community as a physical and economic/social environment where launching an innovative policy and practice on data sharing and reuse across different communities beyond the Academia.

One of the key aspects in open data is that entire data sets can be re-used for purposes that are totally new and different from the purposes for which data have been originally acquired. This is particularly important in the case of the BLUEMED initiative, where innovation, blue jobs and growth are key terms and objectives to support.

Many questions arise where dealing with data, especially in such a complex system as the marine domain. Issues related to interoperability and standardization of web services to access the data, harmonization of data models to compare and integrate different datasets, tools to process and analyse such data, are all fundamental to extend the knowledge on the marine system and support better decisions on it. At the European level, the INSPIRE Directive 2007/2/EC has set up a complex framework for creating a shared Spatial Data Infrastructure in Europe, and it has produced several technical guidance documents on it. Anyway, in this report these elements won't be analysed in detail and will be considered as a reference base to discuss more general issues on data policies and accessibility.

2 Links with other BLUEMED-related activities

2.1 BLUEMED SRIA

In the BLUEMED Strategic Research and Innovation Agenda (SRIA)[1], "knowledge sharing" is one of the scopes cited multiple times in various contexts. In particular, access to data is explicitly mentioned, e.g. "to promote continuous long-term observation based on open data structures to guarantee easy access", "Implement data storage, management and sharing", "Creation of a common disclosure and data sharing policy".

The Technical-Level Meeting on Strengthening Euro-Mediterranean Cooperation through Research and Innovation (3 May 2017, Malta) highlighted, among its recommendations, to "invest in large scale transversal activities, go from data collection to information and services; include developing new digital monitoring applications, take holistic approach by combining all data and measurements (smart

1 http://www.bluemed-project.eu/wp-content/uploads/2016/12/Bluemed-SRIA_A4.pdf

sampling technologies, also include fisheries stock assessments and monitoring)"; "push that all data is made publicly available and protocols for data sharing agreed".

2.2 BLUEMED CSA

Task 3.2 – Research Infrastructures

Activities related to data management and access are also part of the BLUEMED Task 3.2 "Research Infrastructures". In particular, the draft deliverable D3.3 "Research Infrastructure assessment" have collected and organised the information into five categories of infrastructures, namely "Research vessels and equipment", "Marine based facilities", "Land based facilities", "Satellites and spatial", "Marine data management".

In the analysis of the research infrastructure category "Marine data management", many projects, initiatives and databases providing access to various types of marine data have been selected and analysed. 22 references have been listed in the literature and webography section, while 12 have been analysed in comparison with the BLUEMED SRIA key challenges.

While this can of course be used as a base for the identification of relevant research infrastructures, more specific analyses and considerations should be included to extract organised information for an assessment of data policies and accessibility issues and best practices.

BLUEMED Data management plan

The BLUEMED project participates in the Pilot on Open Research Data in Horizon 2020 and, as such, produced a first version of the deliverable D1.7 "Internal Data Management Plan". The Data Management Plan (DMP) contains general information on how data produced in the project will be made available to partners and general public.

As stated in the D1.7 document, "*The BLUEMED project will thus generate and make use of a large amount of relevant information [...] The project will collect and connect (but not necessarily store) processed data and information from available sources/providers on a wide number of arguments [...]*"

Anyway, there will be data and information collected during the project and the BLUEMED DMP is carefully considering that:

"*In order to enable for third parties to access, mine, exploit, reproduce and disseminate (free of charge for any user) data produced in the project, Creative Commons Licenses (e.g. CC-0 or CC-BY) will be assigned to the data deposited (https://creativecommons.org/licenses/).*"

Analyses and findings deriving from the deliverables D3.4 "BLUEMED Research Infrastructure Roadmap" and D3.6 "Data policies and accessibility Plan" will be carefully taken in consideration for possible integration of the BLUEMED Data Management Plan.

One of the important issues in the discovery and possible reuse of data is the high level of fragmentation of the data portals.

At a general level, an analysis of the open government data ecosystem in Europe (Carrara et al., 2017) pointed out that fragmented data portals can act as "disconnected information islands, making it hard to exchange metadata between

them. This situation leads to duplication of information and inconsistencies. It prevents cross-portal search and discovery of datasets.".

The already cited report from Columbus project (McMeel et al., 2017) highlight that "at European level there is a need for de-fragmentation of the plethora of marine observation and data and information sharing initiatives as well as online data portals. In the longer term, there is a need for a joint roadmap."

3 Relevant data and information

Many studies have already identified and assessed initiatives, projects, portals, databases and catalogues of information that are relevant for marine environment and maritime activities.

3.1 Data from research and government bodies

As already mentioned, the BLUEMED deliverable D3.3 "Research Infrastructure assessment" has described and analysed various marine data management research infrastructures. The main points discussed are related to: improved accessibility to data and more innovative and interactive tools; awareness in the science community on managing and sharing data; harmonization and interoperability of data; cooperation between existing infrastructures and organisations/programmes; long-term storage and preservation.

Previously, the EMODnet Mediterranean Sea (MedSea) Checkpoint identified, in its Literature Survey (Moussat et al., 2014), 23 international and intergovernmental monitoring programs and projects, analysing their data appropriateness and availability for a few identified use cases. In general, the conclusions highlighted that the categories 'Time extent and resolution' and 'Spatial resolution and extent' were found as the main criteria to discuss appropriateness. In the case of availability, differences were found between the different matrices: for marine water, availability is high, normally data are free of charge and available; for seabed data, availability is high for low resolution data while high resolution is difficult and data are proprietary; for fresh waters and biota/biology the situation is mixed and data availability is medium to low and data have restricted access; for the air, matrix characteristics the availability is highly mixed, going from fully open and accessible to closed and difficult.

Another example of extensive review of marine data portals is the one carried out for the Deliverable 4.2 "Portals and Repositories and their role in Knowledge Transfer to support Blue Growth"[2] from the Columbus project[3]. Its annex 1 in fact contains an inventory of 88 "relevant portals and repositories of marine data and information". A few recommendations were drafted to address existing barriers: need of promotion, communication and support efforts to lower restrictions to open sharing of data; improve the visibility of marine data and resources beyond the research and specialist communities; ease the use of interfaces and tools to interact with data; simplify alignment and collaboration between marine data systems; increase sustainability in marine data information systems funding; increase engagement and interaction with stakeholders.

2 http://www.columbusproject.eu/Columbus_D4.2-Revision-13122016.pdf

3 http://www.columbusproject.eu/

Very recently, the H2020 funded project AORA (Atlantic Ocean Research Alliance)[4] produced an updated report on "European catalogue of marine data and information portals"[5], describing 68 "European seas infrastructures" plus various others related to European Atlantic states infrastructures. The report concluded that the vast majority of the portals gives free access to data and information products, 66% without any form of negotiation, another large proportion by registration. In a few cases the access is not clearly defined or the links to resources are not functioning, while only in 1 case data are 'restricted'.

With a focus on MSP-related issues, another study carried out by the European Commission "MSP Data Study: evaluation of data and knowledge gaps to implement MSP" (EC DG MARE, 2016), considered in its analysis 60 operational marine data infrastructures with potential relevance to the MSP process.

Many of the initiatives and projects covered in the review reports above mentioned have a European or world-wide level of analysis; fewer projects have a specific focus on the whole Mediterranean basin or its sub-regions (e.g. Perseus, CoCoNet, Odyssea); it will be particularly important to include them in the BLUEMED analysis and to involve correspondent contact persons in all the phases of stakeholders consultation.

3.2 Data from international organizations

Various other international organisations collect and organise data on the marine environment and/or maritime activities. Reasons to collect and ways and functionalities to access this information vary considerably and particular attention should be kept in considering specificities.

Using the key challenges as possible categories for analysis, we should be able to connect and include in this analysis the main reference information systems for fishery, tourism, traffic, energy, defence, etc. (e.g. General Fisheries Commission for the Mediterranean (GFCM)[6], Marine Traffic[7], ...).

In the Mediterranean, a special mention has to be given to the UNEP/MAP[8] (Coordinating Unit for the Mediterranean Action Plan Secretariat to the Barcelona Convention and its Protocols) and its *Regional Activity Centre for Information and Communication* (infoRAC)[9], that is coordinating the efforts for information sharing and communication and is managing a spatial data infrastructure and data portal for the whole Mediterranean area.

One main element to be also considered here is the mass of information produced for the monitoring and assessments activities undertaken for the Marine Strategy Framework Directive. Member states have been collecting and organizing a vast amount of information at national level, that has to be reported to European Commission. Another more recent European Directive, the MSP Directive

4 https://www.atlanticresource.org/aora/

5 https://www.atlanticresource.org/aora/sites/default/files/GalleryFiles/Publications/AORA-CSA-WP11_European-Catalogue-verOct2017.pdf

6 http://www.fao.org/gfcm/data/en/

7 http://www.marinetraffic.com

8 http://web.unep.org/unepmap/

9 http://www.info-rac.org/

2014/89/EU, requires that data are organised and shared to support the definition of maritime spatial plans. Both MSFD and MSP Directives reference the INSPIRE 2007/2/EC Directive as the framework to be used for a standard and interoperable sharing of spatial knowledge. These two streams of information are very important for BLUEMED and should be considered in the analysis of sources of information in the Mediterranean.

Finally, an important synergy has been established between the BLUEMED CSA and the Union for the Mediterranean (UfM)[10] to use as a common access place for maritime knowledge in the Mediterranean, called "The Virtual Knowledge Centre" (VKC)[11]. VKC is a tool developed by UfM that collects and organise information related to three main categories of resource (Knowledge Management Systems, Projects, Stakeholders) and aims at stimulating an active collaboration allowing the upload of information to registered users.

3.3 Data from private sector

Almost all the databases, projects, portals, initiatives analysed in the previously mentioned reports are related to research institutions and mainly funded by public European funds.

But, while research data and public organization data sharing initiatives have an already advanced and well known process and organization to deliver and make accessible their datasets, far less is know about data that are collected by industry and private parties that could be of interest to foster the blue growth agenda.

Despite of this, Blue Growth-related knowledge is heavily affected by and is of high interest for business-related stakeholders, who are collecting, managing, accessing and reusing a vast range of data on the marine and maritime domain.

This information, together with data related to socio-economic aspects of the marine and maritime world, is far to be easily accessible and reusable by research institutions and other stakeholders.

In the context of BLUEMED, we are interested in two different types of data in relation to private sector:

- data collected by private sector that are of interest for the implementation of EU policies and directives on marine and maritime issues in the Mediterranean,
- data collected by research and public activities and institutions that are interesting for private sector.

Among other initiatives, the Columbus project recently investigated various aspect related to *Knowledge transfer for Blue Growth*. In particular, in the document "Use and sharing of marine observations and data by industry - Good practice guide" (McMeel at al. 2017), it states that "coastal and ocean observatories and public data-sharing initiatives face common challenges in their efforts to unlock the full societal and economic potential of the wealth of European marine data and observations at European, national, regional or local level and demonstrating their use and positive contribution to sustainable blue growth". Among the conclusions and recommendations, the fact that "Industry must be involved in the entire life cycle and

10 http://ufmsecretariat.org/

11 http://www.med-vkc-blueconomy.org/

embedded in the governance" is for sure one of the main points to be taken in consideration.

On this very important issue, the report "Legal study on Ownership and Access to Data" (EC DG CONNECT, 2016) studied existing legal instruments and landscape affecting commercial operator's access to and rights over data highlighting the "lack of coherence of its treatment in law within national laws, let alone harmonisation (other than in respect of data privacy and, in future, trade secrets) between different Member States".

4 Collection of information about data policies and accessibility

As stated also in previous sections of this document, there are various projects and initiatives that collected data policies and accessibility information inside reviews and analyses of database, data portals and infrastructures. Despite of this, there are still no studies having that as a specific focus, even if policies and accessibility level of data are always considered of great importance for the reuse of the information.

For this reason, all the previous mentioned documentation and reviews, plus others that in this deliverable have not been mentioned, should be used as a basis for an analysis clearly focused on how, currently, marine and maritime information are being made accessible and how this can be improved and facilitated.

4.1 Categories of assessment

Many data policies have been prepared and are used to make accessible marine data through data portal.

Anyway, it is not easy to find clear common characteristics useful to compare these policies, making difficult to assess commonalities and differences.

There are various ways to try to describe and organise information about data policies and accessibility.

Possible elements to be analysed are:

- Data policies availability with characteristics and description
- Interoperability level, in relation to:
  - Discoverability of metadata
  - View services
  - Download services
- Reuse: additional/specific functionalities
- Preservation
  - DOI
  - Trusted repositories
- Dissemination facilities

A formal way to define the degree of accessibility of resources is the *MD_RestrictionCode* code list from the ISO 19115 standard on Geographic information – Metadata[12].

Name	Definition
copyright	Exclusive right to the publication, production or sale of the rights to a literary, dramatic, musical or artistic work, or to the use of a commercial print or label, granted by law for a specified period of time to an author, composer, artist, distributor.
patent	Exclusive right to make, sell, use or license an invention or discovery.
PatentPending	Procured or sold information awaiting a patent.
Trademark	Name, symbol or other device identifying a product, officially registered and legally restricted to the use of the owner or manufacturer.
License	Formal permission to do something.
intellectualPropertyRights	Rights to financial benefit from and control of distribution of non-tangible property that is a result of creativity.
restricted	Withheld from general circulation or disclosure.
otherRestrictions	Limitation not listed.

A recent report from the Open Knowledge Foundation (OKNF)[13], named "Avoiding data use silos - How governments can simplify the open licensing landscape"[14], highlights that "The proliferation of new licences continues to be a major challenge for open data. [...] Because of legal uncertainties and compatibility issues with many different licenses, this proliferation can have chilling effects on the reuse of data. Standardised licences can smoothen this process by clearly stating usage rights."

One good example of common terminology in the marine domain is the "SeaDataNet data access restriction policies" code list[15], containing 13 labels and descriptions of possible ways to allow (or no allow) the access to data.

Label	Definition
collection cost charge	A charge is made related to the cost of collecting the data.
commercial charge	A charge significantly exceeding the cost of data collection and delivery is made for usage of the data.
licence	Conditions of supply and usage of the data are specified in a formal agreement.
SeaDataNet licence	Access to the data and usage are as specified in the SeaDataNet data policy and licence agreement
moratorium	Data are initially restricted, but the access condition relaxes to academic or unrestricted once a specified period of time after an event (such as collection, publication, completion of QC procedures or project cessation) has elapsed.

12 https://www.iso.org/standard/53798.html

13 https://okfn.org/

14 https://research.okfn.org/avoiding-data-use-silos/

15 http://seadatanet.maris2.nl/v_bodc_vocab_v2/search.asp?lib=L08

no access	Access to the data cannot be negotiated.
distribution cost charge	A charge is made to cover the costs of delivering data to the user.
organisation	The data are unrestricted to members of an organisation or a virtual organisation (such as project or cruise participants) but restricted to anybody else.
by negotiation	The data are witheld from general circulation and disclosure but access may be obtained on a case-by-case basis through negotiation.
academic	The data are freely available for research and education purposes. Usage acknowledgement is usually expected.
unknown	The correct value is not known to and not computable by the creator of this information. However a correct value probably exists.
unrestricted	The data are freely available to anybody and may be used for any purpose. Usage acknowledgement may be required.

Information and categories for the assessment of the accessibility of marine and maritime data has to be analysed and tailored with a focus on the different sectors and communities involved.

The five categories of infrastructures, analysed by the deliverable D3.3 “Research Infrastructure assessment” (Research vessels and equipment, Marine based facilities, Land based facilities, Satellites and spatial, Marine data management) and all sectors involved in the Blue Growth (fishery, energy, maritime traffic, tourism, environmental protection, …) have different aims and approaches in collecting and managing data; so also their data policies and level of accessibility can greatly differ and have to be considered with particular attention to their specificities.

With this perspective, a coherent way to organise and discuss these issues will be to use the BLUEMED key challenges as categories of analysis:

- Mediterranean sea ecosystems
- Mediterranean sea dynamics
- Hazard and protection of coastal areas
- Innovative businesses based on marine bio-resources
- Aquaculture and fisheries
- Sustainable tourism
- Maritime clusters
- MSP and ICZM
- Maritime transport and facilities
- Observing systems and operational oceanography
- Multi-purpose off-shore platforms
- Marine and coastal cultural heritage

4.2 Stakeholders and communities involvement

The actors involved in the collection, analysis, management and dissemination of marine and maritime data are many and with different needs, skills, views and perspectives on how interact, collaborate and share information.

It is undoubted that a good structured plan for stakeholders involvement is key for having access to information in the various domains involved in the Blue Growth. In this sense the BLUEMED CSA structure and, in particular the BLUEMED Platforms[16], will be very useful in creating the right connections and exchange of information needed.

The already mentioned document "*Use and sharing of marine observations and data by industry - Good practice guide*" (McMeel et al., 2017) gives very useful advices on how knowledge transfer between public and private sector should happen. Among others, the following ones should be considered very seriously when interacting with stakeholders in the data policies and accessibility topic:

- Industry representatives should be included in the governance and take part in the entire cycle of decision making, development and operation of marine observation and data-sharing initiatives.
- Data, products and services offered by marine observation and data initiatives should be presented in a user-friendly, attractive and intuitive way which is adapted to the target user.
- Clear, succinct and open communication is critical. Equally important is to provide information on what is not available and the limitations of the resources offered.
- Dedicated data-sharing policies to incentivise the private sector and address their specific needs should be developed

5 Workplan towards a "Data policies and accessibility Plan"

As stated in the introduction section, the BLUEMED Task 3.3 "Data policies and accessibility" is intended to identify the main issues related to data policies and accessibility in the Mediterranean region. This deliverable D3.5 "Data policies and accessibility assessment" has the limited scope to set-up a road-map and activities that will be carried out during next months of the BLUEMED project in preparation of the deliverable D3.6 "Data policies and accessibility Plan" foreseen for the month 38.

During the next 2 years of the project, various activities will have to be set up and managed to collect information, involve partners and relevant stakeholders, organize events and opportunities of discussion, with the view to develop and apply the issues described in the previous paragraphs.

The main activities to be considered in the preparation of the deliverable D3.6 "Data policies and accessibility Plan" will be the following:

- selection of relevant initiatives/projects to be analysed in the view of data policies and accessibility,
- identification of relevant stakeholders to be contacted and included in the analysis and assessment phases,

16 http://www.bluemed-initiative.eu/bluemed-platforms/

- preparation of surveys/questionnaires to collect in a structured way information on data policies and accessibility,
- organization of events and opportunities of discussion with representatives of initiatives/projects and stakeholders identified,
- drafting and preparation of the deliverable D3.6 "Data policies and accessibility Plan".

In the following paragraphs, the previous points will be briefly presented and detailed, with information about draft timeline and partners involved.

5.1 Actors involved

The leading partner (CNR) and the other partners directly involved (IEO, IZOR, MINECO) will actively work on selecting and analysing documents and materials, preparing and conducting questionnaires and interviews, contributing to the organization of events, drafting and contributing to the writing of the final deliverable, while other partners will be contacted and involved in specific activities to contribute with their expertise.

The BLUEMED Platforms will be fundamental in facilitating the exchange on information among different stakeholder and direct contacts with the Platforms coordinators and the national pivots will help in driving requests, messages and communications to the most wide and proper audience.

5.2 Stakeholders involvement

The BLUEMED CSA Coordinators' meeting to be held in Valletta, Malta between 11-12 January 2018 has the aim to bring together a selected group of Coordinators together to initiate discussions to find ways on facilitating a good level of coordination among the different projects operating in the Mediterranean.

This first event could help to start the discussion on current state and issues on data policies and accessibility in the selected projects, highlighting first gaps and possible solutions.

During the next 2 years of activities of the task 3.3 "Data Policies Accessibility", other events will be selected where specific discussion with partners and selected stakeholders will focus on data policies and accessibility for Blue Growth in the Mediterranean.

Specific activities of selection of and interactions with relevant stakeholders are foreseen during the year 2018, where interviews (face-to-face or remote) and questionnaires will be used to gather focused information and perspectives on data policies and accessibility issues.

An important role will be given to the collaboration with the Pilot Blue Cloud, that has the aim to demonstrate in a thematic domain the value and real opportunities given by the European Open Science Cloud (EOSC) initiative[17].

In the context of the Mediterranean areas, the already ongoing collaboration between BLUEMED and the Union for the Mediterranean (UfM)[18] will allow a wider connection

17 http://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud

18 http://ufmsecretariat.org/

with non-EU countries and their initiatives, current state, perspective and concrete issues on data policies and accessibility.

5.3 Timeline

As a general framework, the following table shows the proposed timeline of general activities foreseen for the next two years of activities:

	2018		2019	
General activities	*1st semester*	*2nd semester*	*1st semester*	*2nd semester*
Stakeholders involvement				
Collection of information				
Analysis of needs and gaps				
Guidelines and best practices				

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