UNITED NATIONS

EP

UNEP(DEPI)/MED WG.444/Inf.8

UNEP

UNITED NATIONS
ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN

3 August 2017
Original: English

6th Meeting of the Ecosystem Approach Coordination Group

Athens, Greece, 11 September 2017

Agenda item 4: Review of Quality Status Report (QSR)

Reports of the Science-Policy Interface Workshops (English only)

- **Report of the Inception Workshop: Implementation of the Ecosystem Approach in the Mediterranean: Strengthening the Science-Policy Interface (Sophia Antipolis, France, December 15-16th, 2015)**

- **Report of the Meeting "Workshop on Science Policy Interface (SPI) strengthening for the implementation of the UNEP/MAP Integrated Monitoring and Assessment Programme, for Pollution" (Marseille, France, 20-21 October 2016)**

- **Report of the "Workshop on Science Policy Interface (SPI) strengthening in the field of Marine Protected Areas and Marine biodiversity in the Mediterranean" (Tangier, Morocco, 28 November 2016)**

- **Report of the Meeting "Workshop on Science Policy Interface (SPI) strengthening for the implementation of the IMAP in relation to Marine Litter, Biodiversity & fisheries, Hydrography, with a focus on the Risk based Approach for monitoring" (Madrid, Spain, 2 March 2017)**

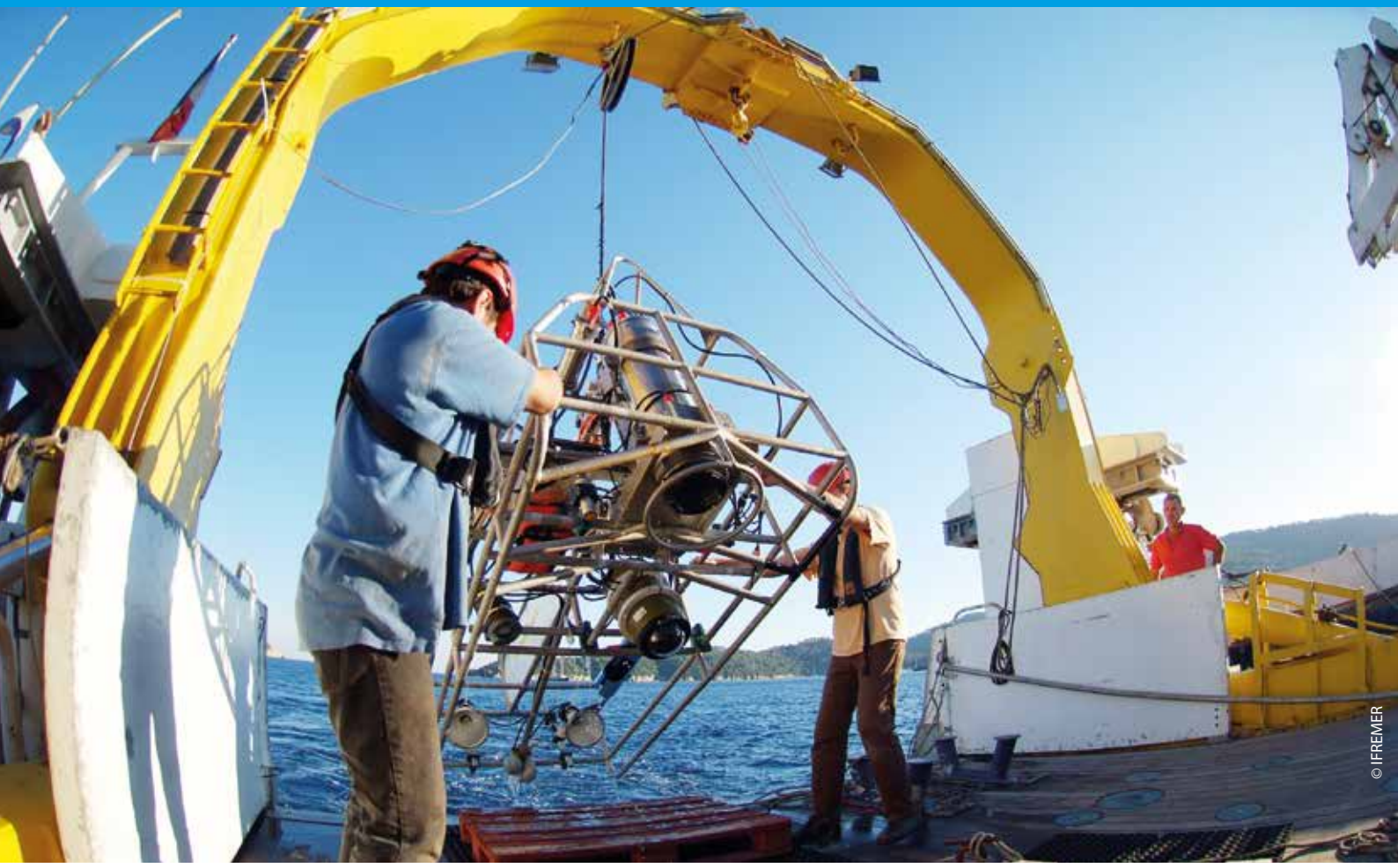
- **Report of the Meeting on "Joint Workshop on Science Policy Interface (SPI) strengthening and Ecosystem Approach Coordination Group Meeting on IMAP scales of monitoring and assessment, including the next QSR" (Nice, France, 27-28 April 2017)**

Report of the Inception workshop

IMPLEMENTATION OF THE ECOSYSTEM APPROACH IN THE MEDITERRANEAN:

STRENGTHENING THE SCIENCE-POLICY INTERFACE

December 15-16th, 2015 - Sophia Antipolis, France



© IFREMER

UNEP

MAP

40 Years TOGETHER FOR A SUSTAINABLE MEDITERRANEAN

Plan Bleu

UNEP/MAP project reference: Mediterranean implementation of the Ecosystem approach, in coherence with the EU MSFD (EcAp MED II)

Authors : This report was edited by Lina Todeand Didier Sauzade, Plan Bleu, on the basis of participants' contribution to the workshop.

Head of publication
Anne-France Didier

Design and production
Texto Imprimerie , Imprim'vert©

Printed by
Texto Imprimerie, Imprim'vert©

The views expressed herein are those of the authors and do not necessarely reflect the opinion of Plan Bleu.

For bibliographic purposes this volume may be cited as: Plan Bleu (2016). Rapport de l'atelier de lancement : « Mise en œuvre de l'approche écosystemique en Méditerranée : renforcement de l'interface entre science et politique ». Tode Lina (ed.), Sauzade Didier (ed.)

Plan Bleu

Plan Bleu pour l'Environnement
et le Développement en Méditerranée

15 rue Beethoven - Sophia Antipolis
06560 Valbonne – France
Tél. : +33 (0)4 92 38 71 30
Fax : +33 (0)4 92 38 71 31
www.planbleu.org

CONTENT

EXECUTIVE SUMMARY

The workshop "Implementation of the Ecosystem Approach in the Mediterranean: strengthening the science-policy interface" took place on December 15-16th, 2015 in Plan Bleu's premises in Sophia Antipolis, France. The workshop united 44 participants from the South, East and North of the Mediterranean representing Contracting Parties to the Barcelona Convention, scientific and research institutions and projects, NGO's and UNEP-MAP components.

This workshop was organized in the framework of EcAp, a specific process under the UNEP/MAP whereby the Contracting Parties to the Barcelona Convention have committed to implement the ecosystem approach in the Mediterranean with the ultimate objective of achieving the good environmental status (GES) of the Mediterranean Sea and Coasts. Specifically, it was the inception event of the Output 3 "Strengthening the science-policy interface" of a 2015-2018 project (EcAp Med II) aiming to support UNEP/MAP Barcelona Convention and its Southern Mediterranean Contracting Parties to implement EcAp in coherence with the implementation of the European Union (EU) Marine Strategy Framework Directive (MSFD). The Output 3 work plan is mostly based on the organization of workshops during the project life.

MAIN OBJECTIVE

The workshop's main objective was to foster the exchange of information between scientists and policy makers and highlight key policy challenges requiring scientific inputs in relation to monitoring, environmental assessment and new measures. Specifically, it provided an opportunity to:

- identify key scientific gaps to be filled as a priority for the implementation of the planned Integrated Monitoring Assessment Programme (IMAP) being developed by UNEP/MAP;
- discuss and agree on key action points related to the identified gaps allowing the scientific community to contribute effectively to the policy processes;
- provide recommendations on the objectives and methods for subsequent workshops;
- identify key relevant projects and research institutions around the Mediterranean, with the view of creating a network that can have an active role in the implementation of IMAP at various scales.

RESULTS

The workshop succeeded in providing a platform for exchange on best practices in terms of science-policy interfaces (SPI) in the Mediterranean thus initiating the setting up of a network to support implementation of the IMAP.

The presentations and discussions of the workshop participants made it clear that SPI is currently a real issue perceived by scientists and decision makers. The workshop opened up perspectives to develop SPI for IMAP, namely by pointing out the need to (i) formalize SPI along with its structure and processes and to (ii) identify dedicated resources to support SPI.

Furthermore, during working sessions in sub-groups and plenary discussions, around 15 key cross-cutting and topic-specific knowledge gaps to be filled for the complete implementation of IMAP have been identified along with proposed actions to be taken to address these gaps.

The workshop took first steps towards the development of a network of relevant projects and institutions to support implementation of IMAP by uniting 9 major research projects in marine science focusing on the Mediterranean Sea and 35 institutions.

It is now recommended to build on the workshop outcomes and prepare the next steps to strengthen SPI for the IMAP. Capitalizing on the results of this inception workshop in terms of SPI recommended practices and formal SPI recognition / structuration, subsequent workshops should be organized to continue the dialogue between scientific experts and policy makers aiming to document the scientific actions required to address the identified knowledge needs that may impede the full IMAP implementation. These scientific actions will be specially shared with the leaders of other EcAp Med II project actions in order to foster their implementation.

INTRODUCTION, CONTEXT

For the past forty years, UNEP/MAP and the Barcelona Convention with its seven protocols have provided a unique political and legal framework in the area of environmental protection, with all the Mediterranean riparian countries and the European Union as Contracting Parties. Pursuant to several decisions of the Contracting Parties, specific efforts were made during the past decade to implement the ecosystem approach (EcAp) with the objective to achieve the good environmental status of the Mediterranean.

The Ecosystem Approach constitutes the overarching principle of UNEP/MAP Barcelona Convention and refers to a specific process (EcAp) whereby the Contracting Parties at the Barcelona Convention have committed to progressively implement the ecosystem approach in the Mediterranean with the ultimate objective of achieving the good environmental status (GES) of the Mediterranean Sea and coast. The GES has been defined through eleven Ecological Objectives (EO) listed in **Annex 4**. In order to reach these ambitious objectives, the process plans to achieve GES through informed management decisions, based on integrated quantitative assessment and monitoring of the Marine and Coastal Environment of the Mediterranean.

Mainstreaming EcAp into the work of UNEP/MAP Barcelona Convention and achieving the GES of the Mediterranean Sea and coast through the EcAp process have been supported by the EU funded project entitled "Implementation of the Ecosystem Approach in the Mediterranean by the Contracting parties in the context of the Barcelona Convention for the Protection of the Marine Environment and the Coastal region of the Mediterranean and its Protocols" (EcAp MED project 2012-2015).
Key achievements of the EcAp process and the EcAp MED project 2012-2015 include the development of 27 common and candidate indicators (**Annex 5**), which will be the basis of an Integrated Monitoring and Assessment Program (IMAP) covering the whole Mediterranean Sea and coast, based on a common regional basis.

The EcAp-MED project 2012-2015 also assessed the state of play in the Mediterranean, facilitated cooperation between the different actors, undertook a socio-economic assessment of maritime activities and tested an EcAp common candidate indicator on coastal land-use change. In addition, it has been supporting the Marine Litter Regional Plan Implementation, the development of the Offshore Action Plan and the building of a framework to facilitate the joint establishment of Specially Protected Areas of Mediterranean Importance in open seas, made possible through a participatory approach in multiple meetings at various levels in order to build consensus.

To continue to progress towards the implementation of the Ecosystem Approach in the Mediterranean, the EcAp MED II project 2015-2018 supported by the European Union has been developed and focus specifically in assisting the Southern Mediterranean Contracting Parties to the Barcelona Convention to implement the EcAp process and specifically the implementation of the new monitoring and assessment requirements of IMAP.
Additionally, in order to contribute to fulfil the above-mentioned objectives, it appeared crucial to bridge the gaps between the scientific and policy making spheres by strengthening the interface between them, thereby constituting one of the activities to be performed in the framework of EcAp MED II project.
Thus, the present inception workshop of the Science-Policy interface's action is the first organized in the framework of the Output 3 of the EU EcAp MED II project entitled "Stronger Ecosystem Approach related Science-Policy Interface in the Mediterranean". In this context, it is planned to undertake the following three major activities:

1. Based on the identification by Contracting Parties of key science and policy gaps relevant to EcAp, organize scientific workshops on a regional basis, targeting specific areas that were identified by Contracting Parties, with pre-defined questions and by harnessing existing knowledge and relevant EcAp implementation-related scientific projects;
2. Reflect relevant scientific recommendations and results and peer-review the planned draft State of Environment Report of the Mediterranean (2017) by the scientific experts;
3. Follow-up with targeted communication material, ensuring further knowledge sharing and specific scientific input both to the development of national work (monitoring implementation plans), sub-regional and regional-policy development.
   This inception workshop fostered the exchange of information between scientists and policy makers and highlighted the key policy challenges requiring scientific inputs in relation to monitoring, environmental assessment and new measures. Specifically, it was an opportunity to:

based on the analysis of the working document, agree on a list of priority scientific gaps to be filled as a priority for a better implementation of IMAP with maximum two priority scientific gaps identified by Ecological Objectives;
discuss and agree on key action points related to the identified gaps addressing how the scientific community could in a practical manner contribute effectively to the IMAP implementation and regional EcAp process;
provide recommendations on the objectives and methods for the following workshops;
identify key relevant projects and research institutions around the Mediterranean, with the view of creating a network that can have an active role in the implementation of IMAP at various scales.

- To achieve these objectives, participants to the workshop have been selected to represent the main stakeholder groups that may be involved in the strengthening of the Science Policy Interface to best implement IMAP. These groups are mainly:
- MAP Focal Points designated by the countries parties to the Barcelona Convention, representing the policy makers of the coastal and marines environmental policies
- Coordinators and participants to recent or on-going research projects willing to provide project results to serve environmental policies
- Regional scientific bodies having to advise policy makers
- Experts in environmental science policy interface, helping to develop sustained and efficient Science Policy interfaces
- UNEP MAP component representatives, in charge to implement policy decision taken by the Conference of Parties.


© Plan Bleu

FLOW OF THE WORKSHOP

The workshop took place from December 15th to 16th, 2015 in Plan Bleu's premises in Sophia Antipolis, France. After the opening of the workshop in the early afternoon of December 15th, its general context, flow and objectives were presented, followed by a presentation of the Mediterranean Action Plan working framework. Then the experience of CIESM – the Mediterranean Science Commission with regards to science-policy interface (SPI) was introduced to the participants. After a brief discussion with the participants, the SPI development experience from 7 recent large EU research projects, namely PERSUS, CoCoNet, DEVOTES, IRIS SES, SEA-ERA MERMAID and STAGES was showcased. EMODnet and COLOMBUS projects were also more briefly presented. A preliminary list of knowledge needs for the implementation of the IMAP has been discussed. The first day of the workshop ended with a plenary discussion. On December 16th, after a presentation of SPI issues addressed within the SPIRAL project, participants got together in three sub-groups, with sessions concentrating on the three EcAp thematic "clusters" (i) contamination and litter, (ii) biodiversity and fisheries, and (iii) coast and hydrography. The results of the working sessions were then carried together in a plenary discussion leading to the workshop's closing.


© Plan Bleu

SUMMARY OF THE PRESENTATIONS OF SCIENTIFIC PROJECTS

Science-policy interface (SPI), the view of the CIESM, by Frederic Briand, General Director

For Frederic Briand, science and policy are two different planets! The media often act as intermediary between these worlds. There are multiple obstacles to good communication between them, in particular the policy makers' lack of scientific culture/background, the complexity of the marine environment, the scientists' lack of time due to their busy fundraising schedule, and scientists lacking a single voice. This distance is also found with the general public who generally has a distorted comprehension of the major risks. Finally governments generally have neither the will nor the ability to integrate scientific advice. These barriers are particularly critical for overcoming key challenges to the Mediterranean marine environment: rapid development of maritime traffic, impacts of the development of offshore oil and gas on marine biodiversity, geo hazards, macro waste... The problems are even greater for the management of the high seas by riparian countries with significant cultural differences which complicate exchanges (cf. Lewis model on country-specific cultural types). SPI activities are provided by CIESM mainly through monographs developed by the network's scientists on topics of interest to policy making (eg. Marine Litter, marine extinctions), a series of political publications (CIESM Marine Policy Series) of which the latest edition is entitled "Doing research is important for the governance of the Sea" and the collective development and international promotion of good practice charters on important issues, such as on access and sharing of the benefits of marine genetic resources.

The activities of the EU PERSEUS project to strengthen SPI for the Mediterranean marine environment by Vangelis Papathanassious, HCMR, scientific coordinator of the project

- This large scientific project (2011-2015) involved over 300 scientists from 53 partners spread over 22 countries. One of the objectives was precisely to provide scientifically based recommendations to develop policies aiming at achieving the GES in the Mediterranean and Black Sea. PERSEUS was able to significantly increase the scientific knowledge usable in the management of the Mediterranean and Black Sea. On this basis, the project organized multiple interactions between scientists and stakeholders, notably through six workshops to strengthen SPI. A framework and a toolkit, the AMP Toolbox, have been developed to help design adaptive marine policies, following the principles of the ecosystem approach. About 100 stakeholders from various riparian countries helped in specifying and testing the AMP Toolbox. Finally PERSEUS published a paper with policy recommendations, which were presented to high level stakeholders in the European Parliament in Brussels. The project sought to cooperate with the Regional Seas Conventions, particularly with UNEP/MAP, in particular through a riverine inputs atlas and the organization, in cooperation with the COCONET, DEVOTES and IRIS SES projects, of a biodiversity workshop (April 2014) for the development of IMAP, which has been a source of inspiration for action to strengthen SPI and which was at the origin of this workshop.
- PERSEUS experience has shown that scientists and

policy makers are on the same planet but do not speak the same language. Concerning policy making, scientists should be aware that the common interface between scientific evidence, political will and capacity of socio-economic structures is generally narrow. SPI relevant lessons learned from the project are:

- Involve stakeholders of environmental issues from the inception of a project
- Foster multidisciplinary research efforts, including social science and humanities, focusing on the complexity of the Mediterranean system, particularly how to practically implement the principles of management according to the ecosystem approach, including an integrated environmental vision and participatory approach
- Provide decision makers with needed management support tools, when it is scientifically possible
- Listen to policymakers and make the effort to transmit their knowledge, or rather their "wisdom" coming from knowledge (data> knowledge> wisdom)
- Explain to policy makers the implications of research rather than the research results themselves
- Be aware that one of the strengths of research is to produce inclusive diplomacy, particularly important in the Mediterranean

The interface between science and policy lessons from the EU project CoCoNet, Ferdinando Boero, Università del Salento CNR-ISMAR, Project Coordinator

CoCoNet (2011-2016) is a large scientific project with political objectives for the Mediterranean Sea and the Black Sea: Recommendations for the establishment of Marine Protected Areas and Wind Chart for the installation of offshore wind farms.
Ferdinando Boero emphasized a gradual evolution of environmental legislation, from anthropocentrism (scenic beauty, remarkable biodiversity) to the consideration of the benthos and the biocentrism (all ecosystem components, GES). Unlike in speeches often heard, science could not fully follow this development, due to a lack of knowledge on ecosystems and their functioning. Both knowledge and experts in taxonomy to do this job are particularly absent, and taxonomy is a discipline in full decline because of the preeminence of molecular biology.
This development also raises unresolved questions about the definition of GES, Man's place in ecosystems, the role of the economy, which must be contained in ecology, and taking into account the natural capital, the concept of sustainable development... For Ferdinando, environmental policies must respect the rules of ecology, or otherwise risk failing. Scientists' recommendations to policy must take into account the views of all relevant disciplines, including taxonomists, often absent for the reasons mentioned before. Policies should encourage upgrading this discipline, or otherwise risk receiving incorrect recommendations.
CoCoNet tried to adopt a holistic approach, by implementing coherent units of management and conservation of marine ecosystems. Cells of ecosystem functioning were defined comprising volumes and not just areas. They were documented by multiple layers of information and can be used for observation, monitoring and protection of biodiversity. In conclusion, good science creates interfaces with policy makers by itself.

Interface between science and policy, the EU project DEVOTES, Angel Borja, AZTI, Project Coordinator

The project DEVOTES aims to develop tools for understanding marine biodiversity, assessing the state of the environment and assisting in the implementation of policies. It has sought to better understand the impact of human activities and climate change. Maps on monitoring and ecosystem services were produced. A description of the socio-economic implications has been done, particularly from a legal angle. The main obstacles to achieve GES have been identified. Support software for the selection and refining of state indicators has been developed and used for national waters of several Member States and at regional level.
For the project DEVOTES, SPI has taken the form of a management support tool summarizing all results of the "NEAT" (Nested environmental assessment tool) provided for policy makers, citizens, researchers, NGOs ... who are interested in these issues.

Interface between science and policy, the EU MERMAID project, Eleni Kaberi (HCMR), Project Coordinator

MERMAID (February 2013 - September 2015) is a Seas-era project on marine environmental target indicators of regional management schemes in the Mediterranean Sea. MERMAID worked especially on the descriptors 3 (exploited species), 7 (hydrography), 8 (environmental chemical contamination), 9 (chemical contamination exploited species) and 10 (marine litter).
MERMAID has developed a tool for linking targets and management measures to achieve GES. This tool allows synthesizing expert opinions on the assessment of the cost / effectiveness of MSFD programs of measures. It has been tested in different case studies and is the main contribution of MERMAID to strengthening SPI, along with the work of setting targets.

The SPI experience of the EU IRIS SES project, Popi Pagou (HCMR), Project Coordinator

IRIS SES (Oct. 2013 - March 2015) is a pilot project of DG Env for preparing the integrated regional monitoring implementation strategy in South European Seas.

This applied research project has faced multiple challenges:

- Large spatial scales
- Multiple elements of ecosystem
- Multiple pressures and human activities
- High cost of monitoring, often seen by policymakers as a compulsory expenditure and not an "insurance policy" to protect goods and services provided by ecosystems.

In terms of SPI, the project especially adapted intelligent

tools for decision makers, as a GIS monitoring and decision support system, DeCyDe-4-IRIS, to help develop common monitoring programs in South European seas. This tool was presented and tested by stakeholders during several regional workshops, allowing to identify and collect their needs and suggestions on the further development of the tool. Thus, opportunities for collaboration have been identified between Cyprus, Greece and Turkey.

However, meetings with stakeholders have highlighted a difficulty concerning the coordination of monitoring activities of a marine region:

- Many indicators are still under development and need to be intercalibrated
- Alack of a common data repository, enabling access data for all - not only aggregate but also raw data when necessary. The comparability of data is often insufficient.
- Decision makers need information on the indicators being monitored and not on models.

Science in support of the MSFD, EU STAGES project, Marisa Fernandez, CETMAR, Co-coordinator of the project

STAGES (September 2012 - August 2014) responds to the EC's strategic need to develop a long-term SPI to support the implementation of MSFD, to bridge the gap between data producers and users. This took the form of extensive consultations with stakeholders, in addition to an interactive workshop. The project resulted in two reports:

- On the views and expectations of stakeholders regarding an effective SPI platform for MSFD
- Proposals and recommendations for an SPI to support the implementation of MSFD

Key components of such SPI were identified:

- Knowledge Mobilization
- Scientific and technical advice
- Evaluation and Knowledge Synthesis
- Knowledge Brokerage

Among the proposals for SPI:

- Balance the bottom up approaches (driven by science) and top-down (driven by policy)
- Optimize SPI with the political cycle of MSFD
- Increase the coherence of different geographical scales
- Share and align with other regulatory requirements (WFD ...) and recognized standards

Science supporting blue growth, EU project COLUMBUS, Marisa Fernandez, CETMAR, Co-coordinator of the project

This project on knowledge transfer for blue growth (March 2015 - February 2018) was introduced as a result of STAGES. The overall objective is to ensure that scientific and technical knowledge can be effectively transferred to advance the governance of marine and maritime sectors in order to promote blue growth. COLUMBUS implemented nodes of expertise, including one in the Mediterranean (aquaculture) where science support processes for policy making will be developed. Marisa is in charge of the node on the governance and management of the sea. The Regional Seas Conventions are also associated, as Virginie Hart from UNEP/MAP/MEDPOL also participates in the External Advisory Board.

Interface between science and policy, the EU EMODnet project Mediterranean Sea checkpoint, Sofia Reizopoulou, HCMR, in charge of the checkpoint

Dans le cadre d'EMODnet, le réseau européen de données Under EMODnet, the European marine observation and data network, basin checkpoints are responsible for evaluating the adequacy of monitoring systems with regards to the challenges of blue growth. Seven sectoral challenges were identified:

- Wind farm siting
- Marine Protected Areas
- Oil platform leaks
- Climate and coastal protection
- Fisheries management
- Marine environment
- River inputs
-

The corresponding services to these challenges include: a browser on the data sets, a dashboard and a data adequacy report pertaining to the challenges. The challenges will be progressively activated, as it is already the case for oil platform leaks.

Getting more from the science and policy relationship - the EU SPIRAL project, Estelle Balian, MEDIAN

The overall aim of SPIRAL is to enhance the connectivity between biodiversity research and policy making in order to improve the conservation and sustainable use of biodiversity. SPIRAL was both a research project, aiming to improve our knowledge and understanding of Science-Policy Interfaces for biodiversity as well an action and learning project, with a resource support group and contributions to designing or improving real-life science-policy interfaces.
The information document in **Appendix 3** presents a summary of the SPIRAL main recommendations.


© Plan Bleu

5. WORKSHOP DISCUSSIONS AND OUTCOMES

5.1. SPI FOR THE IMAP

5.1.1. GOALS

The goal of SPI for the implementation of IMAP is to enhance the relationship between science and policy in order to improve the delivery of IMAP in terms of monitoring and assessment of the status of the Mediterranean Sea and coasts as a basis for further and/or strengthened measures and informed policies for achieving GES.

The expected outcome of SPI for IMAP will be:

- The outputs of IMAP are delivered to decision makers in an appropriate way so as to help them take relevant action towards achieving GES
- Decision makers will make effective use of the scientific information produced under IMAP in view of achieving GES through informed policy making

5.1.2. CHALLENGES AND OPPORTUNITIES

The workshop's participants put forward that any SPI for IMAP needs to adapt to a high level of uncertainty and complexity. Being part of an integrated and systemic approach, IMAP operates in an environment which is per definition complex. The workshop identified the main effectiveness factors of science-policy relationships within IMAP, but also the challenges and opportunities linked to these factors in the Mediterranean context:

- **Knowledge availability**. Different local, national and regional initiatives and projects have been producing a tremendous amount of knowledge relevant to Mediterranean marine and coastal ecosystems. Much of this knowledge can be useful for assessing the gap with the GES and can thus potentially serve as inputs to IMAP, which represents a great opportunity for IMAP. However, the amount of knowledge available is such that some speak of an overabundance of information, an ocean of data. In fact, knowledge production is chronically suffering from a lack of coordination, which hinders stakeholders to take full advantage of the available knowledge.
  - **Knowledge storage and access**. Information is stored in many different places (documents, platforms, websites, etc.) and is not always freely accessible. There is no single-counter making the information accessible for potential users and even less so a single storage.
  - **Timelines**. While some information has been produced over the long-term with a consistent methodology thus forming long and regular time-series, the majority of the knowledge pertaining to Mediterranean marine and coastal ecosystems exists in a much more fragmented way.
  - **Spatial heterogeneity**. Similar data are often produced in abundance in some places and can be missing in other places, making application of homogenous assessment methodologies difficult.
  - **Heterogeneous methodology**. Methodologies used to collect information are not coordinated and do not always allow integrating or comparing information. Interoperability of data is often limited.
  - **Duplication**. The lack of coordination leads to duplication of efforts to produce specific knowledge. Focus, target.
  - **GES-relevance**. Stakeholders have difficulties to identify which information is relevant for monitoring and assessing GES. Much of the available knowledge is not specifically targeted to this end and may be incomplete.
- **Ability to make decisions under uncertainty**. Decision makers generally experience difficulty to make decisions under uncertainty. When decisions involve uncertainty, measures taken can be easily challenged. As science cannot currently produce a complete picture of the state of the Mediterranean Sea and coasts, decision makers need to accept a lack of knowledge for decision making and find ways to be capable to act. Development of adaptive policies, as promoted by the Adaptive Marine Policy Toolbox developed by PERSEUS under the Plan Bleu lead (AMP toolbox), could help to overcome this kind of difficulties.

- **Differences: Disciplines and sectors. Research and policy. Values and worldviews**. Marine and coastal science and decision making in the Mediterranean involve many different actors and disciplines with different jargons, values, interests and capacity. Each of the Contracting Parties may have individual strengths and difficulties with regards to different issues. The presentation given by the CIESM Director especially highlights the existence of cultural differences between Northern and Southern Mediterranean countries, indicating that the "knowledge culture" varies along Contracting Parties.

- **Inappropriate communication procedures**. The workshop participants point out that scientists often provide detailed and segmented explanations while decision makers are asking for holistic opinions. There seems to be a difficulty to find the right "format" to convey scientific messages to decision makers.

- **Balancing and accepting trade-offs**. SPI for IMAP will inevitably come with trade-offs which need to be balanced in the best possible way. These trade-offs include: (i) clarity versus complexity: conveying simple messages versus communicating uncertainty; (ii) speed versus quality: timely outputs versus in-depth quality assessment which takes time; (iii) push versus pull knowledge production: supply-driven versus demand-driven; and (iv) individual time management: interfacing versus doing other things, such as scientific publications which are the bases of the scientists' assessments.

- **Complexity of an iterative/adaptive process**. Science-policy interfacing for IMAP needs to occur in an iterative and adaptive way, as effective relations between science and policy are needed not only to develop measures based on scientific evidence but also to assess the effectiveness of the measures taken or proposed.
  - **Need to overcome project logic – sustainability**. Many elements potentially feeding into IMAP are currently coming from individual projects with a start and an end. While these inputs can potentially be of great use for IMAP, they suffer from the limited duration of projects and their lack of connections with the "outer world". Projects are generally based on their own project logic, methods, objectives, funding and duration (2-4 years) whereas IMAP calls for much longer action.
  - **Funding**. While efforts for interfacing between science and policy exist in the Mediterranean, a dedicated budget line for SPI is usually not provided. However, effective, focussed and regular interfacing requires adequate human and financial resources.
  - **One way communication**. All the showcased projects have developed SPI actions, at least to address the correspondent requirements of the project call. SPI processes were often developed intuitively, and sometimes reduced to a one way communication, from scientists to policy makers, of relevant project results, without policy maker feed-back.

5.1.3. STRUCTURES AND PROCESSES

The workshop participants agreed that a number of SPI structures and processes are currently in place, especially with regards to the presented recent marine scientific projects. These experiences made it clear to participants that there is a number of ways in which science and policy can effectively interface. Given the complex circumstances governing science-policy interaction of IMAP, it appears unrealistic to define one single science-policy interface. It is rather a set of principles, structures, processes and tools, which enrich and complement each other to form an effective SPI framework.
For the set-up of such a framework, three guiding principles have been identified:

- **In the « policy » of SPI, do not confuse policymakers and environmental policies**. Public science lives from targeted funds allocated by national or European, in general high level policymakers. This shows how the relationship between science and political decision makers has always been complex and sometimes conflicting. Some presentations (especially CIESM, CoCoNet) have highlighted this aspect. As part of this action, policy must be understood as relating to environmental policies. This action aims to strengthen the links between scientific experts and those responsible for developing and implementing IMAP.
  - **Formalize the construction of SPI**. Most of the presented SPI structures and processes currently in place have been set up and operate in a rather intuitive way and are mostly not formalized or put forward as a distinctive output of a given project. But in order to address the above mentioned challenges and opportunities, the workshop participants pointed out that any SPI for IMAP has to be based on a formalized construction with defined structures and processes and with a dedicated budget line.
  - **Mainstream IMAP into projects in the MED**. Scientific activities in the Mediterranean have a highly developed project culture and it is realistic to expect that several projects which can potentially produce useful inputs for IMAP are to come in the next years, while not being formally part of IMAP or EcAp. The workshop suggests that IMAP should be consciously built into such projects in a systematic way in order to profit from the opportunity that such projects provide in terms of knowledge generation and dissemination. The mainstreaming of IMAP into new projects should take place already during the project design phase. This will foster the coordination of efforts for the delivery of IMAP and to achieve the GES in the Mediterranean as well as the production of relevant inputs for IMAP while also serving specific objectives on the project level. The mainstreaming of IMAP into such projects will furthermore support stakeholders in achieving shared ownership of results and thus encourage better outreach and impact and involve a maximum of stakeholders.
  - **Sustainability**. The construction of SPI for IMAP should be ideally based on long-term structures and processes, which is in contradiction with the limited span of life of most of the EU funded scientific projects. In this context, it is recommended that project leaders be persistent in SPI processes and continue them in the subsequent projects in which they participate. Sustainability is a strong factor for

mutual knowledge and trust development between given scientists and policy makers, which greatly fosters to strengthen SPI between them.

For an effective implementation of an SPI framework of IMAP, workshop participants recommend the following:

An Integrated Data and Information System as a central underlying structure. The workshop participants call for a consistent structure and single counter for data storage and dissemination, which would be a central structure of the IMAP's SPI framework. It could either be based on a newly created structure or, preferably, on an existing one which would be scaled-up.
IMAP includes provisions for the setting up, deployment and updating of an Integrated Data and Information System (IDIS). This IDIS could serve as a tool to manage the available knowledge and become the central underlying structure of IMAP's SPI.
It will handle data from different activities and ensure that documents, data, and products are managed consistently and are easily available to users. The IDIS will facilitate integrated assessments, overcoming some very fragmented visions of marine scientific disciplines, for example from integrated biological and chemical programmes, or linking the observed changes in spatial distribution and temporal trends in substances or their effects to inputs into the UNEP/MAP Barcelona Convention maritime area.
The IDIS for UNEP/MAP Barcelona Convention requires clearly set roles for data handling and assessment for the various components and a user-friendly reporting platform for Contracting Parties, based on the following strategic points:

- Data and information activities aim to achieve a reliable, quantitative assessment of the status of the Mediterranean Sea and Coast;
- The IDIS should facilitate access to environmental information for the general public.

Basic activities, core elements of UNEP/MAP Barcelona Convention IDIS should include:

- Based on the Common Indicator Fact Sheets and the Integrated Monitoring and Assessment Guidance, develop region-wide, electronic, common indicator based monitoring reporting formats and up-to-date tools for data exchange
- Implement relevant quality control and validation procedures
- Make assessment products available in an integrated manner, on a common platform
- Make data and information available using harmonized standards and practices, following the UNEP access-to-information policy (UNEP/EA. 1/INF/23)

Additionally, training for stakeholders of the IDIS should be ensured and will increase its effectiveness.

A structure such as the IDIS needs to be supported by additional mechanisms in order to function as an effective SPI framework. The workshop mentions the following ones:

Enhancing knowledge presentation -– modelisation and scenarios. Scientific knowledge about the Mediterranean Sea and coast does not always "speak" to decision makers, because raw data is not what they are looking for. Decision makers are keen on recommendations and solutions that are coming out of knowledge. Therefore, the workshop recommends that science and policy could be brought closer by presenting knowledge in the form of scenarios by making use of modelisation. Presenting scientifically based alternate future scenarios has been mentioned to be an effective way to inform policy makers without being prescriptive.

Official bodies have to play a central role for coordination. The workshop calls for improved coordination of initiatives in the Mediterranean. It is suggested to set up governance structures of projects in a way to gear them for more coordination between initiatives by systematically including official policy bodies such as UNEP/MAP as a partner or advisor in projects. Such involvement should start already during the project's early stages and continue all through implementation. This will help improve outcomes and avoid duplication.

Arrangements supporting the formalization and mainstreaming of IMAP's SPI. During presentations and discussions, the workshop identified several mechanisms that can help formalize IMAP's SPI:

- Add official provisions on SPI into the Integrated Monitoring and Assessment Guidance
- Protocols in project documents to define SPI processes and structures which feed into the project design
- Establishing project advisory boards strongly involving (i) policy makers in research projects and (ii) scientists in policy development and governance projects
- Signature of Memoranda of understanding (MoU) between involved actors, projects, institutions, organizations, etc.
- Partnership agreements with local actors (fishers committees for example)
- Setting-up a network of projects

Appropriate communication procedures. The workshop points out that effective communication in SPI needs to be two-way and based on exchange. It is observed that many communication procedures are only one-way (for example scientists writing a policy brief).

Meetings with scientists, policy makers and other stakeholders. Meetings uniting scientists and policy makers can make SPIs effective when they are well prepared and conducted in a way that induces dialogue and incites further exchange. The workshop participants especially highlight the effectiveness of meetings that focus on co-construction of specific outputs, such as databases, tools, interfaces, etc.

Policy briefs. These documents generally inform on a specific issue or present findings and recommendations of a research project to a non-specialized audience. This tool is a medium for exploring an issue, distilling lessons learned from the research and represent a vehicle for providing policy advice. The authors of policy advice need to make sure that their products are really supportive for decision making and that they provide action recommendations (what should happen) and indications about implications (what could happen) . It is equally important to be aware of the limitations of policy guidance documents, especially their need for supportive action in order to be received by policy–makers.

Policy guidance documents should therefore be used in combination with other tools which foster interaction and dialogue, such as meetings with scientists and policy makers. Science briefs. Inversely, although much less frequently used, documents informing scientists about the policy makers' needs for scientific knowledge, with the same limitations as the above, can also effectively support the interactions between science and policy.

Different scopes require different SPI mechanisms. Prior to launching an SPI, the scope on which it will operate should be fixed to make sure that outputs are well received. The effectiveness of mechanisms will differ between regional, national, sub-national or local scales of operation.

Targeting efficient mechanisms and actions to strengthen SPI. Many workshop participants plead for a holistic SPI approach targeting all stakeholders. For example, it can be useful to mobilize specific think tanks or pressure groups because they are known to influence policy making. However, while a holistic approach may be the best case scenario for the overall SPI framework, some SPI actions may be most effective if targeted to a specific audience and/or issue only.

Define the meaning of "policy" in SPI. It should be clearly defined what exactly is meant by the term "policy" within an SPI. While the workshop took into account the broad sense of the term, including policy makers, policy documents and sectoral policies, including the policies responsible for the financial allocations to marine scientific research, SPI for the implementation of IMAP is more focused. Indeed, for IMAP, SPI focuses on marine scientists and experts and the products of their research on one hand and environmental policies and decision makers involved in the implementation of action plans (evaluation, monitoring and measures) to achieve GES in the Mediterranean, on the other hand.

© IFREMER

5.2. KNOWLEDGE NEEDS FOR FULL IMPLEMENTATION OF IMAP

During three working sessions in sub-groups and plenary discussions, the workshop participants have identified a number of knowledge gaps that need to be filled for the full implementation of MAP's IMAP. Some of these gaps are cross-cutting and of general interest, whereas others are related to specific topics. The identified issues are complementary to those already identified in the IMAP reference document (refer to **Annex 7**) and by the STAGES project (refer to **Annex 8**). The remarks presented by the participants are listed in two categories, transversal and thematic, according to the MAP EcAp clusters (biodiversity, pollution and eutrophication, hydrography and coasts).

General observations:

- **A recognized lack of knowledge**. The workshop acknowledges that scientists are not in all areas currently able to provide necessary knowledge to policymakers to support the goal of achieving GES. Participants also recognize that additional efforts for identification, hierarchizing and synthesis of knowledge gaps are currently required.
- **Heterogeneous spatial distribution of knowledge availability**. It is highlighted that knowledge availability differs along Contracting Parties. Generally, a gap between Northern and Southern Mediterranean countries which can impact the robustness of regional Mediterranean models and knowledge can be observed.
- **Monitoring versus obtaining new knowledge**. Workshop participants point out the difference between routine activity with the purpose of monitoring and scientific activities for obtaining new original knowledge. Furthermore, if new knowledge is considered GES relevant, a sustainable monitoring process should be developed.
- **Scientific results to inform different processes**. It is pointed out that the scientific research results produced need to be suitable to cater different purposes integrated in IMAP: (i) monitoring, (ii) integrated environmental assessment and (iii) IMAP further revisions.
- **Ecosystem functioning**. Workshop participants consider that currently available knowledge about the functioning of Mediterranean marine and coastal ecosystems is still lacking, although they also acknowledge that the mobilization around EcAp and the MSFD has so far succeeded in developing new knowledge.

The plenary discussion also proposed a number of action points:

- **Mapping results. It is recommended that outputs of the integrated assessments be mapped under a GIS for a better understanding of environmental processes.**
- **Cost-benefit analysis. Workshop participants bring forward the interest of conducting cost-benefit analyses of monitoring.**

- **Scales. The workshop recommends that relevant scales and timelines for the integrated assessment need to be clearly defined for the implementation of the integrated assessment.**
- **Aggregation rules. Aggregation rules for the results of monitoring if the GES has been achieved or not need to be clarified.**
- **Guidelines for risk-based approach. The IMAP document recommends applying the risk-based approach for the definition of monitoring procedures. The workshop approves this recommendation but calls for the development of guidelines to apply such an approach.**
- **Empowerment of national task forces. It is recommended to develop a mechanism for expertise and capacity building aiming at establishing operational national task forces to support IMAP.**
- **Filling knowledge gaps with remote sensing. The workshop recommends making use of the results of remote sensing for monitoring physical elements, especially for establishing baseline data for coast and hydrography issues, where no field data is available. However, in some cases, more detailed data will require field work.**

5.2.1. BIODIVERSITY CLUSTER

- **Knowledge need: List of species per ecosystem**. It is put forward that a list of species per ecosystem is still to be completed. In general, a description of the species' interactions under "good environmental status" should be established.
  - **Proposed action: Strengthening the marine station network**. The workshop recommends that the network of marine stations be reactivated and further developed in order to provide knowledge regarding (i) taxonomy/list of and functional role of species (allowing to identify shifts or extinctions), (ii) gene banks for identification of species, (iii) ecosystems functioning, (iv) non-indigenous species, (v) monographs of each group of species, (vi) a shift from a habitat logic to en ecosystem logic. The development of the marine station network needs to be animated by a taxonomist. Capacity building and funding for equipment is required for non-European countries.
  - **Proposed action: Include pelagic and benthic realms into monitoring and assessment**. It is recommended to move to a more holistic approach of the marine environment and include pelagic and benthic realms (not only large-top food chain predators), along with linked threats and pressures into IMAP.

- **Knowledge need: Baseline/ reference conditions for biodiversity.**
  - **Proposed action**: Identify reference conditions on the basis of the existing MPAs network. The workshop suggests that the marine stations use well managed MPAs to contribute to the definition of baseline conditions with regards to the different elements mentioned (above points (i) to (vi)).

- **Knowledge need: Develop a cross cutting perspective.**
  - **Proposed action**: The working group mentions that it would be useful to develop links between (i) physicochemical oceanology, (ii) ecosystems functioning knowledge and (iii) threats and pressures considering connectivity effects and processes, not areas but volumes, and overcoming political barriers.

5.2.2. POLLUTION AND LITTER CLUSTER

- **Knowledge need, EO5 Eutrophication: Definition of eutrophication and its ecological impact**. The working group concludes that the observation of chlorophyll-a is not sufficient to characterize eutrophication. In order to assess the natural variability of the basin, long time series are required.
  - **Proposed actio**n: Further use of satellite data and validation with the help of field observations can be useful here. Also, the working group points out that a standard common assessment methodology with more than two indicators should be developed. Thresholds need to be defined for different ecological areas. The scale of sampling needs to be targeted.

- **Knowledge need, EO5 Eutrophication: Concentration of nutrients in water column**. The working group highlights a need to further detail the assessment of the concentration of nutrients in the water column. They also mention that additional information about sources of nutrients such as aquifers and ground water may be useful.
  - **Proposed action**: Establish guidelines for hydrographic parameters

- **Knowledge need, EO9 Contaminants: Further development of monitoring and assessment of EO9**.
  - **Proposed action**: Participants of the working group advise that the relationship between inputs, concentration and effects needs to be further investigated and taken into account.
  - **Proposed action**: The working group advises to cross-enhance the contaminant reference list with the MEDPOL list and suggest additional priorities for each area.
  - **Proposed action**: It is recommended to add observation of pathogens not only in bathing waters but also in shellfish. This issue has been identified by the working group to be of cross-cutting interest and should be further discussed.
  - **Proposed action**: The working group questions if research data for the extension of monitoring strategies beyond coastal areas, in application of the risk based approach, is needed and suggests to discuss this further.
  - **Proposed action**: Participants advocate for a further development of data management at the basin scale.

- **Knowledge need, EO10 Litter: Further development of monitoring and assessment of EO10**
  - **Proposed action**: The working group advises to develop a common approach for the definition of baselines at Regional Seas scale.
  - **Proposed action**: The working group recommends to make use of modelling to define where exactly monitoring should take place (accumulation areas, hotspots, sources). In the medium term, a GIS platform with all information stemming from models and the collected data should be envisaged.
  - **Proposed action**: It is suggested to develop and harmonize sea floor monitoring including through fish stock assessment programmes and remotely operated vehicles for remote areas. .

5.2.3. COAST AND HYDROGRAPHY CLUSTER

Identification of indicators. The working group has discussed the three indicators for EO7 and EO8 and identified some gaps, namely (i) the length of coastline influenced by manmade structures, its division into functionally homogenous units for assessment and the definition of critical thresholds, (ii) the location and extent of habitats directly impacted by hydrographic alterations and (iii) the candidate indicator land use change, as a tool for identifying hot-spots.

- **Knowledge need, EO8 coast: Length of coastline influenced by manmade structures.**
  - **Proposed action**: The working group puts forward that, for a baseline assessment, existing data should be used to generate an indicator at country level; this data generally exists or can be retrieved from satellite data. For example, Copernicus (the European Earth observation programme) has developed a specific initiative on coastal areas (setback area, 100m) with a good level of detail which can provide a useful source of data.
  - **Proposed action**: The working group mentions that it could be beneficial to evaluate cultural attitudes of populations to coastal zones and values attributed to developments in the coastal zone.

- **Knowledge need, EO7 hydrography: Location and extent of habitats impacted directly by hydrographic alterations**
  - **Proposed action**: The working group highlights that the mapping of habitats which is made for other indicators (biodiversity cluster) should be coordinated with the issues linked to this objective for economies of scale and consistency. Mapping of existing man-made structures will provide a baseline for the assessment of future measures and their impacts.
  - **Proposed action**: It is pointed out that future measures need to be assessed on the basis of (hydrological) modelling (present indicator) and investigation on potential interruptions of connections between ecosystems (subsequent indicator) in order to minimize negative impacts. Participants mention that DELTARES (a well-known NL independent institute for applied research in the field of water) can provide guidelines for modelling and impact assessment and that in France approaches for estimation of losses caused by coastal structures are available.

- **Knowledge need, EO8 coast: Candidate indicator: Land use change**. The working group indicates that this indicator has been tested in the Adriatic region (refer to documentation on PAP RAC website). It provides a good insight into spatial dynamics in order to detect hot spots for further investigation. Furthermore, the ClimVar & ICZM project has made an assessment for 11 countries based on data from Google earth.
  - **Proposed actio**n: It is recommended to implement the monitoring with the help of satellite data (COPERNICUS, CORINE Land Cover). The assessment should be done by country experts and should associate socio-economic and other cultural characteristics of each country. Participants advise that the online working group established for the definition of IMAP should assist in the process and that further assistance should be envisaged for interpretation of satellite data which requires specific knowledge.
  - **Proposed actio**n: In terms of communication, the working group highlights that the indicators need to be communicated not in terms of potential future restrictions, but rather as a tool that assists authorities in decision making aiming at coastal safety (climate change, adaptation, tsunami, reducing land losses from erosion).

5.3. RECOMMENDATIONS – CONCLUSIONS

In conclusion, the workshop made it clear that the relationship between science and policy in support of the implementation of IMAP is currently lacking effectiveness despite efforts made in the recent past mainly on scientific research project basis. The workshop made the observation that scientific research and other valuation techniques could be used more effectively in marine environmental policymaking; and that, on the other hand, policy makers do not always effectively inform scientists about their needs for scientific knowledge.
As pointed out during the workshop, well-functioning SPI should be based on a formally recognized structure with defined objectives, indicators and resources.

In addition, the workshop has moved forward with the identification of knowledge gaps to be filled and actions to be taken to address these gaps. It has also discussed ways in which scientific "language" can be made comprehensible and useful for decision makers.

Overall, it can be said that the workshop succeeded in engaging into a constructive reflection process about the methods and concrete actions to be implemented to strengthen the interface between science and policy in view of adopting an adaptive process of science-supported policy making for reaching the goal of achieving the good environmental status of the Mediterranean Sea and coast. The event initiated a series of workshops which will aim at providing a maximum of answers to the scientific questions identified for the implementation of IMAP.

In this context, it is suggested that these workshops be used to further develop the list of knowledge gaps and to precisely define the actions to be taken while identifying the actors and resources to be mobilized. These workshops could focus on specific topics, for example the EcAp clusters (biodiversity, pollution and litter, coast and hydrography).

The network of scientific experts who supported the development of IMAP has been expanded. The next workshops should also identify ways to sustain and if necessary expand this network so that it is effectively and easily mobilized. A reflection will be conducted on whether to establish a Scientific Council to monitor the implementation and developments IMAP or to strengthen and make more operational links between MAP and regional scientific institutions such as CIESM GFCM and ACCOBAMS, as well as scientific NGOs.

6. ANNEXES

ANNEX 1 : WORKSHOP AGENDA

Tuesday 15th December 2015	
12:00-13:00	Welcoming participants- Lunch offered by Plan Bleu
13:00-13:30	Registration
13:30-13:50	Agenda Item I: Opening of the meeting – Hugues Ravenel, Director of Plan Bleu Agenda Item 2: Election of officers Agenda Item 3: Presentation of the meeting and its objectives, adoption of the agenda and roundtable presentation of participants
13:50-14:15	Agenda Item 4: Mediterranean Action Plan working framework Virginie Hart, Monitoring Assessment Officer, UNEP/MAP
14:15-14:35	Agenda Item 5: Presentation of Science-Policy Interface (SPI) issues and methods • Presentation of SPI issues in CIESM-Frédéric Briand, Director General of the Mediterranean Science Commission-CIESM • Presentation of SPI issues in STAGES project -Rosa Fernandez, Technology Promotion and Transfer- CETMAR
14:35-14:50	Discussion
14:50-15:00	Agenda Item 6a): EU PERSEUS Project activities to strengthen marine environmental SPI in the Mediterranean-Vangelis Papathanassiou, Coordinator of PERSEUS
15:00-15:40	Agenda Item 6b): Presentation of EU research or pilot projects 'experiences related to SPI • Presentation of SPI issues in CoCoNET project-Ferdinando Boero, Coordinator of CoCoNET • Presentation of SPI issues in DEVOTES project -Angel Borja, Coordinator of DEVOTES • Presentation of SPI issues in IRIS SES project-Kalliopi Pagou, Coordinator of IRIS SES • Presentation of SPI issues in SEAS-ERA MERMAID project-Eleni Kaberi, Coordinator of MERMAID
15:40-16:00	Discussion
16:00-16:30	Coffee break
16:30-18:30	Agenda Item 7: Presentation of a preliminary list of knowledge needs for the full implementation of IMAP and discussion on how to address these needs Didier Sauzade, Programme Officer "Sea"–Plan Bleu
18:30-19:00	Agenda Item 8: Wrap-up, discussion and agreement on topics to be discussed in working groups the day after-Plan Bleu and the Rapporteur
19:00	End of Day 1
20:30	Dinner offered by Plan Bleu

Wednesday 16th December 2015	
08:30-09:00	Welcome coffee
09:00-09:15	Agenda Item 5: Presentation of Science-Policy Interface (SPI) issues and methods : Presentation of SPI issues in SPIRAL project-Estelle Balian, Co-coordinator of SPIRAL
09:15-09:20	Agenda Item 9: Presentation of the objectives for the working groups 'session Didier Sauzade, Programme Officer "Sea"–Plan Bleu
09:20-10:45	Agenda Item 10a): Working groups' session following the EcAp sub-cluster structure: Pollution and Litter, Biodiversity and Fisheries, Coast Hydrography
10:45-11:15	Coffee break
11:15-12:15	Agenda Item 10b): Working groups 'session-continued / Preparation of the synthesis by the Rapporteurs
12:15-13:00	Agenda Item 11: Synthesis of the working groups discussion by the Rapporteurs
13:00-13:30	Agenda Item 12: Conclusions and recommendations-Plan Bleu and the Rapporteur
13:30	Agenda Item 13: Closure of the meeting-Hugues Ravenel, Director of Plan Bleu and the Chairperson
	Lunch on the spot offered by Plan Bleu

ANNEX 2 : LIST OF PARTICIPANTS

Inception workshop "Implementation of the Ecosystem Approach in the Mediterranean: strengthening the science-policy interface", Sophia Antipolis, 15-16 December 2015

MAP Focal Points				
Mitja	BRICELJ	Ministry for Environment and Spatial Planning	Slovenia	mitja.bricelj@gov.si
Charles-Henri	DE BARSAC	Ministère de l'Ecologie, duDéveloppement Durable et de l'Energie	France	charles-henri.de-barsac@ developpement-durable.gouv.fr
Juxhina	GJONI	Ministry of Environment, Forestry and Water Administration	Albania	Juxhina.Gjoni@moe.gov.al
Tarik	KUPUSOVIC	HEIS Hydro-Engineering Institute Sarajevo	Bosnia and Herzegovina	tarik.kupusovic@heis.ba
Mohamad	SAAYED	Ministry of Environment	Lebanon	saayedmed@hotmail.com ; m.saayed@moe.gov.lb
Mahmoud	SEDEK	Egyptian ministry of environment	Egypt	mahmoudsedek@yahoo.com
MAP RACs				
Hugues	RAVENEL	Plan Bleu	France	hravenel@planbleu.org
Didier	SAUZADE	Plan Bleu	France	dsauzade@planbleu.org
Taos	BOUDINE	Plan Bleu	France	tboudine@planbleu.org
Antoine	LAFITTE	Plan Bleu	France	alafitte@planbleu.org
Juliette	BALAVOINE	Plan Bleu	France	jbalavoine@planbleu.org
Nelly	BOURLION	Plan Bleu	France	nbourlion@planbleu.org
Julien	LE TELLIER	Plan Bleu	France	jletellier@planbleu.org
Anne-France	DIDIER	DREAL PACA, Plan Bleu	France	anne-france.didier@planbleu.org
Virginie	HART	UNEP/MAP	Greece	virginie.hart@unepmap.gr
Marko	PREM	PAP/RAC	Croatia	marko.prem@paprac.org
Franck	LAUWERS	REMPEC	Malte	flauwers@rempec.org
Magali	OUTTERS	SCP/RAC	Spain	moutters@scprac.org
Mehdi	AISSI	RAC/SPA	Tunisia	mehdi.aissi@rac-spa.org
Experts				
Estelle	BALIAN	Belgian Biodiversity Platform	Belgique	estelle.balian@gmail.com
Ferdinando	BOERO	CNR-ISMAR	Italy	boero@unisalento.it
Angel	BORJA	AZTI-Tecnalia	Spain	aborja@azti.es
Margaretha	BREIL	CMCC	Italy	margaretha.breil@cmcc.it
Frédéric	BRIAND	CIESM	France	fbriand@ciesm.org
Olivier	BRIVOIS	BRGM	France	o.brivois@brgm.fr
Rosa	FERNANDEZ	CETMAR	Spain	rfernandez@cetmar.org
Jaume	FONS ESTEVE	Universitat Autònoma de Barcelona	Spain	jaume.fons@uab.es
François	GALGANI	IFREMER	France	Francois.Galgani@ifremer.fr
Franco	GIOVANARDI	ISPRA	Italy	franco.giovanardi@isprambiente.it
Georg	HANKE	Institute for Environment and Sustainability	Italy	georg.hanke@jrc.ec.europa.eu
Barak	HERUT	Israel Oceanographic & Limnological Research / MoEP	Israel	barak@ocean.org.il
Alain	Jeudy de GRISSAC	IUCN	Spain	alain.jeudy@iucn.org
Eleni	KABERI	HCMR	Greece	ekaberi@hcmr.gr
Susan	KHOLEIF	National Institute of Oceanography and Fisheries	Egypt	suzankholeif@gmail.com
Célia	LE RAVALLEC	ACCOBAMS	Monaco	cleravallec@accobams.net
Antoine	MANGIN	ACRI-HE	France	am@acri.fr
Kalliopi	PAGOU	HCMR	Greece	popi@hcmr.gr
Vangelis	PAPATHANASSIOU	HCMR	Greece	vpapath@hcmr.gr
Roberto	PASTRES	University of Foscari Venezia - Department of Environmental Sciences,	Italy	pastres@unive.it
Sofia	REIZOPOULOU	HCMR	Greece	sreiz@hcmr.gr
Cherif	SAMMARI	Institut national des sciences et technologies de la mer	Tunisie	Cherif.sammari@instm.rnrt.tn
Maria	SNOUSSI	Université Mohammed V Agdal	Maroc	ma.snoussi@gmail.com
Chlöe	VINCENT	ACRI-HE	France	cv@acri.fr
Chlöe	WEBSTER	MEDPAN	France	chloe.webster@medpan.org

ANNEX 3 : BACKGROUND: STATE OF THE ART IN SCIENCE-POLICY INTERFACE (SPI) (INFORMATION DOCUMENT)

Why is science important for Environment Policy?

To be robust, environment policy needs to be based on sound evidence, which may be transposed in the environment field as scientific evidence on the state of the environment and trends in environmental indicators (Zamparutti and MILIEU, 2012). In an era of increasing environmental evolution as a result of human activity and climate change – to name just two pressures – policy responses for the future need to be based on as strong a scientific foundation as possible, particularly given increasing public demands for transparency and accountability.

In contrast to other policy areas, environment policy has been generally driven by science (i.e.: side effects of pesticides, thinning of ozone, health effects of mercury, CO2 for climate change).

Over time, environment policies have evolved from being strongly targeted to being more holistic, implying added knowledge demands, in particular to characterize the complexities and uncertainties of integrated issues having potentially long term and irreversible consequences.

Policy impact assessments call for the most up-to-date scientific evidence and economic analysis.

Science is a key factor in generating acceptance and legitimizing policy intervention.

Scientific evidence ensures a greater ability to withstand and counter scrutiny from those who are adversely affected by policy, often quick to challenge the scientific foundations of environment policy.

The judicial system is increasingly faced with litigation cases that present complex issues of science and technology, and increasingly require access to sound science.

Evidence and analysis can play a decisive role in informing policy makers' judgments, and can condition the political environment in which those judgments need to be made.

Solid scientific evidence is needed to underpin sound environment policy. The increasing complexity of environment policy, as well as emerging trends in policy governance and public demand for full and transparent information, all suggest that stronger science policy interfaces for environment policy are necessary (Zamparutti and MILIEU, 2012).

What is a science-policy interface (SPI)?

Science Policy Interfaces have been intensively studied in the EU funded SPIRAL1 project. The focus was on how to identify and address the needs to implement the EU Marine Strategy Framework Directive (MSFD). Considering the similarities between the EU MSFD and the UNEP/MAP initiative, it is worthwhile to present the main results of this project.

According to the SPIRAL Resource book on science policy interface (Young et al, 2013), SPIs are the many ways in which scientists, policy makers and others link up to communicate, exchange ideas, and jointly develop knowledge for enriching policy and decision making processes and/or research. They involve exchange of information and knowledge leading to learning, and ultimately to changed behaviour – doing something differently as a result of the learning – that in turn represents the practical impact of SPIs. SPIs can be very formal structures, such as the Intergovernmental Panel on Climate Change (IPCC), or the newly created Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Many research projects include a component specifically for improving the interactions between the project, the policy makers and other stakeholders and ways in which results are communicated to policy actors – this is also a SPI. Many SPIs, however, are less formal structures. Discussing a project with funders at the beginning of a piece of work can be a SPI: jointly deciding how to carry out research both to benefit science and to input results into aspects of policy. A workshop with policy makers and scientists, and maybe other stakeholders, can be a SPI, so can a field trip.

So SPIs cover a very wide range of communication forums, situations and methods. They can be formal or informal, driven more by policy demand or by supply of science, long-term processes or one-off events. Their common feature is the potential for exchange of information, joint knowledge development and learning. However some SPIs are more effective than others.

1 http://www.spiral-project.eu/content/about-spiral

What makes SPIs effective?

Following the STAGES Resource book, some forms of communication are unlikely to result in effective knowledge exchange and learning. One-way communication, for example writing a scientific paper or giving a talk at a conference, is usually not enough on its own and they need to be backed up with opportunities for exchange and learning. Similarly planning research without considering the needs of policy, or setting questions for research without involving scientists are unlikely to be successful.

Effective SPI communication is best seen as an on-going deliberate process. This can involve spending time on developing common language, building trust, and developing capacities to understand others' positions, views, needs and constraints. People working in SPIs should remain conscious of these dynamic links and learn from them – for this, formal review and updating procedures may help. Because SPIs are about fostering learning and influencing behaviour, their effectiveness is highly dependent on the people involved and on the policy processes and contexts within which they operate. Though there can be no 'one-size-fits-all' set of recommendations for the 'ideal' SPI, there are some general features that tend to support success. One popular metaphor considers the (perceived) credibility, relevance and legitimacy ('CRELE') of the SPI processes and the information exchanged.

- Credibility is the perceived quality, validity and scientific adequacy of the people, processes and knowledge exchanged at the interface;
- Relevance is the perception of the usefulness of the knowledge brokered in the SPI, how closely it relates to the needs of policy and society, and how responsive the SPI processes are to these changing needs;
- Legitimacy is the perceived fairness and balance of the SPI processes.

These CRELE attributes are widely accepted and used, and can explain an SPI's influence.

It is important to acknowledge possible pitfalls of SPIs. Common pitfalls of SPIs can include unclear or poorly thought-through SPIs, power influences, negative interactions with the media, over-reliance on key individuals, and lack of necessary resources. These aspects are developed in the SPIRAL Resource book (Young et al, 2015)

Key features of SPIs

The SPIRAL Resource book develops what are the key features of a deliberate SPI: goals, structure, processes, outputs and outcomes (see Fig 1.)

Fig. 1 Key features of SPI

Goals.
The goals of the SPI are central to understanding how and why it operates, why people participate. Make explicit the goals help to build the foundations of credibility, relevance and legitimacy (CRELE) of the SPI and the knowledge exchanged.

Structure.
The structural features of SPIs describe how they are set up and the constraints within which the processes are defined. This may include the role of different bodies or individuals in the SPI and how they work, for example via meetings and other ways of exchange.

Processes.
The processes of SPIs define the way in which the key functions are actually carried out. Again, there are important trade-offs and SPIs need to decide how to allocate scarce resources (financial, time and human effort) across different activities.

Outputs.
The outputs of SPIs (e.g. briefs, reports, papers, presentations) can be characterised by a set of features describing how and when they are prepared and presented.

Outcomes.
The main outcomes associated with SPIs are the learning, behavioural and policy changes they foster. These are not fully within the control of the SPI and do not follow directly from design or operation choices in the way that the other features do.

ANNEX 4 : LIST OF ECAP ECOLOGICAL OBJECTIVES

1. Biodiversity is maintained or enhanced.
2. Non-indigenous species do not adversely alter the ecosystem.
3. Populations of commercially exploited fish and shellfish are within biologically safe limits.
4. Alterations to components of marine food webs do not have long-term adverse effects.
5. Human-induced eutrophication is prevented.
6. Sea-floor integrity is maintained.
7. Alteration of hydrographic conditions does not adversely affect coastal and marine ecosystems.
8. The natural dynamics of coastal areas are maintained and coastal ecosystems and landscapes are preserved.
9. Contaminants cause no significant impact on coastal ad marine ecosystems and human health.
10. Marine and coastal litter does not adversely affect coastal and marine ecosystems.
11. Noise from human activities cause no significant on marine and coastal ecosystems.

Note: While EO3, EO4 and EO6 Ecological Objectives and common indicators are not included in the initial phase of IMAP implementation they are partly being addressed by the EO1 related common indicators. EO3 related candidate/ common indicators are currently being developed by GFCM, in close cooperation with UNEP/MAP Secretariat with the aim of their introduction to IMAP by its next update, possibly by COP20.

ANNEX 5 : LIST OF COMMON INDICATORS

The Common and candidate indicators agreed upon, which are at the core of IMAP, include:

1. Habitat distributional range (EO1) to also consider habitat extent as a relevant attribute;
2. Condition of the habitat's typical species and communities (EO1);
3. Species distributional range (EO1 related to marine mammals, seabirds, marine reptiles);
4. Population abundance of selected species (EO1, related to marine mammals, seabirds, marine reptiles);
5. Population demographic characteristics (EO1, e.g. body size or age class structure, sex ratio, fecundity rates, survival/mortality rates related to marine mammals, seabirds, marine reptiles);
6. Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas (EO2, in relation to the main vectors and pathways of spreading of such species);
7. Spawning stock Biomass (EO3);
8. Total landings (EO3);
9. Fishing Mortality (EO3);
10. Fishing effort (EO3);
11. Catch per unit of effort (CPUE) or Landing per unit of effort (LPUE) as a proxy (EO3);
12. Bycatch of vulnerable and non-target species (EO1 and EO3)
13. Concentration of key nutrients in water column (EO5);
14. Chlorophyll-a concentration in water column (EO5);
15. Location and extent of the habitats impacted directly by hydrographic alterations (EO7) to also feed the assessment of EO1 on habitat extent;
16. Length of coastline subject to physical disturbance due to the influence of man-made structures (EO8) to also feed the assessment of EO1 on habitat extent;
17. Concentration of key harmful contaminants measured in the relevant matrix (EO9, related to biota, sediment, seawater);
18. Level of pollution effects of key contaminants where a cause and effect relationship has been established (EO9);
19. Occurrence, origin (where possible), and extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution (EO9);
20. Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood (EO9);
21. Percentage of intestinal enterococci concentration measurements within established standards (EO9);
22. Trends in the amount of litter washed ashore and/ or deposited on coastlines (including analysis of its composition, spatial distribution and, where possible, source.) (EO10);
23. Trends in the amount of litter in the water column including microplastics and on the seafloor (EO10);

Candidate indicators

24. Trends in the amount of litter ingested by or entangling marine organisms focusing on selected mammals, marine birds and marine turtles (EO10);

25 Land use change (EO8)

26. Proportion of days and geographical distribution where loud, low, and mid-frequency impulsive sounds exceed levels that are likely to entail significant impact on marine animals (EO11)
27. Levels of continuous low frequency sounds with the use of models as appropriate (EO11)

During the implementation of the initial phase of IMAP, the CORMONs will further develop the candidate indicators towards common indicators as well as to further refine the specifics of agreed common indicators, in particular on geographical scale, in light of the ongoing implementation experience of IMAP.

ANNEX 6 : THE INTEGRATED MONITORING AND ASSESSMENT PROGRAMME (IMAP) OF UNEP/ MAP (INFORMATION DOCUMENT)

Monitoring and assessment, based on scientific knowledge, of the sea and coast is the indispensable basis for the management of human activities, in view of promoting sustainable use of the seas and coasts and conserving marine ecosystems and their sustainable development. The Draft Decision IG.22/7 Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (UNEP/MAP, 2015a), prepared to be endorsed by the next Convention of Parties, describes the strategy, themes, and products that the Barcelona Convention Contracting Parties are aiming to deliver, through collaborative efforts inside the UNEP/MAP Barcelona Convention, over the second cycle of the implementation of the Ecosystem Approach Process (EcAp process), i.e. over 2016-2021, in order to assess the status of the Mediterranean sea and coast, as a basis for further and/or strengthened measures.
Please report to the Draft Decision for additional information.

Background
IMAP builds on the monitoring and assessment related provisions of the Barcelona Convention and its Protocols, previous Decisions of the Contracting Parties related to monitoring and assessment, and to the EcAp process, including on Decision IG. 21/3 and the expert level discussions mobilized based on this Decision, such as the ones taking place in the Correspondence Groups on Good Environmental Status (COR GEST) and Monitoring (CORMON), the On line Working Groups (Eutrophication, Contaminants, Marine litter, Biodiversity and Non-invasive species and Coast and hydrography) as well as the EcAp Coordination Group.
In addition, the development of IMAP took due account of the Contracting Parties" existing monitoring and assessment programmes, practices of other Regional Sea Conventions and other Regional bodies, such as GFCM1 and ACCOBAMS2.

Timeline
IMAP is aiming to deliver its objectives over 2016-2021. It is introduced first however in an initial phase (in line with Decision IG. 21/3, in between 2016-2019), during which the existing national monitoring and assessment programmes will be integrated, according to the IMAP structure and principles and based on the agreed common indicators. This implies in practice that the existing national monitoring and assessment programmes will be reviewed and revised as appropriate so that national implementation of IMAP can be fulfilled in a sufficient manner. The main outputs during the initial phase of IMAP will include the update of GES definitions, further refinement of assessment criteria and development of national level integrated monitoring and assessment programmes. Furthermore, the Quality Status Report in 2017 and the State of Environment and Development Report in 2019 will build on the structure, objectives and data collected under IMAP. The validity of IMAP should be reviewed once at the end of every EcAp six year cycle, and in addition it should be updated and revised as necessary on a biennial basis, based on lessons learnt of the implementation of IMAP and on new scientific and policy developments.

The SPI for IMAP definition phase
As any UNEP/MAP programme, IMAP has been built using available scientific basis. As presented above, IMAP elaboration has been supported by expert advice issued from the Correspondence Groups, themselves complemented by those of the On-line working groups, under the supervision of the EcAp coordination groups. These multidisciplinary groups were composed of technical and scientific experts designated by the Parties to the Barcelona Convention. Their works were facilitated by the dedicated MAP components, supported by contracted experts.

Moreover scientific expertise issued from ongoing research projects were also mobilized for specific question regarding biodiversity. A workshop was co-organized by UNEP/MAP and the EU PERSEUS3 project to follow up the recommendations of February 2014, asking the Secretariat to consult international experts for developing IMAP, especially in relation to biodiversity. This workshop was held on the 28-30April 2014 in Anavissos HCMR4 premises, Greece, with contribution of several on-going research and pilot EU projects, namely PERSEUS, CoCoNet5, DEVOTES6 and IRIS SES7 and was attended by scientific working in the field of biodiversity.
The workshop has resulted in some general and some specific biodiversity and NIS common indicators related scientific recommendations and addressed both overall status or aspects of biodiversity in the Mediterranean, monitoring needs, challenges, methodologies, cost efficiency and feasibility in light of recent scientific developments. As such it provided a key contribution to the development of the draft IMAP.

As stated in the summary of the workshop8, participants and organizers both agreed on the added value of the Workshop, not only in relation to the EcAp process, but also for coordination purposes and proposed further follow-up Workshops to ensure that EcAp related scientific projects are coordinated and feed into the work of the Barcelona Convention/EcAp policy process.
In this sense, this workshop showcases the EcAp SPI action launched by this inception workshop, the aims of which are to extend, make more systematic and sustain the SPI experienced in the definition phase of IMAP.

2. Commission générale des pêches pour la Méditerranée (CGPM)
3. Accord sur la Conservation des Cétacés de la Mer Noire, de la Méditerranée et de la zone Atlantique adjacente (ACCOBAMS)
4. http://www.perseus-net.eu/
5. Hellenic Centre for Marine Research (Centre hellénique de recherche marine), coordinateur des projets PERSEUS et IRIS SES
6. http://www.coconet-fp7.eu/
7. http://www.devotes-project.eu/
8. http://iris-ses.eu/
9. http://planbleu.org/sites/default/files/upload/files/Informal_Summary_EcAp_Biodiversity_Scientific_Expert_Workshop_PERSEUS.pdf

ANNEX 7 : SCIENTIFIC NEEDS FOR ECAP IMAP IMPLEMENTATION IDENTIFIED IN THE IMAP REFERENCE DOCUMENT (INFORMATION DOCUMENT)

Method

It has been chosen to analyse the reference document that presents the IMAP process, namely the draft Decision IG.22/7 "Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria" The cross cutting issues were analysed from the Draft Integrated Monitoring and Assessment Guidance (2015) where these aspects are more developed.

The introduction of the first document provides indications on what could be considered as knowledge needs, as data or process not available in scientific literature.

The method consisted to first select sections of the documents mentioning any further developments for the implementation of IMAP.

Each selected section was analysed in order to:

- Identify the relevant EcAp Ecological Objective (EO), or cross cutting issues addressing several EO (e.g. scale issues)
- Characterize the underlying gap in scientific knowledge
- Formulate it as a need for scientific development
- If required, address relevant remarks about link with other identified gaps, preliminary characterization of the development

Then these needs were synthetized and sorted according main thematic challenges (Cross cutting issues, EcAp EOs) in a table giving both the needs and the proposed action to meet these needs, displaying the following items:

- Needs formulation
- Proposed action to address these needs,
- Scope or typology of the action
- Level or scale of the action (local, national, regional)
- Estimated duration of the action: Short (less than 2 years) Medium (2-4 years), Large (more than 4 years)
- Opportunities: outputs of research project, partnership with UNEP/MAP, resource of scientific centre …) to develop this action.

Main needs identified from the IMAP reference document

The main needs of scientific support for the implementation of IMAP identified from the analysis of the IMAP draft decision and of the guidance document are summarized here, displayed in cross cutting issues and EcAp clusters and Eos.

Cross cutting issues

- Assessment at national scale, according the four Mediterranean sub-regions, characterization of the pressure EO and of the status of state EO, using the EcAp Common Indicators
- Best use of scientific research results for monitoring, integrated assessment, and IMAP revision
- Contaminants, relationship between inputs, concentration and effects
- Relevant scales for integrated assessment and management
- Guideline to apply the risk based approach
- Aggregation rules, from monitoring environmental status
- Map of the integrated assessment outputs
- Cost benefit analysis of monitoring
- Empowerment of national task forces through expertize and capacity building

Pollution and litter Cluster

Eutrophication (EO5)

- Monitoring and status assessment optimal strategies, taking into account sub regional differences

Contaminants (EO9)

- Harmonization of monitoring programmes, specifically on baseline, targets and contaminants reference list
- Development of monitoring methods based on biological effects, baseline and assessment criteria
- Review of the contaminant monitoring on biota
- GES targets in bathing waters
- Extension of monitoring strategies in open waters, beyond coastal areas
- Assessment of acute events

Litter (EO10)

- Definition of baseline to develop a risk based strategy
- Citizen monitoring
- Specific developments on microlitter and litter ingested or entangling marine organisms, especially turtles

Biodiversity and Fisheries Cluster

Biodiversity (EO1)

- Improved definition of Reference list of species and habitats
- Improved definition of GES, characterization of baseline

and thresholds
- Improved knowledge of the relationship between cumulated pressures and impacts
- Identification and characterization of representative sites and species at national scales

Biodiversity / Cetacean (EO1)
- Abundance and distribution of cetaceans
- Monitoring methodologies

Noise (EO11)
- Characterization of baseline and thresholds
- Development of monitoring programmes based on the two selected candidate common indicators, at national and regional levels

Non-indigenous species (EO2)
- Coordinated development of reference lists, baseline assessment, threshold, IAS hotspots

Commercial fishes and shellfishes (EO3)
- Development of a monitoring and assessment strategy in collaboration with GFCM
- Marine food web (EO4)
- Development of a monitoring and assessment strategy in collaboration with GFCM
- Sea floor integrity (EO6)
- Development of a monitoring and assessment strategy in collaboration with GFCM

Coast Hydrography / Coast Cluster

Coast (EO8)
- Development of a harmonized monitoring and assessment programme based on the Candidate indicator 25, Land use change: baseline, threshold, monitoring

ANNEX 8 : SCIENTIFIC NEEDS FOR ECAP IMAP IMPLEMENTATION IDENTIFIED BY THE EU PROJECT STAGES (INFORMATION DOCUMENT)

The Science and Technology Advancing Governance on Good Environmental Status project or STAGES (Connecting science to policy for healthy seas) aimed to connect science to policy to help achieve GES in the EU marine waters. The project worked towards bridging the MSFD science-policy gap and improving the availability of scientific knowledge to allow Member States to achieve GES (Le Moigne et al., 2014). One of the main objectives of the project was to establishing where further research needs to be conducted to improve the scientific knowledge underpinning implementation of the MSFD. This was performed through a consultative process with a broad range of marine stakeholders including European / International organisations involved in the MSFD Process and national organisations with responsibility to support research and provide advice on the MSFD at Member State level. Three main workshops were organised, one of which being on the identification of research needs with regards to the implementation of monitoring programme (STAGES, 2013).

Objectives and methodologies of this EcAp SPI action and those of the STAGES project are similar, in particular the participative approach, justifying to consider the STAGES results. However, the difference in scope of the two actions should be kept in mind, IMAP covering the whole Mediterranean Sea, including coasts, and the STAGES project being for the marine part of the European Seas.

Synthesis of the STAGES results are presented according the EcAp clusters and on line WG, to ease comparisons.

Pollution and litter / Eutrophication (EO5) Cluster
Short-term
- Develop methods to include other characteristics in addition to Chlorophyll a, such as changes in community composition, occurrence of nuisance and toxic species that result from changes in nutrient ratios, and increased duration and frequency of blooms which result from increases in nutrient loads.
- Develop new phytoplankton assessment tools that account for shifts in species composition and frequency of blooms in the status assessment scoring. Support evolving monitoring strategies aimed at optimal integration of various monitoring tools.

Medium-term or requiring moderate investments
- Develop regional algorithms that reduce the uncertainty in the calculation of satellite chlorophyll from global algorithms.

Long-term research or large investments
- Develop algorithms for phytoplankton composition identification using remote sensing and satellite modelling.
- Develop metagenomics in species identification microarrays.
- Develop biological trait analysis for phytoplankton, species analysis, and analysis of harmful toxins.

Pollution and litter / Contaminants (EO9) Cluster
Contaminants in the marine environment

Short-term
- Develop methods to quantify contaminants fluxes and inputs.
- Develop tools to monitor marine ecotoxicology data, including for emerging contaminants.
- Study bioavailability and effects of emerging contaminants.
- Develop integrated surveillance programmes including, at least, different compartments of the ecosystem for the study of pollutant concentrations and associated biological responses.
- Develop projects to study how to include new groups of contaminants and tissue-level biomarkers, as well as embryo-larval bioassays in sediment pollution monitoring.
- Study higher trophic level contamination.

Medium-term or requiring moderate investments
- Develop new passive samplers to increase pre-concentration of samples at sea.
- Develop adaptation of marine monitoring strategies for ubiquitous' contaminants.
- Better understand the ecological relevance and relationship between early warning signals at molecular level and the alteration of physiological functions like reproduction, immunotoxicity and fitness.
- Better understand how contaminants are transferred across trophic levels.
- Long-term research or large investments
- Develop new genomic and transcriptomics methods in ecotoxicological studies.
- Better understand the links with microplastics and whether this acts as an additional exposure vector for contaminants.

Contaminants in Sea food
- Short-term
- Develop specific and on-going monitoring of the concentrations of contaminants in fishery products traceable to their source.
- Analyse additional contaminants, sampling in a wider range, and including more marine commercial species.
- Medium-term or requiring moderate investments
- Develop monitoring programmes outside coastal area monitoring of seafood contamination.
- Long-term research or large investments
- Study of effects of worldwide pollution and long-range transport

Pollution and litter / Litter (EO10) Cluster

Short-term
- Develop conversion factors number/weight/volume.
- Determine litter degradation rates.
- Microplastics :
- Increase knowledge about them: size to be specified and harmonised, inter-calibration protocols and harmonisation needed.
- Quantify them in the environment (including sediments from submerged substrates and beaches, as well as surface water).
- Optimise information collection networks for impact indicators, to supplement existing scientific and technical bases.
- Develop designs which are statistically powerful enough.

Medium-term or requiring moderate investments
- Develop monitoring plans using video or photo images, to assess litter on rocky and deep bottoms.
- Develop tools to assess the landscape and/or cognitive effects of litter on society, mainly affecting tourism and the development of water activities, in order to assess economic and social damage to affected areas.

Long-term research or large investments
- Develop opportunistic data acquisition for deep areas/ canyons (high cost of data acquisition), allowing long-term monitoring.
- Determine the possible origin of litter and dispersion vectors by studying their distribution and coupling with particle drift models or identifying characteristics of the waste.

Biodiversity and Fisheries/ Biodiversity (EO1)
Short-term Cluster
- Automatic analysis methods for plankton samples, to carry out an objective analysis (not influenced by expertise in taxonomic identification) of certain plankton attributes, such as size structure and taxonomic composition.

Medium-term or requiring moderate investments
- Innovative monitoring tools to provide real-time information such as, e.g., remote sensing for plankton composition, use of ferry boxes, ROV (Remotely-Operated Vehicles), acoustic, and molecular approaches.
- For routine implementation, molecular-based methods for population and species diversity assessment should be developed.
- Studies on population genetics (DNA barcoding/ Metagenetics, Short Nucleotide Polymorphisms)

Long-term research or large investments
- Development of 'business models' for upscaling and operationalisation of biodiversity monitoring.
- Anticipating the development of technologies for next generation sequencing.

Biodiversity and Fisheries/ Biodiversity / Noise (EO11) Cluster

Short-term
- Organise efficient data gathering (recording) for impulsive noise and measuring/data gathering for ambient noise, preferably at EU or regional scale.

Medium-term or requiring moderate investments
- Develop sound maps, integrating acoustic models, source information and environmental parameters to

describe current sound levels and trends.

Long-term research or large investments

- Increase knowledge of direct effects of impulsive sounds (sonar and acoustic deterrents, seismic, piling, explosions). This should address behavioural effects; injury may still be relevant for some activities. Effects of impulsive sounds at population/ecosystem level. There are proposals for frameworks to expand from direct/individual effects of disturbance to population/ ecosystem level effects, e.g. the PCAD-model (population consequences of acoustic disturbance).
- Effects of increased ambient noise level, addressing masking potential but also other stress effects. Assessment of relevance of masking for population/ ecosystem effects.
- Verify the most relevant parameters to describe sound (not restricting to presently used pressure parameters but also velocity parameters/particle motion): ultimately international standards would be needed.
- For future impact assessments/risk assessment, improved knowledge on seasonal presence and abundance of marine life may be needed.
- Mitigation potential, e.g. silencing technologies, including assessment of actual mitigation potential of such technologies:
  - Assessment of mitigation effectiveness, not limited to technological solutions but including evaluation of other current measures and exclusion zones/periods, passive acoustic monitoring, ramp-up, including a cost-benefit assessment

Biodiversity and Fisheries/ Non-indigenous species (EO2) Cluster

Short-term

- Development of tools to achieve faster and more accurate identification of habitat/biotopes present in different marine environments (from shallow to deep sea, soft to hard bottom).

Medium-term or requiring moderate investments

- Studies on the changes in the functioning of marine ecosystems subjected to an impact of invasive alien species.
- Molecular-based methods for routine implementation of NIS identification.

Long-term research or large investments

- Relevant hydrodynamic models for understanding the processes of natural dispersion.
- Studies on mechanisms of this natural dispersion of each invasive species.

Biodiversity and Fisheries/ Commercial fishes and shellfishes (EO3) Cluster

Short-term

- Determining a method to select the scale of monitoring and response to the dynamics of fish populations for all exploited populations, dominant populations and dominant fisheries.
- Impact of discard bans on monitoring.
- Establishment of consistent reference points, as well as the development of additional indicators, related to mixed-fisheries characteristics for examples.
- Studies to obtain information on fishing mortality rates and biomass indices for fish populations for which there is little information, such as deep-sea fish. Shellfish are another group with scarce data.
- Assessment of transboundary monitoring needs to be clarified.
- Monitoring of the exploited invasive species, such as Manila clam, king crab, snow crab or Pacific oysters.
- Improving the collating of information on by-catches.

Medium-term or requiring moderate investments

- Studies must be made on integrating criteria and indicators of biological disturbance from fishing, which are related to the level of fishing pressure, particularly ensuring fishing mortality (F) at or below the MSY, in complex situations such as mixed fisheries and cases of significant ecosystem interactions.
- An analysis should be undertaken to assess whether SSBMSY would be achieved simultaneously for all stocks, taking into account the interactions between them.
- More studies on the impacts of selectivity on stocks are needed.

Long-term research or large investments

- New genomic methods should be developed (e.g. short nucleotide polymorphism (SNP)).
- One way to identify which populations should be surveyed and resources prioritised could be achieved by developing and adapting the "productivity and susceptibility" approach (PSA).

Biodiversity and Fisheries/ Marine food web (EO4) Cluster

Short-term

- Adapt the existing monitoring programmes to food web characteristics.
- Increase the study of energy flows: e.g. between benthic invertebrates and waterbirds, carbon remineralisation by the bacterioplankton, etc.
- Increase the study of marine predators feeding areas and feeding strategies.
- Develop/improve methods to measure or to estimate the productivity of key components.

Medium-term or requiring moderate investments

- Develop indicators:
- To describe communities from a structural point of view: e.g. the size spectrum, or the proportion of piscivores in the community.
- That are integrative for trophic connections and energy fluxes: e.g. productivity of key parts of the food webs, carbon recycling indexes, Primary production required

(PPR), sources or prey quality, etc.

- Improve models of food webs by incorporating new understanding from research in order to improve operationality.
- Use models to optimise monitoring programmes: genetic and isotopic based research to understand trophic position and relationships and to assess group-specific and community specific indicators.

Long-term research or large investments

- Technological development and miniaturisation of sensors are needed to increase the automatic data collection.

Biodiversity and Fisheries/ Sea floor integrity (EO6) Cluster

Short-term

- Define agreement on habitats description (EUNIS).
- Study relations between pressures and microbiology.

Medium-term or requiring moderate investments

- Develop new devices and data transmission means for the observation and study of deep sea habitats.

Long-term research or important investments

- Integrate information from different sources and surveys

Coast Hydrography / Coast /. Hydrographic conditions (EO7) Cluster

Short-term

- Studies are required to develop monitoring methods using remote-sensing satellite techniques, high frequency radar systems, and supports for instrumentation such as tide gauge, oceanographic cruises, uplooking Acoustic Doppler current profiler (ADCP), mooring systems, ships of opportunity, gliders and floats.
- Connection between monitoring and modelling needs to be improved.

Medium-term or requiring moderate investments

- Adapt available methodologies to offshore conditions.
- Determine targets and limits.

Long-term research or large investments

- Develop operating models to characterise the hydrographical conditions on short scales and infer if these can be affected by infrastructure development.
- Develop cumulative effects assessment methodologies for geomorphologically complex situations.
- Study regional scale modelling.
- Develop models of possible anthropogenic activities

ANNEXE 9 : A. NEED ANALYSIS IN THE ECAP DOCUMENTS (WORKING DOCUMENT)

Results from the workshop have been added to this table in green writing.

Cross cutting issues

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
Definition of scales and areas for assessment for each Med country.	Eco regions delimitation, sub delimitation per pressure, coherent for management. Expertise to elicit priority issues, hot spots … Define timelines	Expertise, R&I activities, knowledge transfer	Regional, National, Sub national	Short / Medium	
Assessment at national scale, for each Med sub region (or even at lower scale if relevant): - Each main pressure and its impact (EO2, EO5, EO6, EO7, EO9, EO10, EO11) - Status of each functional group and each predominant habitats, at appropriate ecosystem level (EO1, EO7)	Development of methodologies Scientific support at regional level for coordination Scientific support at national level for national assessment Collection of reliable data	Expertise, R&I activities, knowledge transfer	Regional, National, Sub national	Short/ Medium	Synergy with the MSFD implementation
Display the environment status of the different EO across the Mediterranean waters using suitable mapping tool based on a nested scale system as the HELCOM one's	Development of the mapping tool, building on the HELCOM experience, elaboration of a pilot project, specification of the tool, development, tests and extension to the basin	Expertise, R&I activities, knowledge transfer	Regional, National, Sub national	Short/ Medium	Could at term contribute to the QSR and other environmental reporting
Link the scales of assessment to management issues (the management of pressures via measures, the assessment of cumulative impacts on ecosystem components and its links to decision making processes for licencing new developments)	Development of suitable methodologies to link the scales of assessment to management issues	Expertise, R&I activities, knowledge transfer	Regional, National, Sub national	Short/ Medium	Build on the results of the PERSEUS project, including the Adaptive Marine Policy Toolbox
Refine aggregation rules enabling to use fine-scale data (individual samples) to assess the environmental status of broad ecosystem elements for an entire (sub)region	Specification of the rules to define if GES has been reached, test on pilot areas	Expertise, R&I activities, knowledge transfer	Need analysis	Short/ Medium	Methodologies have been developed for the MSFD: Aggregation rules are not yet determined but aggregation is likely to be required across indicators within each criterion

a method for integrated assessment based on the common indicators	Develop in detail a method for integrated assessment based on the common indicators and results of the scientific projects, following this sequence: a. Map the distribution and intensity of human uses and activities (identifies main areas of activity, potential for use as proxy pressure assessment, supports later identification of measures; b. Assess the pressures – spatial distribution and intensity (and temporal aspects, where necessary) of each pressure; c. Assess the impacts – extent of impacts in relation to the elements to be used for the state-based assessments. Appropriate scales for this sequence should be critical. Will probably require pilot projects to develop and test this method d. Assess the state – bringing together the relevant impact assessments from (b) and leading to an overall assessment of status using a specified assessment methodological standard.	Expertise, R&I activities, knowledge transfer	Regional, National	Short, Medium	
Assess cost efficiency in relation to socio-economic benefits of monitoring	Develop Cost Benefit Analysis (CBA) practice of monitoring, and more generally of Environmental Impact Assessment of monitoring. Will require pilot project.	Expertise, R&I activities, knowledge transfer	Regional, National	Short, Medium	

Make best use of available duly validated scientific assessment tools (modelling, remote sensing and progressive risk assessment strategies)	Identify, and assess these tools in cooperation with their developers. Test them through Pilot Case projects. Remote sensing especially for establishing baseline data for coast and hydrography issues, where no field data is available.	Expertise, R&I activities, knowledge transfer	Regional, National	Short, Medium	
Need to carry out research, especially on relationships between inputs, concentration and effects, in order to develop QA/QC practices	Develop collaborations, preferably jointly, research actions necessary to assess the quality of the marine environment, and to increase knowledge and scientific understanding of the marine environment and, in particular, of the relationship between inputs, concentration and effects.	Organization, Expertise, R&I activities, knowledge transfer	Regional, National	Short, Medium	Rooted in the MAP secretariat PoW for the initial phase of IMAP
Consider the results of the scientific research and innovation projects to draft the 2017 Status Report	Development of a science policy interface to contribute to the 2017 Status Report	Organization, knowledge transfer	Regional, National	Short	
Consider the results of the scientific research and innovation projects for the periodic revision of IMAP (biennial update and 6 years cycle)	Development of a sustained science policy interface, including disposition for IMAP periodic revision and update	Organization, knowledge transfer	Regional, National	Short, Medium	
Develop a cross cutting perspective.	Develop links between (i) physicochemical oceanology, (ii) ecosystems functioning knowledge and (iii) threats and pressures considering connectivity effects and processes, not areas but volumes, and overcoming political barriers.	Organization, knowledge transfer	Regional, National	Short, Medium	

Clarify risk-based approach	The IMAP document recommends applying the risk-based approach for the definition of monitoring procedures. Guidelines to apply such an approach should be developed.	Organization, Expertise	Regional	Short	
Coordination at the national level	Empowerment of national task forces. It is recommended to develop a mechanism for expertise and capacity building aiming at establishing operational national task forces to support IMAP.	Organization	National	Short	

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
monitoring and assessment specific of EO5 need to be further developed	Development of risk based optimal strategies of Monitoring (frequency, localisation of the stations, acceptable risk)	Expertise, R&I activities, knowledge transfer	Regional, National	Short	
	Development assessment strategies including fact sheets taking into account sub regional differences	Expertise, R&I activities, knowledge transfer	Regional, National	Short	
	Definition of eutrophication and its ecological impact. The observation of chlorophyll-a is not sufficient to characterize eutrophication. To assess the natural variability of the basin, long time series are required. Further use of satellite data and validation with the help of field observations can be useful here. Standard common assessment methodology with more than two indicators should be developed. Thresholds need to be defined for different ecological areas. The scale of sampling needs to be targeted.	Expertise, R&I activities, knowledge transfer	Regional, National	Short	
	Need to further detail the assessment of the concentration of nutrients in the water column. Additional information about sources of nutrients such as aquifers and ground water may be useful. Establish guidelines for hydrographic parameters.	Expertise, R&I activities, knowledge transfer	Regional, National	Short	

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
monitoring and assessment specific of EO9 need to be further developed	Harmonization in the different contaminant monitoring programmes existing In particular: - Harmonization of monitoring targets, taking into account sub regional differences. - Harmonization of the contaminant reference list at sub regional scale - Setting of priorities for each area	Expertise, R&I activities, knowledge transfer	Regional, National, sub regional	Medium?	Cross-enhance the contaminant reference list with the MEDPOL list.
	Implementation of Common Indicator 18: Level of pollution effects of key contaminants where a cause and effect relationship has been established. Characterization of baseline and thresholds The relationship between inputs, concentration and effects needs to be further investigated and taken into account.	Expertise, R&I activities, knowledge transfer	Regional, National	Short/ Medium	
	Development of operational monitoring methods based on biologic effects	Expertise, R&I activities, knowledge transfer	Regional, National	Short/ Medium	
	Expertise to prepare recommendation for BAC (background assessment concentrations) Formulation of EAC (environmental assessment criteria) for selected biomarkers in Mediterranean species.	Expertise, knowledge transfer	Regional, National	Short/ Medium	
	Review and critical analysis of the monitored contaminant in biota used for human consumption, considering at least: Heavy metals (lead, cadmium, and mercury), polycyclic aromatic hydrocarbons, and dioxins (including dioxin-like PCBs), with the species selection considerations described in the Integrated Monitoring and Assessment Guidance.	Expertise, R&I activities, knowledge transfer	Regional, National	Short/ Medium	

	Definition of GES targets related to the indicator on pathogens in bathing waters in line with Decision IG.20/9 (Criteria and Standards for bathing waters quality in the framework of the implementation of Article 7 of the LBS Protocol, (UNEP/MAP, 2012)) It is recommended to add observation of pathogens not only in bathing waters but also in shellfish. This issue has been identified to be of cross-cutting interest and should be further discussed.	Expertise, R&I activities, knowledge transfer	Regional, National	Short/ Medium	
	Extension of monitoring strategies beyond coastal areas, in application of the risk based approach. It should be investigated and further discussed if research data for the extension of such monitoring strategies is needed.	Expertise, R&I activities, knowledge transfer	Regional, National	Medium	
	Impact assessment analysis of the acute pollution potential events.	Expertise, R&I activities, knowledge transfer	Regional, National	Medium	
Data at the basin scale	further development of data management at the basin scale	Expertise, knowledge transfer	Basin scale	Short, Medium	

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
Monitoring and assessment specific of EO10 need to be developed	Definition of baseline data from pilot or development projects, in order to develop a risk based approach to litter monitoring and measures	Expertise, R&I activities, knowledge transfer	Regional, National	Medium	
	Develop a common approach for the definition of baselines at Regional Seas scale.	Expertise, knowledge transfer	Regional Seas	Short	
	Make use of modelling to define where exactly monitoring should take place (accumulation areas, hotspots, sources). A GIS platform with all information stemming from models and the collected data should be envisaged.	Expertise, knowledge transfer	Regional, National	Medium	
	Development of citizen monitoring strategies.	Expertise, knowledge transfer	Regional, National, Local	Short/ Medium	
	Development of a specific monitoring of floating litter protocol, on a regional basis.	Expertise, knowledge transfer	Regional, National	Short	
	Develop and harmonize sea floor monitoring including through fish stock assessment programmes and remotely operated vehicles for remote areas.	Expertise, R&I activities, knowledge transfer	Regional, National, Local	Short/ Medium	
	Development of monitoring protocol for marine litter in sea turtles specific to the Mediterranean conditions	Expertise, R&I activities, knowledge transfer	Regional, National	Medium	
	Development of research on ingested litters, as candidate indicator.	Expertise, R&I activities, knowledge transfer	Regional, National	Medium	
	Development of research on micro-litter, including stock taking of on-going research works.	Expertise, R&I activities, knowledge transfer	Regional, National	Medium	

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
Monitoring and assessment specific of EO1 need to be further developed	Improvement of the Reference list of species and habitats (Appendix 1 of the document)	Expertise, R&I activities, knowledge transfer	Regional, National	Short / Medium	
	Quantitative definition of the GES for this EO based on the selected common indicators relevant to this EO (CI 1,2,3,4,5,12,15,16)	Expertise, R&I activities, knowledge transfer	Regional, National	Short / Medium	
	Guidance for the nested approach implementation	Expertise, knowledge transfer	Regional, National	Short / Medium	
	Characterization of baselines and thresholds	Expertise, R&I activities, knowledge transfer	Regional, National	Short / Medium	Identify reference conditions on the basis of the existing MPA network. Marine stations to use well managed MPAs to contribute to the definition of baseline conditions
	Guidance for the application of the risk-based approach. Characterisation of the relationships between environmental pressures and main impacts	Expertise, knowledge transfer	Regional, National	Short / Medium	
	Identification and characterization of representative site and species at national scales.		National	Medium?	

List of species per ecosystem and description of the species' interactions under GES.	Strengthening the marine station network in order to provide knowledge regarding (i) taxonomy/list of and functional role of species (allowing to identify shifts or extinctions), (ii) gene banks for identification of species, (iii) ecosystems functioning, (iv) non-indigenous species, (v) monographs of each group of species, (vi) a shift from a habitat logic to en ecosystem logic. The development of the marine station network needs to be animated by a taxonomist. Capacity building and funding for equipment is required for non-European countries. Include pelagic and benthic realms into monitoring and assessment to move to a more holistic approach of the marine environment and include pelagic and benthic realms (not only large-top food chain predators), along with linked threats and pressures.	Expertise (taxonomist), Knowledge transfer, Provision of equipment for Southern countries	Regional, National	Medium?	Existing network of marine stations to be used as a basis, thus avoiding replication.

Cluster Biodiversity and Fisheries/ Biodiversity / Cetacean (EO1)

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
monitoring and assessment specific of EO1 / cetaceans need to be developed	Collection of reliable data on abundance and distribution of cetaceans.	Knowledge transfer	National, Regional	Short	In collaboration with ACCOBAMS (2016-2019)
	Development of monitoring methodologies and capacity building	Expertise, R&I activities, knowledge transfer	National, Regional	Short / Medium	With the support of ACCOBAMS

Cluster Biodiversity and Fisheries/ Biodiversity / Noise (EO11)

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
monitoring and assessment specific of EO11 need to be developed	Development of monitoring programmes on the basis of the two common candidate indicators at national level (CCI 26, 27)	Expertise, knowledge transfer	National	Short/ Medium	UNEP/MAP, ACCOBAMS partnership
	Further development at regional level.	Expertise, R&I activities, knowledge transfer	Regional	Medium	UNEP/MAP, ACCOBAMS partnership
	Definition of monitoring thresholds: a spatial and a temporal threshold concerning candidate indicator 26 - impulsive sounds- and a noise threshold concerning candidate indicator 27 - continuous sounds. - Preliminary desk study for above (C27) - Identification of noise hotspots (C27), Observation of noise, collection of data, definition of baselines - Definition of threshold (C26)	Expertise, R&I activities, knowledge transfer	Regional	Short/ Medium	UNEP/MAP, ACCOBAMS partnership
	Test of the candidate common indicator 27 on pilot areas Identification of noise hot spots	Expertise, R&I activities, knowledge transfer	Regional, Pilot areas	Short /Medium	UNEP/MAP, ACCOBAMS partnership

Cluster Biodiversity and Fisheries/ Non-indigenous species (EO2)

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
monitoring and assessment specific of EO2 need to be further developed	Elaboration of baseline assessment of the present NIS	Expertise, R&I activities, knowledge transfer	Regional, National	Short / Medium	
	Development of guidance on developing invasive alien species (IAS) list (at national scale)	Expertise, R&I activities, knowledge transfer	National, Regional	Short	
	Characterization of baseline and thresholds	Expertise, knowledge transfer	National, Regional	Short / Medium	
	Identification and characterization of IAS hotspots (at national scale) Assessment of the regional coherence of the national proposals	Expertise, R&I activities, knowledge transfer	National, Regional	Short / Medium	

Cluster Biodiversity and Fisheries/ Commercial fishes and shellfishes (EO3)

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
monitoring and assessment specific of EO3 need to be developed	Develop the related common indicators, monitoring and assessment strategies in order to asses if populations of commercially exploited fish and shellfishes are within biological safe limits.	Expertise, R&I activities, knowledge transfer	National, Regional	Short / Medium	In collaboration with GFCM. Will contribute to the 2017 SQR

Cluster Biodiversity and Fisheries/ Marine food web (EO4)

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
monitoring and assessment specific of EO4 need to be developed	Agree on a clear roadmap with relevant partners on the monitoring programme and assessment for EO4	Expertise, knowledge transfer	Regional	Short	With the support of GFCM and other relevant partners
	Development and implementation of an monitoring and assessment programme specific of EO4	Expertise, R&I activities, knowledge transfer	Regional, National	Medium ?	With the support of GFCM and other relevant partners

Cluster Biodiversity and Fisheries/ Sea floor integrity (EO6)

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
monitoring and assessment specific of EO6 need to be developed	Agree on a clear roadmap with relevant partners on the monitoring programme and assessment for EO6	Expertise, knowledge transfer	Regional	Short	With the support of GFCM and other relevant partners
	Development and implementation of an monitoring and assessment programme specific of EO6	Expertise, R&I activities, knowledge transfer	Regional, National	Medium ?	With the support of GFCM and other relevant partners

Cluster Coast and Hydrography: Length of coastline affected by man-made structures and Land use change (EO8)

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
monitoring and assessment specific of EO8 need to be developed	Development on a harmonized baseline at regional scale.	Expertise, knowledge transfer	Regional, National	Very Short	
	Assessment of the current length of coastline affected by man-made structures (data collection) For a baseline assessment, existing data should be used to generate an indicator at country level; this data generally exists or can be retrieved from satellite data. Evaluate cultural attitudes of populations to coastal zones and values attributed to developments in the coastal zone.	Expertise, knowledge transfer	National	Short	Copernicus (the European Earth observation programme) has developed a specific initiative on coastal areas (setback area, 100m) with a good level of detail which can provide a useful source of data.
	Development of thresholds as % and / or m (length?) taking into account the typology of the coast including its ecosystem goods and services related to social and economic benefits, as well as the disturbance that comes from such structures.	Expertise, knowledge transfer	Regional, National	Short/ Medium	

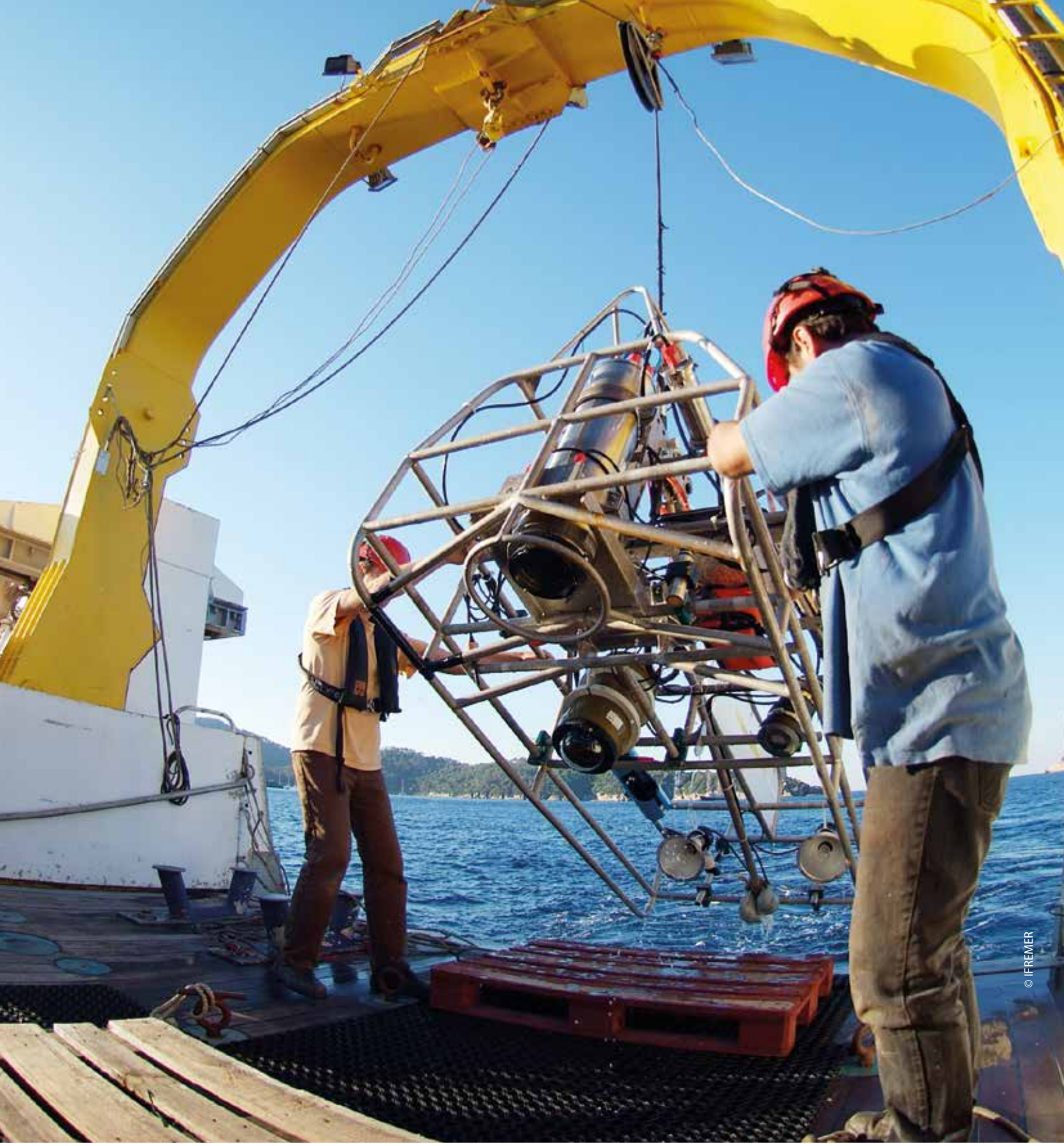
	Development of pilot monitoring programmes based on the candidate indicator on land use change Implement the monitoring with the help of satellite data (COPERNICUS, CORINE Land Cover). The assessment should be done by country experts and should associate socio-economic and other cultural characteristics of each country. The online working group established for the definition of IMAP should assist in the process and further assistance should be envisaged for interpretation of satellite data which requires specific knowledge. In terms of communication, the indicators need to be communicated not in terms of potential future restrictions, but rather as a tool that assists authorities in decision making aiming at coastal safety (climate change, adaptation, tsunami, reducing land losses from erosion).	Expertise, R&I activities, knowledge transfer	Regional, Sub regional, National	Short/ Medium	This indicator has been tested in the Adriatic region (refer to documentation on PAP RAC website). It provides a good insight into spatial dynamics in order to detect hot spots for further investigation. The ClimVar & ICZM project has made an assessment for 11 countries based on data from Google earth.
	Expertise for the support for empowerment of monitoring task forces at country scale. Consultations at sub-regional level.	Expertise, knowledge transfer	Regional, Sub regional, National	Short/ Medium	

Cluster Coast and Hydrography: Location and extent of habitats impacted directly by hydrographic alterations (EO7)

Identified needs	Proposed actions	Scope	Level	Duration	Opportunities
	Mapping of existing man-made structures will provide a baseline for the assessment of future measures and their impacts. Future measures need to be assessed on the basis of (hydrological) modelling (present indicator) and investigation on potential interruptions of connections between ecosystems (subsequent indicator) in order to minimize negative impacts.	Expertise, R&I activities, knowledge transfer	Regional, National	Short/ Medium	Mapping of habitats which is made for other indicators (biodiversity cluster, indicator under EO1) should be coordinated with the issues linked to this objective for economies of scale and consistency. DELTARES (a well-known NL independent institute for applied research in the field of water) can provide guidelines for modelling and impact assessment and that in France approaches for estimation of losses caused by coastal structures are available.

REFERENCES

- Le Moigne et al., 2014, Science policy brief: future research needs to implement the MSFD. Rapport du projet UE FP7 STAGES http://www.stagesproject.eu/images/STAGES/deliverables/STAGES_D3.4_Science_Policy_Brief.pdf
- STAGES, 2013, Needs for further research to support improved and more efficient monitoring programme under MSFD, Rapport d'atelier du projet UE FP7 STAGES, Bruxelles 13-15 mai 2013 http://www.stagesproject.eu/images/STAGES/deliverables/STAGES_Monitoring%20WorkshopReport_v3_04%2002%2013.pdf
- UNEP/MAP, 2015 a, Draft Decision IG.22/7 Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria UNEP(DEPI)/MED WG.421/26/Annex IV/Appendix.10 http://planbleu.org/sites/default/files/upload/files/integrated_monitoring_assessment_programme.pdf
- UNEP/ MAP, 2015 b, Draft Integrated Monitoring and Assessment Guidance http://planbleu.org/sites/default/files/upload/files/Draft_Ecosystem_Approach_Based_Measures_Gap_Analysis.pdf
- Young, J.C., Watt, A.D. van den Hove, S. and the SPIRAL project team1, 2013. The SPIRAL synthesis report: A resource book on science-policy interfaces. http://www.spiral-project.eu/content/documents
- Zamparutti T., White O., Sheate W., Baker J. and the MILIEU Ltd (Belgium) team, 2012, Assessing and Strengthening the Science and EU Environment Policy Interface, rapport préparé pour la Commission européenne, DG Environnement, http://bookshop.europa.eu/en/assessing-and-strengthening-the-science-and-eu-environment-policy-interface-pbKH3112590/



© IFREMER

UNEP

MAP

40 Years TOGETHER FOR A SUSTAINABLE MEDITERRANEAN

Plan Bleu

UNITED
NATIONS

EP

UNEP(DEPI)/MED WG.427/9

UNEP

**UNITED NATIONS
ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN**

15 December 2016
Original: English

Workshop on Science Policy Interface (SPI) strengthening for the implementation of the IMAP in relation to Marine Litter, Biodiversity & fisheries, Hydrography, with a focus on the Risk-based Approach for monitoring.

Marseille, France, 20-21 October 2016

Report of the Meeting "Workshop on Science Policy Interface (SPI) strengthening for the implementation of the UNEP/MAP Integrated Monitoring and Assessment Programme, for Pollution"

UNEP/MAP
Athens, 2016

Table of contents

1. Introduction

1.1. Context

1. Growing awareness of the importance of effective interfaces between science and policy has triggered a range of initiatives at various levels. Science has delivered many assessments, syntheses and reviews and yet, science and other forms of knowledge are not used effectively in policymaking. In turn, policymakers do not always effectively inform scientists about their needs for scientific knowledge. While science–policy interfaces are critical in shaping environmental governance, the most effective means of connecting science with policy is still subject to debate.

2. In the context of the Barcelona Convention, and pursuant to several decisions of the meetings of the Contracting Parties, significant efforts have been made over the last decade by UNEP/MAP to implement the ecosystem approach (EcAp) with the objective to achieve the good environmental status (GES) of the Mediterranean Sea. GES has been defined through eleven Ecological Objectives (EOs), the achievement of which is being monitored through a list of operational objectives and 27 related indicators.

3. These indicators are envisaged to be assessed at the scale of the whole Mediterranean region, and therefore lie at the heart of the UNEP/MAP Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria (IMAP)1, recently adopted in order to monitor and assess the status of the Mediterranean Sea and coast, and as a basis for further and strengthened measures.

1.2. Background

4. The EcAp MED II Project (2015-2018) materialises the second phase of the implementation of the Ecosystem Approach (EcAp) in the Mediterranean. One of the project's key activities focuses on strengthening the interface between science and policy to put in place IMAP, as it is paramount to bridge existing gaps between the scientific and policy making spheres. Plan Bleu/ RAC was mandated by UNEP/MAP to coordinate this activity, and to this purpose several thematic workshops focusing on SPI development and strengthening across the Mediterranean region have been planned to be carried out over a period of three years (2015-2018).

5. In order to launch this activity, an Inception Workshop was organized by Plan Bleu in December 2015 in Sophia-Antipolis (France), bringing together key stakeholders (marine and coastal scientists and policy makers linked to MAP focal points) to discuss on the development of effective science-policy interfaces (SPI) to support IMAP's implementation.

6. During this workshop, successful SPI experiences and practices developed in the Mediterranean region were presented. Focusing on the three EcAp thematic "clusters" (i.e. "Biodiversity and fisheries", "Hydrography and coast" and "Contamination and litter") a first set of 15 key cross-cutting and topic-specific knowledge gaps were identified as in need to be addressed for the implementation of IMAP. A variety of actions were imagined by participants in order to address such gaps.

7. The workshop opened up perspectives to develop SPI for IMAP, namely by pointing out the need to formalize SPI along with its structure and processes and to identify dedicated resources. Participants provided general and specific scientific recommendations, related to biodiversity and NIS

[1] Decision IG.22/7 adopted at the COP 19, in February 2016

common indicators, and addressed overall status and aspects of biodiversity in the Mediterranean, monitoring needs, challenges, methodologies, cost-efficiency and feasibility in light of recent scientific developments. As such, it provided a key contribution to the development of IMAP.

1.3. General objectives: contributions to MEDPOL

8. The second workshop on SPI was organized in collaboration with UNEP/MAP/MEDPOL, as a dedicated session carried out in the context of the Ecosystem Approach Correspondence Group on Monitoring (CORMON) for Pollution. This back-to-back meeting was interesting in the fact that it enabled gathering together CORMON attendants (UNEP/MAP Focal Points and scientists) along with selected scientific experts invited by Plan Bleu, and therefore allowing the continuation of a joint work between researchers and decision makers, in this occasion concerning a specific topic: contaminants and eutrophication issues.

9. In the light of the upcoming completion of the Quality Status Report (QSR) to be issued by MEDPOL in 2017, the SPI workshop was to shed some light on the existing data and sources (made available by MEDPOL) and the remaining gaps regarding IMAP. Indeed, the QSR is to be prepared and built upon the 11 Ecological Objectives laid down for the implementation of EcAp, as well as on the 27 indicators set up to monitor their status.

10. MEDPOL has been collecting and storing a wealth of valuable data in its database over the last decades; however, even if available information can be exploited to characterize some of the indicators, data (and knowledge) gaps exist, making difficult the acquisition of the information needed to describe new aspects of the marine and coastal ecosystems. In particular, the issue of the temporal and spatial scales of monitoring ought to be approached and discussed as a priority in order to define and develop a common methodology for monitoring and assessing the status of the Mediterranean at regional, sub-regional, national and local scales.

11. The expected outcomes of this workshop included not only identifying the science needs to be addressed in order to support the full implementation of IMAP at regional and national levels; but also to propose concrete solutions out of general action lines. Ultimately, it envisaged the provision of recommendations regarding pollution monitoring and assessing to be implemented in the framework of IMAP.

1.4. Flow of the meeting

12. The SPI workshop took place on the 20 and 21 October 2016 at Villa Valmer, Marseille, France. Co-organized by MEDPOL, it was held in the context of the CORMON Meeting on pollution targeting the implementation of IMAP in the Mediterranean.

13. Plan Bleu opened the workshop with a general presentation on its role as mediator between the sciences' and decision maker's spheres, in particular regarding the conservation of the marine environment and the effects of climate change in the Mediterranean region. The need for science-policy interfaces regarding marine protection and conservation in the Mediterranean was presented subsequently, highlighting the importance of a constant and well-planned communication between scientific researchers and policy makers, allowing making the right choices in building up policies to solve environmental problems.

14. The flow of the meeting was then detailed along with the workshop's objectives, followed by a presentation of MEDPOL on the expectations of SPI in the context of the IMAP's implementation. The working documents prepared to guide technical exchanges of participants were then described.

After a short discussion with the audience, several existing SPI experiences and good practices in the Mediterranean region related to pollution issues were shown, namely in the framework of the EU (different SPI carried out at different levels in the EU context, as well as regarding the EU Marine knowledge 2020 Initiative and EMODnet) and on national SPIs developed in Lebanon and France. The first day of the meeting finalised with a plenary session.

15. The second day started by a working session in two sub-groups, focusing specifically on two pollution subjects targeted by the EcAp's CORMON: eutrophication and contaminants. The results of the working sessions were afterwards reported and discussed in a plenary session, which concluded by the expression of several recommendations to keep developing effective SPIs in the Mediterranean region, and by the closing of the workshop.

2. Best practices: summary of the workshop's presentations on SPI experiences on the matter of marine pollution

- **"Interfacing Science and Policy. Knowledge on marine pollution", Georg Hanke, European Commission**

16. Policy needs to be based on scientific knowledge. To this purpose, the EC has issued October 2016 a Communication on "Data, Information and Knowledge Management at the European Commission (SWD(2016) 333 final)" in order to launch an evaluation of the "metadata" characterising existing types of data and knowledge, i.e. their producers, data formats, localisation or storage (e.g. databases), as well as how to better access it in order to improve its use and management to create new knowledge.

17. In the framework of the EU, the generation of data and knowledge on marine pollution in the Mediterranean has been extensively fostered, in different formats and related to different sub-themes, through funded research and training programmes. In fact, figures speak for themselves: CORDIS - EC's primary repository dedicated to the dissemination of European funded projects- and the Marine Knowledge Gate -a project repository platform-, as EU initiatives devoted to the capitalisation of the knowledge generated by such projects, issue over 200 records on "marine pollution in the Mediterranean". Similarly, over 500 professionals (scientific experts, researchers, professors) are registered to work on "marine pollution" matters, in circa 250 oceanographic institutions in Europe. As a result, a large number of publications (15 000) on marine pollution in the Mediterranean are registered in online databases gathering scientific journals and books.

18. While reposition and access to scientific information traditionally had a cost, today the landscape is changing with the development and rapid increase of open-access initiatives, allowing the selection, extraction, compilation and/or interpretation of data through a variety of channels, e.g. review reports, scientific and technical networks and/or advisory groups, conferences and workshops, online platforms and other fora, etc. For instance, a number of expert groups targeting marine pollution are in place in different governance frameworks (ICES, IMO, OSPAR, HELCOM, UNEP/MAP, Black Sea Commission, EMSA, etc.). In the EU context, the implementation of the MSFD, and in particular its Descriptor 8 - "Contaminants and pollution effects", has involved:

i) the creation of different expert (advisory) groups (including partnerships with the structures above) to deal with the assessment of the existing and needed information and knowledge,
ii) extensive funding of research projects to address gaps, and

iii) the development of data storage and management systems to store different kind of available information resources, both existing and newly generated (e.g. for the purposes of the MSFD).

19. In the light of the above, several recommendations are laid down regarding the setting up of SPI in the framework of the UNEP System in the Mediterranean:

- Consider existing approaches
- Identify gaps and needs in "*SPIying*"
- Connect to existing platforms,
- Recognize interest groups, and balance them to moderate the process
- Provide a stable and continuous process, to get used to tools
- Insert modules on output preparation into project calls
- Provide focused project calls with clear questions from policy side
- Insist on focused project output responding to questions
- Resources needed on both sides, Science and Policy

20. In addition, issues specifically related to marine pollution monitoring in the Mediterranean Sea, as in other regional seas, are to be discussed within an SPI expert group in order to evaluate available and needed knowledge. Some examples include:

- Basic science and understanding;
- Including new sampling approaches (passive, transect, high spatial resolution, etc.);
- Identification of emerging substances (and/or processes);
- Screening approaches for different contaminants, including targeted and non-targeted;
- Monitoring of biological effects and toxicology in the marine environment, in order to link effects to causes;
- Evaluation and assessment, in order to set new (policy) measures.

- **"The EMODnet MedSea CheckPoint: assessing observations capacity and data adequacy for users at the regional sea-basin level", Simona Simoncelli, CMCC.**

21. The EMODnet MEDsea Checkpoint provides a good example of decision making-science interface at the scale of the Mediterranean.

22. The concept of the EMODnet Checkpoints was introduced within the framework of the EU's Marine Knowledge 2020 Strategy. Its principle is to unlock fragmented and hidden data resources, and evaluate them, in order to understand the potential of marine knowledge to push the development of a blue, sustainable economy. The observation within the EU of fragmented repositories of marine data, instead of an interoperable sharing mechanism, boosted this strategy towards a new paradigm where data are collected once and used for many purposes. In this sense, Checkpoints support the implementation of the strategy, by assessing the quality of the current observation monitoring data and by showing how such monitoring systems meet the needs of public and private users.

23. Sea Basin Checkpoints carry out monitoring system assessment through the development of targeted products. They aim at evaluating existing national and international programs, along with their roles and synergies, while identifying the gaps and establishing priorities in order to optimize the

system and release recommendations for evolution to better meet the needs. Checkpoints target different audiences, ranging from institutional and policy makers to the general public.

Data collection framework

24. EMODnet MedSea assesses basin-monitoring systems on the basis of the data needs from seven different end-user applications, related to:

- the blue economy sector, i.e. **offshore industries**, and **fisheries**;
- marine environment variability and change, namely **eutrophication**, **river inputs** and **ocean climate change impacts**;
- emergency management (**oil spills**); and
- preservation of natural resources and biodiversity (**Marine Protected Areas**).

25. These applications gather input information through data collection programmes, i.e. a series of databases and data initiatives, at different levels. Checkpoint indicators are then developed, categorized according to their adequacy and used to produce and provide data adequacy reports, based on a number of assessment criteria based on availability and appropriateness.

26. The overall Checkpoint objective is to assess the usefulness of the existing sea basin monitoring through assessment reports. To this purpose, a Checkpoint Information and a Checkpoint Service are developed i) to describe upstream data (discovery, quality and availability metadata); ii) to develop targeted products based on the monitoring data to determine whether these monitoring systems meet the needs of industry and public authorities for the seven challenges identified; and iii) to carry out the assessments based on the targeted products and make them available.

Example: MedSea Checkpoint's Challenge 6
The checkpoint's Challenge 6 is related to eutrophication phenomena in the marine environment. Its objective is to assess the evolution of eutrophication in the Mediterranean over the last decade based on available historical in situ (namely temperature and salinity, nitrate and phosphate, dissolved oxygen, chlorophyll) and remote data (e.g. ocean-colour satellite products).

Targeted products include maps of seasonal chlorophyll and chlorophyll trends, as well as maps of seasonal eutrophication and eutrophication trends (based on eutrophication indicators, e.g. TRIX index). The development of targeted products allows for a first expert evaluation, regarding the availability of data and the existence of gaps in space and time for "building-up" the indicators. For instance, estimating TRIX index available for all seasons every year and for the whole Mediterranean is far from being achieved based only on databases, as it requires a variety of data (nitrogen, phosphorous, oxygen, chlorophyll). Access to restricted databases and numerical modelling tools may help improving TRIX calculations.

27. Preliminary conclusions and way forward

- The MedSea Checkpoint is a new method to assess the basin-scale monitoring systems, developed upon ISO quality principles;
- Challenge Targeted Products require several tens of input data sets, from different environmental matrices;
- Availability indicators show that upstream data are not accessible through INSPIRE services and data policy is partially restricted;
- Gaps in observations for the specific Challenges are emerging for river nutrients, mass balance at the coasts, fishery data, several human activity data sets (AIS data specifically);

28. As a consequence, the Checkpoint service is to be developed as a permanent authoritative structure, including more challenges in all sea-basins in Europe, in order to overcome the challenges above presented and perform a global assessment.

29. The EMODnet Checkpoints can be part of the SPIs that, without being explicit, are necessary for policy making, as recommended by the OECD (2015). In fact, both management of urgent crisis and the development of long-term policy demand solid scientific evidence, based on data and information that need to be managed and made available by permanent authoritative structures. Such mechanisms need to report on data quality and gaps at multiple space and time scales. To this purpose, international coordination, clarification of responsibilities and mandates are essential aspects that are to be previously elucidated.

- **"Pollution of the Lebanese coastal waters", Gaby Khalaf, National Centre for Marine Sciences (CNRSL)**

30. The Lebanese coastline extends for 220km and covers a surface of circa 200 000 hectares, standing for 16% of the national territory. Almost 70% of the Lebanese population is concentrated in the coastal fringe, which also registers the presence of the 85% of the industrial plants of the country (around 20 000).

31. Conflicts on land uses are hence evident in the coastal area, subject to different sorts of pollution:

i) physical and aesthetical pollution, deriving from dumpsites, embanking, destruction of terraces, uncontrolled urbanization, sand extraction and use of dynamite in fishing;
ii) chemical pollution, caused by port activities and fuel tankers, chemical and cement industries, and the electrical power plant, all located on the coast and releasing untreated effluents to the sea; and
iii) bacteriological pollution, originated by domestic sewage outfalls, wastewater releases and river discharges.

32. Lebanon lacking adequate wastewater treatment facilities, pollution impacts on coastal areas are multiple and severe, ranging from deterioration of natural habitats and extinction of sandy beaches, to migration and/or disappearance of animal and plant species, water and sediment pollution by trace metals (among other dangerous substances) and effects on human health.

33. A monitoring strategy for the Lebanese coastal waters has been running for over thirty years, enabling delivering the status of the Lebanese coasts at over thirty sampling sites and according to different parameters. The monitoring of the coastal fringe has allowed the development of a cartographic tool displaying sites suitable for bathing as well as contamination hotspots, useful to communicate with the general public on environmental concerns.

- **"The SPI and its applications in Lebanon", Gaby Khalaf, National Center for Marine Sciences (CNRSL)**

34. In spite of political and economic challenges, Lebanon has managed to establish a science-policy interface focusing on the conservation and protection of the marine environment, with good results.

35. The Lebanese SPI experience consists on a platform integrated by key national stakeholders, namely:

i) Science suppliers: in particular, the National Centre for Marine Sciences of Lebanon (CNRSL) which provides on its own 80% of the existing reliable and available data regarding the marine environment; the remaining 20% issues from different public and private universities, occasionally producing and delivering point data.
ii) National and local authorities and decision makers, including the Prime Minister, the Ministry of Environment, the Council for Development and Reconstruction (CDR), municipal authorities and representatives of the Lebanese Confessionalism.

36. This SPI features a variety of successes in managing critical environmental situations:

- The CRNSL was mandated to carry out the scientific monitoring following a 2006 oil spill, including the elaboration of an action plan and the production of a national report on the environmental damages; this process culminated in the development of a national plan to deal with oil spills and other severe hydrocarbon pollution events;
- The issuing of two draft laws for establishing marine protected areas in the northern (Ras Chekka) and southern (Nakoura) coastal part of the country, receiving essential support of regional bodies for the conservation of the marine environment (i.e. UNEP/MAP RAC/SPA and IUCN), thereby enabling the protection of benthic ecosystems and biodiversity hotspots;
- The conversion of a coastal dumpsite in a public garden at the location of Saida, including the planning and development of a public beach and the construction of an urban wastewater treatment plant;
- The closure of a public beach due to its deteriorated condition.

37. In contrast, the identified remaining unmanaged issues allow realizing that further efforts are needed to support, improve and strengthen the Lebanese SPI to address marine environmental concerns:

- Domestic waste of coastal urban centres still not adequately treated, and is being dumped in coastal landfills;
- While 12 wastewater treatment plants are envisaged by the Lebanese CDR, only two are currently operational;
- Coastal industrial plants are directly releasing untreated effluents to the sea;
- The largest public beach in the country has been closed down due to urban wastewater pollution.

38. The strong popular opposition to wastewater treatment facilities, the lack of urban water collection networks and the absence of policy requirements regarding wastewater treatment provide some explanations for the current situation, highlight different sorts of needs and confirms the way to go:

- To keep developing and producing research and scientific outputs;
- To keep bringing together researchers, policy makers and the general public to achieve improved communication and dialogue and address social, economic and environmental needs based on research and scientific evidence.

➢ **"A French view on Science Policy Interface", Jean-François Cadiou, Ifremer**

39. Ifremer is a French marine research institute conducting applied research and expert assessment reports. A large part of its research activities deal with marine societal issues: among many other missions, it is actively involved in supporting the implementation of marine policy, namely the EU Water Framework Directive, the Marine Strategy Framework Directive and the Common Fishery Policy. To this purpose, it maintains a fluent relationship with the French administration and public agencies in charge of transposing European policy to the national level.

40. Ifremer's interactions with public administrations are carried out to implement actions at different levels:

i) international, through the setting of thematic expert groups;
ii) national, by establishing direct relationships with central administrations and agencies responsible for marine policies;
iii) regional, by providing scientific advice and studies to regional administrations and public bodies; and,
iv) local, by delivering technical and scientific support to local structures in charge of coastal, marine and maritime affairs (e.g. ICZM).

41. This variety of stable and multi-level SPIs evidences the need to involve science and technical expertise in management so as to optimally address environmental resources. Since science is often ahead from politics, it has the capacity of being proactive and anticipating societal needs.

42. Through its active involvement in SPI platforms, Ifremer has come to identify problem areas and challenges along with ways to overcome them:

- the increasing demand from public administrations and the increasing complexity of the issues requested, requiring i) prioritisation of the activities and projects according to Ifremer's domains of scientific expertise, thereby ensuring the delivery of added value, and ii) involving other partners if needed;
- prevention of conflicts of interests, as some of its projects might also involve the private sector (e.g. marine renewable energies), thus being incompatible its work with the public administration on the same topic;
- clear formalisation of processes with public administrations, via agreements, conventions or contracts, including contract specifications (expected deliverables, budgetary provisions, etc.);
- readiness to respond to crisis situations, such as oil spills and other acute pollution events.

43. In addition, several lessons learned and pitfalls are also laid down for their consideration in other SPI experiences.

Lessons learned:

- Achieving common understanding is key to SPI success, and is easily achievable through meetings and workshops with policy makers, scientists, general public and other pertinent stakeholders;
- The use of a simple and comprehensible language, free of scientific jargon, is needed to facilitate understanding by non-scientific groups;
- The setting of dedicated SPI structures within scientific structures is occasionally required, to better understand policy makers' expectations and better respond to their numerous requests (e.g. MSFD expert group within Ifremer);
- There is a need to provide solid scientific evidences, validated through peer reviewed papers and based on high quality datasets and time series; policies, regulations and measures have strong implications on socioeconomic sectors and need to be built upon robust scientific basis; in the field of pollution, few datasets and thresholds are found specific to the Mediterranean Sea, therefore the use of common methods and intercalibration is paramount to obtain reliable data;

Common pitfalls:

- Risk of "overselling" research projects for the purposes of raising resources (e.g. financing);
- Particularly regarding pollution, attention needs to be paid to communication and to how messages are delivered, to avoid misunderstandings;
    - Practical example: PCBs are transported by the Rhone river from industrial sources to the Mediterranean, where they are stocked in sediments; some years ago, some French media picked up this story, which became top priority, although it entailed no risk to marine life.
- Developing a fluent dialogue with decision makers is paramount, and also the setting of pertinent and effective mechanisms to disseminate information and communicate with the general public, which needs to be well-informed as it plays a key role in generating public debate and placing issues on the public agenda.

44. Finally, several key questions for next steps were raised for discussion:

- Is there a need for a dedicated body on SPI specific to the Mediterranean, acting as EEA does at EU level?
- How to improve coordination observing / monitoring systems in the domain of pollution in the Mediterranean?
- Should we advance towards an EMODnet-like open access database at the Mediterranean scale?

3. Best practices: Key aspects for a well-implementation of SPIS

(From presentations and debates in plenary)

Structuring	• Need to better structure SPI at different levels, starting from simple interfaces adapted to the context (local, national, or regional); • Need to create links between the scientific community and policy makers/ public institutions in order to create a network of experts and projects regarding specific issues (e.g. pollution monitoring); • SPI should include evaluation processes to assess their performance and allow their improvement.
Communication	• Learning to deliver clear and simple messages, allowing scientists to communicate about science uncertainties and complexity as well as enabling policy-makers to express their needs and expectations; • Need for a communication procedure allowing integrating different stakeholders to a multilateral debate; • Scientific experts need to be trained to be able to "translate" academic/scientific results into advice on socioeconomic issues; • Dialogue should be fluent and effective also with the media.
Time limits	• Scientific experts need time to conceive and implement scientific and technical protocols to collect and analyse data; their time periods differ from the timing dictated by politics; • On the contrary, science is one step ahead policy-making, and needs to find an optimal way of periodically inform policy-makers on environmental evolution; • Scientists need to deal with the gradual increase of political demand for scientific advice.
Resource allocation	• To deal with limited (economic) resources, SPI processes should be integrated into research projects; • Existing scientific expertise should be capitalised; • Scientific gaps are not a matter of financial resources but a matter of availability of (monitoring) methods to monitor; there is a need for data and knowledge efficiency for monitoring.

4. Strengthening SPI at the Mediterranean level to support the full implementation of IMAP regarding pollution

4.1. SPI in the context of IMAP, focusing on pollution issues: specific objectives

45. Taking up the baton of the Inception Workshop, the second SPI workshop envisaged three principal objectives:

1. Reviewing and fine-tuning the scientific needs identified as preventing the effective implementation of IMAP, at regional and national levels, by:
   v) Reviewing and completing the list of pre-identified science needs;
   vi) Proposing concrete actions in order to translate general initiatives into specific activities at different geographical scales (regional, national, local, etc.).
   vii) Reflect on the actions to be implemented to fill the gaps, and prioritise them according to the following criteria:
      - The cross-cutting nature of activities (e.g. actions addressing many science needs, allowing optimising resources);
      - The urgency to address the science needs, initially conducting actions addressing aspects related to the first stages of IMAP's implementation schedule;
      - The existence of opportunities: a favourable context (ongoing scientific projects and/or initiatives, laboratory works, datasets, etc.) already existing and facilitating the implementation of the action.

2. Define the rationale and set proposals regarding pertinent geographical and temporal scales for periodic monitoring, reporting and assessing in the context of IMAP, in order to describe the status of Ecological Objectives 5 and 9 (Eutrophication and Pollution);

3. Suggest actions to keep the SPI platform active in order to continue supporting IMAP's implementation.

Reference documents

46. Based on the outputs of the Inception Workshop on SPI, a working document was prepared to guide the participants' expected scientific and technical discussions2, specifically focusing on pollution issues falling within the scope of IMAP3. The document presented an assessment of the IMAP science needs related to pollution, providing their related state of play in terms of recent research progress and a set of possible specific scientific actions to enlighten the way forward towards filling such gaps (see Annex III).

47. In addition, "opportunities" -i.e. favourable context(s) given by ongoing or planned research projects and/or partnerships, resources of specific scientific centres, etc. that may facilitate the development of a particular action- were taken into consideration for the identification of possible solutions or actions.

[2] UNEP(DEPI)/MED WG.427/8/Corr.1 Enhancing the Science-Policy Interface in the Mediterranean for Marine pollution based on ecosystem approach.
[3] Ecological Objective 5 - Eutrophication, Ecological Objective 9 – Contaminants

4.2. Objective 1: Knowledge needs for implementation of IMAP: From gaps to actions

48. Parallel working group sessions were held, each one targeting a specific pollution theme, eutrophication and chemical contaminants, integrated by scientific experts in the domain. The objective was to prioritise among knowledge needs and come up with pertinent actions and opportunities enabling addressing them.

Results of the sub-group session: EO 5- Eutrophication and EO 9- Contaminants:

1. EO 5: Eutrophication

49. The revision of the science needs generated a rich debate that culminated in a series of recommendations regarding several priorities on which to concentrate during the initial phase of IMAP, in order to develop an effective plan for monitoring eutrophication events.

- **Prioritisation of science needs and development of concrete actions:**
  - **Priority:** "Assessment of spatial and temporal natural variability concerning processes related to eutrophication at basin level"
    Eutrophication is not a generalized problem in the Mediterranean Sea, but a local phenomenon occurring in concrete coastal areas, receiving higher impacts of economic activities or freshwater inputs arriving to the sea.
    Needs:
    Natural temporal (monthly, seasonal, etc.) and spatial variability of parameters related to eutrophication should be better considered for the development of national monitoring plans.

  - **Priority**: "Definition of scales (temporal and spatial) and areas for the monitoring and assessment of eutrophication for each Mediterranean country"
    Needs:
    There is a need to make more types of spatial assessment. Grids to conduct nutrient monitoring are to be developed at local and national scales (exception of the North Adriatic).

  - **Priority**: "Assessment of main pressures (and related impacts) concerning eutrophication at national scale or lower if relevant"
    Needs:
    More research is to be developed in countries' hotspots:
    - The scale of coastal areas and lagoons is important, as activity sectors impact and generate eutrophication phenomena.
    - Monitoring tasks and resources should concentrate in these precise areas, presenting higher risks, and temporary measures are to be taken in other areas.
    - Pressures should be considered in countries' monitoring plans.

  - **Priority**: "Definition of eutrophication thresholds for different ecological areas at national or sub-national scales"
    Since eutrophication events occur locally, areas of risks or eutrophication hotspots are not regional, and therefore, thresholds differ across the basin according to local conditions.
    Needs:

Taking into account the differences between eastern and western areas of the Mediterranean (registering different concentration of Chlorophyll-a and nutrients), consider the areas where eutrophication risks are shared (depending on close or open basins), which are the causes (e.g. freshwater inputs, other) and examine whether thresholds might be shared or not.

- **Priority:** "Development of a (minima) common standard assessment methodology for all Mediterranean countries based on existing monitoring strategies for eutrophication"
  Needs:
  A common and comparable methodology is to be developed among countries, including:
  - Inter-calibration: some national programmes in Mediterranean countries have been monitoring nutrients, but inter-calibration procedures need to be urgently carried out to obtain comparable data;
  - Development of a unique and revised common database, as in the case of Italy, Slovenia and Croatia in the Adriatic Sea;
  - Development of thresholds for nutrients, according to geographical areas and conditions

Recommended actions:

- River inflows should also be monitored: whenever possible, data on river inflow for salinity and nutrients should also be acquired;
- Due to limited economic resources, monitoring efforts at the scale of the basin should be spaced out and concentrated in specific high risk areas;
- Assess first areas where nutrients have an impact; once sensitive areas are identified, proceed with measurement;
- Establish thresholds for different Mediterranean areas/ sensitive areas;
- Pressures should be considered in drawing up monitoring plans in order to be assessed;
- Coastal hotspot areas, where risks are important, are to be monitored regularly (space) and frequently (time);
- Since salinity is a relevant indicator for eutrophication, it should be added whenever possible to the common parameters to be monitored in national plans;
- Maximum and minimum values are to be included for Chlorophyll-a and nutrients;
- Frequency of blooms is to be considered, instead of their variability.

Obstacles:

- Elevated costs of monitoring measurements, in particular ship trips: need to find substantial financial inputs.

Opportunities:

- Different thresholds in several areas of the Mediterranean have been studied under the MedGeek programme;
- For EU Member States:
  - Coastal areas: EU WFD, although the indication for EU WFD is more on Chl-a and not on nutrients concentration;
  - Offshore areas: MSFD
- Use EMODnet: in particular, the MedSea Checkpoint, providing a variety of verified information and data on the Mediterranean Sea;

- Copernicus Project.

2. EO 9: Contaminants

50. The development of a monitoring strategy for contaminants, especially on the new components required by IMAP, generated an active discussion regarding the identification and prioritization of science needs as well as the design of actions to address them.

➢ **Prioritisation of science needs and development of concrete actions:**

51. Priority has been given by participants to different scientific needs and corresponding actions, especially to these ones:

- **Priority:** "The implementation of IMAP's Common Indicator 18-Level of pollution effects of key contaminants where a cause and effect relationship has been established";
- **Priority: "**Research on the relationship between inputs and concentration, and between concentration and effects"

  Needs:

  There is a need to conduct research at two levels:
  - the cycle of contaminants and on the biomagnification rate;
  - ecotoxicology and effects they cause on organisms, specifying whether effects are caused at the organism, population of ecosystem level.

  Recommended action:
  - Carry out a Workshop on the issue of the known cause-effect relationship for contaminants

  A specific workshop on the available data and knowledge on contaminant cause-effect relationship could be useful to determine the state of play, open to Mediterranean scientists from different countries and also to international experts, as well as to decision-makers; This workshop could provide an indication on possible research lines for future research projects, such as metabonomics and biomarkers.

- **Priority**: "Selection of monitoring parameters according to EO 9 indicators (key pollutants, contaminant concentrations, pollution effects, etc.) and monitoring procedures based on existing experiences"

  Needs:

  The development of a common standard assessment methodology for all Mediterranean countries to assess contamination is considered urgent and a real priority.

  Recommended action:
  - Conduct a Workshop to define a common standard assessment methodology

  A workshop on available methods used in Mediterranean (or other sea basins, whenever pertinent) countries could be useful to harmonise practices for pollution monitoring. In addition, it could help to answer the CORMON requests on the issue of the scales at which to assess and report.

- **Priority**: "Definition of GES targets related to the different indicators for EO 9"

  Needs:

Establishing thresholds is a real priority yet demands hard work.

Recommended actions:
Characterization of baseline and thresholds;
- Develop expertise to prepare recommendations for BAC (background assessment concentrations);
- Formulation of EAC (environmental assessment criteria) for selected biomarkers in Mediterranean species.

- **Priority**: "Develop common procedures for data collection, management and storage"
  Needs:
  Identified as a real priority in the Mediterranean; developing procedures for data collection, management and storage is also a way to capitalise the existing, and progress towards assessing GES.

  Recommended actions:
  Further development of data management at the basin scale:
  - Collection of reliable data through standardised protocols;
  - Development and testing of data infrastructure(s) to store and access data, favouring the management and accessibility of new and existing data in a compatible manner;

- **Priority**: "Use of marine ecosystem modelling to assess pollution"
  Needs:
  Use exiting tools to complement the assessment of pollution issues in the sea basin, in particular considering the limited economic resources.

  Recommended action: Consider the integration of available modelling tools to assess environmental status

- **Priority:** "Develop coordination at the national and regional level"
  Needs:
  Including the policy expertise, since not only scientific knowledge is needed;
  It is a priority and demands efforts to increase capacity building in the area.

  Recommended action:
  Setting of a mechanism for expertise and capacity building aiming at establishing operational national task forces to support IMAP regarding monitoring and assessment of contaminants occurrence and effects.
  It has been mentioned that policy-makers should also be included in such coordination mechanism.

  Opportunities:
- Consider what has been done in the context of other regional Seas, particularly OSPAR.

4.3. Objective 2: setting monitoring appropriate scales and reporting procedures for IMAP

1. Scale / Frequency of Periodic Reporting & Assessment of Eutrophication Phenomena

52. The participants discussed on the pertinent temporal and geographical scales for carrying out Eutrophication monitoring, took decisions whenever possible, according to their scientific knowledge and technical expertise, and proposed actions and recommendations to be implemented under IMAP.

➢ **Defining temporal and spatial scales**

- Challenge and needs:
  Focal Points stressed the need to define a common methodology, valid on a general basis for all Mediterranean countries, allowing defining a minimum frequency and spatial sampling distribution for the suitable monitoring of parameters related to Eutrophication phenomena, as well as for their reporting (to UNEP/MAP/MEDPOL) and assessment.

- Particularities:
  Spatial: eutrophication is a very local phenomenon; therefore, monitoring needs to be carried out on a **local or national level**, with the exception of the Gulf of Trieste, requiring an expanded effort involving transnational monitoring and assessment
  Temporal: eutrophication phenomena experience rapid variations over time, and their monitoring should be carried out on a **regular basis** to guarantee its effectiveness.

- Recommendations:
  Monitoring:
  - Spatial:
    Eutrophication hotspots are to be defined by countries, at least one or two hotspot areas to be identified per country by means of satellite images, so that a targeted, in-field monitoring takes place regularly;
  - Temporal:
    The minimum monitoring periodicity for eutrophication hotspots highly recommended by the participants is **monthly or bi-monthly,** through basic related parameters
    However, expert judgement can justify different monitoring periods, and take into consideration eutrophication risks and trends.

  Reporting:
  - To be carried out for eutrophication hotspot areas on a **bi-annual** basis
  - **Seasonal** frequency of reporting might be adopted for a few hotspots, if needed, based on expert advice

  Assessment:
  - The assessment frequency proposed by the participants is **annual**

- Obstacles:
    - The economic cost of monitoring is often an obstacle to achieve adequate frequency and pertinent spatial sampling.

- Take advantage of existing opportunities:
    - Use of alternatives or "smart" solutions can help overcoming the difficulties of monitoring (e.g. tools such as gliders, satellite images, programs providing free updated data, such as Copernicus, etc.).
    - New technologies, data from other projects, modelling and combination of modelling and experimental data may allow complementing monitoring.

2. Scale / Frequency of Periodic Reporting & Assessment of Pollution

➢ **Defining temporal and spatial scales**

- Challenge and needs
  On account of the elevated costs, location of the sampling stations to measure pollution is a matter of cost-benefit analysis.
  However, the development of a common methodology for the definition of the sampling frequency and location of stations is urgent, and needs scientific assistance.

- Particularities regarding pollutants:
    - Spatial
    - Temporal

- Recommendations:
  Monitoring:
    - Spatial:
      It is necessary to monitor contaminants also offshore; access to hydrodynamic modelling might support prevision of the distribution of pollutants.

  Reporting:
  Assessment:

- Obstacles:
    - The economic cost of monitoring is often an obstacle to achieve adequate frequency and pertinent spatial sampling.
- Take advantage of existing opportunities:
    - Integrate modelling (and geographic information systems) with traditional (field) monitoring.
    - The use of hydrodynamic models allows predicting pollutants' transport and dynamics, although these transport models still need development and training.

4.4. Objective 3: Keeping SPI alive: Suggestions to support science-policy interfaces

53. The Meeting also formulated proposals on how to sustain the SPI Science-Policy Interface, especially in the context of IMAP:

- Develop new pertinent research projects, scheduling SPI in their program and adequately guiding scientific research to measure values/parameters/etc. that are important for policy making

  Recommendations:

- Include policymakers in projects from the beginning: different research projects related to the MSFD and SPI (Perseus, Devotes) have conducted pilot experiences, including policy makers from the beginning.
- New research projects should follow the same path, and link young professionals from the scientific and social disciplines.

- Develop research and technical expertise in SPI:

  Recommendations:

- Develop PhD and postdoc research in SPI: strengthen SPI by integrating PhD students in the policy area, either by common projects or through training carried out by the policy makers.
- Regroup policy makers and institutions which have to implement policies to produce knowledge in this domain.

- Develop SPIs at different levels according to different scopes (of action), even at lower organisation levels (including common joint workshops, as an example);
- Include social scientists in the above research projects to facilitate science/policy communication: scientific language should be “translated” to policy maker's language and include social aspects;

- Carry out pilot initiatives:

  Some examples:

- Develop living examples involving both scientists and policy-makers in a small-scale pilot project, involving one or few countries; the idea being to develop good practices that can be further extended.
- Triple AS: Programme (running for over 4 years) integrating scientists inside policy/decision making processes: allows the injection of young scientists in the environmental administrations for a limited time, which has been experienced in other countries.

4.5. Conclusions and approved final recommendations

54. The participants attending the specific session dedicated to the SPI acknowledged that the strengthening of science-policy interfaces at different scales is a need for IMAP implementation in the Mediterranean, reinforcing the idea that environmental policy needs to be based more than ever on scientific evidences, on account of the rapid environmental evolution and the rising complexity of environmental policy making.

55. From the current SPI experiences presented by some participants, it was highlighted that a diversity of SPIs exist, reflecting country contexts and needs, as well as decision-maker's expectations. However, participants agreed on a series of recommendations for any successful SPI:

- the independency of the public environmental scientific research needs to be guaranteed, especially to recognize emerging environmental issues,
- SPIs, although existing in number of Mediterranean countries, should be better recognized as operational processes both by involved scientists and policy makers;
- better coordination is to be developed within the scientific community as well as among policy makers, at the pertinent scales;
- more effective cooperation is needed between the scientific community and policy makers, in particular regarding the exchanges of information and data, in order to increase interoperability and generalise open access of existing data.

56. The meeting allowed reviewing the working document WG 427/8 on SPI, and especially the identification of science gaps and needs regarding EO 5 (Eutrophication) and EO 9 (Contaminants). On this basis, participants proposed a series of related concrete priority actions and recommendations especially aimed at addressing the issue of appropriate geographical scales for assessing, monitoring and reporting in the context of IMA

Annex 1

Agenda of the meeting

Workshop on Science Policy Interface (SPI) strengthening for the implementation of the UNEP/MAP IMAP for pollution, join in the Meeting of the Ecosystem Approach Correspondence Group on Pollution Monitoring (CORMON pollution)

Marseille, France, 20-21 October 2016

Provisional Agenda

1st Day, Thursday, 20 October 2016, from 14:00 to 18:00

Agenda item 6. 14:00 -14:15 Opening of the workshop *(D.Sauzade & A.Lafitte; Plan Bleu, France).*

Agenda item 6. 14:15 - 14:30 The EcApMedII project output 3, Stronger Ecosystem approach related science-policy interface in the Mediterranean. (*A.Lafitte; Plan Bleu, France).*

Agenda item 6. 14:30 - 15:00 Presentation of the analysis of the science needs supporting the implementation of the Integrated Monitoring and Assessment Programme (IMAP), focusing on pollution issues. *(D.Sauzade; Plan Bleu, France).*

15:00 - 15:15 Discussion

Agenda item 6. 15:15 - 18:00 Presentation of SPI good practices

15:15 - 15.30: G.Hanke Institute for Environment and Sustainability – JRC (European Commission). Presentation of the DG ENV and JRC/CMC visions on science-policy interface in Mediterranean focusing on pollution issues. Presentation of recommendations in order to strengthen science policy interfaces and how to make these interfaces more efficient and sustainable.

15:30 - 15:45: S.Simoncelli, CMCC (Italy). Presentation of EMODnet MedSea Checkpoint project on the evaluation of the monitoring system in the Mediterranean Sea. And some good practices in matter of scientific data provision to support monitoring and assessment plans, focusing on pollution issues.

15:45 - 16:00 Discussion

16:00 - 16:15 Coffee break

16:15 - 16:30: G.Khalaf, CNRS (Liban). Presentation of some good practices in matter of marine science policy interfaces experienced in Lebanon, focusing on pollution issues.

16:30 - 16:45: JF.Cadiou, Ifremer (France). Presentation of some good practices in matter of marine science policy interfaces experienced in France, focusing on pollution issues.

16:45 – 17:00 Discussion

17:00 - 17:45: Presentation of the working document. Presentation of the methodology of work for the "working session in groups" (on 21th October) and expected results. *(C.Murciano, Plan Bleu's consultant, D.Sauzade & A.Lafitte; Plan Bleu, France).*

17:45 - 18:00 Question and closure of the meeting *(D.Sauzade & A.Lafitte; Plan Bleu, France).*

2nd Day, Friday, 21 October 2016, from 9:00 to 14:30

Agenda item 6. 9:00 - 11:00 Work in two groups (eutrophication & contaminants) to review of the scientific needs supporting the full implementation of IMAP focusing on pollution issues and to propose / prioritise solutions addressing these needs.

11:00 - 11:15 Coffee break

Agenda item 6. 11:15 -12:30 Reporting in plenary, discussion and conclusion of the Workshop on Science Policy Interface. *(One representative of each of the working group).*

Agenda item 7. 12.30 - 13:30 Conclusions and recommendations of the joint meetings. *(D.Sauzade & A.Lafitte; Plan Bleu, France).*

Agenda item 8. 13:30 - 14:00 Any other business

Agenda item 9. 14:00 - 14:30 Closure of the joint meetings (CORMON on Pollution and ISP workshop). *(UNEP/MAP).*

No lunch break scheduled

Annex 2

List of participants

LIST OF PARTICIPANTS

ALBANIA / ALBANIE	**Mrs Silvamina Alshabani** Head of Protected Areas Unit Directorate of Biodiversity and Protected Areas Ministry of the Environment E-mail: Silvamina.Alshabani@moe.gov.al
BOSNIA AND HERZEGOVINA / BOSNIE ET HERZÉGOVINE	**Mrs Simone Milanolo** Head Water Quality Laboratory HEIS Hydro-Engineering Institute Sarajevo Tel: +387 33 212 466 Mobile: +387 061 914618 E-mail: simone.milanolo@heis.ba
CROATIA / CROATIE	**Mr Mladen Solic** Senior scientist Institute of Oceanography and Fisheries Tel:+385 21 460933 Mobile: +385 91 5708704 Fax: +385 21 358650 E-mail: solic@izor.hr
CYPRUS / CHYPRE	**Mr Konstantinos Antoniadis** Officer of Fisheries and Marine Research Officer Marine Environment Division Department of Fisheries and Marine Research Ministry of Agriculture, Rural Development and Environment Tel: +357 22807854 Mobile: +357 99234020 E-mail: kantoniadis@dfmr.moa.gov.cy
EGYPT / EGYPTE	**Mr Sameh Ayoub** General Manager of Alexandria Environmental Quality Department Egyptian Environmental Affairs Agency (EEAA) Tel: +203-4970-720 E-mail:samehayoub@hotmail.com **Mr Mahmoud Abd Allah Sedek Ahmed** Environmental researcher/coastal water quality directorate Egyptian Environmental Affairs Agency (EEAA) Tel: +202 5256452 Mobile: +201 226486064 E-mail: mahmoudsedek@yahoo.com

EUROPEAN UNION / UNION EUROPEENNE	**Mr Georg Hanke** Water and Marine Resources Unit D.02 Directorate D – Sustainable Resources T.P. 270 European Commission Joint Research Centre Tel: +39 0332785586 E-mail: georg.hanke@jrc.ec.europa.eu
FRANCE / FRANCE	**Mr Bruno Andral** Expert Département Océanographie et Dynamique des Ecosystèmes Centre de Méditerranée IFREMER Tel: +334 94 30 48 55 Mobile: +336 07 35 56 15 E-mail: Bruno.Andral@ifremer.fr
GREECE / GRÈCE	**Mr Ioannis Hatzianestis** Chemist Oceanographer Institute of Oceanography Hellenic Center for Marine Research Greece Tel: +30 22910 76365 Email: jhat@hcmr.gr
ISRAEL / ISRAEL	**Mr Rani Amir** Director Marine Pollution Control Division Ministry of Environmental Protection Tel: +972 4 8633500 Mobile: +972 50-6233050 E-mail : rani@sviva.gov.il **Mr Dror Zurel Surname Zurel** Marine monitoring and Research coordinator Marine and Coastal Division Ministry of Environmental Protection Tel: +972-50-6237652 E-mail: DrorZ@sviva.gov.il , drorzurel@gmail.com
ITALY / ITALIE	**Mr Giordano Giorgi** Researcher, ISPRA Tel: + 39065007464 Mobile: +39331640882

	E-mail: giordano.giorgi@isprambiente.it
LEBANON / LIBAN	**Mr Hassan Hoteit** Acting Head Department of Urban Environmental Protection Ministry of the Environment Tel: +961 1 976 555 ext. 448 Email: hhoteit@moe.gov.lb **Mrs Olfat Hamdan** Head of Department of Protection of Urban Environment Ministry of the Environment Tel: +961 1 976555 Mobile: +961 3998334 E-mail:O.Hamdan@moe.gov.lb
LIBYA / LIBYE	**Mr Nassir Naser Bsher** MED POL Focal Point Environment General Authority (EGA) Tel: +218 91390017 Mobile: + 218 91390017 E-mail: nassirega@gmail.com **Mr Mustafa Soliman** GEF Libyan operational Focal Point, Sabha University E-mail: Mustafa.ega@gmail.com **Mr Mohamed B Chirgawi** National Focal Point /UNFCCC/ Environmental Sciences Department/University of Sabha Tel: +218 91215693 Mobile: +218 92514236 E-mail: chirgawi@gmail.com
MALTA / MALTE	**Mrs Tamara Micallef** Assistant Environment Protection Officer Environment & Resources Authority Tel: +356 22923662 Mobile: +356 79247229 E-mail:tamara.micallef@era.org.mt
MONTENEGRO / MONTÉNEGRO	**Ms Jelena Knezevic**

	Head of Department for Sustainable Development and ICZM Ministry of Sustainable Development and Tourism Tel: + 382 20 446225 Mobile: + 382 67 255604 Fax: + 382 20-446215 E-mail: jelena.knezevic@mrt.gov.me **Mrs Ana Misurovic** National Expert Trg Bozane Vucinic 6 Tel: +382 67 620 626 E-mail: anajuceti@t-com.me
MOROCCO / MAROC	**Mr Mohamed Elbouch** Chef de la Division "Laboratoire National des Etudes et de Surveillance de la Pollution" Direction de la Surveillance et de la Prévention des Risques Ministère Délégué auprès du Ministre de l'Energie, des Mines,de l'Eau et de l'Environnement, chargé de l'Environnement Tel : +212 537 77 01 18 Mobile : +212 73.08.29.36 E-mail : elbouch21@yahoo.fr, elbouch@environnement.gov.ma **Mr Abdelslam Abid** Engineer Responsible of monitoring programme Ministère Délégué auprès du Ministre de l'Energie, des Mines,de l'Eau et de l'Environnement, chargé de l'Environnement Tel: +212 537 77 01 18 Mobile: +212 668 07 62 03 E-mail:ab.abdeslam@yahoo.fr **Mr Moulay Lahcen Ouahidi** Head of Department analysis of micropolluants Ministère Délégué auprès du Ministre de l'Energie, des Mines,de l'Eau et de l'Environnement, chargé de l'Environnement Mobile: + 212 6 44 53 36 00 E-mail: mouahidi2@yahoo.fr
SLOVENIA / SLOVENIE	**Mrs Valentina Turk** Assoc. prof. Marine Biological Station Piran Institute of Biology

	Tel: +38659232916 Mobile: +386 41357137 E-mail: turk@mbss.org
SPAIN / ESPAGNE	**Mr Víctor Manuel Leon** Researcher Instituto Español de Oceanografía Tel: +34968179410 Mobile: +34649388937 E-mail:victor.leon@mu.ieo.es
TUNISIA / TUNISIE	**Mr Samir Kaabi** Chef de département Contrôle et suivi de la pollution Agence Nationale de Protection de l'Environnement Tel: +216 71 845003 Mobile: +21698621751 E-mail: dt.ctl@anpe.nat.tn **Mr Lasaad Chouba** INSTM Port de Pêche la Goulette Tel: +216 71735848 Mobile : +216 98426234 E-mail: lchouba@yahoo.fr
TURKEY / TURQUIE	**Mrs Nazli Yenal** Expert General Directorate of Environmental Management Marine and Coastal Management Department Ministry of Environment and Urbanisation of Turkey E-mail: nazli.yenal@csb.gov.tr

REPRESENTATIVES OF UNITED NATIONS SPECIALIZED AGENCIES AND OTHER INTERGOVERNMENTAL ORGANIZATIONS

INTERNATIONAL ATOMIC ENERGY AGENCY	**Mr Michail Angelidis** Section Head | IAEA Environment Laboratories Tel: +377 9797-7236 Fax: +377 9797-727 E-mail: M.Angelidis@iaea.org
AGREEMENT ON THE CONSERVATION OF CETACEANS IN THE BLACK SEA, MEDITERRANEAN SEA AND CONTIGUOUS ATLANTIC AREA (ACCOBAMS)	**Mr Alessio Maglio** Joint ACCOBAMS-ASCOBANS-CMS Noise Working Group member Tel.: +33 2 50 01 15 52 Email: alessio.maglio@sinay.fr
EUROPEAN ENVIRONMENTAL AGENCY	**Mrs Cecile Rodier Quefelec** Project Manager - ENI SEIS Support Mechanism South Tel: +45 3343 5940 Mobile: +45 2048 7065 E-mail: cecile.roddier-quefelec@eea.europa.eu **Mrs Claudette Spiteri** Senior Advisor EEA/ETC-ICM Tel: +31 62 235 0983 E-mail: claudette.spiteri@deltares.nl

NON-GOVERNMENTAL ORGANIZATIONS

INTERNATIONAL CENTER OF COMPARATIVE ENVIRONMENTAL LAW	**Mrs Pantelina Emmanouilidou** CIDCE Tel : +33950771568 Mobile : +33770082130 E-mail : linanimae@hotmail.com

OTHER INVITED SPEAKERS

ALTERRA	**Mr Joop Harmsen Harmsen** Senior Scientist Tel: +31 317 483246 E-mail: joop.harmsen@wur.nl

SCIENTIFIC RESEARCHERS AND EXPERTS

Mr Mostefa Boulahdid
Directeur du Laboratoire des Ecosystèmes Marines et Littoraux
ENSSMAL
Algeria

Tel : +21321917743
E-mail: m.boulahdid@enssmal.dz; mostefaboulahdid@hotmail.com

Mr Jean François Cadiou
Project Manager
IFREMER
France

Tel : +3349430497
E-mail: jfcadiou@ifremer.fr

Mr Gaby Khalaf
Researcher
National Centre for Marine Sciences (CNRSL)
Lebanon

Tel: +961 6 741 580 ; +961 3 30 39 69
E-mail: bihar@cnrs.edu.lb

Mr Franco Giovarnadi
Professor
ISPRA
Italy

E-mail: franco.giovanardi@isprambiente.it

Ms Eleni Kamperi
Mermaid project coordinator/ HCMR Associate researcher
HCMR
Greece

Tel: +30 229 1076381
Mobile: +30 229 1076347
E-mail: ekaberi@hcmr.gr

Ms Kalliopi Pagou
Researcher, coordinator of IRIS SES and ActionMed Projects
HCMR
Greece

Tel: +30 2 29 1076 409

Tel: +30 229 1076347
E-mail: popi@hcmr.gr

Mr Vangelis Papathanassiou
Director – PERSEUS Project Coordinator
HCRM
Greece

E-mail: vpapath@hcmr.gr

Mr Cherif Sammari
Professor
Institut National des Sciences et Technologies de la Mer
Tunisia

E-mail: Cherif.sammari@instm.rnrt.tn

Mrs Simona Simoncelli
EMODnet Checkpoint project
Centro EuroMediterraneo sui Cambiamenti Climatici
University of Bologne
Italy

E-mail: simona.simoncelli@ingv.it

Mr Hervé Thebault
Researcher
IRSN – IFREMER
France

E-mail: Herve.Thebault@ifremer.fr

**SECRETARIAT TO THE BARCELONA CONVENTION
AND COMPONENTS OF THE MEDITERRANEAN ACTION PLAN**

UNEP/MAP	**Ms Tatiana Hema** Deputy Coordinator Tel.:+30 210 7273115 E-mail: tatjana.hema@unep.org **Ms Virginie Hart** Programme Officer Tel:+30 210 7273122 E-mail: virgine.hart@unep.org **Mr Carlos Guitart** Marine Contaminant Assessment Expert E-mail : carlos.guitart@unep.org **Mr Dimitrios Poursanidis** Marine Pollution DataBase Management Expert E-mail : dpoursanidis@gmail.com **Mr Stavros Antoniadis** ActionMed Project Expert Tel: +30 210 7273140 E-mail: stavros.antoniadis@unep.org
PLAN BLEU REGIONAL ACTIVITY CENTRE (PLAN BLEU/RAC)	**Mme Anne France Didier** Director Tel: +33 4 92 38 71 38 Email: afdidier@planbleu.org **Mr Didier Sauzade** Chargé de Programme Ecosystèmes Marins Tel: +33 4 84 08 00 52 E-mail: dsauzade@planbleu.org **Mr Antoine Lafitte** Chargé de Programme Gestion Intégrée des Zones Côtières / Integrated Coastal Zone Management E-mail: alafitte@planbleu.org

	Mrs Carla Murciano Consultant Ecosystem Approach to Marine Management Plan Bleu Tel: +33 4 84 08 00 50 E-mail: carlamurciano@gmail.com
REGIONAL MARINE POLLUTION EMERGENCY RESPONSE CENTRE FOR THE MEDITERRANEAN SEA (REMPEC)	**Mr Franck Lauwers** Programme Officer (Prevention) Tel: +356 21 337 296/7/8 E-mail: flauwers@rempec.org, rempec@rempec.org
REGIONAL ACTIVITY CENTER FOR SPECIALLY PROTECTED AREAS (SPA/RAC)	**Mr Mehdi Aissi** Project Officer Tel: +216 71 206 649 / 485 Mobile: +21698947026 E-mail: mehdi.aissi@rac-spa.org\

Annex 3

Analysis of the needs to implement imap concerning eo 5 eutrophication and eo 9 contaminants

Note:

Needs that have been considered as priorities by experts during working group sessions have been bold-highlighted.

Modifications and additions suggested by participants are indicated in red.

Table 1: Analysis of the needs to implement IMAP concerning EO 5 Eutrophication

Identified IMAP needs	**Category**	**Current state of play (baseline)**	**Proposed actions**	**Duration**	**Link to projects/initiatives/ opportunities**
1) Assessment of spatial and temporal natural variability concerning processes related to eutrophication at basin level	Data / knowledge deficiency	Research - review: - 1 IRIS-SES Project	Continue to develop long time series to assess the natural variability in the basin; Differentiation of water types according to parameters linked to eutrophication phenomena (chl-a, nutrients, primary production. oxygen, turbulence, etc.)	Short (collecting existing data) to long (long time series measurements)	
2) Assessment of main pressures (and related impacts) concerning eutrophication at national scale or lower if relevant	Data / knowledge deficiency	Research - review: - 2 STAGES Project - 3 VECTORS Project - 4 IRIS-SES Project	Develop methodologies to monitor pressures driving eutrophication phenomena; Assess in detail the concentration of nutrients in the water column; Provide additional information about sources of nutrients such as aquifers and ground water.	Medium	
3) Research on relationships between inputs, concentration and effects in the Mediterranean	Data / knowledge deficiency	Research: - 5 Thresholds Project - 6 IRIS-SES Project	Develop collaborations, preferably jointly, and the research actions required for assessing the quality of the marine environment, to increase knowledge and scientific understanding of the marine environment and, in particular, of the relationship between inputs, concentration and effects.	Medium	
4) Definition of eutrophication thresholds for different ecological areas at national / sub-national scale	Data / knowledge deficiency			Short	

Identified IMAP needs	Category	Current state of play (baseline)	Proposed actions	Duration	Link to projects/initiatives/ opportunities
5) Definition of scales (temporal and spatial) and areas for the assessment of eutrophication for each Med country	Methods / Guidelines	Research - review: - 1 IRIS-SES Project - 23 HELCOM Policy: - 7 WFD	Delimitation of eco-regions and sub-regions according to water types, pressures and/or management units;	Short / Medium	
			Development of risk based optimal strategies and corresponding guidelines for monitoring eutrophication: sampling frequency, localisation of the stations, acceptable risk, etc.	Medium	
			Expertise to elicit priority issues, hot spots … And define timelines	Short	
6) **Development of a (minima) common standard assessment methodology for all Med countries based on existing monitoring strategies for eutrophication**	Methods / Guidelines	Review of practices: - 8 IRIS-SES Project - 9 JRC Policy: -10 MSFD	Selection of monitoring parameters (nutrients) and monitoring procedures based on existing experiences	Short	
7) Make best use of available duly validated scientific assessment tools (modelling, remote sensing and progressive risk assessment strategies)	Methods / Guidelines	Research: - 11 PERSEUS Project Guidelines: - 12 JRC	Identification and assessment of existing monitoring/assessment tools in cooperation with their developers. Testing of tools according to areas to be monitored (coastal, open sea, highly or less studied, highly or less impacted by eutrophication, etc.) through Pilot Case projects (e.g. remote sensing especially useful for establishing baseline data where no field data is available).	Short / Medium	
8) Assess cost efficiency in relation to socio-economic benefits of monitoring	Methods / Guidelines	General guidelines: - 13 UNEP/MAP	Develop Cost Benefit Analysis (CBA) practice for monitoring, and more generally of Environmental Impact Assessment for monitoring. Pilot project recommended.	Short / Medium	

Identified IMAP needs	**Category**	**Current state of play (baseline)**	**Proposed actions**	**Duration**	**Link to projects/initiatives/ opportunities**
9) Ensure quality assurance, quality control (QA/QC)	Methods / Guidelines	Guidelines: - 14 PERSEUS Project - 15 Hood et al. (IOCCP) - 23 HELCOM	Development of guidelines to develop standardized eutrophication monitoring to ensure quality assurance, quality control (QA/QC). Capacity building and exchange of good practices.	Short / Medium	
10) Develop methods for an integrated assessment based on the common indicators	Methods / Guidelines	Guidelines: - 23 HELCOM	Refine aggregation rules enabling to use fine-scale data (individual samples) to assess the environmental status of the broad ecosystem elements for each spatial unit Develop in detail a method for integrated assessment based on the common indicators and results of the scientific projects.	Short / Medium	
11) Develop common procedures for data collection, management and storage	Models and tools to support IMAP	Research: - 16 OpEc Project - 17 SESAME Project	Collection of reliable data through standardised protocols: development assessment strategies including fact sheets taking into account sub regional differences; Development and testing of data infrastructure(s) to store and access data	Short / Medium?	
12) Use of marine ecosystem modelling to assess eutrophication	Data / knowledge deficiency Methods / Guidelines	Research: - 18 MEECE Project - 19 OpEc Project Guidelines: - 20 DEVOTES Project	Integrate available modelling tools to assess environmental status	Medium	

Identified IMAP needs	**Category**	**Current state of play (baseline)**	**Proposed actions**	**Duration**	**Link to projects/initiatives/ opportunities**
13) Display the environmental status of EO5 across Mediterranean waters using suitable mapping tool based on a nested scale system (such as Helcom)	Models and tools to support IMAP	Research: - 21 OpEc Project - 22 IRIS-SES Project	Development of the mapping tool, building on the HELCOM experience; Elaboration of a pilot project, specification of the tool, development, tests and extension to the basin.	Short / Medium	
14) Develop coordination at the national and regional level	Scientific Expertise and Network		Setting of a mechanism for expertise and capacity building aiming at establishing operational national task forces to support IMAP regarding monitoring and assessment of Eutrophication.	Short	

References for EO 5 Eutrophication

1 IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)
Evaluation of ongoing monitoring programmes in EU Mediterranean countries, determination of monitoring gaps to assess GES according to MSFD;
Evaluation of current knowledge on natural variability in terms of both spatial and temporal scales detailed for each of the indicators considered for the EU MSFD Descriptor 5 Eutrophication, as it represents natural processes that could significantly affect the data collected during monitoring of marine ecosystems, and therefore the indicators used to measure D5, which are:

- Variability of the environmental factors (nutrients, dissolved oxygen, transparency);
- Related physical parameters (temperature, salinity, hydrological parameters, rivers' discharges, currents, waves and winds);
- Biological components of the systems (chlorophyll-a, changes in abundance, population structures, species composition – shift in species dominance, structure, etc.).

Recommendations for designing Joint Monitoring Programs for Eutrophication assessment in the Mediterranean, including its seabasins and sub-seabasins, timing and periodicity, position of sampling stations, use of satellite data, use and storage of generated data;

2 STAGES Project (EU FP7, "Science and Technology Advancing Governance on Good Environmental Status", 2012-2014)
Assessment of monitoring gaps and formulation of research monitoring needs (including definition of sampling/ monitoring variables and parameters) at the short-mid-long term;
Identification of research needs with regard to the pressures and their impacts on marine ecosystems, namely:

- Updating of the list of the research needed and in particular to seek to identify research needs that would lead to a more holistic and cross-cutting approach to the monitoring and assessment of pressures and impacts;
- Identification of knowledge gaps and uncertainties associated with assessment of cumulative pressures and impacts and potential measures that could be taken to achieve or maintain GES.

3 VECTORS Project (EU FP 7, VECTORS of Change in European Marine Ecosystems and their Environmental and Socio-Economic Impacts, 2011-2015)
Evaluation and review of pressures and impacts related to Eutrophication in European Regional Seas' coastal waters, including specifically the Mediterranean.

4 IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)
Development of a review of the available data on pressures exerted on the marine and the coastal ecosystems of the Mediterranean and Black Seas; provision of an analysis of the main human activities affecting the marine and coastal environments, by reference to the needs for an integrated monitoring of pressures.

5 THRESHOLDS Project (EU FP6 "Thresholds of Environmental Sustainability", 2005-2009)

Assessment of ecological thresholds and points of no return of environmental sustainability in data describing the dynamics of ecosystems, focusing on nutrients (and contaminants). Analysis of nutrient-driven thresholds connected to the anthropogenic pressures contributing to nutrient emissions for use in case studies and integrated assessment models.

6 IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)
Reference to the threshold values for Eutrophication status (based on scientific literature and/or based on implementation of WFD) that have been defined for a) the Western Mediterranean and b) the Eastern Mediterranean, indicating the ecological status (poor to high with three to five intermediate levels).

7 WFD, Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.
Provides some guidelines for the minimum operational (for water bodies at risk) monitoring frequency in coastal waters:

- Phytoplankton 6 months
- Other aquatic flora 3 years
- Macro invertebrates 3 years
- Morphology 6 years
- Thermal conditions 3 months
- Oxygenation 3 months
- Nutrient status 3 months
- Other pollutants 3 months
- Priority substances 1 months

8 IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)
The metadata catalogue developed under the PP project IRIS-SES includes information on monitoring programmes operational in the European seas reported by some Mediterranean countries (Greece, Cyprus, Italy, Spain, Croatia and Turkey). The catalogue includes information relevant to MSFD descriptors 1 to 11. This metadata covers information on: (i) the monitoring that is currently being performed, (ii) spatial and temporal coverage, (iii) monitoring methods, and (iv) the pressures it is linked to.

9 Joint Research Centre (JRC):
Inventory of monitoring methods, their applicability in off- shore areas and their capability to collect data relevant for MSFD indicators
Inventory of monitoring requirements among EU Directives (WFD, HB, BD, CFP, EQS) and the Barcelona Convention (UNEP/MAP)

10 MSFD, Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).
Eutrophication is to be assessed via the following indicators:

- 5.1: Nutrient levels
- 5.1.1.Nutrient concentration in the water column
- 5.1.2. Nutrient ratios

- 5.2: Direct effects of nutrient enrichment
- 5.3: Indirect effects of nutrient enrichment

11 PERSEUS Project (FP7, Policy- oriented marine Environmental Research for the Southern European Seas, 2012-2015)
Review and assessment of the existing observational capabilities in the Southern European Seas (i.e. Mediterranean and Black Seas) enabling monitoring at basin, sub-basin and local scale;
Evaluation of deployed monitoring systems and efforts across the Mediterranean, identification of most sampled and understudied areas:

- Argo profilers, surface drifters and expendable sensors (ship of opportunity) (sub-basin and basin);
- Research ships monitoring (basin, sub-basin, local);
- Moorings (deep & coastal).
- Gliders (local, sub-basin)
- Coastal monitoring (buoys, radars, moorings, fixed stations)
- Satellite remote sensing (including spatial and temporal resolutions)

Parameters: water column, physical and biogeochemical parameters (including chl-a, temperature, salinity), except for coastal monitoring systems which also monitor pollution, biological disturbance, marine litter and underwater noise.

12 Joint Research Centre (JRC):
Description and evaluation of some (new) approaches and techniques available for the effective spatial monitoring of Eutrophication in the framework of MSFD – Descriptor 5 (D5):

- Moorings and buoys
- Ship of opportunity/ ferry-box system:
- Continuous Plankton Recorder (CPR)
- Underwater video & imagery
- Remote sensing
- Autonomous underwater vehicles and gliders

13 UNEP/ MAP Guidelines on cost-effectiveness and cost-benefit analysis in selecting the programmes of pollution prevention and reduction measures in the NAP update process, UNEP(DEPI)/MED WG.404/6.

14 PERSEUS Project (FP7, Policy- oriented marine Environmental Research for the Southern European Seas, 2012-2015)
Laying down of protocols and guidelines on Quality Assurance and Quality Control, including training of personnel, testing of instruments, calibration/inter-comparison, and control of data and instruments during acquisition.

15 Hood, E.M., C.L. Sabine, and B.M. Sloyan, eds. 2010. The GO-SHIP Repeat Hydrography Manual: A Collection of Expert Reports and Guidelines. IOCCP Report Number 14, ICPO Publication Series Number 134.

The GO-SHIP program was developed to provide a sustained coordination mechanism for global repeat hydrography. Central to this coordination is ensuring that measurements made by different groups are comparable, compatible, and of the highest quality possible. Under the guidance of the GO-SHIP committee, the following measurement standards have been developed as goals for the data quality desired from GOSHIP reference sections, including standards for salinity, dissolved oxygen, or nutrients.

16 OPEC Project (EU FP7 "Operational Ecology Marine Ecosystem Forecasting", 2012-2014)

- List of feasible operational ecology applications and benefits by using existing monitoring and data infrastructure
- Recommendations on the potential optimization of the existing monitoring and data infrastructure for future operational ecology application improvements
- Listing of research priorities in order to fully exploit the benefits of using the existing monitoring and data and to optimise future monitoring and data infrastructure for the purpose of improving the variety of operational ecology applications.

17 SESAME Project (EU FP6, Southern European Seas: Assessing and Modelling Ecosystem Changes, 2006-2011)
Data management (i.e. data collection, manipulation and archiving) was a cross-cutting theme for SESAME, which intended to improve data storage, access and manipulation. Appropriate tools have been developed together by experimentalists and modellers to uniform digitization of historical and newly observed data, together with data issued from modelling, in order to suit researchers' needs.

18 MEECE Project (EU FP7 "Marine Ecosystem Evolution in a Changing Environment", 2008-2012)
Ecosystem modelling in support of the MSFD Eutrophication Descriptor (D5)
Development of modelling tools to be used in decision making and management around eutrophication in European regional seas:
MEECE Model Library, including a range of current biogeochemical models on impacts of eutrophication, considering CC and policy management.
Eutrophication modelled considering indicators:

- Nutrient concentration in the water column
- Chlorophyll-a concentration or phytoplankton biomass
- Dissolved oxygen

19 OPEC Project (EU FP7 "Operational Ecology Marine Ecosystem Forecasting", 2012-2014)
Review and assessment of the existing modelling capabilities in the European Regional Seas (i.e. Mediterranean, Black Seas);
Environmental models are used for simulating and analysing the long-term dynamics and stability properties of complex environmental systems;
Research and development efforts include -but are not limited- optimization of monitoring network and models, data assimilation, *in situ* observations and fisheries data;
Regional model systems provided by the OPEC project can be used to provide estimates of recent dynamic and current conditions of selected indicators of ecosystem state: temperature, salinity, phosphate, nitrate, silicate, chlorophyll-a, phytoplankton, zooplankton and fish biomass.

20 DEVOTES Project (EU FP7 "DEVelopment Of innovative Tools for understanding marine biodiversity and assessing good Environmental Status")

Review and assessment of the possible ecological models useful to assess ecosystem status in support of the European Marine Strategy Framework Directive.

21 OPEC Project (EU FP7 "Operational Ecology Marine Ecosystem Forecasting", 2012-2014)
The project, aiming at supporting environmental assessment and ecosystem-based management, intended to contribute predicting the future status of the marine environment and ecosystems. It delivered regular quality ensured information products in support of management and decision making via relevant information, in a format which can be easily accessed. The Marine Operation Ecology data portal developed by OPEC displays model simulated ecosystem data for European Regional Seas, including maps and plots.

22 IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)
A set of GIS tools has been developed to assess the Environmental Status (ES) in respect to eutrophication and contaminants. The concept is to provide a simple yet intelligent tool, to support scientists as well policy makers, managers and stake-holders on the issue. The Eutrophication status toolbox comprises a set of semi-automated commands, in graphic environment, used for the rapid assessment of eutrophication in a water body, in accordance to defined environmental thresholds. User input refers only to an excel file with station based data, comprising nutrients, oxygen and chlorophyll-a data, used for the calculation of various indices.

23 Manual for marine monitoring in the Cooperative Monitoring in the Baltic Marine Environment (COMBINE) programme of HELCOM. This Manual is directed to all performing monitoring in the COMBINE Programme. The Manual defines the contributions made by all Contracting Parties and regulates all methods used.

Table 2: Analysis of the needs to implement IMAP concerning EO9 Contaminants

Nota bene: in red are comments and inputs coming from presentations and debates in plenary.

Identified IMAP needs	**Category**	**Current state of play (baseline)**	**Proposed actions**	**Duration**	**Concrete actions**	**Link to Projects/initiatives Opportunities**
1) Harmonization in the different monitoring programmes existing	Methods / Guidelines	Research: - 1. IRIS-SES Project - 2. STAGES Project - DeFishGear Project Harmonization of Marine Litter programme across all countries in the Adriatic Sea	Assessment and critical analysis of the different existing monitoring programmes targeting contaminants: - Harmonization of monitoring targets, taking into account sub regional differences; - Harmonization of the contaminant reference list at sub regional scale; - Setting of priorities for each area	Short	Action: Writing a common procedure explaining how to establish a list of priority substances to be monitored according to local specificities at the national level (make choices based on the common understanding); Action: Re-organisation of the existing: Evaluation of the national monitoring programmes of countries, fine tuning while asking for a scientific advice if necessary	Organisations/ Projects:

Identified IMAP needs	**Category**	**Current state of play (baseline)**	**Proposed actions**	**Duration**	**Concrete actions**	**Link to Projects/initiatives Opportunities**
2) Assessment of main pressures (and related impacts) concerning contaminants at national scale (or lower if relevant)	Data / knowledge deficiency	Research: - 3. STAGES Project - 4. VECTORS Project - 5. IRIS-SES Project MEDPOL: - NAPs, in process of updating (also involving a new analysis of pressures); - NDAs - PRTR	Develop methodologies to monitor pressures causing contamination; Provide additional information about sources of pollutants; (Continue to assess the concentration of (selected) pollutants in the different matrixes (sediment, water column, biota) in order to identify pollution sources and/or hot spots and provide long time series enabling to assess environmental status and trends.	Short (setting methods) – Long (measurements of long time series)	Considerations: Revision of emission factors needed; information exists and should be updated Need for support from the scientific community as some substances are difficult to evaluate	

Identified IMAP needs	**Category**	**Current state of play (baseline)**	**Proposed actions**	**Duration**	**Concrete actions**	**Link to Projects/initiatives Opportunities**
3) Development of risk-based optimal monitoring strategies for pollution based on existing monitoring practices and knowledge	Methods / Guidelines	Research: - 6. PERSEUS Project - 7. IRIS-SES Project Guidelines: - 8. JRC Policy - 9. EQS Directive - 26. WFD Technical guidance exists on acceptable risk The technical guidance provides info on Risk based approach;	Definition of areas for the assessment of contamination for each Med country Extension of monitoring strategies beyond coastal areas, in application of the risk-based approach. Development corresponding guidelines for pollution monitoring: - sampling frequency, - localisation of the stations, - acceptable risk, etc. Expertise to elicit priority issues;	Short	Urgent and cross-cutting: Definition of sampling frequency, localisation of stations, etc., and needing scientific assistance Action: Include monitoring contaminants offshore; Action: Integration of modelling + traditional (field) monitoring; Complement monitoring with hydrodynamic modelling (on the transport and dynamics of pollutants); however, accurate simulating of transport still needs more training (rather than science)	No ongoing research action on this issue

Identified IMAP needs	**Category**	**Current state of play (baseline)**	**Proposed actions**	**Duration**	**Concrete actions**	**Link to Projects/initiatives Opportunities**
4) Implementation of Common Indicator 18: "Level of biological effects of key contaminants where a cause and effect relationship has been established".	Methods / Guidelines	Review: - 23 OSPAR - 22 CIESM (not recent) Work done under EU for WFD	Review and assessment of available data regarding eco-toxicological effects of contaminants	Short	Action: Workshop including all countries expressing interest, with scientific experts and targeting the assessment of the available data in order to reflect the state of the art regarding biological effects; Action: Carry out research projects on metabonomics and biomarkers.	
5) Research on the relationship between inputs, concentration and effects (Precise the level of the effects: Individual? Population? Ecosystems?)	Data / knowledge deficiency	Research and technical guidance: - 24 OSPAR Work done under EU for WFD (OSPAR has maybe done it on the marine environment although not as much as imagined)	Develop collaborations and research actions to assess the relationship between inputs, concentration and effects of contaminants. 2 processes to be differentiated: 1) Cycle of contaminants and % of biomagnification, and 2) Ecotoxicology and the effects contaminants cause	Medium	Considerations: Development of tools from the scientific perspective	
6) **Selection of monitoring parameters**	Methods / Guidelines	Research and technical guidance:	Development of **a (minima) common standard assessment methodology** for all Med countries	Short / medium	Consideration:	Opportunities in the context of new EU calls

Identified IMAP needs	**Category**	**Current state of play (baseline)**	**Proposed actions**	**Duration**	**Concrete actions**	**Link to Projects/initiatives Opportunities**
according to EO9 indicators (key pollutants, contaminant concentrations, pollution effects, etc.) and monitoring procedures based on existing experiences		- 10. IRIS-SES Project MISTRAL – MERMEX: Related to the understanding of processes, not explicitly targeting monitoring.	based on existing monitoring strategies for pollution; Development of operational monitoring methods based on biological effects.		The development of a common methodology is considered urgent for Med countries; Action: Workshop including statistics and revision of existing statistical models and methods for IMAP	
7) Development of monitoring procedures for acute pollution events	Methods / Guidelines	Technical reports exist (IMO-TTOPF and OSPAR)	Development of impact assessment analysis for acute pollution events	Medium	Considerations: Some data gaps exist regarding what this events cause in the marine environment.	
8) **Definition of GES targets related to the different indicators for EO9**	Methods / Guidelines	Research and technical guidance: - 11. IRIS-SES Project - 12. THRESHOLDS Project Technical reports - 13. MEDPOL	- Characterization of baseline and thresholds; - Develop expertise to prepare recommendations for BAC (background assessment concentrations); - Formulation of EAC (environmental assessment criteria) for selected biomarkers in Mediterranean species.	Medium	Considerations: - Assessing contaminants needs to be linked to thresholds and “threshold setting” - Establishing thresholds is a priority and demands a lot of work	

Identified IMAP needs	Category	Current state of play (baseline)	Proposed actions	Duration	Concrete actions	Link to Projects/initiatives Opportunities
		Policy - 14. EQS Directive	Review and critical analysis of the monitored contaminant in biota used for human consumption, considering at least: - Heavy metals (lead, cadmium, and mercury), - Polycyclic Aromatic Hydrocarbons, and - Dioxins (including dioxin-like PCBs), with the species selection considerations described in the Integrated Monitoring and Assessment Guidance. Characterization of baseline and thresholds levels	Short / Medium		
9) Inclusion of indicator on pathogens in bathing waters (not directly a need for IMAP, although a requirement for implementation of LBS Protocol)	Methods / Guidelines	Policy: - 15. BWD	Consider inclusion of indicator on pathogens in bathing waters and related definition of GES target, in line with Decision IG.20/9[4]	Short	Considerations: Not a priority, it is well covered	

[4] Decision IG.20/9 Criteria and Standards for bathing waters quality in the framework of the implementation of Article 7 of the LBS Protocol (UNEP/MAP, 2012)

Identified IMAP needs	**Category**	**Current state of play (baseline)**	**Proposed actions**	**Duration**	**Concrete actions**	**Link to Projects/initiatives Opportunities**
10) Make best use of available duly validated scientific assessment tools (modelling, remote sensing and progressive risk assessment strategies)	Methods / Guidelines	Guidelines: - 16. JRC	Identification and assessment of existing monitoring/assessment tools in cooperation with their developers. Testing of tools according to areas to be monitored (coastal, open sea, highly or less studied, highly or less impacted by contaminants, etc.) through Pilot Case projects (e.g. remote sensing especially useful for establishing baseline data where no field data is available).	Short / Medium	Considerations: Utility in case of urgent/acute events; otherwise, the use of remote sensing is not useful for the analysis of contaminants	
11) Assess cost efficiency in relation to socio-economic benefits of monitoring	Methods / Guidelines	General guidelines: - 17. UNEP/MAP	Develop Cost Benefit Analysis (CBA) practice for monitoring, and more generally of Environmental Impact Assessment for monitoring. May require pilot project.	Short / Medium		
12) Develop methods for an integrated assessment based on the common indicators	Methods / Guidelines	Research and technical guidance: - 18. IRIS-SES Project	Refine aggregation rules enabling to use fine-scale data (individual samples) to assess the environmental status of the broad ecosystem elements for each spatial unit; Develop in detail a method for integrated assessment based on the common indicators.	Short / Medium		

Identified IMAP needs	Category	Current state of play (baseline)	Proposed actions	Duration	Concrete actions	Link to Projects/initiatives Opportunities
13) Develop common procedures for data collection, management and storage	Models and tools to support IMAP	Research: - 19. MEECES Project	Further development of data management at the basin scale: - Collection of reliable data through standardised protocols - Development and testing of data infrastructure(s) to store and access data, favouring the management and accessibility of new and existing data in a compatible manner	Short / Medium	Considerations: - Common procedures for data collection and management is a priority, especially in the Mediterranean; - It is a way to progress and assess GES	
14) Use of marine ecosystem modelling to assess pollution	Data / knowledge deficiency Methods / Guidelines	Research: - 20. MEECE Project Based on modelling tools, Montenegro is producing maps on contaminants and on sensitivity in determined sites with respect to some selected pollutants	Consider the integration of available modelling tools to assess environmental status	Short	Considerations: Scientific inputs might be related to transport of pollution, and modelling this transport (in water, in suspended particles); dynamics are very complicated	
15) Display the environmental status of EO9 across Mediterranean waters using	Models and tools to support IMAP	**Research:** - 21. IRIS-SES Project	Development of the mapping tool, building on the HELCOM experience; Elaboration of a pilot project, specification of the tool,	Medium		

Identified IMAP needs	**Category**	**Current state of play (baseline)**	**Proposed actions**	**Duration**	**Concrete actions**	**Link to Projects/initiatives Opportunities**
suitable mapping tool based on a nested scale system (such as Helcom)			development, tests and extension to the basin.			
16) Develop coordination at the national and regional level	Scientific Expertise and Network Including the policy expertise, not only scientific	**<u>Organisation</u>** OSPAR	Setting of a mechanism for expertise and capacity building aiming at establishing operational national task forces to support IMAP regarding monitoring and assessment of contaminants occurrence and effects.	Short	<u>Considerations</u>: Priority: very important to increase the capacity building in the area.	

. IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)

Evaluation of ongoing monitoring programmes in EU Mediterranean countries, determination of monitoring gaps to assess GES according to MSFD;

Recommendations for designing Joint Monitoring Programs for the assessment of the Mediterranean status, including:

- design and planning of monitoring networks, matrices, sampling, analytical methodologies, integration of other monitoring approaches (remote sensing devices, buoys, etc) and innovative monitoring systems (satellite imagery, etc.), storage and accessibility of data, integration of ongoing monitoring programmes/ surveys (WFD, MEDITS & MEDIAS surveys)

2. STAGES Project (EU FP7, "Science and Technology Advancing Governance on Good Environmental Status", 2012-2014)

Assessment of monitoring gaps and formulation of research monitoring needs (including definition of sampling/ monitoring variables and parameters) at the long-mid-short term

3. STAGES Project (EU FP7, "Science and Technology Advancing Governance on Good Environmental Status", 2012-2014)

Assessment of monitoring gaps and formulation of research monitoring needs (including definition of sampling/ monitoring variables and parameters) at the short-mid-long term

Identification of research needs with regard to the pressures and their impacts on marine ecosystems, namely:

- Updating of the list of the research needed and in particular to seek to identify research needs that would lead to a more holistic and cross-cutting approach to the monitoring and assessment of pressures and impacts;
- Identification of knowledge gaps and uncertainties associated with assessment of cumulative pressures and impacts and potential measures that could be taken to achieve or maintain GES.

4. VECTORS Project (EU FP 7, VECTORS of Change in European Marine Ecosystems and their Environmental and Socio-Economic Impacts, 2011-2015)

Evaluation and review of pressures and impacts related to chemical contamination in European Regional Seas' coastal waters, including specifically the Mediterranean.

5. IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)

Development of a review of the available data on pressures exerted on the marine and the coastal ecosystems of the Mediterranean and Black Seas; provision of an analysis of the main human activities affecting the marine and coastal environments, by reference to the needs for an integrated monitoring of pressures.

6. PERSEUS Project (FP7, Policy- oriented marine Environmental Research for the Southern European Seas, 2012-2015)

Review and assessment of the existing observational capabilities in the Southern European Seas (i.e. Mediterranean and Black Seas) enabling monitoring at basin, sub-basin and local scale;

Parameters: water column, physical and biogeochemical parameters (including chl-a, temperature, salinity), except for coastal monitoring systems which also monitor pollution, biological disturbance, marine litter and underwater noise.

7. IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)

Investigation of new tools for the determination of GES regarding main chemical pollutants;

Assessment of possible monitoring methods/ techniques for organic and inorganic pollutants in different matrix (sediments, seawater).

8. Joint Research Center (JRC):

Inventory/ review of monitoring methods, their applicability in off- shore areas and their capability to collect data relevant for MSFD indicators.

9. EQS Directive, 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policys. Long- term trend analysis of concentrations of WFD priority substances that tend to accumulate in sediment and/or biota is advised to be based on data collected in monitoring occurring every three years, unless technical knowledge and expert judgment justify another interval.

0. IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)

- Assessment of quality values (incl. GES values) set up for organic and inorganic pollutants (HM, PAHs, PCBs, Pesticides) in different matrixes (sediments, seawater, biota);
- Recommendations on sampling of contaminants in seawater (HM, spatially and seasonally; Organic pollutants)

1. IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)

Project outputs highlight that literature does not provide any widely accepted policy on the assessment of pollution in waters, sediments and seafood. The national legislation thresholds on various contaminants have been listed and a GIS application for the analysis and visualization of pollution status according to ERL-ERM (Long, 1995), Directive 2006/44/EC and EC REGULATION No 1881/2006 has been set. Two main categories of contaminants are considered, PAHs and Metals (Cd, Hg, Cu, Pb, Zn) in sediment, seawater and seafood.

2. THRESHOLDS Project (EU FP6 "Thresholds of Environmental Sustainability", 2005-2009)

Assessment of ecological thresholds and points of no return of environmental sustainability in data describing the dynamics of ecosystems, focusing on contaminants (and nutrients). Analysis, comparison and assessment of the effects of contaminants in coastal ecosystems.

3. UNEP(DEPI)/MED WG. 365/Inf.8 Development of Assessment Criteria for Hazardous Substances in the Mediterranean

Definition, following the OSPAR approach, of concentration "thresholds" to be defined for the hazardous substances included in the MEDPOL Database, namely trace metals, chlorinated pesticides and PCBs, in sediments and biota, in order to determine the levels that can be considered of concern and to identify hot spots for priority action. Definition of reference concentrations, particularly of Background Assessment Concentrations (BACs) and the Environmental Assessment Criteria (EACs).

14. EQS Directive, 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy: Setting environmental quality standards for priority substances and certain other pollutants in surface waters;

Commission Regulation (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs:

5. BWD, Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality.

Provisions laid down for monitoring (according to time and space) and classification of bathing waters according to microbiological criteria.

6. Joint Research Center (JRC):

Description and evaluation of some (new) approaches and techniques available for the effective spatial monitoring of Eutrophication in the framework of MSFD – Descriptors 8 and 9:

- moorings and buoys: relevant for D8 and D9
- ship of opportunity/ ferry-box system: relevant for D8 and D9
- remote sensing: relevant for D8
- autonomous underwater vehicles and gliders: relevant for D8

7. UNEP/ MAP Guidelines on cost-effectiveness and cost-benefit analysis in selecting the programmes of pollution prevention and reduction measures in the NAP update process, UNEP(DEPI)/MED WG.404/6.

8. IRIS-SES Project (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)

Development of intelligent tools and computation of indexes to enable visualization of data for MSFD Descriptors 8 and 9 (Contaminants and Contaminants in seafood).

9. MEECE Project (EU FP7 "Marine Ecosystem Evolution in a Changing Environment", 2008-2012)

MEECE Model Library, including a range of current biogeochemical models on impacts of contaminants, considering CC and policy management.

Project activities focusing on target contaminants such as heavy metals, alkylphenols, antibiotics and herbicides.

Available scientific information about the fate of key-pollutants and the biological effects on marine organisms collected and collated into structured databases.

20. MEECE Project

Ecosystem modelling in support of the MSFD Descriptors (including D8)

Development of modelling tools to be used in decision making and management, including contaminant concentrations in European regional seas.

Development of a range of decision support tools: a specific expert Decision Support System (DSS), focused on managing contamination data in marine coastal areas and calculating the pollution-related environmental risk on a scale from 0 (no risk) to 1 (maximum risk) integrating a complex set of chemical (concentration of target contaminants) and biological data (ecotoxicological effects on model organisms), and supporting environmental managers in the estimation of environmental quality.

21. IRIS-SES PROJECT (EU Pilot Project, "Integrated Regional monitoring Implementation Strategy in the South European Seas", 2013-2014)

Methodology and development of visualization tools for the assessment of contamination (HM and PAHs) in seawater, sediment and seafood based on available data, including thresholds for the substances

22. CIESM Monographies

19 - Metal and radionuclides bioaccumulation in marine organisms, Ancona, 27 - 30 October 2002, 126 p. (354 refs)

15 - Mediterranean Mussel Watch. Designing a regional program for detecting radionuclides and trace-contaminants.

Marseille, 18 - 20 April 2002, 133 p. (234 refs)

23. OSPAR

Draft Levels and trends in marine contaminants and their biological effects – CEMP Assessment report 2015 Year: 2016 No: 676

24. OSPAR

Trial application of the OSPAR JAMP Integrated Guidelines for the Integrated Monitoring and Assessment of Contaminants Year: 2016 No: 678

25. OSPAR

OSPAR Science Agenda (publication 642)

26 WFD, Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.

Provides some guidelines for the minimum operational (for water bodies at risk) monitoring frequency in coastal waters:

- Other pollutants: 3 months
- Priority substances: 1 month

Report of the "Workshop on Science Policy Interface (SPI) strengthening in the field of Marine Protected Areas and Marine biodiversity in the Mediterranean".

Tangier, Morocco, 28 November 2016

Table of contents

List of tables

Introduction and context

The SPI workshop took place on the 28 November 2016 in Tangier, Morocco. It was held in the context of the "2016 Forum of Marine Protected Areas in the Mediterranean". The workshop targeted the implementation of IMAP in the Mediterranean, in particular regarding monitoring of biodiversity as well as the effective management of MPAs as tools for its conservation.

Anne-France Didier, Plan Bleu Director, opened the workshop together with Khalil Attia, SPA RAC Director and Laurent Sourbes, MedPAN Vice-President. They offered a general introduction on the role of the respective centres as mediators between the sciences' and decision maker's spheres, in particular regarding the conservation of the marine environment and the effects of climate change in the Mediterranean region. The need for science-policy interfaces regarding marine protection and conservation in the Mediterranean was presented subsequently, highlighting the importance of a constant and well-planned communication between scientific researchers and policy makers, allowing making the right choices in building up policies to solve environmental problems.

The flow of the meeting was then detailed along with the workshop's objectives, followed by a presentation of UNEP/MAP/SPA-RAC on IMAP and the MPA Roadmap. After a short discussion with the audience, some existing SPI experiences and good practices in the Mediterranean region related to MPA and conservation of biodiversity were shown, namely challenges and opportunities arising from the implementation of MPA, as well as national SPIs developed in the context of MPAs in Turkey, Algeria and Morocco. The morning session of the meeting finalised with a plenary session.

The afternoon session started by a short presentation of the working documents that had been prepared to guide the exchanges of participants. Then, the working session in two sub-groups was launched: the first group targeted aspects related to the monitoring of biodiversity, including habitats, indicator and invasive species, marine food webs and mammals; while the second group focused on Mediterranean MPAs as instruments for biodiversity conservation and monitoring, in particular how to foster connectivity and representativity of MPAs and socioeconomic aspects. The results of the working sessions were afterwards reported and discussed in a plenary session, which concluded by the expression of several recommendations to keep developing effective SPIs in the Mediterranean region, and by the closing of the workshop

State of play - presentations

IMAP PRESENTATIONS

In the framework of the EcAp Initiative

Aim: update national monitoring programmes

Common indicators:

- Marine mammals
- Sea turtles
- Seabirds

IMAP assessment project

- High pressure areas
- Low pressure areas (MPAs, SPAMIs)

MPA ROADMAP PRESENTATION

- Current state of Mediterranean MPAs
  - 34 SPAMIs: resulting from the implementation of the Protocol SPA Biodiv
    Shows an unbalanced distribution, similar to the general trend of MPAs in the Med: mostly located in the western basin, northern rim;
  - 15 EBSAs: non MPA, big areas, very important for the conservation of biodiversity

  - Aichi target 11: cover a marine area of 10% as MPA + other measures of spatial conservation involving the good connection of MPA and its effective management

- Parties to the Barcelona Convention: roadpmap MPA
  - Strengthening of the MPA network: spatial cover, representativity of species and habitats in the Mediterranean
  - Improvement of the effective management of MPAs
  - Integration of the MPAs in their social and economic environment, make local populations share socioeconomic benefits (principle of equality)
  - Improvement of the financial aspect of the MPAs (fitting them for a certain autonomy in their functioning)
  - List of tasks to be accomplished for the achievement of each objective

ECAP Mediterranean SPI Action: State of Play

Science has traditionally been the basis of environmental policy.

There has been in recent times a general demand for more transparency and accountability due to the environmental evolution (Climate change, etc.).

It has been recognised that the elaboration of environmental policies is rather complex, and that there is a need of legitimacy, robustness, by those responsible for their design and implementation

Science-Policy Interfaces:

- Processes acknowledged for the improvement of the design, management, implementation and evaluation of public environmental policies
- There has always been a back and forth dialogue between science and politics, but the process can be substantially improved
- Some progress has already been done, notably through partnership with SPA RAC
- Scientific production exists and needs to be capitalised
- Some examples of SPI also exist

Challenges for their improvement:

- Scientists reason according to their scientific discipline, while decision-makers are guided by socioeconomic factors and data
- Time scales: science and research need and operate in long timescales, decision makers need to continuously in short-medium lead times
- Communication: need for an effective communication mode
- Power games: conflicts of interest exist; scientists tend to consider their work topic as the most important one;

Approaches to be developed:

- Structuring SPIs: processes need to be better defined and structured, through the definition of stages and evaluation processes, and by means of resources (capacity building, financial …)
- Producing a handbook reflecting "do's" and "don'ts" aspects
- Producing a bibliography

SPI track record:

- Action launched in the framework of the EcAp Initiative, by UNEP/MAP and EC
- 2 workshops have been done:
  - Inception workshop
  - Strengthening SPI in the Mediterranean for marine pollution based on the Ecosystem Approach
- Involving managers, decision makers and scientists
- Identification of gaps
- Regarding AMPs, work has been produced already, notably during the Syracuse workshop.

Next steps:

- Workshop on marine litter
- Issue of scales (spatial and temporal) to be developed in the context of the implementation of monitoring programmes, which is a key element.

Summary of the workshop's presentations on SPI experiences

PARTICIPANT EXCHANGES

Dialogue between science and policy makers:

- Science brings very important data on the near future
- Significant difficulties are found by scientific experts in communicating figures and data to decision makers
- The socioeconomic component needs to be included in the dialogue, as well as the "human science" subject
  - For instance: data on pollution need to be accompanied by data on human impacts, e.g. lethal effects, or consequences on children;
- In the framework of the roadmap for the conservation of biodiversity, there is a need to include cooperation issues in projects financed by the EC, since there is an imbalance between northern and southern Mediterranean countries while the Mediterranean is a closed sea. The possibilities for cooperation need to be clear before formulating environmental policies regarding Mediterranean marine biodiversity;
  - Some examples are MAPER and MEDINA Projects, which focus on the development of indicators on North African countries

Decision makers need "simplified science" for an easier understanding of the crux of the matter, which is essential

The evolving environment pushes towards a variety of new environmental policies which increase substantially administration's workload, often with the same resources.

- Need to channel social science;
- Economic sustainability (revenues need to be higher than investments) vs environmental sustainability (which considers the natural capital, not the economic capital): Blue growth has a clear economic connotation.
- Existing parallel initiatives on SPI:
  - European Marine Board (European organisation on Marine Science)
  - Euroceans 2014 (Rome)
- No clear data on the natural capital: how any capital may be managed without having conducted any inventory?
- Communication is essential:
  - Common language
  - Common capabilities need to be developed to better communicate

  - Recommendations are lacking and are to be drafted to communicate on technical and scientific contents
  - Little research is done on management

- Creation of permanent platforms?
- Include SPI projects in scientific and also management projects, include communication aspects
- Scientific Workshop organised in Syracuse by MedPAN: gathered scientists and managers to reflect on constructive solutions for AMP management, including namely:
  - Communication
  - Resources
  - Interest
  - Time perception: management (short) vs scientific (medium-long): how management scales and scientific scales can be matched?
- Scientific Workshop organised in Albania, gathering scientists and managers, to discuss on resources implemented to support AMPs, many of them provided by MedPAN:
  - Early-warning system: precautionary principles needs of warning systems
  - Newsletter
  - Interactive database, etc.
- Stakeholders to be involved in SPIs:

Scientists

  - Managers: which ones? Environmental and fisheries ministries often take part in SPI, but Ministries of Finance are often left apart.
  - Journalists: should also be there! often poorly trained on environmental matters; medias may exert pressure only when well-trained
- SPI: environment and society are complex systems, therefore their articulation needs to be well-structured and define a straightforward goal and a targeted audience
- Role of MPA manager: preserve the existing natural capital so that there is a social and economic return on investment
- Challenge for MPAs: ensuring effective management in MPAs is a matter of resources; need to develop autonomy and empowerment, strengthen MPAs' operational and resource independence
- Scientists and researchers are often requested to give advice in processes of policy drafting, while not trained and SPI platforms not always available.
- Science: competitive environment, evaluated by means of scientific publications as indicator of eligibility for financial resources; SPI demand hard work and are not adequately valued
- The socioeconomic context should be taken into account

Strengthening SPI at the Mediterranean level to support the full implementation of IMAP

SPI in the context of IMAP, focusing on biodiversity and MPAs as a tool for its conservation: specific objectives

Following the wake of the Inception Workshop and the SPI Workshop related to pollution, the third SPI session envisaged three major objectives:

1. Reviewing and fine-tuning the scientific needs identified as preventing the effective implementation of IMAP, at regional and national levels, by:

- Reviewing and completing the list of pre-identified science needs;
- Proposing concrete actions in order to translate general initiatives into specific activities at different geographical scales (regional, national, local, etc.).
- Reflect on the actions to be implemented to fill the gaps, and prioritise them according to the following criteria:
  - The cross-cutting nature of activities (e.g. actions addressing many science needs, allowing optimising resources);
  - The urgency to address the science needs, initially conducting actions addressing aspects related to the first stages of IMAP's implementation schedule;
  - The existence of opportunities: a favourable context (ongoing scientific projects and/or initiatives, laboratory works, datasets, etc.) already existing and facilitating the implementation of the action.

2. Define the rationale and set proposals regarding pertinent geographical and temporal scales for periodic monitoring, reporting and assessing in the context of IMAP, in order to describe the status of Mediterranean biodiversity (Ecological Objectives 1, 2 and 4);
3. Suggest actions to keep the SPI platform active in order to continue supporting IMAP's implementation.

Reference documents

Based on the outputs of the Inception Workshop on SPI, a working document was prepared to guide the participants' expected scientific and technical discussions[5], specifically focusing on biodiversity aspects falling within the scope of IMAP[6]. The document presented an assessment of the IMAP science needs related to biodiversity, including habitats, indicator species, non-indigenous species, marine food webs and mammals, as well as regarding the connectivity and representativity of Mediterranean MPAs and their socioeconomic aspects. The documents provided the related state of play of each need identified, in terms of recent research progress, and a set of possible specific scientific actions designed to point out the way ahead towards filling such gaps (see Annex 1).

In addition, "opportunities" -i.e. favourable context(s) given by ongoing or planned research projects and/or partnerships, resources of specific scientific centres, etc. that may facilitate the development of a particular action- were taken into consideration for the identification of possible solutions/actions.

OBJECTIVE 1: KNOWLEDGE NEEDS FOR IMPLEMENTATION OF IMAP: FROM GAPS TO ACTIONS

Based on their skill and knowledge, the audience were split in two in order to work in group sessions on marine biodiversity and marine protected area. They revised on the working document prepared for the workshop in order to better precise the science needs and gaps for the implementation of IMAP and especially the related ecological objectives (EO 1 and 6) of EcAp.

[5] Strengthening the Science Policy Interface in the field of Marine Protected Areas (MPAs) and marine biodiversity in the Mediterranean Sea. Workshop organized in the framework of the 2016 Forum of Marine Protected Areas in the Mediterranean. Tangier, Morocco, 28 November 2016. Working Document.
[6] Ecological Objective (EO) 1 – Biological Diversity, EO 2 – Non-indigenous species, EO 4: Marine food webs

Presentation of the results of the sub-group session:

Marine biodiversity

PRIORITY	ACTIONS AND OPPORTUNITIES
HABITATS	

Improve the knowledge of main Mediterranean habitats	• **Progressively extend the concept of habitat to the pelagic realm, as a further extension of IMAP;**
	  ○ Build on CoCoNet project outputs and consider the fishery knowledge.
	• **Strengthen the habitat inventory (and species inventory) to produce reliable data with the support of scientific research programmes**
	  ○ Develop chairs on management & conservation between scientific institutions and MPAs (exchanges of scientists and MPA managers, funding of thesis or co-supervised internships, etc.) on specific projects.
	  ○ Promote the formation of taxonomists, since many marine habitats have as key species algae and invertebrates
	  ○ Develop a regional organisation of scientific experts working on MPAs (e.g. extension of the MedPAN scientific council)
	  ○ Foster capacity building for linking phenotypes and genotypes
	• **Map a significant part of selected representative habitats,** encompassing geological and biological features.
	• **Develop a GIS database or harmonise existing GIS databases** to store and make available results of habitat mapping, incl. data mining of past projects.

INDICATOR SPECIES	

Improve the knowledge regarding Mediterranean indicator species to quantify GES	• **Select common indicator species** to measure major environment disturbances, including CC (e.g. NIS and species sensitive to temperature increase), to be monitored at regional scale in order to address IMAP common indicators 1 to 5
	  ○ Use existing network of marine stations, universities, research institutes and MPAs with scientific capacities as **observational platforms of Mediterranean biodiversity**.
	  ○ Capacity building and funding for equipment would be required for non-European countries.
	  ○ When possible, produce monographs of Mediterranean biodiversity to foster taxonomy expertise

MARINE MAMMALS	

Improve collection of reliable information on diversity, density, distribution and important marine mammal habitats	• **Identify a minimum of two species** (e.g. coastal dolphins) **of two different functional groups** to be included in national monitoring programs based on the specificity of their marine environment and biodiversity
	  ○ Use the survey of whales to observe other environmental features (jelly fishes, marine litter, fronts…)
	  ○ Develop aerial surveys
	• **Based on existing large scale observations allowing identifying recurrent patterns**, develop national monitoring programmes (coherent, standardised operational methods using sea or aerial observations, physiology, epidemiology) for a regional perspective on the status of marine mammals.
	  ○ Link to existing observational systems.
	• **Improve and sustain existing data bases and GIS** for marine mammal distribution
	  ○ Link to regional geo-referenced databases like MedBiodivSDI and MAPAMED, and the regional cetacean stranding database MEDACES

NON-INDIGENOUS SPECIES (NIS)	
Increase knowledge on marine NIS distribution	• Link to MAMIAS, MedMIS and MedBiodivSDI.
Implement monitoring on NIS and IAS "Hot spots"	• **Implement Rapid Assessment Survey (RAS), at least yearly at national scale**, in Invasive (Alien) Species (IAS) hot spots areas**.** • **Improve knowledge on major vectors and filters of introduction processes** ○ During the IMAP initial phase, develop guidance for NIS citizen survey, as additional and cost-efficient method strengthening public awareness. Promote the risk based approach to get an overview of the NIS presence at large spatial scale from scattered data.
Measure occurence of IAS and their evolution	• **Define reference baselines,** implement assessments of IAS impacts, including impacts on ecosystem services ○ Use MPAs as reference sites, at least when far from IAS sources.
MARINE FOOD WEBS	

Improve knowledge on trophic networks as part of the ecosystem functioning	• **Extend applications of the Ecosystem-Based Quality Index (EBQI) applied to few significant Mediterranean ecosystems** (Posidonia beds, coralligenous, caves and other dark habitats).
	• **Provide an assessment of the pan-Mediterranean biogeographic variability,** transpose few (2-3) selected case studies of well-studied networks dealing to harvested species (molluscs, fishes...) to 4 distinct biogeographic areas.
	• **Develop research projects:**
	  ○ on orphan bentho-pelagic couplings - e.g. short food webs including microbial loops, role of suspension feeders (sponges, gorgons) in the ecosystem functioning.
	  ○ on other networks of interactions (e.g. chemical ecology) explaining some behaviour leading to habitat selection, recruitment, etc.

Marine Protected Areas

Science needs regarding connectivity and representativity of existing MPAs were revised. A variety of actions to address these needs were devised, and the group actively contributed with a series of recommendations regarding several priorities on which to concentrate for the pertinent management of the MPAs and their contribution to the effective implementation of IMAP.

Prioritisation of science needs and development of concrete actions:

Priority has been given by participants to different scientific needs and corresponding actions regarding connectivity and representativity, especially to these ones:

1. **Priority:** Improve knowledge to better assess and increase the connectivity of the Mediterranean MPAs;

Recommended actions:

- Better use the existing information, namely:
  - Distribution of habitats to set up new MPAs (on which a variety of projects have already worked, e.g. Oceana reports);
  - Ecologically or Biologically Significant Marine Areas (EBSAs) to evaluate connectivity within existing and new MPAs/ EBSAs;
  - Biological data;
  - Oceanographic data, regularly generated and constitute key data to understand oceanographic processes and connectivity between different marine areas.
- Make profit of the existing framework on spatial planning, allowing developing working groups and increase opportunities for spatial and conservation planning;
- Actors: planners, decision makers, scientists, etc.

2. **Priority:** Analyse the gaps of the current MPA system in matter of representativity and connectivity at national level;

Context: In the Mediterranean, 46 different designations/ preservation provisions for marine areas exist, targeting different aspects and providing different levels of protection.

Recommended action:

- Establish baselines for existing MPAs: not all MPAs have established their baseline (regarding habitats, species and socioeconomic benefits, among others);
- Compile information on the MPA (baseline) as a tool to confirm its adequate location and its (effective) "performance".
- Prioritisation for new MPAs could be done in terms of urgency (as a possible criteria), based on the species needing higher protection levels and thereby using the precautionary principle;
- Use of adaptive management to set and implement MPAs and adjust protection level.

3. **Priority:** Scientific contribution to the elaboration of measures aiming to increase representativity and connectivity of the Mediterranean MPAs at national level;

Context and needs**:**

There is (today) a system of MPAs, not a network; in order to protect what needs to be protected (i.e. representativity) and develop a network of well-coordinated MPAs, there is a need to combine information (what exists and what is being produced) and make it available and understandable: scientists/ technical experts need to deal with the "big data".

Collaboration is needed between academia from different countries;

There is a need for implemented management: financing is needed to apply the results of projects on MPAs that have already proposed recommendations

Recommended actions:

- Research (for instance, under the form of PhD programmes, research projects, etc.) needs to be carried out between countries, focusing on similar experiences effectively working (in the matter of MPAs) in different areas and developing comparative work, taking into account their respective contexts.
- Use the platforms of already declared MPAs as a forum for interaction of stakeholders, regardless of their protection degree.
- Use the scientific information (which does exist) to select new sites.
- Participation of the private sector, together with decision makers and managers, is essential both at the local and national level, since there is no financial assistance if economic/social interest is not well-shown

Concerning MPA database and socioeconomic aspects, participants came up with the following actions and recommendations to meet the following scientific needs:

4. **Priority:** Improve the MAPAMED database;

Context and needs**:**

Major problem regarding the development and maintenance of databases: the data contained in databases is often incorrect; there is a need of sound data, validated, reliable;

(It is not the case for MAPAMED, for which a method/mechanism for validation and contrasting information has been put in place).

There is a need to encourage countries to provide (sound) information regarding their MPA and biodiversity data, to overcome the lack of coherence (related to connectivity) regarding the location of MPAs.

Recommended actions:

- Set strong system(s) of data sharing and validation, especially with large amounts of data, could be under the form of validation committees.
- Check legal texts and contrast them with the information reported by countries of the MPAs (as done for MAPAMED, for instance).
- Use the potential of MAPAMED to follow/ assess the monitoring registered by MPA managers: reflection is needed to develop a method to do so, given the repeated and numerous requests;

Players: Regional Centres working on marine conservation (e.g. RAC/SPA), and especially Focal Points from environmental ministries and/or national agencies (since they report on data and are well-placed to put in place a mechanism to spread and validate scientific information.

5. **Priority:** Ecosystem services assessments in MPAs;

Context and needs**:**

Ecosystem services should come together with socioeconomic benefits, knowing that the second are part of the first;

Recommended action:

Use results of existing research on socioeconomic benefits provided by marine ecosystems to push/ support ongoing processes, adjusting to the different contexts of MPAs, and to concrete decision making.

6. **Priority:** Improve the sustainable funding of MPAs in the Mediterranean;
Context and needs**:**

Different financial measures exist, allowing developing a strong and healthy financial situation for MPAs; the capitalisation of the existing regarding financial tools to support and sustain MPAs is needed.

Attention should be paid so that financing compensatory measures/ payment systems are not imposed on the general public.

Recommended action:

- Evaluate existing mechanisms to obtain sustainable funding for Mediterranean MPAs:
  - Set ecotaxes: paying permits, for divers, fishers, users of the MPAs, directly going to the MPA managers.
  - A "Trust Fund" dedicated to the funding of Mediterranean MPAs is currently in its developing process -the "association" status has been set up- and capital (public, private) will be searched (private actors need to be mapped).
  - Set "Compensatory payments for ecosystem services" mechanisms to fund MPAs management; especially for activities exploiting marine resources in the Mediterranean (dredging, Hydrocarbon exploiters, etc.), which benefit from resources but ned to contribute at the regional level to their conservation. In the Med case, it could fall onto the "Trust Fund for Med MPAs".
  - Setting "public-private partnerships" (from the perspective of a MPA network, not single MPAs), although it presents (legal) difficulties and depends on the legal framework of countries; it involves partnerships between public agencies and the companies that are using, exploiting, extracting natural resources in the Med.
    E.g. Increasing activities such as the cruise sector might represent an opportunity to develop public-private partnerships.

7. **Priority:** Improve the assessment of socio economic benefits provided by MPAs;
Recommended action:

A socioeconomic assessment should be done for each MPA as soon as practicable, on the basis of existing information (since a variety of data and sources exist), and would make a compelling reason to develop the ecotax/ funding measures described above.

OBJECTIVE 2: SETTING MONITORING APPROPRIATE SCALES AND REPORTING PROCEDURES FOR IMAP

Scale / frequency of periodic reporting & assessment for biodiversity features

The participants discussed on the pertinent temporal and geographical scales for carrying out monitoring, reporting and assessments, according to their scientific knowledge and technical expertise, and suggested some proposals to be implemented in the context of IMAP.

1. Defining spatial scales

- Challenge and needs:

The Mediterranean being such a vast region, there is a need to define concrete areas for monitoring, both including different biodiversity features (representativity of the region) and allowing monitoring to be resource-efficient.

There are spatial units, such as EBSAs, or EMAs for cetaceans, etc. which could be useful to report in the framework of IMAP; However, several countries do not have EBSAs, there is a gap particularly important in southern Med countries.

- Recommendations:
  - Use of MPAs as a measure for baseline (reference condition) and not to report on the state of ecosystems.
  - Use the "minimum level of representativity": a report issued in the framework of the COCONET Project, accepted by EU, suggests identifying "functional units", spatial units based on its functioning which could provide the basis for this; however, it is highly resource consuming.
  - Reporting should be done at national level, occasionally in coordination with neighboring countries.

2. Defining temporal scales

- Recommendations
  - For EBSAs, monitoring could be done every 2 years.
  - National assessments to be conducted every 2-3 years, depending on what is being measured and assessed.
  - National level but coordinated.

Both, temporal and spatial scales should be indicator-specific (and therefore, set according the indicator and the parameter being measured).

OBJECTIVE 3: KEEPING SPI ALIVE: SUGGESTIONS TO SUPPORT SCIENCE-POLICY INTERFACES

The group also formulated proposals on activities aimed to sustain the SPI Science-Policy Interface, especially in the context of IMAP:

- Put in place an SPI platform including scientists, planners and managers, at the sub-regional scale (as exists in the Adriatic Sea);
- Design communication strategies to guide scientists, decision-makers and MPA managers in the process of setting and implementing MPAs effectively to ensure a common understanding of their challenges and meet their particular needs; communication strategies are believed essential, even between decision-makers at different levels.

Annexes

Annexe 1: Scientific needs analysis and proposed actions

Notice: The state of play focuses on scientific projects and institutions having provided or providing inputs relevant for the implementation of the biodiversity component of IMAP and for the MPA Roadmap. It has been voluntarily omitted to mention the UNEP/MAP RAC/SPA directly in charge to implement these programmes, as well MedPAN, a key partner for the MPA Roadmap implementation, in order to avoid multiple repetitions of their names in the tables.

Nota bene: in the tables below, in red are the inputs provided by participants on the working document prepared for the workshop.

Table 1: Habitats

Identified science needs for IMAP and the MPA Roadmap	Category	State of play (see Reference list)	Proposed actions	Duration	Comments and opportunities to develop the proposed actions
Improve the knowledge of main Mediterranean habitats	Research / expertise	EUNIS UNEP/MAP - RAC/SPA (Mediterranean Habitats Reference List and toolbox), Natura 2000, HABREF and ZNIEFF (France) BIOMARE MedDiversa MALTA SEABIRD PROJECT CoCoNet MedKey Habitats	1. Develop a common typology of main representative habitats, based on existing typologies	Short	Disseminate the Natura 2000 network principles extended to main Mediterranean habitat formers and bio-constructions into non-EU Mediterranean waters, building on the experience in the Emerald Network for non-EU countries, to increase the MPA complementarity and representability.
			1. bis Progressively extend the concept of habitat to the pelagic realm, as a further extension of IMAP	Medium to Long	Build on the CoCoNet outputs and consider the fishery knowledge.
			2. Strengthen the habitat inventory (and species inventory) to produce reliable data with the support of scientific research programmes	Medium to Long	Promote the formation of taxonomists, many marine habitats have as key species algae and invertebrates Develop chairs on management and conservation between scientific institutions and MPAs (exchanges of scientists and MPA managers, funding of thesis or co-

					supervised internships, etc.) on specific projects. Develop a regional organisation of scientific experts working on MPAs, could be an extension of the MedPAN scientific council. Capacity building for linking phenotypes and genotypes
	Monitoring, mapping / Database	MedBiodivSDI MAPAMED MedKeyHabitats CoCoNet CYBELLE MERCES	3. Map a significant part of selected representative habitats	Long	Encompassing geological and biological features.
			4. Develop a GIS database or harmonise existing GIS data base to archive and make available results of Mediterranean habitat mapping, including data mining of past Mediterranean projects.	Medium to Long	Could be inspired by EMODNet Seabed Habitats and SeaDataNet To be linked to MedBiodivSDI and MAPAMED

Table 2: Indicator species

Identified science needs for IMAP and the MPA Roadmap	Category	State of play (see Reference list)	Proposed actions	Duration	Comments and opportunities to develop the proposed actions
Improve the knowledge regarding Mediterranean	Research / Expertise	CIESM tropical signals Program DEVOTES STAGES	Linking fishery yield with hydrological characteristic. Select common indicator species of major environment disturbances, including climate change (may include NIS and	Short to Medium	Existing network of marine stations[7], universities, research institutes and MPAs with scientific capacities to be used as a platform to observe Mediterranean biodiversity. Capacity building and

[7] "Why marine stations (which are relatively few) instead of universities, research institutes or even MPA management bodies? Actually, governmental agencies are usually the ones charged with monitoring responsibility, but often need to build further capacity to perform this task".

indicator species to quantify GES		T-MEDNet	also species sensitive to temperature increase) to be monitored at regional scale, to document IMAP common indicators 1 to 5		funding for equipment would be required for non-European countries. Produce monographs of Mediterranean biodiversity in order to foster taxonomy expertise[8]
	Expertise / monitoring	MedBiodivSDI CoCoNet BIOMARE CYBELLE SEAWATCHERS	2. Develop monitoring strategy of common indicator species at national scale and implement monitoring.	Medium to Long	
	Database		3. Develop a common regional GIS data base to store observation and monitoring data about indicator species distribution in the Mediterranean.	Medium	To be linked to regional databases such as MAMIAS, MedBiodivSDI, MAPAMED
	Monitoring / mapping		4. Cartography of these indicator species distribution (including bathymetric range at the Mediterranean scale) and report results in the regional data base	Medium to Long	Use the common indicators 1 to 5 to quantify the GES. Some lists exist but may be simplified or completed

Table 3: Marine mammals

Identified science needs for IMAP and the MPA Roadmap	**Category**	**State of play** (see Reference list)	**Proposed actions**	**Duration**	**Comments and opportunities to develop the proposed actions**
Improve the collection of reliable information about the diversity, the density, the distribution and the	Research	IUCN task force marine mammals SAMM PACOMM	1. Identify a minimum of two species (e.g. coastal dolphins) of two different functional groups to be included in national monitoring programs based	Short	Use the survey of whales to observe other environmental features (jelly fishes, marine litter, fronts…)

[8] "The production of monographs is resource demanding and has little impact on the valuation of the scientific activity. Hence is difficult to implement without dedicated provisions in scientific valuation procedures and funding schemes. It is probably far more cost-effective to rely onto molecular tools, which should be (and certainly will be) enhanced at fast rate during the next few years".

important marine mammals habitats		ACCOBAMS Survey initiative GREC GIS3M	on the specificity of their marine environment and biodiversity		In general develop aerial surveys.
	Expertise / Monitoring		2. Based on existing large scale observations giving recurrent patterns, develop national monitoring programmes (coherent and standardised operational method using at sea or aerial observations, physiology, epidemiology) in a coherent way to get a regional perspective of the status of marine mammals.	Medium to Long	Link with observation systems.
	Database / Mapping		3. Improve and sustain existing data bases and GIS for marine mammals distribution	Medium to Long	To be linked to regional geo-referenced databases like MedBiodivSDI and MAPAMED, and the regional cetacean stranding database MEDACES

Table 4: Invasive species

Identified science needs for IMAP and the MPA Roadmap	**Category**	**State of play** (see Reference list)	**Proposed actions**	**Duration**	**Comments and opportunities to develop the proposed actions**
Increase knowledge on marine NIS (Non Indigenous species) distribution	Research/ Monitoring	EASIN CIESM: Atlas of Exotic Species in the Mediterranean GISD MMIS SEAWATCHERS	1. Improve the inventory and mapping of NIS presence in the Mediterranean by including a selected list of NIS in national monitoring programs.	Medium to Long	

	Database / mapping		2. Develop a regional GIS database on the NIS in the Mediterranean	Short to Medium	To be linked to MAMIAS, MedMIS and MedBiodivSDI.
Implement monitoring on NIS and IAS (Invasive Alien Species) "Hot spots"	Monitoring	REDMEDIND STAGES	3. Implement Rapid Assessment Survey (RAS), at least yearly at national scale, in IAS hot spots areas.	Medium	During the IMAP initial phase, develop guidance for NIS citizen survey, as an additional cost-efficient method strengthening public awareness. Promote the risk based approach to get an overview of the NIS presence at large spatial scale from scattered data.
	Research	STAGES VECTORS	4. Improve our knowledge on the major vectors and filters acting on introduction processes	Long	
Measure occurence of IAS, their impacts and their evolution	Research/ Expertise / Monitoring	GISD MMIS VECTORS CoCoNet	5. Define reference baselines, implement assessments of IAS impacts, including impacts on ecosystem services	Medium to Long	MPAs can be used as reference sites, at least where they are not close to introduction sources.

Table 5: Marine food webs

Identified science needs for IMAP and the MPA Roadmap	**Category**	**State of play** (see Reference list)	**Proposed actions**	**Duration**	**Comments and opportunities to develop the proposed actions**
Improve knowledge on trophic networks as part of the ecosystem functioning	Research/ Expertise/ Monitoring	Personnic *et al.* (2014) Rastorgueff *et al.* (2015)	1. Extend applications of the Ecosystem-Based Quality Index (EBQI) applied to a few number of Mediterranean ecosystems (Posidonia beds, Coralligenous, Caves and other dark habitats) to other significant Mediterranean ecosystems.	Medium to Long	

	Research/ Expertise/ Monitoring		2. To provide an assessment of the pan-Mediterranean biogeographic variability, transpose few (2-3) selected case studies of well-studied networks dealing to harvested species (molluscs, fishes, ...) to 4 distinct biogeographic areas	Medium to Long	
	Research		3. Develop research projects on orphan bentho-pelagic couplings - e.g. short food webs including microbial loops, role of suspension feeders (sponges, gorgons) in the ecosystem functioning	Long	Would provide better knowledge on the overall functioning of the ecosystem, the potential consequences of the global change, especially on services
	Research	STAGES	4. Develop research projects on other networks of interactions (e.g. chemical ecology) explaining some behaviour leading to habitat selection, recruitment, etc.	Long	

Table 6: MPA connectivity and representativity

Identified science needs for IMAP and the MPA Roadmap	**Category**	**State of play** (see Reference list)	**Proposed actions**	**Duration**	**Comments and opportunities to develop the proposed actions**
Improve knowledge to better assess and increase the connectivity	Research/ Methodology	STAGES CoCoNet	1. Select model species after defining the good criteria of selection on	Medium to Long	Better use the existing information, namely:

of the Mediterranean MPAs		PERSEUS MediSeH Oceana CBD – EBSA Process (Mediterranean regional scale)	population dynamics and genetics (baseline knowledge, molecular tools availability, biological traits). Develop guidelines for MPA managers.		- Distribution of habitats to set up new MPAs (on which a variety of projects have already worked, e.g. Oceana reports); - Ecologically or Biologically Significant Marine Areas (EBSAs) to evaluate connectivity within existing and new MPAs/ EBSAs; - Biological data; - Oceanographic data, regularly generated and constitute key data to understand oceanographic processes and connectivity between different marine areas. Make profit of the existing framework on spatial planning, allowing developing working groups and increase opportunities for spatial and conservation planning; Actors: planners, decision makers, scientists, etc. Develop scientist chairs between MPA and scientific institutions (exchanges of scientists and MPA managers, financing for thesis or internships co-supervised, etc.) on specific projects
Analyse the gaps of the current MPA system in matter of representativity and connectivity at national level	Research / Expertise/ Methodology	COCONET	2. Define the methodology for the national gap analysis in matter of representativity and connectivity of the Mediterranean MPAs, including consultation of all the involved stakeholder categories. Develop Guidelines. Test in selected sub-regions.	Medium	In the Mediterranean, 46 different designations/ preservation provisions for marine areas exist, targeting different aspects and providing different levels of protection. Establish baseline for existing MPAs: not all MPAs have established their baseline (regarding habitats, species and socioeconomic benefits, among others); Compilation of information on the MPA (baseline) as a tool to confirm its adequate location and its (effective) “performance”.

			Extend to the whole Mediterranean basin.		Prioritisation for new MPAs could be done in terms of urgency (as a possible criteria), based on the species needing higher protection levels and thereby using the precautionary principle; Use of adaptive management to set and implement MPAs and adjust protection level.
Scientific contribution to the elaboration of measures aiming to increase representativity and connectivity of the Mediterranean MPAs at national level.	Research/ Expertise/ Methodology		3. Develop conceptual model and indicators regarding MPA representativity (R) and connectivity (C) in a given coherent sub region. Elaborate a list of possible measures to improve R and C, including methods to prioritise these measures, including socioeconomic impact assessment, involving relevant stakeholders. Develop guidelines. Test in selected sub regions.	Medium to Long	Extension of the EU Natura 2000 network further offshore: despite the rather low protection level, it provides an opportunity to carry out research on where to put new sites (even if the level of protection is low). There is (today) a system of MPAs, not a network; in order to protect what needs to be protected (i.e. representativity) and develop a network of well-coordinated MPAs, there is a need to combine information (what exists + what is being produced) and make it available and understandable: scientists and technical experts need to deal with the "big data". Collaboration is needed between academia from different countries; Research (under the form of PhD programmes, research projects, etc.) needs to be carried out between countries, focusing on similar experiences effectively working (in the matter of MPAs) in different areas and developing comparative work, taking into account their respective contexts. Use the platforms of already declared MPAs as a forum for interaction of stakeholders, regardless of their protection degree.

					Use the scientific information (which does exist) to select new sites. There is a need for implemented management: financing is needed to apply the results of projects on MPAs that have already proposed recommendations. Participation of the private sector, together with decision makers and managers, is essential both at the local and national level, since there is no financial assistance if economic/social interest is not well-shown.
	Expertise		4. Extend to the Mediterranean basin		

Table 7: MPA Database and socio economic aspects

Identified science needs for IMAP and the MPA Roadmap	**Category**	**State of play** (see Reference list)	**Proposed actions**	**Duration**	**Comments and opportunities to develop the proposed actions**
Improve the MAPAMED database	Expertise/ Database	MAPAMED	1. Promote the use of MAPAMED database and publish it on the web; Link the MAPAMED with the MedBiodivSDI overall Mediterranean biodiversity portal. Study a possible MAPAMED extension to store and disseminate monitoring data recorded by MPA managers. (as requested repetitively by multiples players)	Short to Medium	Major problem regarding the development and maintenance of databases: Data contained in databases is often incorrect; there is a need of sound data, validated, reliable; (It is not the case for MAPAMED, for which a method/ mechanisms for validation and contrasting information has been put in place).

					There is a need to encourage countries to provide (sound) information regarding their MPA, in particular biodiversity data and justifications of their location. Possible action: set strong system(s) of data sharing and validation, especially with large amounts of data, could be under the form of validation committees. - Checking of legal texts with info reported by countries of the MPAs (as done for MAPAMED, for instance). Players: Regional Centres working on marine conservation (e.g. RAC/SPA), and especially Focal Points from environmental ministries and/or national agencies (since they report on data and are well-placed to put in place a mechanism to spread and validate scientific information.
Ecosystem services assessments in MPAs	Expertise	PERSEUS Plan Bleu	2. Develop a robust methodology and assess the main socio economic benefits provided by the ecosystem services at MPA scale and apply it to some selected cases. Use results of existing research on socioeconomic benefits provided by marine ecosystems to decision making.	Medium	Ecosystem services are a pre-requisite for socioeconomic benefits, acknowledging that the second are a result of the first
	Research	PERSEUS COCONET	3. Assess the impact of the main change in biodiversity within each MPA.	Long	
Improve the sustainable funding of MPAs in the Mediterranean	Expertise	Plan Bleu	4. Analyse the different possibilities of sustainable funding of Mediterranean MPAs, including public-private partnerships. Details the pro and cons of each possibility.	Short	Different financial measures exist, allowing developing a strong and healthy financial situation for MPAs: capitalisation of what already exists regarding financial tools to support and sustain MPAs:

					- Set ecotaxes: paying permits, for divers, fishers, users of the MPAs, directly going to the MPA managers. - A "Trust Fund" dedicated to the funding of Mediterranean MPAs is currently in its developing process -the "association" status has been set up- and capital (public, private) will be searched (private actors need to be mapped). - Set "Compensatory payments for ecosystem services" mechanisms to fund MPAs management; especially for activities exploiting marine resources in the Mediterranean (dredging, Hydrocarbon exploiters, etc.), which benefit from resources but need to contribute at the regional level to their conservation. In the Med case, it could fall onto the "Trust Fund for Med MPAs". - Setting "public-private partnerships" (from the perspective of a MPA network, not single MPAs), although it presents (legal) difficulties and depends on the legal framework of countries; it involves partnerships between public agencies and the companies that are using, exploiting, extracting natural resources in the Med. E.g. Increasing activities such as the cruise sector might represent an opportunity to develop public-private partnerships. Attention should be paid so that financing compensatory measures/ payment systems are not imposed on the general public.
Improve the assessment of socio	Expertise	EMPAFISH Plan Bleu	5. From the various assessments made in the Mediterranean and elsewhere, elaborate a robust methodology and develop guidelines	Short	This socioeconomic assessment should be done for each MPA as soon as practicable, on the basis of existing information (since a variety of data and sources

economic benefits provided by MPAs			enabling to most of the Mediterranean MPAs to perform these socioeconomic assessments in routine, including considerations on impact equity.		exist), and would make a compelling reason to develop the ecotax/ funding measures

Table 8: Relevant scales for reporting on the state of the environment in the framework of IMAP

Relevant scales for reporting and assessment on the state of environment (biodiversity issues) for IMAP;	Spatial scale: There are spatial units, such as EBSAs, or EMAs for cetaceans, etc. which could be useful to report in the framework of IMAP; Drawback: - Several countries do not have EBSAs, there is a gap particularly important in southern Med countries; - Use of MPAs as a measure for baseline (reference condition) and not to report on the state of ecosystems. Use the "minimum level of representativity": a report issued in the framework of the EU COCONET project, suggests identifying "functional units", spatial units based on their role in ecosystem processes could provide the basis for this; yet, highly resource consuming. Reporting should be done at national level, hopefully in coordination with neighboring countries.
	Temporal scale: - For EBSAs, could be done every 2 years. - National assessments to be conducted every 2-3 years, depending on what is being measured and assessed.

	Both, temporal and spatial scales should be indicator-specific (set according the indicator and the parameter being measured). National level but coordinated.

Table 9: Actions to maintain the Science-Policy Interface active for the implementation of IMAP

Activities to support SPI	- SPI platform, scientists + planners and managers, put in place at sub-regional scale (as exists in the Adriatic Sea); - Design of communication strategies to guide scientists, decision makers and MPA managers in the process of setting and implementing MPAs effectively to ensure a common understanding and meet their particular needs; communication strategies are essential and even between decision makers at different levels.

Annexe 2: List of participants

Dania	ABDUL MALAK	University of Malaga	Spain	daniaabdulmalak@uma.es
Awatef	ABIADH	LPO	Tunisie	abiadhawatef@yahoo.fr
Mehdi	AISSI	RAC/SPA	Tunisia	mehdi.bfsa@yahoo.fr
Mustapha	AKSISSOU	Faculty of Science	Morocco	aksissou@yahoo.fr
Tovo	ANDRIATSIORY	Réseau MIHARI	Madagascar	tovo@mihari-network.org
Khalil	ATTIA	CAR/ASP	Tunisia	director@rac-spa.org
Arhab	AZEDDINE	Algerian Platform	Algeria	grigale@live.fr
Anita	BABAČIĆ AJDUK	Public Institution for Management of protected areas in Šibenik-Knin County	Croatia	ababacic@zpv-sibenik.hr
Antonios	BARNIAS	Samaria National Park	Greece	antbarnias@yahoo.gr
Lobna	BEN NAKHLA	RAC/SPA	Tunisia	lobna.bennakhla@rac-spa.org
Mouloud	BENABDI	ETS ABYSS	Algeria	benabdi@gmail.com
Kais	BLOUZA	Ministère de l'environnement et du développement durable	Tunisia	kais.blouza@mineat.gov.tn
Ferdinando	BOERO	University of Salento	Italy	boero@unisalento.it
Lorenzo	BRAMANTI	CNRS	France	philebo@gmail.com
Maddy	CANCEMI	Office de l'Environnement de Corse / Parc International Marin des Bouches de Bonifacio	France	cancemi@oec.fr

Tina	CENTRIH	Institute of the Republic of Slovenia for Nature Conservation	Slovenia	tina.centrih-genov@zrsvn.si
Joachim	CLAUDET	MedPAN	France	joachim.claudet@gmail.com
Tidiani	COUMA	Département des Relations Extérieures et de la Coopération	Monaco	tcouma@gouv.mc
Richard	DACOSTA	United Nations Environment Program UNEP Division of Environmental Policy Implementation (DEPI) Abidjan Convention Secretariat	Cote D'ivoire	richard.dacosta@unep.org
Nadia	DECKERT	Ministère des Affaires Etrangères et du Développement International	France	nadia.deckert@diplomatie.gouv.fr
Rosemary	DEVOS	Coasts for Life Ltd	Uk	rosemarydevos@ymail.com
Sami	DHOUIB	WWF NA	Tunisia	sdhouib@wwfna.org
Giuseppe	DI CARLO	WWF Italy	Italy	gdicarlo@wwfmedpo.org
Anne-France	DIDIER	Plan Bleu	France	afdidier@planbleu.org
Jean-Marie	DOMINICI	Parc Naturel Régional de Corse / Réserve Naturelle de Scandola	France	pnrc.scandola-jm@wanadoo.fr
Mohamed	EL ANDALOSSI	Association AZIR pour la Protection de l'Environnement	Morocco	andalosiazir@gmail.com

BOUCHTA	EL MOUMNI	Université A. ESSAADI, FP-Larache - Maroc	Morocco	bmoumni@yahoo.fr
Darren	FA	The University of Gibraltar	Gibraltar	darren.fa@unigib.edu.gi
Joaquim	GARRABOU	CSIC	Spain	garrabou@icm.csic.es
Najoua	GHOUAT	Université des sciences de Tétouan	Maroc	najoua.ghouat@gmail.com
Samir	GRIMES	ENSSMAL	Algeria	samirgrimes@yahoo.fr
Hacene	HAMDANI	Association le dauphin	Algeria	assodauf@gmail.com
Yves	HENOCQUE	Ifremer	France	Yves.Henocque@ifremer.fr
Jean	JALBERT	Tour du Valat	France	jalbert@tourduvalat.org
Imed	JRIBI	Faculty of Sciences of Sfax (FSS)	Tunisia	imed.jribi@fss.rnu.tn
Tayeb	KERRIS	Parc National de Gouraya	Algeria	pngouraya06@gmail.com
Cetin	KESKIN	Fisheries Faculty, University of Istanbul	Turkey	seahorse@istanbul.edu.tr
Silvija	KIPSON	University of Zagreb	Croatia	silvija.kipson@biol.pmf.hr
Zafer	KIZILKAYA	Mediterranean Conservation Society	Turkey	kizilkaya.zafer@gmail.com
Antoine	LAFITTE	Plan Bleu	France	alafitte@planbleu.org
Sofiane	MAHJOUB	WWF North Africa	Tunisia	smahjoub@wwfna.org
Emanuela	MANCA	Sinis MPA	Italy	manca.emanuela@gmail.com
Chokri	MANSOUR	Association Pinna pour le Développement et la Promotion de l'écotourisme	Tunisia	mansour_chokri@yahoo.fr

Giorgio	MASSARO	Sinis Peninsula – Mal di Ventre Island	Italy	direzione@areamarinasinis.it
Hicham	MASSKI	Université Mohammed V	Maroc	hmasski@gmail.com
José Carlos	MENDOZA	Spanish Secretariat for Fisheries	Spain	bec_sgci2@magrama.es
Bruno	MEOLA	MedPAN	France	bruno.meola@medpan.org
Marina	MISKOVIC	Ministry of Sustainable Development and Tourism	Montenegro	marina.spahic@mrt.gov.me
Mohamed	NAJI	Institut Agronomique et Vétérinaire Hassan II	Morocco	m.naji@iav.ac.ma
Fatima-Zahra	NAJJAR	France Volontaires	Guinée	najjar.fati@gmail.com
Giuseppe	NOTARBARTOLO DI SCIARA	Tethys Research Institute	Italy	disciara@gmail.com
Doreid	PETOSHATI	United Nations Development Programme, (UNDP) Albania	Albania	dpetoshati87@yahoo.it
Alfonso	RAMOS ESPLA	CIMAR, University of Alicante	Spain	Alfonso.Ramos@ua.es
Silvia	REVENGA	Secretaría General de Pesca	Spain	srevenga@magrama.es
Mayada	SAAD	Ministry of Local Administration and Environment Affairs	Syria	mayadasaad5@yahoo.com
Ziad	SAMAHA	IUCN ROWA	Lebanon	ziad.samaha@iucn.org
Laurent	SOURBES	MedPAN	Greece	lsourbes@nmp-zak.org
Tharaka	SRIRAM	Ocean Education	Germany	tharaka.sriram@googlemail.com

Houssam	TACHIKART	Association de Protection de l'Environement Marin de Tanger	Maroc	association@tangier-meps.esy.es
Nur Eda	TOPÇU ERYALÇIN	TUDAV	Turkey	edatopcu@istanbul.edu.tr
Cherif	TOUEILEB	FAO/SNE	Tunisia	Cherif.Toueilib@fao.org
Marie Suzanne	TRAORE	RAMPAO	Senegal	marie.traore@iucn.org
Robert	TURK	Institute of the Republic of Slovenia for Nature Conservation	Slovenia	robert.turk@zrsvn.si
Vadhet	ÜNAL	Ege University, Faculty of Fısheries	Turkey	vahdetunal@gmail.com
Thomas	VEGA	National Council of Research (CNR) - Institute of Coastal Marine Environment (IAMC)	Italy	tomas.vegafernandez@cnr.it
Chloë	WEBSTER	MedPAN	France	chloe.webster@medpan.org
Mohammad	ZAHER	Tyre Coast Nature Reserve	Lebanon	mohammad.daher@regie.com.lb
Javier	ZAPATA	Organismo Autónomo Parques Nacionales	Spain	jzapata@oapn.es

UNITED NATIONS

EP

UNEP(DEPI)/MED WG. 432/6

UNITED NATIONS
ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN

15 March 2017
Original: English

Workshop on Science Policy Interface (SPI) strengthening for the implementation of the IMAP in relation to Marine Litter, Biodiversity & fisheries, Hydrography, with a focus on the Risk-based Approach for monitoring.

Madrid, Spain, 2nd March 2017

Report of the Meeting "Workshop on Science Policy Interface (SPI) strengthening for the implementation of the IMAP in relation to Marine Litter, Biodiversity & fisheries, Hydrography, with a focus on the Risk-based Approach for monitoring, Madrid, Spain, 2 March 2017"

FINAL DRAFT

UNEP/MAP
Athens, 2017

Table of Contents

Introduction

1. Plan Bleu is mandated by UNEP/MAP to coordinate one of the key activities of the second phase of EcAp, the EcAp MED II project (2015-2018), focusing on the science-policy interface (SPI) strengthening. Indeed, in the framework of the implementation of the ecosystem approach (EcAp), the Integrated Monitoring and Assessment Programme (IMAP) has been adopted to monitor 27 indicators set up to assess the status of the Mediterranean Sea and Coast towards to achieving their Good Environmental Status (GES). In order to enable the implementation of the IMAP, it is crucial to bridge existing gaps between the scientific and policy making spheres. To this purpose, until 2018, a series of SPI workshops are planned, aiming to identify scientific needs in programmes that contribute to achieving the GES and detail solutions to fill them. A good coordination with the corresponding thematic UNEP/MAP Regional Activity Centers (RACs), having to support IMAP implementation at regional and national scales, is essential to involve environmental policy makers beside scientists; therefore, the principle of SPI workshops joined to thematic events organised by RACs has been agreed.

2. The first workshop, organized by Plan Bleu, took place in Sophia Antipolis (France) in December 2015. The objective was to bring together key stakeholders (scientists and policy makers) to discuss the implementation of science-policy interface (SPI) activities for IMAP. During this workshop, a first set of around 15 key cross-cutting and topic-specific knowledge gaps to be filled for the implementation of IMAP was identified, along with proposed actions to be taken to address these gaps. Since the Inception workshop held in December 2015, two SPI thematic workshops have been carried out: the second SPI workshop focused on IMAP pollution issues and was held as a specific session of a UNEP/MAP CORMON (Correspondence Group on Monitoring) on Pollution issues (19-21 October 2016, Marseille, France); the third meeting on SPI targeted biodiversity and MPAs and was held as a joint session of the 2016 Forum of Marine Protected Areas (MPAs) in the Mediterranean(Tangier, Morocco, 28th November 2016).

3. Further to the decision IG. 22/7 of COP19 of the Barcelona Convention in February 2016 adopting the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast (IMAP), the objective of this forth workshop on SPI was to highlight the usefulness of the Risk-based Approach (RBA) to develop and optimize strategies for monitoring to marine ecosystem and supporting the implementation of IMAP at regional and national levels. The concept of "risk" concerns the non-achievement of GES for the Mediterranean Sea following the 11 Ecological Objectives of the Ecosystem Approach.

4. The workshop was held back to back with the Meetings of the Ecosystem Approach (EcAp) Integrated Correspondence Group (CORMON) on Marine Litter, Biodiversity and fisheries, and Hydrography and coast co-organized by UNEP/MAP, MEDPOL, SPA RAC and PAP RAC. Joining the different events enabled to gather scientific researchers invited by Plan Bleu for the SPI workshop, scientific experts designated by governments of Contracting Parties to the Barcelona Convention to participate to the CORMON meetings, National Focal Points of UNEP MAP and RACs.

5. The meeting underscored the importance for countries to strengthen SPI in order to achieve Good Environmental Status (GES) and in particular for the following topics: marine litter, biodiversity & fisheries, hydrography and coast. In particular, the session focused on the Risk-based Approach (RBA), a transversal approach which was identified as an overarching principle for the IMAP of EcAp.

Participation

6. The meeting was attended by participants from the following Contracting Parties: Albania, Bosnia & Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Montenegro, Morocco, Slovenia, Spain, Tunisia and Turkey. The UNEP/MAP Secretariat was represented by the MED POL Programme, Plan Bleu, SPA/RAC, PAP/RAC and INFO/RAC. The meeting was also attended by the Agreement on the Conservation of Cetaceans in the Black Sea Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS), the European Environmental Agency

(EEA) and the International Union for Conservation of Nature (IUCN), as well as by several key scientific experts working in national institutions and regional projects. The full list of participants is attached as Annex IV to the present report.

Agenda item 1. Opening of the Meeting and organizational matters

Opening of the Meeting

7. Ms. Itziar Martín Partida, Technical Director of the Division for the Protection of the Sea at the Spanish Ministry of Food, Agriculture and Environment, opened the meeting as representative of the host country and addressed some welcoming words to the participants.

8. Ms. Tatjana Hema, UNEP/MAP MED POL Program Officer, welcomed and thanked the participation of the attendees to the forth Science Policy Interface (SPI) workshop. Ms. Hema highlighted the importance of linking decision makers and scientific experts towards increasing sustainability of human practices, and stressed that the development of SPI is becoming a priority for Contracting Parties to the Barcelona Convention. Therefore, the EcAp MED II envisages specific activities devoted to develop and strengthen SPI strategically, to reinforce the bidirectional communication between scientific and managerial communities. In this respect, she pointed out the importance of carrying out the SPI session in the framework of the integrated CORMON Meetings (i.e. Biodiversity and fisheries, Marine Litter, and Hydrography) to bring together country representatives, managers and high level experts from various academic fields to bridge existing gaps, allowing the implementation of IMAP.

9. Mr. Didier Sauzade, Plan Bleu Officer for marine ecosystems, presented the rationale of this workshop focused on strengthening the SPI in the field of the use of the Risk-based Approach (RBA) as a method aiming at both developing monitoring strategies to implement IMAP and dealing with the risks of not achieving Good Environmental Status (GES) in national waters. The RBA is an overarching principle of IMAP and may represent a method for joined-up thinking across scientists, managers and decision makers. Previous SPI workshops recommended thus holding a specific workshop on this approach. The overall objective of this workshop was to share experiences between countries on this approach, to exchange on the importance and usefulness of the RBA for IMAP implementation, as well as to provide recommendations for its application. The agenda of the workshop was then presented.

Adoption of the Agenda

10. The proposed Provisional Agenda appearing in document UNEP(DEPI)/MED WG.432/1 was adopted and appears as Annex I to the present report.

Election of officers

11. In accordance with the Rules of procedures for meetings and conferences of the Contracting Parties the meeting elected one (1) President, three (3) Vice-Presidents and one (1) Rapporteur from among the participants, as follows:

President:	Mr. Mohamed El Bouch, Morocco
Vice-President 1:	Mr. Mustafa Fouda, Egypt
Vice- President 2:	Ms. Jelena Knezevic, Montenegro
Vice- President 3:	Mr. Jesús Gago, Spain
Rapporteur:	Ms. Antoniadis Konstantinos, Cyprus

12. The Chair emphasized the need the bridge the gap between science, policy making and politics, in order to have a vision of the existing constraints and make the good decisions to progress towards achieving GES in the Mediterranean Sea by 2020.

Agenda item 2. State of play of the EcApMEDII Project

13. Ms. Gyorgyi Gurban, UNEP/MAP EcAp Project Manager, presented the status of implementation of the EcAp MED II project and the related output 3, dedicated to stronger Ecosystem Approach related science-policy interface strengthening in the Mediterranean. Ms. Gurban recalled that the EcAp process started almost a decade ago in Spain and has been since then reconfirmed through various decisions. The last one, related to IMAP, reflected one of the main EcAp's achievements, i.e. establishing for the first time an integrated monitoring programme in the Mediterranean. She also recalled that the EcAp MED II project was EU financed to strengthen capacities and integrate southern and eastern Mediterranean countries into the process, focusing on gaps existing in monitoring and specific needs.

14. In this respect, Ms. Gurban pointed out that previous CORMON meetings had recommended SPI development to ensure policy makers are aware of scientific projects, are able to take advantage of project results and can contribute to them by providing inputs and recommendations from administrations. She recalled that three previous SPI workshops had been carried out, involving the MED POL and different RACs (Plan Bleu and SPA/RAC), as well as scientific researchers and experts, managers in charge of IMAP implementation and representatives from CPs. She finally stressed the importance and usefulness of the RBA for the implementation of IMAP, common thread of the forth SPI workshop.

15. Ms. Gurban announced that, in order to facilitate the implementation of a national IMAP-derived programme, a system of data sharing and management at the regional level had been undertaken by INFO/RAC and that a funding strategy was being prepared to mobilize resources by the end of the year.

16. Mr. Antoine Lafitte, Plan Bleu, made a brief presentation on the progress achieved under Output 3 of the ECAP MEDII project, regarding Science-Policy Interfaces. Mr. Lafitte quickly remembered the activities conducted and envisaged, as well as their principal objectives. He made a quick review of the three SPI workshops already carried out and described their main results and outputs issued in support of the implementation of IMAP.

Agenda item 3. Introduction to the RBA for monitoring

17. Mr. Sauzade, Plan Bleu, introduced the RBA and its application to monitoring in the context of the IMAP implementation, in the fields of marine litter, biodiversity and hydrography (see Working document UNEP(DEPI)/MED WG.432/5).

18. Mr. Sauzade started his intervention recalling that the RBA is an overarching principle of IMAP, and highlighting the interest of dedicating one SPI session to this approach. He pointed out that the RBA allows dealing with uncertainty in the attempt to reach Good Environmental Status (GES). Uncertainty is an implicit aspect in the field of the environment, especially regarding the marine environment and its management, since many valuable ecosystem components are to be protected while there is still much high uncertainty about threats and risks affecting them.

19. Mr. Sauzade highlighted the advantages of the application of the RBA, as an approach allowing balancing different languages and information coming from various sources (managers, decision-makers, scientists, other) that provides a base for a good communication. In addition, it is a method that enables identifying and prioritizing research needs for the implementation of monitoring, and provides a framework for the management of environmental risks according to different criteria (such as risk exposure, related effects and severity of impacts, determination of risk levels, etc.) allowing for prioritization. The implementation of the RBA requires going through a series of stages, including problem formulation, hazard identification, risk analysis (likelihood of exposure and environmental effects), and characterization of risks. The RBA is part of the preparatory phase of the strategic cycle that links monitoring, assessment and management, related to the determination of what and where to

monitor. This preparatory phase includes tasks that are intuitive to a certain extent, related to the collection of data on human activities and environmental systems, the identification of components present in the region to be evaluated and monitored, and the definition of ecologically relevant areas for assessment, as well as reference states and targets.

20. Mr. Sauzade stressed that, for the definition of the object of monitoring, it is necessary to identify components and locations likely to be at most risk of impact from human activities. Therefore, the risk of impact needs to be assessed (i.e. in terms of intensity, frequency and geographical extent of pressures) for each component. As a result, a set of components and locations ranging from expected high impact to low or no impact (reference areas) are to be compiled, and prioritised according to the risk of not achieving the established targets. In order to prioritise, the spatial and temporal occurrence as well as the intensity of pressures are to be considered. GIS tools are recommended to overlap and link different data in order to identify critical areas.

21. In conclusion, Mr. Sauzade stated that the RBA is a convenient way to design and optimize marine and coastal environmental monitoring and assessment strategies, as well as to improve their cost effectiveness. Therefore, it is believed a useful tool providing significant support in the implementation of IMAP.

Agenda item 4. Presentation of experiences on risk-based approach related to monitoring

22. Mr. Pascal Peduzzi, UNEP GRID, delivered a presentation on "Supporting monitoring with data, models and dissemination platforms".

23. Mr. Peduzzi showed how the development of tools, capacities and expertise regarding data acquisition and processing (i.e. modelling, programming, remote sensing, infrastructure for spatial data management and storage, maps and graphs, GIS, web mapping, or capacity building) allows spatially approaching and monitoring environmental states and pressures over time, from local to global scales, based on UNEP GRID's experience. He made particular focus on Mediterranean marine and coastal environments and provided various examples of the use of tools for spatial monitoring of specific pressures and environmental state changes (e.g. use of remote sensing for mapping and classifying marine ecosystems, as well as for mapping, modelling and assessing coastal evolution and erosion processes; mapping and evaluating the intensity of (e.g. fishing) activities; or assessing distribution and intensity of environmental pressures, such as oil spills). Mr. Peduzzi finally stressed the importance of disseminating and sharing data, and of the use of web services to make them available and interlinkable.

24. Mr. Andreas Paliaexis, from the European Commission, presented the "JRC's experiences on RBA for Biodiversity within the frame of the implementation of the MSFD: General methodology and concepts of RBA".

25. Mr. Palialexis highlighted the alignment between the EU MSFD and the UNEP/MAP EcAp Initiative, in terms of EO and indicators, and highlighted the opportunity for the EcAp process to build on MSFD experiences for IMAP implementation. In this sense, he stressed the usefulness of the RBA given the different capacities, and therefore needs, of CPs. Considering that assessing biodiversity is an ambitious and resource-demanding task, the RBA provides a framework for a pragmatic design of environmental monitoring. It provides guidance for prioritization based on relevancy of ecosystem components in terms of ecological value, types of human activities, impacts of pressures and risk to biodiversity of non-achieving GES. RBA can help CPs focus and allocate resources on particular needs, thus adopting cost-effective practices. Mr. Palialexis also pointed out some aspects of the RBA requiring further efforts, such as the identification of causal relationships between pressures and states; the way ecosystem respond to managerial actions, since multiple pressures act simultaneously; as well as linking the level of pressures and impacts to GES thresholds.

DISCUSSION

26. Participants expressed interest on the RBA through a rich exchange of views after the morning presentations. They agreed that the concept of risk was intuitive and shared, and that the application of the RBA appealed to common sense. However, they highlighted the complexity of the experiences presented, related to the application of methods. They also underlined the need to further develop on the cost-effectiveness aspect of the approach, for instance by developing methodological guidelines, in order to allow understanding how to conceive more efficient and less costly monitoring networks, in particular in countries with limited resources.

27. Despite a number of expressed methodological difficulties regarding the application of the approach, participants agreed that these could be overcome as there exist wide opportunities in developing new monitoring strategies. In this respect, they highlighted the need to grab the opportunity represented by the next update of the National Assessment Programmes (NAPs) for the application of the RBA at the national level.

DISCUSSION

28. After presentation of a number of issues related to RBA to be addressed in priority for the implementation of IMAP at the national level (appearing in Annex II to the present document) a discussion session was opened. The issue of the application of the RBA in relation to non-indigenous species (NIS) raised a number of participant interventions, dealing mostly with their recommendation to focus on areas easy to monitor as well as to include NIS hotspots, such as areas close to the Suez Canal or to ports facilities, besides Marine Protected Areas (MPAs). Furthermore, participants asked to consider separately NIS and AIS (alien invasive species) by reason of the differences they pose in terms of threat and risk; while NIS might not necessarily pose risk of disturbance to indigenous species, AIS might need surveillance and early warning system(s) allowing taking the necessary measures to avoid or mitigate their impacts.

29. Another issue that raised interest was the development of joint or integrated thematic monitoring, that is, the design of monitoring strategies allowing measuring different parameters simultaneously, as a way to become cost effective.

30. On the other hand, the rapid assessment method was suggested as a useful method that could be considered in the preparation of national monitoring programmes, since it allows for a quick evaluation of the existing monitoring methods for the different ecosystem components, in order to select the most suitable one(s) for each case. In this sense, the use of this "rapid assessment" could also contribute to enhance the cost effectiveness of the regional and national monitoring strategies (link: http://www.mass.gov/eea/docs/czm/invasives/ras-2013-final.pdf).

31. Overall, participants recognized that the RBA provides an approach understood both by scientists and decision makers, and constitutes thus a common language. They also noted that there is a link between RBA and the risk-based management regarding the need to concentrate resources and efforts to address identified priorities.

32. At the end of the session, participants expressed their concern regarding the issue of (temporal) sustainability of the several different SPI networks already in place.

Agenda item 5. SPI good practices and examples of risk-based approach

33. Mr. François Galgani, IFREMER, presented "How to address research needs for the marine litter and micro litter indicator related to biota".

34. Mr. Galgani recalled that three Common Indicators (two validated, one remaining Candidate) had been set up to assess marine litter under EcAp. He also recalled the origin of plastic waste in the production and consumption chain, as well as the different plastic litter types in the marine environment ranging from micro to macroplastics, causing different economic, social and environmental impacts. In the framework of IMAP, Candidate Indicator 24 calls for the selection of sentinel species to monitor impacts of plastics. In this respect, the RBA provides a risk assessment framework useful to define areas to monitor, based on the identification, analysis and evaluation of risks, as well as in terms of relevancy of impacts. High risk areas might be identified and prioritized by overlapping information (from observational data or modelling) of the spatial distribution of litter and relevant ecosystem components (e.g. sea turtles, fish populations) or human uses (e.g. tourism, fisheries).

35. Ms. Kalliopi Pagou presented "The implementation of a joint marine monitoring for the Mediterranean. Experiences from the IRIS-SES project".

36. Ms. Pagou recalled that the Integrated Regional Monitoring Implementation Strategy in the South European Seas (IRIS-SES) Project is a pilot project (2014-2015) set in the framework of the EU MSFD. The MSFD involves increasing monitoring efforts, but foresees equal or less financing, and calls for coherence among MS to get comparable results. Therefore, the project envisaged highlighting opportunities to carry out joint monitoring programmes (JMP), through the identification of links between different MSFD monitoring requirements, in order to develop decision making tools to support management. Gathering data on socioeconomic maritime sectors and pressures, on the one side, and on ongoing monitoring programmes, on the other side, allows overlapping information and thereby provide recommendations for the planning of a monitoring strategy further focusing on identified needs. Some lessons can be drawn from IRIS-SES, namely: the need for strong coordination among countries, to develop comparable methods and carry out similar practices (including intercallibration) allowing for the comparability of resulting data; or the need for a data repository, well-coordinated and top-down managed to ensure data quality. Ms. Pagou also insisted on the fact that JMP should be based on existing monitoring programmes and strategies, and suggested that MPAs could serve as opportunities to implement them.

37. Mr. Stelios Katsanevakis, Aegean University, provided a visual presentation on "Methods for monitoring marine alien invasions and their impacts on biodiversity".

38. Mr. Katsanevakis stated that the objective of his intervention was to present tools generating products easily understandable by policy makers and, therefore, providing answers to their needs regarding biological impacts of alien invasive species (AIS). The first method, the CIMPAL index, was created to reflect impacts of high alien species richness in the Mediterranean, based on the number and abundance (or presence) of invasive species, the extent of affected habitats (coverage or presence/absence), and impact weight of species in specific habitats, ranging from no impact to individual, population or community impacts. The CIMPAL index allows for determination of hotspot areas on which impacts of AIS are higher, therefore indicating areas (and species and/or habitats) to be prioritized for management actions. On the other hand, a second methods estimating AIS occupancy was presented. Occupancy - the probability of a species (AIS in this case) to be present in a specific area- is estimated based presence/absence data, yet going beyond and providing a rough estimate of population state. It was pointed out that collection of information to be used in the application of this method is easy and cheap to collect. Moreover, it was stressed that the method can be used in many studies, e.g. of distributional range and/or temporal trends (useful for IMAP's Common Indicator 6) as well as in large-scale monitoring programs (dealing with large-scale coverage and different species). This method also issues areas showing different levels of AIS occupancy; areas of higher occupancies can be prioritized for management actions to control AIS populations.

39. Mr. Samir Grimes, from the Algerian National School of Marine Sciences and Coastal Management, presented the "Risk-based Approach for monitoring marine litter, coastal georisks, biodiversity and fish stocks. State of play and perspectives in Algeria".

40. Mr. Grimes recalled that environmental surveillance and monitoring have often been based on risk and vulnerability evaluation and that in the framework of the EcAp Initiative it is necessary to develop a management system based on agreed tools, indicators and standards. He underlined the need to act in a coordinated, efficient and durable way so that different institutions (academic, administrative, etc.) meet requirements from different agreements in an optimal manner. In Algeria, in order to identify where to allocate resources, a synthetic map of the coastal zone based on scientific works has been produced to display no-data areas, high biodiversity richness areas, zones of intense pressures and, as a result, areas of high vulnerability (hotpots). Capturing together all this information will allow conceiving a systematic and comprehensive monitoring system covering the entire coastal zone, focusing on ecosystem components and human pressures, as well as the standardization of data according to a number of biotic indices. A series of examples were provided, regarding the monitoring of old (algae blooming, coastal erosion) and new issues (e.g. marine litter). Finally, Mr. Grimes concluded by highlighting some critical aspects in need of further efforts to overcome existing constraints, namely: improving data collection (also, and especially, socioeconomic and institutional); improving involvement and consultation of stakeholders, to enhance intersectoriality; or developing a medium and/or long term strategy allowing for the development of capacities, knowledge, and allow time to reach process objectives.

41. Ms. Claudette Spiteri, Deltares, delivered a presentation on the "Link to the usefulness of RBA for hydrography and coast monitoring", to address Common Indicator 15 on the extent of the habitats impacted by hydro alterations.

42. Ms. Spiteri pointed out the Deltares guidance document to assess changes in hydrographical conditions, which could be of use under IMAP. She referred to the RBA as a pragmatic approach allowing for the prioritisation of monitoring strategies and assessment, thereby managing large scales and keeping monitoring requirements practicable. Indeed, the RBA allows considering variation in scale, and areas of high pressures and high vulnerability. A three-step method was proposed for the assessment: the characterization of baseline hydrographical conditions (i.e. without structures, through monitoring and modelling); the assessment of hydrographical alterations induced by new structures (modelling); and assessment of habitats directly impacted by hydrographical changes (through overlaying alterations with habitat maps). In the framework of IMAP, there is a need to identify significant alterations (i.e. pressures acting on biological habitats) of hydrographical conditions as well as to focus on vulnerable types of habitats (MPAs, breeding, spawning, etc.) in order to produce a final spatial map of the areas where hydrographical changes overlap key habitats. Ms. Spiteri underlined the need to determine the resolution/accuracy required in each case (i.e. spatial scales), according to the specific topography/ bathymetry, and taking into account that a data gradient exists between coastal and offshore areas. She also stressed that significant alterations might be evaluated through long-time series to distinguish them from natural variability. Ms. Spiteri ended by highlighting the opportunity brought by the assessment of EO7 to enhance SPI, due to the fact that scientific models are to be developed in line with policy requirements and partnerships will thus be needed between administrative bodies and the scientific communities.

43. Mr. Anthony M. Knights, Marine Biology and Ecology Research Centre at Plymouth University, presented "An exposure-effect approach for evaluating ecosystem-wide risks from human activities: the experience of the ODEMM project".

44. Mr. Knights recalled the valuable resources and ecosystem services provided by marine environments and the effort undertaken under the Millennium Assessment (2005) to reach consensus among stakeholders to quantify them. Under the ecosystem approach, He pointed out three interlinked spheres under the ecosystem approach,

45. Mr. Knights highlighted the complexity of interlinkages between drivers, pressures and states. Under the ODEMM Project, in order to evaluate threats and risks, an attempt to map and weigh existing relationships between maritime socioeconomic sectors, environmental pressures impacting the

environment, and ecosystem components experiencing state changes resulted in a picture reflecting the complex networks of ecosystem interactions (almost 10 000 recorded) in different regions from different sea basins. The threat each interaction poses to ecosystems was characterised and evaluated through expert judgement, in terms of habitat's spatial extent, frequency, degree of impact (severity) and persistence of pressures, and ecosystem resilience. This holistic methodology, based on the impact chain concept, allows evaluating risks from larger to lower scales and provides an integrated assessment of risk and management potential as it supports the setting of specific targets. It can help targeting key risk factors, by focusing on specific interests such as key sectors and related pressures, in order to assess the effects of management options regarding reduction of risks, since it allows identifying fast and slow recovery systems after implementing managerial measures. It is therefore a methodology suitable to underpin the decision-making process in order to render it more transparent and provide clear justification of trade-offs made.

DISCUSSION

46. Following presentations of scientific experts, a new discussion session was opened to allow participants to provide further recommendations on how to apply RBA for the implementation of IMAP.

47. Participants agreed on the usefulness of the RBA to help defining priorities among "risks" for environmental management and the need to further work and develop on it to facilitate its application in the framework of IMAP.

48. Participants acknowledged that the objective of the RBA is not the acquisition of knowledge in itself, but ensuring that we do not take unacceptable risks to society; in fact, the approach draws upon scientific knowledge that allows reaching an acceptable level of risk. In this context, the development of SPI platforms can be of particular interest for the optimal application of the RBA in the design of monitoring strategies for IMAP. In addition, it was noted by participants that the assessment of state changes (DPSIR approach) can provide an opportunity for the application of the RBA, in order to evaluate acceptable and inacceptable risks; however, the application of the RBA requires scientific knowledge regarding pressures, state changes and impacts (on human welfare).

49. Participants agreed that, in order to seek simplicity, the RBA needs to be applied by using existent and available data, taking into account that decision will certainly need to be make in a context of uncertainty. In this respect, whenever a notion of relationship between pressure and state changes exists, there will be an opportunity to implement the RBA, as it is considered that existent data provide sufficient knowledge to apply this approach.

50. In addition, it has been noted that participative sciences might partially allow compensating for scientific knowledge deficiencies in the framework of the RBA. Some participatory techniques, such as the "world café" have been suggested as useful to gather expert advice and opinion.

51. Finally, participants noted that SPI allows overcoming some critical concerns rising from the fact that time periods necessary to carry out scientific work differ from timing dictated by politics.

Agenda item 6. Recommendations on how to use the RBA to implement national IMAP for the three clusters

52. The Secretariat presented the Conclusions and Recommendations of the meeting which after minor changes were adopted and are included in Annex III to this report.

Agenda item 7. Any Other Business

53. Under the eight Agenda item, participants didn't raise and discuss any other matters.

Agenda item 8. Closure of the meeting

54. The President concluded the meeting and thanked the participants in his closing remarks for their constructive contribution to the meeting which resulted in the very good consensus about the way forward for the next steps in the implementation of IMAP. The Secretariat and Plan Bleu celebrated their fruitful collaboration and noted with thanks the significant guidance and inputs during the meeting, which allowed providing substantial recommendations for the progress of monitoring initiatives at the regional and national levels, as well as for the improvement and strengthening of SPIs to contribute to the successful implementation of IMAP across the region.

After the expression of usual courtesies, the President declared the meeting closed at 18.30 p.m. on Thursday 2nd March 2017.

Annex I
Agenda of the Meeting

Provisional Annotated Agenda

2nd march 2017

Agenda item 1: Opening of the Meeting and organizational matters (9.00-9.15)

UNEP(DEPI)/MED WG.432/1, UNEP(DEPI)/MED WG.432/2

The Meeting will be opened by Ms. Tatjana Hema, MAP Deputy Coordinator and Plan Bleu Representative.
The Meeting will elect one (1) President, three (3) Vice-Presidents and one (1) Rapporteur from among the participants.
The proposed provisional agenda appearing in document UNEP(DEPI)/MED WG.432/1 and annotated in the present document will be proposed for adoption by the meeting. The meeting will review and adopt the agenda and the proposed timetable contained in the Annex to the present document, including as appropriate issues suggested to be addressed under the item "Any other business" of the provisional agenda.
Simultaneous interpretation in English and French will be available for the plenary sessions. Documentation will be in English and French. As per practice, pre-session documentation will not be distributed on paper. Participants are encouraged to download the documentation on their computers in advance of the session.
Sessions are scheduled every day from 09:30-12:30 and 14:30-17:30.
The Meeting is expected to adopt a list of Conclusions and Recommendations.

Agenda item 2: State of play of the EcApMEDII project (9.15 - 9.30)

The Secretariat will give a short presentation on the EcApMedII project and the related output 3 dedicated to stronger Ecosystem approach related science-policy interface in the Mediterranean. A document has been prepared in order to present the objectives and main outcomes of the previous SPI workshops (UNEP(DEPI)/MED WG.432/3).

Agenda item 3: Introduction on the RBA for monitoring (9.30-9:50)

(UNEP(DEPI)/MED WG.432/4), (UNEP(DEPI)/MED WG.432/5)

Plan Bleu will introduce the Risk-based approach for marine monitoring (UNEP(DEPI)/MED WG.432/4) presented in the Background document related to on Risk-Based Approach (RBA) (UNEP(DEPI)/MED WG.432/5) and its usefulness for IMAP implementation (UNEP(DEPI)/MED IG.22/28).

Agenda item 4: Presentation on risk based approaches related to monitoring (9.50-10.45)

This session will be structured around 2 presentations done by UNEP Global Research Infrastructure Database in Geneva and Joint Research Centre (JRC). The JRC will make a presentation on the usefulness of Risk based approach (RBA) for Marine Litter Monitoring in Mediterranean and for Biodiversity within the frame of the implementation of the MSFD: General methodology and concepts of RBA.

DISCUSSION (11.00-12.30)

Following the above presentations and a synthetic presentation of issues identified as priorities on the use of RBA for the implementation of national IMAP and specifics of marine litter, biodiversity and fisheries and coastal and hydrography monitoring (UNEP(DEPI)/MED WG.432/4), participants will embark on a discussion and provide recommendations on the application of RBA for IMAP implementation and will give directions on further work related to SPI and on Risk-based approach for

marine monitoring.

Agenda item 5: SPI good practices and examples of risk based approach (14:00 - 16:15)

A series of presentations will be delivered by F. Galgani, Ifremer, France; K. Pagou, HCMR, Greece; S. Katsanevakis, Eagean University, Greece; S. Grimes, ENSMAL, Algeria; C. Spiterri, Deltares, Netherlands; A. Knights, University of Plymouth, UK; on : SPI good practices and examples of risk based approach to give an overview of the existing use of RBA for monitoring to marine litter, marine biodiversity, coast and hydrography at Mediterranean and national levels and related to the corresponding MAP Ecological objectives and IMAP indicators.

- How to address research needs for the marine litter and micro plastics indicator for biota, related to the application of the RBA for IMAP.
- The implementation of a joint marine monitoring for the Mediterranean. Experiences from the IRIS SES project.
- Developing and applying methods for marine monitoring. A focus on marine alien invasions and their impacts on biodiversity.
- Risk Based Approach for monitoring to Marine litter, coastal geo-risks, biodiversity and fish stocks. State of play and perspectives in Algeria.
- Presentation on MAP EO7 (Hydrography) and common indicator 15 and link with the usefulness of RBA for hydrography & coast monitoring
- An exposure-effect approach for evaluating ecosystem-wide risks from human activities: the experience of the ODEMM project

Following these presentations participants will undertake discussions and provide further recommendations on how to apply RBA for IMAP implementation.

Agenda item 6: Recommendations on how to use the RBA to implement national IMAP for the three clusters (16.30-17.15)

This session will review and agree as appropriate on a set of recommendations formulated by the audience n the risk based approach (RBA) to monitoring and assessment in order to support national IMAP implementation.

Agenda item 7: Any Other Business (17.15-17.30)

Agenda item 8: Closure of the meeting (17.30)

The Chairperson will close the Meeting at 17.30 hours on 2nd march 2017.

DRAFT TIMETABLE

Thursday, 2nd March 2017	
8.30-9.00 **9.00-9.15**	*Registration* ***Agenda item 1: Opening of the Meeting and organizational matters***
9.15-9.30	***Agenda item 2: State of play of the EcApMEDII project***
9.45-10:00	***Agenda item 3: Introduction on the RBA for monitoring***
9.50-10.45	***Agenda item 4: Presentation on risk based approaches related to monitoring***
11.00-12.30	***Discussion***
12.30-14.00	*Lunch Break*
14:00 - 16:30	***Agenda item 5: SPI good practices and examples of risk based approach***

16.30-17.15	***Agenda item 6: Recommendations on how to use the RBA to implement national IMAP for the three clusters***
17.15-17.30	***Agenda item 7: Any Other Business***

Annex II

Issues to be addressed for the implementation of IMAP at the national level in relation to RBA

Issues to be addressed for the implementation of IMAP at the national level in relation to RBA

1. **Which scientific improvements are needed the most for RBA practical implementation in relation to IMAP** (monitoring, evaluations and management)?

2. **More precisely, in line with IMAP, under practical implementation of RBA:** "*areas that are under high pressures and the biota that are known to be more sensitive would be identified*".

   What **scientific tools** are available?

3. As for **sensitive biota**, should the focus be on**:**

   - **Habitats**
   - **Spawning, breeding and feeding areas**
   - **Marine Protected Areas**
   - **Migration routes**
   - **Other?**

   What priorities, if any, could be made between them?
   As a practical & cost-effective approach, could the focus be on MPAs?

4. In relation to **non-indigenous species (NIS), is there a need for a different approach than the one adopted to monitor biodiversity common indicators?**

5. Which are the **main elements to consider for the optimization of monitoring strategies, in line with the RBA?**

6. In relation to marine litter, in terms of distribution and quantities (especially for micro-plastics), **what are the key steps / elements to locate hotspots?**

7. Regarding Common Indicator 15 (Location and extend of the habitats impacted directly by hydrographic alterations), **how to monitor the areas subject to hydrographical changes taking into account the spatial distribution of habitats?**

8. In relation to Common Indicator 16 (coastal monitoring)**, how urbanized areas in the vicinity of sensitive habitats can be highlighted?**

9. In relation to Candidate Indicator 25 (land use change), in line with RBA**, how to put the focus on areas of valuable habitats that were lost due to land use change? (e.g. changes from natural to urbanized areas)**

10. **Are there any opportunities for joint / integrated monitoring?**

    - of Marine litter with other Pollution and Biodiversity Indicators?
    - of seafloor litter and fish stock assessment surveys?
    - of addressing selected Biodiversity and Coastal Indicators?

Annex III
Conclusions and Recommendations

Recommendations and conclusions of the Workshop on Science Policy Interface (SPI) strengthening for the implementation of the IMAP in relation to Marine Litter, Biodiversity and Fisheries, Hydrography, with a focus on the Risk Based Approach (RBA) for monitoring

The Workshop dedicated to the SPI with a focus on the usefulness of RBA to monitoring has gathered the attendants of the Marine Litter, Biodiversity and fisheries and hydrography and coast CORMONs and scientific experts invited by Plan Bleu. It was acknowledged by the participants that the strengthening of Science Policy interface should be a very important component for IMAP implementation.

The Workshop resulted in the following recommendations and conclusions:

1. Based on the presentations regarding practical RBA applications, the meeting acknowledged that this approach is an efficient tool to develop monitoring and assessment schemes and enhance integration between Ecological Objectives.

2. The meeting recognized the important of RBA for (i) optimizing existing national coastal and marine monitoring programmes; and (ii) allowing prioritization of measures to be taken.
3. The RBA was agreed to be an approach offering benefits both for policy makers and for scientists in order to prioritize and ensure cost effectiveness on common grounds;

4. The meeting highlighted that in order to efficiently apply the RBA, there is a need to work towards shared methods related to different Ecological Objectives;

5. The meeting recognized the need for strong coordination on national level between various sectoral, administrative services and scientific experts who work on various aspects related to IMAP.

6. The meeting encouraged Contracting Parties to further exchange best experiences on their applications of the risk based approach in relation to IMAP implementation;

7. The meeting highlighted the benefits of integration and the importance of joint thematic monitoring to ensure coherence and cost efficiency.

8. The meeting highlighted that the RBA could be applied for monitoring and assessment of the environment to manage human activities and to support the Marine Spatial Planning.

9. The meeting highlighted that the development of guidelines to implement RBA could be useful for whom decide to use such approach in line with specific needs of IMAP, in a simple, user-friendly and concrete form, to provide a common language both for scientists and for monitoring experts and decision-makers on how RBA can guide their implementation efforts related to IMAP in a cost-efficient manner.

10. The meeting highlighted the need for capacity building and sharing of best practices in order to support those who chooses to apply RBA in the national monitoring schemes.

11. The meeting agreed on the further need, for implementing IMAP, also taking into consideration RBA, if suitable and needed, to address the issue of appropriate temporal and geographical scales for monitoring, reporting and assessment in the context of IMAP.

Annex IV
List of Participants

ALBANIA / ALBANIE	**Mr. Edvin Bica** Head of Sector Ministry of Environment, State of Inspectorate Tel: 355693245868 / 3556932456868 Email: edvinbica@gmail.com **Dr. Zamir Dedej** General Director National Agency of Protected Areas Tel: 35542238300 / 355682080733 Email: zamir.dedej@akzm.gov.al **Mrs. Klodiana Marika** Director Ministry of Environment Tel: 35542267623 / 355 692092872 Email: Klodiana.Marika@moe.gov.al **Ms. Ilda Shahu** Expert on EIA, SEA and Enviromental Standarts Ministry of Environment Tel: 355692964531 / 355692964531 Email: ilda_shahu@hotmail.com
ALGERIA / ALGÉRIE	**Mr. Reda Behlouli** Environmental Engineer Ministry of Water Resources and Environment Tel: 21321431144 / 213553581389 Email: r.behlouli@hotmail.fr **Ms. Souad Boustila** State Engineer in Environment Ministery of Water Ressources and Environment Tel: 21321431144 / 213774165488 Email: soad-cnl@hotmail.fr **Ms. Naïma Ghalem** Office manager Ministry of Water Resources and Environment Tel: 21321431144 / 213773866799 Email: ghalem_nm@yahoo.fr **Mr. Mokhtar Guerfi** Professor Higher Education

	Tel: 21323794823 / 213551513541 Email: sguerfi@yahoo.fr **Ms. Saida Laouar** Sous Directrice Ministère des Ressources en Eau et de l'Environnemet Tel: 21321434376 / 213771724752 Email: saidalaouar2017@gmail.com **Mr. Menhaouara Mohammed** Ingénieur d'etat Ministère des ressources en eau et de l'environnement Tel: 213775678819 / Email: cnlmostaganem@gmail.com
BOSNIA AND HERZEGOVINA / BOSNIE ET HERZÉGOVINE	**Mr. Admir Aladžuz** Biologist Hydro - Engineering Institute Sarajevo Tel: 387603285402 / 387603285402 Email: admir.aladjuz@gmail.com **Mrs. Senida Dzajic Rghei** Researcher / Designer Hydro-Engineering Institute Sarajevo Tel: 38761387683 / 38761387683 Email: senida_dz@hotmail.com **Dr. Vesna Tunguz** University professor Faculty of Agriculture University of East Sarajevo Tel: 38757340401 / 38766192354 Email: vesna.tunguz@gmail.com
CROATIA / CROATIE	**Mr. Igor Cizmek** Assistant Minister Ministry of Construction and Physical Planning Tel: 38513782471 / 38598448368 Email: igor.cizmek@mgipu.hr **Mrs. Gordana Kovacevic** Head of Service Ministry of Construction and Physical Planning Tel: 38513782457 / 385992685031 Email: gordana.kovacevic@mgipu.hr **Mr. Branko Petricevic**

	Assistant Director Hydrographic Institute of the Republic of Croatia Tel: 38521308814 / 385912157060 Email: branko.petricevic@hhi.hr **Mr. Pero Tutman** Research Scientist Institute for Oceanography and Fisheries Tel: 38521408030 / Email: tutman@izor.hr
CYPRUS / CHYPRE	**Dr Konstantinos Antoniadis** Officer of Fisheries and Marine Research Ministry of Agriculture, Rural Development and Environment Tel: 35722807854 / Email: kantoniadis@dfmr.moa.gov.cy
EGYPT / EGYPTE	**Dr. Reda Aboumoustafa** Environmental researcher Egyptian Environmental Affairs Agency (EEAA). Tel: 20572282455 / 201061151582 Email: redaabomoustafa1@gmail.com **Ms. Fatma Bekhit** Environmental Researcher Egyptian Environmental Affairs Agency Tel: 2034575130 / 01155094594 Email: fatma-m-ahmed@hotmail.com **Mrs. Amany Mahmoud** General Director of sea water quality environmental ministry Tel: 20 / 2001066397694 Email: amanyyes@yahoo.com **Mrs. Noha Sami** Manager of ICZM EEAA Tel: 2025256452 / 01092704644 Email: nohasamy2000@yahoo.com

EUROPEAN UNION / UNION EUROPEENNE	**Ms. Anna Cheilari** Policy officer European Commission Tel: 3222965348 / Email: anna.cheilari@ec.europa.eu
FRANCE / FRANCE	**Dr. Olivier Brivois** Project manager BRGM Tel: 33238643094 / Email: o.brivois@brgm.fr **Mrs. Francoise Claro** coordinatrice du GTMF Muséum national d'Histoire naturelle Tel: 33140793789 / 33687400205 Email: claro@mnhn.fr **Mrs. Olivia Gerigny** Researcher in Marine Ecology, MSFD Marine Litter Ifremer Tel: 33494304943 / 33 6 61 98 58 96 Email: olivia.gerigny@ifremer.fr
GREECE / GRÈCE	**Mrs. Maria Rampavila** Hellenic Focal Point at Pap/Rac Hellenic Ministry of Environment and Energy Tel: 302131515332 / 306977772836 Email: m.rampavila@prv.ypeka.gr **Ms. Evangelia Stamouli** Officer Ministry of Environment and Energy Tel: 300302106969807 / 306941595976 Email: e.stamouli@prv.ypeka.gr **Dr. Thomais Vlachogianni** Programme/Policy Officer MIO-ECSDE Tel: 302103247490 / 306976776132 Email: vlachogianni@mio-ecsde.org
ISRAEL / ISRAEL	**Mr. Frederic Arzoine** Deputy director Israeli Ministry of Environmental Protection Tel: 972 / 506237621

	Email: freda@sviva.gov.il **Ms. Maayan Haim** Coastal Environment Engineer Israel Ministry of Environmental Protection Tel: 97248633513 / Email: maayanh@sviva.gov.il **Dr. Yael Segal Rozenberg** Researcher Tel: 97248565215 / 972585196196 Email: yael_segal@ocean.org.il **Dr. Nir Stern** Researcher Israel Oceanographic and Limnological Research Institute Tel: 97248565230 / Email: nirstern@ocean.org.il **Dr. Ruth Yahel** Marine Ecologist Israel Nature and Parks Authority Tel: 972532300191 / 972532300191 Email: ruthy@npa.org.il **Dr. Dror Zurel** Marine monitoring and research coordinator Israel Ministry of Environmental Protection Tel: 972506237652 / Email: drorz@sviva.gov.il **Dr. Dov Zviely** Costal and Marine Processes Consultant Ministry of Environmental Protection Tel: 972525805758 / Email: zviely@netvision.net.il
ITALY / ITALIE	**Mrs. Lorenza Babbini** Researcher Italian Ministry for the Environment, Land and Sea Tel: 39657228404 / Email: lorenza.babbini@isprambiente.it **Mr. Matteo Braida** Scientific Expert - Environmental Engineer Unità Assistenza tecnica Sogesid spa presso Ministero dell'Ambiente e della Tutela del Territorio e del Mare - DG PNM

	Tel: 393387202259 / Email: braida.matteo@minambiente.it **Prof. Maria Cristina Fossi** Full Professor in Ecology University of Siena Tel: 390577232913 / 393204374459 Email: fossi@unisi.it **Mr. Roberto Giangreco** officer Italian Ministry of Environment Territory and Sea Tel: 390657228406 / 3473313191 Email: giangreco.roberto@minambiente.it **Dr. Giordano Giorgi** Researcher Italian National Institute for Environmental Protection and Research Tel: 390650074640 / 393316408819 Email: giordano.giorgi@isprambiente.it **Mrs. Maria Teresa Spedicato** Researcher COISPA Tel: 390805433596 / 393357321505 Email: spedicato@coispa.it **Mr. Leonardo Tunesi** Research Director ISPRA Tel: 390650074776 / 393346243333 Email: leonardo.tunesi@isprambiente.it **Mrs. Stefania Di Vito** Legambiente scientific office Legambiente ONLUS Tel: 393332672445 / Email: s.divito@legambiente.it
LEBANON / LIBAN	**Mrs. Olfat Hamdan** Head of Department Ministry Of Environment Tel: 9611976555 / 9613998334 Email: o.hamdan@moe.gov.lb **Ms. Lara Samaha**

	Head of Department Ministry of Environment Tel: 9613976555 / 9613717127 Email: l.samaha@moe.gov.lb **Mr. Adel Yacoub** Head of Department Ministry of Environment Tel: 9611976555 / 9613370002 Email: a.yacoub@moe.gov.lb **Mr. Hassan Hoteit** Civil Engineer Ministry of Environment Tel: 9611976555 / 9613261455 Email: hhoteit@moe.gov.lb **Ms. Sabine Ghosn** Head of Department Ministry of Environment Tel: 9611976555 / 9613740171 Email: s.ghosn@moe.gov.lb **Mr. Bilal Issmail** Geologist Ministry of Environment Tel: 96170765346 / 96170765346 Email: B.Issmail@moe.gov.lb
LIBYA / LIBYE	**Mr. Ibrahem Ben Amer** Lecturer Omar Mukhtar University (OMU) Tel: 21864633311 / 21622724279 Email: benamer.ly@gmail.com **Dr. Mohamed Salem Hamouda** Technical Advisor/Focal Point Environment General Authority Tel: 218214871590 / Email: mshamouda@yahoo.com **Dr. Esmaile Shakman** University Staff Tripoli University Libya Tel: 218 / 218922761703

	Email: shugmanism@yahoo.com
MALTA / MALTE	**Ms. Angela Bartolo** Environment Protection Officer Environment Resources Authority Tel: 35622923500 / 35679054460 Email: angela.bartolo@era.org.mt **Mr. Gilbert Gauci** Assistant Environment Protection Officer Environment and Resources Authority Tel: 35622923616 / 35679958192 Email: gilbert.a.gauci@era.org.mt
MONACO	**Mr. Ludovic Aquilina** Head of Section Departement of the Environment Tel: 37798984421 / Email: luaquilina@gouv.mc
MONTENEGRO / MONTÉNEGRO	**Ms. Milena Batakovic** Senior Advisor Environmental Protection Agency Tel: 38267225504 / Email: milena.batakovic@epa.org.me **Mr. Luka Calic** Head of Hydrographic Department Institute of Hydrometeorology and Seismology of Montenegro Tel: 38220655183 / 38268518438 Email: luka.calic@meteo.co.me **Ms Jelena Knezevic** Head of Department for Sustainable Development and ICZM Ministry of Sustainable Development and Tourism Tel: 38220446225 / 382 (0) 67 255 604 Email: jelena.knezevic@mrt.gov.me

	Dr. Milica Mandic Research associate Institute of marine biology, University of Montenegro Tel: 38232303140 / 382 69 264 793 Email: mamilica@ac.me
MOROCCO / MAROC	**Mr. Mohammed El Bouch** Director Ministry Tel: 212537770118 / 212673082936 Email: elbouch21@yahoo.fr **Mrs. Fatima Zohra Bouthir** Head of laboratory Institut National de Recherche Halieutique Tel: 212522397385 / 212661377684 Email: fzbouthir@gmail.com **Mrs. Naoual Zoubair** Chef du Service Littoral Ministère délégué chargé de l'Environnement Tel: 212537570601 / 212662108154 Email: zoubair@environnement.gov.ma **Mr. Hamid Chrifi** Coordinateur OING Enda Maghreb Tel: 212537680673 / 212661353165 Email: hamid.chrifi@enda.org.ma
SLOVENIA / SLOVENIE	**Ms. Tina Centrih Genov** Nature conservation adviser Institute of the Republic of Slovenia for Nature Conservation Tel: 38656710900 / Email: tina.centrih-genov@zrsvn.si **Dr. Manca Kovac Virsek** Independent expert associate Institute for Water of the Republic of Slovenia Tel: 38614775301 / Email: manca.virsek@izvrs.si **Mr. Borut Mavric** Reasearcher with PhD National Institute of Biology Tel: 38640234457 /

	Email: borut.mavric@nib.si **Mr. Uros Robic** Technical assistant Institute for Water of the Republic of Slovenia Tel: 38641530687 / Email: uros.robic@izvrs.si **Mr. Štefan Trdan** Technical assistant Institute for water of the Republic of Slovenia Tel: 38614775341 / 38631468367 Email: stefan.trdan@izvrs.si
SPAIN / ESPAGNE	**Dr. Francisco Alemany** Científico Titular Ministerio de Economía y Competitividad Tel: 34 / 34 667561549 Email: francisco.alemany@ba.ieo.es **Dr. Rosa Balbín** Researcher Instituto Español de Oceanografía Tel: 34971401561 / Email: rosa.balbin@ba.ieo.es **Mr. Jose Luis Buceta Miller** Technical Advisor CEDEX Tel: 34913357676 / 34652461354 Email: Jose.L.Buceta@cedex.es **Ms. Laura Díaz** Water and Marine Policy Advisor Spanish Ministry of Agriculture and Fisheries, Food and Environment Tel: 34915975570 / Email: ldiaz@magrama.es **Mr. Jaume Fons-Esteve** Senrior researcher Universitat Autònoma de Barcelona Tel: 34935813520 / Email: jaume.fons@uab.cat **Mr. Jesus Gago** Researcher

	Ministry of Economy and Competiveness Tel: 34986492111 / 34674255703 Email: jesus.gago@vi.ieo.es **Mr. Juan Gil Gamundi** Technological of MAPAMA Ministry of Agriculture and Fisheries, Food and Environment Tel: 34915976289 / Email: jgilgamu@magrama.es **Ms. Marta Martínez-Gil Pardo de Vera** Head of Area Ministry of Agriculture and Fisheries, Food and Environment Tel: 34915975590 / Email: mmgil@magrama.es **Mr. Jorge Ureta Maeso** Sea Protection Division Spanish Ministry of Agriculture, Food and Environment Tel: 34915975508 / 34635113045 Email: jureta@magrama.es
TUNISIA / TUNISIE	**Mrs. Leila Ben Abdeladhim** Principal Engineer Tel: 21671906577 / 21658159612 Email: l.babdeladhim@gmail.com **Mr. Jabri Hamdi** Engineer Ministère des Affaires Locales et de l'Environnement/ANGEd Tel: 21678442082 / 21698919994 Email: jabrihamdi@yahoo.fr **Mr. Samir Kaabi** Head of Departement Agence Nationale de Protection de l'Environnement Tel: 21671845003 / 21698621751 Email: kaabi_samir@yahoo.fr **Prof. Chouba Lassaad** Chercheur Marine National institute of Sciences and Technologies (INSTM) Tel: 21671735848 / 21698426234 Email: lchouba@yahoo.fr **Prof. Jamila Ben Souissi**

	Professeur et Directrice de Département Ministère de l'Agriculture /Institut National agronomique de Tunisie Tel: 21671287110 / 21655289100 Email: jbensouissi@yahoo.com **Dr. Sana Taktak Keskes** President Organisation Tel: 21674400252 / Email: sana.t.keskes@gmail.com
TURKEY / TURQUIE	**Ms. Tutku Gökalp** City Planner Ministry of Environment and Urbanism of Turkey Tel: 903124102398 / 905368517915 Email: tutku.gokalp@csb.gov.tr **Mrs. Hacer Selamoglu Caglayan** Environment Expert/Chemist Turkish Republic Ministry of Environment and Urbanization Tel: 903124982150 / 905052033731 Email: hacer.caglayan@csb.gov.tr

INTERNATIONAL AND NON GOVERNMENTAL ORGANISATIONS

INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN)	**Mr. Antonio Troya** Director Malaga, SPAIN Tel: 34415441409 / Email: antonio.troya@iucn.org
EUROPEAN ENVIRONMENT AGENCY (EEA)	**Ms. Ana Tejedor** WISE-Marine coordination & cooperation with Regional Sea Conventions Copenhagen K, DENMARK Tel: 4533367227 / 4553691981 Email: ana.tejedor@eea.europa.eu

SCIENTIFIC RESEARCHERS AND EXPERTS

Dr. Dror Angel
Research Scientist
University of Haifa
Haifa
Israel

Tel: 97248288130 /
Email: dangel@univ.haifa.ac.il

Mr. Francois Galgani
Project manager
IFREMER
Bastia
France

Tel: 33495389510 / 33638425290
Email: francois.galgani@ifremer.fr

Dr. Stelios Katsanevakis
Researcher Ecology, Marine Biology
University of the Aegean
Greece

Tel: (+30)22510 36821
Email: katsanevakis@marine.aegean.gr

Dr. Antony Knights
Lecturer in Marine Ecology
Plymouth University
School of Biological and Marine Sciences
PL4 8AA, Plymouth
United Kingdom

Tel: 441752587889 / 447794344880
Email: antony.knights@plymouth.ac.uk

Dr. Kalliopi Pagkou
Research Director
Hellenic Centre for Marine Research (HCMR)

Tel: 302291076409 / 306972232496
Email: popi@hcmr.gr

Mr. Andreas Palialexis
Scientific Officer
EC Joint Research Centre
Via E. Fermi 2749, Building 27 (TP 270)
21027, Ispra
Italy

Tel: 390332789206 / 306948588600
Email: andreas.palialexis@ec.europa.eu

Mr. Pascal Peduzzi
Director
Global Change & Vulnerability Unit
UNEP GRID
Geneva

Tel: (+41 22) 510 56 76
Email: pascal.peduzzi@unepgrid.ch

Mr. Grimes Samir
Researcher
National High School of Marine Sciences and Coastal Management
University Campus of Dely Brahim, Bois des Cars,
16320, Algiers
Algeria

Tel: 21321382124 / 213672554339
Email: samirgrimes@yahoo.fr

Mrs. Claudette Spiteri
DELTARES
Marine and Coastal Systems Unit
P.O. Box 177, 2600 MH Delft
The Netherlands.

Tel: (+30) 22710 41111.
Email: claudette.spiteri@deltares.nl

SECRETARIAT TO THE BARCELONA CONVENTION AND COMPONENTS OF THE MEDITERRANEAN ACTION PLAN

UNEP/MAP	**Ms Tatiana Hema** Deputy Coordinator Tel.:+30 210 7273115 E-mail: tatjana.hema@unep.org **Ms. Gyorgyi Gurban** Ecosystem Approach Project Manager Tel: 302107273105 / Email: gyorgyi.gurban@unep.org **Ms Virginie Hart** Programme Officer Tel: 302107273122 / Email: virginie.hart@unep.org **Mr. Carlos Guitart** Marine Environment Strategies/Policy/Science Consultant Tel: 34639305081 / Email: guitart.carlos@gmail.com **Mr. Christos Ioakeimidis** Consultant Tel: 302107273126 / 306974946994 Email: christos.ioakeimidis@unep.org **Mr. Georgios Petridis** Procurement and Meeting Services Assistant Tel: 302107273125 / Email: giorgos.petridis@unep.org **Mrs Nathalie Gomez** Programme Assistant Tel: Email: nathalie.gomez@unep.org
PLAN BLEU REGIONAL ACTIVITY CENTRE (PLAN BLEU/RAC)	**Mr Didier Sauzade** Programme Officer Marine and Coastal Environments Tel: +33 4 84 08 00 52 E-mail: dsauzade@planbleu.org **Mr Antoine Lafitte** Programme Officer Integrated Coastal Zone Management E-mail: alafitte@planbleu.org

	Mrs Carla Murciano Consultant Ecosystem Approach to Marine Management Tel: +33 4 84 08 00 50 E-mail: carlamurciano@gmail.com
REGIONAL ACTIVITY CENTER FOR SPECIALLY PROTECTED AREAS (SPA/RAC)	**Mr. Khalil Attia** Director Tel: 21671206465 / 21694430792 Email: director@rac-spa.org **Mrs. Lobna Ben Nakhla** Programme Officer Tel: 21671206485 / 21698600313 Email: lobna.bennakhla@rac-spa.org **Mr. Atef Ouerghi** Programme officer Tel: 21620510728 / Email: atef.ouerghi@rac-spa.org **Mr. Mehdi Aissi** Project Officer Tel: 21697948163 / Email: mehdi.aissi@rac-spa.org **Mr. Chedly RAIS** Consultant RAC/SPA Tel: 21698444629 / Email: chedly.rais@gmail.com **Ms. Asma Yahyaoui** EcAp MED II Technical Assistant Tel: 216 / 21626867052 Email: asma.yahyaoui@rac-spa.org **Mrs. Imtinen Kefi** Financial Assistant Tel: 21671206485 / 21698526735 Email: imtinen.kefi@rac-spa.org **Mrs. Naziha Guesmi Ben Moussa** Administrative Assistant Tel: 216206642 / 216 99 495 642 Email: naziha.benmoussa@rac-spa.org

PRIORITY ACTIONS PROGRAMME REGIONAL ACTIVITY CENTRE (PAP/RAC)	**Mr. Marko Prem** Deputy Director Tel: 38521340475 / Email: marko.prem@paprac.org **Mr. Ivan Sekovski** Programme officer Tel: 38521340480 / 385981832844 Email: ivan.sekovski@paprac.org

UNITED NATIONS

EP

UNEP(DEPI)/MED WG. 438/8

UNITED NATIONS
ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN

UNEP

02 June 2017
Original: English

Joint Workshop on Science Policy Interface (SPI) strengthening and Ecosystem Approach Coordination Group Meeting on IMAP scales of monitoring and assessment, including the next QSR

Nice, France, 27-28 April 2017

Report of the Meeting on "Joint Workshop on Science Policy Interface (SPI) strengthening and Ecosystem Approach Coordination Group Meeting on IMAP scales of monitoring and assessment, including the next QSR, Nice, France, 27-28 April 2017".

UNEP/MAP
Athens, 2017

Table of Contents

Introduction

1. The workshop was composed of two sessions. The SPI session on the 27th of April 2017 and a specific session to discuss the Quality Status Report (QSR) Draft Assessment factsheets on Marine Litter and Pollution, Biodiversity and fisheries, and Hydrography and coast on the 28th April. The workshop was co-organized by UNEP/MAP, MEDPOL, SPA RAC and PAP RAC. Joining these events enabled to gather scientific researchers invited by Plan Bleu for the SPI session, scientific experts designated by governments of Contracting Parties to the Barcelona Convention and EcAp coordination group members (National Focal Points of UNEP MAP).

2. Plan Bleu is mandated by UNEP/MAP to coordinate one of the key activities of the EcAp MED II project (2015-2018), focusing on the science-policy interface (SPI) strengthening. Indeed, in the framework of the implementation of the ecosystem approach (EcAp), the Integrated Monitoring and Assessment Programme (IMAP) has been adopted to monitor 27 indicators set up to assess the status of the Mediterranean Sea and Coast towards to achieving their Good Environmental Status (GES). In order to enable the implementation of the IMAP, it is crucial to bridge existing gaps between the scientific and policy making spheres. To this purpose, until 2018, a series of SPI workshops are planned, aiming to identify scientific needs in programmes that contribute to implement IMAP, to achieve the GES and detail solutions to fill them. A good coordination with the corresponding thematic UNEP/MAP Regional Activity Centers (RACs) and MEDPOL, having to support IMAP implementation at regional and national scales, is essential to involve environmental policy makers beside scientists; therefore, the principle of SPI workshops joined to thematic events organized by RACs has been agreed.

3. The first workshop, organized by Plan Bleu, took place in Sophia Antipolis (France) in December 2015. The objective was to bring together key stakeholders (scientists and policy makers) to discuss the implementation of science-policy interface (SPI) activities for IMAP. During this workshop, a first set of around 15 key cross-cutting and topic-specific knowledge gaps to be filled for the implementation of IMAP was identified, along with proposed actions to be taken to address these gaps. Since the Inception workshop held in December 2015, three SPI thematic workshops have been carried out: the second SPI strengthening workshop focused on IMAP pollution issues and was held as a specific session of a UNEP/MAP CORMON (Correspondence Group on Monitoring) on Pollution issues (19-21 October 2016, Marseille, France); the third meeting on SPI strengthening targeted biodiversity and MPAs and was held as a joint session of the 2016 Forum of Marine Protected Areas (MPAs) in the Mediterranean (Tangier, Morocco, 28th November 2016); the fourth meeting was an integrated SPI workshop gathering policy makers and scientists who attended the CORMON of the three clusters and focused on Risk-based approach to optimize monitoring; the firth meeting was a joint workshop on Science Policy Interface (SPI) strengthening and Ecosystem Approach Coordination Group Meeting on IMAP scales of monitoring and assessment, including the next QSR (27-28 April 2017).

4. Further to the decision IG. 22/7 of COP19 of the Barcelona Convention in February 2016 adopting the IMAP, the objective of this last workshop on SPI strengthening was to highlight the definition of relevant spatial and temporal scales for monitoring to marine ecosystem and supporting the implementation of IMAP at national levels.

Participation

5. The meeting was attended by experts designated by the following Contracting Parties: Albania, Algeria, Egypt, Israel, Italy, Lebanon, Libya, Malta, Montenegro, Morocco, Slovenia, Tunisia and Turkey. The UNEP/MAP Secretariat was represented by the MED POL Programme, Plan Bleu, SPA/RAC, PAP/RAC and INFO/RAC. The meeting was also attended by Ifremer (representative of the French Ministry of Environment), the European Environmental Agency (EEA) as well as by several key scientific experts from 7 beneficiary countries of EcApMEDII project working in national institutions and regional projects. The full list of participants is attached as Annex I to the present report.

Agenda item 1. Opening of the Meeting and Organizational Matters

6. Ms. Gyorgyi Gurban, UN-Environment/MAP, project manager of the EcApMEDII project welcomed and thanked the participants to the fifth Science Policy Interface (SPI) workshop. The Secretariat highlighted the importance of linking decision makers and scientific experts towards increasing sustainability of human practices, and stressed that the development of SPI is becoming a priority for Contracting Parties to the Barcelona Convention. It was expressed that EcAp implementation needs a lot of inputs from both sides: policy makers and scientists. The implementation phase of IMAP is ongoing which means a revision of national monitoring programmes at national level and an assessment at regional level. The Secretariat stressed its confident on the outputs of the meeting to feel into national implementation process of IMAP.

7. It clearly appears according to the Secretariat that coordinated and strong marine monitoring could strengthen the science policy interface. It was mentioned the current work related to Assessment and the QSR 2017. This work follows a regional approach and is based on IMAP Common Indicators. The Secretariat reminded that the first day is dedicated to the SPI and the second day will be dedicated to discuss specific factsheets on QSR. The outcomes of the meeting will be to feed into the regional and national IMAP.

8. Mr. Didier Sauzade, Plan Bleu Officer for marine ecosystems, welcomed the participants on behalf of Plan Bleu. He announced he will be soon retired and passes the lead of this action to his colleague Antoine Lafitte.
Plan Bleu reminded that the action of Science-policy interface is important to be strengthened. Here, the question of marine and coastal environmental policy within the framework of EcAp is concerned. Strengthened the science - policy interface means that enable scientists to better assist managers and decision makers in monitoring, assessments and measures to achieve good environmental status (GES).

9. Plan Bleu reminded that most of the audience is familiar with the fundamental importance of science for environmental policy making and that dialogue between scientists and managers is not easy, mainly because the time of the scientific research is not the same of the management. So, there are more and more initiatives around the world to facilitate this dialogue and strengthen this interface. This is particularly true for the implementation of IMAP, which represents a major challenge.

10. Plan Bleu said that this workshop is the first one organized on this subject. The need for these cross-sectoral workshops has emerged during the previous workshops and is in line with the revision of the national surveillance systems to correspond to the specificities of IMAP for the Mediterranean countries.

11. Plan Bleu stressed that there is therefore concerned with the temporal and spatial scales of monitoring. These scales have not been fully defined in IMAP reference documents that mostly specify indicators, target values, methods. They are left to the countries to do so. The definition of these scales has a direct consequence on the cost of monitoring. In general, finer the scales are, higher the cost is, but also higher the quality of the results is. This depends of course on the variability and predictability of the phenomena to be monitored, greater the variability and the unpredictability are, more the scales must be fine to provide reliable results. Countries have a responsibility to find an acceptable compromise between reasonable cost and acceptable quality of assessments that derive from monitoring to build measurement programs relevant to achieving good environmental status. It is therefore these important questions that the audience was invited to debate during the workshop.

Adoption of the Agenda

12. The proposed Provisional Agenda appearing in document UNEP(DEPI)/MED WG.438/2 was adopted and appears as Annex II to the present report.

Election of officers

13. In accordance with the Rules of procedures for meetings and conferences of the Contracting Parties the meeting elected one (1) President, three (3) Vice-Presidents and one (1) Rapporteur from among the participants, as follows:

President:	Mr. Klodiana Marika, Albania
Vice-President 1:	Mr. Abed El Rahman HASSOUN, Lebanon
Vice- President 2:	Ms. Samia GRIMIDA, Libya
Vice- President 3:	Mr. Mitjia Bricelj, Slovenia
Rapporteur:	Ms. Tamara MICALLEF, Malta

14. The Chair emphasized the need to bridge the gap between science, policy making and politics, in order to have a vision of the existing constraints and make the good decisions to progress towards achieving GES in the Mediterranean Sea by 2020.

Agenda item 2. Further Implementation of the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria: Focus on Scale of monitoring

UNEP(DEPI)/MED WG.438/3; UNEP(DEPI)/MED WG.438/Inf.7

15. Ms. Maria Caparis, expert and consultant for Plan Bleu delivered a presentation on the definition of temporal and spatial scales of monitoring. The presentation was also prepared by Ms. Marina Penna and Mr. Carlos Guitart. It was indicated that the 3 clusters (Pollution and Marine Litter; Biodiversity and Fisheries; Coast and Hydrography) were previously discussed in 3 separate CORMON meetings.

16. It was reminded the definition of temporal and spatial Scales for monitoring and assessment in the Mediterranean policy context. Monitoring scales and assessment scales are linked but distinct, the latter defining the scale at which for each specified element GES has been achieved or not, a process that needs to draw from and aggregate the monitoring data that will often be collected at finer spatial and temporal scales. She also said that national scales of monitoring and regional level assessment are linked, as data on monitoring serve to feed the assessment, but are addressed through different methodological approaches.

17. It was pointed out that within the EcApMEDII project, the Secretariat and the RACs support countries which are required to adapt to the new requirements of the IMAP to design their national monitoring. It was also stressed that strengthening the Science Policy Interface (SPI) is crucial to address the new IMAP requirements to design national monitoring.

18. It was recalled that the concept of "scales" reflects the necessity to clearly define the different scales of the integrated monitoring, and assessment actions, using a "nested approach", as depicted in the IMAP initial draft guidance document. The state of the art of the definition of relevant spatial and temporal scales for the three IMAP clusters and related EOs (Biodiversity, Fisheries and NIS; Pollution and Marine Litter; Hydrography and Coasts) and a final synthesis of recommendations were presented.

19. Mr. Samir Grimes, from the Algerian National School of Marine Sciences and Coastal Management, gave a presentation on monitoring and environmental monitoring of marine and coastal areas in the southern Mediterranean with a specific focus on Algeria. The 3 main key elements in the presentation are i) existing monitoring protocol in Algeria; ii) geographic scales; iii) temporal scales.

20. It was indicated that there are challenges such as developments along the coastline and the

impacts to be monitored and assessed. It highlighted the fact that it is feasible to deliver ecological results following an ecosystem approach with few resources.

21. It was said that the resilience of a monitoring approach depends on its inherent complexity and varieties of challenges monitoring strategies, in general, are dealing with. There are many different approaches based on risk analysis. But the most important element is to understand the expectations related to monitoring, for whom it is addressed, and which stakeholders are involved.

22. The work for the Case of Algeria has been done in collaboration with the PAP/RAC and the PAM. It consisted in a follow-up of the priority areas in the Mediterranean Sea, and went beyond the scale of the identified zones. One example was given regarding the spatial representation which was used for harbour areas (impacted by anthropogenic activities) and untouched zones (with few or no anthropogenic activities). Another example was given regarding the fishing resources which take into account a different temporal scale. Moreover, an important point highlighted was that the financing and human resources do not necessarily need to be important to monitor fishing resources.

23. The Scientists must deliver a clear and comprehensive message for policy-makers. The main obstacle is often the cost of such monitoring and assessments. Nevertheless, the key to success is to encourage interdisciplinarity. Monitoring should also be attended at a more local scale in order to increase the impact. Thus, satellite imageries may provide inputs for monitoring at low cost for instance, satellite imageries make it possible to follow the behaviour of invasive phytoplankton.

24. Another tool is to use mapmaking of key habitats through diving. Furthermore, network helps to share means and fill in gaps. It is crucial to remind that monitoring has allowed legislative progress, and has enhanced education and general awareness.

25. It was recalled that gaps exist but most of the EOs are covered in Algeria. Monitoring areas for pollution have been defined with MEDPOL and monitoring areas for key habitats have been defined with SPA/RAC.

26. It was highlighted at the end of the Algerian Case presentation that it's crucial to improve the coordination of national monitoring and to put in synergy regional and national networks around the Mediterranean and encourage them to collaborate. It was stressed that it’s also important that citizen science be also involved when monitoring coastal zones: the examples of involving diving clubs for NIS monitoring and leisure boats which can also give information to scientists were given.

DISCUSSION

27. The chair opened the floor for discussion with the audience regarding the previous presentations delivered.

28. After presentations, a certain number of comments were provided by participants. The audience appreciated the really focused and comprehensive presentations. Participants highlighted the balance between policymakers and scientists’ representatives in the audience. The presentations focused firstly on scientific level, which was appreciated.

29. Participants indicated that SPI is a comprehensive approach and that all stakeholders must be addressed at all levels involving policy level and science.

30. Moreover, the participants stressed that it is important to take really into account the fact that the second presentation bring the audience to the ground in explaining that the bottom-up approach is corresponding to policy makers and scientists’ needs. According to the audience, Algeria has a good approach to address the huge number of EO indicators because Algeria is considering two dimensions in their interventions: general and local levels.

31. With regards to this, participants suggested to use results from the existing data banks and adopting a bottom-up approach to shift towards implementation, and that EcApMEDII project should serve the local needs for the users and not for bureaucrats (cost-effective).

32. In addition, the audience said that as far as the funding strategy goes, it could be a relevant idea to train fishermen on ways to fight against litter pollution.

33. With regards to ongoing funding strategies, an issue raised about the best way to mobilise them on the implementation of monitoring programme. It was also indicated that the EU research and innovation programme Horizon 2020 is open to non-European countries as well. Moreover, it was said that the EcApMEDII project supports a funding strategy for the implementation of existing national monitoring programmes and will encourage monitoring in new areas. It is not a classic strategy but as far as possible it will use citizen science and leisure shipping.

34. The audience stressed that, in order to be cost-efficient, it's necessary for managers to use available data in a cooperative manner. They also said that a monitoring strategy should be accompanied by an analysis of monitoring costs.

35. Then, participants added that sharing existing data is crucial. States should promote the open access of data.

36. Finally, it has been suggested, for the next step of IMAP implementation, to demonstrate synergies (e.g.: JRC offered partnerships) and it has been encouraged the recognition of eco regions (to deal with spatial scale aspect) which are important for national reporting and monitoring.

37. The audience stressed the importance of the objectives given by the working document UNEP(DEPI)/MED WG438/3. The chair remembered that the UNEP(DEPI)/MED WG.438/3 will be discussed during this meeting while the factsheets will be also presented during the PAP and SPA RACs Focal Point Meetings in May 2017. Once all comments will be collected, the fact sheets will be revised for the EcAp coordination group meeting in September 2017.

38. Some discussions focused on issues related to the cost benefit analysis. Participants remembered the procedures and the interest of benchmarking of monitoring parameters. The Authorities and scientists should consult together to define a maximum for their budget regarding the implementation of their monitoring programmes. It is indeed important to define the monitoring goals to keep the costs under control.

39. Participants also indicated that available data form scientific projects should be made available to the policy makers, highlighting the fact that SPI is very important. It has been expressed in addition that the cost-benefit balance would be achieved through the merge of monitoring researches combined with the strengthening of Science-Policy Interfaces.

40. It was made clear that costs will vary between different countries. It was also pointed out that scientists have to become connected to decision-makers that trigger the monitoring. It was emphasized that there must be open access to data and data is exchanged with the institutions, NGOs, etc. It was also indicated that the various elements of monitoring can be combined such as marine litter with bathing water quality.

41. Participants also noted that the cost benefit analysis has improved as it is now possible for everyone to consult data of national and regional projects. It has been said that acquiring data at sea is expensive. To go beyond that, one way is to share the acquired data. So, public authorities, NGOs, industry and scientists must share and disseminate data. Countries should encourage this action. For example, the EU requires to make the data available (with the exception of industrial property) to award H2020 grants.

42. In addition to that, participants agreed that there must be synergies between different marine researches for European and non-European countries.

43. A participant exposed the example of the DCSMM and reminded that corrective actions for monitoring are used to reach the targets. Also, it is important to define the field of surveillance so as not to do more than necessary. Moreover, it was pointed out that States should establish priorities in defining precise objectives of the monitoring, not for fundamental research but to achieve GES. It could be done thanks to a strong collaboration/ cooperation between managers and scientists.

44. Another example was done by a participant who mentioned that the macro regional strategy on northern Adriatic (a 3-year-old exercise) was an excellent example of contribution to enhance regional cooperation, to be more efficient with existing cash flow and following a bottom-up approach (national with sub regional/ ecoregional) in order to address common gaps and issues.

45. An example was done by a participant regarding the interest to follow an elementary monitoring, by surveying the same parameters monthly, together with new parameters such as the carbonate system variables, in the context of global phenomena, like climate change and ocean acidification. The audience highlighted that:

- they are important parameters which are not yet included in strategic regional IMAP. A reference was made to IMAP reference document but this issue could be included in the next IMAP cycle (UN-Environment / MAP is looking for volunteers to contribute for this next cycle);
- many topics/elements are related to the common needs of the Mediterranean region and so need to be addressed in common;
- there is a need for data concerning mammal species in Southern countries of the Mediterranean.
- not only nutrients but also biogeochemical parameters (i.e. carbonate system) are affecting other physical and chemical parameters.

46. So, the audience suggested to develop a platform for the Mediterranean or an online application to be introduced allowing dissemination and exchanges of best practices regarding the above-mentioned topics, directly to other countries. In addition to that, the participants highlighted the importance of establishing warning systems between countries (e.g. on *Pinna Nobilis* massive mortality).

47. At the end of the session of discussions, the audience highlighted that there is a huge lack of data on NIS in the south of the Mediterranean and also emphasized the importance of establishing a network to bring the south of the Mediterranean together to monitor species. This is very important if correlation between pollution events and species death in various areas of the Mediterranean can be monitored.

Agenda item 3. Best Practices on Assessment and Reporting Scales (Practices Of Regional Seas and of Contracting Parties)

48. Biodiversity and Alien Species in the Libyan Coast.

Mr Esmail Shakman delivered a presentation on the needs and challenges for their monitoring giving an overview of their monitoring programme of seabirds, turtles and NIS.

Libya has 2000km of coast and three main regions according to the FAO. Its sandy coast is a good habitat for alien species. It also has 2MPAs and a National Park (included in total coastline). Its 20 wetlands of regional importance attract many water bird species. Out of the 131 landlines, 8% are seasonal sites (specific species) and 92% are permanent. The country's main endangered species are mammals such as monk seals. After 2013, 58 cartilaginous species have been recorded, but research has not yet been conducted. There are 70 alien species recorded (fauna and flora). The studies on the impacts of alien species must also take into account the change in biodiversity. There is a problem of competition between alien and indigenous species in Libya. Some alien species are infected by parasites originating from the Red Sea.

49. National Strategy for Monitoring the Marine Environment - Moroccan Experience of the INRH. Mr. Samir Benbrahim presented the characteristic of the Mediterranean coastline, its diversity and wealth which makes the natural heritage rich but also attracts many species (of which parasites). It is important to align socio-economic activities with the marina sector. A regulatory framework is therefore necessary. The combination of marine monitoring strategy and research preserves and protects consumers, but marine knowledge still needs further improvement. Through legislative arsenal, programs are better-adapted and deliver an enhanced strategy. Monitoring allows to give the alert in case of accidents (invasion of species for instance). As the INRH addresses simultaneously marine environment monitoring and health protection, it permits the Institute to better convince policy-makers.

50. The monitoring framework is not a research framework but one cannot go without the other. The needs are necessary for coastal monitoring and for interventions, yet are highly dependent on external stakeholders for continuity. The implementation and development of the six laboratories has allowed the monitoring of 35000km of Moroccan coast.

51. It was recalled the fact that there are socio-economic interests related to the monitoring. For example, politicians need to back up scientists to monitor the marine environment and regional agreements must be signed and ratified.

DISCUSSION

52. After presentations, participants acknowledged that it's necessary, regarding the monitoring of new parameters, to encourage collaboration with other research institutes (e.g.: with Accobams to monitor marine mammals) to buy new instruments and equipment and to exchange on new methods to monitor.

53. Overall, participants stressed that compliance monitoring is demanding through the Barcelona convention. It's needed to have more specific sites and better resolution of results that do not exist currently in national monitoring.

54. Regarding the climate change issue, participants were informed that it exists different expert groups working on climate change adaptation (like CC expert group of UfM; the informal Scientific network of MedECC gathering around 260 experts from the Mediterranean,) and that GEF supports direct actions regarding climate change adaptation. Moreover, in IMAP guidance (inf. doc of the CoP 18) the effects on climate change are considered.

55. Some participants asked for the building of transnational observatory for Biodiversity monitoring and expressed the need to support southern Mediterranean countries in the update / revision of their national monitoring programmes.

56. Continuation of the presentations. Mr. Antoine Lafitte, programme officer at Plan Bleu, made a brief presentation on the organisation of the afternoon work, in three sub-groups in order to address general and specifics issues for each cluster (Marine litter & contaminants; Biodiversity & Fisheries; Coast & Hydrography) regarding the definition of relevant spatial and temporal scales for monitoring. He presented the main objectives of the session which are (i) to engage specific discussions with the audience on the main issues related to the definition of relevant spatial and temporal scales for the implementation of national IMAP related to marine litter, biodiversity and fisheries and coast and hydrography and (ii) to contribute to the formulation of the recommendations of the workshop and for futures actions in this field.

57. The moderator and rapporteur for each sub-group were presented by Plan Bleu and each participant expressed their wishes to attend the most relevant sub-group for them.

Sub-group 1: pollution and marine litter monitoring	Sub-group 2: biodiversity and fisheries monitoring	Sub-group 3: coast and hydrography monitoring
Moderator: Virginie Hart	Moderator: Mehdi Aissi	Moderator: Marko Prem
Rapporteur: Carlos Guitart	Rapporteur: Marina Pena	Rapporteur: Maria Caparis

58. Plan Bleu presented the general issues which were discussed in the afternoon:

- Are the available IMAP elements (GES components, as defined by the EcAp EO and indicators, QSR fact sheets) sufficient to define scales of monitoring at national level?
- How science can best help to define these scales?
- In a next step, how science can support the adoption and then the implementation of national monitoring programmes in a coordinated manner at Mediterranean level?
- How should be linked national monitoring scales and marine reporting units at regional level? (Articulation between national and regional levels).
- How monitoring should contribute to develop the programmes of measure to achieve the GES?
- How to define in practice relevant scales of national monitoring to assess GES with confidence on the results (quality assurance point of view)?
- What are the main difficulties the Southern Mediterranean countries are facing regarding the definition of the national monitoring scales?
- How to support the implementation of the national IMAP compatible integrated monitoring programmes, with a focus on specific needs of Southern Mediterranean countries?
- Is there a need of specific capacity building modules on how to efficiently carry out the national monitoring?

59. Plan Bleu presented the specific issues which were discussed in the afternoon:

60. Regarding the Sub-group 1:

- The development of geospatial statistics, the use of GIS tools, RBA and uncertainty analysis would assist the setting of temporal and spatial scales.
- There is the need to outline appropriate and reasonable monitoring scales to capture the natural and the pressure-induced variability.
- At the initial stage of IMAP the differentiation between initial/screening monitoring and long-term monitoring is particularly important.

61. Regarding the Sub-group 2:

- Spatial heterogeneity of pressures and their impacts on biodiversity. How better considered these aspects when defining relevant scales?
- In the broader context of the IMAP framework there is the need to keep the monitoring requirements manageable. Especially, but not exclusively, when considering biodiversity, it has been recommended (UNEP(DEPI)/MED WG.432/4) to focus on “representative sites”. Common understanding? Need for a specific monitoring?
- When considering biodiversity, but not exclusively, decreasing the monitoring frequency is possible for locations where established time series show the status to be well below risk levels of concern, and without any deteriorating

trend over a number of years.

62. Regarding the Sub-group 3:

- Regarding EO7 it is essential to recall that it is not the scale of the construction that is important but the scale of the impacts. The chosen spatial and temporal scales for monitoring must be able to cover all the habitats of interest that could be potentially impacted. The scale determination should therefore also take into account the scales used for the EO1 habitat assessments.
- Regarding EO8 and the CI 16, the availability of well trained personnel for GIS digitalization and relevant information sources (in this case recent maps having adequate spatial resolution) are considered essential as well as the requirement for agreed procedures to be applied uniformly throughout the coastline.
- Regarding EO8 and Candidate Indicator 25 the interpretation of the results obtained by different analytical units of the coastal zone may be revised by local experts in view of local-specific socio-economic, historic and cultural dimensions, in addition to specific geomorphological and geographical conditions. In any case, it is important to take into account the implications of the different delineations on the interpretation of the results.

63. The audience was split into 3 groups discussing the 3 main clusters. Discussion on the issues identified as priorities on the definition of relevant spatial and temporal scales for the implementation of national IMAP and specifics of marine litter, biodiversity and fisheries and coastal and hydrography monitoring.

64. Participants has been embarked on a discussion per sub group and share their points of views and experiences related to the definition of relevant spatial and temporal scales for the implementation of national IMAP common indicators and specifics of marine litter, biodiversity and fisheries and coast and hydrography monitoring.

65. After the discussions in sub groups, the rapporteurs exposed the main conclusions.

66. Regarding the sub group 1 (Pollution, Marine Litter and Eutrophication cluster), the audience agreed on:

- Use sediment mapping for the toxicology of seawater
- The concentration of pollution in mussels is under the pollution level but following the sediment level, mussels are highly polluted
- Evaluation of substances especially for metal
- Pollution accidents and spillages in the Mediterranean have decreased significantly since the 70’s
- Gap to monitor the impacts of pollution on biota
- Impact of industrial oil spillages: those that are not only marine spillages as the precision and accuracy of the impact of pollution are high
- MPA are also affected by oil spillages
- Regarding eutrophication, phytoplankton communities must be taken into account in a parallel program in CI 13 and CI 14;
- Discussions on whether satellite imagery is used on coastal eutrophication or on larger scales;
- Eutrophication should be combined with marine litter when monitoring hot spots;
- Microlitter in beach monitoring is still

an issue;

- EEA developed a marine litter watch app and they are discussing the effectiveness of this app;
- Scales and strategy: monitoring versus research monitoring.

EO5 EUTROPHICATION	● Phytoplankton communities to be taken into account in a parallel program feeding EO5 and their common indicators (CI13, CI14). Therefore, future candidate indicators in a new IMAP cycle. ● Coastal eutrophication *versus* Larger Scales (satellite imagery), depending on inputs. ● Examples from Israel found resolution could be a problem. ● Egypt performed on site calibrations. ● Morocco pointed about sensitivity in measurements. ● Egypt will combine Eutrophication selected sites (n=32; hot spots, coastal and reference) with Marine Litter monitoring focusing in "hot spots" (n=to be determined).
EO9 POLLUTION	● Turkey is planning to revise the scale every 5-year. They have a 3-years new programme (2017-2019) with 269 sites (including the Mediterranean Sea) focusing on "hotspots".
EO10 MARINE LITTER	● European projects can involve non-European projects (MEDICIS). Opportunities to get on board! ● Morocco mentioned beach litter monitoring is taking place after the year 2000, although microliter monitoring still an issue. Involve fisherman could help to provide data and solutions. ● UNEP/MAP is coordinating currently some initiatives to start monitoring specially with the Mediterranean southern Member States. The work needs to continue. ● The European Environment Agency is coordinating tools to test effectiveness of beach monitoring in EU countries.

67. Regarding marine litter and pollution monitoring, regarding scales and monitoring strategies, Montenegro raised the point of low number of monitoring stations and the need to revise the established ones. These actions should help to further define thresholds, baselines and scales. Some data on EO10 through research projects available.

68. Related to this point, participants reminded the difference between routine monitoring vs Research (observation) monitoring. Monitoring need to comply with IMAP requirements. Compliance monitoring (mid- long-term monitoring) is important for IMAP.

69. Also, participants highlighted the difference between hotspot (thus, already polluted) and impacted coastal sites suggesting the later as a better proxy to evaluate the environment.

70. An example was presented regarding "temporal scales for monitoring". Indeed, in Egypt, 4 times a year, CIs for Pollution are monitored for 32 sites. It was said that marine litter will be added but not for all stations. Monitoring is done by accredited laboratories and in Egypt, reference sites are clean. It has been said that monitoring in hot spots should be done with multiple points (typically 6).

71. Participants acknowledged that the main challenge is to reduce the number of monitoring stations. There is a need to define new monitoring station and strategies. There are skills at sub regional level and countries are ready to work on the revised IMAP.

72. Participants agreed that the main issue is the lack of a committee ensuring that every scientist could speak. Marine monitoring should be based on sound science (e.g. France could analyse contaminants below the detection level). It was pointed out that scientific observations of today allow preparing the monitoring of tomorrow.

73. Some participants acknowledged that there is a need to revise their national monitoring programs because in some places the pollution is increasing, (e.g. in the Marmara Sea, in Turkey).

74. It was pointed out that the Moroccan Monitoring Strategy doesn't focus on hotspots but on the impacts of pollution all along the coast.

75. Regarding Marine Litter monitoring, some participants stressed that it is very demanding and it needs science. It's a challenge because it's also not easy to involve citizen on the long term.

76. An important point has been raised by the audience regarding the importance to split in two what is observable and what is not visible. It seems important to involve fishermen and raise their awareness on marine litter. We should ask them to weight the amount of litters they capture. In fact, the audience stressed the importance of participative science.

77. Regarding the sub group 2 (Biodiversity, NIS & Fisheries), the audience expressed the following points:

- Contracting Parties queries whether there are available IMAP elements sufficient to define scales of monitoring at national level;
- More work needs to be done at a sub-regional level;
- Data should be collected from national monitoring programmes. This is to ensure to have a baseline of data.
- More networking should be done among scientists;
- More work on standardized protocols should be done;
- There is lack of data or sometimes it exists but not publicly available;
- Strong recommendation to involve stakeholders to define scales of monitoring.

78. With regards to the following question: *are the available IMAP elements (GES components, as defined by the EcAp EO and indicators, QSR fact sheets) sufficient to define scales of monitoring at national level?* The audience acknowledged that IMAP sets a base to define the monitoring activities to be done. Defining scales for IMAP implementation at national level is very relevant but there is a need to put together efforts at sub regional level.

79. The audience also said that great parts of the EOs are already monitored at national level but there is a need to do more for some CIs. It is necessary to capitalize data from national monitoring programmes and other programmes with focusing on existing gaps.

80. With regards to the following question: *How science can best help to define these scales?* The audience agreed that there are many national and international institutions that should invest on science for regulatory purposes. Science and scientists have to investigate on practical issues to answer to managers and stakeholders. There is a need for networking among scientists even on interdisciplinary tasks and it is necessary to agree on standardized protocols.

81. With regards to the following question: *In a next step, how science can support the adoption and then the implementation of national monitoring programmes in a coordinated manner at Mediterranean level?* The audience pointed out that contacts should be promoted among ministry of research, ministry of environment, ministry of fisheries and other authorities and stakeholders. Moreover, virtual courses (E learning platform) could be organized with clear ToR ensuring dissemination of knowledge after the courses. Finally, the audience suggested involving as observer other countries in pilot sub regions to monitoring activities.

82. With regards to the following question: *What are the main difficulties the Southern Mediterranean countries are facing regarding the definition of the national monitoring scales?* The audience mentioned that there are difficulties to have data trends to understand processes and reminded the presence of disperse (and sometimes not localized) data which are not centralized in data sets.

83. With regards to the following question: *How to support the implementation of the national IMAP compatible integrated monitoring programmes, with a focus on specific needs of Southern Mediterranean countries?* The audience stressed that there is a need to have mixed research teams (mixing disciplines) on specific issues at regional and sub regional levels. Then, there is a need for stakeholders' involvement and a need for coordination, at the national and sub regional levels.

84. Regarding the sub group 3 (Coast and Hydrography cluster) the audience acknowledged:

- Theory is available but there must be more assistance with implementation;
- Data availability is a challenge for linking habitat maps related to EO1 Biodiversity to EO7 Hydrography, as well as a free access of public data;
- More capacity building is needed for the implementation of EO7 and EO8 indicators, such as for modelling, GIS, step by step approach, etc... ;
- The European Space Agency has a software dealing with coastal elements; but a step by step guidance should be proposed to actually apply this software.

85. PAP RAC reminded that the length of the coastline considers natural areas and those occupied by human activities (how many kilometers are still natural or already occupied). With regard to EO7 on hydrography, the spatial scale concerns the physical alterations of the environment and the impacts of new constructions only (decided in CORMON and incorporated into Indicator Guidance Fact sheets for EO7).

86. PAP RAC reminded that the spatial scale for the Indicator on "Land use / cover change" is monitored in competent coastal units (municipality, wilaya, countries…) as defined in the ICZM protocol. The approach consists in looking on the changes among five cover classes (artificial surfaces, agricultural, forests and semi-natural, wetlands, and water bodies) and to monitor how these classes change from one monitoring to another. For that approach, aerial photos and remote sensing are of key importance to do analysis (e.g: ESA - European Space Agency and SENTINEL satellite imagery; COPERNICUS – already the marine survey and coastal survey on going).

87. The audience pointed out the important role of interpretation of the results by local expertise, especially when it concerns land use / land cover changes.

88. PAP RAC reminded that the temporal scale for monitoring CI 15 is yearly up to 5 years after the construction, and bi-annually (every two years) following 10 years after the construction. For CI16 the monitoring should be done every 6 years.

89. The audience stressed out that the main difficulties that Southern Mediterranean countries are facing regarding the implementation of the national monitoring are a need of capacity building and training on use of GIS (well-trained experts on basic layers needed for monitoring for the three indicators) and modelling (need for training the programmers at national levels to use software). They also need financial capacity to buy data.

90. As far as concerned the usefulness of GIS, participants said that to measure changes on sea surface that's fine but not to monitor intermediate and deep waters.

91. With regards to the question: *How science can best help to define these scales?* The audience said that science is needed to define spatial scale for building new installations/structures. Indeed, environmental impact assessments (before and after building) are necessary. The audience suggested to link current monitoring with new environmental impact assessments. The audience also agreed that science is also needed for the definition of the national monitoring scales.

92. In addition, it has been noted that regarding the definition of spatial and temporal scales for coast and hydrography monitoring, it's crucial to consider natural variability of the coastline's position. The example of the Knowseas project has been given in which this aspect was the initial work asked to scientists. Therefore, an official coastline should be defined first (if not yet available) and all monitoring should use the same coastline, otherwise there is no possibility for comparison, regardless of natural/induced processes such as coastal erosion.

93. With regards to how make capacity more effective, participants suggested to promote South-South training and specific training as soon as the national IMAPs are adopted.

DISCUSSION

94. The audience pointed out that there are some common problems such as availability of data; stronger connections between policy-makers, and between scientists themselves; lack of coordination between projects at regional level which to limit synergies and create overlapping.

95. During the discussions, it appears necessary to go from costal monitoring to offshore monitoring. It could be a future implementation of IMAP. It's possible to look forward to another workshop more focusing on offshore monitoring.

96. In line with the previous series of research project in the Mediterranean (FP7 programme), it was mentioned the MEDCIS project, focusing on marine litter monitoring and started in April 2017) which, allows a better coordination of the MSFD implementation at the Mediterranean level and encourage the work with the southern countries.
On another hand, it was also presented the BLUEMED Initiative which is a research and innovation agenda to promote the blue growth. There are two main messages: (i) it's absolutely necessary to imply the southern Mediterranean countries (H2020 actions to finance projects), (ii) the blue growth is not possible without a good environment status.

97. Participants pointed out that capitalisation of previous projects or experiences is very important. It was reminded that one of the Decisions of the COP 19 was to organize the work in a pragmatic manner and think about next steps.

98. Another issue that raised interest was that it's important to use and capitalize existing data and knowledge. There is no need for more indicators and data. There is a need to synthetize, simplify and to be pragmatic and work at transboundary levels: the ecoregions.

99. At the end of the session, participants alerted that there is a multiple interface, not only Science and Policy but political, governments, administrations, stakeholders…/ interfaces. Stakeholders are missing here. They have to come on board, this message is essential.

Examples of other RSCs: from monitoring to assessment at regional level

100. Ms Roddier-Queffelec from EEA, delivered a presentation on examples of the marine reporting units for Europe and approaches for defining scales of assessment. This presentation refers to the EU MSFD working group of DIKE. The presentation allowed to make a transition between the two sessions of the workshop: the "definition of relevant scales of monitoring" and "of assessment". It will highlight the fact that the monitoring allows to feed the assessment and that the concern of scales is linked but methods are different. Indeed, the different scales of assessment and nested approach further allow considering features and impacts in transboundary context at the relevant scale and adjusting monitoring activities/requirements to the needs of the assessment scale concerned.

Closure of the SPI session

101. The Chairperson presented first informal conclusions of the SPI session considering that the official conclusions and recommendations will be discussed after the session dedicated to the QSR.

102. The Chairperson concluded the session of the day and thanked the participants in her closing remarks for their constructive contribution to the meeting which resulted in the high-level discussions and presentations.

103. Plan Bleu took the floor and said that the issue of "the definition of spatial and temporal scales" is a relevant issue as countries need to revise their monitoring plan as part of the implementation of IMAP in a coordinated manner at the regional level, mainly taking into account national waters beyond coastal waters and some new components such as specific aspects regarding Biodiversity and marine litter.

104. Discussions emphasized the role of science, but stressed that regulatory monitoring such as IMAP should be driven by managers.

105. However, the exchanges also showed the diversity of situations between European countries that are required to implement the DCSMM, the Adriatic countries, which benefit from a strong integrative strategy, and southern countries with contrasting situations, some of them benefiting from well-run systems, and others from systems to be consolidated or rebuilt.

106. According to the audience, the right way is to capitalize, be pragmatic, simplify and articulate the efforts made by the Countries and EcApMEDII project's partners with the blue growth.

107. After the expression of usual courtesies, the Chairperson declared the SPI session closed at 17.30 hours on 27th April 2017 and remembered that the 28th starts the session dedicated to the QSR and draft assessments factsheets (Agenda item 4).

Agenda item 4. **Regional Assessment of the Mediterranean Marine and Coastal Environment: the Development of the Quality Status Report**

108. The Secretariat introduced the mandate, structure and timeline for the development of the 2017 Quality Status Report (QSR). The 19th COP of the Barcelona Convention in 2016, Mediterranean countries adopted the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and

Coast and Related Assessment Criteria (IMAP - Decision IG.22/7), and this included agreement on the development of a Quality Status Report (QSR) for the Mediterranean by the end of 2017.

109. This was followed by three presentations on the QSR Assessment Factsheets for Biodiversity, pollution and Marine Litter, and Coast and Hydrography.

110. SPA/RAC introduced the draft QSR Assessment Factsheets on Biodiversity, presented in document UNEP(DEPI)/MED WG.438/4. In the discussion that followed, national experts noted the disparity among data and information from the countries related mainly to the lack of dedicated monitoring programmes, and requested SPA/RAC to further detail the methodology section of the factsheet related to the sources of all data and information, as well as the countries which have contributed to provide the information and the temporal scale of the assessment. For Common Indicators 1 and 2: Habitat distributional range and Condition of the habitat's typical species and communities, respectively, national experts suggested including soft communities in this assessment in addition to the hard-benthic habitats. Regarding the Common Indicator 3: Species distributional range, national experts expressed their interest to provide additional information based on the national monitoring activities and research studies on marine mammals and sea turtles. The Secretariat also confirmed that GFCM would support UNEP/MAP through the development of the assessment factsheets related to the six common indicators related to the EO3: Harvest of commercially exploited fish and shellfish. Participants stressed the need to look at the synergies between fisheries (and bycatch) and biodiversity in the finalization of the assessment factsheets.

111. MEDPOL presented the content of the draft QSR Assessment Factsheets on Pollution and Marine Litter, as elaborated in documents UNEP(DEPI)/MED WG.438/5 and UNEP(DEPI)/MED WG.438/6. Regarding the Pollution Indicator Common Indicator 17: Concentration of key harmful contaminants measured in the relevant matrix, the assessment factsheet was based on existing data in the MEDPOL database. Participants noted that many countries have not submitted data to MEDPOL on a consistent basis, and this caused limitations in the analysis of data. Several national participants committed to follow up with MEDPOL Focal Points for future more regular reporting. It was suggested that some work is still needed to harmonize the information in the extended and brief sections of the assessment factsheets and further elaborate the conclusions and gaps. One country suggested that in the revision data below the detection limited should be included. Regarding Indicator 19: Occurrence, origin (where possible), extent of acute pollution events (e.g. slicks from oil, oil products and hazardous substances), and their impact on biota affected by this pollution (EO9), it was suggested that more work is undertaken, to include land-based sources of accidents (and harbour commercial activities), and to establish linkages between the pollution events and marine protected areas. For the two Marine Litter indicators under Ecological Objective 10, several countries offered to provide additional new studies in support of the finalization of the assessment factsheets.

112. PAP/RAC presented the content of the draft QSR Assessment Factsheets on Biodiversity, in document UNEP(DEPI)/MED WG.438/7.

113. PAP RAC presented the current status regarding information for QSR for
all three indicators: Common Indicator 15 of EO7 Hydrography; and Common Indicator 16 and Candidate Common Indicator 25 of EO8 Coastal ecosystems and landscapes. Due to the fact that all the three indicators were comparatively new in the framework of UN Environment/MAP, there was only partial and general information available on the Mediterranean status. He urged the Contracting Parties to provide additional information to fill the knowledge gap, if available, and in particular to provide case studies, pilot studies or project reports related to national monitoring exercises to enrich the QSR by May 26, 2017.

114. It was asked why Common Indicator 15 was focused on coastal structures and not on off-shore structures as well. PAP/RAC answered that this is a highly complex indicator, so for the first monitoring cycle the information on coastal structures are relatively more available, since monitoring tends to be more present in coastal waters. In addition, it seems that in Mediterranean off shore structures are less

present than elsewhere, i.e. there is potentially greater impact from coastal structures on hydrographic conditions in Mediterranean since these structures are more widespread.

Agenda item 5. Any Other Business

115. Under the eight Agenda item, participants didn't raise and discuss any other matters.

Agenda item 6. Conclusions and Recommendations

116. The Secretariat presented the draft Conclusions and Recommendations of the meeting which after minor changes were adopted and are included in Annex III to this report.

Agenda item 7 Closure of the Meeting

After the expression of usual courtesies, the President declared the meeting (both SPI and QSR sessions) closed at 17:30 hours on 28 April 2017.

Annex I
List of Participants

LIST OF PARTICIPANTS

ALBANIA / ALBANIA	**Ms Klodiana Marika** Director of Biodiversity and Protected Areas Ministry of Environment Blv. Zhan d'Ark, Norbert Jokl 23 Tirana Albania Tel: +355 42 267 623 E-mail: Klodiana.Marika@moe.gov.al
EGYPT/EGYPTE	**Mr Samir Nasr** Professor University of Alexandria Alexandria Egypt Tel: +20 34251038 E-mail: samir_nasr@yahoo.com
FRANCE / FRANCE	**Mr Jean-Paul Lecomte** IFREMER Coordination nationale DCSMM/ MSFD National Implementation Rue de l'Ile d'Yeu 44311 Nantes Cedex 3 France Tel: +33 2 40 37 42 66 E-mail: jean.paul.lecomte@ifremer.fr
ISRAEL / ISRAEL	**Mr Frederic Arzoine** Deputy Director Marine environmental protection division Ministry of Environmental Protection Pal-Yam 15a P.O. Box 811 31333 Haifa Israel Tel: +97248663511 E-mail : freda@sviva.gov.il
ITALY / ITALIE	**Mr Roberto Giangreco** Officer Italian Ministry of Environmnent Land and Sea Via Cristoforo Colombo 44 00147 Rome Italy Tel. +39 0657228406 E-mail: giangreco.roberto@minambiente.it

LEBANON / LIBAN	**Mr Adel Yacoub** Head Protection of Nature Resources Department Ministry of the Environment MarieRose Matli Bldg, 1st Floor, El Berbara St. Zahle Lebanon Tel: 00961 1 976 555 Ext 456 E-mail: a.yacoub@moe.gov.lb **Mr Abed El Rahman Hassoun** Researcher Conseil National de la Recherche Scientifique-Centre National des Sciences Marines P.O. Box 534, Batroun, Lebanon Tel: 00961 6 741582 E-mail:abedhassoun@cnrs.edu.lb
LIBYA / LYBIE	**Mr Ali Ali Ragab El Kekli** Director Technical Cooperation &Consultation Department Environment General Authority P. O. Box 83618 El Ghiran Tripoli Libyan Arab Jamahiriya Tel: +218 21 4873761 E-mail: arelkekli@gmail.com **Mr Esmail Shakman** Scientist EGA, Libya and Oceanography unit - Tripoli University Tripoli Libyan Arab Jamahiriya Tel: + 21 8214174537 E-mail: shugmanism@yahoo.com
MALTA / MALTE	**Ms Tamara Micallef** Assistant Environment Protection Officer Environment and Resources Authority Hexagon House, Spencer Hill Marsa MRS 1441 Malta Tel : +35622923662 E-mail: tamara.micallef@era.org.mt
MONTENEGRO / MONTÉNEGRO	**Ms Ivana Stojanovic** Advisor Department for Sustainable Development and Integrated Coastal Zone Management Ministry of Sustainable Development and Tourism IV Proleterske, 19 81000 Podgorica Montenegro

	Tel: + 382 20 446 388 E-mail:ivana.stojanovic@mrt.gov.me
MOROCCO / MAROC	**M. Rachid Firadi** Chef de la Division de la Coopération Internationale Direction du Partenariat, de la Communication et de la Coopération Secrétariat d'Etat chargé de l'Eau et de L'Environnement Département de l'Environnement 9, Avenue Araar, Secteur 16 Hay Riad Rabat Maroc Tel: + 2125 3757 0640; +2126 7308 2319 E-mail: firadi@environnement.gov.ma, firadienvironnement@gmail.com **M. Samir Benbrahim** Chef Département de Surveillance du Milieu Marn Institut National de Recherche Halieutique Boulevard Sidi Abderrahman, Ain Diab Casablanca Maroc Tel: + (212)0522397385 E-mail:benbrahimsamir10@yahoo.fr; benbrahim@inrh.ma
SLOVENIA / SLOVÉNIE	**Mr Mitja Bricelj** Secretary Ministry of the Environment and Spatial Planning, Dunajska 48 1000 Ljubljana Slovenia Tel: +38614787477 E-mail: bricelj56@gmail.com; mitja.bricelj@gov.si
TUNISIA / TUNISIE	**Ms Jamila Ben Souissi** Professeur/Directrice Département des Ressources Animales, Halieutiques et des Technologies Agroalimentaires Institut National Agronomique de Tunisie (INAT) 43, avenue Charles Nicolle 1082 Tunis Tunisie Tel: +21 671287110 E-mail: jbensouissi@yahoo.com
TURKEY / TURQUIE	**Mr Şule Bektaş** Environment and urbanisation expert Ministry of Environment and Urbanisation Haymana Yolu 5. km Gölbaşı 06830 Ankara Turkey Tel: + 903124982150 E-mail: sule.bektas@csb.gov.tr

NON GOVERNMENTAL ORGANIZATIONS/ORGANISATIONS NON-GOUVERNEMENTALES

MAREI UCC	**Mr Martin Le Tissier** Executive Director Future Earth Coasts MaREI Haulbowline Road Ringaskiddy Co Cork Ireland Tel: +353214864308 E-mail: martin.letissier@ucc.ie
EUROPEAN ENVIRONMENT AGENCY	**Ms Cécile Roddier-Quefelec** Project Coordinator ENI SEIS Support Mechanism South Kongens Nytorv, 6 050 Copenhagen k Danemark Tel: +4533435940 E-mail: cecile.roddier-quefelec@eea.europa.eu

SECRETARIAT TO THE BARCELONA CONVENTION
COORDINATING UNIT AND COMPONENTS OF THE MEDITERRANEAN ACTION PLAN
SECRETARIAT DE LA CONVENTION DE BARCELONE UNITE DE COORDINATION ET COMPOSANTES DU PLAN D'ACTION POUR LA MEDITERRANEE

UNEP/MAP **PAM/PNUE**	**Ms Gyorgyi Gurban** EcAp Project Officer 48, Vassileos Konstantinou 11635 Athens Greece Tel: +30 210 7273105 Fax: 210 7253196-7 E-mail: gyorgyi.gurban@unep.org
UNEP/MAP MED POL **PAM PNUE/MED POL**	**Ms Virginie Hart** Programme Officer 48, Vassileos Konstantinou 11635 Athens Greece Tel.:+30 210 7273122 Fax: +30 7253196-7 E-mail: virginie.hart@unep.org
PLAN BLEU REGIONAL ACTIVITY CENTRE CENTRE D'ACTIVITES REGIONALES PLAN BLEU	**M Didier Sauzade** Programme Mer Villa Valmer 271 Corniche Kennedy 13007 Marseille France

	Tel.:+33 643082023 E-mail:dsauzade@planbleu.org **M Antoine Lafitte** Chargé de mission 75 rue d'Endoume 13007 Marseille France Tel.:+ 33 668207225 or +33 786381720 E-mail: alafitte@planbleu.org
REGIONAL ACTIVITY CENTER FOR THE PRIORITY ACTIONS PROGRAMME (PAP/RAC) **CENTRE D'ACTIVITES REGIONALES DU PROGRAMME D'ACTION PRIORITAIRES (CAR/PAP)**	**Mr Marko Prem** Deputy Director Kraj sv. Ivana 11 21000 Split Croatia Tel.:+385 21 340475 Fax:+385 21 340490 E-mail:marko.prem@ppa.t-com.hr **Mr Ivan Sekovski** Programme Officer Tel.:+38521340480 Fax:+385 21 340490 E-mail: ivan.sekovski@paprac.org
REGIONAL ACTIVITY CENTER FOR SPECIALLY PROTECTED AREAS (SPA/RAC) **CENTRE D'ACTIVITES REGIONALES POUR LES AIRES SPECIALEMENT PROTEGEES (CAR/ASP)**	**Mr Mehdi Aissi** EcAp MED II Project Officer Bd. du Leader Yasser Arafat, La Charguia I, B.P. 337, Tunis1080 Tunisia Tel: 21671206649 Fax: 216 71 206490 Email: mehdi.aissi@rac-spa.org
INFORMATION AND COMMUNICATION REGIONAL ACTIVITY CENTRE (INFO/RAC)CENTRE D'ACTIVITÉS RÉGIONALES POUR L'INFORMATION ET LA COMMUNICATION (INFO/CAR)	**Ms Celine Ndong** Information Officer Via Vitaliano Brancati 48 00144 ROME RM Italy Tel: +39.06.50.07.21.72 Email: celine.ndong@isprambiente.it

INDEPENDENT EXPERTS / CONSULTANTS

Mr Carlos Guitart
Marine Sciences&Environment Consultant/Manager
c Londres 2 Apart 1-B
Lo Pagan
30740 San Pedro del Pinatar Murcia
Spain

Tel: + 34639305081
Email: guitart.carlos@gmail.com

Ms Maria Kaparis
38 Thane Villas
N7 7PG London
UK

Tel.:+ 44 7464729944
E-mail: maria.caparis@gmail.com

Mr Samir Grimes
Enseignant-Chercheur et expert
Ecole Nationale Supérieure des Sciences de la Mer et de l'Aménagement du Littoral
Cité 64 logements BT D N°9 , Ouled Fayet
16000 Alger
Algérie

Tel: + 21 3672554339
E-mail: samirgrimes@yahoo.fr

Ms Marina Penna
Researcher Consultant
ISPRA Institute for Environmental Protection and Research
via Vitaliano Brancati, 48
Rome 00144
Italy

Tel. +39 0650074703
E-mail: marina.penna@isprambiente.it

Annex II
Agenda of the Meeting

Agenda of the Meeting

Provisional Agenda

Agenda item 1. Opening of the meeting and organizational matters

a) Opening of the Meeting
b) Rules of procedure for the meeting
b) Election of officers
c) Adoption of the Provisional Agenda
d) Organization of work

Agenda item 2. Further implementation of the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria: Focus on spatial and temporal scales of monitoring, reporting and assessment

Agenda item 3. Best practices on reporting and monitoring scales (practices of regional seas and of Contracting Parties)

Agenda item 4. Regional Assessment of the Mediterranean Marine and Coastal Environment: the development of the Quality Status Report

a) Biodiversity and Fisheries
b) Pollution and Marine Litter
c) Coast and hydrography

Agenda item 5. Any Other Business

Agenda item 6. Conclusions and next steps

Agenda item 7. Closure of the Meeting

Annex III
Conclusions and Recommendations

Draft Conclusions and Recommendations of the Science Policy Interface and Ecosystem Approach Coordination Group Joint Meeting on IMAP Scale of Monitoring and Assessment and QSR

The Science Policy Interface and Ecosystem Approach Coordination Group Joint Meeting on IMAP Scale of Monitoring and Assessment (the SPI Workshop) and QSR Workshop was held on 27-28 April 2017 in Nice, France, organized jointly by Plan Bleu and the CU/MED POL of UN Environment/MAP.

Following review and discussions of all agenda items, the meeting agreed on the following, conclusions and recommendations:

Conclusions and Recommendations in relation to the IMAP[9] of Scale of Monitoring and Assessment

1. The Meeting stressed the importance of further strengthening science-policy interface in relation to IMAP implementation and highlighted the need to share more openly existing potentially relevant scientific data ;
2. The Meeting welcomed the opportunity to discuss the scale of monitoring as it is a highly timely topic in light of ongoing work on the finalization of the revision of national monitoring programmes in line with IMAP;
3. Participants highlighted the importance to develop cost-efficient monitoring programmes and the need for further support to national monitoring implementation, both in form of possible pilot projects, stronger interaction with scientific projects and building also on monitoring opportunities provided by citizens science and possibly by new partnerships with business and public bodies managing relevant environmental data;
4. The Meeting underlined that in order to address different starting points and capacities of Contracting Parties, the work on IMAP implementation and the scales of monitoring approach must capitalize on existing information, best practices of each other and of other regions, in a simplified way, taking note that achieving or maintaining GES is one of the pillars of the Blue growth.
5. The Participants, while giving the specific comments under, were also encouraged to provide additional, written comments on the Working Documents of the SPI Workshop, by 11 May to Plan Bleu and UN Environment/MAP in relation to UNEP (DEPI)/MED WG. 438/3.

<u>The SPI Workshop recommended the following points, as necessary actions for science based IMAP implementation, specifically in relation to scales of monitoring:</u>

6. Further analyze most cost-efficient options of monitoring, as well as funding possibilities for implementation of IMAP;
7. Note difference between compliance monitoring in line with actual IMAP requirements and research (observation) monitoring, noting that they are complementary and that scientific observations are important for future evolutions of compliance monitoring such as IMAP;
8. Strengthen scientific and monitoring networks, around key IMAP common indicators, such as ones related to common indicator 6 on NIS;
9. Countries which have not yet done so, are required to report without further delay the pollution monitoring data as provided for in the provisions of the Convention and the LBS Protocol including past monitoring reports;
10. Develop specific trainings, in an efficient manner, in line with the specific needs of the relevant monitoring clusters and countries, in cooperation and building on existing partnerships and projects;

[9]Decision IG 22/7 Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria, so-called IMAP

11. Both national and international institutions are called to build more on science for regulatory purpose;

12. Build more on opportunities offered by research programmes of the European Union, especially Horizon 2020, which are open to riparian countries across the region.

The SPI Workshop gave the following specific recommendations on scales of monitoring in relation to Pollution and Marine Litter:

13. In order to ensure the development of cost effective monitoring programmes, strong coordination is essential between national centers responsible for monitoring overall, to develop joint monitoring;
14. In relation to EO10 participants highlighted that Marine Litter is a new subject where still further research is needed to understand especially the impacts of the different types of marine litter.
15. Beach Litter can be monitored at relatively low cost, whereas micro-litter monitoring will be very challenging for many countries, and solutions will need to be found, such as engagement of fishermen for sampling;
16. Further, in relation to EO10, participants welcomed the ongoing work of UNEP/MAP (including the Marine Litter project) and new EC funded projects to support national revision of monitoring plans, and requested further support through projects and better coordination of projects;
17. Participants also welcomed in relation to EO10 the ongoing work of the European Environment Agency on coordinating tools to test effectiveness of beach monitoring in EU countries.

The SPI Workshop gave the following specific recommendations on scales of monitoring in relation to Biodiversity and Non-Indigenous Species:

18. Noting that IMAP sets a base to define the monitoring activities to be done and that the IMAP process is very relevant to define scales at national level, there is also a need to put together efforts at sub-regional level;
19. It is key to build stronger networks, more communication channels among scientists even on interdisciplinary tasks;
20. There is the need to capitalize data from national monitoring programmes and other programmes also focusing on existing gaps.

The SPI Workshop gave the following specific recommendations on scales of monitoring in relation to Coast and Hydrography:

21. There is a need to provide assistance to countries on the implementation of the common indicator 15 (hydrography), in particular for the determination of the baseline conditions, modelling for the impact assessments prior to construction, and monitoring habitats impacted by hydrographic alterations after construction has been completed;
22. It is key to have national official coastline and coastal zone delimitation in order to define the spatial scale for monitoring the coast related to common and candidate indicators; Scientists to assist policy makers, in coastline definition in case of ambiguities
23. Data availability linked to EO1, habitats in relation to common indicator 15 (hydrography) is a challenge and scientists involved in the biodiversity monitoring would need to provide an input to this common indicator at a higher resolution spatial scale;
24. Open source software available (such as European Space Agency's C-TEP) step by step guidance would be beneficial for the implementation of the coastal and hydrography common indicators.

Conclusions and Recommendations in relation to the draft 2017 Quality Status Report (QSR2017)

25. The Meeting welcomed the structure, lay-out and ongoing work of the QSR2017;
26. The Meeting stressed that purpose of the QSR 2017 is to see where we stand to achieve GES to ensure ecosystem based management and this should be further reflected in the draft QSR2017;
27. The Meeting stressed the importance to clarify for each indicator the geographical scale of Assessment, and as such, also include the countries who are covered by sub-region/region;
28. The Meeting requested that specific attention be given in the revision of the Assessment Factsheets to clarify the exact sources of information, data or meta-data and reports used for the Assessment, including temporal scales.
29. The importance of more inclusion of fisheries related data and need of further elaboration of linkage between biodiversity and fisheries, in cooperation with General Fisheries Commission for the Mediterranean, was highlighted;
30. With regards to the biodiversity assessment factsheets, all comments and suggestions would be included in the revised factsheets following the SPA/RAC Focal Points meeting;
31. In addition, the Meeting welcomed the offer for the creation of an online working groups to further develop the Assessment Factsheets, with a deadline of 26 May as follows:
    a) Habitats (CI 1 and 2)
    b) Marine mammals (CI 3, 4 and 5)
    c) Sea turtles and sea birds (CI 3, 4 and 5)
    d) Invasive NIS species (CI 6);
32. With regards to the data used from the MEDPOL database for Common Indicator 17, it was agreed that the excel sheets used to prepare the graphs would be shared with participating countries, and further clarification would be provided to Morocco and Montenegro regarding their data submissions;
33. The Meeting requested that in the further development on the Assessment Factsheet for Indicator 19 on acute pollution events, take into consideration all accidents including from land based sources, and to consider an analysis comparing the reported accidents with the location of marine protected areas.
34. Regarding Indicators 22 and 23 on Marine Litter, several additional studies were suggested and will be submitted to the UNEP/MAP Secretariat following the meeting for inclusion;
35. In relation to coast and hydrography, the Meeting acknowledge the work undertaken to prepare the indicator assessment factsheets, taking into account the limited data and information available, especially in the southern Mediterranean and noted that the aspect of offshore installations could not be assessed in this QSR report but would be further developed for further assessments.
36. The Meeting also noted that in the Gaps section for each Assessment Factsheet mention could be made of key capacity or knowledge gaps;
37. Participants were encouraged to provide written comments by 26 May in relation to UNEP (DEPI)/MED WG. 438/4, UNEP (DEPI)/MED WG. 438/5, UNEP (DEPI)/MED WG. 438/6 and UNEP (DEPI)/MED WG. 438/7.