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Sub-regional expert group meeting on Coast and Hydrography indicators

6-7 December 2017 Zagreb, Croatia

Report of the meeting

Split, 2017

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Meeting report

Introduction

1. A two-day meeting of the Sub-regional expert group on Coast and Hydrography of the EcAp Med II project was held in Zagreb, Croatia (Grand Hall of Journalists' Association Club) on 6 and 7 December 2017. The meeting was attended by eight national consultants from five EcAp MED II eligible countries (Algeria, Israel, Lebanon, Morocco and Tunisia) together with four representatives from Croatia, representatives from Montenegro and Slovenia (two from each country), one representative from Albania, one from Turkey, and one from Bosnia and Herzegovina. In addition, four representatives of PAP/RAC and three consultants (one for each indicator) have participated at the meeting (*the full list of participants is attached as Annex I to this report*).

2. Following the adoption of the decision IG.22/7 on the "Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria" (IMAP) by the 19th Ordinary meeting of the Contracting Parties to the Barcelona Convention (COP19) in 2016, the Contracting Parties should update their national monitoring programs to incorporate the new elements of IMAP. The EcAp MED II project, financed by the European Commission, supports the preparation of National IMAPs for seven eligible countries (Algeria, Egypt, Israel, Lebanon, Libya, Morocco and Tunisia). Since the development of IMAPs is important for all Contracting Parties (CPs), additional resources were mobilised to allow all of them to participate at the meeting so to exchange experiences and learn from each other. PAP/RAC has the role of assisting these countries in the preparation of these documents for the Coast and Hydrography indicators.

3. This meeting was dedicated to three indicators belonging to IMAP's Coast and Hydrography cluster, namely: Common Indicator 15 "Location and extent of the habitats impacted directly by hydrographic alterations; Common Indicator 16 "Length of coastline subject to physical disturbance due to the influence of manmade structures"; and Candidate Common Indicator 25 "Land-use change".

4. The main objectives of the meeting were to: present the final draft of National IMAPs (by representatives of eligible countries); discuss the state-of-the-art regarding the National IMAPs on Coast and Hydrography in other Mediterranean countries; encourage collaboration and experience-exchange on monitoring Coast and Hydrography between different sub-regional groups of countries; and present and discuss the step-by-step implementation of the guidance fact sheets on the Coast and Hydrography indicators.

Opening of the Meeting

5. The meeting was opened at 9 am on 6 December 2017 by Ms. Željka Škaričić (PAP/RAC Director) and Mr. Marko Prem (PAP/RAC Deputy Director), who welcomed the

participants in the name of PAP/RAC; introduced the background and objectives of the meeting; and presented the meeting agenda (*attached as Annex II to this report*). Mr. Ivan Radić, PAP/RAC National Focal Point, then welcomed the participants on behalf of the Croatian Ministry of Environmental Protection and Energy.

6. Mr. Prem then presented the background of the Ecosystem Approach process, the basics of IMAP, and the EcAp MED II project. At the COP19 in 2016, the IMAP was adopted (Decision IG.22/7), with the aim of establishing monitoring and assessment practice to assess the status of the Mediterranean Sea and coast. The backbone of IMAP are its indicators, three of which belonging to the Coast and Hydrography cluster. During the IMAP initial phase (2016-2019), the focus is on updating/preparing national IMAPs, reporting data, and developing the Quality Status Report (QSR) to assess the state of marine and coastal environment. As for the EcAp MED II project, its aim is to support the implementation of IMAP in eligible Southern Mediterranean Countries (Algeria, Egypt, Israel, Lebanon, Libya, Morocco and Tunisia). The presentation then continued with general contents of national IMAPs: institutional and regulatory aspects; scientific aspects; and implementation/operational plan.

SESSION 1: Presentations of the final draft National Integrated Monitoring and Assessment Programmes (IMAP) - Coast and Hydrography indicators

7. Mr. Prem briefly introduced the contents of the national IMAPs according to which the national experts prepared their reports and presentations for the meeting. National experts presented in more detail the institutional and regulatory aspects, and the implementation/operational plan. Since scientific aspects heavily relate to Indicator Guidance Fact Sheets that is common to all reports. This part was presented in more detail on the following day.

8. The first to present the National IMAP for Coast and Hydrography indicators was Mr. Mokhtar Guerfi, who introduced the draft National IMAP for **Algeria** (*see presentation in Annex III*). Mr. Guerfi presented, as part of institutional and regulatory aspects, the institutions that are responsible for coast and hydrography monitoring in Algeria. He continued with presenting the relevant legal framework in Algeria which can serve as a basis for upgrading the existing monitoring programmes. The presentation concluded with the operative plan, dealing with issues such as capacity building, training, coordination, management and financing of monitoring activities, etc. The draft national IMAP for Algeria is currently under consideration on both sectoral and inter-sectoral levels and can be possibility modified.

9. During the discussion, participants wanted to know about laws and regulations in Algeria, i.e. the institutions in charge (especially regarding the parameters of physical oceanography – waves, currents, etc.) and the major gaps. Mr. Guerfi explained that many

data are available at institutions such as SEISMER (Information system on the sea), hydrographical department, etc. He said that the data collection was going relatively well through the national system of monitoring. The national administration has an institutional framework to ensure the application of regulatory texts, including the prominent role of the *Police de l'Urbanisme et de l'Environnement*.

10. Experts from Algeria then explained that there was a certain political will for improvement in terms of enforcement of the legal framework for mitigation of problems related to coastal construction (e.g. fighting illegal construction). The work is in progress, and it would be improved with better coordination among different institutions.

11. Mr. Fred Arzoine presented the final draft of the National IMAP for Coast and Hydrography indicators for **Israel** (*see presentation in Annex III*). Mr. Arzoine presented, for each indicator, the existing legal framework in Israel (a summary of most relevant laws); production method (data analysis); and the relevant data sources.

12. In the discussion, some additional details were provided such as those related to the Plan for monitoring which is being established. From a governance perspective, there are no major obstacles: the GIS analysis was done for offshore parts, and all data come from official surveys and Universities, he explained. It is possible to integrate all relevant data gathered on one single map; however, some knowledge gaps remain, especially in terms of habitats, and so a work is being done to identify habitat per habitat. Furthermore, there is an official coastline established for Israel which is a crucial element for the EO8 indicator "Length of coastline subject to physical disturbance due to the influence of manmade structures."

13. Mr. Ali Fadel presented the final draft of the National IMAP for Coast and Hydrography indicators for **Lebanon** (*see presentation in Annex III*). Mr. Fadel started the presentation with introducing the relevant laws and institutions in charge for given indicators in Lebanon. He then presented a detailed operational plan for monitoring the parameters of the Coast and Hydrography indicators: data availability (the institution which has the needed data), estimated costs of implementation, as well as the estimated time period needed.

14. The estimation of costs of specifics of monitoring was particularly interesting to the participants. Mr. Fadel explained that the budget presented (e.g. the budget for research assistants, field verification, data sharing, etc.) was indicative. For example, for measuring the coastline change the budget should be reviewed every 5 years, on the basis of a 5-year plan.

15. Mr. Mohamed Menioui presented the final draft of the National IMAP for Coast and Hydrography indicators for **Morocco** (*see presentation in Annex III*). The existing national

legislation regarding the Coast and Hydrography was presented, as well as legislation on data collection and information sharing. Inventory of human resources and the existing expertise in Morocco (e.g. scientific institutions, public departments, NGOs, etc.) was also presented. Mr. Menioui also provided details on coordination, management and funding of monitoring activities (e.g. technical meetings, consultation with relevant stakeholders) in Morocco, and operational arrangements such as logistical resources, human resources, financial resources, etc.

16. After the presentation, Mr. Menioui emphasized the coordination between institutions as a crucial issue for Morocco. As for the accessibility of data, he noted that the constitution from 2011 (Art. 27) specifies that all information available in institutions should be available to general public. However, the access to information still needs to be made operational (a law is in preparation for the access modalities).

17. Mr. Adel Abdouli presented the final draft of the National IMAP for Coast and Hydrography indicators for **Tunisia** (*see presentation in Annex III*), also providing the details on legislative, institutional, and regulatory aspects; and the implementation/operational plan for Tunisia. He stressed out that the process of the ICZM Protocol ratification was well advanced, with possible ratification in early January-February 2018. This process is embedded in a GEF project on vulnerability to climate change in coastal zones, where the process for the definition of an ICZM National Strategy is also planned (partnership between the Agency for coastal protection and management (APAL) and the UNDP Tunisia).

18. There are two major issues for Tunisia: (i) definition and implementation of the ICZM National Strategy and the ICZM Protocol ratification; and (ii) integration of climate change in the monitoring and planning processes.

19. During the discussion, he said that as for the land-use change, APAL and its Coastal Observatory were responsible for data and information on coastal land use; the measure of built-up areas (industrial, infrastructure, residential) are being measured in a similar way to EcAp candidate indicator “Land-use change”. Efforts are being involved for a better management of anthropic pressures regarding built-up areas, to set up a clear limit/buffer zone. Resources are being invested towards a land acquisition process similar to approach of “Conservatoire du littoral” (Coastal conservatory) in France. Still, political will and support are needed.

20. With regard to the data needed to implement the Common indicator 16 (“Length of coastline…”), he said that the orthophoto were available for all Tunisia in 2010 (colours) and 1996. For the series of 1957 and 1962, the South of Tunisia is not well photographed/documented (e.g. Kerkennah, Djerba islands).

SESSION 2: State-of-the-art regarding National IMAPs on Coast and Hydrography in other Mediterranean countries

21. In Session 2, the representatives of non-eligible countries (to the EcAp MED II project) were invited to present the state-of-the-art regarding National IMAPs on Coast & Hydrography in their respective countries.

22. The first to give presentation in Session 2 was Mr. Emrah Soylemez, an expert from **Turkey**, who presented the information on Turkish coastal areas, as well as on how these coastal areas are being managed and monitored (*see presentation in Annex III*). Mr. Soylemez presented the structure of the sustainable coastal planning framework in Turkey: 32 data layers belonging to Land side, Sea side, Environmental Impact Criteria, and Ecological and Biological Diversity Criteria. He also presented the current work being done for inventory of coastal man-made structures (2,454 km) and the current land use (300 m, 1 km, and 10 km belts). He concluded with the upcoming projects in Turkey related to maritime spatial planning; sustainability performance in coastal areas; and methods of territorial impact assessment and spatial quality index in order to ensure urban resilience.

23. Mr. Soylemez mentioned that there were three scales to monitor the land-use change – 300 m, 1 km, and 10 km from the coastline, and a national scale. A yearly monitoring is costly and difficult to implement so far. He also added brief information on upcoming projects, which are planned but not yet accepted, and all are to be financed at the national level.

24. As for the data accessibility, there are Web Map Service (WMS) open-format data and geo-viewer available on www.atlas.gov.tr/

25. Mr. Andrain Vaso presented the situation in **Albania**. In addition to the oral presentation, he provided an overview table presenting the monitoring programme of significant environmental impacts in Albania (*see presentation in Annex III*). For each environmental component, Mr. Vaso presented the environmental indicators, relevant monitoring authorities, environmental parameters measured, and monitoring frequency.

26. Mr. Vaso added that legal aspects and technical parts (e.g. Geographic Information Systems) are generally fine, but the accessibility of data and quality of the data-analysis remain an issue. Due to the coastal dynamics of the Adriatic (related to river mouths), more efforts are needed in the North of the country, than in the South. He explained that Albania approved the National General Plan and Coastal Zone Management Plan (also the General plan at the county level). According to Mr. Vaso, impacts of sea-level rise supported by the development of man-made structures and salt-water intrusion are key issues that require a better planning.

27. Mr. Luka Ćalić informed the participants on the state-of-the-art regarding development of the National IMAP in **Montenegro** (*see presentation in Annex III*). He stressed the importance of regional cooperation which can serve as an information basis that will support the development of such a programme: Programme of monitoring of Montenegrin marine waters supported by MEDPOL; Coastal Area Management Programme (CAMP) Montenegro and the National ICZM Strategy; etc. The two projects (EcAp/MSP Project for the Bay of Kotor and the ongoing GEF Adriatic Project) are of particular relevance since both employ the Coast and Hydrography indicators as in IMAP, in order to derive guidelines for the future marine spatial planning.

28. During the discussion, the participants agreed that there is a recognizable know-how in Montenegro, important for the whole sub-region. Mr. Mitja Bricelj, Ministry of Agriculture and the Environment of Slovenia, invited participants from interested countries to a side event during the COP20 where the sub-regional cooperation activities of EUSAIR of the EU and the Barcelona Convention in the Adriatic-Ionian macro region will be presented, as well as some next steps for joint actions proposed.

29. Ms. Škaričić emphasized the need to make synergies between the Barcelona Convention initiatives and the sub-regional strategies, and how cooperation between the countries can increase the possibilities to access the funds. She invited participants eligible for the GEF funding to propose activities that are priority for respective countries and collaborate with the donors for their implementation. The GEF Adriatic project, for example, will be supporting the ICZM-MSP planning integration, while other EU and GEF projects will support the implementation of MSP, as well. MSP, as she stressed, is an important ICZM tool that takes IMAP indicators fully into account.

SESSION 3: Discussion on collaboration and experience-exchange on monitoring Coast and Hydrography between different sub-regional groups of countries

30. Mr. Prem introduced the main idea of Session 3, and that is to assign participants to two sub-groups in order to discuss collaboration and experience-exchange on monitoring Coast and Hydrography.

The groups established were:

Working Group 1: West Mediterranean and Adriatic Sea (moderated by Mr. Olivier Brivois, PAP/RAC consultant); and

Working Group 2: Ionian-Central Mediterranean and Aegean-Levantine (moderated by Mr. Giordano Giorgi, PAP/RAC consultant).

Mr. Prem introduced some ideas for the discussion, namely:

1. State-of-the-art: Is monitoring of the parameters of Coast and Hydrography indicators in place or not?; experience with these indicators, main difficulties
2. Any specifics related to coastal and hydrography indicators
3. Availability of the basic GIS information layer as: coastal infrastructures (main or minor), reference coastline, land-use maps
4. Availability and possibility to use satellite data sets and/or aerial photographs surveys. Possible linkages with ESA Sentinel or other sources
5. Human, technical, financial capacities regarding implementation of these indicators with special focus on staff technical competence and infrastructure availability
6. Major knowledge gaps
7. What could be collaboration between sub-regional groups based on? Technical issues (such as computer software, interpretation of areal/satellite images, definition of coastline, etc.), building capacities, (e.g. trainings on implementation), sharing of satellite data sets and/or aerial photographs surveys, etc.

After the very lively discussions of the two WGs the rapporteurs presented the brief results and proposals for the possible cooperation at the sub-regional level.

31. **The Working Group 1** "West Mediterranean and Adriatic Sea" proposed the following:

- Cooperation at the regional or sub-regional level is a key issue, but cooperation must also be developed at the national level between identified agencies involved in IMAP.

- There is a need for common norms, standards and protocols (for instance for a specific list of habitat, or the use of CORINE classification).

- There is a strong need for support of technical and scientific aspects:
    - Expertise on existing data (Copernicus, aerial/satellite images, EIA, EU projects, etc.)
    - Training courses on specific software (hydrodynamic models, GIS tools, etc.)
    - Examples of case studies
    - Data acquisition and data base (standards, protocols, exchange formats)
    - Constitution of sub-regional working group

- The links between different regulations and protocols (MSFD, MSP, ICZM) like the Blue economy are important, with explicit consideration of environmental objectives in development projects

32. **The Working Group 2** "Ionian-Central Mediterranean and Aegean-Levantine" proposed the following:

- Knowledge coming from experts that have previous and sound experience on the field should be shared via web forum for each indicator. People involved in the implementation of monitoring fact sheet and data analysis could submit questions on forum and receive quick responses and feedbacks.

- There is a need for general graduate or post-graduate level training courses on specific topics in coastal issues as sediment dynamics, coastal defence structures and impact assessment, coastal ecosystem dynamics, etc. The training should be taken by experts on the e-learning platform with the possible additional on-site special sessions. Such a basic knowledge does not seem to be properly covered by standard university courses, and technical staff from the CPs could apply to enhance their abilities contributing to implement EO7 and EO8 indicators on common grounds

- Survey of available satellite images is needed, with possible exchanges between CPs according to user license agreements and analysis of available free repositories from the European and international institutions (ESA, NOOA, USGS, etc.). The possibility to acquire satellite images with common resources should be considered by a group of CPs

- Photo interpretation automatic software tools should be shared in order to standardize such procedures between CPs and optimize the work flow to update GIS layers more frequently on a bi-annual or annual basis

- Common criteria in terms of spatial and temporal resolutions provided by numerical modelling implementation for indicator EO7 should be established. Such criteria should also cover design and implementation of monitoring programmes necessary to provide data for numerical modelling validation and calibration. A cost-benefit analysis should play an important role to eventually enhance EIA carried out by public or private bodies.

33. In conclusion, Mr. Prem underlined the common issues emphasized by both Working Groups: the need for capacity-building/training possibilities, and the need for exchange of good practices within the countries of the sub-region.

Day 2

Session 4: Step-by-step the guidance fact sheets on the Coast and Hydrography indicators

34. Mr. Prem introduced the main objective of the session 4, which was to provide guidelines on monitoring the Coast and Hydrography indicators. The presentations were based on indicator guidance fact sheets, which are the basis for successful implementation of the indicators. Presentations went step-by-step going through key elements of the factsheets: methodologies for indicator calculation, indicator units, data sources, uncertainties, spatial and temporal scope, statistical analysis, gaps, etc.

35. Mr. Olivier Brivois presented in detail the indicator guidance fact sheet for **EO7 Hydrography Common Indicator 15 "Location and extent of the habitats impacted directly by hydrographic alterations"** (*see presentation in Annex III*). The presentation focused on goals and main principles of monitoring (e.g. How to define baseline conditions? Which new

developments and what kind of hydrographic alterations to consider?, etc.), as well as on difficulties (e.g. insufficient data, choice of appropriate spatial and temporal scale, etc.). Mr. Brivois also presented an imaginary case study of "building a new harbour" to illustrate the implementation of the EO7 Common Indicator 15 Indicator for the new structure.

36. During the discussion, important issues were raised by the participants. There is a difficulty in linking a certain impact (it is possible to measure certain impacts when monitoring after construction) with the cause of that impact. Also, calibrating the data is crucial and quite site-specific. The linkage between the construction and the impacted habitat could be followed with the comparison with another similar area/habitat type. The first step is to identify areas where a risk of impact exists.

37. In addition, the indicator is relatively complex and it could be costly to measure it on the proposed time scale basis. High competencies are needed, and therefore, the training is crucial.

38. As for the insufficiency of data, there is always the need to gather the maximum amount of existing data. On the other hand, limited data do not necessarily mean a no-go for action. Evaluating initial state is crucial, and different hypotheses must be clearly stated to pave the road for future improvements. There is also a question of uncertainties regarding what an "impact" is, and where exactly the limits of impacts are. Knowing that the indicator is adopted by the Contracting Parties, its implementation is needed, with many efforts needed for fine-tune implementation. Also, what is needed to at least implement the indicator? Is all needed? Can it be site-specific, with more flexibility allowed? The message needs to be transmitted to the EcAp process, such as CORMON and Coordination Group, to raise the importance on wide range of realities on the ground. Countries will have to implement this indicator, so pragmatism should lead towards a simplification of the methodology, but without losing scientific relevance.

39. The question of social acceptance of some projects in the EIA was also raised. Some areas are almost pristine, others are very impacted already. Socio-economic evaluation is sometimes done for some infrastructure projects via public consultation, for example.

40. It is therefore important that, in the future, consultants and experts present specific and concrete examples from developed countries, for different types of constructions, to steer know-how exchange and to help avoid repeating the same mistakes (a sort of good and bad examples). It seems that, at the moment, concrete examples where changes, impacts and habitats are interlinked, are quite rare.

41. The coordination between EO7 and EO1 Biodiversity is needed and such links are already established. The participants pointed out that priorities are different in the EO1,

where mapping of habitats focuses more on sensitive, rich and valuable natural areas rather than on areas with major expected impacts. Mr. Giorgi (PAP/RAC consultant) mentioned that this was the case in Italy. Engineering and modelling are being applied for the last 15-20 years, but implementation is focused on building the infrastructure, instead on natural habitats. This needs to be addressed, and relates as well to spatial and temporal scale, which are rather different. A switch towards longer term perspective is needed.

42. The participants proposed to prepare a very simplified and more realistic method to implement this indicator and present it as an option to the CORMON Coast and Hydrography.

43. Mr. Giorgi presented in detail the indicator guidance fact sheet for **EO8 Coast Common Indicator 16 "Length of coastline subject to physical disturbance due to the influence of manmade structures"** (*see presentation in Annex III*). The presentation focused on policy context (the ICZM Protocol and UNEP/MAP related decisions); some conclusions from the last CORMON meeting in Madrid (March 2016); some technical specifications (e.g. reference coastline, imagery resolution, reference year, etc.). A brief summary on the implementation of this indicator in Italy was also presented.

44. During the discussion, it was pointed out that this indicator seems less complex than the Hydrography one, but still crucial to measure. The goal of the indicator is to give a trend on artificialisation of the coast.

45. There are still some further specifications that need to be discussed and later added in the fact sheet. For example, the indicator also entails an inventory of the impervious surface in the coastal fringe (100 m from the coastline). This can have some coincidence between this indicator and the Land-use change indicator, so detailed specifics of what is required for monitoring need to be clarified. In addition, there is a need for addressing the temporal span of measurements between coastlines to be compatible, and hence, comparable between countries.

46. It was highlighted that, when digitalising the man-made structures, it is not mandatory to depict the details of the structures. Most constructions are represented with polylines, however, for the indicator it is the projection of the construction to the coastline that we measure. A common typology for coastal infrastructure has been described in the fact sheet and includes groins, marinas, and ports among others.

47. Mr. Jaume Fons-Esteve, from the University of Barcelona, Spain, presented in detail the indicator guidance fact sheet for **EO8 Coast Candidate Common Indicator 25 "Land use change"** (*see presentation in Annex III*). The presentation started with a brief overview of the indicator, negative and positive aspects of different land-use changes. The question of

determining a Good Environmental Status (GES) for this indicator was then discussed, and it was underlined that the definition of GES, as well as measures to achieve it, should be left to the countries. The reason is in the local knowledge, socio-economic situation, culture, tradition and other elements that guide spatial development. The objective of the indicator is to detect areas with most rapid changes in land use and to ask countries to provide more information of the processes. The presentation concluded with key steps that enable this indicator to be operational in practice: definition of reporting units, data requirements, data sources, data processing, and interpretation of the results.

48. During the discussion, it was pointed out that each country should decide about the acceptability of land-use change trends revealed by the indicator, due to the different social, cultural, geographical dimensions of each country. The indicator responds to the fact that areas beyond the coastline, i.e. the areas in the hinterland, are important for the overall picture of the state of the coastal environment and need to be monitored. The results of this indicator can be "provocative", they can steer the discussion about specific measures. For example, in one pilot area in Spain with the results gave material to municipalities to decide on what kind of development to choose.

49. The implementation of the indicator can also promote the idea of blue and green corridors, natural corridors, for huge possible benefits in terms of security of people and investments, relating also to prevention from climate change impacts, as elaborated by Mr. Bricelj.

50. Some participants argued that it is hard to find the data with the same resolution, if the trends are to be compared. Also, various data do not fit the CORINE classification, i.e. the scales can be different, for example. Mr. Fons-Esteve clarified that five major land cover classification types (artificial surfaces; agricultural; forest and semi-natural; wetlands and water bodies) have been selected to be compatible with most countries' classifications – this classification is more general and flexible. The further in-detail specification is up to the country if needed. Mr. Prem recalled that the analytical units for this indicator are 300 m and 10 km as at the last CORMON meeting the meeting decided to remove 1 km unit from the analysis.

51. Before the closure of the meeting, Ms. Škaričić informed the participants about the GEF MedProgramme Child Project 2.1: Mediterranean coastal zones: climate resilience, water security and habitat protection. She invited the eligible countries: Albania, Bosnia and Herzegovina, Egypt, Lebanon, Libya, Montenegro, Morocco and Tunisia to take into consideration possible on-the-ground activities related to the EcAp methodology, such as testing and fine tuning of the indicators, organizing and implementing trainings, implementing online trainings (such as the MedOpen specific sessions). She said that the following week 2nd consultation meeting for the Child Project 2.1 would take place in Rabat,

Morocco, for the representatives of Egypt, Lebanon, Libya, Morocco and Tunisia. She invited the national teams of these countries to propose the activities for their countries. In addition, she invited the participants to inform the GEF Focal points in the eligible countries about ICZM activities and initiatives, and to get actively involved in the project definition and preparation.

52. M. Prem wrapped-up on the rich exchanges, thanked the participants for their involvement which resulted in great debate and discussions and closed the meeting at 1 pm.

The meeting was organised with the green and sustainable meeting principles. These included the selection of the meeting room with day light, use of no plastic glasses nor plastic bottles, use of local products (lunch), paperless meeting as far as the working documents, and at the end of the meeting the participants returned their badges to organizers (for re-use).

Annex I - List of participants

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Annex II - Agenda of the meeting

EcAp Med II project

Sub-regional expert group meeting on Coast and Hydrography
6-7 December 2017
Venue: Velika dvorana, Klub Novinarskog doma
(Grand Hall, Journalists' Association Club)
Perkovčeva 2, Zagreb, Croatia

08:30 - 09:00	Registration of participants
09:00 – 09:10	Welcome addresses: Ms. Ž. Škaričić, PAP/RAC Director and Mr I. Radić Croatian Ministry of Environment and Energy
09:10 – 09:20	Background and objectives of the meeting (Mr. M. Prem; PAP/RAC)
09:20 – 09:30	Presentation of the EcAp MED II project (Mr. M. Prem, PAP/RAC)
09:30 – 13:00	**Session 1: Presentations of the final draft National Integrated Monitoring and Assessment Programmes (IMAP) - Coast and Hydrography indicators**
09:30 – 09:45	Final draft National IMAP for C&H for Algeria (Mr. M. Guerfi)
09:45 – 10:00	Discussion
10:00 – 10:15	Final draft National IMAP for C&H for Israel (Mr. F. Arzoine)
10:15 – 10:30	Discussion
10:30 – 11:00	*Coffee break*
11:00 – 11:15	Final draft National IMAP for C&H for Lebanon (Mr. A. Fadel)
11:15 – 11:30	Discussion
11:30 – 11:45	Final draft National IMAP for C&H for Morocco (Mr. M. Menioui)
11:45 – 12:00	Discussion
12:00 – 12:15	Final draft National IMAP for C&H for Tunisia (Mr. A. Abdouli)
12:15 – 12:30	Discussion

12:30 – 12:45	Final draft National IMAP for C&H for Libya (Mr. M. Elsmeh)
12:45 – 13:00	Discussion
13:00 – 14:00	*Lunch break*
14:00 – 15:15	**Session 2: State-of-the-art regarding National IMAPs on C&H in other Mediterranean countries**
15:15 – 15:30	*Coffee break*
15:30 – 16:30	**Session 3: Discussion on collaboration and experience-exchange on monitoring Coast and Hydrography between different sub-regional groups of countries** Participants will be divided to two sub-regional groups (Group 1: West Mediterranean and Adriatic Sea, and Group 2: Ionian-Central Mediterranean and Aegean-Levantine)
16:30 – 17:00	Reports of the Working groups
17:00	Closure of the day one

2nd day Thursday 7 December

09:30 – 13:00	**Session 4: Step-by-step the Guidance Fact Sheets on the Coast and Hydrography indicators**
09:30 – 10:00	Step-by-step guidelines for EO7 Common Indicator 15: Location and extent of the habitats impacted directly by hydrographic alterations (Mr. O. Brivois; PAP/RAC expert)
10:00 – 10:30	Discussion
10:30 – 11:00	Step-by-step guidelines for EO8 Common Indicator 16: Length of coastline subject to physical disturbance due to the influence of manmade structures (Mr. G. Giorgi; PAP/RAC expert)
11:00 – 11:30	Discussion
11:30 – 12:00	*Coffee break*
12:00 – 12:30	Step-by-step guidelines for EO8 Candidate Common Indicator 15: Land use change (Mr. J. Fons-Esteve; PAP/RAC expert)

12:30 – 13:00	Discussion
13:00	Closure of the meeting

Annex III – Meeting presentations

Ecosystem Approach in the Mediterranean - EcAp MED II Project

Sub-regional expert group meeting on Coast and Hydrography indicators
Zagreb, Croatia, 6-7 December 2017

Marko Prem, PAP/RAC
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The Ecosystem Approach Process of the Barcelona Convention

Commitments to implement the Ecosystem Approach since 2008 at COP in Almeria

Vision: "A healthy Mediterranean with marine and coastal ecosystems that are productive and biologically diverse for the benefit of present and future generations"

Overall aim: to Achieve GES of the Mediterranean Sea and Coast

Ecosystem Approach Process

- **7** step roadmap on the implementation
- Current step two-fold:
  - (i) preparation of **Integrated Monitoring and Assessment Programme (IMAP)** based on the agreed common indicators and targets
  - (ii) preparation of the **Quality Status Report 2017**: to assess state of marine and coastal environment

Key milestone in EcAp Process: IMAP

- COP19 (Athens 2016) the IMAP was adopted (Decision IG.22/7)
- Aim of IMAP: Establish monitoring and assessment practice in order to assess the status of the Mediterranean sea and coast - GES
- Core of the IMAP are the common indicators (23 common indicators and 4 candidate indicators):
  - Biodiversity, Fisheries and NIS (12 common indicators)
  - Pollution and litter (9 common indicators related to eutrophication, contaminants and litter, 1 candidate indicator in relation to ingested litter); energy including underwater noise (2 candidate indicators)
  - **Coast and Hydrography (2 common indicators, 1 candidate indicator)**
- IMAP Initial Phase: 2016-2019 - to update/prepare national IMAPs, report data, develop the QSR

Coast and Hydrography indicators

EO7 **Alteration of hydrographical conditions**
➢ Common Indicator 15:
Location and extent of the habitats impacted directly by hydrographic alterations

EO8 **Coastal Ecosystems and Landscapes**
➢ Common Indicator 16:
Length of coastline subject to physical disturbance due to the influence of manmade structures

➢ EO8 Candidate Common Indicator 25:
Land use change

EcAp-MED II Project

- Support to IMAP implementation through EcAp-MED I (2012-2015) and **EcAp-MED II** (2015-2018) EU Funded Projects
- Supporting Southern Med Countries (Algeria, Egypt, Israel, Libya, Lebanon, Morocco and Tunisia) in EcAp implementation
- Capacity building/Training on indicators
- Drafting of national IMAPs
- Strengthening science-policy interface
- Addressing sub-regional challenges
- Supporting SEIS (Shared Environmental Information System)
- Contributing to MAP data and information system

Contents of National IMAPs

A. Institutional and regulatory aspects
B. Scientific aspects
C. Implementation/ operational plan

A. Institutional and regulatory aspects

- National legislation related to marine/coastal monitoring
- Rules and regulations related to monitoring marine/coastal data, information sharing
- Existing monitoring programmes and assessment to provide data and information to National IMAPs
- Inventory of human resources and existing expertise
- Coordination, management and financing of monitoring activities

B. Scientific aspects

For each Indicator:
i. Parameters or elements to monitor
ii. Methods and protocols including quality assurance/ quality control
iii. Spatial and temporal scale
iv. Monitoring sites & use of a risk-based approach to select these

→ **Indicator Fact Sheets**

C. Implementation/ operational plan

Implementation aspects:

- Operational arrangements (logistics, human resources, financial resources)
- Responsibility for implementation
- Data sharing and access principles, including reporting formats

Thank you!

Marko Prem
PAP/RAC Deputy Director
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Mediterranean Action Plan
Barcelona Convention

PAP/RAC

UN environment

ALGERIE – IMAP national pour les indicateurs relatifs à la côte et à l'hydrographie

Réunion du groupe d'expert subrégional sur les indicateurs relatifs à la côte et à l'hydrographie (EcAp MED II)
Zagreb, Croatie, 6-7 décembre 2017

GUERFI Mokhtar
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Emplacement et étendue des habitats impactés directement par les altérations hydrographiques

Aspects institutionnels et réglementaires

- Le cadre juridique pertinent pour la prise en charge de l'EO7:
  - La loi n° 03-10 du 17/09/2003 relative à la protection de l'environnement dans le cadre du développement durable, Article 1 de la loi stipule que "*toute action sur le littoral ou sur les zones côtières doit respecter les prescriptions sur l'étude d'impact*", la loi prévoit dans article 05 un certains nombre d'instruments de gestion parmi lesquels **«** *le système d'évaluation des incidences environnementales des projets de développement* **»** concrétisé dans l'étude d'impact.
  - Les décrets n°06-198, 2006 et n°07-145, 2007 déterminent le champ d'application, le contenu et les modalités d'approbation des études et des notices d'impact sur l'environnement et les études de dangers.
- L'institution responsables de la surveillance:
  - **Le service hydrographique des forces navales** –SHFN- est le principal acteur national dans le domaine de l'hydrographie. C'est un établissement sous tutelle du ministère de la défense. 'Le SHFN assure des services dans les domaines suivants : levés hydrographiques; cartographie; instructions nautiques, livre des feux, etc.
  - Autres intervenants: ONSM, LEM et l'ONEDD

- Loi 03-10 du 17/09/2003 ,Chapitre 1, article 6: de l'information environnementale : Il est institué un système global d'information environnementale qui comporte les réseaux de collecte, **AUCUNE INDICATION SUR LE PARTAGE DES DONNEES.**
- Inventaire des ressources humaines et de l'expertise existante:
  - L'Observatoire national de l'environnement et du développement durable (**ONEDD**) : Le rôle de l'ONEDD est de collecter, traiter, produire et diffuser l'information environnementale sur les plans scientifique, technique et statistique. L'ONEDD dispose de stations et de réseaux de surveillance, de laboratoires régionaux.
  - Le Centre National de Recherche et Développement de la Pêche et de l'Aquaculture (**CNRDPA**), établissement public à caractère scientifique et technologique (EPST), chargé de contribuer à l'élaboration et la réalisation des programmes nationaux de recherche scientifique dans le domaine de la pêche et de l'aquaculture. En matière de surveillance du milieu marin, le CNRDPA dispose de nombreuses stations, d'un navire de recherche doté d'équipement de prospection pour l'évaluation de stocks pélagiques et benthiques, d'un sonar multifaisceaux pour la cartographie des fonds marins et des habitats.
  - École Nationale Supérieure des Sciences de la Mer et de l'Aménagement du Littoral (**ENSSMAL**) est une école de formation et de recherche dans les domaines de l'océanographie, de l'aménagement et de la gestion du littoral. Ses principales missions sont la formation académique et la recherche scientifique et technique. Elle assure des parcours de formations pluridisciplinaires de graduation (Ingéniorat) et de post-graduation (Magistère et Doctorat).

- Centre National de développement des ressources biologiques (**CNDRB)** : Il est chargé des activités liées à la connaissance, à la conservation et à la valorisation de la diversité biologique. Il a pour mission entre autres, de : (i) centraliser l'ensemble des inventaires de la faune, de la flore, des habitats et des écosystèmes, (ii) proposer, en concertation avec les secteurs concernés, la conservation des ressources biologiques nationales selon les modalités fixées par la réglementation en vigueur ; etc.
- Le Commissariat National du Littoral (**CNL**): il a pour mission de : (i) préserver et valoriser le littoral, les zones côtières et leurs écosystèmes, (ii) mettre en œuvre des mesures de protection du littoral et des zones côtières, (iii) fournir aux collectivités locales toute assistance se rapportant à ses domaines d'intervention, (iv) maintenir, restaurer et réhabiliter les espaces terrestres et marins remarquables ou nécessaires au maintien des équilibres naturels en vue de leur conservation, (v) promouvoir des programmes de sensibilisation et d'information du public sur la conservation et l'utilisation durable des espaces littoraux ainsi que de leur diversité biologique.

Potentiel des programmes de surveillance et d'évaluation pertinents existants à fournir des données et des informations pour les IMAP nationaux

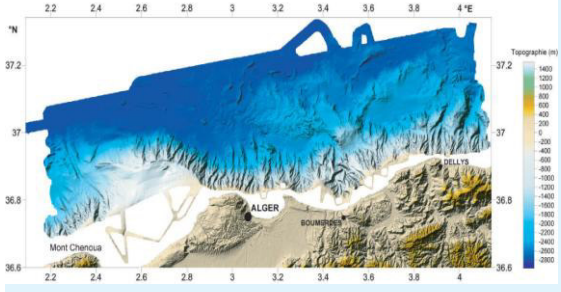
- Le réseau Algérien de surveillance et d'alerte sismique : qui fournit entre autres des données bathymétriques;
- Le projet **REGAT** (REseau Gps de l'ATlas) consiste à installer un réseau de près de soixante-dix (70) stations géodésiques permanentes GNSS afin de quantifier la déformation des régions nord algériennes.

Les données acquises dans le cadre des activités de recherche :

- Une couverture bathymétrique multifaisceaux en continu a été acquise dans le cadre de projets de recherche menés conjointement par l'IFREMER (France) et le CRAAG(Algérie). Ces données sont archivées dans la base de données SISMER (Système d'information sur la mer) de l'IFREMER. Quelques unes de ces campagnes :
  - **MARADJA1 et 2 (MARge Active DJAzaïr) 2003-2005 :** 10 000 km de profils, sondeur de sédiments, sismique réflexion, bathymétrie multifaisceaux, sonar Acoustique remorqué SAR, etc.
  - **PRISMA 2004** ((PENFELD pour l'évaluation des Risques d'Instabilité Sédimentaire sur la Marge Algérienne): 4 carottages longs
  - **SAMRA 2005** : (SAr de la Marge dans la Région d'Alger) : SAR et carottages régions de Boumerdès, Alger, El Marsa, bathymétrie multifaisceaux moyens fonds, sismique rapide, sondeur de sédiments, carottages, magnétisme
  - **SPIRAL 2009:** (**S**ismique **P**rofonde et **I**nvestigation du **N**ord de l'**AL**gérie) 5 transects sismique grand angle.

Bathymétrie et topographie de la zone littorale centre du pays

(Source : MARADJA, 2003)



Emplacement et étendue des habitats impactés directement par les altérations hydrographiques

Mise en œuvre/plan opérationnel

L'ONEDD est l'organe national en charge de la mise en place et de la gestion des réseaux d'observation et de mesure de la pollution et de surveillance des milieux ; il est l'organe indiqué pour l'implémentation de ces deux indicateurs (Guichet unique).

La cohérence des informations sur la zone côtières, où interviennent de nombreux acteurs est une nécessité pour assurer la gestion de cet espace.

Mettre en place une commission nationale littorale au sein du CNIG: avec pour mission:

Structurer la communauté littoral en réseau de partenaires, mettre en place des mécanismes pour l'interaction et la communication entre les Acteurs du littoral, adopter une cartographie de base par tous les utilisateurs, s'assurer que les données et informations sont partagées et minimiser la duplication, identifier les applications qui facilitent et encouragent la coopération entre les différents organismes, mettre en place les équipements et outils de formation qui soutiennent toutes les agences dans leur démarche.

- **Formation, transfert de technologie et renforcement des capacités:**
  - l'amélioration de l'infrastructure, grâce à de nouveaux équipements de surveillance et de laboratoire et des installations de communication et de transfert de données,
  - Formations : dans le domaine des technologies spatiales (télédétection) et leur apport à l'IMAP, Modélisation, traitement des données, SIG.
- **Coordination, gestion et financement des activités de surveillance (par ex. réunions techniques, consultation avec les parties prenantes pertinentes).**
  - **Fond national pour la protection du littoral et des zones côtières.**

Longueur de côte soumise à des perturbations dues à l'influence des structures artificielles

Aspects institutionnels et réglementaires

La loi n° 01-20 du 12/12/2001 relative à l'aménagement et au développement durable du territoire, a consacré quatre articles à la question du littoral : (i) l'article 4 mentionne que la politique nationale d'aménagement et du développement durable du territoire a pour finalité l'allègement des pressions sur le littoral ; l'article 7 prévoit le SDAL comme instrument du SNAT ; l'article 44 dispose que les espaces littoraux font l'objet d'un schéma directeur sur la base des orientations fixées par le SNAT.

La loi n° 90-29 du 01/12/1990 relative à l'aménagement et l'urbanisme a consacré deux articles à la question du littoral dans le chapitre IV intitulé dispositions particulières à certaines parties du territoire et plus particulièrement dans la section intitulée « le littoral » (i) l'article 44 détermine le littoral sur la base de critères géographique et naturel, l'article 45 mentionne d'une manière générale que l'extension de l'urbanisation doit préserver le littoral

Les instruments d'urbanisme : Le plan Directeur d'Aménagement et d'Urbanisme (PDAU) et le plan d'occupation des sols (POS)

« Veiller à orienter l'extension des centres urbains existants vers les zones éloignées du littoral et de la côte maritime »;

Longueur de côte soumise à des perturbations dues à l'influence des structures artificielles

Mise en œuvre/plan opérationnel

- Coopération entre l'ONEDD (guichet unique) et les services en charge de l'urbanisme;
- Institutions en charge: Les services déconcentrés de l'état
  - DUCH: Direction de l'Urbanisme de la Construction et de l'Habitat (Wilaya)
  - SUCH: Sous Direction de l'Urbanisme de la Construction et de l'Habitat (Daïra)
  - SUCH: Service de l'Urbanisme de la Construction et de l'Habitat (local, communal)
- Agences de l'urbanisme
  - URBANIS: Alger et sa région

Changement de l'utilisation des sols

Aspects institutionnels et réglementaires

La loi n° 01-20 du 12/12/2001 relative à l'aménagement et au développement durable du territoire,
La loi n° 90-29 du 01/12/1990 relative à l'aménagement et l'urbanisme,

« Veiller à orienter l'extension des centres urbains existants vers les zones éloignées du littoral et de la côte maritime »;

Changement de l'utilisation des sols

Mise en œuvre/plan opérationnel

Coopération entre l'ONEDD (guichet unique) et les services en charge de l'urbanisme;

Institutions en charge: Les services déconcentrés de l'état

DUCH: Direction de l'Urbanisme de la Construction et de l'Habitat (Wilaya)
SUCH: Sous Direction de l'Urbanisme de la Construction et de l'Habitat (Daïra)
SUCH: Service de l'Urbanisme de la Construction et de l'Habitat (local, communal)

Agences de l'urbanisme

URBANIS: Alger et sa région

- **Formation, transfert de technologie et renforcement des capacités:**
  - l'amélioration de l'infrastructure, notamment informatique,
  - Formations : dans le domaine des technologies spatiales (télédétection) et leur apport à l'IMAP, Modélisation, traitement des données, SIG.
- **Coordination, gestion et financement des activités de surveillance (par ex. réunions techniques, consultation avec les parties prenantes pertinentes).**
  - **Fond national pour la protection du littoral et des zones côtières.**

Merci!

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ISRAEL
MARINE ENVIRONMENT PROTECTION DIVISION

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ISRAEL - National IMAP for Coast and Hydrography Indicators

Sub-regional expert group meeting on Coast and Hydrography indicators
(EcAp MED II)
Zagreb, Croatia, 6-7 December 2017

Fred Arzoine, Deputy director
MARINE ENVIRONMET PROTECTION DIVISION
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Location and extent of the habitats impacted directly by hydrographical alterations

Institutional and regulatory aspects

- Planning and Building Law (1965):
  - A detailed monitoring program is a prerequisite for issuing a permit for many requested activities in the coastal environment. The content of each program is determined case by case.
  - Most marine infrastructure (currently - all new ones), are subject to Environmental Impact Assessment (EIA). The requirements of each EIA are determined case by case.
- Regulations related to the Prevention of Sea Pollution law (1988): a permit is required for brine disposal from desalination plants.
- Environmental quality standards for the Mediterranean Sea in Israel (2002): provides an official benchmarks for monitoring the coastal waters.
- Law for National Parks, Nature Reserves, National Sites and Memorial Sites (1998): monitoring of species and habitats in marine nature reserves.
- Protection of the Coastal Environment Law (2004): protects the coastal environment that extends from two miles inside Israel's territorial waters to 300 meters inland.

Location and extent of the habitats impacted directly by hydrographical alterations

Institutional and regulatory aspects

- The Committee for the Protection of the Coastal Environment (established under the Protection of the Coastal Environment Law) – reviews plans concerning marine and coastal infrastructure.
- The monitoring of the Mediterranean marine environment is carried out within the framework of a **National Monitoring Programme:**
  - coordinated by the **Ministry of Environmental Protection** (IMEP) - **Marine Environment Protection division**;
  - conducted mainly by the **National Institute of Oceanography** (NIO) that performs a multi-faceted research program in oceanography and marine biotechnology;
  - NIO is part of the **Israel Oceanographic and Limnological Research** (IOLR);
  - IOLR is the main actor regarding monitoring of the marine environment and has an official approval from the IMEP for performing compliance marine monitoring programs.

Location and extent of the habitats impacted directly by hydrographical alterations

Implementation/operational plan

The accessibility and availability of the multiple hydrographic data bases varies. Some are open-access, some are available only to researchers and decision makers, and some have to be purchased. *Authorization for publicly distributing data that is not open access will have to be obtained case by case.*

Data sources:

- Recent EIAs for manmade structures (baseline and prediction) (available, but financial resources are needed for data integration)
- IOLR surveys (has to be acquired)
- Geological Survey of Israel (GSI) - (available)
- CAMERI-Coastal and Marine Engineering Research Institute (has to be acquired)
- Israel Meteorological Service (IMS) – general data (available)
- Habitat maps from Israeli Maritime Strategic Assessment – has knowledge gaps (available)
- Monitoring plans for new ports, marinas, breakwaters, desalination and power plants (financial resources are needed for data integration)

Frequency of monitoring data:

Defined case by case

Length of coastline subject to physical disturbance due to the influence of manmade structures

Institutional and regulatory aspects

- Planning and Building Law (1965):
  - Most marine infrastructure (currently - all new ones), are subject to Environmental Impact Assessment (EIA) requirements. The requirements of each EIA are determined case by case.
- Protection of the Coastal Environment Law (2004): protects the coastal environment that extends from two miles inside Israel's territorial waters to 300 meters inland.
- The Committee for the Protection of the Coastal Environment (established under the Protection of the Coastal Environment Law) – reviews plans concerning marine and coastal infrastructure.

Length of coastline subject to physical disturbance due to the influence of manmade structures

Implementation/operational plan

Production method:

Analysis of very high-resolution satellite imagery or orthorectified aerial photographs

Data sources:

- Survey of Israel (SOI)* - (available, but financial resources are needed for data analysis)
- Ministry of Environmental Protection (IMEP)

* *Analyzed data could be distributed with authorization from SOI*

Land-use change

Institutional and regulatory aspects

- Planning and Building Law (1965):
  - Most marine infrastructure (currently - all new ones), are subject to Environmental Impact Assessment (EIA) requirements. The requirements of each EIA are determined case by case.
  - Local and national outline plans for the coastal environment contain principles of ICZM.
- Protection of the Coastal Environment Law (2004): protects the coastal environment that extends from two miles inside Israel's territorial waters to 300 meters inland.
- The Committee for the Protection of the Coastal Environment (established under the Protection of the Coastal Environment Law) – reviews plans concerning the coastal environment.
- The Israel Marine Plan (2016) (non-statutory):
  - provides guidelines for maritime spatial planning;
  - emphasizes monitoring of the marine environment.

Land-use change

Implementation/operational plan

Production method:

Analysis of very high-resolution satellite imagery or orthorectified aerial photographs

Data sources:

- Survey of Israel (SOI) - *The ITSI Structure - Israeli Topographic Spatial Infrastructure**(available, but financial resources are needed for data analysis – mainly transformation of land-use classes)
- Ministry of Finance (Planning Authority) – for recently approved detailed planning schemes

* *Analyzed data could be distributed with authorization from SOI*

Thank you!

Mediterranean Action Plan
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Mediterranean Action Plan
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REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

National Council for Scientific Research

UN environment

LEBANON - National IMAP for Coast and Hydrography Indicators

Sub-regional expert group meeting on Coast and Hydrography indicators
(EcAp MED II)
Zagreb, Croatia, 6-7 December 2017

Ali FADEL
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Location and extent of the habitats impacted directly by hydrographical alterations

Institutional and regulatory aspects

- The Environment Act (no. 444/2002 specifies the principles for environmental action and outlines provisions regarding the conservation of various environments.
- The Directorate General of Land and Maritime Transport has been involved in the enforcement of laws and regulations relating to coastal control including navigation and ports, and controlling their violations.
- No clear provisions are available on coastal defence infrastructures.
- Legal documentation related to ports lack proper environmental conditions especially regarding the construction and the exploitation of maritime transportation vehicles and facilities.
- EIA studies were only implemented on a small number of harbours.

Location and extent of the habitats impacted directly by hydrographical alterations

Institutional and regulatory aspects

- Few indirect studies have been made on the modelling of Lebanese coast (surface velocity, waves, Mediterranean Forecasting System (MFS) model downscaling)
- Several separate studies on the biodiversity (Bitar et al., 2007; El Shaer et al., 2012; Kapiris and Al., 2014; Ministry of Environment, 2004; Zenetos and et al., 2015), fisheries (Lteif, 2015), turtles (Newbury et al., 2002; St. John et al., 2003), sea birds and phytoplankton community (El Hourany et al., 2017), that were never modelled or linked to hydrographic models.
- Inventories of habitats and species are available thanks to a series of exploration campaigns performed in Lebanon in June 2012 and August-September 2013, covering the littoral and sublittoral surveys (0-47 m depth), on 6 sites of interest along the Lebanese coast

Location and extent of the habitats impacted directly by hydrographical alterations

Implementation/operational plan

- Remote Sensing Centre (RSC) can handle this indicator due to its expertise in mapping and integrated coastal zone management but only after collaborating with:
- NCMS that has data about water quality, biodiversity and habitats
- National Center for Geophysics is updating the bathymetric map of the Lebanese coast that can be also found with lower precision at EMODNET (http://portal.emodnet-bathymetry.eu/#)
- National or International habitats and modelling experts.

Location and extent of the habitats impacted directly by hydrographical alterations

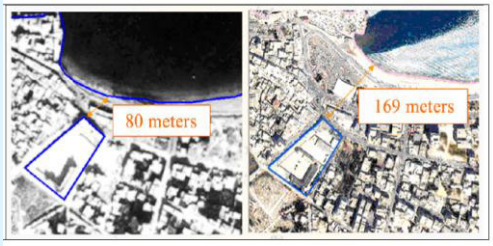
Implementation/operational plan

- Final objective of minimizing the impact on coastal and marine ecosystem and promoting ecosystem health can be more effective after discussion with the different experts of biodiversity that would or have been active in this project, under the umbrella of the Ministry of Environment.
- Sharing can be performed using the geoportal of the RSC

Institute	Financial needs	Costs in USD
NCMS	Field campaigns funding	30,000
	Training on hydrography modelling or expert salary	10,000
NCRS	Mapping expert salary	5,000
	GPS trackers/ surveying cameras	10,000
Total		55,000

Length of coastline subject to physical disturbance due to the influence of manmade structures

Institutional and regulatory aspects



Length of coastline subject to physical disturbance due to the influence of manmade structures

Implementation/operational plan

- RSC will handle this indicator using ArcGIS interface each 5 to 6 years with no major gaps.
- The Centre can make a researcher available together with partial time GIS analyst to handle the task of monitoring of EO8 indicator on length of coastline.
- Meanwhile, a reference coastline was produced by the RSC in 2008 from previous satellite images, this coastline is not agreed on as an official one. A new reference coastline with higher resolution can be produced if requested

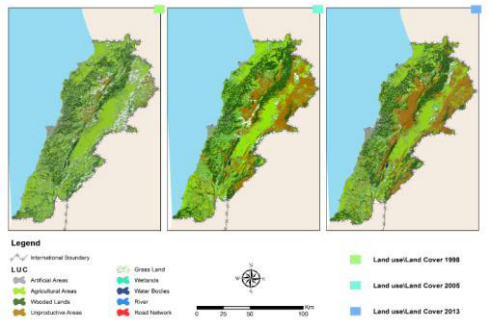
Financial resources	~ Cost in USD
Research assistants	4,000
Field verification	1,000
Data sharing, management and coordination	5,000
Total	10,000

Length of coastline subject to physical disturbance due to the influence of manmade structures

Implementation/operational plan

- RSC shares and provides researchers from universities and stakeholders with several types of shapefiles and maps for free.
- The center has also implemented an open-access geoportal system to share data online. It consists of Map Viewer system for viewing and downloading geographical data and maps of wildfires, flood hazards, erosion, landcover, solar map, snow cover, etc. These maps can be found on: http://rsensing.cnrs.edu.lb.
- The center is willing to improve and enhance this geoportal by adding additional tools that can be of use for different stakeholders and the public community. RSC already shares some land cover data. When done, RSC can share the reference and updated national coastline that has been performed each 5 to 6 years.

Land-use change



Land-use change

Implementation/operational plan

- RSC will handle this EO8 indicators using very high resolution images like what was done using 40 cm GeoEye 2013 Satellite imageries to monitor the Land use change using ArcGIS interface each 5 to 6 years with no major gaps.
- A researcher can be made available together partial time GIS analyst to handle the task of monitoring of this indicator on length of coastline.

Financial resources	~ Cost in USD
VHR images (about 15 USD per 1 km^2)	30,000
Research assistants (Digitizing)	30,000
Field verification	1,000
Management and coordination	5,000
Sharing, Softwares and hardwares	10,000
Total	76,000

- RSC can share changes in Landuse/Landcover that has been involved on it each 5 to 6 years, through their geoportal

Thank you!

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Maroc – IMAP national pour les indicateurs relatifs à la côte et à l'hydrographie

Réunion du groupe d'experts subrégional sur les indicateurs relatifs à la côte et à l'hydrographie (EcAp MED II)
Zagreb, Croatie, 6-7 décembre 2017

Menioui Mohamed
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EMPLACEMENT ET ÉTENDUE DES HABITATS IMPACTÉS DIRECTEMENT PAR LES ALTÉRATIONS HYDROGRAPHIQUES

Aspects institutionnels et réglementaires

- Législation nationale existante en rapport avec les indicateurs relatifs à la côte et à l'hydrographie

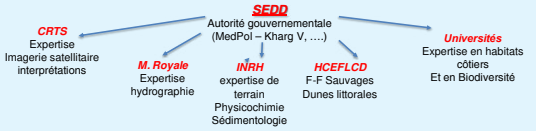
- Loi 81-12 - Littoral : **protéger les milieux naturels / la flore et de la faune sauvages y compris leur habitat naturel ;**
- Loi 11.3 - "Protection et la mise en valeur de l'environnement": **1.1. protéger l'environnement contre toutes formes de pollution et de dégradation quelle qu'en soit l'origine**;
- 12-3 – Etudes d'impact:

- Lois et règlementations actuelles en matière de recueil des données et de partage d'information

Dahir 1958	*Art. 27 de la Constitution*	*loi 31-13*
Interdiction de divulguer l'information (secret / discrétion professionnelles)	Accéder à l'information détenue par les Ad Pub, les Institutions élues et les organismes investis d'1 mission de service publique	projet de loi n° 31.13 relatif au Droit à l'Accès à l'Information

- ***Institutions responsables de la surveillance:*** ***Pas de programme National surveillance***
  - ***SEDD*** **(Laboratoire National des Etudes et de Surveillance de la Pollution) MedPol / Eaux d baignade**
  - ***INRH*** Réseau de **Surveillance** de la Salubrité du Littoral de l'**INRH** (RSSL)

- Inventaire des ressources humaines et de l'expertise existante (par ex. institutions scientifiques, départements publics, ONGs, etc.)



- Potentiel des programmes de surveillance et d'évaluation pertinents existants à fournir des données et des informations pour les IMAP nationaux ***(Activités)***

- Nature des altérations hydrographiques
- Peuplements dunaires;
- Peuplements littoraux et côtiers
- Impacts des altérations hydrographiques sur les habitats
- Altérations géomorphologiques
- Cartographie de l'évolution de ces impacts

- Coordination (PF), gestion et financement (GF) des activités de surveillance (par ex. réunions techniques, consultation avec les parties prenantes pertinentes).

Mise en œuvre / Plan opérationnel

- ***Responsabilité*** (partagée) ***dans la mise en œuvre de l'IMAP pour les indicateurs*** relatifs ***à la côte et à l'hydrographie*** (comité de pilotage)
  - ***SEDD*** **(en tant que PF et autorité gouvernementale QG)**
  - ***INRH*** **(en tant que coordinateur d'exécution) sur le terrain**
  - ***Universités / CRTS*** **(en tant que collaborateurs) interprétations**

- ***Dispositions opérationnelles telles que ressources logistiques, humaines, financières***
  - ***Ressources logistiques:*** *- mutualisation des moyens (surtout INRH)*
  - ***Ressources humaines :*** *- mutualisation des moyens (INRH-CRTS-Universités)*
  - ***Ressources financières:*** *- mutualisation des moyens (SEDD - Régions R.av – INRH, CRTS, MESRS,*

Moyens demeurent insuffisants:

- *Moyens matériels*
- *Formations*
- *Moyens financiers additionnels (Cadres de coopération)*

Mise en œuvre / Plan opérationnel (suite)

- ***Partage des données et principes d'accès: principalement l'ONEM et les OREDDs*** */ configuration unique, pas dans l'IMIST et l'INRH – Régionalisation avancée*

Objectif / rôle: mettre à disposition les informations sur l'environnement et le développent durable. Trois principes fondamentaux :

- Le souci de développer une Base Informationnelle pluridisciplinaire fiable, facilement accessible et régulièrement mise à jour ;

- La volonté de créer un contexte d'échange d'informations et d'expériences au service d'objectifs convergents ;

- L'intérêt de promouvoir une participation active des différents partenaires à travers la réalisation de projets communs et répondant à des objectifs partagés.

Accès à l'information conforme à la constitution et la loi 31-13

LONGUEUR DE CÔTE SOUMISE À DES PERTURBATIONS DUES À L'INFLUENCE DES STRUCTURES ARTIFICIELLES

Aspects institutionnels et réglementaires

- Législation nationale existante en rapport avec les indicateurs relatifs à la longueur de côte soumise à des perturbations dues à l'influence des structures artificielles

- 1-12 - Loi-Littoral
- 12-3 – Etudes d'impact:
- Dahir de 1914 relatif au domaine public;
- Dahir du 30-11-1918 relatif aux occupations temporaires du domaine public dont le domaine public maritime
- Dahir 1934 relatif la création des parcs nationaux ;
- Loi 61-00 sur les activités touristiques ;
- Loi 34-95 sur l'investissement agricole (CIA) ;
- Loi 12-90 de l'urbanisme ;

- Lois et règlementations actuelles en matière de recueil des données et de partage d'informations

Art. 27 de la Constitution

Accéder à l'information détenue par les Ad Pub, les Institutions élues et les organismes investis d'1 mission de service publique

loi 31-13

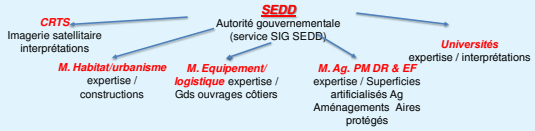
projet de loi n° 31.13 relatif au Droit à l'Accès à l'Information · Projet de loi relatif au droit d'accès à l'information

Aspects institutionnels et réglementaires (suite)

- ***Institutions responsables de la surveillance:*** ***Pas de programme National surveillance***

  - ***SEDD*** **(ONEM, OREEDs) - Coordination**
  - ***M. Equipement et logistique*** statistiques ***numérisées*** espaces consommés par les grands ouvrages / A. portuaires / Rocades côtières…
  - ***M. urbanisme*** statistiques ***numérisées*** espaces consommés par les constructions
  - ***M. A PM DR EF*** statistiques ***numérisées*** espaces consommés par l'agriculture / aquaculture /

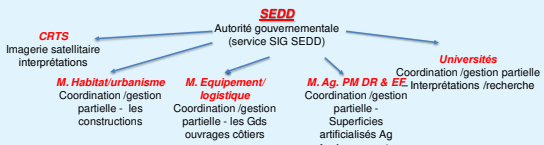
- Inventaire des ressources humaines et de l'expertise existante (par ex. institutions scientifiques, départements publics, ONGs, etc.)



- Potentiel des programmes de surveillance et d'évaluation pertinents existants à fournir des données et des informations pour les IMAP nationaux (Activités)

- ***Base de donnée nationale et des BD régionales dans les 12 régions*** **(ONEM, OREEDs)**
- **Statistiques espaces consommés par les grands ouvrages**
- **Statistiques espaces consommés par l'urbanisation**
- **Statistiques espaces consommés par l'agriculture / aquaculture /**

- Coordination (PF), gestion et financement (GF) des activités de surveillance (par ex. réunions techniques, consultation avec les parties prenantes pertinentes).



CHANGEMENT DE L'UTILISATION DU SOL

Aspects institutionnels et réglementaires

- Législation nationale existante en rapport avec les indicateurs relatifs au changement de l'utilisation des sols

- 81-12 - Loi-Littoral
- Circulaire n°2007 du 19 Juin 1964 relative au développement touristique du littoral;
- Dahir du 30-11-1918 relatif aux occupations temporaires du domaine public dont le domaine public maritime
- Loi 34-95 sur l'investissement agricole (CIA) ;
- Loi 12-90 de l'urbanisme ;
- Loi 27-03 sur les carrières

- Lois et règlementations actuelles en matière de recueil des données et de partage d'information

Art. 27 de la Constitution

Accéder à l'information détenue par les Ad Pub, les Institutions élues et les organismes investis d'1 mission de service publique

loi 31-13

projet de loi n° 31.13 relatif au Droit à l'Accès à l'Information · Projet de loi relatif au droit d'accès à l'information

- ***Institutions responsables de la surveillance:***
  - ***SEDD (Laboratoire National des Etudes et de Surveillance de la Pollution – Cellule SIG)***
  - ***M. Equipement et Logistique (ports, carrières et grands ouvrages)***
  - ***M. Agriculture, pêches DR / EF*** *(agriculture, Aquaculture, Aires protégées…)*
  - ***M. Aménagement du territoire national, de l'urbanisme, de l'habitat et de la politique de la ville*** *(constructions)*

- ***Inventaire des ressources humaines et de l'expertise existante (par ex. institutions scientifiques, départements publics, ONGs, etc.)***

- ***Potentiel des programmes de surveillance et d'évaluation pertinents existants à fournir des données et des informations pour les IMAP nationaux:*** *Pas de programmes de surveillance (aquaculture, demande, cahier de charge, plans de masse…)*
  - *Informations sur la nature du changement d'occupation (spécifique selon l'acteur);*
  - *les statistiques et l'ampleur de ce changement;*
  - *des compétences pour les interprétations et les prises de décisions;*
  - *des expertises et des idées pour trouver des solutions*

Coordination (PF), gestion et financement (GF) des activités de surveillance (par ex. réunions techniques, consultation avec les parties prenantes pertinentes).

(Idem que les ressources humaines et expertise)

Mise en œuvre / Plan opérationnel

- ***Responsabilité*** (portagle) ***dans la mise en œuvre*** (participative) ***de l'IMAP pour les indicateurs*** relatifs ***changement de l'occupation des sols*** (comité de pilotage)
  - ***SEDD*** **(en tant que PF et autorité gouvernementale QG) - Coordinateur**
  - ***M. Equipement logistique*** **(carrières, grands ouvrages , routiers, portuaires, …)**
  - ***M. A.PM.DR et E&F*** **(activités agricoles, aquacoles, espaces protégés, …)**
  - ***M. "Urbanisme"*** **(constructions)**
  - ***CRTS et Universités*** **(interprétations des images satellitaires et des données , …)**
  - ***Urbanisme*** **(informations sur les constructions)**

- ***Dispositions opérationnelles telles que ressources logistiques, humaines, financières*** *(aucune administration ne peut assumer seule)*

- Ressources logistiques: *- mutualisation des moyens (surtout SNDD & CRTS)*

- Ressources humaines : *- mutualisation des moyens (Tous les concernés surtout CRTS et Universités)*

- Ressources financières: *- mutualisation des moyens (SEDD – Régions, tous les acteurs concernés) Budget de l'état FE, Budgets des acteurs, budget de la coopération*

Mise en œuvre / Plan opérationnel (suite)

- ***Partage des données et principes d'accès: ONEM et OREDDs*** */ ce qui n'existe pas dans l'IMIST et l'INRH – Régionalisation avancée*

Objectif / rôle: mettre à disposition les informations sur l'environnement et le développent durable. Trois principes fondamentaux :

- Le souci de développer une Base Informationnelle pluridisciplinaire fiable, facilement accessible et régulièrement mise à jour ;

- La volonté de créer un contexte d'échange d'informations et d'expériences au service d'objectifs convergents ;

- L'intérêt de promouvoir une participation active des différents partenaires à travers la réalisation de projets communs et répondant à des objectifs partagés.

Accès à l'information conforme à la constitution et la loi 31-13

Le CRTS est le distributeur officiel au Maroc des images satellites **SPOT, Landsat, ERS, NOAA, et autres**. Grâce à son archive propre, son accès direct aux archives de SPOT **IMAGE (France)** et **EURIMAGE (Italie)** et son réseau de contact (stations de réception), le CRTS réalise les recherches catalogues et les études pour le choix des images satellites les mieux adaptées (date, zone, type). Des procédures d'orientation et de recherche sont mises en place sous forme de fiches d'acquisition de données afin d'assister les utilisateurs. Cette procédure permet aux utilisateurs de bénéficier de l'accès aux différents catalogues d'images, à des prix meilleurs, avec une rapidité d'acquisition et de livraison de données satellite ainsi qu'un contrôle de la qualité des images reçues.

Merci!

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Barcelona Convention

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Tunisie – IMAP national pour les indicateurs relatifs à la côte et à l'hydrographie

Réunion du groupe d'expert subrégional sur les indicateurs relatifs à la côte et à l'hydrographie (EcAp MED II)
Zagreb, Croatie, 6-7 décembre 2017

ABDOULI Adel
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Emplacement et étendue des habitats impactés directement par les altérations hydrographiques

Aspects institutionnels et réglementaires

Législation nationale existante en rapport avec OE7 : Emplacement et étendue des habitats impactés directement par les altérations Hydrographiques

- Décret N°1991 du 11 juillet 2005 **:** Evaluation technique des dossiers relatifs aux études d'impacts sur l'environnement des projets de constructions ou interventions sur les structures de défense côtière : (digues, épis, brise-lames..) ou des constructions des ports de commerce, de pêche, de plaisance, marinas
- Loi n° 2009-49 du 20 juillet 2009 relative aux aires marines et côtières protégées (AMCP) **:** Cette loi introduite en 2009 traite des types d'écosystèmes marins et côtiers, de la biodiversité marine, des habitats en voie de disparition, des espèces menacées et des sites scientifiques importants
- Code des ports maritimes (loi n° 2009-48 du 8 juillet 2009) **:** Ce texte comporte de nombreuses dispositions relatives à la protection du milieu et ressources aquatiques et côtiers
- Décret n° 2013-4824 du 25 nov. 2013 fixant les conditions et procédures d'octroi de l'autorisation d'occupation temporaire du domaine public des ports maritimes de commerce

Emplacement et étendue des habitats impactés directement par les altérations hydrographiques

Aspects institutionnels et réglementaires

- **Lois et règlementations actuelles en matière de recueil des données et de partage d'information**

La Tunisie ne se dispose pas de loi et réglementations en rapport avec le partage de données et d'informations relatives à OE7

- Institutions responsables de la surveillance

APAL, INSTM, ANPE, CAR/ASP, DGSAM,

- **Inventaire des ressources humaines et de l'expertise existante**

Observatoire du Littoral, Laboratoires INSTM, CAR/ASP, Comité technique-ANPE

- **Potentiel des programmes de surveillance et d'évaluation pertinents existants à fournir des données et des informations pour les IMAP nationaux**

Projets de coopération, réseau de mesure océanographique, bases de données existantes, logiciels de modélisation, cartographie de biocénose benthique, EIE..

- **Coordination, gestion et financement des activités de surveillance**

Plateforme d'échanges , Comité de pilotage, Comité technique EIE, CAR/ASP

Emplacement et étendue des habitats impactés directement par les altérations hydrographiques

Mise en œuvre/plan opérationnel

▪Responsabilité dans la mise en œuvre de l'IMAP pour les indicateurs relatifs à la côte et à l'hydrographie

l'Observatoire du Littoral/APAL

▪ Dispositions opérationnelles

- Renforcement du SIAD (Réseau de mesure en mer, contrôle de stockage et bases de données, modélisation et simulation et aide à la décision)
- Renforcement SIG…
- Cartographie de la biocénose marine
- Renforcement de capacité technique et humaine et manuel de procédure de traitement et surveillance
- Renforcement de l'aspect institutionnel et réglementaire

Emplacement et étendue des habitats impactés directement par les altérations hydrographiques

Mise en œuvre/plan opérationnel

▪Dispositions opérationnelles

- Renforcement financier
- Etablissement des conventions nationales et internationales de collaboration et renforcement technique et humaines
- Ratification du Protocole GIZC

▪Partage des données et principes d'accès

Mise en place d'une Plateforme centralisé et commune d'échanges de données

Longueur de côte soumise à des perturbations dues à l'influence des structures artificielles

Législation nationale existante en rapport avec OE8:Longueur de côte soumise à des perturbations dues à l'influence des structures artificielles

- Loi n°95-72 de la 24/7/1995 portante création de l'APAL
- Loi n° 95-73 du 24 juillet 1995, relative au DPM, telle que modifiée et complétée par la loi n° 2005-33 du 4 avril 2005
- Décret n° 2000-167 du 24 janvier 2000, fixant les procédures et modalités de régularisation et d'apurement des situations foncières de constructions, ouvrages et implantations établis de manière illégale sur le DPM ou sur des parties de ce domaine
- Le Code d'Aménagement du Territoire et de l'Urbanisme (Loi 94-1223; Loi 2003-78), CATU et la Loi (28/ 11/ 1994) sur l'utilisation des Terres et la planification urbaine
- Le décret d'application N° 91-362 du 13 mars 1991 précise les dispositions et les procédures réglementaires d'élaboration et d'approbation des études d'impact sur l'environnement

Longueur de côte soumise à des perturbations dues à l'influence des structures artificielles

Aspects institutionnels et réglementaires

- **Lois et règlementations actuelles en matière de recueil des données et de partage d'information**

La Tunisie ne se dispose pas de loi et réglementations en rapport avec le partage de données et d'informations relatives à OE8-Longueur de côte…

- **Institutions responsables de la surveillance**

APAL, ANPE, CNCT, Observatoire de l'agriculture, AUGT, INS

- **Inventaire des ressources humaines et de l'expertise existante**

Observatoire du Littoral, OTEDD, CNCT, AUGT, INS

- **Potentiel des programmes de surveillance et d'évaluation pertinents existants à fournir des données et des informations pour les IMAP nationaux**

Projets de coopération, bases de données existantes, logiciels SIG, Images satellites, photographies aériennes, Lidar,

- **Coordination, gestion et financement des activités de surveillance**

Plateforme d'échanges , Système d'Information Centralisé

Longueur de côte soumise à des perturbations dues à l'influence des structures artificielles

Mise en œuvre/plan opérationnel

▪**Responsabilité dans la mise en œuvre de l'IMAP pour les indicateurs relatifs à la côte et à l'hydrographie**
l'Observatoire du Littoral/APAL

▪ **Dispositions opérationnelles**
•Renforcement SIG…
•Images satellites, Photographie aériennes, Lidar..
•Renforcement de capacité technique et humaine et manuel de procédure d'analyse spatiale et de surveillance
•Renforcement de l'aspect institutionnel et réglementaire
•Renforcement financier
•Etablissement des conventions nationales et internationales de collaboration et renforcement technique et humaines
•Ratification du Protocole GIZC

▪**Partage des données et principes d'accès**
Mise en place d'une Plateforme centralisé et commune d'échanges de données

Changement de l'utilisation des sols

Législation nationale existante en rapport avec OE 8 : Changement de l'utilisation des sols

▪ Loi n°95-72 de la 24/7/1995 portante création de l'APAL
▪Loi n° 95-73 du 24 juillet 1995, relative au DPM, telle que modifiée et complétée par la loi n° 2005-33 du 4 avril 2005
▪Décret n° 2000-167 du 24 janvier 2000, fixant les procédures et modalités de régularisation et d'apurement des situations foncières de constructions, ouvrages et implantations établis de manière illégale sur le DPM ou sur des parties de ce domaine
▪Le Code d'Aménagement du Territoire et de l'Urbanisme (Loi 94-1223; Loi 2003-78), CATU et la Loi (28/ 11/ 1994) sur l'utilisation des Terres et la planification urbaine
▪Le décret d'application N° 91-362 du 13 mars 1991 précise les dispositions et les procédures réglementaires d'élaboration et d'approbation des études d'impact sur l'environnement
▪Code forestier (promulgué par la loi n° 88-20 du 13 avril 1988 : Prise en charge financière par l'État des travaux de fixation des dunes.
▪Décret n° 98-2092 du 28 octobre 1998, fixant la liste des grandes agglomérations urbaines et des zones sensibles qui nécessitent l'élaboration de schémas directeurs d'aménagement (SDAGAU et SDAZS)

Changement de l'utilisation des sols

Aspects institutionnels et réglementaires

- **Lois et règlementations actuelles en matière de recueil des données et de partage d'information**

La Tunisie ne se dispose pas de loi et réglementations en rapport avec le partage de données et d'informations relatives à OE8-Changement de l'utilisation des sols

- **Institutions responsables de la surveillance**

APAL, ANPE, CNCT, Observatoire de l'agriculture, AUGT, INS

- Inventaire des ressources humaines et de l'expertise existante

Observatoire du Littoral, OTEDD, CNCT, AUGT, INS

- **Potentiel des programmes de surveillance et d'évaluation pertinents existants à fournir des données et des informations pour les IMAP nationaux**

Projets de coopération, bases de données existantes, logiciels SIG, Images satellites, photographies aériennes, Lidar,

- **Coordination, gestion et financement des activités de surveillance**

Plateforme d'échanges , Système d'Information Centralisé

Changement de l'utilisation des sols

Mise en œuvre/plan opérationnel

▪**Responsabilité dans la mise en œuvre de l'IMAP pour les indicateurs relatifs à la côte et à l'hydrographie**
•L'Observatoire du Littoral/APAL

▪ **Dispositions opérationnelles**
•Renforcement SIG…
•Images satellites, Photographie aériennes, Lidar..
•Renforcement de capacité technique et humaine et manuel de procédure d'analyse spatiale et de surveillance
•Renforcement de l'aspect institutionnel et réglementaire
•Renforcement financier
•Etablissement des conventions nationales et internationales de collaboration et renforcement technique et humaines
•Ratification du Protocole GIZC

▪**Partage des données et principes d'accès**
•Mise en place d'une Plateforme centralisé et commune d'échanges de données

Merci!

Mediterranean Action Plan
Barcelona Convention

UN environment

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ALBANIA: Monitoring Program of Significant Environmental Impacts

No	Environmental Aspect	Environmental Indicator	Monitoring Authority	Environmental Parameters	Monitoring Frequency	Comments
1	Soils	▪ Percentage of degraded land ▪ Quantities of waste disposed in landfills ▪ Development of per capita and total waste generation ▪ % e recycling (paper, glass, BMW[1], aluminium)	Competent Authorities of Region and Municipality Landfill Management Body	▪ Percentage of degraded land ▪ Quantities of waste disposed in landfills ▪ Development of per capita and total waste generation ▪ % recycling (paper, glass, biodegradable municipal waste, aluminium)	Annually	
2	Air	▪ Days of exceedance of air quality limits[2] ▪ Emissions by Source	Ministry of Tourism and Environment	SOx, NOx, PM_{10}, greenhouse gases, Pb, CO	Annually	Networks of air pollution Quality Monitoring
3	Climatic factors	▪ Greenhouse Gas Emissions ✓ emissions by source (%) ▪ Development of energy demand ▪ Percentage of RES[3] (%) ▪ Evolution of number of service vehicles	Ministry of Tourism and Environment Ministry of Tourism and Environment Competent Directorates of Regions	SOx, NOx, PM_{10}, greenhouse gases, Pb, CO Percentage Energy from RES (%) Number of service vehicles	Annually	Networks of air pollution Quality Monitoring
4	Waters	▪ Quality of surface water ▪ Quality of groundwater ▪ Water use by sector	Competent Directorates of Regions WWTP Management	▪ Total N, total P, BODs, COD, SS, TDS, pH, conductivity, etc. ▪ pH, conductivity,	Sampling and measurements in accordance to the approval of	According to the Law no. 111/2012 “Integrated Management of Water Resources”.

[1] BMW: Biodegradable Municipal Waste
[2] National air quality limits (NSDI II)
[3] RES: Renewable Energy Sources

No	Environmental Aspect	Environmental Indicator	Monitoring Authority	Environmental Parameters	Monitoring Frequency	Comments
		▪ Percentage of water recycling ▪ Percentage of population connected to wastewater treatment	Bodies Ministry of Tourism and Environment	hardness, chlorides, sulphates, COD, BOD, nitrate, nitrite, total P, metals, detergents, toxins, etc. ▪ Microbiological parameters for waters	environmental conditions. As per the National System of Surface Water Quality Monitoring	According to the Law no. 9915, date 12.5.2008 "Regulatory framework of water supply and wastewater disposal and treatment sectors".
5	Nature (Biodiversity - fauna- flora)	▪ How many important habitats are in satisfactory condition ▪ Number and/or area of protected areas ▪ Size biodiversity, (number of endemic and rare species) ▪ Number and area occupied by natural areas	Management bodies of protected areas Competent Directorates of Regions	▪ Habitats ▪ Number and/or area of protected areas ▪ Number of endemic and rare species ▪ Number and area occupied by natural areas	According to the Management Plan Annually	
6	Population – human health	▪ Number of complaints received ▪ Number of schools involved in waste management programs ▪ Number of occupational accidents	Competent office in Municipality	▪ Number of complaints received ▪ Number of schools involved in waste management programs ▪ Number of occupational accidents	Annually	
7	Cultural Heritage Landscape	▪ Number of preserved spaces restored ▪ Number of visitors ▪ Number of complaints received	Competent office in Region / Municipality	▪ Number of preserved spaces restored ▪ Number of visitors ▪ Number of complaints received	Annually	

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MONTENEGRO - National IMAP for Coast and Hydrography Indicators

Sub-regional expert group meeting on Coast and Hydrography indicators
(EcAp MED II)
Zagreb, Croatia, 6-7 December 2017

Zeljka Curovic and Luka Calic
zeljka.curovic@mrt.gov.me; luka.calic@meteo.co.me

Current situation

- Programme of monitoring of marine environment based on the MED POL programme (2008-2011), focusing on eutrophication and pollution (EO5, EO8, EO9), while only some parameters are being measured for EO1 and EO2
- Additional data available are project-dependent
- EU integration process – fully dependent on IPA funds

Current situation

- Importance of regional and subregional cooperation
  - Programme of monitoring of marine waters supported by MEDPOL (2008-2011)
  - Coastal Area Management Programme, CAMP Montenegro (2011-2014); NS ICZM (2015)
  - NAP 2015 (defined introduction of IMAP as one of the investment projects)
  - EcAp/MSP in Boka Bay (Dec 2015-Sept 2017)
  - GEF Adriatic Project (2017-2019)

EcAp/MSP in Boka Bay

- **Pilot project – defininig the methodologiacl framework (based on CAMP and defined in the NS ICZM)**
- **Vulnerability assessment based on the ecosystem approach**
- **Coast and Hidrography**

• **Common Indicator 15 –** Location and extent of the habitats impacted directly by hydrographic alterations
• **Common Indicator 16 -** Length of coastline subject to physical disturbance due to the influence of manmade structures

- **Candidate Indicator 25 -** Land-use change (only data available during CAMP project – Analysis of built up areas, 2013; case study)

GEF Adriatic procjet

- **Based on the EcAp/MSP project – methodology**
- **Support to the introduction of IMAP in Montenegro, including:**

• Biodiveristy and Fisheries
• Eutrophication and Pollution
• **Coast and Hydrography**
• Marine litter

- **Expected results**

1) **Establishment of the programme of monitoring in line with IMAP**
2) Preparation of the proposal of the marine spatial plan through the application of EcAp

Challenges

- Provision of finances
- Establishment of a fully functional inter-sectoral cooperation
- Capacities to be strengthen at administrative, technical and institutional level
- Significant gaps in data avilibility
- Data Quality Assurance

Thank you!

Mediterranean Action Plan
Barcelona Convention

Luka Calic and Zeljka Curovic

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www.unep.org

Implementation of Coastal Indicators Turkish Integrated Coastal Zone Planning

Outline

Turkish Integrated Coastal Zone Planning

- *Information on Turkish Coastal Areas*
- *How Coastal Areas are Planning*
- *Coastal Monitoring with ICZM*

ICMZ and Turkish Coastal Areas

Some Facts

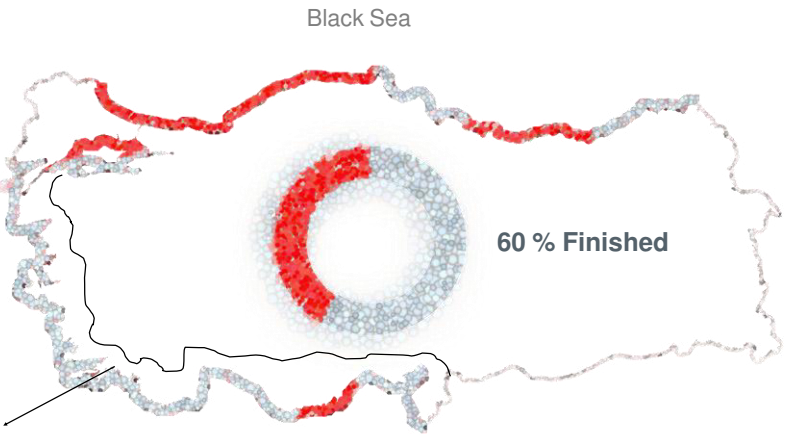
Total lenght of Turkish Coastline (sea) is approximately 8600 km

The Mediterranean part is approximately 5000 km long

95 % of Mediterranean part of Turkish coastal zone plans/strategies will be finished at the end of 2017.

9 Mediterranean Coastal Cities have aprroximately 16 million population

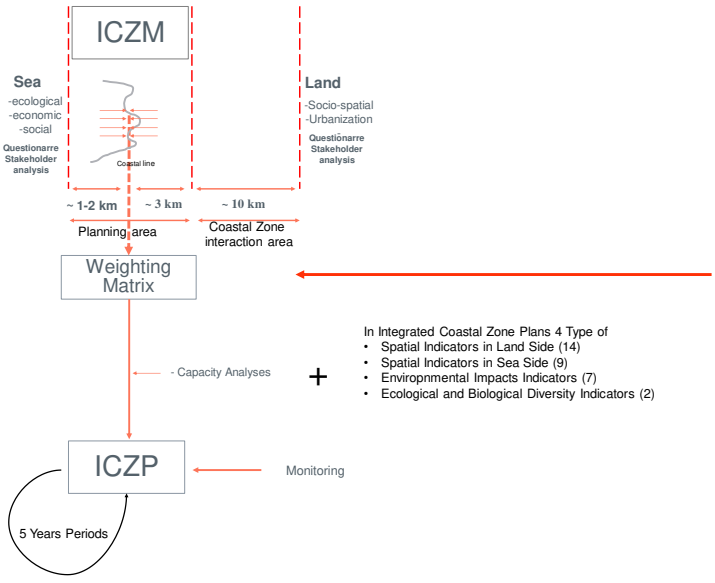
Total Mediterranean Coastal City Population	2010	14.590.961
	2016	15.790.789

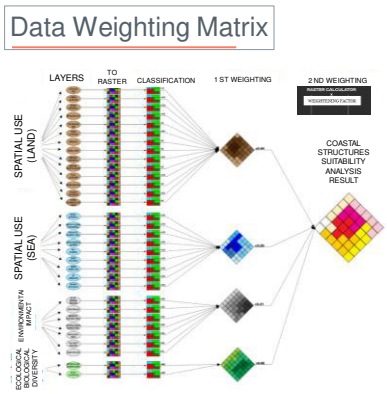


8,22 % increase in population → Rapid Urbanization → Habitat Loss

Sustainable Coastal Planning Framework in Turkey

From ICZM to ICZP





Sustainable Coastal Planning Framework in Turkey

5

Data & Indicators in ICZP

Land side

Spatial landuse

- Forestry
- Natural reserve area
- Biodiversity
- Topography
- Agricultural land
- Geological structure
- Erosian
- Natural disasters (Tsunami, climate change, flood, etc.)
- Urban protection areas
- Urban settlements
- Beaches
- Accessibility
- Restricted area
- Jeomorphological structure of the shore line

Sea side

Spatial landuse

- Current situation and need-demand
- Wave and climate features
- Stream climate and cycling
- Shore line jeomorphology
- Sea topography
- Seismicity
- Seafood farming area
- Restricted area
- Natural reserve area

Environmental Impact Criteria

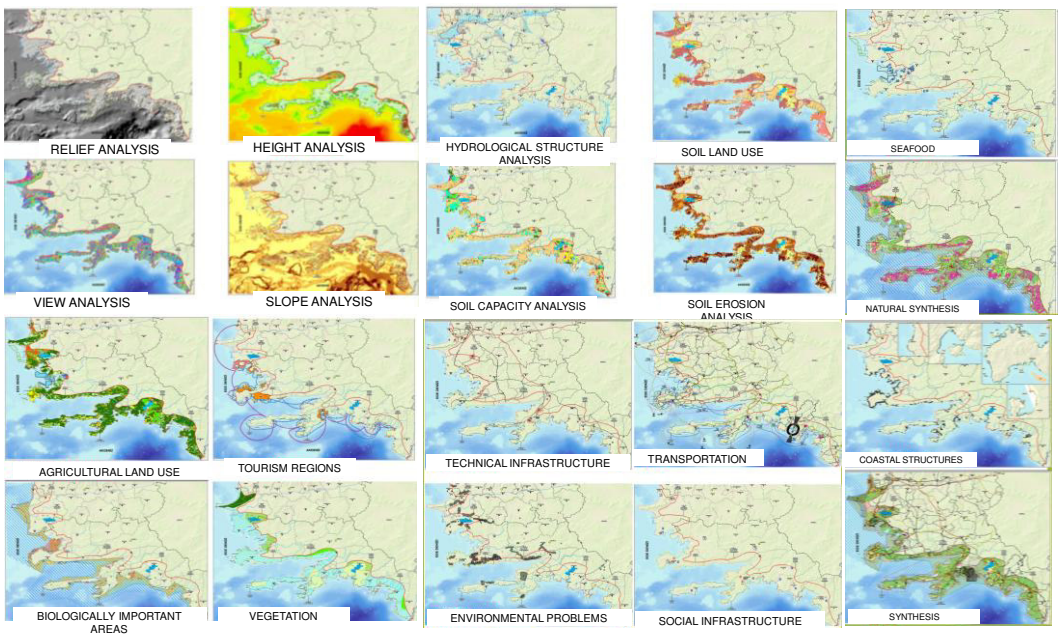
- Water and sediment pollution
- Solid Wastes
- Industrial pollution
- Pollution carried by rivers
- Ecological status
- Beach water quality
- Air pollution

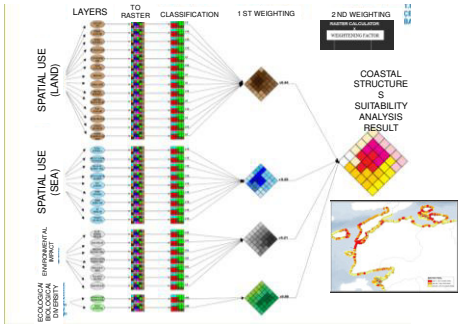
Ecological and Biological Diversity Criteria

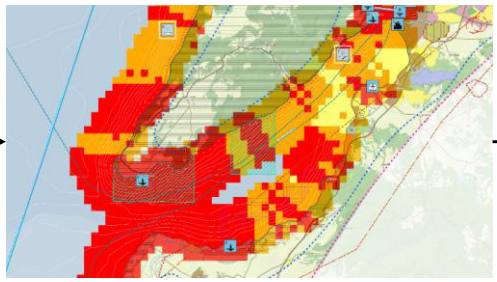
- Bio-ecological assessment (endemic species, endangered species, etc)
- Aquatic ecosystem (flora, fauna)
- Land ecosystem (flora, fauna)

32 Data layers

6

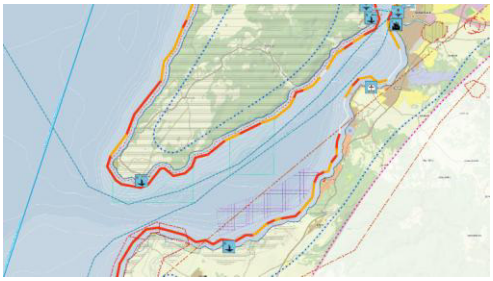






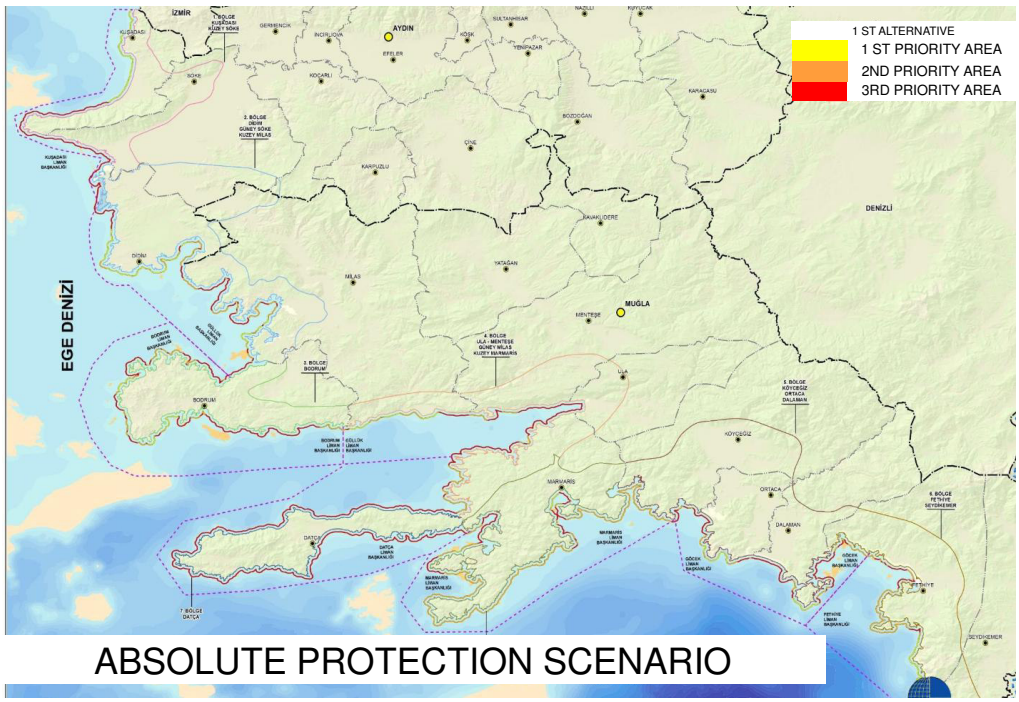
ALTERNATIVES MATRIX 7

RASTER DATA, SHOWING RISK VALUATION IN PIXELS, OBTAINED FROM MATRIX

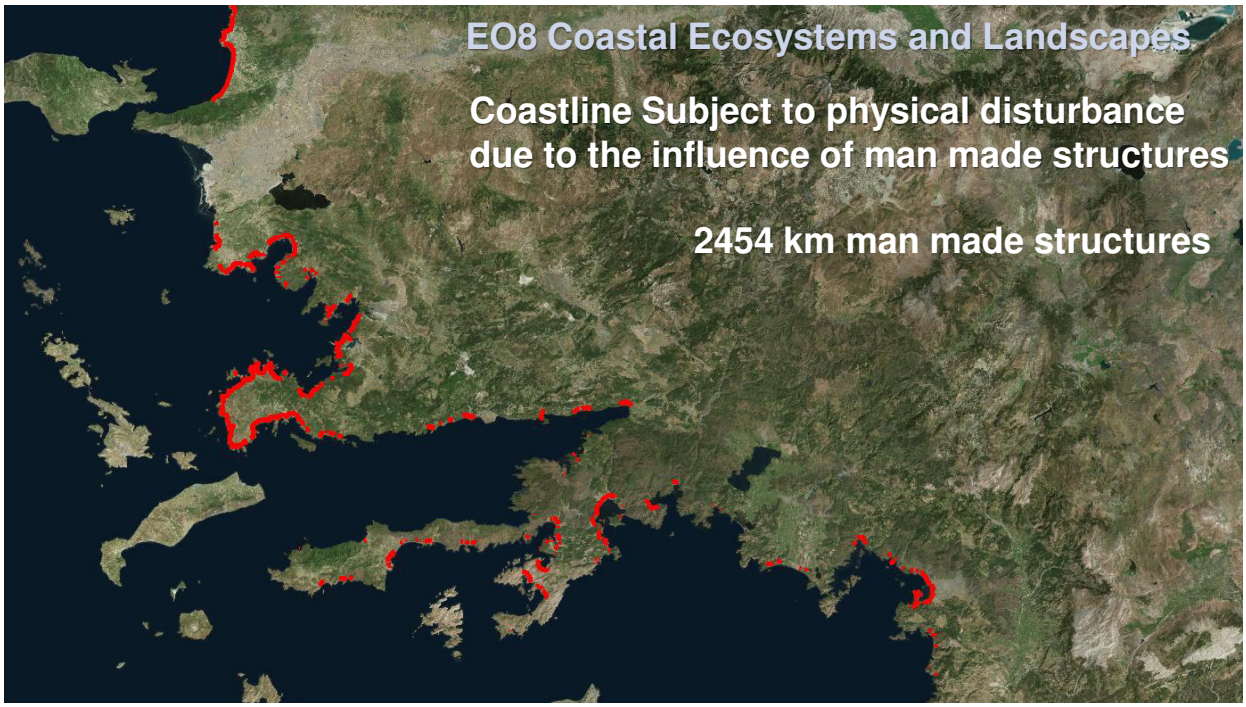


BY THIS WAY COASTAL STRUCTURE SUITABILITY ANALYSIS DATA HAS OBTAINED

8



ABSOLUTE PROTECTION SCENARIO



Upcoming Projects

10

Project 1 — Maritime spatial planning for sustainable marine area management

2018-2019

Developing the methods of maritime planning, application and monitoring process to protect marine environment with an intersectoral, multi-institutional and interboundary approach

Project 2 — Measurement of sustainability performance in coastal areas

2018-2019

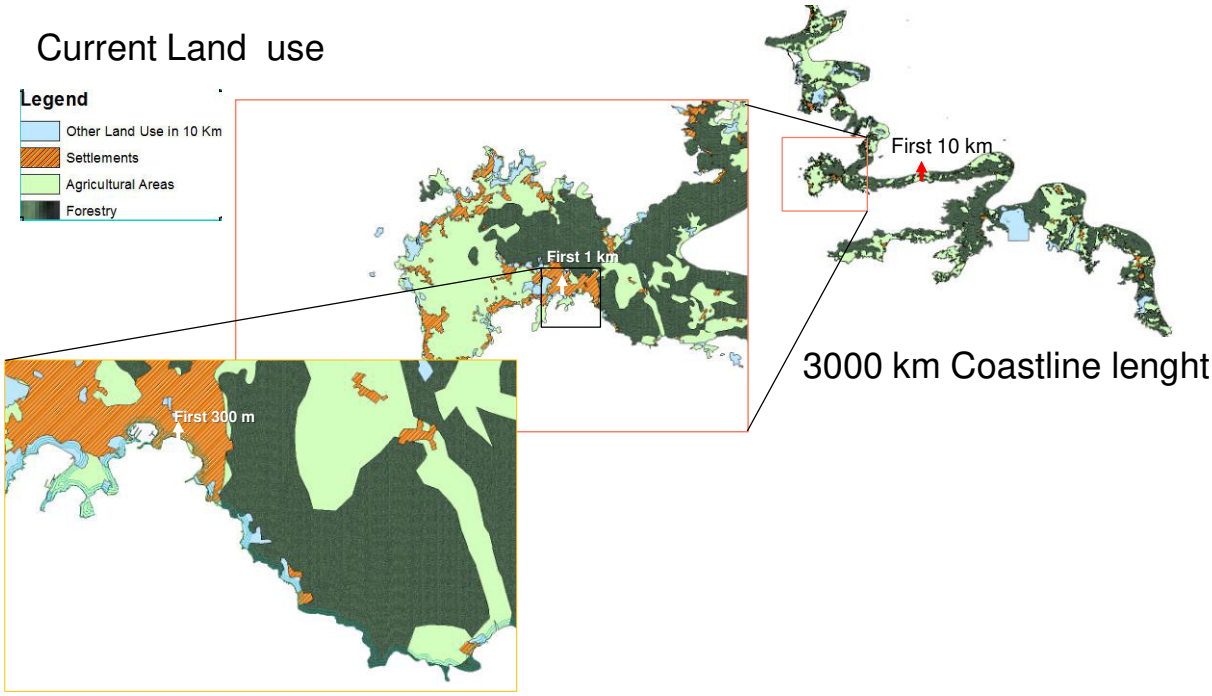
Measuring and assessment of the sustainability performance and develop coastal area strategies to achieve sustainability development and management of coastal areas

Project 3 — Adaptation of territorial impact assesment and spatial quality index method to Turkey in order to ensure urban resilience.

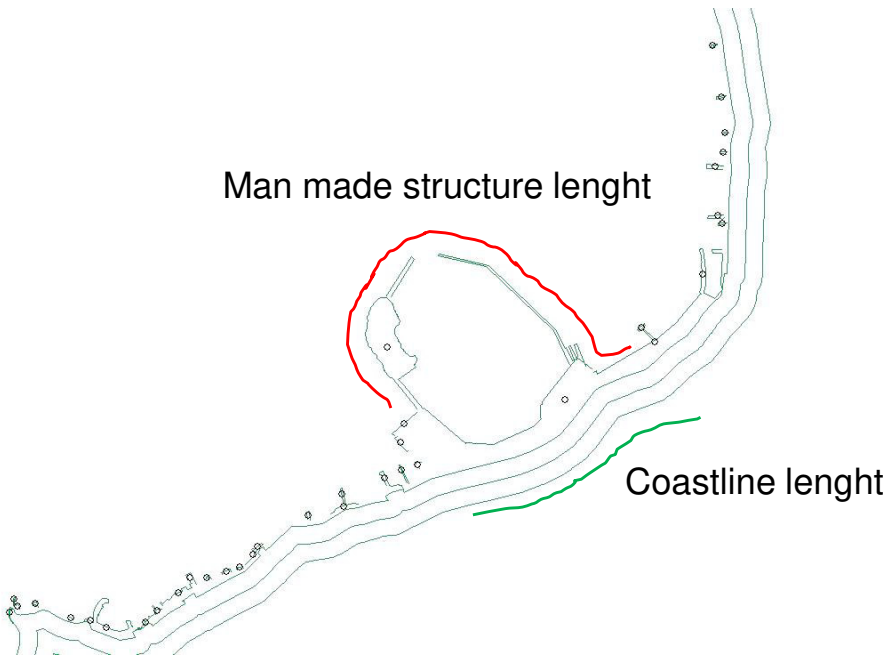
2019-2020

Developing the method and criteria of territorial impact assessment and spatial quality index to analyze and monitor the effects of spatial plans onto socio-economic and natural environment of cities for teh achievement of resilience

Current Land use



Man made structure lenght




THANK YOU
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Ecological Objective 7 Alteration of hydrographical conditions

EcAp Med II project
Sub-regional expert group meeting on Coast and Hydrography

Olivier Brivois / 7 Décembre 2017 / Zagreb, Croatie.

EO 7 indicator:

"Location and extent of the habitats impacted directly by hydrographic alterations"

considers marine habitats which may be affected or disturbed by changes in hydrographic conditions

- Is a not straightforward indicator

→Concerns physical and biological (EO1) aspects

→Looks for assessing future impacts on marine habitats

Goal of EO7:

Assess and minimise the physical impacts of **permanent new structures** on ecosystems

permanent structure : > 10 years

- How to achieve this goal
  - When planning new structures: mitigations measures to minimize these impacts
  - During construction: limiting physical impacts
  - After construction: Monitoring of hydrographical alterations

→ Compensation measures?

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→ Compensation measures?

Which new developments are concerned (type, dimension)? (1/2)

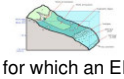
It would be convenient to define a **threshold of footprint area** from which the new structure has to be considered under EO7 indicator.

But even "medium-size" structures can have relative important impacts on their surrounding hydrographical conditions.

- Cross-shore structures on locations with long-shore sediment transit can induce strong changes in coast morphology.
- Water outlet can be small in size but deliver important fresh water volume.

Which new developments are concerned (type, dimension)? (2/2)

- It is proposed to use **case by case approach** depending on the **nature of the coast**, the **function of the structure** and **the depth reached by the structure** where appropriate threshold values are taken into account
  - Such as absolute surface in m²
  - Range of depths where structure will be built (to avoid habitat "segmentation")
  - ...



- All permanent structures for which an EIA and/or a planning/building permit is required should be considered
  - But this requirements may vary from country to country...

Main principles of EO7 indicator assessment (when planning new structure)

- 3 steps of evaluation
  - Base-line hydrographical conditions characterisation
    - Modelling of actual conditions without structure
  - Assessment of hydrographical alterations induced by new structure
    - Comparing base-line conditions and with structure conditions modelling
  - Assessment of habitats impacted directly by hydrographic alterations
    - By crossing hydrographical alterations and habitat maps

How to define the base-line conditions (and then conditions with structure)? (1/3)

The base-line conditions are the actual conditions.

→ Defining the base-line conditions consist in characterizing **the actual hydrographical conditions** and **their natural variability** on the site of interest

Depending on the **physical characteristics considered** and **on available means and data**, the definition of base line conditions can differ.

How to define the base-line conditions (and then conditions with structure)? (2/3)

The base-line hydrodynamic conditions are defined by:

- Actual bathymetric data (with quite fine resolution to the coast or closed to the structure, less fine resolution off-shore) and knowledge of bottom nature (taken from habitat map EO1)
- Water level variations (tide, storm surge)
- Waves and currents characterisation in terms of direction, intensity, occurrence and period for waves (from long duration waves and currents data analysis and hydrodynamic modelling).
  - Seasonal variability, Mean/max/min values, quantile

How to define the base-line conditions (and then conditions with structure)? (3/3)

The base-line hydrodynamic conditions are defined by:

- For sandy/with sediment transit sites: quantitative assessment of sediment transport rate and turbidity, actual evolution tendencies (stability, erosion, accretion of the coast) and rate of change (ex: coast retreat of x meter/year).
- Temperature and salinity actual conditions if the new structure will involve water discharge, water extraction or changes in fresh water movements.
- New structure location and dimensions (footprint, height, shape, …).

What kind of hydrographical alterations must be considered? (1/2)

Depending on the **natural hydrographical conditions** of the site and **their variability** and on the **new structure and its future functions**, different physical characteristics should be considered.

First alterations location (permanent and total): the structure itself

- Its footprint on sea bottom
- Its "volume" in the water column

What kind of hydrographical alterations must be considered? (2/2)

The following hydrographical conditions should be considered:

- At least, waves and currents changes (can be used to assess changes in bottom shear stress, turbulence,…).
- For sandy sites or sites with natural sediment dynamic, changes in sediment transport processes and turbidity and induced changes in morphology of the coast.
- If the new structure involves water discharge, water extraction or changes in fresh water movements: assessment of salinity and/or temperature changes.

Illustration of principles of hydrographical alterations assessment using numerical modelling

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"Ideal virtual" example: Harbour extension

Illustration of principles of hydrographical alterations assessment using numerical modelling

"Ideal virtual" example: Harbour extension

Actual hydrographic conditions: Assessment of baseline conditions

- Data needed

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  - Bathymetry (eventually substrate)

Actual hydrographic conditions: Assessment of baseline conditions

- Data needed
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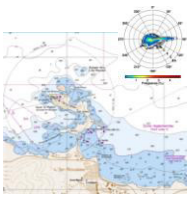
  - Hydrodynamic data (waves, currents, wind), off-shore/coastal



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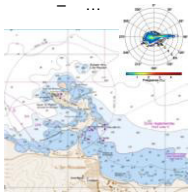

SHOM

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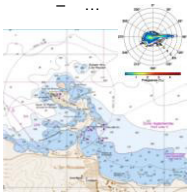

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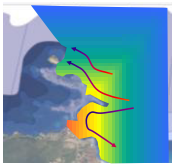


Illustration for « baseline » hydrodynamic conditions

Characterisation of baseline conditions: For instance simulations of most frequent wave climates (and characteristic extreme events)

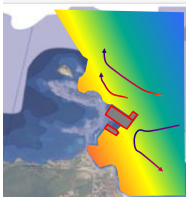
Modelling future hydrographic conditions to get hydrographic alterations/changes

- Data: New Structure plan

Topo/bathymetric data with structure

Modelling future hydrographic conditions to get hydrographic alterations/changes

- Data: New Structure plan



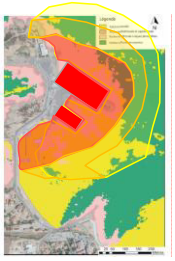
Assessment of habitats impacted by future hydrographical alterations

- Benthic Habitats Map (EO1)

STARESO, 2011

Assessment of habitats impacted by future hydrographical alterations

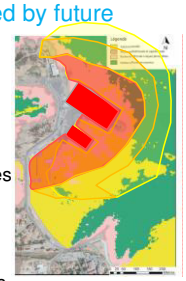
- Benthic Habitats Map (EO1)
- Map of physical alterations



STARESO, 2011

Assessment of habitats impacted by future hydrographical alterations

- Benthic Habitats Map (EO1)
- Map of physical alterations
- EO7 parameters:
  - Area of hydrographical changes induced by structure
  - Area of habitats impacted by these changes
  - Proportion of impacted habitats in the area of interest



STARESO, 2011

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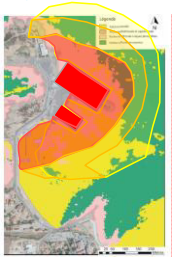
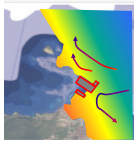


STARESO, 2011

→ Mitigations measures?

Principle of Monitoring after construction:

- Monitoring of hydrographical conditions
  - Assessing the effective changes in hydrographic conditions induced by the structure and **their evolution**



Principle of Monitoring after construction Expected assessments outputs:

- Maps / GIS data showing the spatial and temporal evolution (measured or modelled) of
  - Area of hydrographical changes induced by structure
  - Area of habitats impacted by these changes
  - Proportion of impacted habitats area in the zone of interest

30

To sum up, assessment of EO7 indicator for new structures should involve

31

To sum up, assessment of EO7 indicator for new structures should involve

- Assessment of baseline conditions (physical and biological)

32

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- Assessment of future physical changes due to structure
  - Use of numerical modelling

→Identification of habitats potentially impacted

33

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- Assessment of future physical changes due to structure
  - Use of numerical modelling

→Identification of habitats potentially impacted

- After construction, monitoring of effective physical changes, in space and time

→Monitoring the response of habitats to these changes (see EO1)

(See Factsheet on Hydrography about monitoring frequencies)

34

To sum up, assessment of EO7 indicator for new structures should involve

- Assessment of baseline conditions (physical and biological)
- Assessment of future physical changes due to structure
  - Use of numerical modelling

→Identification of habitats potentially impacted

- After construction, monitoring of effective physical changes, in space and time

→Monitoring the response of habitats to these changes

(See Factsheet on Hydrography about monitoring frequencies)

- **Strong links with EO1**

35

Difficulties relatives to EO7 indicator assessment

- Lots of data required (depending on the site considered)
  - Physical and biological (EO1) characteristics
  - Long-period data: to assess natural variability

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  - On each site and between different sites
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- Use of numerical models
  - Presents some limitations
  - Can be costly
- Lack of knowledge (physical pressures/biological impacts, cumulative impacts)

What in the case where there is no sufficient data? (1/1)

Lack of data will mainly concerns the base-line conditions characterisation (also the mapping of existing habitats → see EO1)

Proposal:

- Data can be collected from regional models (bathymetry, hydrodynamics, salinity, temperature)
  - Coarse resolution data (need to be refined close the new structure location)
- Use of assessment methods needing less data: empirical formulae, expert judgment, comparison with similar sites
- Acquisition/monitoring of missing data, promoting regional cooperation

Choice of spatial and temporal scales of study (1/2)

It is not the scale of the construction that is important but **the scale of the impacts**.

The chosen spatial and temporal scales must be able to **assess all the (main) hydrographical alterations** induced by the future structure.

→ These scales are so **strongly site-dependent.**

Choice of spatial and temporal scales of study (2/2)

Proposal:

- **Spatial scale** (in cross-shore and long-shore directions):
  - 10 to 50 times the characteristic length of the structure should at first be used.
  - Depending on the first results obtained for this area, the area should be enlarged or zoomed in.
- **Temporal scale** (depending on the natural dynamics of the site) :
  - Short term: yearly up to 5 years.
  - Mid/long term: biennium till 10 years…
  - …

42

Data required relative to EO1 Biodiversity

The following data relative to EO1 is required:

- Map of benthic habitats in the zone of interest (broad habitat types and/or particular sensitive habitats).
- Sensitivity/vulnerability of these habitats to hydrographical changes
  - To better assess the effective impact on habitats
  - To prioritize the monitoring of habitats (EO1)

43

Conclusion

It is not possible to propose a unique and well-defined assessment methodology as it strongly depends:

- On the site of interest and its natural hydrographical conditions.
- On the dimension, the location and the functions of the future structure.
- On the data and means available.

There is also a strong dependency on EO1 "Biodiversity", in terms of data on existing habitat and on their sensitivity to hydrographical changes.

44

Next steps in the future implementation of EO7

- Identification of existing data and monitoring
  - Physical/biological characteristics, global/regional scales, measured/modelled, short/long periods,…
- Analysis of existing data:
  - Identification of gaps to assess Baseline conditions?

→ Planning of National monitoring program (promoting regional cooperation)

- **Use of Environmental Impact Assessment**
  - If applicable for the new structure considered

45

Thank you

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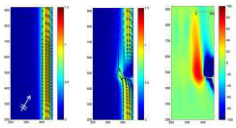
Annex

How to define alterations in hydrographical conditions? (1/2)

Modelling the base-line conditions and the conditions with structure (for the same "off-shore conditions") allows, by comparison, to identify changes in hydrographical conditions.

All the range of changes should not be considered as alterations.



Example of wave-induced currents modelling: with groins, without groins, and relative difference (in %)

How to define alterations in hydrographical conditions? (2/2)

Proposal: Thresholds should be used to define values from which changes are considered as alterations

- % of relative change for a target variable?
- Values for particular physical parameters? (for instance altered currents or bottom shear stress should not exceed a specific value for this particular habitat/bottom nature to avoid substrate modification).
- Using Risk Based Approach: alterations could be potentially defined relatively to the sensitivity of particular biologic habitats to changes in specific hydrographical conditions.

Monitoring guidelines for
EO8 „Coastal ecosystems and landscapes“

Indicator: **Length of coastline subject to physical disturbance due to the influence of manmade structures**

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Policy context:

ICZM Protocol (Article 8, point 3):

*The Parties shall also endeavour to ensure that their national legal instruments include criteria for **sustainable use of the coastal zone**. Such criteria, taking into account specific local conditions, shall include, inter alia, the following:*

(a) identifying and delimiting, outside protected areas, open areas in which urban development and other activities are restricted or, where necessary, prohibited;
*(b) **limiting the linear extension of urban development and the creation of new transport infrastructure along the coast**;*
(c) ensuring that environmental concerns are integrated into the rules for the management and use of the public maritime domain;
(d) providing for freedom of access by the public to the sea and along the shore;
*(e) **restricting or, where necessary, prohibiting the movement and parking of land vehicles**, as well as the movement and anchoring of marine vessels, in fragile natural areas on land or at sea, **including beaches and dunes.***

Decision 20/4 of the 17th CPs Meeting in Paris 2012
Ecological objective 8:
The natural dynamics of coastal areas are maintained and coastal ecosystems and landscapes are preserved

Operational Objective 8.1:
The natural dynamics is respected and coastal areas are in good condition

Indicators:
8.1.1 - Areal extent of coastal erosion and coastline instability
8.1.2 – Changes in sediment dynamics along the coastline
8.1.3 – Areal extent of sandy areas subject to physical disturbance (including: beach cleaning by mechanical means, sand mining, beach sand nourishment)
8.1.4 - Length of coastline subject to physical disturbance due to the influence of manmade structures

---

Manmade structures categories:

i) Hard coastal defence (excluding soft techniques, e.g. beach nourishment)
ii) Ports and marinas
iii) Land claim
iv) Impervious surfaces in the hinterland (100 mt. from the coastline)

Physical disturbance:
a) Alter coastal hydrodynamics: waves, tides, currents
b) Change sediments flow
c) Modify hydrostatic balance between seawater and groundwater, alter water table
d) Alter capacity to trap sands transported by winds

Monitoring aim is to:
1. Quantify the rate and spatial distribution of the Mediterranean coastline artificialitsation
2. Provide a better understanding of the impact of manmade structures on shoreline dynamics

---

CORMON 3rd March 2017, Madrid (1)

i) Coastline to be considered: a fixed reference (official) coastline as defined by responsible Contracting Party should be considered. The optimal resolution should be 5 m or 1: 2000 spatial scale.

ii) As monitoring should be done every 6 years, every CP should fix a reference year in the time interval 2000-2012 in order to eliminate the bias due to too old or past manmade infrastructures.

iii) The identification procedure of manmade structures should be carried on based on typical situations added to the indicator Fact Sheet, including the minimum size (length, width of manmade structures) to be taken into account

iv) Indicator units:
   a) Km of artificial coastline and of total length of coastline.
   b) Percentage (%) of natural coastline on the total coastline length.

CORMON 3rd March 2017, Madrid (2)

v) The length of artificial coastline should be calculated as the **sum of segments on reference coastline identified as the intersection of polylines representing manmade structures with reference coastline**. Polylines representing manmade structures with no intersection with reference coastline will be ignored. The **minimum distance between coastal defence structures should be set to 10 m** in order to classify such segments as natural, i.e. if the distance between two adjacent coastal defence structures is less than 10 m, all the segment including both coastal defence structures is classified as artificial.

vi) The **optimum spatial scale** for a proper identification of manmade structures should be **5 m by satellite imagery or aerial photographs**. Common procedures for GIS digitalization should be added to the Indicator Guidance Fact Sheet operated by well trained personnel on GIS photo-interpretation.

CORMON 3rd March 2017, Madrid (3)

vii) The total length of coastline influenced by manmade structures, should be provided on a map showing the coastline subject to physical disturbance due to manmade structures (**artificial segments) in red line** and the rest (**natural segments) in green line**. Shape file format with **GRS as WGS84**. Shape file with other GRS will also be accepted if provided with a complete .prj file that allows GRS transformations by standard GIS tools.

Note: impervious surfaces GIS layer is not included in the above calculations but should be provided in a separate layer possibly covering 300 m on land from the coastline.

Reference coastline and resolution (1)

i) Coastline to be considered: a fixed reference (official) coastline as defined by responsible Contracting Party should be considered. The optimal resolution should be 5 m or 1: 2000 spatial scale.

- The implementation of 8.1.4 indicator requires a reference coastline on which the length subject to physical disturbance is calculated
- To assure comparability of results between successive reporting exercises, each CP should choose during all the process a fixed reference coastline.
- Coastal erosion, sea level rise and morphological modifications induce coastline changes
- Compromise between the level of accuracy and details of the coastline and its chance to represent a lasting and homogenous reference between CPs

Reference coastline and resolution (2)

Reference coastline 2006

Reference coastline and resolution (2)

Reference coastline 2012
: Coastal erosion

Reference coastline and resolution (3)

Reference coastline with optimal resolution should be 5 m or 1: 2000 spatial scale **does not imply that in some years there will be no difference** between the such reference coastline and actual coastline.

BUT
The resolution for the reference coastline should allow to identify and project (intersect) new manmade structures with the reference coastline.

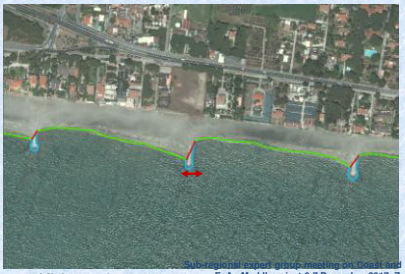
Reference year

ii) As monitoring should be done every 6 years, every CP should fix a reference year in the time interval 2000-2012 in order to eliminate the bias due to old or past manmade infrastructures.

In fact: choosing as a reference year the same year of the starting of the monitoring programme (i.e. 2018) affects the trend to be assessed between the reference year and the first year of monitoring: there is no increment between them.

Typical situation and minimum size

iii) The identification procedure of manmade structures should be carried on based on typical situations added to the indicator Fact Sheet, including the minimum size (length, width of manmade structures) to be taken into account



↔ : Minimum size

Indicator units

iv) Indicator units:
a) Km of artificial coastline and of total length of coastline.
b) Percentage (%) of natural coastline on the total coastline length.

	LENGTH (KM) 2006			PERCENTAGE 2006		PERCENTAGE 2012		TREND 2006-2012
	total	natural	artificial	natural	artificial	natural	artificial	artificial
ITALY – continental	3844.985	3058.103	786.882	79.53	20.47	79.02	20.98	+0.51%
SICILIY	1177.769	1003.140	174.629	85.17	14.83	85.01	14.99	+0.16%
SARDINIA	1512.145	1444.395	67.749	95.52	4.48	95.46	4.54	+0.06%
TOTAL	6535.899	5505.638	1029.261	**84.25**	**15.75**	**83.89**	**16.11**	**+0.36%**

Source: Italy contribution to QSR 2017 for EO8

Calculation of length of coastline (1)

v) The length of artificial coastline should be calculated as the **sum of segments on reference coastline identified as the intersection of polylines representing manmade structures with reference coastline**. Polylines representing manmade structures with no intersection with reference coastline will be ignored.

Only red segments on reference coastline are considered for the length of artificial coastline

These segments have no intersection with reference coastline and are ignored

Calculation of length of coastline (2)

v) (continue) The **minimum distance between coastal defence structures should be set to 10 m** in order to classify such segments as natural, i.e. if the distance between two adjacent coastal defence structures is less than 10 m, all the segment including both coastal defence structures is classified as artificial.

↔ : Minimum distance

Satellite imagery resolution

vi) The **optimum spatial scale** for a proper identification of manmade structures should be **5 m by satellite imagery or aerial photographs**. Common procedures for GIS digitalization should be added to the Indicator Guidance Fact Sheet operated by well trained personnel on GIS photo-interpretation.

Final product (1)

viii) The total length of coastline influenced by manmade structures, should be provided on a map showing the coastline subject to physical disturbance due to manmade structures (**artificial segments) in red line** and the rest (**natural segments) in green line**. Shape file format with **GRS as WGS84**. Shape file with other GRS will also be accepted if provided with a complete .prj file that allows GRS transformations by standard GIS tools.

Final product – General remarks (2)

- Impervious surfaces are identified on a buffer from the coast landward that depends on the provisions approved by each CP for the application of ICZM protocol and it is **at least 100 mt**. 300 mt would be better but there are exception, Italy for ex. applies ICZM on the all territory of coastal municipalities.
- Impervious surfaces are not at the moment included into the calculation of the length of artificial coastline and further work is needed in order to share a common point of view.
- Trend between the reference year and 2018 play an important role in order to assess coastal erosion and urbanization process that are on-going. Actually we need at least two monitoring survey one for the reference year and for 2018.
- Satellite imagery could be make available for ex. from a MoU with ESA regarding Copernicus Sentinel satellite but also other tools as Google earth can be used.
- Choosing a reference coastline represents the first step and if not available there are regional product distributed by EEA or other projects.

Final product – Further development (3)

An index can be developed to represent different level of artificialization

Session 3: Discussion on collaboration and experience-exchange on monitoring Coast and Hydrography between different sub-regional groups of countries.
Group 2: Ionian-Central Mediterranean and Aegean-Levantine

- Sharing of knowledge coming from experts that have previous and sound experience on the field by a web forum for each indicator. People involved in the implementation of monitoring fact sheet and data analysis could submit questions on forum and receive quick responses and feedbacks.
- Necessity of a general graduate or post-graduate level courses on specific topics on coastal issues as sediment dynamics, coastal defence structures and impact assessment, coastal ecosystem dynamics, etc… Courses should be taken by experts on e-learning platform with the possible addition of on-site special sessions. Such basic knowledge does not seem to be properly covered by standard universities courses and technical staff from CPs could apply to enhance their abilities contributing to implement EO7 and EO8 indicators on common grounds
- Survey of available satellite images with possible exchanges between contracting parties according to user licence agreements and analysis of available free repositories from European and international institutions (ESA, NOOA, USGS, etc..). Consider the possibility to acquire satellite images with common resources from a group of CPs
- Share photointerpretation automatic software tools in order to standardize such procedures between CPs and optimize the work flow to update GIS layers more frequently on bi-annual or annual basis
- Establish common criteria in terms of spatial and temporal resolutions provided by numerical modelling implementation for indicator EO7. Such criteria should also cover design and implementation of monitoring programmes necessary to provide data for numerical modelling validation and calibration. Cost-benefit analysis should play an important role to eventually enhance EIA carried out by public or private bodies

Thank You

Mediterranean Action Plan
Barcelona Convention

PAP/RAC

UN environment

EO8 Land Use Change

Sub-regional expert group meeting on Coast and Hydrography

Jaume Fons-Esteve (UAB)
6-7 December 2017, Zagreb

Structure of the presentation

I. **Indicator overview**
II. **Indicator in practice.**

I. Indicator overview

1. Definition
2. Why land use change is relevant for coastal ecosystems?
3. GES

1. Definition

Land use change is the change of purpose to which land is profited by humans (e.g., protected areas, forestry for timber products, plantations, row-crop agriculture, pastures, or human settlements).

Focus on:
- where pressures are higher (by **amount** of change and by **pace** of the process);
- **spatial** trends (along the coast and landwards)

1. Example of land use change (2000-2012)

Year 2000

Year 2012

1. Particularities of land use change indicator

- Focus on the land side
- Diverse land use changes have different impacts (either positive or negative)
- There is not a unique ideal combination of land uses that ensures GES.

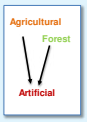
2. Land use change: from pressure on ecosystems…

	Artificial	Agricultural	Forest	Wetlands	Water
Artificial	x	without	without	without	without
Agricultural	high	x	without	without	without
Forest	high	moderate	x	low	low
Wetlands	high	high	high	x	high
Water	high	high	high	low	x

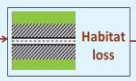


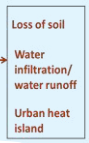


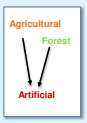
… to negative impacts (land take)



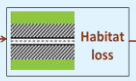
… to negative impacts (land take)

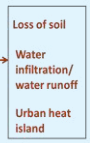


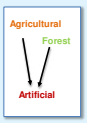




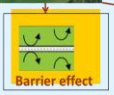
… to negative impacts (land take)

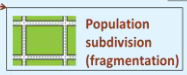






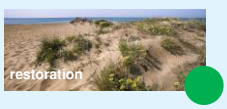
Ecosystem integrity!





… or positive impacts

Connectivity
Decreased erosion
Increased soil organic carbon



Biodiversity
Coastal protection

3. What is the GES for land use indicator?

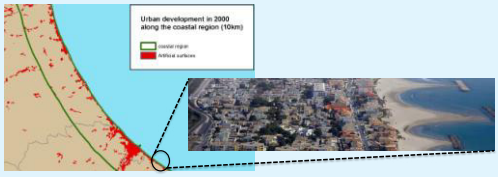
Difficulty to establish a clear quantitative GES boundary (e.g. an increase of 5% land take is 'in GES' or 'not in GES'???)

This indicator needs a different approach, it cannot be classified according to a numeric threshold.

Linking **changes** to **potential impacts** provides an indication if we are moving to the right direction (improving GES).

3. What is the GES for land use indicator?

3. What is the GES for land use indicator?



ICZM compliant?

...No further construction within the setback zone...

3. GES: Conclusion

- GES definition linked to sustainable measures to mitigate negative impacts. For example:
  - Linear coastal development minimised, with perpendicular development being in balance with integrity and diversity of coastal ecosystems and landscapes.
  - Mixed land-use structure achieved in predominantly man-made coastal landscapes.
  - Promote land recycling where the degree of urbanization is higher
- Targets and measures proposed in the Indicator Fact Sheet are general recommendations.
- Adapted to regional/local specificities and knowledge by the Contracting Parties.

II. Indicator in practice

1. Definition of reporting units
2. Data
3. Processing
4. Results

1. Definition of the reporting units

Land part of the coastal zone as defined by the Contracting Party.

But…

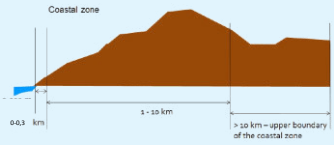
- Not all Mediterranean countries have defined its coastal zone
- Only an administrative criteria? Are administrative units comparable between countries?

1. Definition of the reporting units

1. Reporting units: Proposed solution

Land part of the coastal zone as defined by the Contracting Party.

Additional geographic criteria: proximity to the sea (within the coastal zone)



2. Data requirements

- Resolution
  - Minimum mapping unit 0.5 ha and 10 m of linear elements
- Temporal scale
  - 5 years
  - 1st reporting will only include one year (reference year)

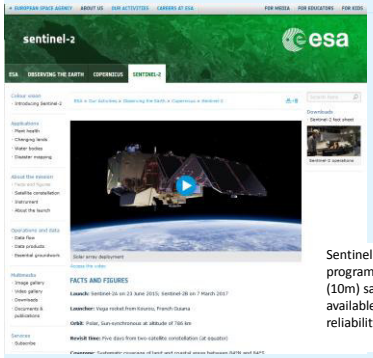
2. Data sources

- Develop your own land use map
  - Already existing programme
  - Guidelines from Corine Land Cover.
- Possibility to use existing global/regional data sources

2. Data acquisition availability

- There is no common land-use map of the Mediterranean region.
- The continuity of global LU products in time is not always ensured and/or they offer incompatible temporal analysis.

2. Data acquisition availability



Sentinel satellites (Copernicus programme) provide high resolution (10m) satellite imagery freely available. Ensuring continuity and reliability.

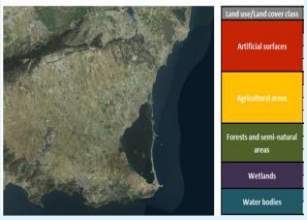
- **Artificial surfaces**
- **Agricultural**
- **Forest and semi-natural**
- **Wetlands**
- **Water bodies**





2. Data requirements. From satellite to LU.

2. Data requirements. From satellite to LU.



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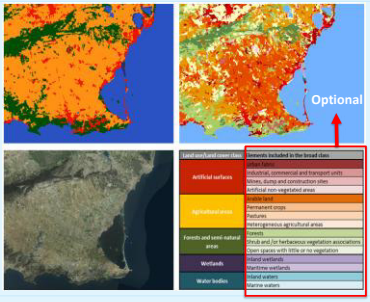
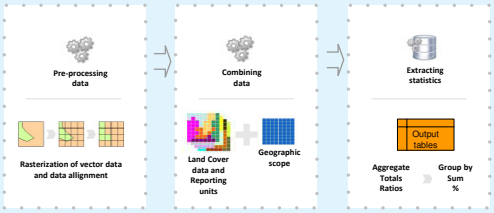


3. Data processing



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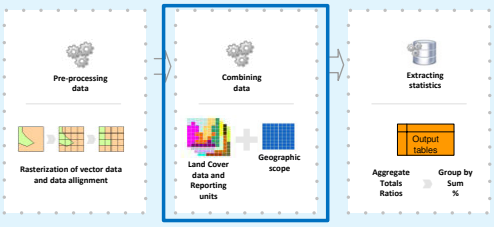

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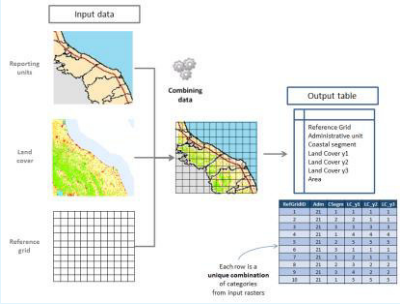
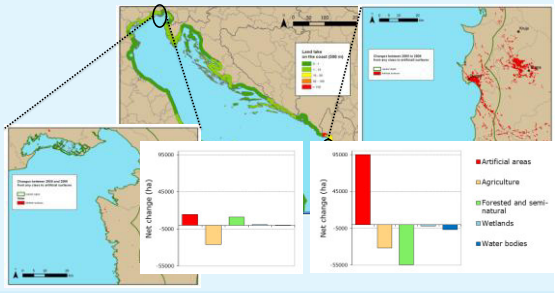


4. Results



Thank you

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