D.2.3 Report on science capacity

August 2011

Pegaso Project
People for Ecosystem based Governance in Assessing Sustainable development of Ocean and coast

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Contents

1. Executive Summary

The **objective of PEGASO WP2** is to integrate scientific, policy, managerial and societal views and attitudes towards ICZM governance in the Mediterranean and the Black Sea regions. In particular, the **strategic line of WP2** is to construct an ICZM governance platform to support the development of integrated policies for the coastal, marine and maritime realms of the Mediterranean and Black sea basins.

Task 2.3 successfully conducted an inventory of research institutions, science capacity in ICZM work, scientific projects and scientific literature related to the main topics relevant for PEGASO.

Deliverable 2.3 aims principally at taking the stock of ICZM scientific activities inside and outside the PEGASO consortium. The aim is also to identify scientific and policy gaps while preparing a living document that will beupdated at regular timesteps during the project. This document is divided into four subtasks and the ouputs from a recent report on “Analysis and lessons learned from national ICZM strategies”.

Subtask 2.3.1 A bibliographic compilation of key coastal zone management publications resulted in 511 references published from 1984 to 2010 that were entered in Mendeley bibliographic tool. A comparative analysis is presented for other web-based bibliographic solutions.A decision needs to be made now by the Pegaso coordination team on which web-based solution to use for this project and how to connect it with the other Pegaso web-based tools.

Subtask 2.3.2 The objective of subtask 3.2.2 is to explore the creation of an ICZM professional network. Two solutions were explored for ICZM professional network on the Internet with LinkedIn and the PEGASO wiki platform. A final decision by the coordination team of Pegaso is needed to decide which solution is best for the project. Then, an important campaign will be needed to advertise the selected solution among project partners and beyond.

Subtask 2.3.3 The PEGASO task 2.3.3. Review of Science capacity in ICZM - aims at verifying the state of the art of scientific knowledge related to Integrated Coastal Management (ICZM) among the Mediterranean and Black sea research institutions. From the analysis of the questionnaires it is possible to point out that the sample was mainly oriented towards the so-called hard science disciplines. The sample characteristics may have influenced the kind of educational training described and the importance assigned to the physical and technical aspects of coastal zone management compared to the socio-politic ones.

The main challenges of ICZM are concerned to the effective involvement of stakeholders in the implementation of ICZM process and principles and inter-disciplinary approaches. Interestingly, it is recognised the need to improve the integration not only of different disciplines and sectors but also of the different knowledge contributions. Furthermore, it is promising that the majority of the scientific articles cited are related to the integration among sectors.

Subtask 2.3.4 This subtask aims at presenting on the project wiki of existing marine and coast related science and research projects and their main results (all EU projects on both seas, including the FP6 projects, LIFE projects, INTERREG projects, etc.), emphasis on climate change and coastal ecosystem management. Annex 2 presents a list of several representative projects across the Mediterranean and the Black Sea. Overall, the projects represented the diversity of the ecological, economic and social situations of the Mediterranean/Black Sea coastal zones.

In annex are presented the Questionnaires used for the scientific stocktaking, a list of selected ICZM projectsand a report on the Lessons learned from national ICZM strategies.

2. Bibliographic search and analysis

This subtask (2.3.1) aims at performing a bibliographic compilation of key coastal zone management publications with links also to maritime activities, planning, and conflicts within the limits of the territorial waters. The methodology includes bibliographic and web-based searches, and scientific databases and networks analysis. The final goal is to create a web-based database with key references on specific topics relevant for the PEGASO project. The PEGASO partners involved in this subtask are JRC and HCMR.

Methodology

The PEGASO ID.2.3.1 bibliographic database is a comprehensive compilation of references (mostly in English) considered as key coastal management publications for the Mediterranean and Black Sea region.
In this research, documents including information related to ICZM, coastal management, coastal planning, maritime issues, or international conflicts within the Mediterranean Sea and/or Black Sea were selected and analysed. All the results were manually controlled to verify their relevance for the PEGASO project. In general, the subject areas are life, physical and social sciences. Outputs were imported into reference management software. Then, data accuracy was checked and corrected when necessary (spelling errors, lack of basic information, and duplicates, amongst others).
Two main software were used during the database construction: Endnote X, due to its robustness and its wide applicability within the scientific community; and Mendeley Desktop version 0.9.8.1, due to its versatility and correctness. Possible export formats for the database include xml, bib, ris, and enl (only for Endnote). In general, ris is considered the best option when working with Mendeley, and xml/enl with Endnote.
The bibliographic research performed to build ID.2.3.1 included a broad web-based search, based on scientific literature databases and specific web sites, and experts' consultation. The most important data sources were:

- Scientific bibliographic search engines and databases (e.g. scopus, science direct, mendeley, scirus, or google scholar).
- Internal databases for scientific and technical reports. Due to the direct access of the partners involved in this task, the JRC PUBSY repository and the HCMR Library Anavissos have been intensively analysed. 195 reports from these catalogues were included in the PEGASO database. Other 14 reports published by international institutions like the European Environmental Agency or the United Nations Environment Programme were also included.
- Specific web sites (e.g. http://www.pap-thecoastcentre.org/ from PAP/RAC; http://ec.europa.eu/environment/water/index_en.htm from DG ENV; or http://www.medcoast.org.tr/ from MEDCOAST)
- International theses repositories, in particular the DART-Europe E-theses Portal (http://www.dart-europe.eu), Open Thesis (http://www.openthesis.org), OAIster (http://oaister.worldcat.org), and NDLTD (http://www.ndltd.org). In most of the cases, none or very few records satisfied the selection criteria.

Results

The WP2.3.1 bibliographic database comprises 511 references published from 1984 to 2010, classified as follows:

- 272 journal articles,
- 209 reports,
- 15 conference proceedings volumes,
- 5 thesis,
- 5 books,
- 3 book's sections,
- 2 protocols

ISI Web of Sciences

A complementary analysis made in ISI web of sciencesand web of social sciences with the "ICZM" keyword that returned a total of 215 publications with a net increase of both published items and citations since 2000. The most cited work by Fabbri totalized 26 citations since 1998 (Fig. 1).

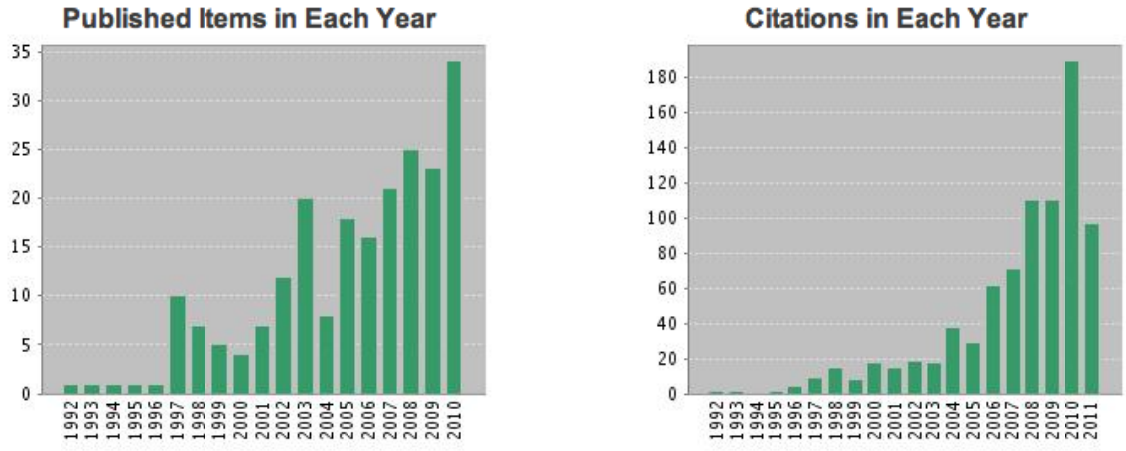

Figure 1. ISI Web of Science and Social Sciences results with "ICZM" keyword

A similar analysis was made with the following keywords"coastal zone"by splitting the references found in Web of Sciences and Web of Social Sciences in two groups.
Web of Sciences returned8573peer reviewed publications between years 2000.and 2010(Fig. 2), with the most cited paper by Cloern in 2001 on coastal eutrophication reaching 693 citations. Note that in general the number of publication only doubled in 10 years, where the number of citations increased dramatically. If we add the keyword Mediterra*, the number of publications reaches 576 (6.7% of total), and 141 with the "Black Sea" keyword (1.6% of total).

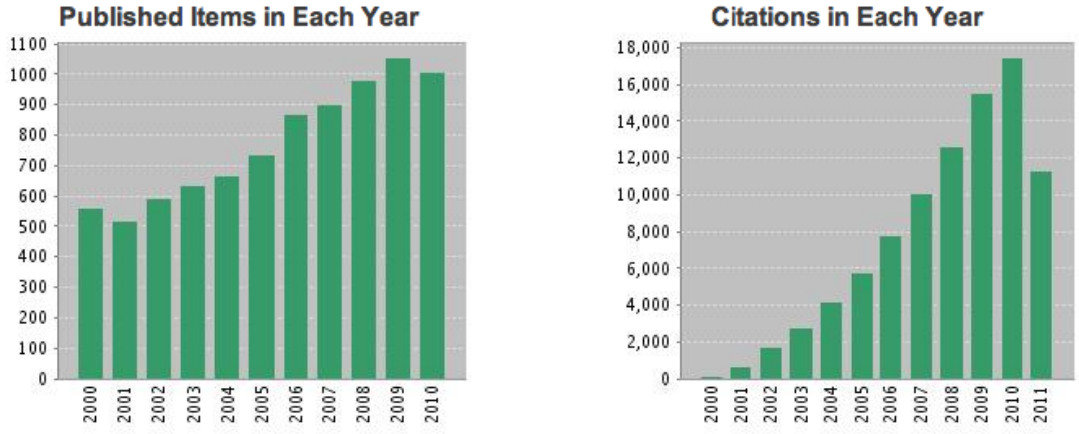

Figure 2. ISI Web of Sciences results with the "coastal zone" keywords

Web of Social Sciences returned only 368 peer reviewed publications (Fig. 3) during the same period between 2000 and 2011.

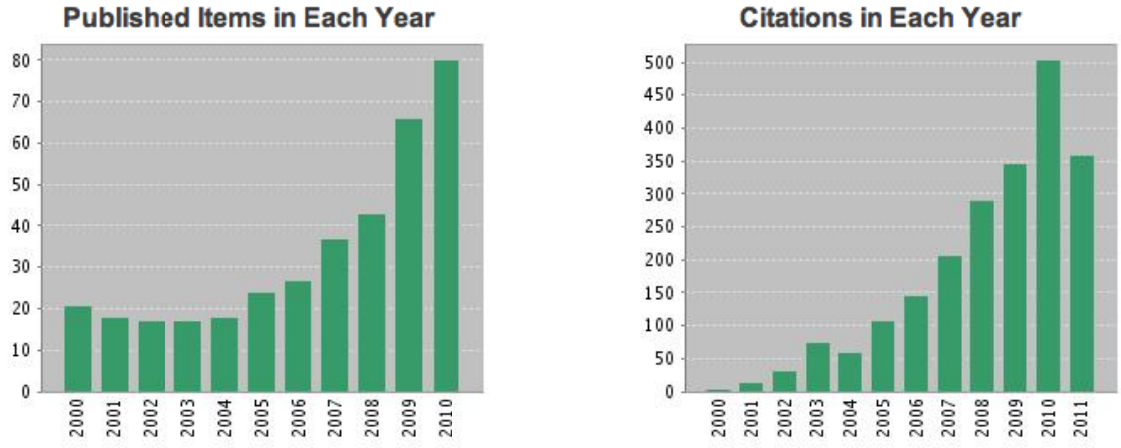

Figure 3ISI Web of Social Sciences results with the "coastal zone" keywords

The second analysis can be further categorized according to the different themes in which they were entered by ISI (Fig. 4). This shows how coastal management is interdisciplinary by nature with the main themes ranging across most natural sciences, some technology and engineering oriented fields, and the legal domain. However social and economical sciences do not appear in the top 25 domains.

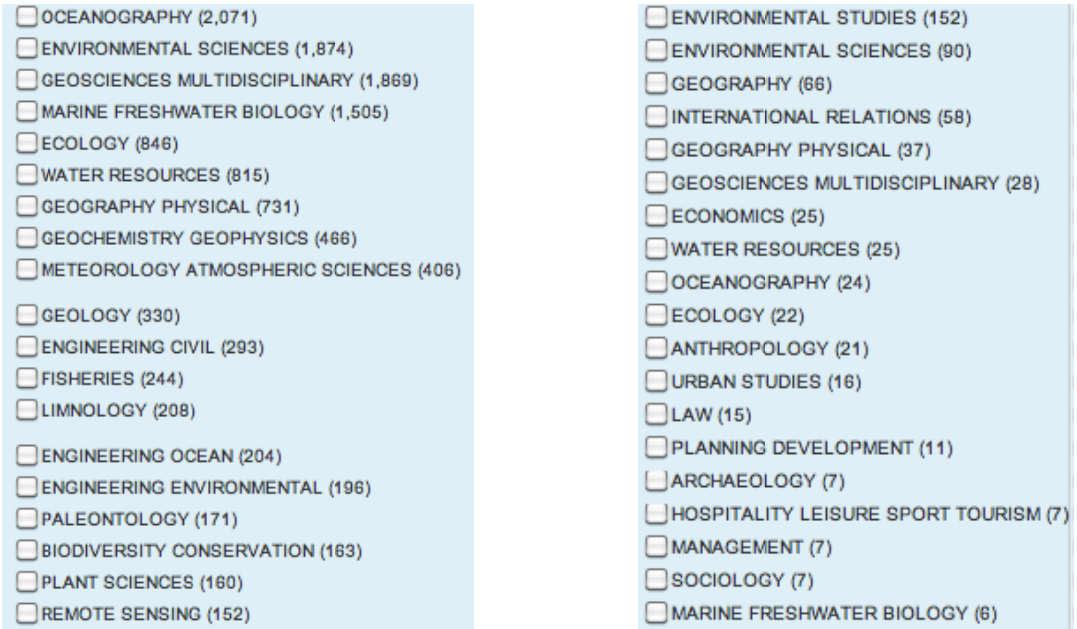

Figure 4. Subject areas in which coastal zone articles have been categorized in Web of Sciences (left) and Web of Social Sciences (right).

Our interpretation of this discrepenca between the number of peer reviewed publications on coastal zones in Natural Sciences versus Social Sciences is that it reflects both a true phenomena of less work being done in socio-economical aspects of coastal zones, but a stronger tradition of natural sciecnes to publish their work in peer reviewed journals.

Bibliographic databases

Concerning the web-based solutions that can be used to present and manage the bibliographic database resulting from this task, they were analyzed recently within the enviroGRIDS project in the public deliverable D7.3 that is available from the following web site: www.envirogrids.net. The main result of this work showed that the best solution appears to be the Evergreen open source software when comparing 5 solutions a cross 6 criteria (Table 1). We added in this comparison the solution proposed used by JRC, which is the Mendeley package (http://www.mendeley.com/compare-mendeley). This solution appears to be particularly attractive with many advantages over other solutions, with many interesting features such as being cross-platform, plugged-in MS Office and Open Office, and connected to scientific networks (http://www.mendeley.com/#features).We added also by interest another very good solution that is Zotero, which is very comparable to Mendeley. After discussion with the people involved in the Pegaso web portal, it has been decided tobuild a citation database in a group on the Mendeley website, and if possible share them regularly with the Coastal wiki supported by the Pegaso project (http://www.coastalwiki.org).

Table 1. Comparison of a selection of web-based bibliographic tools

Solution	**Criteria**					
	Implementation ++easy ….- - difficult	Cost (++ no cost…--costly)	Easy to add data ++easy..- - difficult	Easy to extract data (++easy..—difficult)	Suitability for less than 5000 publications ++ suitable …- - Not suitable	Integrable in other systems ++easy ….--difficult
Microsoft-Access database	+	+	++	++	++	+
RSS feed	+	+	+	++	++	+
Evergreen open source software	++	++	++	++	++	++
Sourceforge web-based library catalogue	-	++	+	++	+	-
EndNote web	+	--	+	+	++	-
CiteULike	-	-	-	+	++	--
Zotero	++	++	++	++	++	++
Mendeley	++	++	++	++	++	+

3. Inventory of ICZM research institutions and scientists

The objective of subtask 3.2.2is to explore the creation of an ICZM professional network on the Internet such as a LinkedIn group (http://www.linkedin.com)and/or the use of the contact database on thecoastalwiki (http://www.coastalwiki.org). The PEGASO partners involved in this subtask are UNIGE and MHI.

The objective is to promote the registration of project partners and their related network of people and institutions into both platforms. The strategy adopted is to open a PEGASO group and advertise on this group the Coastal wiki contact databse.

Nowadays, LinkedIn is the natural web-based solution for professional networks as it is being used by millions of professionals around the globe. It is also already used by several European projects (e.g. EnviroGRIDS, AfroMaison) and by the European Commission itself (Fig. 5). The first aim of LinkedIn is to present personal professional profiles and CVs, however it is also possible to create groups of common interest. A group was created for Pegaso and is now ready to be open to the users. The main advantage we see in using LinkedIn is that people joining it will be able to connect also to other groups, to advertise their personal profiles to potential employees. Another advantage is the fact that LinkedIn will undoubtedly survive the end of the Pegaso project.
As the aim is also to promote and support the Coastal wiki, it is important that the people registering to the LinkedIn group also register into the wiki contact database.

In the meantime, everyone interested to join both networks can proceed:

LinkedIn: http://www.linkedin.com/groups?viewMembers=&gid=3108727&sik=1314177639122

Coastal Wiki: http://www.coastalwiki.org/index.php?option=com_imis&Itemid=17

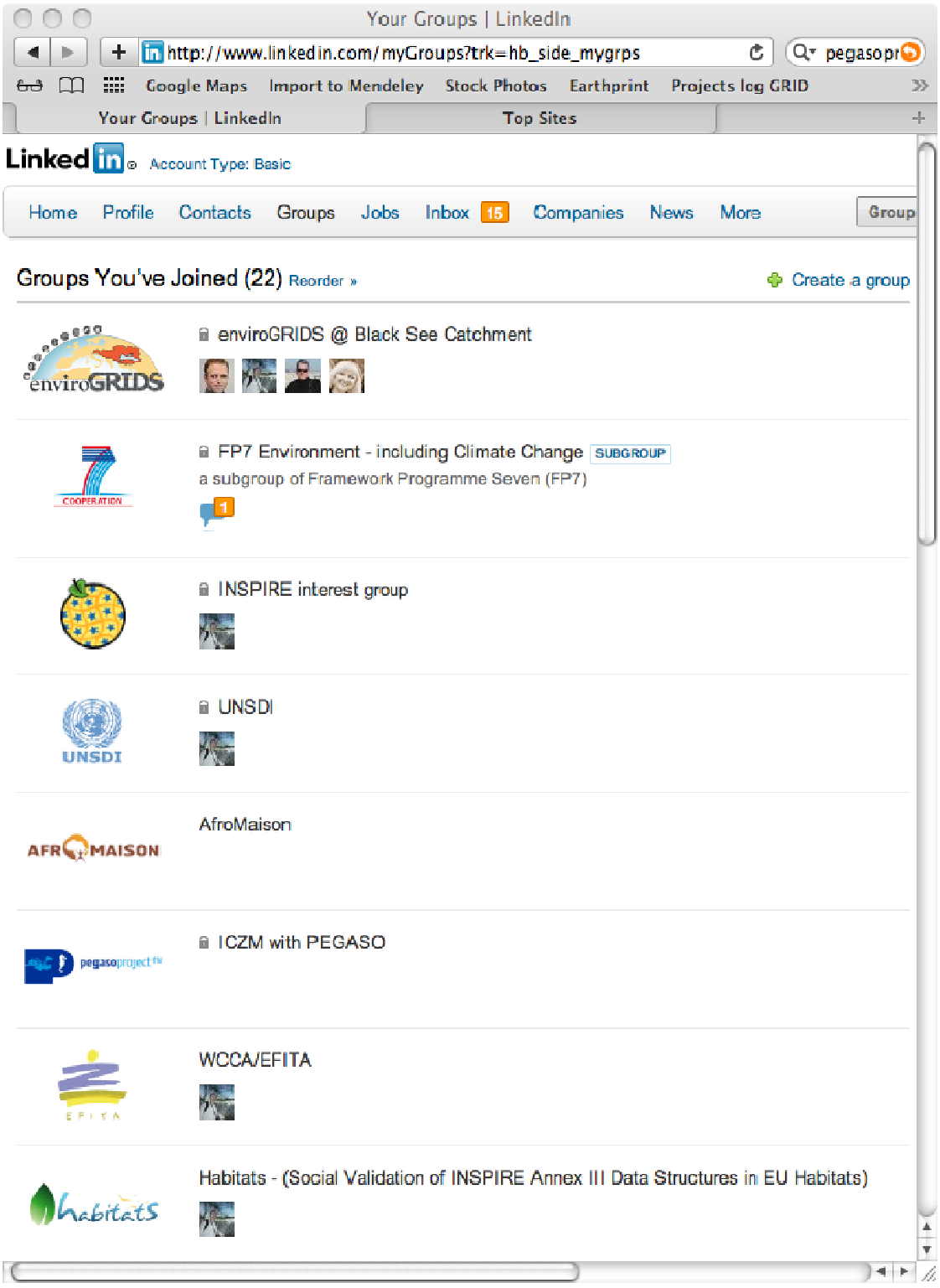

Figure 5. Examples of existing LinkedIn professional groups.

The other option that was explored is the use of the existing ICZM Pegaso wiki, which is embedded within the Coastal and Marine wiki (Fig. 6 and7). The main advantage of this solution is to build upon the solution developed within the Pegaso project and to take advantage of the existing Coastal and Marine Wiki.

Figure 6. Pegaso wiki interface.

http://www.coastalwiki.org/coastalwiki/Portal:PEGASO

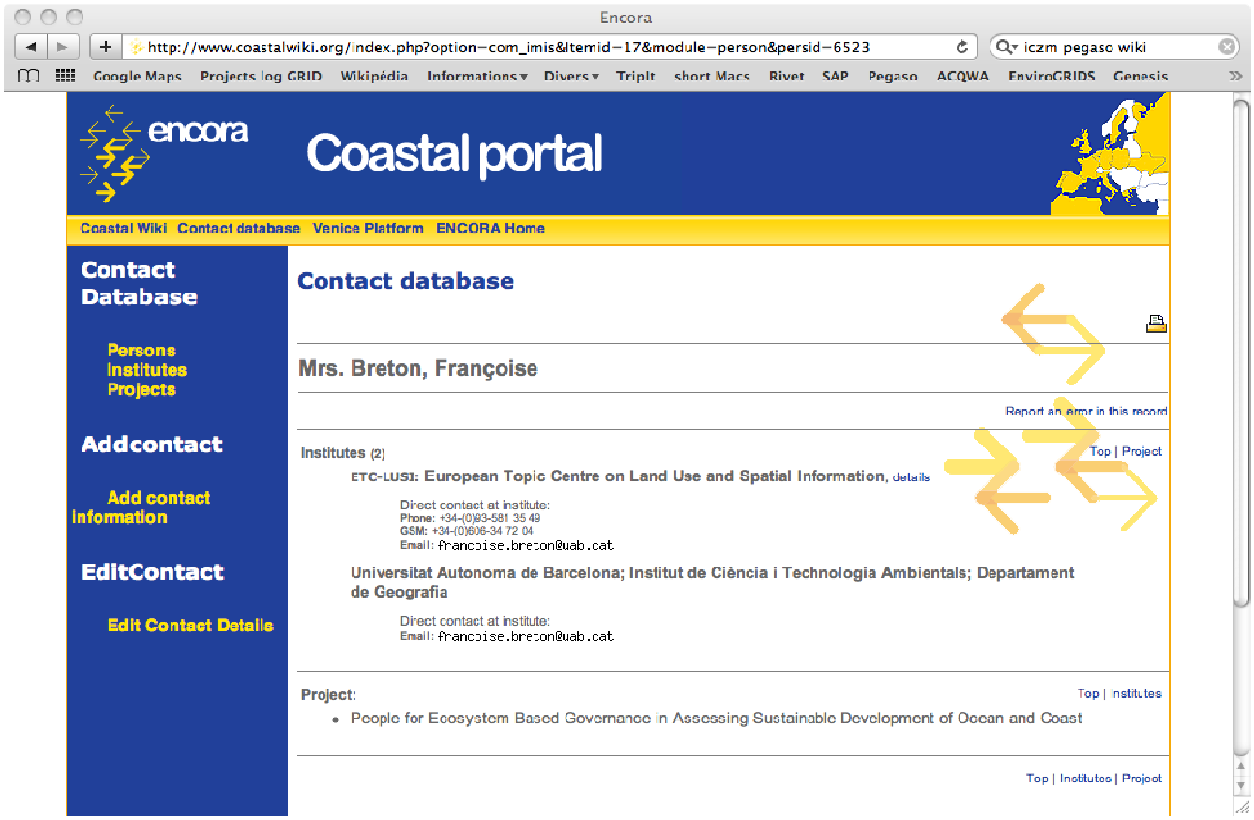

Figure 7. Coastal portal contact database.

http://www.coastalwiki.org/index.php?option=com_imis&Itemid=17

4. Review of science capacity in ICZM

The PEGASO task 2.3.3 - Review of Science capacity in ICZM - aims at verifying the state of the art of scientific knowledge related to Integrated Coastal Management (ICZM) among the Mediterranean and Black sea research institutions. The PEGASO partners involved in this subtask are UNIVE and MEDCOAST.
In order to fulfil this task a questionnaire was addressed to research institutions in the Mediterranean and Black Sea.

Objectives of the questionnaire

The questionnaire was developed to acquire directly from the researchers involved in ICZM the information needed to depict the current situation of research at Mediterranean and Black sea scale. The questions provide some general information on the disciplinary background of researchers on ICZM as well as training opportunities provided by the research institutes in the Mediterranean and Black sea. Moreover, the proposed questionnaire aimed to detect the scientific contribution to ICZM, the existing projects, data networks and the main challenges and research gaps. The questionnaire was addressed to the members of the MEDCOAST, PAP/RAC and Plan Bleu contact list. These three lists allowed reaching a quite large set of experts already involved in ICZM research and activities.

Structure of the questionnaire

The questionnaire (see Annex 1) was structured through 33 questions both open and close format.
Three main sections were developed to obtain data regarding general information on the respondents, the role of different knowledge and disciplines on ICZM as well as existing experiences. The sections were structured as follows:

1. Personal information: 5 open format questions regarding name, disciplinary background, Institution, Country.
2. Knowledge in ICZM: 7 close format questions regarding the factors influencing a good ICZM implementation, the relevance of different kinds of knowledge and disciplines for ICZM, research gaps and participatory process.
3. Experience on ICZM: 21 open and close format questions regarding the courses on ICZM provided by the institutions and the relative tools, the scientific contribution, scientific papers and project about ICZM.

The questionnaire was administrated by a free survey web platform both in English and French accessible at the following links:

http://scientificstocktake.limequery.com/32367/lang-fr.
http://scientificstocktake.limequery.com/79232/lang-en

Analysis of the results

The invitation letter and the web link to the questionnaire were delivered by MEDCOAST, Plan Bleu and PAP/RAC directly to their contact lists.
PAP/RAC sent the questionnaires to Universities, scientific institutions and not to those involved in the administration; MEDCOAST contacted social and natural scientists as well as engineers in Turkey; while the Plan Bleu disseminated the questionnaire by selecting contacts of scientists and experts, and particularly the CAMPs's network and scientists with whom they worked through academic and professional training. Furthermore, Plan Bleu published the questionnaire on the website (http://www.planbleu.org/).

The survey was open from January 2011 until the end of March 2011. The English and French versions of the questionnaire were visited, on the whole, by 155 contacts. However, only 57 of them completed the entire questionnaire. Interpreting this data is not easy but we can assume that probably a so high rate of uncompleted questionnaires might depend on the structure. The high number of open questions could have been considered by the respondents too laborious. This issue must be taken in consideration for eventual revisions.

The analysis regarding principal information about general data, training and educational opportunities offered by the institutions members of the contact lists, their experiences and the emerging issues related to stakeholders involvement, will be presented in the following paragraphs.

It is important to highlight that sample is not a comprensive one. Therefore, the results should be interpreted considering this constrain.

Sample general information

The first section of the questionnaire aimed at depicting the general characteristics of the respondents, such as the disciplinary background, the category and the geographical distribution of the institutes included in the

contact list of MEDCOAST, PAP/RAC and Plan Bleu.

As it is possible to note from figure 8, within the Mediterranean Basin it was not covered a uniform distribution of respondents, which were mainly concentrated in few Countries. The situation was different for the Black sea, where all the coastal Countries are present with at least one questionnaire compiled.

Additionally, some questionnaires were completed by experts working in Australia, Belgium, India, Germany, UK and the Netherlands, because their inclusion in the two above mentioned contact lists.

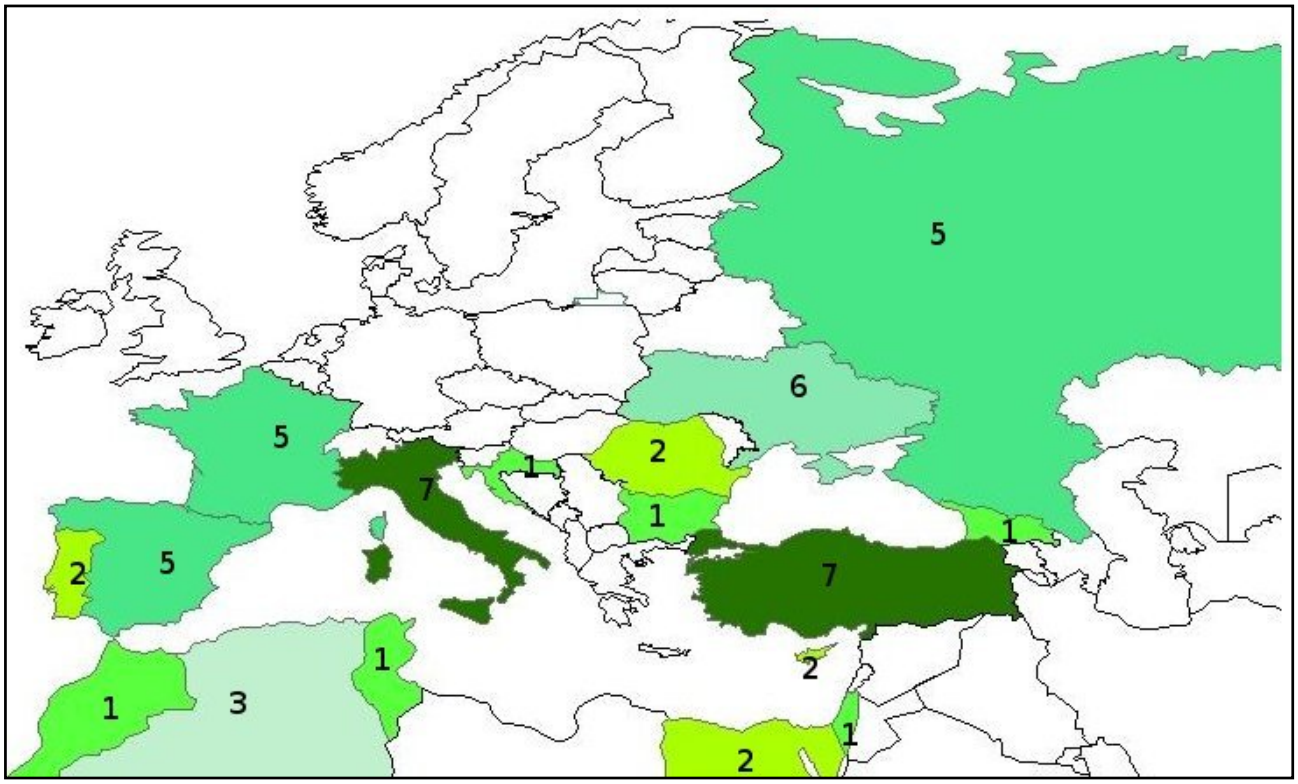

Figure 8 Which is the country the institution is located?

Regarding the disciplinary background, the survey highlighted that the majority of the experts on ICZM among respondents are biologists and engineers while moreinterdisciplinary professionals such as planners, geographers and environmental scientists are less mentioned.

These results reflect in part the characteristics of the initial sample composed by the three mailing lists. Indeed, the sample reflects the different approaches of disseminating the questionnaire.

The mailing list provided by MEDCOAST is composed of 30 persons in Turkey. The scientific discipline of each person is not available. However, they represent a mixture of social and natural scientists as well as engineers.
The PAP/RAC has selected within its contact list only people working in universities and scientific institutes. The resulting sample (37 contacts) was therefore, composed mainly by natural scientists (65%), followed by tourism and economics researchers (11% each), legal experts (8%) and one architect and one sociologist. Regarding the Plan Bleu we do not have information on the scientific background of the whole mailing list but only of 18 person on 72. Within the 18 contacts it is again prevailing the presence of natural scientists (72%), followed by economists (17%) and geographers (11%).

The sample characteristics may also have influenced the kind of educational training described and the importance assigned to the physical and technical aspects of coastal zone management compared to the socio-politic ones. Nevertheless, these answers seem to confirm that ICZM is still related to some specific disciplines; probably this factor is still influencing the development of a proper inter and transdisciplinary approach.

Moreover, it is interesting to note that despite the fact that ICZM implementation is mainly a political process, which depends on the implemented legislative framework, among the completed questionnaires there was not mention of law and political science backgrounds (Fig. 9).

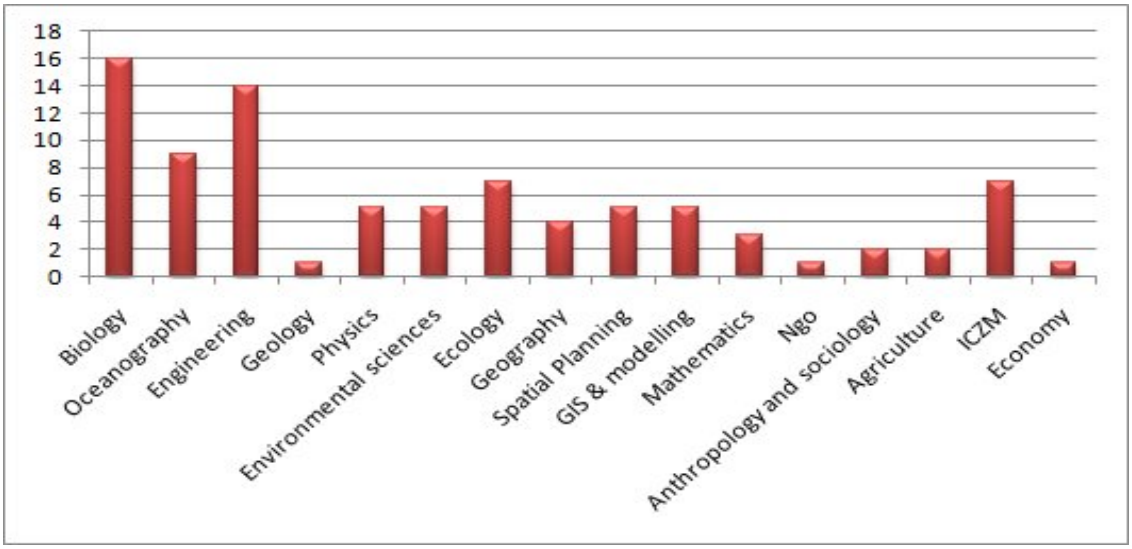

Figure 9 Which is your disciplinary background?

The contact lists reached different experts on ICZM, working on research and /or consultancy. In order to define the kind of organizations involved in ICZM activities the answers were categorized in 7 main groups (University, Research Institute, Ministry, Non Governmental organization, Private sector, Intergovernmental agency and National Agency).

As is possible to note from the Figure 10 within the two networks the respondents are working mostly in Universities (45%) and Research Institutes (35%). It is interesting to highlight that within the respondents private sector (8%) appears more involved in ICZM research and activities than governmental bodies (Ministry 2% and National Agency 5%).

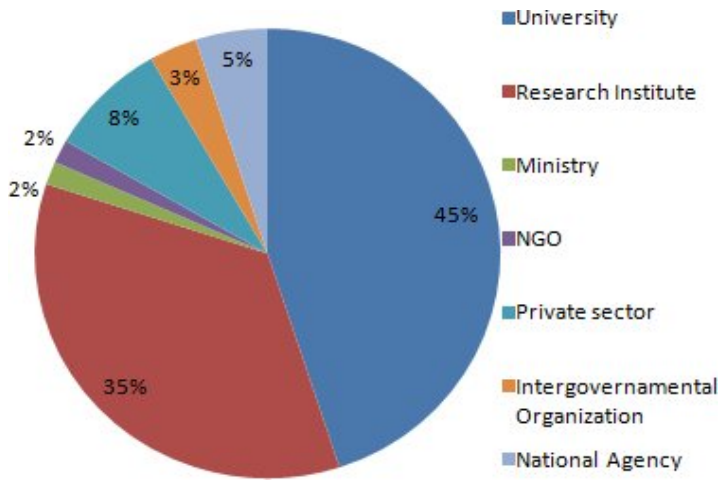

Figure 10 Which institutions are you working in?

Training and education on ICZM

Different questions were aimed to get information on the level and the typologies of ICZM educational programs available within the sampled institutions. Their preliminary analysis show that less than half of the

institutions of the respondents are providing educational programs on ICZM. These programs are mostly (65%) postgraduate courses, while only 35% of them are addressed to undergraduate students.

Moreover, the survey highlights that the majority of the post graduate programs are organised within the faculties of Engineering (8 respondents) and Science and Technology (7 respondents) while less often post graduate ICZM educational programs are organized within faculties characterized by more interdisciplinary approaches such as regional sustainability and environmental planning.

The participants were lately asked to specify (for the postgraduate programs) the kind of courses organized. In order to have a broad categorization, the courses were divided in 4 main thematic fields and for each categorization the respondents had to provide examples of the courses organised. The examples were mainly given in the thematic fields of Natural Science and Environmental Planning. For Natural Science the main courses listed were Coastal Engineering, Marine Biology, Monitoring and Geography, while within Environmental Planning category were specified Remote Sensing, Environmental Assessment and Monitoring as well as Coastal Planning. The fields of Social and Political Science were less mentioned. For the Social Science were provided as examples Fishery organizations, Climate Change adaptation and Socio-economic Management courses while the only example offered for Political Science was International law. These answers seem to confirm the conclusions of Barale and Ozhan (2010)[1] that highlighted "the traditional sectorial approach to education and training, and curriculum development" within University programs in ICZM in the Mediterranean and Black Sea Countries.

It is interesting to note that despite the plethora of literature regarding the need of adopting an interdisciplinary approach on ICZM the survey pointed out that educational programs are still based on a strict academic division. They mainly focus on the physical and technical aspects of coastal management while little attention is devoted to the socio-economic and political dimensions of coastal issues.

Experiences about ICZM

With the aim of detecting the experiences and projects about ICZM as well as networks between institutes, the respondents were asked to specify whether they have been involved in projects about ICZM.

From the results come out that 54% of the respondents have been involved in ICZM projects, 37% did not and finally 9% did not provide any answer. Regarding the nature of the projects it is possible to point out from the Figure 11 that the main scale of ICZM projects is national.

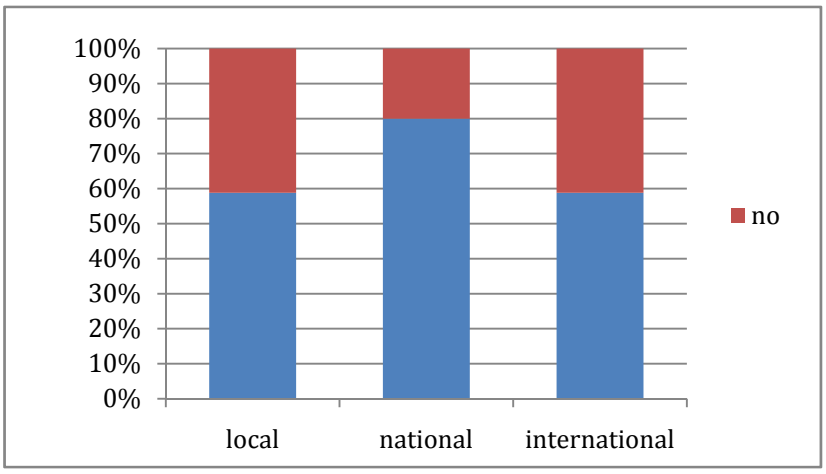

Figure 11 Which type of projects ?

In order to identify the main outcomes of ICZM projects the respondents were asked to provide their main accomplishments. To facilitate the understanding of the results, the received answers were categorised in 4 main themes based on the projects' outcomes: Scientific research, Monitoring programs, Strategies development, Programs and plans development.

The graph (Figure 12) shows that Programs and plans development and Monitoring programs implementation (respectively 36% and 24%) are the main focus of ICZM projects followed by Scientific research and Strategies development (both 20%). It should be noted that the majority of programs and plans are related to protected areas and wetlands management, fact that can easily explain the national scale of ICZM project.

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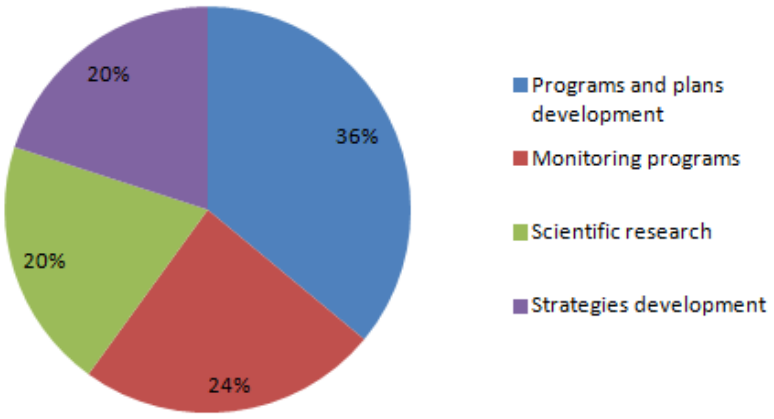

Figure 12 Which were the main accomplishments of the project?

Moreover, to understand if there is any active collaboration (exchange of data, experiences and knowledge) among the different institutes, the participants were invited to state their collaboration within Data Sharing networks. 33% of the respondents stated to be within Data Sharing networks, 16% did not provide any answers while 51% does not collaborate in any. In order to get a better picture of the existing networks the participants were asked to specify the name of the network. The below table lists all the networks of data sharing which have been mentioned during the survey and provides a brief description as well as website link.

Table 2: Data Sharing Networks

Network of data sharing	WebSite	Brief description
OSPAR CAMP DATABASE	http://www.ospar.org/content/content.asp?menu=00910301410000_000000_000000	The Comprehensive Atmospheric Monitoring Programme (CAMP) aims to assess the input of selected contaminants to the OSPAR maritime (North-East Atlantic) area and its regions via atmospheric deposition.
WORLD SEABIRD UNION	http://www.seabirds.net/wsu.php	The Union aims to place seabird research, management, and conservation into a worldwide perspective.
AQUATNET	http://www.archive.aquatnet.com/	It is an European thematic network in the field of aquaculture, fisheries and aquatic resources management.
OURCOAST	http://ec.europa.eu/environment/iczm/ourcoast.htm	It supports and ensures the exchange of experiences and best practices in coastal planning and management.
ENCORA	http://www.encora.corila.it/	It is a network on multidisciplinary and valuation for INTEGRATED COASTAL ZONE MANAGEMENT
SUSTAIN	http://www.nwcoastalforum.org.uk/projects/current-projects/	The project aims to develop a universal tool to help deliver sustainability on Europe's coast
CIESM Tropical Signals	http://www.ciesm.org/marine/programs/tropicalization.htm	It aims to track and evaluate the effects of tropicalization of the Mediterranean Sea using reliable and representative biological macro descriptors of climate warming.
CIESM JellyWatch	http://www.ciesm.org/marine/programs/jellywatch.htm	The Program aims to gather baseline data on the frequency and extent of jellyfish outbreaks across the Mediterranean Sea.
CIESM MEDZOO	http://www.obs-vlfr.fr/LOV/ZooPart/MedZoo/article.php3?id_article=17	Association of scientists willing to collaborate on the harmonization of methods for study the evolution of Mediterranean and Black Sea zooplankton in time and space.
MOOSE	http://www.allenvi.fr/?page_id=777	The Mediterranean Ocean Observing System on Environment aims to detect and identify long-term environmental anomalies and trends in the NW Mediterranean Sea.
SINAnet	http://www.sinanet.isprambiente.it/it	SINAnet is the Italian National Environmental Information Network System
SIGC (Coastal Geographical Information System)	www.altoadriatico.com	GIS and Geo-database of the central and northern parts of the Adriatic sea. The GIS collects, shares and integrates data on the availability and exploitation of fishery resources,
OpenEarth	http://public.deltares.nl/display/OET/OpenEarth	It is a free and open source initiative to deal with data, model and tools in marine & coastal engineering projects.
EUCC Pocoast Coastal List	http://www.coastalguide.org/	It is the information service of the EUCC aimed at professionals in coastal management, planning, conservation and research in Europe.
SEADataNet	http://www.seadatanet.org/	Digital repositories to manage, access and share data, information, products and knowledge originating from oceanographic fleets, new automatic observation systems and space sensors.
IODE	http://www.iode.org/	It facilitates the exchange of oceanographic data and information between participating Member States, and by meeting the needs of users for data and information products.
Upgrade Black SCENE Project	http://www.blackseascene.net/	The project promotes scientific cooperation, exchange of knowledge and expertise, and strengthens the Black Sea regional capacity and performance of marine environmental data & information.
EMODNET	http://ec.europa.eu/maritimeaffairs/consultation_emodnet_en.html	It is the European Marine Observation and Data Network.
enviroGRIDS	http://www.envirogrids.net/	EnviroGRIDS project contributes to the Global Earth Observation System of Systems (GEOSS) by promoting the use of web-based services to share and process large amounts of key environmental information about the Black Sea catchment.

GTS	http://www.wmo.int/pages/prog/www/TEM/GTS/index_en.html	The Global Telecommunication System (GTS) is the co-ordinated global system of telecommunication facilities and arrangements for the rapid collection, exchange and distribution of observations and processed information within the framework of the World Weather Watch.
MARBEF Biodiversity	http://www.marbef.org/	The platform integrates and disseminates knowledge and expertise on marine biodiversity, with links to researchers, industry, stakeholders and the general public.

Challenges

From the analysis of the question on stakeholders' involvement it results that 85% of the participants have actively involved stakeholders within ICZM projects. Among this group, 55% defined the process successful because it facilitated the co-production of new knowledge. It is interesting to note that the effective stakeholders involvement is the prevalent answer (44%) to the question on "the main challenges in collaborating with policy and decision makers during the projects." These results together lead to consider that the importance of stakeholders' involvement in ICZM is widely recognized.

Considering the question regarding the success or failure of stakeholder involvement, it is interesting to highlight that the inability to synthesize in one language the different knowledge contributions were considered by 11% of the sample as the main cause of failure of the stakeholders involvement and that 32% of respondents stated that their involvement was conflicting because the dialogue was hindered by the use of different types of languages.

Moreover, as it is possible to note from the Figure 13 there is consensus on the need of acquiring and integrating different knowledge (scientific, expert and local) for a proper implementation of ICZM. This seems to confirm that the need of transdisciplinary approach, skills and experiences to deal with different specific knowledge about ICZM is still a relevant challenge.

Coming back to the question on the practical challenges that respondents have faced while collaborating with policy and decision-makers in projects, it is worthy to note that the lack of legal and governance framework is also reported as a relevant challenge (22%). The non-existence of a legal and governance framework does not legitimize the implementation of ICZM principles and practices thus weakening the whole project. Moreover, time management and time scale of the project are considered an important issue which if not properly managed may jeopardize the collaboration with policy and decision-makers. Data availability and access, lack of trained coastal managers and consensus building were also mentioned, but only by 6 % each.

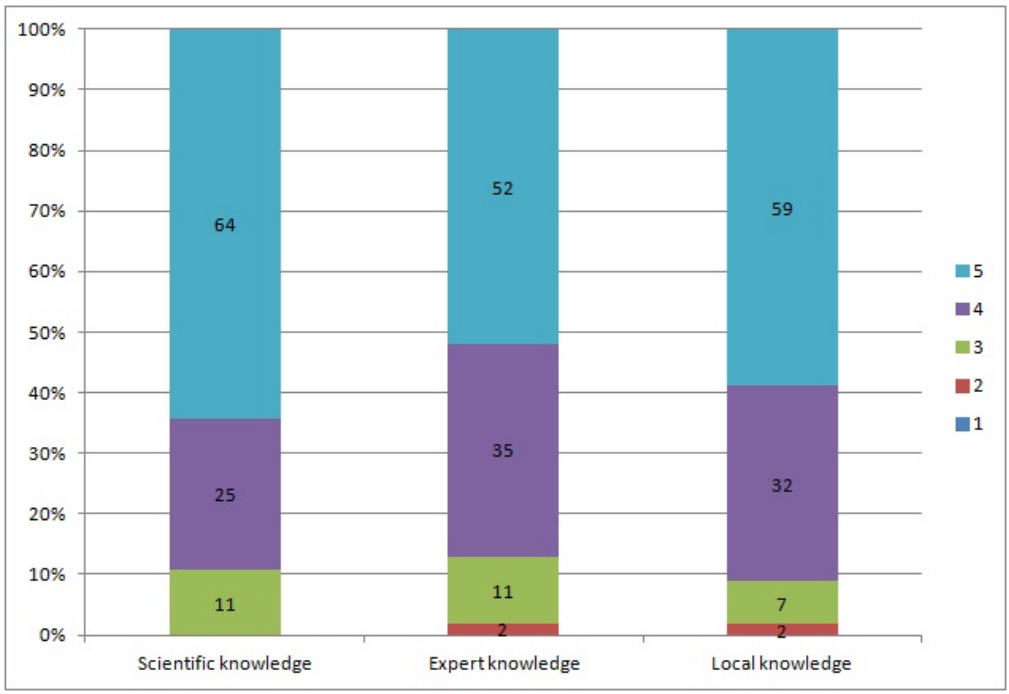

Figure 13 In your opinion for a good ICZM implementation how much important is to gain the following typologies of knowledge?(The labels are expressed in %)

Research gaps

The investigation among the existing research gaps for ICZM was concentrated on understanding how much the development of different tools was relevant. The categories proposed were: a) tools for the understanding of natural coastal processes, b) tools for the understanding of coastal socio-economic dynamics, c) tools for simulating future conditions (e.g. scenarios), d) tools for the analysis of the coastal and marine governance framework, and e) tools to better understand the interaction between terrestrial and marine processes.

The scale from 1 to 5 was equivalent to:

- 1= Not at all,
- 2= A little,
- 3= On average,
- 4= Enough
- 5= A lot.

The results (Figure 14) do not draw attention to any particular emerging issue; all the aspects are considered relevant.

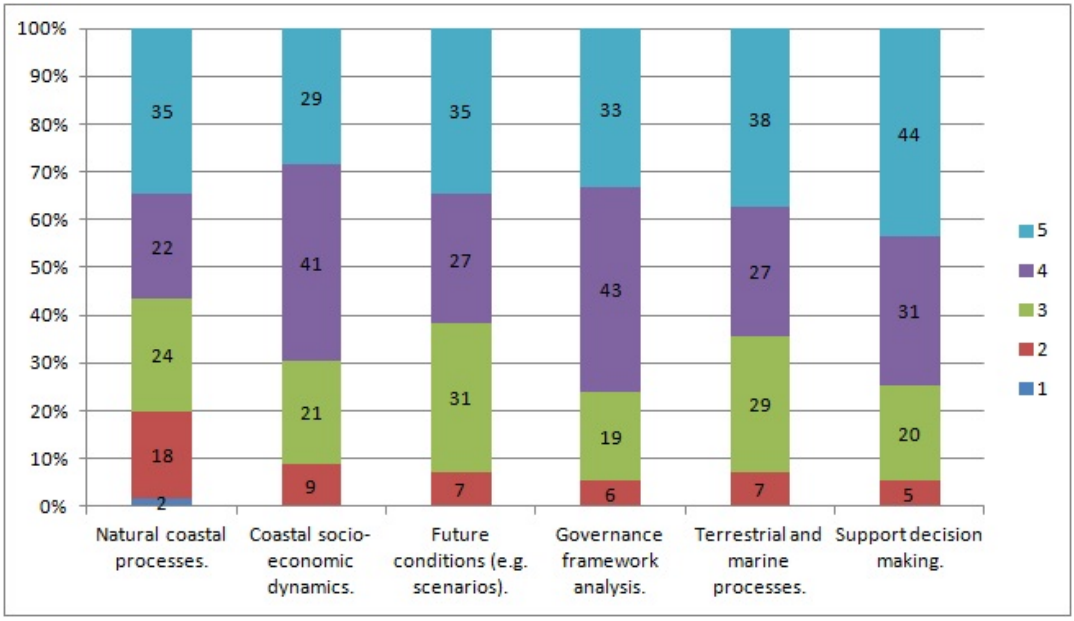

Figure 14 Which are in your opinion the research gaps for ICZM?(The labels are expressed in %)

Using the same scale, the participants to the survey were asked also to identify the importance of the following disciplines:

- Marine sciences
- Earth sciences
- Economics
- Political sciences
- Geography
- Social sciences
- Planning

Once more, as summarised in Figure 15, it is possible to note that within ICZM research the contribution of the so-called hard science is considered predominant in comparison to the social and political aspects. However, it is not easy to understand how much these results represent a general trend or depend on the sample features.

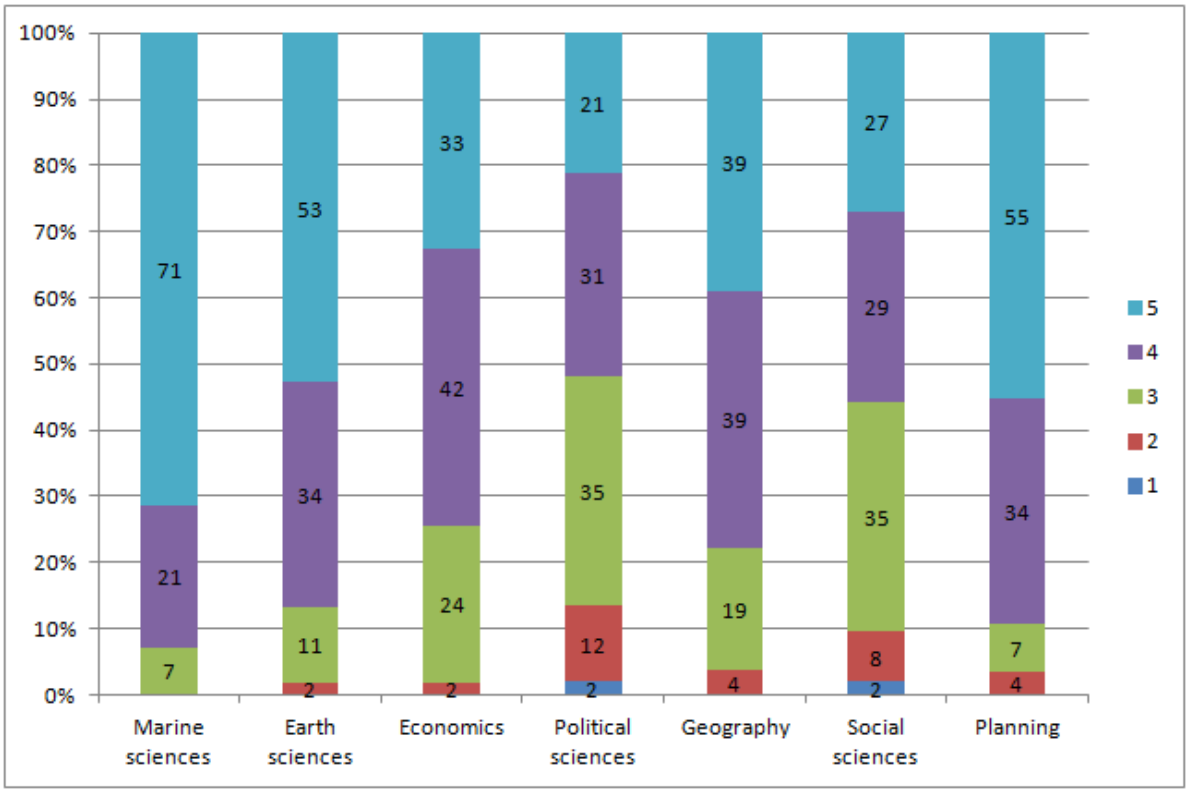

Figure 15 According to your opinion how much important are the following disciplines for ICZM?(The labels are expressed in %)

Thequestionnaire investigated also the typologies of published research papers. It is worthy to note that among the 91 scientific publications listed by respondents half of them are dealing with management, integration among sectors and participation as well as economical evaluation. This result shows that the need to integrate different disciplines and knowledge within ICZM is clearly addressed by research, despite the disciplinary background of researchers.

5. Existing ICZM projects

This subtask aims at presenting on the project wiki of existing marine and coast related science and research projects and their main results (all EU projects on both seas, including the FP6 projects, LIFE projects, INTERREG projects, etc.), emphasis on climate change and coastal ecosystem management (Annex 2). The PEGASO partners involved in this subtask are UOB, IFREMER and NIOF.

A total of 80 projects of Marine and Coastal Zone Management have been selected out of the total number of projects that have been conducted in the Mediterranean and the Black Sea during the last decade. Some of the projects were dated before the last decade. Information from selected projects were compiled in this report and presented in a table. Each of the projects involved several aspects related to 1) coastal zone integrated management and cooperation procedures, and their efficiency, and/or 2) marine sciences within at least one study area in the Mediterranean and/or the Black Sea. The intervention scale of the selected projects varied from local and regional to international level.

The projects were mainly selected in the context of the following financial instruments: EU FP6 and FP5, EC LIFE-Environment, SMAP, and INTERREG programmes, among others. The projects table is not a complete list of all projects related to marine and coastal science but it is to a certain extent a comprehensive table of several representative projects across the Mediterranean and the Black Sea. The selected projects were categorized according to the funding agencies of the projects and in aplhabatical order. Accordingly, the following legend describes the colour of each category(Table 2).

Table 2 Color legend used by group of projects in Annex 2

	EU FP6 projects
	SMAP III projects
	INTERREG projects
	EU FP5 projects
	EC LIFE projects
	Other

The table of the projects briefly described the title of the project, acronym, the time of implementation, funding agency and budget (total cost), the project coordinator, the objectives, the results, and the project website. Each project was given and ID and attributed several keywords (Figure 16).

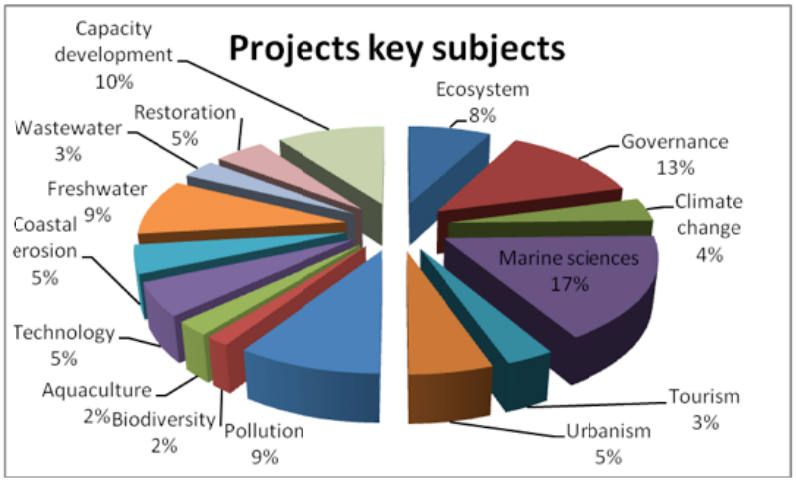

Figure 16 Key subjects treated in the selected projects

Overall, the projects represented the diversity of the ecological, economic and social situations of the Mediterranean/Black Sea coastal zones. It was observed that the subject of “Marine sciences” was addressed in at least 24 projects, “Governance” in at least 20 projects, “capacity development” in at least 15 projects, “pollution” and “freshwater” in at least 12 projects each, and “ecosystem” in at least 10 projects. The other key subjects (e.g. climate change, tourism, urbanism, biodiversity, aquaculture, technology, coastal erosion, wastewater, restoration) were addressed by a maximum of 7 projects each.

More specifically, the projects that addressed marine sciences included topics related to the marine environment, ocean monitoring and forecasting, marine ecosystems, mechanisms of stocks recovery, stresses and pollution in aquatic ecosystems, evaluation tools to appraise the biological effects of fisheries management, marine biotoxins, and best practices in marine sciences.

Projects addressing “governance” included many topics related to the establishment of good governance in coastal zone management. This included the review of most relevant EU policies and legislation and their effects for the implementation of coastal zone management and marine planning, the development of efficient public policies, the establishment of a number of services enabling coastal professionals to take better advantage of existing knowledge resources, the development of a multidisciplinary assessment framework with a balanced consideration of the ecological, social and economic sectors of Coastal Systems, the analysis of public participation facilitation, public information, ICZM Action Plan development with involvement of stakeholders, and the development of Integrated Coastal Area Management strategies. In addition, “governance” related projects worked on enabling policy frameworks for environment and development integration with focus on Integrated Coastal Management and assessing sustainability and strengthening operational policy. Many projects contributed to the creation and implementation of EU policy on coastal zones and maritime areas, such as the Green Book and Blue Book, and led to creation of numerous national laws and strategies. Furthermore, the development of innovative approaches to territorial governance was achieved by improving the coordination of regional maritime policies with each other and with other levels of governance, in particular the national, European and Mediterranean levels.

The “capacity development” key subject under its different forms (including education, training and awareness) was addressed in many projects. Such projects involved the demonstration of Multimedia tools and participation processes through exploitation of data, models and institutional knowledge with outreach perspectives to civil society in its various forms, the development of bases for education-training-outreach programmes including pedagogic materials, and the provision of technical assistance for the updating and enhancing national legislative frameworks on coastal zone management. Also, different workshops and training courses were designed, developed and conducted. Local, national and international experts were

identified to carry out trainings in relevant fields, and technical capacity of key stakeholders was strengthened in ICZM planning and related fields. Local stakeholders were involved through several workshops and capacity building programmes.

Projects involving “pollution” were focused on presenting evidences of toxic stress in aquatic ecosystems. New tools for the detection (and quantification) of marine biotoxins were developed. The capabilities of mitigating and eliminating the threat arising from oil spill incidents were built in different countries. Some projects comprising the development of novel technological approaches for industrial (prevention) and coastal (remediation) water treatments were conducted and computer simulations were developed accordingly. Also, pilot integrated water management plans for pollution decrease were developed for several coastal zones. Some other projects worked on increasing the collection of volume of waste from vessels. The development of selective collection for certain dangerous waste and problematic waste were also conducted in Mediterranean coastal zones.

Projects addressing “freshwater” included the development of novel technological approaches for industrial (prevention) and coastal (remediation) water treatments. Also, conflicts of use among stakeholders across Mediterranean coastal areas, which suffer from water scarcity and associated constraints, were identified. Projects under this category comprised an assessment of the impact/s of various water uses as well as nearby human activities on coastal water bodies, such as fluvial systems, estuaries, marshlands and lagoons. Interdisciplinary scientific inputs were produced for improved participatory water management strategies and related planning regimes for a rational use of water resources. In addition, alternative management strategies and plans were developed for selected sites as well as general guidelines were proposed for appropriate and sustainable management of water resources in Mediterranean coastal areas. Some projects included the establishment of a network of scientists, authorities and local communities within the Mediterranean to enhance local awareness on water quality, to optimize water resources allocation and pollution decrease, and to improve the use and misuse of water. Some pilot integrated water management plans were developed. Moreover, socio- economic, legal framework, and environmental issues with specific reference to water were analyzed.

Finally, “ecosystem” was one of the top treated subjects in the listed projects. Projects including this category of keywords aimed at developing analytical methods to predict the effects of pollutants on coastal and marine ecosystems, developing a new approach to assess the societal cost of fishing activities to the ecosystem, and modelling the consequences of alternative scenarios for human development on the marine ecosystems, including natural and anthropogenic pressures exerted upon the functioning of the ecosystem. A number of projects worked on assessing and predicting changes in the Mediterranean and Black Sea ecosystems as well as changes in the ability of these ecosystems to provide goods and services. Other projects aimed at developing interlinked and verified predictive modelling tools as well as state-of-the-art effect-assessment and analytical methods generally applicable to European freshwater and marine ecosystems. Many other projects worked on regenerating marine and coastal ecosystems by eliminating the adverse effects of the infrastructure development and restoring damaged areas.

As previously indicated, only few projects addressed directly key subjects such as climate change, tourism, urbanism, biodiversity, aquaculture, technology, coastal erosion, wastewater, and restoration. However, this does not mean that these subjects were not indirectly tackled in projects addressing the previously presented key subjects. The table listing all selected projects give further details and information inr elation to what has been discussed above.

Annex 2 briefly describes the title of the project, Acronym, the time of implementation, funding agency and budget total cost, the project coordinator, the objectives, the results, and the project website.

7. Conclusions and recommendations

Task 2.3 successfully conducted an inventory of research institutions, science capacity in ICZM work, scientific projects and scientific literature related to the main topics relevant for PEGASO. The consortium needs now to implement the main results of this task within PEGASO and beyond.

Subtask 2.3.1A bibliographic compilation of key coastal zone management publications resulted in 511 references published from 1984 to 2010 that were entered in Mendeley bibliographic tool. A comparative analysis is presented for other web-based bibliographic solutions.It was decided to use web-based Mendeley solution proposed by JRCwithout forgetting to connect the bibliographic tool to the Coastal Wiki.

Subtask 2.3.2 Two solutions were explored for ICZM professional network on the Internet with LinkedIn and the PEGASO wiki platform. It was deiced to promote both solutions, as they appear to be complementary. Now, an important campaign is needed to advertise both solutions among project partners and beyond.

Subtask 2.3.3 The contacted sample was mainly composed by natural scientists and this composition is reflected in the findings of the survey. However, it is not possible to define the degree of representativeness of the three mailing lists and consequently the significance of the survey's results.

Besides the lack of information regarding the scientific background of the sample the questionnaire clearly highlight the main challenges perceived by researchers and consultants working in the field of ICZM. According to the respondents the implementation of ICZM is challenged by the effective involvement of stakeholders in the execution of process and principles and by the lack of inter-disciplinary approaches. Interestingly, it is recognised the need to improve the integration not only of different disciplines and sectors but also of the different knowledge contributions. Furthermore, it is promising that the majority of the scientific articles cited are related to the integration among sectors.

Subtask 2.3.4 Annex 2 is not a complete list of all projects related to marine and coastal science but it is to a certain extent a comprehensive table of the several representative projects across the Mediterranean and the Black Sea. Overall, the projects represented the diversity of the ecological, economic and social situations of the Mediterranean/Black Sea coastal zones.

In general, this scientific stocktaking has demonstrated that there was already a large amount of information and people specialized on ICZM. A bias appeared regularly towards Natural Sciences compared to Social Sciences. It is however not clear whether this biais is real, or if it is mainly due to the choice of keywords and questions used in the different part of this report.

The contribution, presented in annex 3, from IFREMER and PAP/RAC about lessons learned from ICZM projects and programmes from around the world comes strengthening and enlarging the scope of the statements made out of the scientific stocktaking, hence making it more operational.

The main recommendation from this report is to make the content behind this document quickly available to the project partners and other interested people. Several web-based solutions have been chosen and need now to be implemented.

Annex 1: Questionnaire for scientific stock-take on ICZM implementation in the Mediterranean and in the Black sea

This questionnaire aims to verify the state of the art of scientific knowledge related to integrated coastal management (ICZM) among the Mediterranean and Black sea research institutions.
This survey was developed within the context of the project FP7 PEGASO (www.pegasoproject.eu) that is meant to support the implementation of the Protocol on ICZM in the Mediterranean and to verify the possibility to create a similar document for the Black sea.
The results of this survey will be used to establish a network among all researchers dealing with ICZM.
We are willing to share the results that will come out of this questionnaire with all those interested.
There are 33 questions in this survey

A) PERSONAL INFORMATION

1 [A1]Name (first name, family name)
Please write your answer here:

2 [A2]Which is your disciplinary background?
Please write your answer here:

3 [A3]Which institution are you working in?
Please write your answer here:

4 [A4]What is your role within the institution?
Please write your answer here:

5 [A5]Which is thecountry the institution is located?
Please write your answer here:

B) KNOWLEDGE IN ICZM

6 [B1]1) In your opinion, how much relevant are the following factors in the good implementation of an ICZM? Express with a number the relevance of the following factors:
Please choose the appropriate response for each item:

	1	2	3	4	5
Knowledge base	○	○	○	○	○
Ecosystem approach	○	○	○	○	○
Institutional support	○	○	○	○	○
Conflict management	○	○	○	○	○
Relevant stakeholders engagement	○	○	○	○	○
Integration of scientific with non-scientific local knowledge	○	○	○	○	○

1=Not at all, 2= A little, 3= On average, 4= Enough, 5= A lot

7 [B2]2) According to your opinion how much important is the contribution of scientific knowledge to ICZM:

Please choose the appropriate response for each item:

	1	2	3	4	5
for the understanding of dynamics of the physical environment	○	○	○	○	○
for the understanding of the dynamics of the socio-economic environment	○	○	○	○	○
for the understanding of the interactions between the physical and social dimensions of the system	○	○	○	○	○

Rate from 1 to 5 where 1 = not at all, 5 = a lot

8 [B3]3) According to your opinion how much important are the following disciplines for ICZM?

Please choose the appropriate response for each item:

	1	2	3	4	5
Marine sciences	○	○	○	○	○
Earth sciences	○	○	○	○	○
Economics	○	○	○	○	○
Political sciences	○	○	○	○	○
Geography	○	○	○	○	○
Social sciences	○	○	○	○	○
Planning	○	○	○	○	○

Rate from 1 to 5 where 1= not at all, 5= a lot

9 [B4]4) During your research work on ICZM, have you ever involved actively other type of stakeholders (e.g. fishermen representatives , tourism managers, local authority representatives, professionals)

Please choose **only one** of the following:

○ Yes

○ No

10 [B5]5) If yes, how could you describe the process?

Please choose **only one** of the following:

○ Successful: because the process facilitated the coproduction of new knowledge

○ Conflicting: because the dialogue was hindered by the use of different types of languages.

○ Failing because of the inability to synthesize in one the different knowledges contributions.

○ Other (please specify)

Make a comment on your choice here:

11 [B6]6) In your opinion for a good ICZM implementation how much important is to gain the following typologies of knowledge?

Please choose the appropriate response for each item:

	1	2	3	4	5
Scientific knowledge	○	○	○	○	○
Expert knowledge	○	○	○	○	○
Local knowledge	○	○	○	○	○

1= Not at all, 2= A little, 3= On average, 4= Enough, 5= A lot

12 [B7]7) Which are in your opinion the research gaps for ICZM?

Please choose the appropriate response for each item:

	1	2	3	4	5
Development of proper tools for the understanding of natural coastal processes.	○	○	○	○	○
Development of proper tools for the understanding of coastal socio-economic dynamics.	○	○	○	○	○
Development of proper tools for simulating future conditions (e.g. scenarios).	○	○	○	○	○
Development of tools for the coastal and marine governance framework analysis.	○	○	○	○	○
Development of proper tools to better understand the interaction between terrestrial and marine processes.	○	○	○	○	○
Development of tools and methods to support decision making.	○	○	○	○	○

1= Not at all, 2= A little, 3= On average, 4= Enough, 5= A lot

C) EXPERIENCE ON ICZM

13 [C01]1) Is there any undergraduate, post-graduate course on ICZM in your Institution?

Please choose **only one** of the following:

○ Yes

○ No

14 [C02]2) If yes specify the typology of the course:

Please choose **all** that apply:

☐ Undergraduate

☐ Post-graduate

15 [C03]3) Within which faculty the programme is organised?

Please write your answer here:

16 [C04]4) If it is a master programme, which courses can be found in it?

Please write your answer(s) here:

- natural sciences (please specify)
- social sciences (please specify)
- environmental planning (please specify)
- political sciences (please specify)

17 [C05]5) Which tools are taught in the course(s)?
Please choose **all** that apply:

☐ modelling

☐ spatial analysis (GIS)

☐ participatory methods

☐ decision support tools

☐ Other:

18 [C06]6) Which is your scientific contribution to ICZM?
Please write your answer here:

19 [C07]7) Have you recently published scientific papers on ICZM (in the last 5 years)?
Please choose **only one** of the following:

○ Yes

○ No

20 [C08]8) If yes, could you please list them?
Please write your answer here:

21 [C09]9) Are you within a network of Data sharing?
Please choose **only one** of the following:

○ Yes

○ No

22 [C10]10) If yes, please specify:
Please write your answer here:

23 [C11]11) Have you developed tools for ICZM implementation?
Please choose **only one** of the following:

○ Yes

○ No

24 [C12]12) If yes, please specify
Please write your answer here:

25 [C13]13) Which of them are open source?
Please write your answer here:

26 [C14]14) Have you ever participated in ICZM projects?
Please choose **only one** of the following:

○ Yes

○ No

27 [C15]15) If yes, which type of projects
Please choose **all** that apply:

☐ local

☐ national

☐ international

28 [C16]16) Which was your contribution to the project(s)? (Please describe the projects of the last 5 years)
Please write your answer here:

29 [C17]17) Which were the other partners involved in the project? (Please specify the Institution(s))
Please write your answer here:

30 [C18]18) Which were the main accomplishments of the project(s)?
Please write your answer here:

31 [C19]19) Are you involved in any consultancy project with the national or local institutions in charge of ICZM in your country?
Please choose **only one** of the following:

○ Yes

○ No

32 [C20]20) If yes, specify the project(s) name:
Please write your answer here:

33 [C21]21) If yes, could you please list which were, in your opinion, the major challenges in collaborating with policy and decision makers during the projects?
Please write your answer here:

Thank you for your cooperation!

Annex 2: A compilation of selected existing Marine and Coastal Zone Management Projects in the Mediterranean and the Black Sea

Color legend:

	EU FP6 projects
	SMAP III projects
	INTERREG projects
	EU FP5 projects
	EC LIFE projects
	Other

ID	Acronym	Title	Implementation date	Funding agency and costs	Coordinator	Objectives	Results	Website	Keywords
1	AQUAGRIS	Environmental management reform for sustainable farming, fisheries and aquaculture	2007-2010	European Commission, under the 6th Framework Programmed (899671.00 euro)	UNIVERSITA' DEL SALENTO DIPARTIMENTO DI SCIENZE E TECNOLOGIE BIOLOGICHE ED AMBIENTALI - FACOLTÀ DI SCIENZE MATEMATICHE FISICHE E NATURALI - ITALY	To co-ordinate research on environmental management reform to improve sustainability in the farming, fisheries and aquaculture industries.	• Set of guidelines and recommendations of best practice to help to decrease the environmental impact of the farming, fisheries and aquaculture industries. • On-line European database, linked to existing web sites and databases of specialist groups Exchange of European researchers • Specialized web site, technology transfer workshops and exchange programme	http://www.aquagris.org	Aquaculture, technology
2	BIOTOXMARIN	Development of novel analytic tools	2005-2007	European Commissionunder	JOHANNES GUTENBERG-	To develop fast, simple and cost-effective detection	• New tools for the detection (and quantification) of	http://www.biotoxmarin.de	Marine sciences, pollution

		for the detection of marine biotoxins		the 6th Framework Programmed (2.02 million euro)	UNIVERSITÄT INSTITUT FÜR PHYSIOLOGISCHE CHEMIE / ABTEILUNG ANGEWANDTE MOLEKULARBIOLOGIE - GERMANY	methods for marine biotoxins in seafood based on the application of high-affinity capture antibodies and novel artificial receptor mimics against the toxins	marine biotoxins are developed • User-friendly chip assay methods as well as new bioassays are developed.		
3	CONSCIENCE	Concepts and Science for Coastal Erosion Management	2007-2010	European Commissionunder the 6th Framework Programmed (848861.00 euro)	STICHTING DELTARES SCENARIOS AND POLICY ANALYSIS - NETHERLANDS	To develop and test concepts, guidelines and tools for the sustainable management of erosion along the European coastline, based on best available scientific knowledge and on existing practical experience.	• A decision-making framework based on the concepts formulated by the EUROSION project, i.e. coastal resilience, coastal sediment cells, favorable sediment status and strategic sediment reservoirs is defined. • Concepts are developed into measurable standards, which can be evaluated in practice for any field situation. • Standards are linked to ongoing European initiatives as GEO/GMES, the European Soil Strategy in preparation, the	http://www.conscience-eu.net	Coastal erosion,

							European Maritime Strategy and the Recommendation on Integrated Coastal Zone Management. • Guidelines and tools are produced to enable an effective implementation in European coastal management.		
4	ECOOP	European Coastal-shelf sea Operational observing and forecasting system	1997-2000	European Commission's Sixth Framework Programmed (11,238,655 €)	Centre for Ocean and Ice, Danish Meteorological Institute (DMI).	To consolidate, integrate and further develop existing European coastal and regional seas operational observing and forecasting systems into an integrated pan	• Integrated and harmonized existing EU wide ocean observing systems. • Existing ocean forecast systems are evaluated • Ocean model forecasting skills are improved • Existing ocean forecast systems are updated and integrated into a • Pan European system. • A pan European marine information system (EuroMISS) is developed • An integrated marine service in support of marine environmental management, search and rescue applications is developed. • Monthly to decadel variability of the European shelf sea climate is quantified • Capacity in non-EU	www.ecoop.eu	Marine sciences, capacity development,

							countries is developed to observe and model the coastal ocean following ECOOP standards.		
5	ECOST	Ecosystems, Societies, Consilience, Precautionary principle: Development of an assessment method of the societal cost for best fishing practices and efficient public policies	2005-2010	European Commission, under the 6th Framework Programmed (3.81 million euro)	UNIVERSITY OF PORTSMOUTH HIGHER EDUCATION CORPORATION CENTRE FOR THE ECONOMICS AND MANAGEMENT OF AQUATIC RESOURCES (CEMARE) - UNITED KINGDOM	To develop a new approach to assess the societal cost of fishing activities to the ecosystem	A method for a greater and more complete understanding of the ecological, economic and social incidence of fishing activities on the various eco-regions is developed	www.ecostproject.org	Governance, ecosystem
6	EFIMAS	Operational evaluation tools for fisheries management options	2004-2008	European Commissionunder the 6th Framework Programmed (7.42 million euro)	TECHNICAL UNIVERSITY OF DENMARK DEPARTMENT OF MARINE FISHERIES - DENMARK	To develop an operational management evaluation framework that allows evaluation of the trade-off between different management objectives when choosing between different management options.	Evaluation tools are developed to appraise the biological, social and economic effects of fisheries management measures in the EU	http://www.efimas.org/	Marine sciences,
7	ELME	European lifestyles and	2004-2007	European Commissi	UNIVERSITY OF	To model the consequences of	Existing knowledge of environmental state	http://www.elme-eu.org	Ecosystem, marine

		marine ecosystems		onunder the 6th Framework Programmed (2.98 million euro)	PLYMOUTH MARINE BIOLOGY & ECOLOGY RESEARCH GROUP, SCHOOL OF BIOLOGICAL SCIENCES SCHOOL OF EARTH, OCEAN AND ENVIRONMENTAL SCIENCES DRAKE CIRCUS UNITED KINGDOM	alternative scenarios for human development in post-accession Europe on the marine environment through improved understanding of the relationship between European lifestyles and the state of marine ecosystems,	changes, sectoral pressures and social and economic drivers is integrated using a common conceptual model.		sciences,
8	ENCORA	EUROPEAN NETWORK ON COASTAL RESEARCH	2006-2009	European Commissi onunder the 6th Framework Programmed (3.43 million euro)	MINISTRY OF TRANSPORT, PUBLIC WORKS AND WATER MANAGEMENT - RIJKSWATERSTAAT - CENTRE FOR WATER MANAGEMENT	To improve sharing of knowledge and experience in coastal expertise within Europe	A number of services enabling coastal professionals to take better advantage of existing knowledge resources in Europe, for tackling the challenges posed by the future of European coasts	http://www.coastalwiki.org	Governance,
9	ESONET	European Seas Observatory	2007-2011	European Commissi onunder	INSTITUT FRANCAIS DE	To create an organization capable of	Integration across disciplines from geosciences, through	http://www.esonet-noe.org/abo	Technology,

		NETwork		the 6th Framework Programmed (13.99 million euro)	RECHERCHE POUR L'EXPLOITATION DE LA MER CENTRE DE BREST/ DÉPARTEMENT - FRANCE	implementing, operating and maintaining a network of ocean observatories in deep waters around Europe from the Arctic Ocean to the Black Sea connected to shore with data and power links via fibre optic cables. The fundamental scientific objective is to make continuous real-time observations of environmental variables over decadal, annual, seasonal, diel and tidal time scales.	physical, chemical and biological oceanography to technologies of instrumentation, cables, data processing and archiving.	ut_esonet	
10	EU-MOP	ELIMINATION UNITS FOR MARINE OIL POLLUTION	2005-2008	European Commissionunder the 6th Framework Programmed (2.9 million euro)	NATIONAL TECHNICAL UNIVERSITY OF ATHENS SCHOOL OF NAVAL ARCHITECTURE AND MARINE ENGINEERING, DIVISION OF SHIP DESIGN AND MARITIME	To design and present proof of concept of autonomous Elimination Units for Marine Oil Pollution (EU-MOPs), capable of mitigating and eliminating the threat arising from oil spill incidents.	Conceptual development and validation of low cost, possibly recyclable, autonomous vessels/drones that will be released in the oil spill area, will automatically (through proper sensors) track the oil concentration specifics of the spill and will apply either mechanical or chemical countermeasures locally.	http://www.martrans.org/eu-mop/isum.htm	Marine sciences, pollution

					TRANSP - GREECE				
11	IASON	International Action for Sustainability of the Mediterranean and Black Sea EnvirOnmeNt(IASON)	2005-2006	European Commissi onunder the 6th Framewor k Programm ed (613550.0 0 euro)	HELLENIC CENTRE FOR MARINE RESEARCH INSTITUTE OF MARINE BIOLOGICA L RESOURC ES INSTITUTE OF OCEANOG RAPHY - GREECE	To create synergies in networking and exchanges at several levels, addressing for the first time the system of interconnected basins (Mediterranean and Black Sea) as one, based on the integration of, both horizontally and vertically, natural scientists and economists.	• An international, interdisciplinary platform coordinating the region's scientific potential in order to prepare RTD projects, based on a Science Plan for the region, securing sustainable development. • Natural and anthropogenic pressures exerted upon the functioning of the ecosystem. • An environment/resource monitoring network in the light of existing observation networks of different scopes.	http://www.i asonnet.gr	Ecosystem
12	MAPO	Enhancing Research and Development Projects to find Solutions to Struggle against various Marine Pollutions	2005-2007	European Commissi onunder the 6th Framewor k Programm ed (1.01 million euro)	L'ASSOCIA TION DU TECHNOP OLE BREST IROISE - FRANCE	To gather a wide range of actors who are committed to sensibilizing and supporting innovative SMEs to take part to European projects/networks in the field of marine pollution.	• Best practices are identified in order to facilitate the integration of European SMEs into current and future FP projects. • Technological needs and research priorities are identified for future RTD projects. • A list of relevant SMEs is established in order to point out which ones are likely to take part to EU projects. • Technological partnerships are	http://www. marine-pollutions.o rg	Marine sciences, pollution

							developed for last FP6 calls and FP7 calls.		
13	MARTEC	ERA-Net Maritime Technologies	2006-2011	European Commission, under the 6th Framework Programmed (2.09 million euro)	PROJEKTTRÄGER JÜLICH (PTJ) Leo-Brandt Str. GERMANY	To form a sustainable network and partnership of key funding agencies and ministries aiming at deepening the understanding of conditions for management of maritime technologies research between the key European countries actively funding RTD in this sector.	• National projects and programs of maritime RTD activity, funding instruments and mechanisms for initiation, evaluation as well as management procedures leading to best practice and optimization of national research funding are mapped and analyzed. • SWOT analysis of the synergistic use of maritime research is executed and infrastructures facilitating to a more cost effective use of national resources are tested. • Topics most suitable for immediate co-operation and integration as well as existing thematic gaps between national programs are identified through close communication with key maritime stakeholders. • Awareness and dissemination of maritime R&D activities is conducted • Strategies and an action plan for the mutual opening of	www.martec-era.net	Technology ,

							national programs are developed. • A joint multinational research program/call in a specific thematic area between some partner-countries is implemented as a test-case to level grounds for future common programs		
14	MEDINDUS	Advanced technologies for treatment of industrial and coastal waters of the Mediterranean region	2004-2008	European Commissi onunder the 6th Framewor k Programm ed (941995.0 0 euro)	UNIVERSIT Y OF SURREY SCHOOL OF BIOMEDICA L AND LIFE SCIENCES, THERMOC HEMISTRY LABORATO RY GUILDFOR D - UNITED KINGDOM	To develop novel technological approaches (making use of regional resources) for industrial (prevention) and coastal (remediation) water treatments with a higher degree of efficiency than existing ones.	• Development of novel technological approaches for industrial (prevention) and coastal (remediation) water treatments. • Production of easily recyclable and low cost receptors. • Regional silicates (modified silicates); • Using of soil-applied mobilized receptors • POPs removal. • Computer simulation studies	N.A.	Technology , pollution, freshwater, wastewater ,
15	MERSEA	Marine Environment and Security for the European Area Integrated Project	2004-2008	European Commissi on under the 6th Framewor k Programm ed	IFREMER, BP 70 29280 Plouzané France	To provide an integrated service of global and regional ocean monitoring and forecasting to intermediate users and policy makers in support of safe and efficient offshore activities, environmental management, security, and	• A single high-resolution global ocean forecasting system shared by • European partners together with a coordinated network of regional systems for European waters, which provides the platform required for coastal forecasting systems.	www.merse a.eu.org	Marine sciences,

						sustainable use of marine resources.			
16	MODELKEY	Models for Assessing and Forecasting the Impact of Environmental Key Pollutants on Marine and Freshwater Ecosystems and Biodiversity	2005-2010	European Commissionunder the 6th Framework Programmed (12.36 million euro)	UFZ - UMWELTFORSCHUNGSZENTRUM LEIPZIG-HALLE GMBH. DEPARTMENT OF CHEMICAL ECOTOXICOLOGY - GERMANY	To develop interlinked and verified predictive modeling tools as well as state-of-the-art effect-assessment and analytical methods generally applicable to European freshwater and marine ecosystems	• Evidence of toxic stress in aquatic ecosystems. Evidence that impairment of ecological status results from impact of multiple stressors, • A tiered approach to assess impact of chemicals on ecological status, • A new approach for deriving candidate compounds for monitoring and prioritization. • Improvement suggestions for WFD water quality monitoring programmers. • New integrated tools for basin-scale risk assessment and decision making. • A Decision Support System to support river basin management.	http://www.modelkey.org/	Ecosystem, marine sciences, biodiversity, pollution, freshwater
17	PASARELAS	Discovery Modeling Mediation Deliberation: Interface Tools for Multi-stakeholder Knowledge Partnerships for the	2005-2006	European Commissionunder the 6th Framework Programmed (312700.00 euro)	UNIVERSITÉ DE VERSAILLES SAINT-QUENTIN-EN-YVELINES CENTRE D'ECONOMIE ET D'ETHIQUE	To accompany existing INCODEV research projects on coastal and marine fisheries resources with the aim of maximizing research impact through the development of stakeholder	• Multimedia tools and participation processes are demonstrated through exploitation of data, models and institutional knowledge from ongoing INCODEV research projects, with outreach perspectives to civil	N.A.	Marine sciences, capacity development,

		Sustainable Management of Marine Resources and Coastal Zones			POUR L'ENVIRONNEMENT ET LE DÉVELOPPEMENT - FRANCE	dialogue "interfaces" between science and society	society in its various forms. • The basis for a permanent education-training-outreach programme including pedagogic materials is defined in technical and legal terms		
18	PHENOMED	Climate change, phenology and reproduction: Mediterranean sponges as models	2007-2008	European Commissionunder the 6th Framework Programmed (10206.00 euro)	SAINT-PETERSBURG STATE UNIVERSITY DEPARTMENT OD BIOLOGY AND SOIL SCIENCES - RUSSIAN FEDERATION	To understand the recent and forthcoming effects of the warming at the life/reproductive cycle level	Reproductive cycles and strategy of temperature sensitive and tolerant species living in different ecological conditions are investigated	N.A.	Climate change, marine sciences,
19	RISICO	Risk Assessment of Surfactants in Coastal Environments	2004-2008	European Commission, under the 6th Framework Programmed (710049.00 euro)	PROCTER & GAMBLE EUROCOR N.V. CENTRAL PRODUCT SAFETY Temselaan 100 BELGIUM	To develop analytical methods to predict the exposure to xenophobic mixtures in sea-sprays and in marine sediments and their effects on coastal ecosystems.	The following are developed and validated: • Specific analytical methods targeting surfactants in sea sprays • A non destructive radiotracer approach to characterize kinetics of surfactants biological uptake and subsequent destabilization in target marine organisms, Insight into the bioavailability and sorption of organic xenobiotics in marine	N.A.	Ecosystem, marine sciences, pollution,

							sediments • A microbiofilm in stratified toxic/anoxic sediments to identify recalcitrant metabolites, and New standardized ecotoxicity tests for marine sediments.		
20	SEACASE	Sustainable extensive and semi-intensive coastal aquaculture in Southern Europe	2007-2010	European Commission, under the 6th Framework Programmed (2.42 million euro)	CENTRO DE CIENCIAS DO MAR DO ALGARVE-AQUACULTURE GROUP Universidade do Algarve, Campus de Gambelas PORTUGAL	To develop effective tools for maintenance of competitiveness, productivity, profitability and thus sustainability of extensive and semi-intensive aquaculture production in Southern Europe, while minimizing its environmental impacts and improving the quality and public image of its products.	• Environmentally-friendly farming protocols are analyzed and/or developed and certification possibilities are assessed and proposed for voluntary use by the industry. • Quality markers are studied in order to be able to differentiate aquaculture products from extensive and semi-intensive systems from the ones produced in intensive systems. • A socio-economic assessment of the production systems used in the case studies is produced.	www.seacase.org	Aquaculture,
21	SESAME	Southern European Seas: Assessing and modeling ecosystem changes	2006-2011	European Commissionunder the 6th Framework Programmed (14.79 million	HELLENIC CENTRE FOR MARINE RESEARCH INSTITUTE OF OCEANOGRAPHY - GREECE	To assess and predict changes in the Mediterranean and Black Sea ecosystems as well as changes in the ability of these ecosystems to provide goods and services.	• The basis for an improved 'societal dialogue' between scientists and stakeholders is set • A merging of economic and natural sciences is conducted to study the changes in the western and	http://www.sesame-ip.eu	Ecosystem

				euro)			eastern Mediterranean and the Black Sea within the period from 50 years in the past to 50 years in the future		
22	SPICOSA	Science and policy integration for coastal System Assessment	2007-2011	European Commissionunder the 6th Framework Programmed (14.26 million euro)	INSTITUT FRANCAIS DE RECHERCHE POUR L'EXPLOITATION DE LA MER DIRECTION DES PROGRAMMES ET DE LA STRATÉGIE - FRANCE	To develop a self-evolving, holistic research approach for integrated assessment of Coastal Systems so that the best available scientific knowledge can be mobilized to support deliberative and decision-making processes aimed at improving the sustainability of Coastal Systems by implementing Integrated Coastal Zone Management (ICZM) policies.	A multidisciplinary assessment framework is developed with a balanced consideration of the Ecological, Social and Economic sectors (ESE) of Coastal Systems.	http://www.spicosa.eu	Governance,
23	UNCOVER	Understanding the mechanisms of stock recovery	2006-2010	European Commissionunder the 6th Framework Programmed (5.74 million euro)	JOHANN HEINRICH VON THÜNEN - INSTITUTE INSTITUTE FOR BALTIC SEA FISHERIES - GERMANY	• To identify various changes experienced during the decline of fish stocks in order to understand the prospects for their recovery. • To enhance the scientific understanding of the mechanisms of fish stock recovery.	• Changes experienced during stock decline as well as key processes impacting upon the potential for stock recovery are identified. • A modeling framework is developed in order to evaluate and develop management strategies incorporating biological and environmental factors	www.uncover.eu	Marine sciences,

						• To formulate recommendations for fisheries managers how to best implement stock recovery plans. •	as well as technical and socio-economic constraints. • Failures and successes of previous stock recovery activities are investigated. • Recommendations for rebuilding, as well as alternatives to existing recovery plans are developed		
24	WADI	Sustainable management of Mediterranean coastal fresh and transitional water bodies: a socio-economic and environmental analysis of changes and trends to enhance and sustain stakeholders benefits	2006-2008	European Commissionunder the 6th Framework Programmed (2.11 million euro)	UNIVERSITÀ DEGLI STUDI DI FIRENZE DIPARTIMENTO DI BIOLOGIA - ITALY	To encourage the rational and sustainable use of fresh and transitional water resources within the Mediterranean coastal area, which experiences freshwater scarcity, through participatory approaches.	• Conflicts of use among stakeholders arising from improper management of water bodies and related constraints within selected study sites, across the Mediterranean coastal areas, which suffer from water scarcity and associated constraints, are identified. • The impact/s of various water uses as well as nearby human activities on coastal water bodies, such as fluvial systems, estuaries, marshlands and lagoons are assessed. • Interdisciplinary scientific inputs are produced for improved participatory water management	http://www.wadi.unifi.it	Freshwater,

							strategies and related planning regimes for a rational use of water resources. • Alternative management strategies and plans are developed for selected sites as well as general guidelines are proposed for appropriate and sustainable management of water resources in Mediterranean coastal areas. • A network of scientists, authorities and local communities within the Mediterranean is established to enhance local awareness on water quality, use and misuse.		
25	AMIS	Algerian Coast Management through Integration and Sustainability	2006-2008	SMAP III (€ 985.684,00)	Italian research institute CIRSA	To support national efforts in promoting sustainable use of coastal resources in Algeria and simultaneously contribute to the protection of the environment and sounder development of coastal zones in the Mediterranean by developing an ICZM Plan for the	• ICZM plan. • Technical assistance for the updating and enhancing national legislative frameworks on coastal zone management. • Mainstreaming the application of the ICZM approach into local and regional development policy in Algeria. • Implementation of ICZM demonstration	http://www.smap3-amis.org/	Pollution, freshwater, capacity development

						Wilaya d'Alger	activity or project design in pilot site. • Pilot integrated water management plan for optimization of water resources allocation and pollution decrease. • Evaluation of certificatory institution and procedure availability for ISO 14001certification of tourist resorts and socio-economic activity. • Workshops and training courses.		
26	CAP-Nado	Reducing conflicts of coastal natural resources in the Nador area of Morocco	2006-2009	SMAP III EuropeAid Cooperation Office (580,000 €)	EUCC – The Coastal Union The Netherlands	To promote sustainable development in the coastal area of the province of Nador, Morocco, through the establishment of an Integrated Coastal Zone Management Plan of Action with civil society participation.	Analysis of status-quo, public participation facilitation, public information, ICZM Action Plan development with involvement of stakeholders, support of initial implementation, capacity building, and project management.	http://www.eucc.net/en/capnador/index.htm	Governance, capacity development,
27	ICAM	Integrated Coastal Area Management strategies for the "Kroumirie & Mogods" Region and "Grand Sfax" municipality in Tunisia.	2006-2008	EC MEDA (€1,240,000)	WWF MedPo	To elaborate a participatory and concerted integrated coastal zone management (ICZM) plans of action for the region of Grand Sfax	• A Coastal Area Report produced for the pilot area of the Region of K&M • A Coastal Area Report produced for the pilot area of Grand Sfax Municipality • A central Data Management System	N.A.	Governance, technology, capacity development,

						(Tunisia), to be used as a model for the development of a national integrated coastal management plan	(DMS) and a Geographical Information System (GIS) established and fed with information and data from the Coastal Area Reports • Local, national and international experts identified to carry out trainings in relevant fields • Technical capacity of key stakeholders strengthened in ICAM planning and related fields • Report on alternative "development and conservation scenarios" elaborated for the pilot area of Grand Sfax and K&M region • ICAM Plan of action elaborated for the pilot areas		
28	IMAC	Integrated Management of East Mediterranean Coastlines	2006-2009	SMAP III EuropeAid Cooperation Office (924,056 €)	Institute of the Environment – University of Balamand – Tripoli, Lebanon	to establish the process of Integrated Coastal Zone Management (ICZM) as a tool to develop a structural strategy in cooperation with local stakeholder for the management of the Lebanese Northern coast	• Stakeholder analysis • Conflict uses • Economic study • Legal study	http://www.balamand.edu.lb/english/IMAC	Governance,

29	N.A.	Plan of Action for an Integrated Coastal Zone Management in the area of Port Said (Egypt)	2006-2008	SMAP III EUROPE AID (€1,499,997)	Nucleo di Ricerca sulla Desertificazione dell'-Universitá degli Studi di Sassari Italy	To prepare an Integrated Coastal Zone Management Plan (ICZM) for the area of Port Said (Egypt) and create the basis for its successive concrete implementation through an integrated and interdisciplinary approach, with the direct involvement of the relevant stakeholders (national and local competent authorities and local communities).	• An active network of stakeholders. • Socio- economic, legal framework, environmental issues with specific reference to water, land and fishery resources are analyzed. • Gaps, opportunities and solutions for the environmental and socio-economics sustainable coastal development are identified.	http://www.iczmportsaid.uniss.it	Freshwater,
30	N.A.	Promoting Awareness and Enabling a Policy Framework for Environment and Development Integration in the Mediterranean with Focus on Integrated Coastal Management	2009-2011	SMAP III (€1,200,000)	PAP/RAC	To promote awareness of the value and state of the coasts, and to provide support to the project countries in strengthening and modifying the existing national-level enabling environment, including policy and legislation.	undergoing	N.A.	Governance,
31	AquaReg	Co-operation between the regions of	2003-2007	INTERREG IIIC (4.847.000	Sør-Trøndelag fylkeskomm	To provide opportunities and design strategies	AuqaReg contributes to coherent and sustainable	www.aquareg.com	Marine sciences,

		Trøndelag (Norway), Galicia (Spain) and Border, Midland and Western (Ireland), in the field of Marine Resources		€)	une - Norway	for the sustainable development of peripheral coastal communities by promoting interregional cooperation in aquaculture and fisheries	development in aquaculture and fisheries in the three regions involved, promotes innovative actions and business development in relevant marine industries, and increases employment in the marine sector		aquaculture ,
32	CADSEALAND	Land-sea interaction: coastal state and evolution in CADSES	2004-2006	EC - Interreg III (2528996€)	CINFAI: Consorzio Interuniversitario Naz. per la Fisica, UNICAM - Italy	• Environment protection, resource management and risk prevention • Promoting integrated water management and prevention of flood	Guidelines for coast protection and management based on an integrated land-sea culture of coastal areas, on a general view of coastal areas in southern Europe, on specific experiences in the Italian and Greek basins.	N.A.	Freshwater,
33	CoPraNet	Coastal Practice Network	2004-2006	INTERREG IIIC (1.855.740 €)	EUCC The Coastal Union – The Netherlands	• To develop a network of coastal stakeholders to exchange information and examples of best practice in order to support local and regional efforts for an integrated planning of coastal areas. • To support interregional exchanges of	The CoPraNet Clearing House, which includes the following: a project communication system comprising a multilingual website and multilingual electronic newsletters; a website-based tool-kit that can be used externally by other European authorities and interested stakeholders	www.coastalpractice.net	Tourism, coastal erosion, urbanism,

						best practice information on the subjects of sustainable tourism as well as coastal erosion and beach management through an integrated approach.			
34	MedCOAST.NET	Mediterranean Cooperation for On-shore Accessibility and Sustainability Themes: NETwork for managing urban coastal areas		Programme Interreg III ArchiMed	Municipality of Agria - Greece	The project's main objective is the sustainable development of urban coastal areas	• The establishment of an appropriate policy framework for coastal urban areas, determined by the coastal area's geographical size and physical and socio-economic conditions. • The enhancement of the interdisciplinary research on common management problems and the development of standardized environmental quality and socio-economic monitoring objectives. • The regeneration of declining urban coastal areas in each partner region. • The establishment of an integrated and prototype system of EMAS application	www.agria.gr	Governance

							for urban coastal areas. • The establishment and continuation of an extended and permanent network of urban coastal areas for sustainable management and access		
35	MEDPAN	Réseau de gestionnaires d'aires marines protégées de Méditerranée	2005-2008	INTERREG IIIC (1.649.418 €)	Fondation WWF France	To facilitate cooperation between protected marine areas at the European and interregional levels and with third countries in the Mediterranean basin and, on the basis of exchanges, to propose tools to make the management of such territories more efficient.	• Sharing of information and experiences. • The transfer of best practices. • Shared development of management tools. • Development of skills amongst participants. Local awareness amongst institutions, elected representatives and citizens. • Launch of the MedPAN network of managers of protected marine areas in the Mediterranean.	www.medpan.org	Marine sciences,
36	MESSINA	Managing European Shoreline and Sharing	2004-2006	INTERREG IIIC (1.723.008 €)	IGN France – International - France	To set up a network of local authorities, national administrations, and coastal interest	A "Coastal manager toolkit" consisting of four practical guides ("Monitoring and modeling the shoreline",	www.interreg-messina.org	Coastal erosion, urbanism

		Information on Nearshore Areas				groups located in six European countries, in order to find new and innovative techniques for managing coastal erosion and coastal planning processes.	"Valuating the shoreline", "Engineering the shoreline", "Informing investment decisions along the shoreline") and a demo CD-ROM featuring a GIS-based prototype of shoreline management planning.		
37	Mytilos	Development of an interregional network of monitoring of the quality of coastal water by bio-integrators for the durable protection of the Western Mediterranean	2004-2007	Interreg III B MEDOCC (1 516 246,67 €)	Toulon Var Technologies (TVT) - France	To develop an interregional costal water quality monitoring network through biological integrators (mussels Mytilus galloprovincialis), for the sustainable protection of the Western Mediterranean Sea	• Mediterranean chemical pollution benchmarking • Protocol analyses intercalibration • Permanent alert network (made up of specialists, regional or national laboratories, etc.). • Information and publication of summarized data through the web site	http://mytilos.tvt.fr	Pollution, freshwater,
38	PlanCoast	PlanCoast	2006-2008	INTERREG IIIB NP CADSES in addition to EFRE, CARDS, PHARE, and TACIS (1,979.020 euro)	Ministry of Transport, Building and Regional Development Mecklenburg–Vorpommern	To develop the tools and capacities for an effective integrated planning in coastal zones and maritime areas in the Baltic, Adriatic and Black Sea regions.	The Project: • Introduced the completely new spatial planning instrument Maritime Planning • Linked Integrated Coastal Zone Management (ICZM) and Maritime Planning with the processes of statutory spatial planning in selected number of pilot projects • Spread the use of modern geographical	http://www.plancoast.eu/	Governance, technology, capacity development

							information systems (GIS) for an effective transnational planning • Contributed to the creation and implementation of EU policy on coastal zones and maritime areas, such as the Green Book and Blue Book, and led to creation of numerous national laws and strategies		
39	SAWWTACA	Sewerage And Waste Water Treatment in the Adriatic Coastal Area: development of an adequate tool on project development	2003-2006	Interreg III (Espace Cadses) (908.850,00 EUR)	Municipality of Rimini, Settore Lavori Pubblici Piazza Cavour 27 47900 Rimini Italy	The improvement and harmonization of policies and actions aimed at upgrading sewerage networks and wastewater treatment in urban settlements around the Adriatic Sea.	• Creation of a transnational co-operation network on sewerage and wastewater treatment in order to jointly improve the surface water quality of the Adriatic Sea. • Improvement of management skills and technological know-how within agencies in the Adriatic area dealing with sewerage and wastewater issues. • Dissemination of information on how to cope effectively with the growing demand on wastewater infrastructures in line with European legislation. • Identification of common, transnational	http://www.sawwtaca.com/	Freshwater, wastewater,

							standards, methods and technologies for sewerage and wastewater treatment planning which meet the specific requirements of Adriatic seaside resorts.		
40	SUSTAIN	Assessing sustainability and strengthening operational policy	Ongoing	INTERREG IVC programme (€1.8m)	Coastal & Marine Union – EUCC (The Netherlands).	To create a fully implementable policy tool to help coastal authorities and communities throughout Europe to deliver sustainability on Europe's coast	A universal tool to help deliver sustainability on Europe's coasts.	http://www.sustain-eu.net	Governance,
41	COLASU	Sustainability of Mediterranean coastal lagoon ecosystems under semi-arid climate	2002-2005	INCO MED (FP5)	Centre De Géochimie De La Surface - Ecole Et Observatoire Des Sciences De La Terre - France	To present guidelines for green tourism development. t	• The characterization of morphodynamic processes in lagoon case studies • The determination of the pollutant elements distribution in space and time • The impact assessment of pollutants, and the risks limiting factors inventory. • The politico-economical results are public authorities helping tool.	http://www.colasu.com/	Ecosystem, Tourism,
42	MAMA	**M**editerranean network to **A**ssess and upgrade	2002-2005	EC programme, Environme	International Marine Centre in Sardinia,	To bring for the first time marine institutions from all Mediterranean countries to work	• (i) a survey of the regional capability for ocean observations in terms of infrastructures and	http://capemalta.net/MAMA-NET/	Capacity development

		Monitoring and forecasting **A**ctivity in the basin		nt and Sustainable development, 5th framework programme	Italy supported by the MedGOOS Secretariat at the IOI-Malta Operational Centre within the University of Malta	together and targeting to strengthen the research infrastructure in support of ocean forecasting in the basin	human resources; (ii) empowerment for partner institutions to improve their participation in ocean observations; (iii) test cases for the initial ocean observing system; (iv) awareness on the benefits of operational oceanography.		
43	MEDCOASTLAND-NET	Mediterranean co-ordination and dissemination of land conservation management to combat land degradation for the sustainable use of natural resources in the Mediterranean coastal zone	2002-2006	INCO MED (FP5) (€1305001)	ISTITUTO AGRONOMICO MEDITERRANEO DI BARI - CENTRE INTERNATIONAL DE HAUTES ETUDES AGRONOMIQUES MEDITERRANEENNES	To provide research and project reviews, indications-guidelines to implement LDM through the assessment of interactions among major factors of resources management such as soil, water, biota, human activity, cultural resources, soil erosion, land degradation	• Better understanding of research and research needs. • Better communication between players involved in landscape and soil degradation management, improved accessibility to information on relevant research. • Better approach to real participatory ecosystem and economically-based land-soil conservation management	http://wasamed.iamb.it/	Ecosystem, coastal erosion, freshwater,
44	MELMARINA	Monitoring and modeling coastal lagoons: making management tools for aquatic	2002-2005	INCO MED (FP5)	University College London (UCL)	To develop understanding of the functioning of coastal lagoons in North Africa and to develop tools to enhance the management of these important	• Management tools aquatic resources. • Integrated monitoring and survey programmers for hydrology, and sediment quality and aquatic ecology. • Longer-term changes	http://www.geog.ucl.ac.uk/melmarina/index.stm	Marine sciences,

		resources in north Africa				aquatic ecosystems	are evaluated through the analysis of extant ground data and satellite remote sensing techniques. • Environmental factors controlling vegetation characteristics are established using hydrological, hydrochemical and ecological data. • A dynamic hydrological/hydraulic 2-D finite element model coupled to a eutrophication model is applied to key sites		
45	SMART	Sustainable management of scarce resources in the coastal zone	2002-2005	INCO MED (FP5)	Environmental Software & Services GmbH, Austria	To develop, implement and test a new, participatory but scientifically sound and rational approach to planning and management of the coastal zone that can help to reconcile conflicting demands on scarce natural resources.	A common methodology for policy design, evaluation, and decision making is developed and tested in a set of parallel case studies. In each of the participating Mediterranean countries, and compared with the corresponding EU policies.	http://www.ess.co.at/SMART/	Governance, urbanism
46	SWIMED	Sustainable water management in Mediterranean coastal aquifers: recharge	2003-2005	INCO MED (FP5) (854812.00 euro)	UNIVERSIDAD DE GRANADA – Spain	To develop an integrated approach combining advanced computational tools (numerical modeling and optimization) and	• Scenarios varying recharge location and storage capacity are simulated to assess the best control of seawater intrusion and meeting demand requirements	http://www.crs4.it/EIS/SWIMED	Freshwater,

		assessment and modeling issues				GIS, for sustainable water resources management in Mediterranean coastal aquifers			
47	CoLD	Improving Coastal Land Degradation Monitoring in Lebanon and Syria	2002-2004	LIFE00 TCY/INT/069 (522,000.00 €)	ERS/RAC - Italy	To improve the capacities of Syria and Lebanon in advanced environmental management and planning of coastal zones, according to the principles of sustainable development	• The analysis of existing strategy and techniques and justification for the ones selected • Recommendations for procedures of formulation and adoption of respective national coastal areas degradation control management plans (draft management plans). • Recommendations for the establishment and functioning of a system for monitoring the effects of the implementation of the suggested management plans.	N.A.	Restoration, urbanism
48	Destinations	Development of Strategies for Sustainable Tourism Development in Mediterranean Nations	February 2007 - November 2009	EC life project	Priority Actions Programme/Regional Activity Center (PAP/RAC) of Mediterranean Action Plan (MAP)	Promote a continuous planning and management process for sustainable tourism development in southern Mediterranean countries through: • introduction of decision-making	• Analysis of the project areas and assessment of their carrying capacity for tourism (TCCA); • Definition of an integrated strategy for sustainable tourism	http://www.project-destinations.org/	Tourism, capacity development, urbanism

					of United Nations Environment Programme (UNEP) - Split, Croatia	tools for an effective management of tourism destinations in three pilot zones in Algeria, Morocco and Tunisia • production of guidelines for tourism investors that would help assess the sustainability of their investments in coastal zones in terms of environmental risks and added value for the local communities; • strengthening of the capacity of investors, decision-makers and other target groups for the use of tools for environmental management of tourism activities; • raising the awareness of sustainable tourism	development in the project areas; • Definition of guidelines for sustainable tourism investments in the project areas; • Implementation of the demonstration projects focused on the application of environmental management tools such as EMAS, ISO 14001, EU Ecolabel, etc.; • Involvement of local stakeholders through workshops and capacity building programmes; • Communication and dissemination of project results		

49	Drana lagoon	Restoration and conservation management of Drana lagoon in Evros Delta	2001-2005	LIFE00 NAT/GR/007198 (2,086,533.00 €)	ANEE-Evros Development Company – Greece	To restore and manage Drana Lagoon and the habitats of the species red-breasted goose, lesser white-fronted goose, slender-billed curlew and the pygmy cormorant	• The total restoration of the Drana lagoon, which was reconnected to the sea • A 30 hectare area of humid grasslands was also created allowing a better balance in the levels of salinity in the surrounding areas and providing an important biotope for avifauna. • The extension of the riparian woodland vegetation of the Loutros stream by 22 hectares	www.evros-delta.gr	Restoration,
50	Dunas Albufera	Model of restoration of dunes habitats in 'L'Albufera de Valencia'	2001-2004	EC life (1,951,482.00 €)	Oficina Técnica Devesa - Albufera Ajuntament de València - Spain	To regenerate the ecosystems of the 'Devesa', eliminating the adverse effects of the infrastructure development and restoring the damaged areas	• Demolition of 2.1 Km of sea promenade. • The elimination of 30,159 m2 of roads and parking plots and 300 water supply and sewage underground features, plus 10 km of pipelines. • Restoration of 2,100 m of the first dune ridge. Overall, 2 million plants of 27 species were used. • 52,618 examples of 7 species were saved from the intervened area before the work started. • Regeneration of 15,600 m2 (c.1.5 ha) of coastal lagoons	www.lifeduna.com	Ecosystem, freshwater, wastewater, restoration,

							("malladas"). • Construction of a trail (2,286 m2) for non-motorized vehicles. • Awareness raising campaign reaching a wide range of target public, including guided site visits for 3,500 people.		
51	Dolphins	Conservation of the dolphins from the Romanian Black Sea waters	2001-2004	LIFE00 NAT/RO/007194 (416,631.00 €)	National Institute for Marine Research and Development - Romania	To develop a technical and legal basis for the conservation of the three endangered dolphin species in the Romanian Black Sea area.	• Significant steps towards the development of a technical and legal basis for strengthening the national regulatory and management framework for the effective conservation of the three endangered dolphin species. • Knowledge of the dolphin's populations has greatly improved • A survey of adverse impacts of marine and land-based economic activities on dolphins was undertaken • A national action plan for dolphin conservation with the collaboration of the main stakeholders and authorities involved in dolphin conservation	http://www.delfini.ro	Marine sciences,
52	MED-	Strategies and	2000-	LIFE00	Province of	To foster	• Development of	N.A.	Tourism,

	COASTS S-T	Tools Toward Sustainable Tourism in Mediterranean Coastal Areas	2003	ENV/IT/000167 (1,136,400.00 €)	Rimini - Italy	integration of environmental strategies into development of the tourist industry.	integrated coastal management plans for Rimini and Calvià • Implementation of eco-label and green purchasing criteria in the two districts. • Hosting of a series of sustainable tourism conferences • Awareness-raising actions to make tourists and tour operators more aware of environmental concerns.		
53	Prosit	Planning and restoring of Cinque Terre costal traditional agricultural landscape	2001-2004	LIFE00 ENV/IT/000191 (701,752.00 €)	Parco Nazionale delle Cinque Terre - Italy	To undertake a series of actions based on environmentally and economically compatible mechanisms in order to protect and recover the coastal rural territory of the Cinque Terre	The maintenance of the historical quality of the landscape; safeguarding villages from hydro-geological risk; the involvement of the local population and interested actors at different levels; and the experimentation of a model of recovery of coastal terraced landscape.	N.A.	Restoration, urbanism
54	ROVIDUNE	Conservation and recovery of dune priority habitats among the sites of Cagliari, Caserta, Matera, Taranto provinces	2009-2012	LIFE07 NAT/IT/000519 (3,352,392.00 €)	Provincia di Cagliari - Italy	To contribute to the local implementation of the Integrated Coastal Zone Management (ICZM) European recommendations.	• The application of best practices and demonstration actions to protect the EU priority habitat, coastal dunes and the other related habitats within five Natura 2000 sites. • The establishment of a common approach for the long-term protection of these habitats based on	N.A.	Restoration,

							sound monitoring of biotic and abiotic characteristic. • A decrease/elimination of the threats affecting these habitats in the identified sites • An increase in the level of awareness of the local population and stakeholders of the importance of these habitats, not only for their landscape value.		
55	Residuos Pesqueros	Integral management of fishing waste in a coastal area : Pilot scheme	2001-2004	LIFE00 ENV/E/000560 (280,793.00 €)	Cofradías de Pescadores de O Salnés - Spain	• Creating integrated management. • Development /optimization of selective waste collection. • Collection of waste from vessels and transfer to port.	• Increase in the collection of volume of waste from vessels. • Development of selective collection for certain dangerous waste and problematic waste. Increase in the collection of used oil up to a level of 90 percent (volume) of that produced by the sector. • Increase in the selective collection of paper, glass and containers.	**Error! Hyperlink reference not valid.**	Pollution,
56	Response	Responding to the risks from climate change'	2006-2009	EU LIFE	Isle of Wight Centre for the Coastal Environment, UK,	demonstrate a process of assessing contemporary and future hazard and risk at the coast	The Project has demonstrated regional-scale mapping of coastal evolution and risks, taking into account the impacts of climate	http://www.coastalwight.gov.uk/RESPONSE_webpages/re_theproje	Climate change

							change. It has also examined the current and future costs of coastal natural hazards, to encourage cost-effective solutions.	ct.htm	
57	SE.L.SY	Sea-Land System: concerted Actions for the Coastal Zone Management	2001-2004	LIFE00 ENV/IT/000090 (1,332,828.40 €)	N.A.	To propose an integrated approach to the environmental protection and management problems presented by a coastal strip	• A floating platform was successfully developed and launched to carry out real-time monitoring of water-quality along the coasts of the three provinces. • A pilot waste water treatment (WWT) plant was constructed alongside the existing depuration plant of Bellavista in Taranto. • A supporting information campaign and environmental studies were carried out • Studies and pilot actions implemented on erosion & dunes problems. • The renovation of three coastal towers (one per province), and their use as environmental education centers, was also completed.	N.A.	Coastal erosion, freshwater, wastewater,
58	Zantecoast	ICZM: Demonstration actions in the National Marine Park of Zakynthos	2001-2004	LIFE00 ENV/GR/000751 (1,437,693.00 €)	National Marine Park of Zakynthos – Greece	• to incorporate sustainable development principles in economic and social activities /	• The promotion of environmental awareness and active public (local population and visitors) participation	www.nmp-zak.org/Life_Env/	Governance,

						functions; • to protect the environment within the NMPZ • to promote the idea of integrated coastal zone management and sustainable development • to inform people living on the island about the values of the environment and their protection through integrated management and participation; • To ensure that visitors to the area are correctly informed about the importance of natural habitats.	in integrated coastal management and sustainable development actions. • The promotion of volunteer work and stakeholder commitment through the development of commonly accepted codes of conduct (good environmental practices). • The promotion of the idea that local residents and visitors can coexist and that the natural environment can benefit from their cooperation. • The provision of the necessary on-site demonstration and guidance facilities to help local people and visitors to participate in activities to protect the area.		
59	N.A.	Creating an experimental and demonstrative network of lagoon and dune Natura 2000 sites on the Mediterranean coastline of Languedoc-Rousillon	2009-2013	EC LIFE NAT/F/000193 (2,201,834 €)	Conservatoire des Espaces Naturels du Languedoc-Roussillon – France	To create a network of five lagoon and dune Natura 2000 sites. Such a network and other actions are expected to improve the management of each site.	Expected results: • The state of conservation of lagoon, perilagoon and dune habitats of Community interest is directly improved. • The state of conservation of the species associated	N.A.	Marine sciences,

							with these habitats is indirectly improved		
60	N.A.	Concrete Conservation Actions for the Mediterranean Shag and Audouin's gull in Greece including the inventory of relevant marine IBAs	2009-2012	EC LIFE NAT/GR/000265 (2,357,922 €)	Hellenic Omnithological Society - Greece	To improve the conservation status of the Mediterranean shag and the Andouin's gull in Greece	Expected results: • Improved breeding performance of the National population of the Mediterranean Shag by between 20 and 25%. • Improved breeding performance of the Andouin's Gull National population by between 10 and 15%.	N.A.	Marine sciences,
61	N.A.	Actions for the conservation of coastal dunes with *Juniperus spp.* In Crete and the South Aegean (Greece)	2009-2012	EC LIFE NAT/GR/000296 (1,501,210 €)	Mediterranean Agronomic Institute of Chania - Greece	To promote and enable the long-term conservation of coastal dune habitats with *Juniperus spp.* In Greece	Expected results: • The dune system and plant communities associated with *Juniperus spp.* Along with population and structure information • The effect of anthropogenic threats on the habitat's ecological condition. • Effective monitoring and conservation methods through the drawing up of habitat protection and restoration guidelines	N.A.	Restoration ,

							and monitoring protocols.		
62	N.A.	Inventory and designation of marine Natura 2000 areas in the Spanish sea	2009-2013	EC LIFE NAT/E/000732 (15,405,727 €)	Fundacion Biodiversidad – Spain	To protect and sustainably use biodiversity in the Spanish seas through the implementation of the Natura 2000 network	Expected results: Increased scientific knowledge on habitats and species of the EU conservation directives (Habitats and BIRDS Directives) and regional marine conventions: size and location, characterization, threats and conservation status	N.A.	Marine sciences, biodiversity
63	BSEP	Black Sea Environmental Programme	1993-1996	Global Environment Facility (GEF)		•	• Development of Institutional Network • Institution strengthening • Analytic and office equipment provided to countries • National Reports for each activity • Regional Assessments for each activity • Trans-boundary Diagnostic Analysis • Strategic Action Plan for the Rehabilitation and Protection of the Black Sea adopted in October 1996 • Development of Black Sea Information System and GIS		Governance
64	CAMP	Coastal Area	In the	Contractin	PAP/RAC is the MAP	CAMP is oriented at the implementation of	4. local level – by solving priority	http://www.	Governanc

		Management Programme of the UNEP's Mediterranean Action Plan	1990-98 period, two cycles of the Programme were implemented consisting of individual projects implemented in Albania Croatia, Egypt, Greece, Syria, Israel, Tunisia and Turkey. The third cycle of the Programme started in 1997 with projects in Algeria	g Parties to the Barcelona Convention	centre responsible for the co-ordination of CAMP, under the supervision of MED Unit.	practical coastal management projects in selected Mediterranean coastal areas, applying Integrated Coastal Zones Management (ICZM) as a major tool. The objectives of CAMP are: • to develop strategies and procedures for a sustainable development in project areas; • to identify and apply the relevant methodologies and tools; • to contribute to the capacity building at local, national and regional levels; and • to secure a wider use in the region of the results achieved.	environment and development problems in selected coastal areas; 5. national level – by contributing to the formulation and implementation of relevant national policies and strategies; 6. regional level – by disseminating the results and experience achieved, contributing to the formulation and implementation of relevant regional policies and strategies; 7. wider international level – by co-operating, exchanging experience, and offering results, methodologies and procedures to other regions, potentially those within UNEP's Regional Seas Programme. Since the signature of the ICZM Protocol in 2008, CAMP projects became prototype interventions to assist countries to implement the Protocol, with clear link to the preparation of over-arching national strategies and policies.	pap-thecoastcentre.org/	e, capacity development, pollution,

			, Cyprus , Lebanon, Malta, Morocco and Slovenia. Currently, projects in Spain and Montenegro are in implementation, and two new pojects are in a negociation phase (Italy and France).						
65	CoastLearn	CoastLearn	2001 – present	The Netherlands Agency of the Leonardo da Vinci Programme	EUCC	To promote integrated planning and management of coastal resources and consequently sustainable development along	A powerful training tool and a starting point for the ICZM learning process.	http://www.coastlearn.org	Capacity development,

						the coast. In addition, CoastLearn aims to exchange knowledge and practice experience, support ICZM processes and promote trans-national and trans-sectoral networks.			
66	CONSTANCE	Regional Common Action Strategy Against Coastal Erosion in the Mediterranean Basin	2009-2012	Project co-financed by European Regional Development Fund - ERDF	Region of Eastern Macedonia and Thrace - Greece	Capitalization of knowledge and resources already acquired in the field of coastal protection Mid to Long Term planning actions for climate change effects adaptation of coastal zones in line with the EU Directive 2007/60/EC	Coastal risks : Submersion and Erosion Territorial action plans for coastal protection management Guidelines for Environmental Impacts Studies focused on coastal protection works and plans	http://www.coastance.eu/	Governance, coastal erosion
67	CoMSBlack	The Cooperative Marine Science Programme for the Black Sea	1991-ongoing	Intergovernmental Oceanographic Commission (IOC)		• to provide an assessment of the natural and anthropogenically-induced environmental changes using historical data; • to determine past and present fluxes of water, sediment, carbon, nutrients, heavy metals,	• Conducted one of the first large International Workshops on the problems of the Black Sea, in Varna, Bulgaria, in September 1991. • Responsible for more than 100 scientific publications in various journals in		Marine sciences

						hydrocarbons and other selected materials from rivers, atmosphere, straits, and bottom sediments; • to determine the fluxes of carbon, nutrients, organisms, and selected pollutants across the coastal and shelf seas, the shelf break and within the Basin; • to understand the fundamental physical and biogeochemical processes governing the transport, transformation and fates of carbon, nutrients, suspended sediments and selected substances; • to provide a quantitative understanding of the physical and biogeochemical processes and nutrient fluxes affecting primary productivity;	the US, Western Europe, and the Black Sea countries. • Five multi-ship scientific cruises to the Black Sea, with shared data by all participants. • Conduct of multiple training workshops, cruises, and intercalibration exercises. • Fund-raising for various purposes, including cruises, scientific exchange, scientific programs, etc. • Played a major role in initiating the TU-Black Sea Program for ongoing modelling efforts in the Black Sea. • Participation in international programs to bring the Black Sea to the forefront of scientific concern • Briefing of policy makers and managers to initiate concern over the Black Sea, and to address ways to analyse the problems • Provided scientific exchange for large numbers of scientists between the Black		

						• to provide an assessment of man-made and natural influences on the ecosystem structure and function in the water column (phytoplankton and zooplankton) and benthos (selected benthic organisms); • to develop multiple and interactive scale models including general circulation, ecosystem, and regional processes that will be applicable to the studies concerned with the ecology and biogeochemistry of the Black sea; and • to assess space and time scales of general circulation and mesoscale features and their energetics, and processes leading to the formation, spreading and transformation of	Sea region and external academic institutions		

						CIL.			
68	Liturgy	Training Mediterranean local authorities and civil organizations on integrated coastal zone management and reaction to the impacts of climate changes	2009-Ongoing	EU Lifelong learning Programmed	ISOTECH Ltd Environmental Research and Consultancy, Cyprus	To fill training gap through the development of a well-structured, innovative, interactive, work-linked vocational training program, directly focused on Mediterranean Local Authorities and NGOs and through them to practitioners, tuned to accommodate Mediterranean particularities and needs especially in touristic coastal areas.	Training Manuals, implementation of interactive ICT tools, on-the-job trainings, dedicated workshops, test-training sessions and field visits	http://www.litusgo.eu	Climate change, capacity development
69	MarCoast	Marine & Coastal Environmental Information Services	2005-2008	European Space Agency	Thales Alenia Space - France	To deliver a single portfolio of marine and coastal services at a European scale.	Satellite-based services in the field of marine and coastal applications	http://www.gmes-marcoast.com	Marine sciences, technology
70	MAREMED	MAritime REgions cooperation for the MEDiterranean	2010	Programme cofinanced by the European Regional Development Fund	Provences-Alpes-Côte d'Azur	The project focuses on those constituents of maritime policy with a strong transnational dimension, namely Integrated Coastal Zone Management, pollution (including small and medium scale accidental coastal pollution), adaptation to climate change in	The development of innovative approaches to territorial governance will be achieved by improving the coordination of regional maritime policies with each other and with other levels of governance, in particular the national, European and Mediterranean levels. The development of cooperation between	http://www.maremed.eu/	Governance, climate change, pollution, capacity development

						coastal areas, fisheries and coastal and maritime data management	technical stakeholders will facilitate: - the development of pilot schemes and the development of operational instruments to support territorial maritime policy decision-making; - the identification of specific Mediterranean problems encountered in the implementation of the European policies concerned; - Ensuring that maritime policies developed by regional territories are better exploited by European and Mediterranean authorities. - the development of more effective transnational projects and better use of the results of past projects; - the development of dialogue on maritime policy in the framework of the Barcelona Process:Union for the Mediterranean.		
71	MedPartnership	Strategic Partnership for the Mediteranean	5 years Commencing: Septe	Global Environment Facility (GEF) and	UNEP/MAP	The MedPartnership's overarching goal is to enable a	A long term partnership for joint planning and financing in the Mediterranean,	www.medpartnership.org	Governance

		sea large marine ecosystem	mber 2008 Compl etion: August 2013	other partners		coordinated and strategic approach to catalyze the policy, legal and institutional reforms, and the investments necessary to reverse the degradation trends affecting the unique Mediterranean Large Marine Ecosystem, including its coastal habitats and biodiversity. The specific objectives of the Medpartnership are: • to assist countries in the implementation of the SAPs and NAPs to reduce pollution from land-based sources, and preserve the biodiversity and ecosystems of the Mediterranean from degradation; • to assist countries in the	facilitating effective and efficient use of resources in addressing countries' priorities for the protection of the marine and coastal environment. More specifically: • The improvement of environmental conditions in 15% of Hotspots and sensitive areas of national priority. • More sustainable use of coastal resources through the use of Integrated Water Resources Management (IWRM), Integrated Coastal Zone Management (ICZM) and aquifer management. • The reduction of pollution from land based sources through demonstration and adoption of environmentally sound technology. • More sustainable use of fisheries resources through the adoption of an ecosystem based approach to fisheries, and improved protection off critical biodiversity through the management of coherent network of		

						implementation of the Integrated Coastal Zone Management ICZM Protocol; • to leverage long-term financing, and • to ensure through the Barcelona Convention and MAP systems the sustainability of activities initiated within the project beyond its specific lifetime.	Marine Protected Areas. • The replication and scaling up of investment projects and demonstrations during the 5 year lifespan of the project.		
72	MedWetCoast	MedWetCoast Project for conservation of Wetlands and Coastal Ecosystems in the Mediterranean Region	1999-2004	Global Environment Facilities (GEF) and the Fond Français pour l'Environnement Mondial (FFEM).	UNDP	The overall goal to which the project intends to contribute is the conservation and sustainable use of wetland biodiversity in the Mediterranean.	The project invovled a set of 15 important sites in 6 countries: Albania, Egypt, Lebanon, Morocco, Palestinian Authority, Tunisia. 6 national projects and a regional component that has a supporting and facilitating role to the national components were delivered. MedWetCoast project, conservation sustainable use of wetland biodiversity in the Mediterranean countries, Albania,	http://vinc.s.free.fr/	Ecosystem

							Egypt, Lebanon, Morocco, Palestinian Authorithy, Tunisia		
73	MSICZMP	Cooperation in the Development of a Plan for Integrated Coastal Zone Management between MarsaMatruhand El Sallum, Egypt	2006-2008	AECI (Spanish Agency for International Cooperation)	IH Cantabria –Institutode HidráulicaAmbiental	To analyze the coastal zone system To propose alternative scenarios for development	The analysis of the coastal system focused on the identification of resources (natural and cultural) and on the opportunities for its sustainable exploitation (Phase I, 2005-2007). The proposal of alternative scenarios for development based on the zonificationof uses along the coastal stretch combined with the carrying capacity of the coastal system (Phase II, 2007-2008).		Governance,
74	OURCOAST	OURCOAST	2009-2012	Directorate General (DG) Environment of the European Commission (€ 1 million)	ARCADIS, The Netherlands	To create an information base and groundwork that will further support implementation of ICZM in coastal areas by the establishment of long-lasting information mechanisms that will promote the sharing of experiences and practices throughout Europe.	• A multi-lingual database of Europe-wide ICZM practices accessible through this website • A comprehensive review of more than 350 ICZM case studies based on the OURCOAST themes • Comparative analysis of ICZM experiences leading to an overview of the state-of-the-art by theme and typical success and fail factors • Review of most relevant EU policies and legislation and	http://ec.europa.eu/ourcoast/index.cfm?menuID=3	Governance, marine sciences,

							their effects for the implementation of coastal zone management and marine planning • Development and validation of guidance for authorities for future integrated coastal and marine planning and for the design of policies and tools. • Development of recommendations that can set the implementation agenda of ICZM for the next decade • Development of a contact list of EU, national, regional, local coastal and marine stakeholders and other interested parties on ICZM implementation • Organization of a final stakeholders event, in Latvia (Autumn 2011		
75	SHAPE	Shaping an Holistic Approach to Protect the Adriatic Environment	Starting 2011 (3 years)	IPA ADRIATIC Programme	(Invovlement of 13 partners from 6 countries from the IPA Adriatic cooperation area (Italy, Albania, Bosnia	To develop a global vision of the Adriatic basin and to undertake unequivocal development action from all sides	Through its activities, the project plans to promote and successfully implement the Integrated Coastal Zone Management (ICZM) Protocol, which is the current governance instrument for marine and coastal areas, and wants to	N.A.	Governance, marine sciences, urbanism

					Herzegovina, Slovenia, Croatia and Montenegro).		develop plans for Marine Spatial Planning (MSP), which is considered a fundamental aspect of the European Union's Integrated Maritime Policy		
76	STOPS	Black Sea GOOS: a Step Towards Observation and Prediction System	1996-1998	Intergovernmental Oceanographic Commission (IOC)	•	• to implement basic elements of operational network for observation, oceanographic data exchange, assimilation, forecasting, and issue of products for marine ecological applications; • to develop science plan for the Black Sea GOOS programme further development •			Capacity development
77	TU-WAVES	Wave Climatology of the Turkish Coast: Measurement-Analysis-Modeling	1993-1998	North Atlantic Treaty Organization, Science for Peace Program (NATO - SfP)	Coastal and Harbor Engineering Research Center, Civil Engineering Department of the Middle East	• To improve knowledge on wind/waves over the entire Black Sea and along the Turkish coasts on the other seas and to generate a reliable data bank by operating a network of wave measurements	A reliable wind and wave-data bank for the Black Sea and the other Turkish coasts		Marine science

					Technical University, Ankara, Turkey	and a system of wave analysis in real time; • To achieve and advanced and reliable wave model which is verified for the Black Sea and the other Turkish coasts, and to make it operational for routine wave forecasts; and • To prepare a wave atlas for the Black Sea and the other Turkish coasts, which will also contain detailed statistical information on wind and wave climate. •			
78	N.A.	Adaptation to Climate Change in the Nile Delta through Integrated Coastal Zone Management	2009-2014	The Special Climate Change Fund (SCCF) – GEF 16,838,060 $ (Total cost)	UNDP	to integrate the management of SLR risks into the development of Egypt's Low Elevation Coastal Zone (LECZ) in the Nile Delta.	Capacity to improve resilience of coastal settlements and development infrastructure is strengthened Innovative and environmentally friendly adaptation measures enforced in the framework of Nile Delta ICZM.	-	Climate change, capacity development

							M&A framework and knowledge Management system in place		
79	N.A.	Alexandria Coastal Zone Management Project	2010 - 2015	Investment Fund for the Mediterranean Sea Large Marine Ecosystem (654.15 US$ millions)	EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY	To improve the institutional mechanisms for sustainable coastal zone management in Alexandria in particular to reduce land-based pollution to the Mediterranean Sea.	The expected outcomes and results: • An increased capacity by the various relevant entities to manage the coastal zones in and around Alexandria in an integrated, participatory and sustainable manner. • In-stream treatment (set of bio-films) in the Qalaa drains; and (ii) set of aerators in the Qalaa drains. The completion of a monitoring and evaluation system and the documentation of the project results for the purpose of up-scaling and replication.	http://web.worldbank.org/external/projects	Ecosystem, pollution, capacity development
80	N.A.	Danube River Basin Programme	1994-1998	Global Environment Facility (GEF) European Union - PHARE Programme EU-PHARE	•	• Collecting data and establishing national and regional databases and information systems • Providing technical assistance to participating Countries in identifying key problems and developing	• Strategic Action Plan adopted in December 1994 • National Action plans developed by each Danube country • Institution strengthening • Development of Danube Accidental and Emergency Warning System • Development of Danube Information System		Governance

						overviews of the existing situation • Establishing networks for information exchange and providing training and institutional strengthening • Developing a Strategic Action Plan for addressing environmental management problems in the Danube. • Preparing a series of pre-investment studies for high priority investments for local and international funding •	•		

Annex 3. Lessons learned from ICZM good practice around the world

This section of the report was extracted from a recent report made by Y. Henoque (IFREMER) for the Priority Actions Programme (PAP) on lessons learned and analysis of ICZM good practices around the world that can be useful for the Mediterranean and Black Sea coasts.

1 Establishing the ICZM strategy

Lesson 1 - Assessing policy options: a stepwise approach

Looking at the process involved in South Africa is extremely instructive (Glavovic, 2000) :

- from the outset of the Coastal Management Policy Programme, the intention was to prepare a "neutral" Discussion Document for public comment. It was envisaged that this document would provide the basis for developing a draft Coastal Policy document that could eventually be published as formal government policy. It was finally decided by the Minister in charge, the Minister of Environmental Affairs and Tourism (DEAT), that the Discussion Document should be published as a Green Paper[2];

- considerable attention was then focused on drafting the Green Paper, which was conceptualised as a capacity building "tool" that would inform stakeholders about the coast and the challenges inherent in its management. To achieve this purpose, it drew upon a variety of information sources, including past research as well as the findings of a series of *Specialist Studies* and input of stakeholders and the public, together with the insights developed by the Coastal Management Policy Programme team;

- the key elements of the Green Paper included background information about the coast and its management, a normative framework or the vision (regional and national visions), principles, goals and objectives for coastal management, and three institutional and legal option models for implementing the policy. A series of questions were posed to prompt readers to think about the implications of these different institutional and legal models . Since then, the same kind of consultation approach has been used by many countries including the EU using the internet among other things;

- after systemically collating the feedback on the Green Paper, the Project Management Team sought to address the more serious concerns raised by stakeholders, subsequently revised the document and submitted it for discussion again. This kind of iterative drafting process leads to the development of a close working relationship between the main actors involved at national and provincial level. Particular attention was given to developing a practical Plan of Action that would guide the implementation of the policy;

- through this iterative process, the Green Paper turned to the draft of a White Paper, which was again submitted to stakeholders for their information requesting them to send written comments;

- seven month after the launching of the Green Paper (September 1998 – March 1999), the Draft White Paper was finalised and handed to the Minister of Environmental Affairs and Tourism. It was then distributed to all stakeholders who had participated in the Coastal Management Policy Programme.

[2] A Green Paper is aimed at stimulating public awareness and discussion about a public policy issue. It precedes a White Paper, which outlines formal government policy.

Lesson 2 - Promoting meaningful public participation

In all the models, public participation and local involvement are recognized as crucial components of coastal management. Similarly, NGOs and community organizations are, among others, increasingly playing a major role in costal zone management initiatives around the world. In most of the cases, communities have typically participated in coastal zone management through public meetings, hearings and inquiries, and as representatives on advisory committees or councils. In many countries, public involvement is a legislated requirement for the development of and implementation of any sector or field management programmes. In Japan for example, local involvement has been included for a long time with traditional community approaches forming a key component of managing resources in the coastal zone. Elsewhere, the special area management (SAM) approach adopted by a number of countries (e.g. Ecuador, Sri Lanka, Barbados) involve coastal community and government partnerships. In the Philippines, coastal zone management is largely the responsibility of the municipal level of government acting within a national coastal zone management framework and action plan.

Generally speaking, there are a number of lessons that may be considered as central to provoke and grab opportunities allowing public participation to happen:

- *At the outset, key stakeholders should agree on an appropriate process and structure to secure broad political support for the initiative*. This approach stands in contrast to common practice, which typically begins with technical analysis of a problem. By concentrating on process considerations first, attention can be given to building political support before stakeholders assume positions based on differing perceptions about how best to solve the problem. The setting up of a specific programme and its coordination body may promote the credibility of the process seen as a partnership between government, civil society and the private sector.

- *The process should be designed in an inclusive, voluntary and culturally sensitive manner*. Particular attention needs to be given to designing culturally sensitive and appropriate methodologies to engage diverse participants effectively in the participatory process. Different kinds of opportunities, forums and participation methodologies need to be developed, tested and applied, depending on stakeholder needs. It should be an iterative process in which capacity and trust are progressively built over time, contributing to deeper insights and to enhanced stakeholder relationships. Locally networked and informed regional managers may play a key role in this regard.

- *The process should be aimed at empowering historically disadvantaged individuals, groups and communities*. Socially and geographically distinct patterns of poverty and inequality will be perpetuated unless there is a commitment to empowering those who are marginalized. Creating opportunities for meaningful public participation can be a powerful means of mobilising historically disadvantaged people.

- *The process should be conceptualised as a partnership-building endeavour.* A broadly owned policy outcome is based on a shared commitment to its implementation. Such partnership-like relationships provide the basis upon which stakeholders can learn about and appreciate the interests of others. Conceptualising the process as a partnership-building endeavour helps to foster a common understanding of the issues and builds a share set of values that can be then translated into practical measures for cooperation.

- *The process should be designed and managed to deepen and extend public deliberation*. Promoting public participation presumes that participants are well informed about the issues at hand and are able to engage in group discussions that get to grips with the substantive nuances of the issues. It also presumes that participants are able to work through their differences of opinion and develop a common understanding of the issues. Usually, public meetings provide limited opportunity for in-depth discussion. Alternative forums and participatory methodologies are required to extend and deepen discussion, including small group discussion that facilitate increased interaction between specialists and stakeholders, as well as deeper levels of interaction between stakeholders.

- *The process should be managed in an innovative, reflective and deliberative manner that is responsive to changing circumstances and stakeholder interests.* From an operative point of view: (a) keeping the momentum requires *independent facilitators* who, depending on circumstances, may need to play different roles, ranging from mediator to negotiator, educator, advocate and so forth; (b) building stakeholders' interest, understanding and trust necessitates timely, accurate and *regular feedback* that reflects the nature of their contributions and the manner in which they have been integrated into the products of the process; (c) the process should be designed and managed to be *responsive* to the needs and interests of stakeholders and to the new insights that emerge in the course of the process, (d) careful attention needs to be given to using the most *appropriate media* and means to make the outputs of the process widely accessible and reach particular target audiences, such as key decision-makers or the youth; (e) conducting such an extensive participatory process requires securing sufficient *financial resources* as well as a *reasonable timeframe* to engage stakeholders in formulating the coastal policy.

Table 3Promoting meaningful public participation

Political legitimacy	At the outset, key stakeholders should agree on an appropriate process and structure to secure broad political support for the initiative
Process-driven approach	The process should be designed and managed in an inclusive, voluntary and culturally sensitive manner
Empowering process	The process should be aimed at empowering historically disadvantaged individuals, groups and communities
Building partnerships	The process should be conceptualised as a partnershio-like relationship building endeavour
Deepening public deliberation	The process should be designed and managed to deepen and extend public deliberation
Innovation, reflection and feedback	The process should be managed in an innovative, reflective and deliberative manner that is responsive to changing circumstances and stakeholder interests

From: Glavovic, 2000

Lesson 3 - Building on past efforts throughout a long process

Current and future coastal management efforts can be improved by understanding the successes and failures of past efforts. Past efforts not only provide an important historical context for prevailing efforts, they provide the point of departure for future efforts. All models show that time and resources are required before coming up with a national ICZM strategy whatever the form it takes. Conducting an extensive participatory process that deals with complex issues necessitates securing sufficient financial resources as well as a reasonable timeframe to engage stakeholders in contributing to the formulation of the coastal policy.

In South Africa, a variety of coastal management activities were carried out in the 1970s and 1980s. But it was not until 1992 that the government initiated activities to develop a coastal policy in dialogue with coastal stakeholders. It took a further five years before the policy formulation process actually got underway till the final publication in June 2000 of the *White Paper for Sustainable Coastal Development in South Africa,* a new government policy that promotes sustainable development through integrated coastal management.
To reach that stage, a Coastal Management Policy Programme was set up over a five-year period based on three separate sets of activities: (i) securing political support; (ii) putting the "building blocks" in place, (iii) the inception phase.[3]

[3] Bruce Glavovic. 2000. Building partnerships for sustainable coastal development. The South African coastal policy formulation experience: the process, perceptions and lessons learned. Common Ground Consulting/Department of Environmental Affairs and Tourism

Other countries like Canada or the UK have been through the same preparatory process before coming up with respectively the Oceans Act (1997) and the Canada's Oceans Strategy (2002), and, in the UK, a quite comprehensive process including a first draft of the national strategy (*Safeguarding our Seas,* May 2002) followed by a stocktake of current practice in ICZM (2004), a national consultation in 2006 (*Promoting an integrated approach to management of the coastal zone in England*) and lastly a national ICZM strategy (2009) soon followed by the enactment of the Marine and Coastal Access Act (2010).

Defining an ICZM national strategy is thus a long process in which constituency building is a key component of successful ICZM efforts to create public awareness of the need for ICZM, catalyse the necessary political support, and promote compliance.

Lesson 4 - Knowledge and understanding for system thinking

The identification of issues should be based on the gathering and integration of existing knowledge with additional studies where it is needed in order to share the available knowledge and promote a common understanding of ecosystem changes over time.

The UK report, *Charting Progress – An Integrated Assessment of the State of UK Seas (2005),* "brings together the scientific monitoring data, describing and evaluating what the data says about the current state of UK seas, and some of the trends, which are currently observable". As said, it is made on existing information to "provide a firm foundation for future policy-making and for *charting progress* towards achieving the vision that was set out in a previous report *(Safeguarding Our Seas, 2002).* The reverse could have been true: bringing the knowledge together to then set out a vision for the country and its regions.
It is important to underline that such a synthetic assessment was not made in once but has been going through a whole process including the previous drafting of four sector reports (Marine environment quality; Marine processes and climate; Marine habitats and species; Marine fish and fisheries).

It is also the opportunity to instil a "system thinking" approach where the coastal and marine system is thought of holistically, as an interconnected natural-human system that is complex, evolving and unpredictable. In Australia, the *Coastal Management Policy Programme* was seen to have developed a more holistic view of the coastal system as an integrated natural-human system but also of the significant value of ecosystem goods and services and the importance of viewing coastal management as an opportunity to invest in future sustainable development opportunities.

Even where information is limited, much can be achieved by consulting informed people, including specialists, government officials, resource users and coastal stakeholders. But in the same time, attention needs to be given to synthesising and sharing research findings with a broad audience, necessitating more effective communication not only between researchers but between researchers, managers, coastal stakeholders and the public. At the end, what counts is not to make a comprehensive assessment of the status of the coastal and marine ecosystems elements but to identify the major threats and issues that have to be tackled.

Lesson 5 - The issues that ICZM programmes address

Coastal issues are somewhat similar around the world. With few exceptions, most coastal nations are experiencing the environmental problems of habitat loss, pollution, and declining resources, as well as the social problems bound to such issues, including resource se conflicts and the governance issues raised by poor planning and decision-making on major development actions (Table 6). But beyond this apparent similarity there are important differences between countries, and particularly developed and developing countries where local people are heavily dependent on natural resources and almost no alternative when these local resources decline or disappear. A second big difference is in the rate of transformation of the landscape and the changes in resource condition; when development happens (e.g. shrimp mariculture, tourism development), its pace usually far exceeds the ecosystem resilience threshold but also the capacity of society to internalise the process of change and steer it to sustainable forms of development.

Table 4Environmental and development issues in the US and USAID-funded CRMP countries

Coastal issues	***U.S.***	**Ecuador**	***Sri Lanka***	**Indonesia**	**Kenya**	**Tanzania**	**Mexico**
Mariculture							
Threats to critical areas and habitats							
Decline in coastal fisheries							
Tourism							
Urban development							
Land-based sources of pollution							
Water supply and sanitation							
Erosion/accretion hazards							
Shorefront development (including ports/marinas development)							
Losses in historic, scenic and archeological sites							
Public access							

Black: CRMP first priority *Grey: CRMP second priority*

Lesson 6 - The focus on coastal regions' specific features

The UK regional assessments, like for other countries' Green or White Paper of South Africa or of Madagascar, is a recognition that a "one size fits all" policy approach is not appropriate. A national strategy should be considered as an overarching national framework within which the characteristics of different provinces, regions and localities are addressed. In order to develop a policy along these lines, coastal stakeholders should be involved at three distinct but related geographical scales: the local level (i.e. a village, a community, town or city); the regional level (i.e. a coastal area that stakeholders consider to have characteristic biophysical, social, organisational and institutional features); and the national level (i.e. the coast as a whole, which would be the geographic focus of the national committee in charge).

In South Africa, thirteen coastal regions were identified on the basis of telephonic interviews and regional visits. The definition of regional boundaries was informed by the factors affecting the extent to which stakeholders could participate in the Coastal Management Policy Programme, e.g. organisational and institutional characteristics, the geographic location of stakeholders and the anticipated resource requirements to bring stakeholders together to public meetings. Regional Managers were appointed to facilitate public participation in the regions. Hence, the coastal regions boundaries were drawn out in a very pragmatic way, as a tradeoff between natural characteristics, administrative boundaries, and stakeholders' networks.

Table 5Fostering scientific integrity to improve knowledge and understanding

Systems thinking	The coastal system should be thought of holistically – as an interconnected natural-human system that is complex, evolving and unpredictable
Collaborative research	Policy-relevant research and analysis should foster collaboration and integration across traditional disciplinary boundaries
Integrating knowledge, understanding and values	Scientific and technical knowledge should be integrated with local knowledge and societal values
A process of social learning	Building public awareness and understanding of the coast and costal management should be understood as a process of learning from experience
Building an information base	A sound information base and an effective information management and monitoring system should be

	developed

From: Glavovic, 2000

In Spain and in the framework of the preparation of the Strategy for Coastal Sustainability (Sano et al. 2010[4]), the Technical Diagnostic for the Spanish coast consisted in dividing the area of study (about 68% of the coast of Spain) into 8 coastal stretches corresponding to the coastal side of the River Basin District (RBD) along the following steps: (i) identification of management units, (ii) analysis of the physical, ecological, socio-economic, and land-use subsystems for each management unit, (iii) SWOT (Strengths /Weaknesses /Opportunities /Threats) analysis for each management unit, (iv) identification of priority interventions for each management unit, and (v) calculation of basic pressure, state, and response indicators for each management unit. Here, "management units were defined as spatial units with homogeneous features from a physical, ecological, socio-economic, or administrative point of view".

Based on these investigating steps, 6 factsheets were prepared for each of the 154 management units: (i) a physical subsystem factsheet, (ii) an ecological subsystem factsheet, (iii) a socio-economic factsheet, (iv) a land-use subsystem, (v) a SWOT analysis, and (vi) a strategic coastal interventions factsheet. To make this large amount of data communicable to the stakeholders and decision-makers, a set of PSR (Pressure /State, /Response) indicators were developed to come up with a more synthetic information.

Lesson 7 - Anticipating the impacts of climate change

As said earlier, climate change adaptation measures should be part of the strategy and not dealt with separately. The likely and potential impacts of sea level rise, increased frequency of storm events, acidification of seawater, desertification of arable land and the associated declines in ecosystem function should be considered on the short- (10 years), mid- (30 years), and long-term (100 years) periods. Some adaptation handbooks already exist like the USAID (2009) one on *Adapting to Coastal Climate Change: A Guidebook for Development Planners,* which offers a comprehensive overview of the impacts of climate change on coastlines and the tools that can be applied to the mitigation of its impacts.

The UK *Charting Progress* report (2005) for an integrated assessment of the state of UK seas, underlines the importance of fully integrating the assessment of possible climate change impacts in future strategies, considering that "in the long term, the greatest threat to the planet, including the marine environment, could be the impacts of climate change".

Table 6Contents of the UK Charting Progress report[5]

Measuring State: Indicators of change
A new integrated approach to marine assessment and the need for indicators of state
Physical and biological status of the seas
Physical characteristics of the seas
Biological indicators of state
Human impacts on marine environmental quality
Climate change; capture fisheries; aquaculture and shellfish harvesting; hazardous substances; nutrients; sewage treatment discharges; microbiological quality; radioactive discharges; oil impacts; construction in the sea and coastal zone; aggregate extraction and seabed disturbance; dredging of harbours and navigation channels; litter and waste; introduction of non-native species
Regional assessments
How the regional areas have been defined
What the regional assessment shows
Integrated assessment – the Status of the seas
Rationale and approach for the integrated assessment

[4] Sano M., Gonzalez-Riancho P., Areizaga J., and Medina R. 2010. *The Strategy for Coastal Sustainability: A Spanish Initiative for ICZM.* Coastal Management, 38: 1, p.76-96.

[5] Defra. 2005. *Charting Progress. An Integrated Assessment of the State of UK Seas.* www.defra.gov.uk

Overview of the significant impacts and pressures affecting status
Lessons learnt and forward look

Lesson 8 - Defining the coastal zone and putting it into context

In the Protocol, coastal zone boundaries are defined in a very flexible way as: (i) the seaward limit of the coastal zone is the external limit of the territorial sea; (ii) the landward limit is the limit of the competent coastal units.

It is clear that the definition of the coastal zone varies with each existing model. With respect to the size of the coastal zone, there is usually a tradeoff between comprehensiveness (bigger) versus acceptability and practicality (smaller). Some countries, such as Sri Lanka and Costa Rica, have adopted a narrow definition of the coastal zone. In contrast, seaward boundaries can extend as far as the outer limit of the Exclusive Economic Zone (EEZ), which is the case for most of the countries that developed a Maritime or Ocean Strategy. This trend towards more "comprehensiveness" makes the ecological boundaries of the entire coastal and marine ecosystem easier to consider and include into the strategy. The EU hence its Member States, and countries like Korea, Japan, China, India, Canada, Australia, and lastly the US have defined the coastal zone in such a way as to bring together the coastal and ocean aspects of management from internal waters out to the 200nm limit. This is seen as a critically important linkage to make in order to manage marine areas on an ecosystem basis, the very rationale of the Large Marine Ecosystem approach.

But because of the dynamic and "open system" nature of coastal and marine areas, analysis for planning and management should add other areas to the boundaries of the management of the ecological area, which are the *demand areas*[6]: demands from within the designated area; demands from outside the designated area but within the catchment area; demands from outside the catchment area, with respect to, e.g. waste disposal of pollutants transported into the area via atmospheric transport, demands for coastal recreation, including visits to unique marine areas,; and internationally determined demands, such as for global shipment of crude oil and oil products. Therefore, any management area should be considered in its multi-scale dimensions.

Lesson 9 - About the multi-sector approach

It has to be noted that at their inception many models are not comprehensive, but are rather single issue programmes that expand over time to include other sectors. For example, Sri Lanka, Barbados, Queensland (Australia), the UK and France initiated their respective coastal zone management programmes to address coastal erosion control and shore protection against urbanisation where the setback boundaries enforcement was a key issue. Nowadays, these countries and particularly those which have developed an overall coastal and ocean policy are attempting to coordinate and manage many sectors.

The most common approach to building a multi-sectoral capacity has been to develop working groups, such as committees or advisory councils, composed of agencies responsible for each key sector in the coastal and marine areas. Whatever the institutional arrangements made (we will come back to this issue later on), it is essential to look at the ways coastal stakeholders and the public actually contribute to the shaping of the policy outcome and its planned implementation.

Often, disillusions result from the fact that the sources and the scales at which the forces are driving the various issues are not or ill-taken into consideration into the action plan. For example, overfishing and the impacts of unregulated tourism may be considered as local pressures, but the degradation of wetlands or seagrass beds from the area of focus may be reducing the flows of larvae that repopulated the area and these impacts may be or may not be beyond the reach of local action. Careful documentation of the impacts of such global pressures as climate change might help to be aware of this scale issue and link with other policies or programmes addressing the causes of global warming.

[6] B.T. Bower & R.K. Turner. 1996. *Characterising and analysing benefits from integrated coastal zone management (ICZM).* "Designing Sustainability", Fourth Biennal Conference of the International Society for Ecological Economics, Boston University, 4-7 August 1996.

2 Setting the vision

Lesson 10 - Baseline conditions in terms of process and outcomes

Referring to the widely used framework, the GESAMP (1996) cycle, it begins with an analysis of problems and opportunities, then proceeds to the formulation of a course of action, and looks at the commitment of stakeholders, managers, and political leaders through the appropriate allocation of resources by which the necessary actions will be implemented.

The effort and time to initiate and secure the "establishment" (previous section) of the strategy or programme will condition the nature and extent of the vision and objectives setting. As an example, in South Africa the dominant influence on the thinking behind the coastal policy was first rooted in traditional ideas about environmental policy. Progressively, through consultation, regional sector meetings, special scientific studies, the Coastal Management Policy Programme team members shifted from a focus on natural resources towards a more people-centred strategic perspective that aimed to realise the value of the coast as a place of enormous developmental potential, whilst maintaining the integrity of the coastal and marine ecosystems. This subtle but significant shift in thinking moved coastal management from the nature conservation arena and aligned it with the dominant political, social and economic agenda in South Africa, namely the pursuit of sustainable development.

In reflecting on the challenges and opportunities confronting the Coastal Management Policy Programme, a number of critical success factors were identified: (1) the policy should provide a national statement of political intent that secures buy-in for an integrated multi-sector coastal management approach, mainly through an understanding of why the coast is important, in political and economic terms; (2) the policy should outline a normative framework including the vision, principles, goals and objectives for coastal and marine management; (3) the policy should present a Plan of Action that provides clear direction for taking action to improve the coordination and integration of sectoral activities affecting the coast, as well as strengthening other policies and building capacity to implement the policy; (4) the policy should not attempt to address all issues of concern but rather should focus attention on agreed-upon priority issues that are uniquely coastal and specifically require a coastal policy response; (5) the policy should focus on issues that can be successfully addressed and its implementation must result in tangible changes that improve the livelihood of coastal stakeholders.

Lesson 11 - Visualizing a desirable future

The ICZM Mediterranean Awareness-Raising Strategy (MARS) is a framework strategy to support policy development and implementation. Among its core messages figure the vision of the future of the Mediterranean coast and sea, i.e. a coast and sea that are:

- *resilient* - resilient to climate change, resilient to natural processes, resilient to human processes);
- *productive* – productive financially, competitive, high in value, increasing GDP, alleviating poverty;
- *diverse* – diverse in ecological, diverse in experiential terms;
- *distinctive* – distinctive culturally, distinctive in marketing;
- *attractive* – attractive to visitors, investors and to local people;
- *healthy* – free from pollution.

This vision needs to be then translated into practical terms for each of the Mediterranean countries, putting the emphasis on one aspect or the other. It will be best developed with involvement of multiple stakeholders. It should lead to the description of the Third Order outcomes (practical results and benefits) but may highlight features of the First (enabling framework) and Second Order (changes in behaviour) outcomes that are especially important to achieving those ends.

In the case of the *Victorian Coastal Strategy*[7], the vision is clearly articulated with the specific policy directions which are then developed in the document, i.e. *Sustain, Protect, Direct, and Develop,* as shown below:

[7] Victoria Coastal Council. 1997. *Victorian Coastal Strategy.* Official document 56pp.

Table 7The vision for the Victorian Coast (Australia)

"The coast of Victoria will be a pleasure to experience by both present and future generations, respected by all and recognised as one of the nation's icon"

The Victorian Coastal Strategy provides the framework to realise the vision for the coast. With community support and involvement, the Strategy will ensure that in the long term, the outcomes for Victoria's coast will:

Ensure the *sustainable* use of natural resources, so that the coastal and marine environment will be in better health in 20, 50 and 100 years time, and	**Ensure the *protection* of significant environmental features of the coast through establishing:**	**Provide clear *direction* for the future use of the coast including the marine environment, and which**	**Identify suitable *development* areas and development opportunities on the coast, and which**
is managed to preserve a diversity of marine and land-based ecosystems has improved standards of marine and estuarine water quality, is managed for the long term with care, efficiency, and skill is internationally recognised as one of the best coastlines in the nation and the world	a comprehensive system of well-managed national, marine and coastal parks and reserves other forms of open space which provide for the conservation and protection of significant natural areas effective mechanisms and actions to ensure the conservation and management of indigenous coastal and marine flora and fauna	**1.** integrates the planning and management of coastal land and sea **2.** provides a diversity of experiences for Victorians and visitors **3.** effectively and clearly defines areas for the location of appropriate activities 4. is characterised by world class quality of design, construction and maintenance	**1.** are recognised for the significant role they play in contributing to the economic prosperity of Victoria **2.** continue to contribute to the health and well being of the millions of people who visit and use the coast **3.** support an ecologically sustainable range of new and improved commercial, recreational and tourism activities of world class standard **4.** has developments which are of a scale and character sympathetic to the surrounding coastal landscape or built environment

Lesson 12 - Developing appropriate indicators

To become powerful ICM management tools, indicators must demonstrate the measures of effectiveness of a project, programme or policy (strategy). Further, they become effective tools when they are used to encapsulate changes in the state of coastal and marine environments, trends in socio-economic pressures and conditions in coastal and marine areas (3rd Order outcomes), but also the state of ICZM enabling conditions (1st Order) and changes in behaviour of stakeholders and institutions (2nd Order of Outcomes) so that each change in the state of the coast may be correlated with corresponding changes in behaviour.

Generally speaking, as for the regional or national sustainable development strategies, their objectives are:

1. *To inform* – The importance of informing the public, elected officials and all sectors of society in a comprehensible way about the state and progress of the strategy, where leaders are expected to act as catalysts in interpreting and promoting sustainable development.
2. *To measure progress* – Progress is often measured in terms of objectives defined in a sustainable development plan or strategy. This facilitates periodic comparisons in time within the country and with other countries, and makes possible to determine the principal trends as part of a long-term evolution, as it is the case with the Mediterranean Strategy for Sustainable Development (2006).
3. *To aid decision making* – A number of documents emphasize the importance of assisting national decision-making processes on sustainable development by providing a set of indicators to measure advances in critical sectors.

A comparative analysis of 36 indicator systems for sustainable development[8] reveals that public administrations favour four main procedures for drawing up their list of indicators: interministerial collaboration, working groups, public consultations and the lessons learned from foreign and international experience.

According to Eurostat[9], there are two grand categories of indicator systems for sustainable development: *policy-driven* systems, where indicators reflect a strategy, and *statistics-driven* systems, which are developed to maximize the availability and quality of data. The problem is that reports dealing with strategies and indicators are very often distinct as in the case of the Mediterranean system where a few *policy-driven* indicators are included (see note 12).

The OECD, in a document entitled *National Strategies for sustainable development: good practices in countries of the OECD (2006),* presents the systems of Austria, the Czech Republic and Ireland as examples of "good practice in terms of indicators and objectives". Austria's strategy presents 52 indicators associated with 20 key objectives divided into four domains: quality of life, dynamic territory for business, living space and global responsibility. The objectives are quantified and have deadlines attached. For its part, the Czech system is based on two sets of objectives: the first (with a 116 indicators) is for monitoring the evolution of particular aspects, while the second (with 24) is for communicating with decision makers and the public. The indicators are organised in six categories. As for Ireland, it stands apart with its national green accounting and a method that uses satellite accounts to complete the economic accounts. According to Eurostat, the indicator system of the European Union, like virtually all national or local systems, is linked to the objectives in numerous treaties ratified by member states. Most of the latter have developed their own indicator systems for their national sustainable development strategies, to facilitate the measurement of progress toward national objectives.

Another interesting example more specifically focused on assessment of coastal trends is the US State of Florida case[10]. The Florida Assessment of Coastal Trends (FACT) is structured around nine strategic issues judged to be critical to the future of the coast over the next 20 years. These broad strategic issues were refined into two-to-four sub-issues or components of each issue. These sub-issues then became the final framework around which indicators were developed. Moreover, to make a clear link with the main elements of sustainable development (coastal ecology; quality of life; economic structure; cultural and aesthetic values), and since each indicator measures one or more of these characteristics, each one has been labelled with a series of icons representing each component.

Table 8The nine issues and their associated sub-issues for the Florida Assessment of Coastal Trends (1997)

1. Impact of growth in the coastal zone 1. Impacts of population growth 2. Patterns of development 3. Sufficiency of infrastructure 4. Economic impacts **2. Disruption of coastal physical processes** **1.** Alteration of existing natural systems **2.** Construction of altering structures **3. Responding to coastal threats and hazards** **1.** Coastal hazard mitigation **2.** Incompatible living areas	**5. Sustaining the human uses of the coast** **1.** Maintenance of recreational value **2.** Sustainable economic use **3.** Balancing development with coastal resources **4. Balancing public and private uses of resources** **1.** Private property issues **2.** Stewardship of coastal resources **3. Preservation of cultural and Aesthetic resources** 1. Preservation of archaeological and historical

[8] Bureau de coordination du développement durable, Ministère du Développement durable, de l'Environnement et des Parcs. 2007. *Comparative analysis of indicator systems for sustainable development.* 42pp.

[9] European Commission and Eurostat. 2004. *EU Member States experiences with sustainable development indicators.* Luxembourg, Office for Official Publications of the European Communities.

[10] Florida Coastal Management Program.1997. *Florida Assessment of Coastal Trends.* www.fsu.edu

3. Industrial impacts **4. Degradation and restoration of coastal ecosystems** **1.** Habitat change **2.** Species population trends **3.** Water quality trends **4. Managing freshwater allocation** **1.** Freshwater allocated for ecological maintenance **2.** Freshwater allocated to meet residential needs **3.** Freshwater allocated to meet commercial/industrial needs **4.** Freshwater allocated to meet agricultural needs	resources 2. Preservation of living resources 3. Conservation of coastal ocean space **4. Encouraging public awareness and involvement** **1.** Public awareness **2.** Public participation

From: FACT, 1997

Focusing on the coastal and marine areas, a report from the European Commission[11] mentions that "only a few countries and regions have effectively engaged in the collection and analysis of specific indicators to the coastal zone. A methodology to link the efforts in ICZM to trends in sustainability is still lacking. While the methodology to assess the spatial impacts of EU policies has progressed[12], the gaps in data and the lack of effective information-sharing systems are still a barrier to its more widespread and pro-active use in decision-making processes".

Another worth-looking at model comes from a European Commission study on measuring progress towards Maritime Spatial Planning (MSP)[13] that should be considered in the context of ICZM (see section on *The case of coastal and marine spatial planning*): a set of indicators (Policy and legal framework; Information management; Permitting and Licensing; Consultation; Sector conflict management; Cross-border cooperation; Implementation of MSP) has been proposed and tested on four countries on the basis of existing and compiled information. The main conclusion was that there was not sufficient information within these reports to fully assess the proposed indicators.

To support the implementation of a national ICZM strategy, information needs to be managed, analysed and eventually produced as a tangible end-product to ensure that it reaches and is understood by the broader user community. Bowen and Riley (2003) identified the sequential steps involved in the wider application of indicators:

1. articulating an indicator framework;
2. determining a data acquisition strategy;
3. sustaining data management;
4. agreeing on protocols for data analysis; and,
5. developing reporting products.

Based on the PEMSEA's experience[14], Table below shows initiatives that are carrying out these sequential steps, based on current or possible Mediterranean approach and outputs. The objective is to demonstrate how representative initiatives may be addressed and strengthened across scales. This would create a greater impetus for the successful implementation of an articulated indicator framework across scales that could streamline efforts at the local, national and regional levels.

Table 9Indicator-led data management following sequential steps across scales

[11] Commission of the European Communities. 2007. Report to the European Parliament and the Council: An evaluation of Integrated Coastal Zone Management (ICZM) in Europe. Communication from the Commission COM(2007) 308 final

[12] European Environment Agency. 2006. *The hanging faces of Europe's coastal areas.* EEA Report No.6/2006, European Spatial Planning Observatory Network www.espon.eu

[13] European Commission. 2008. *Legal aspects of maritime spatial planning.* Final Report to DG Maritime Affairs & Fisheries. 78pp.

[14] Chua Thia-Eng. 2006. The dynamics of integrated coastal zone Management. Practical applications in the sustainable coastal development in East Asia. PEMSEA/GEF/UNDP/IMO Ed. 431pp.

	Local	*National*	*Regional*	*International*
Articulate an indicator framework driving the selection of specific measures	Orders of Outcome framework?		MSSD Objective: Sea & Coastal zones 4 priority indicators+ additional indicators	GCOS GOOS GTOS GIWA LOICZ IHDP MEA
Determine an efficient and effective data acquisition strategy	Ecosystem assessment Risk assessment Environmental impact assessment Stakeholder analysis Cost-benefit analysis		RACs and MEDPOL data systems networking European Atlas (Mediterranean basin)	UN Atlas
Create and maintain a sustained data management	Integrated Information Management System		MISESD INFO-MAP	
Agree to protocols for data analysis	Risk quotient and standards Social science research standard protocols		MEDPOL	Observing systems protocols
Develop reporting products to ensure information reaches and is understood by the broader user community	Coastal profile	State of the coast	State of the environment and development in the Mediterranean	Global assessments

GCOS – Global Climate Observing System
GOOS – Global Oceanographic Observing System
GTOS – Global Terrestrial Observing System
GIWA – Global International Waters Assessment
LOICZ – Land-Ocean Interactions in the Coastal Zone Project (International Geosphere Biosphere Programme/IGBP)
IHDP – International Human Dimensions Programme on Global Environmental Change (IGBP)
MEA – Millennium Ecosystem Assessment
MISESD – Mediterranean Information System on Environment and Sustainable Development
Adapted from Chua Thia-Eng (2006)

3 Analysis and futures

Lesson 13 - Going offshore with MSP

In the Mediterranean like elsewhere, the management of ocean resources is often limited to fisheries while countries' approaches, objectives and policy structure vary greatly. States with burgeoning ocean management schemes are looking to more established national programmes for lessons learned and best practices, as well as a better understanding of what "maritime spatial planning" (MSP) truly means in relation with ICZM and for the future of ocean planning within their maritime boundaries and in the Mediterranean region.

It is to help states and federal government agencies in taking a fresh look at management of ocean resources that the US NOAA Coastal Services Centre launched a large stakeholder analysis[15] across the states of the country in order to get a better understanding of stakeholders' current and potential future use and collaboration as regards the MSP tool. The study built on earlier experiences to develop a forward-looking assessment of what was needed for broader use of MSP. The information was gathered from

[15] NOAA Coastal Services Center. 2010. *Marine Spatial Planning Stakeholder Analysis.* NOAA Report, 74pp.

literature reviews, Web searches, and interviews with stakeholders from across the eight designated NOAA coastal regions: Northeast, Mid-Atlantic, Southeast and Caribbean, Gulf of Mexico, West Coast, Hawaii and the Insular Pacific, Alaska, and Great Lakes.

Among the report recommendations, it is noted that MSP is a difficult concept to grasp and define with particular areas of confusion which are: the scale of planning (ecoregions / coastal zone?), the iterative nature of the process, whether efforts that are looking at multiple uses, but are driven by management of one particular use, can be considered MSP?

Making a parallel with the Mediterranean Action Plan, the regional organizations including the Regional Activity Centres could become the backbone of regional MSP efforts within the ICZM framework, providing countries with forums to share and coordinate data management strategies, facilitating stakeholder engagement, and more generally speaking sharing lessons learned.

Lesson 14 - Building scenarios

Depending on the scale, scenarios may have different functions:

1. there are global or regional scenarios like those of the IPCC (2008), the Millennium Ecosystem assessment (2005), or those of the MAP-Blue Plan (2006) for the Mediterranean; these scenarios are composed of a set of coherent, plausible stories designed to address complex questions about the uncertain future of coastal and marine socio-ecosystems at global or regional level. Here, scenario analysis offers a means of exploring a variety of long-range alternatives. Global scenarios draw on both science –our understanding of historical patterns, current conditions and physical and social processes- and the imagination to articulate alternative pathways of development and the environment. While we cannot know what will be, we can tell plausible and interesting stories about what COULD be.

2. at a smaller scale and as defined in the SMAP III Practical guide to ICZM (2009), “the scenario approach is a prospective analysis corresponding to the description of a future situation and of the various steps needed to move from the original situation to the future situation”. It is a participatory approach (see *Imagine* approach)[16] which helps in developing a shared vision hence reinforcing the stakeholders’ sense of ownership. The same practical guide then makes a short description of how and what kind of scenarios were developed and discussed in the case of the ICZM pilot project of Sfax, Tunisia. Here, we don’t know what will be as well, but we try to define what we WANT.

The building up of a national strategy and its action plans may necessitate the use of both, which has been seldom done in past experiences, i.e. considering two possible futures as defined by a “global” scenario and cutcrossing their outcomes with, for example, three other possible scenarios as regards the attainment of the desirable goals. That would make three prospective scenarios each integrating two different global situation that the country much depends on but without much control on its occurrence. A study carried out by the Economic and Social Council of Brittany (2009)[17] is one example of such an approach integrating IPCC’s climate change scenarios with governance development scenarios within the region.

Rather than prediction, the goal of scenarios is to support informed and rational action under a strategy and/or a plan by providing insight into the scope of the possible and the desirable. They illuminate the links between issues, the relationship between global/regional and national development and the role of human actions in shaping the future. Scenarios may make use of various quantitative tools, but they can provide a broader perspective giving voice to non-quantifiable aspects such as values, behaviours and institutions.

[16] UNEP/MAP/MCSD/Blue Plan. 2006. *A practitioner's guide to "Imagine" The Systemic and Prospective Sustainability Analysis.* MCSD Reports.

[17] CESR Bretagne. 2009. *Pouvoirs et démocratie en Bretagne à l’épreuve du changement climatique, à l’horizon 2030.* Report 199pp. www.cesr-bretagne.fr

4 Designing the future

Lesson 15 - Integrating coastal conservation and development

One role of ICZM, as a sustainable development approach of the coast and the sea, is to balance development and conservation. In costal regions, and in developing countries in particular, degradation is likely to impact the sustainability of livelihoods of local populations and the long-term viability of any development strategy, including tourism. For example, in the Mediterranean like elsewhere, degraded coastal areas can lead to a decline in overall tourist revenue with serious consequences for local economies, and can lead to negative impacts on subsistence activities.

In Mexico, Bahia de Santa Maria area, with the assistance of the Coastal Resource Centre (CEC)[18] (University of Rhode Islands, USA) and Conservation International/Mexico (CIMEX), users and stakeholders have established an integrated management plan with a focus on fisheries, freshwater inflows, and bay circulation to sustain the fisheries and the bay's natural productivity. The plan helps define a balance between long-term economic growth and conservation, recognizing that the ecological and economic systems have linkages, often with direct and immediate feedback.

The guidelines for mariculture and tourism development prepared under the leadership of the Tanzania Coastal Management Programme (TCMP) have the goal of promoting income-generating businesses while protecting the coastal environment. These practices promote a better balance between development and conservation, thereby fostering a tourism industry that will be sustainable in the long term (PAP/RAC, 2009).[19]

In another Special Area Management (SAM) in Mexico (Sinaloa), the same CRC and CIMEX worked with shrimp farm organisations and the marina industry to integrate development in these industries with environmental stewardship. Experience shows that private businesses are willing to accept responsibility for their actions and to consider alternative actions provided they are acknowledge as part of the process and they can increase the value and long-term viability of their activity. Similarly, Proyek Pesisir, a national programme in Indonesia, has worked with a village on the island of Sumatra to improve the economic and environmental sustainability of shrimp farms as it was done on a bigger scale in Ecuador[20].

Lesson 16 - Generating commitment through adaptive management

If the necessary constituencies, the institutional capacity, or both are weak or missing, a formal commitment by a national government can have real little meaning. Thus, formalized commitments are no more important than the other two 1st Order Outcomes (motivated constituencies and institutional capacity) as enabling conditions.

To do so, ICZM practitioners should adapt quickly to the political evolving climate and take full advantage of political opportunities that might be available to move the ICZM process forward. Another important element is the practitioners ability to convey the possible outcomes of ICZM to elicit political buy-in through improving their communication skills.

In Thailand, although it was a national ICZM project and not yet a strategy, the five-years CHARM (Coastal Habitats and Resources Management) project[21] kept on adapting and turning the different events into opportunities. Among these, the Tsunami catastrophic event has been a turning point in regard to the visibility and implementation of the project. Compared to the planned one and with the same content, the actual phasing was characterized as follows:

1998-2002: *Project initialization* and feasibility study.

[18] CRC/USAID. 2003. Crafting Coastal Governance in a Changing World. CRMP, S.B. Olsen, Ed. 376pp.

[19] PAP/RAC. 2009. Sustainable coastal tourism. An integrated planning and management approach.

[20] CRC/USAID. 1995. Eght years in Ecuador: the Road to Integrated Coastal Management. D. Robadue Ed., 319pp.

[21] CHARM. 2007. *CHARM project completion report (2002-2007).* www.charmproject.org

2002-2004: *Project starting and long warming up*: looking for partners through establishing communication flow, identifying the existing national expertise, passing first partnership agreements.

2004-2006: *Project motoring*: turning Tsunami aftermath into an opportunity: partnership with NGOs network, Save Andaman Network; participation to government Task Forces; dialogue with donors; starting working with local governments.

2006-2007: *Project speeding up for smooth shifting out:* field projects and community organizations strengthening; local governments strengthening and networking; promoting national dialogue and policy green paper; linking with projects and donors for continuation of activities.

At a certain scale, successful ICZM projects or programmes can help to convince national governments to develop national policy or enact national legislation in support of ICZM practice, its replication and scaling-up. A good example is the issuance of an Executive Order by the President of the Philippines[22] adopting integrated coastal management as a national strategy. This Executive Order is based on the success experienced in the development and implementation of ICZM in the regions of Batangas and Bataan, as well as the Manila Bay project. The same could be said for China (Xiamen experience) and for Vietnam (Danang experience). Here, the regional programme in charge, PEMSEA, has developed a strategy where the most populated and heavily impacted areas from human activities were picked up as ICZM pilot areas to have a significant national impact.

Lesson 17 - Institutional arrangements

There are three main institutional approaches used throughout the world to effect the required integration of coastal and marine management:

- Concentrate authority in a new centralized agency. For example, Sri Lanka set up a Coastal Conservation Department to develop and coordinate management efforts, the UK created the Marine Management Organisations under its Marine and Coastal Access Act (2009), Japan created a Cabinet Council of Oceans under its Ocean Basic Law (2007), and the US Ocean Task Force very recently proposed to create the Ocean National Council to “consolidate and strengthen the Principal- and Deputy-level components of the existing Committee on Ocean Policy within a single structure”[23].
- Expand and enhance the duties of an existing agency. In New Zealand, the Department of Environment was given significant powers under the Resource Management Act (1991), and in South Africa the Department of Environmental Affairs and Tourism became the lead national agency responsible for coastal management.
- Establish an inter-agency coordinating committee. The Netherlands established and institutionalised an inter-agency coordinating committee, while in Ecuador an inter-agency committee was established and placed at the highest level of government.

There are many coastal zone activities that have an international dimension, including marine environment quality, pollution from watersheds, shipping, oil and gas drilling and production, the exploitation of living marine resources, and maybe in a not too far future, the management of large marine protected areas like it is already the case for a few of them. A successful ICZM programme must then be capable of integrating transboundary issues with multiple sovereign governments. Many nations have coastal neighbours and have established multilateral agreements and mechanisms to address mutual concerns. Among others, The Netherlands is well-known for its long standing cooperation with other nations bordering the North Sea and, in the Mediterranean, the ICZM calls for transboundary cooperation for contiguous coasts.

At a large scale, the Gulf of Maine Action Program (GMAP) is a multilateral coastal zone initiative intended to address ocean use and river basin management in the Gulf of Maine. Nova Scotia and New Brunswick, together with the new England states, are members of the Gulf of Maine Council with the objective of developing an integrated management approach for the region. The GMAP provides a potential mechanism

[22] Chua Thia-Eng, 2006

[23] White House Council on Environmental Quality. 2010. *Final Recommendations of the Interagency Ocean Policy Task Force, July 19, 2010.* Report to the Government 77pp.

for multiple government cooperation concerning ICZM, requesting the participation of both the Canadian and US federal governments to negotiate and enter into additional multilateral agreements and arrangements.

5 Realising the vision

Lesson 18 - ICZM legislation and spatial planning

Without enjoying a regional sea ICZM Protocol like in the Mediterranean (the EU has only an ICZM Recommendation which is not legally binding), the other countries engaged in an ICZM strategy or programme development, present a variety of legislative instruments directed toward particular sectors, as well as some specific to ICZM needs like protecting coastal environments. Among these, two general types of legislation may be identified: ICZM-specific legislation, and more general legislation which includes provisions for ICZM.

But as stated earlier, the trend is now going towards Ocean-related laws and ocean or maritime national strategies including the use of integrated coastal zone management. However, the existence of "ocean laws" and their strategy, whilst giving the benefit of overall coherence, does not replace existing or future specific laws, recommendations and strategies on ICZM like it is the case in a number of EU Member States following the EU Recommendation on ICZM (2002) and the EU Integrated Maritime Policy and its Plan of action (2007).

Following Billé and Rochette (2010)[24], eight Mediterranean countries have a specific law dedicated to the coastal area, mostly from the coastal protection point of view while incorporating the requirements and principles of ICZM: recently in Algeria, Israel and Croatia, but also in Spain, France, Turkey, Greece and Lebanon.

Citing many cases, the same authors argue about the benefits of combining action plans with a normative approach: "While the existence of a legal framework does not in any way guarantee its implementation, and ICZM project, outside of any normative framework that is pre-established or under construction, is almost useless – at least in comparison with the sums of money invested."

Another important aspect regards the existing spatial planning legislation that is likely to affect the ease of implementing ICZM. An evaluation of ICZM in Europe[25], reported that one of the key constraints is the legal division between spatial planning of land and sea based activities. This is slightly easier where spatial planning covers both land and sea areas, although this normally only goes up to the territorial sea (12nm), e.g. in both Germany and Sweden municipal plans can be extended to 12nm but not into the EEZ.

Lesson 19 - Making national and local budgets available

Regional and national governments and organisations should play a key role in obtaining funding to start local initiatives and sustain larger programmes that provide resources for enhancing local success. The Sri Lanka coastal programme has been receiving recurrent allocations from the national budget with stable staff and operating funds. Ecuador was able to obtain eight years (1986-1994) of funding through its collaboration with USAID, followed by a much higher level of support from the Inter-American Development Bank. In Mexico, international donors and NGOs, as well as the Mexican Conservation Trust Fund, have been moving toward greater coordination in funding site-based coastal conservation projects and work in *hot spots* or *eco-regions.* The combined efforts included capacity building, regional analysis, visioning exercises and priority setting, and promoting national and regional attention to critical local situations. At the local level, a large proportion of revenues collected from concessions located in the 20-mile federal coastal zone were returned to coastal municipalities, including a fraction targeted specifically for local coastal management actions (CRC/USAID, 2003).

[24] R. Billé & J. Rochette. 2010. *Combining project-based and normative approaches to upscale ICZM implementation.* Background Paper, Policy, Science and Technical Symposium, Session 36: Integrated Coastal Zone Management: Time to Upscale. Global Oceans Conference 2010, May 3-7 2010, UNESCO, Paris.

[25] *Evaluation of ICZM in Europe.* 2006. www.ec.europa.eu/environment/iczm/pdf/evaluation_iczm_report.pdf

Lesson 20 - Implementing capacity building

The recent report *Increasing Capacity for the Stewardship of Oceans and Coasts (National Research Council, USA, 2008)* found that capacity building to strengthen the effectiveness of ocean and coastal governance has seldom been the primary focus of most of the coastal management initiatives. The report defines capacity building as strengthening the knowledge, the abilities, relationships and values that enable organisations, groups and individuals to reach their goals, addressing the following themes:

1. how ecosystems function and change;
2. how the processes of governance can influence the trajectories of societal and environmental change;
3. how strategies can be tailored to the history and culture of the place;
4. how to assemble and manage interdisciplinary teams.

Referring to the Orders of Outcomes, effective action requires understanding the degree to which the 1st Order preconditions for the practice of the ecosystem approach is present and selecting the issues that can be addressed to begin the process of changing the behaviours associated with the 2nd Order while simultaneously assembling constituencies for such actions and winning commitments for sustained effort.

Practically, capacity must first be instilled within individuals and then expressed through institutions. Learning-by-doing, complemented by education, specialised training and exchanges among practitioners together form effective strategies when they are tailored to the identified needs in the different sectors and specific places. Still, much that is being learned is undocumented and remains within the personal experience of the individuals concerned. Many funding organisations persist in demanding 3rd Order outcomes (e.g. more fish, restored environmental conditions, higher incomes) in the short timeframe of a highly funded project. They most of the time underestimate the challenges of achieving the specific changes in the practices required of specific groups and their institutions within a society.

The seven-year (1996-2003) programme Conserving Critical Coastal Ecosystems in Mexico (C3EM) approach was for a good part about the definition of roles of the project team members asking the different partners to assume the lead role in interactions with local authorities and other groups. However, the tendency in the mid 1990s, was to emphasize scientific and technical expertise over advocacy. Process skills like skills in building constituencies and in negotiating and implementing successful co-management agreements remained poor. Partner organisations recognized then that their staff had little experience collaborating with other NGOs or universities and decided to establish ICZM programmes robust enough to endure a three-year cycle of staff turnover and political change at the local level. The annual workplan requirements and semi-annual reporting became a team-building effort, and a time to periodically assess and adapt the programme.

Lesson 21 - Monitoring and evaluation system

The purpose of monitoring and evaluation is to determine the extent to which and ICZM programme is achieving its objectives. Although it is an integral part of the policy and management processes, it is often ignored because the functions of monitoring and evaluation and their dynamics are usually poorly understood and rarely used for refinement of the programme or the policy.

Generally speaking, far more effort has gone into developing, refining, and monitoring Third Order outcomes than either First or Second Order outcomes. This has contributed to a major problem with the designs of most ICZM initiatives in many nations. Most investments in ICZM set their targets in Third Order terms even when experience should have made it abundantly clear that these lie beyond the time scales of the usual donor or any external donor funded “project.” The more successful ones such as the Chesapeake Bay Program, and the Great Barrier Reef Authority, have taken two or more decades to achieve their Third Order goals. In developing nations in the tropics but, for example, in European countries as well, Third Order outcomes are often limited to small demonstration sites. Even in the most experienced countries like in the U.S., the documentation of Third Order achievements potentially attributable to the coastal zone management programs of coastal states has been frustrated by an absence of baselines and adequate monitoring protocols (Olsen, 2003).

Yet, the stepwise approach through the management cycle, like the one promoted in the Mediterranean CAMP projects, is largely used to track the actions and accomplishments of the programme/project as a whole. *Performance evaluations* look at the quality of project implementation and how well goals are being achieved; its purpose is to seek ways to improve programme or project design and make adjustments to the internal workings of the ICZM programme or project.

Outcome assessments evaluate the impacts of a coastal management initiative on coastal resources and/or the associated human society, mainly focusing on the three Orders of outcomes as mentioned earlier. For example, over the five- to eight-year life of USAID-funded Coastal Resources Management Programmes (1995-2003) in six countries, it was assumed[26] that substantial and important First Order outcomes (Enabling conditions: adopted policies, strategies, order and laws) and Second Order outcomes (changed institutional and individual behaviours) have been achieved at multiple scales. These provided the foundation for larger-scale Second and ultimately Third Order outcomes, namely changes in environmental and/or socio-economic conditions at a number of demonstration sites but at a relatively small scale. The same has been observed with the rate of progress made by ICZM programmes in the US after passage of the Coastal Zone Management Act: once programmes are approved and begin implementation, achieving significant Third Order outcomes has required many years of sustained efforts.

1st Order outcomes

Experience tends to show that an effective programme will be strengthening its 1st Order four categories of preconditions[27] as it generates some 2nd and 3rd Order outcomes by addressing the most tangible issues. The key therefore, is to build many bridges between the 1st and the 2nd Orders and not to structure a programme too rigidly into planning and implementation phases. Nonetheless, a well informed understanding of the existing governance system and careful consideration of the indicators for the 1st Order preconditions will support sound judgments about readiness for implementation[28].

2nd Order outcomes

The selection of *boundary partners* (see Strategy section: Identifying the boundary partners) enables a programme to specify what 2nd Order changes in behaviour is anticipated to generate progress towards the 3rd Order goals. The IDRC methods[29] suggest organising such monitoring by identifying an *outcome challenge* for each category of boundary partners and then selecting graduated variables for assessing the degree to which those changes in behaviour are achieved. In that sense, the 2nd Order outcomes may be looked at as an expression of a *learning by doing* approach.

3rd Order outcomes

What will be monitored and how the monitoring will be done is logically to be determined by the specific 3rd Order targets or objectives supposed to be achieved. It is therefore important to describe and as much as possible quantify the environmental and social respective baseline conditions. From past experiences, it is strongly advisable to avoid getting lost in tracking changes on too many items (abundance of fish, water quality, income of target social groups, etc.) but instead to carefully select a very few indicators that will provide future comparison to the baseline conditions. As mentioned earlier, the relative simplicity of the monitoring system of the Mediterranean Strategy on Sustainable Development should be taken as an example.

[26] CRC/USAID. 2003. Crafting Coastal Governance in a Changing World. CRMP, S.B. Olsen, Ed. 376pp.

[27] (1) Specific goals for target environmental and societal outcomes ; (2) Supportive and informed constituencies ; (3) Required implementation capacity ; (4) Commitments for necessary authorities and resources for implementation.

[28] Olsen, S.B. ; Page, G.G. & Ochoa, E. 2009. *The analysis of governance. Responses to ecosystem change: a Handbook for assembling a baseline.* LOICZ Reports & Studies No.34. GKSS Research Center, Geesthacht, 87pp.

[29] S. Earl, F. Carden, T. Smutylo. 2001. *Outcome mapping – Building learning and reflection into development programs.* International Development Research Center Ed. 139pp.

Baselines

The Orders of outcomes method calls for baselines that provide a reference point for assessing the progress and performance of a programme that has adopted the ecosystem approach. They are at least of two dimensions:

3. a baseline of the characteristics and functioning of the governance system that the programme is attempting to influence through 1st and 2nd Orders achievements, and the project's capacity to do it;
4. a baseline that specifies the desired 3rd Order societal and environmental conditions that constitute the long term target of the programme.

As said in the corresponding handbook (see note 48), this method has been initially applied in Latin America under the support of LOICZ, the Inter-American Institute for Global Change Research, the International Human Dimensions Programme on Global Environmental Change, the AVINA Foundation, the Coastal Resources Center at the University of Rhode Island, SustainaMetrix, and EcoCostas.

Annex 4: Complementary useful bibliographic references in French

- Bresson D. (coord.), 2006. Zones côtières : un bilan de la mise en œuvre de la stratégie française de gestion intégrée. Rapport de la DIACT, 87 p.
- Breton F. (dir.), 2006. Report on the use of the ICZM indicators from the WG-ID. A contribution to the ICZM evaluation. Version 1. Barcelone : ETC-TE/EEA, septembre 2006, 63 p.
- Commission Environnement Littoral (Hénocque Y. rédac.), 2002. Pour une approche intégrée de gestion des zones côtières, initiatives locales, stratégies nationales. Rapport au gouvernement, 82 p.
- Corlay J-P., 2003. Interactions fonctionnelles et spatiales en zone côtière : réflexions pour l'analyse et la gestion. In : Gascuel D., Fontenelle G. (éd. sc.), Activités halieutiques, aménagement et gestion en zone côtière. Plouzané : IFREMER, Actes de colloques n°35, p.69-86
- Deboudt P., Dauvin J-C., Meur-Férec C., Morel V., Desroy N., Dewarumez J-M, Dubaille E., Ghézali M., 2006. Dix ans de démarche GIZC en Côte d'Opale : bilan et enjeux. In : Actes du colloque « Prospective du littoral, Prospective pour le littoral » du ministère de l'Ecologie et du Développement Durable, 1 et 2 mars 2005, Paris.
- Deboudt Philippe, Inégalités écologiques, territoires littoraux et développement durable, Presses universitaires du Septentrion, 2010.
- DEDUCE Consortium, 2007. Guide d'utilisation des indicateurs. Mettre en œuvre une approche basée sur les indicateurs pour évaluer le développement durable sur le littoral. Barcelone : ministère de l'Environnement et du Logement, Gouvernement catalan, 70 p.
- Guineberteau T., Trouillet B., 2006. Quelle politique du littoral en France et en Europe ? In : Guellec J., Lorot P. (dir.), Planète Océane. L'essentiel de la mer. Paris : Choiseul La Documentation Française, p.201-214
- Kiss A., Beurrier J.P., Droit international de l'environnement, Pédone 4ème édition, 2010, p. 368,
- Klinger T., 2004. International ICZM : in search of successful outcomes. Ocean & Coastal Management, 47, p. 195-196.
- Lozachmeur O., 2005. Le concept de gestion intégrée des zones côtières en droit international, communautaire et national. Le droit maritime français, n°657, Paris, p.259-277.
- Meur-Férec C., 2006. De la dynamique naturelle à la gestion intégrée de l'espace littoral : un itinéraire de géographe. Habilitation à Diriger des Recherches, géographie, Université de Nantes, 247 p
- Olsen S.B., 2003. Frameworks and indicators for assessing progress in integrated coastal management initiatives. Ocean & Coastal Management, 46, p. 347-361.
- Prieur M. et Ghézali M .législations nationales relatives à l'aménagement et la gestion des zones côtières en méditerranée, proposition de lignes directrices, PNUE, PAP/ RAC, Split, 2000
- Prieur M. Integrated coastal zone management, in Festchrift, E. Rehbinder, Umwelt recht, Erich Schmidt verlag, Berlin , 2007
- Prieur M. la GIZC, in Environmental law and policy, Vol. 37, march 2007
- Prieur M. la gestion intégrée des zones côtières : le défi méditerranéen, in Mélanges J. Morand-Deviller, Montchrestien , 2008
- Prieur M. le protocole GIZC, in Vertigo.revues.org, mai 2009
- Prieur M. rapport de synthèse sur la GIZC, colloque GIZC de Boulogne sur mer, in Vertigo.revues.org, mai 2009
- Prieur M. et Javier Sanz Larruga, el protocolo sobre la gestion integrada de la zona costera del mediterraneo, in Observatorio del litoral, Universidad de la Coruna, 2009
- Rey-Valette H., Roussel S., 2006. L'évaluation des dimensions territoriale et institutionnelle du développement durable : le cas des politiques de Gestion Intégrée des Zones Côtières. *Développement Durable et Territoires.* Dossier 8 : Méthodologies et pratiques territoriales de l'évaluation en matière de développement durable. [en ligne : http://developpementdurable.revues.org/document.html?id=3311, consulté le 13 décembre 2006]
- Roland G., 2005. Synthèse bibliographique sur la gestion intégrée des zones côtières. État des lieux en France dans son contexte européen et international. Rivages de France, 37 p.
- Rupprecht Consult et International Ocean Institute, 2006.Evaluation of Integrated Coastal Zone Management (ICZM) in Europe. Final Report. Cologne : rapport d'évaluation de la recommandation européenne sur la GIZC, 18 août 2006, 360 p.

- Sorensen J., 2002. Baseline 2000 Background Report: The Status of Integrated Coastal Management as an International Practice. Second Iteration, 26 August 2002. 167 p. [en ligne : http://www.uhi.umb.edu/b2k/baseline2000.pdf, consulté le 15 juin 2007]
- Trouillet B., 1998. Le SIG « suivi des SMVM » des Côtes d'Armor. Des outils au service de la gestion intégrée du littoral. Mémoire de maîtrise, géographie, Université de Rennes 2, 202 p.
- Vertigo.revues.org, La GIZC, risques et responsabilité, colloque Boulogne sur mer, hors série 8, octobre 2010

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- Barde Julien, Mutualisation de données et de connaissances pour la gestion Intégrée des Zones Côtières; sous la direction de Thérèse Libourel, Université des sciences et techniques de Montpellier 2. Université de soutenance, 2005,
- Bawedin Vincent, La gestion intégrée des zones côtières (GIZC) confrontée aux dynamiques territoriales dans le bassin d'Arcachon et sur la côte picarde; sous la direction d'Alain Miossec Université de Nantes, 2009,
- Lozachmeur Olivier, La consécration du concept de "gestion intégrée des zones côtières" en droit international, communautaire et national; sous la dir. de André-Hubert Mesnard, Université de Nantes. Faculté de droit et des sciences politiques. Université de soutenance, 2004,
- Saholy Harinirina Rambinintsaotra épouse Rabelisoa, Vers la gestion intégrée des zones côtières à Madagascar ; sous la direction de Michel Prieur, Université de Limoges. Faculté de droit et des sciences économiques, 2006,
- Salbert Vincent, Tourisme et gestion intégrée des zones côtières : les conditions d'un développement durable : exemple de l'île de Tahiti (Polynésie française) ; sous la direction de Michel Ricard, 2005