



Mediterranean
Action Plan
Barcelona
Convention



PRIORITY ACTIONS PROGRAMME REGIONAL ACTIVITY CENTRE

SPLIT, KRAJ SV. IVANA 11

INVITATION TO TENDER

PROCUREMENT SUBJECT : Consultant for the preparation of the Report on the IMAP common indicator 15 “Location and extent of the habitats potentially impacted by hydrographic alterations” for Israel, in the frame of the EcAp MED III project

Split, July 2021

1. GENERAL INFORMATION

1.1. Client information:

Name: UNEP/MAP – PAP/RAC (hereinafter: the Client)

1.2. Procurement type: Simple procurement

1.3. Estimated procurement value: Procurement value is estimated at USD 6 000 gross.

In case of natural person, the amount includes all the relevant taxes. In case of legal person, it includes VAT.

2. INFORMATION ON THE PROCUREMENT SUBJECT MATTER

2.1. Introduction

The EC-funded EcAp MED III project (Full title: Support to Efficient Implementation of the Ecosystem Approach-based Integrated Monitoring and Assessment of the Mediterranean Sea and Coasts and to delivery of data-based 2023 Quality Status Report in synergy with the EU MSFD) will be implemented by UNEP/MAP in the framework of the GPGC Priority Area 1 – Component 4: International environment and Climate governance. It will support the delivery of a data-based 2023 Mediterranean Quality Status Report (2023 MED QSR) through support to the implementation of national IMAPs in the respective countries. It will also support harmonized assessment at national level through the preparation of national assessment factsheets. As such, the EcAp MED III project is directly linked to the implementation of the COP 19 Decision IG.22/7 on IMAP, of the COP 20 Decision IG.23/6, and COP 21 Decision IG.24/4 on the 2023 MED QSR Roadmap and Implementation Plan. Preparation of a report on monitoring of CI 15 makes part of Activity 1.3.1 of the EcAp MED III Project.

The Ecological Objective 7 (Alteration of hydrographical conditions) addresses permanent alterations in the hydrographical regime of currents, waves and sediments due to new large-scale developments that have the potential to alter hydrographical conditions. An agreed Common Indicator 15 „Location and extent of the habitats potentially impacted by hydrographic alterations“ considers marine habitats which may be affected or disturbed by changes in hydrographic conditions (such as currents, waves, suspended sediment loads). At the PAP/RAC Meeting of the Ecosystem Approach Correspondence Group on Monitoring (CORMON meeting) on Coast and Hydrography in Rome, Italy, 21-22 May 2019, alternative factsheet for Common Indicator 15 was presented to the countries (UNEP/MED WG.471/6) in order to better facilitate the implementation of this indicator. This alternative version of the Indicator Guidance Fact Sheet (UNEP/MED WG.467/6) was finally accepted on 9 September 2019 at the 7th Meeting of the Ecosystem Approach Coordination Group in Athens, Greece, and can be found in Annex 4.

The methodology for the preparation of the report is therefore based on the guidance factsheet for CI 15 in the Annex 4.. Given that CI 15 concerns the development of new structures there are usually no fixed monitoring stations for CI 15. The monitoring needs to be based on the site selection for the new structures supported by monitoring stations (providing information that is statistically significant, during several years) or sites where structures were placed recently and there are certain implications on their potential impacts, i.e. hydrographic alterations. This report should encompass all the recent or upcoming activities in Israel where coastal and offshore structures lead to physical loss induced by the structure itself (« first level assessment » - see Annex 4) or permanent changes to the seabed due to human activities (related to the construction and the use of the structure (« second level assessment » - see Annex 4), including cartographic presentation

2.2. Description of the procurement subject matter

The subject matter is to prepare the report on the IMAP common indicator 15 “Location and extent of the

habitats potentially impacted by hydrographic alterations” for the entire coastal and marine area of Israel. The Report should be structured according to the accepted factsheet, presented in Annex 4.

The consultant should communicate and work in close contact with the responsible institutions (Ministries, agencies etc.) to obtain relevant information.

2.3. Deliverables and deadlines

For the delivery of the Outputs the consultant will be remunerated with the amount of 6 000 dollars (USD) gross. Payment will be made after the clearance by PAP/RAC. The reports should be submitted in English, in an electronic form (Word for Windows).

Deliverable	Date
a. Draft Report	15 November 2021
b. Final Report	15 December 2021

3. ELIGIBILITY OF ECONOMIC OPERATORS (SELECTION CRITERIA)

3.1. Technical and professional capacity

The consultant should possess the following general qualifications and professional experience:

- University degree in one of the following fields: hydrography, geography, coastal zone management, environmental or marine sciences.
- At least 5 years of experience in working on the projects relevant to the main activity fields of this project.
- Written and oral fluency in English

For the purposes of establishing the grounds set out in item 3.1. of the Invitation to Tender the Tenderer shall submit the following in his Tender:

- j) The Tenderer's curriculum vitae (CV), clearly highlighting, among others, **required technical and professional qualifications.***

4. INFORMATION ON THE TENDER

4.1. Tender contents and format

The Tender proposal should contain the following elements:

- Tender sheet** signed and filled in according to this Invitation to Tender (Annex 1);
- Curriculum vitae** of the Tenderer, proving required technical and professional capacity;
- Declaration of interest** (1 page maximum)
- List of projects verifying expertise** (see chapter 5) **of the Tenderer** (Annex 2);
- Cost statement** signed and filled in according to this Invitation to Tender (Annex 3);

4.2. Tender format and submission

Tender offers need to be drafted according to the requirements laid out in the Invitation to Tender.

Offers shall be sent electronically to the following e-mail addresses: paprac@paprac.org and ivan.sekovski@paprac.org.

4.3. Date, time and place of tender submission

Tender offers must be received **by 26 July 2021, 11:59 pm CEST**.

All offers received after the bid opening deadline will be marked as late and excluded from the procedure.

4.4 The Tenderer may amend or withdraw his Tender before the Tender submission deadline.

The amended Tender shall be submitted in the same manner as the original and clearly marked as amended. The Tenderer may withdraw his Tender by submitting a written statement before the Tender submission deadline. The written statement shall be submitted in the same manner as the original Tender and clearly marked as a statement of Tender withdrawal. Alternative Tenders are not permitted.

4.5 Tender currency: US dollars.

The Contractor shall express the price in USD, and the payment will be made in USD.

4.5. Language and script: The Tender shall be drafted in French language, using the Latin script.

4.7 Period of validity: 15 days from the tender submission deadline.

4.8. Price setting method

The Tender price includes all costs and discounts pertaining to the services indicated as the subject matter of the procurement (i.e. gross amount).

The Tender price shall be expressed in USD and written in numbers. The tender price cannot be altered.

5. AWARD CRITERIA

The Tender will be awarded according to the **most economically advantageous tender (MEAT) criteria**.

The following table sets out the criteria, units of measure, labels and their relative importance. They will be applied to Tenderers who satisfy technical and professional capacity criteria set in Chapter 3.1. The MEAT award criteria are the following:

- proposed price (Annex 3);
- expertise of the Tenderer (Annex 2); and

Determining the MEAT according to the above criteria for selecting the MEAT will be done as follows: after the Client has determined the score value by individual criteria for each Tenderer, the points awarded to Tenderer according to each of the criteria will be summed in order to obtain the total number of points for each Tenderer. The most favourable Tenderer will be the one who has earned the highest total score according to all the above criteria.

At that, the MEAT is equal to the highest total score resulting from the ranking of the Tenders; the total maximum number of points is 100.00 with the total points being calculated in two decimal places. In case that two or more Tenders achieve equal number of points, the one received earlier will be chosen. As a proof, data will be used on the order in which tenders have been received.

Criteria	Criteria label	Description and measuring unit	Methodology	Number of points	Maximum
Price	P	The Tender price, i.e. the financial Tender amount in USD including VAT, if applicable	$C = (\text{lowest bid price/bid price being evaluated}) \times 30$	30	30
Expertise	E	Number of projects related to the coastal zone management, hydrography or hydrography-related marine monitoring/assessment in Israel, in which the tenderer was involved as expert / main coordinator.	1 - 2	20	70
			3 - 5	40	
			5 - 6	60	
			More than 6	70	

Selection of the most economically advantageous Tenders (ENP) will determine the basis for evaluating the criteria for each individual Tender according to the delivery of the requested Tenderer's documentation, in the appropriate form: **ENP = P + E**.

For the purposes of establishing the grounds set out in item 5. of the Invitation to Tender the Tenderer shall submit the following in his/her Tender:

- i. *List of projects verifying expertise of the Tenderer* (Annex 2);

6. DUE DATE, CONTRACT AND TERMS OF PAYMENT

The Contract will be made in US dollars.

The Client shall make the payment to the Tenderer in two instalments i.e.:

- 50% upon submission and clearance by PAP/RAC of the deliverable a.
- 50% upon submission and clearance by PAP/RAC of the deliverable b.

An advance payment by the Client is not permitted.

Envisaged duration of the Contract is 4 months.

Annex 1

Tender sheet

Tender date:

Contracting Authority: Priority Actions Programme Regional Activity Centre (PAP/RAC), Kraj Sv. Ivana 11, 21000 Split, Croatia

Subject of procurement: Consultant for the preparation of the Report on the IMAP common indicator 15 "Location and extent of the habitats potentially impacted by hydrographic alterations" for Israel

Tenderer information:

Tenderer's name and registered seat	
PIN¹	
Bank name	
IBAN	
SWIFT	
The economic operator is VAT registered (select)	YES NO
Name, family name and position of a person / persons authorised to sign the public procurement contract	
Name and title of the contact person:	
Mail address:	
E-mail address:	
Telephone number:	

Tender price:

Tender price, gross	
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Bid validity date: (at least 15 days after the bid submission deadline)

For Tenderer:

¹ Or national identification number according to the economic operator's country of establishment, if applicable

Annex 2

Practical experience verifying expertise of the Tenderer

Relevant experience of the tenderer- expert (*Name and Surname*) _____, to the coastal zone management, hydrography or hydrography-related marine monitoring/assessment in Israel:

No ² .	Experience (name of the project or other type of engagement)	Role of the expert	Year
1.			
2.			
3.			
4.			
5.			
6.			

In _____, _____ 2021

(Full name of the applicant or legal representative)

(Signature of the applicant or legal representative)

² Add rows, as necessary

Annex 3

Cost statement

Technical description and cost statement for the consultant for the preparation of the Report on the IMAP common indicator 15 "Location and extent of the habitats potentially impacted by hydrographic alterations" for Israel					
No.	Deliverable description	Unit	Approx. amount	Unit price in USD	Total USD
1.					
2.					
Tender price USD					

In _____, _____ 2021

(Full name of the applicant or legal representative)

(Signature of the applicant or legal representative)

Annex 4

Indicator guidance factsheet for the Common Indicator 15

“Location and extent of the habitats potentially impacted by hydrographic alterations”

1. Indicator guidance factsheet for the Common Indicator 15

Ecological Objective 7	Alteration of hydrographic conditions does not adversely affect coastal and marine ecosystems.	
Indicator Title	Location and extent of the habitats potentially impacted by hydrographic alterations	
Relevant GES definition	Related Operational Objective	Proposed Target(s)
Negative impacts due to new structure are minimal with no influence on the larger scale coastal and marine system.	Alterations due to permanent constructions on the coast and watersheds, marine installations and seafloor anchored structures are minimised.	Planning of new structures takes into account all possible mitigation measures in order to minimize the impact on coastal and marine ecosystem and its services integrity and cultural/historic assets. Where possible, promote ecosystem health.
Rationale		
Justification for indicator selection		
<p>After agreeing to progressively apply the ecosystem approach (EcAp) to the management of human activities in the Mediterranean at the 15th Meeting of the Contracting Parties to the Barcelona Convention (COP15, 2008), the Contracting Parties agreed, at COP17 in 2012, on an overall vision and goals for EcAp, and on 11 ecological objectives for the Mediterranean. Among these ecological objectives was the Ecological Objective 7 („Alteration of hydrographical conditions“), with its clearly outlined operational objectives and indicators. EO7 corresponds to Descriptor 7 (Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems) of the European Marine Strategy Framework Directive (MSFD).</p> <p>Ecological Objective 7 („Alteration of hydrographical conditions“) addresses permanent alterations in the hydrographical regime of currents, waves and sediments due to new large-scale developments that have the potential to alter hydrographical conditions. An agreed common indicator - 'Location and extent of habitats impacted directly by hydrographic alterations' considers marine habitats which may be affected or disturbed by changes in hydrographic conditions (currents, waves, suspended sediment loads).</p> <p>There is a clear link between EO7 and other ecological objectives, especially EO1 (Biodiversity). Such link needs to be determined on a case-by-case basis. Refer to Annex 1 for habitats to be considered in EO7. Ultimately, the assessment of impacts, including cumulative impacts, is a cross-cutting issue for EO1 and EO7.</p>		
Scientific References		
<p>EC JRC (2015). Review of Commission Decision 2010/477/EU concerning MSFD criteria for assessing good environmental status Descriptor 7: Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems</p> <p>EMEC Ltd (2005). Environmental impact assessment (EIA) guidance for developers at the European Marine Energy Centre.</p> <p>OSPAR Commission (2012). MSFD Advice document on Good environmental status - Descriptor 7: Hydrographical conditions. A living document - Version 17 January 2012.</p> <p>OSPAR Commission (2013). Report of the EIHA Common Indicator Workshop.</p>		

Ecological Objective 7	Alteration of hydrographic conditions does not adversely affect coastal and marine ecosystems.
Indicator Title	Location and extent of the habitats potentially impacted by hydrographic alterations
<p>Royal Haskoning DHV (2012). Environmental Impact Assessment (EIA) and Appropriate Assessment (AA) Evaluation of assessment tools and methods. Lot 2: Analysis of case studies of port development projects in European estuaries. Tidal Rover Development (TIDE) Interreg IVB</p> <p>Some reference and guidance documents on EIA can be found at : http://ec.europa.eu/environment/eia/eia-support.htm and in the „Guidance Document on how to reflect changes in hydrographical conditions in relevant assessments” (UNEP/MAP/PAP, 2015).</p>	
Policy Context and targets	
Policy context description	
<p>Following the COP17 agreement on an overall vision and goals for EcAp, on 11 ecological objectives, operational objectives and indicators for the Mediterranean, a six-year cyclic review process of EcAp implementation was established (EcAp MED I 2012-2015), with the next EcAp cycle set to cover 2016-2021.</p> <p>At COP18, in 2013, the targets for achieving GES of the Mediterranean Sea and its coastal zone by 2020 were adopted. In addition, through Decision IG. 21/3 (the so called "COP18 EcAp Decision") the EcAp roadmap was agreed on. The Contracting Parties also agreed to design an Integrated Monitoring and Assessment Programme (IMAP) by COP19, which would, for the first time, ensure a common assessment basis for the Mediterranean marine and coastal environment. At COP19, in 2016, the IMAP was adopted. The IMAP provides guidance to the parties on how to practically implement quantitative monitoring and assessment of the ecological status of the Mediterranean Sea and coast in line with the EcAp.</p> <p>As part of the EcAp roadmap, expert-level monitoring discussions took place in the various Correspondence Groups on Monitoring (CORMONs) meetings on Biodiversity and Fisheries; Pollution and Litter; and Coast and Hydrography sub-clusters. An Integrated Correspondence Group on Monitoring Meeting (Integrated CORMON) took place on 30 March-1 April 2015, to discuss the main elements of the Integrated Monitoring and Assessment Programme.</p> <p>As for Protocols of the Barcelona Convention relevant for the EO7, the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean calls to Contracting Parties of the Barcelona Convention for continuous monitoring of ecological processes, population dynamics, landscapes, as well as the impacts of human activities (Article 7 b). In addition, it calls to Parties to evaluate and take into consideration the possible direct or indirect, immediate or long-term impacts, including the cumulative impact of the projects and activities, on protected areas, species and their habitats (Article 17).</p> <p>Another Protocol of the Barcelona Convention, the Protocol on the Integrated Coastal Zone Management in the Mediterranean, in its Article 9, calls for Parties to minimize negative impacts on coastal ecosystems, landscapes and geomorphology, coming from infrastructure, energy facilities, ports and maritime works and structures; or where appropriate to compensate these impacts by non-financial measures. In addition, the Article 9 demands maritime activities to be conducted “in such a manner as to ensure the preservation of coastal ecosystems in conformity with the rules, standards and procedures of the relevant international conventions“.</p>	

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<p>Out of other international legislation that can be relevant for the EO7 Ecological Objective, it is essential to mention Marine Strategy Framework Directive – MSFD 2008/56/EC since EcAp's EO7 corresponds to MSFD's Descriptor 7 to large extent. The hydrographical conditions outlined under the MSFD are, to a large extent, comparable to the hydromorphological conditions referred to under the Water Framework Directive (WFD) which calls for the protection of all water resources, including coastal waters. EO7 overlaps with other policy frameworks, such as the Environmental Impact Assessment (EIA) procedure on the assessment of the environmental impacts of certain public and private projects; the Strategic Environmental Assessment (SEA) procedure on the assessment of the effects of certain plans and programs on the environment; assessments undertaken under Marine Spatial Planning (MSP); and in the context of integrated coastal zone management (ICZM).</p>	
<p>Targets</p> <p>Planning of new structures takes into account all possible mitigation measures in order to minimize the impact on coastal and marine ecosystem and its services, integrity and cultural/historic assets. Where possible, promote ecosystem health.</p>	
<p>Policy documents</p> <p>Protocol on the ICZM in the Mediterranean - http://www.pap-thecoastcentre.org/pdfs/Protocol_publicacija_May09.pdf</p> <p>Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean - http://www.rac-spa.org/sites/default/files/protocole_aspdb/protocol_eng.pdf</p> <p>MSFD Directive - http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0056&from=EN</p> <p>Other EU-related documents can be found at: http://ec.europa.eu/environment/eia/eia-support.htm</p>	
<p>Indicator analysis methods</p>	
<p>Indicator Definition</p> <p>The EO7 Common Indicator reflects location and extent of the habitats potentially impacted by the alterations and/or the circulation changes induced by them. It concerns area/habitat and the proportion of the total area/habitat where alterations of hydrographical conditions are expected to occur (estimations by modelling or semi-quantitative estimation).</p>	
<p>Methodology for indicator calculation</p> <p>Methodology used for indicator measurement encompasses elaboration on:</p> <ul style="list-style-type: none"> (i) Mapping of area where human activities may cause permanent alterations of hydrographical conditions (using i.e. existing EIA, SEA and Maritime Spatial Planning -MSP); and (ii) Mapping of habitats of interest in this area of hydrographical changes; and (iii) Intersection of the spatial map of the areas of hydrographical changes with spatial maps of habitats to determine the areas of individual habitat types that are impacted by hydrographical changes. <p><u>New structures to be considered under EO7 assessment:</u></p>	

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<p>As far as the type and dimension of structures to be taken into account: use the 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”). As an additional criterion it was agreed that all permanent structures, for which an EIA and/or a planning/building permit is required, should be considered.</p> <p><u>Hydrographical conditions to be considered:</u></p> <ul style="list-style-type: none"> • At least, waves and currents changes (can be used to assess changes in bottom shear stress, turbulence and alike). • 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. <p>Steps to assess hydrographical alterations:</p> <p>In case of insufficient data and resources and if the implementation of hydrodynamic modelling is not feasible, a simplified approach for assessing hydrographical alterations is proposed.</p> <p>Following new decision on the MSFD (Decision 2017/048/UE, May 2017), an alternative approach proposes to assess first the hydrographical alterations as a result of physical loss (permanent changes to the seabed in term of bathymetry, morphology or nature substrate) induced by the structure itself or human activities in its surroundings.</p> <p>Such approach aims to focus on:</p> <ol style="list-style-type: none"> 1. The hold of the structure (location and extend on the sea floor). In this area, the presence of the structure will definitively alter the existing habitats (physical loss). 2. Permanent changes to the seabed related to the structure and due to human activities. For instance, the creation of a port often requires the digging of basins and the dumping of materials at sea. These diggings and discharges, leading to permanent bathymetric and eventually substrate changes and modifying waves and currents propagation, will also definitively alter the existing habitats. 3. Effects of the structure on hydrographical conditions in its neighbourhood. The existence of the structure will modify the regime of currents and agitation and also the coastal transit with creation of erosion and deposition zones. For instance, in a harbour, the presence of dikes attenuates the currents and the swell inside the basins and leads to decantation of suspended material (vases, organic matter, debris plants.) inducing changes in benthic settlements. <p><u>First level of assessment: assessment of physical loss induced by the structure itself (on sea floor and in water column)</u></p> <p>The objective here is to represent by a polygon (GIS data) the exact location and extend on sea floor of the expected construction, i.e. a footprint (and not only the extent of the submerged part of the structure). These data can be taken from the construction plan of the structure that should be present in the EIA or another planning document.</p> <p>A proposal for attribute's GIS data can be found in Chapter „Expected assessment outputs“ below.</p> <p><u>Second level of assessment: assessment of permanent changes to the seabed due to human activities (related to the construction and the use of the structure)</u></p> <p>The objective here is to represent by a polygon (GIS data) the exact location and extend of dredged and disposal areas leading to permanent changes in bathymetry. These changes can happen during the</p>	

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<p>construction of the structure (digging of basins) or for its normal use (channels dredging to maintain a certain depth). Information relative to these activities can be found in the EIA or can be asked to the project manager responsible for its construction or to the structure owner.</p> <p>Third level of assessment: assessment of hydrographical changes induced by the structure in the <u>surrounding area</u> The first possibility to assess these alterations is to use the information provided by the EIA if available. Even if the EIA does not fully meet the needs of this indicator, it should at least provide some information on the main expected hydrographic changes since they may compromise the use or sustainability of the structure. For instance, in case of a port or a marina, the attenuation of agitation, being the objective, should be well studied. The same way, on a coast with strong sediment transit, the impact of the structure on erosion and sedimentation changes should be studied as they could compromise the use or the durability of the structure.</p> <p>If the EIA does not provide a sufficient level of information, other available sources of information concerning similar or close sites have to be explored: historical evolution of sediment supply, analysis of the evolution of the coastline and the seabed, analysis of the impact of existing defence structures and ports on the morphodynamics of the coastline and alike. These available data and studies are not directly applicable to assess hydrographical alterations induced by the new structure. Nevertheless, they can be used by experts to extrapolate evolution tendencies on the site of interest, thus providing a first level of characterization of expected hydrographic alterations and allowing to roughly specify their extent and location. In the case where no information can help to characterize the extent of the expected hydrographic alterations, a buffer zone proportional to the largest dimension of the structure may be used to assess this extend (eg a buffer zone of 5 times the cross-shore length of the structure). If this approach is used to assess the extend, this must be clearly said in the attribute table relative to this GIS layer (see <i>Expected assessments outputs</i>).</p> <p>For the first level of assessment, it is clear that under the hold of the structure the hydrographical conditions and the habitats will be definitively and permanently altered. On the other side, for the second and third levels of assessment, depending on the available data, the actual knowledge and the assumptions followed, there may be some degree of uncertainty in the assessment of location and extend of expected hydrographical alterations. To take into account these uncertainties and the limits of the assessments, it is proposed to notify them in the attribute table relative to these assessments (A proposal for attribute's GIS data can be found in „Expected assessment outputs“). These notifications will help to identify and subsequently improve the evaluations deemed to be the least reliable. At the end, the results of the above assessments are integrated on one single GIS layer (i.e. hydrographical alterations GIS layer). The last step of the EO7 indicator calculation consists of overlaying hydrographical alterations GIS layer with habitats GIS maps/layer. Calculations are made with GIS tools in order to define habitats potentially impacted by hydrographic alterations.</p> <p>If the assessment of hydrographic alterations presents a high level of uncertainty, a risk-based approach can be used to identify habitats that are most sensitive to expected alterations. To do this sensitivity matrix can be used (see for instance: La Rivière M. et al., 2018. <i>An assessment of French Mediterranean benthic habitats' sensitivity to physical pressures</i>. UMS PatriNat, AFB-CNRS-MNHN. Paris, 86 pp.).</p> <p>Due to the ecological importance of <i>Posidonia</i> meadows in the Mediterranean Sea and their vulnerability to coastal development, a specific paragraph for this habitat is presented.</p>	

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<p><u>Particular considerations for <i>Posidonia</i> meadows:</u></p> <p>In addition to direct impacts, induced by the structure itself, which will definitively destroy the meadow by recovery, some construction techniques and then indirect impacts, following its construction, on currents and sedimentary transport, may also alter this habitat, on areas much larger than the structure footprint.</p> <p>Indeed, the <i>Posidonia</i> is very sensitive to water turbidity, even transient. Also, during the construction of the structure, a turbid cloud can be generated (discharge at sea of fine materials). This turbid cloud will decrease the transparency of the water, and therefore photosynthesis, in the short term; it can also be deposited on the seagrass meadow that can cause smothering by hyper sedimentation. The thinnest sediments can also be resuspended during storms, thus decreasing the transparency of the water in the long term. Major seagrass meadow destructions due to these phenomena have been observed, for example, in France following the construction of the ports of Pointe Rouge in Marseille and Mouillon in Toulon.</p> <p>Moreover, the construction machines are often fixed on the bottom, for stability reasons, directly and / or by means of anchors, which has a very negative impact on the bottoms: digging holes (feet of the machines) or furrows (chains of anchors) in the <i>Posidonia oceanica</i> meadows.</p> <p>Once the structure is built, its presence can modify the sedimentary transit and induce areas of erosion and accumulation around it. These modifications will alter the equilibrium between the sedimentation rate and the vertical growth of <i>Posidonia</i>. So, if the rate of sedimentation exceeds 5-7cm / year, the vegetative points die; conversely, if this rate is zero or negative (sediment departure), the rhizomes are loosened; they are then very sensitive to breakage (hydrodynamism, anchors, trawling, etc.)</p> <p>It should also be noted that it is extremely rare for a seagrass meadow to survive in a harbor basin in the medium or long term.</p> <p>In order to avoid all these phenomena, it is therefore advisable to:</p> <ul style="list-style-type: none"> • Use materials and construction techniques that minimize the suspension of fine particles that can induce turbidity in the surrounding waters. (for example: the dumping of fine materials (diameter less than 1 mm) at sea, or of blocks mixed with fine materials, is to be excluded completely; when rockfill is installed, it is advisable to rinse the blocks of rock; geotextile protective screens must be put in place around the site to minimize turbidity induced). • Avoid the use of construction machines located at sea by favouring the use of machines lying on the ground. if it is essential to use them at sea, they must not be anchored or relied on <i>Posidonia</i> meadows. • Avoid carrying out construction work in summer, when the plant rebuilds its reserves for the following year • Build a new development at several tens of meters from the closest living <i>Posidonia</i> meadow • Avoid including <i>Posidonia</i> meadow in a port basin • Monitor the condition of the surrounding seagrass, both during and at the end of the work. <p>(These elements on <i>Posidonia</i> meadows have been taken from : Boudouresque et al., 2006, Préservation des herbiers à <i>Posidonia oceanica</i>. RAMOGE pub.: 1-202, N°ISBN 2-905540-30-3)</p>	
Indicator units	

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<ul style="list-style-type: none"> • km2 of impacted habitats • proportion (%) of the total area/habitats impacted 	
<p>List of Guidance documents and protocols available</p> <p>UNEP/MAP/PAP (2015). Guidance document on how to reflect changes in hydrographical conditions in relevant assessment (prepared by Spiteri, C.). Priority Actions Programme. Split, 2015.</p> <p>UNEP(DEPI)/MED IG.22. UNEP(DEPI)/MED IG.22/Inf.7 (2016). Draft Integrated Monitoring and Assessment Guidance</p> <p>UNEP(DEPI)/MED WG.433/1 (2017) PAP/RAC Meeting of the Ecosystem Approach Correspondence Group on Monitoring (CORMON) on Coast and Hydrography – Working Document</p> <p>Advice document on hydrographical conditions (Descriptor 7) in the context of MSFD, published by OSPAR Commission (2012);</p> <p>Scientific and technical review of the MSFD Commission Decision 2010/477/EU in relation to Descriptor 7 carried out by the EC JRC; etc.</p>	
<p>Data Confidence and uncertainties</p> <p>Data used or produced for the monitoring should be in agreement with Shared Environmental Information System (SEIS) principles. More on SEIS principles can be found in Draft Integrated Monitoring and Assessment Guidance.</p>	
<p>Methodology for monitoring, temporal and spatial scope</p>	
<p>Available Methodologies for Monitoring and Monitoring Protocols</p> <p>At this stage, there is no clear available methodology and monitoring protocols (see Known gaps and uncertainties in the Mediterranean).</p> <p>Some methodologies or protocols could be proposed, once done an inventory of existing and available data in Mediterranean Sea.</p> <p>For more details, see “Guidance document on how to reflect changes in hydrographical conditions in relevant assessments“.</p>	
<p>Available data sources</p> <p>Global marine data source at the scale of the Mediterranean Sea:</p> <ul style="list-style-type: none"> - EMODnet Central Portal (http://www.emodnet.eu/) - Mediterranean Marine Data (http://www.mediterranean-marinedata.eu/) - Copernicus, Marine environment monitoring service (http://marine.copernicus.eu/) <p>Available regional or local data sources (in each country) should be also identified.</p>	
<p>Spatial scope guidance and selection of monitoring stations</p> <p>The monitoring will focus on habitats of interest, around new permanent constructions (lasting more than 10 years) in coastal waters.</p>	

Ecological Objective 7	Alteration of hydrographic conditions does not adversely affect coastal and marine ecosystems.
Indicator Title	Location and extent of the habitats potentially impacted by hydrographic alterations
<p>The study area should depend on the footprint of the new construction considered and on the local (or regional) geographical and marine conditions. It should be large enough:</p> <ul style="list-style-type: none"> - to show all the hydrographic alterations induced by the construction, even for long term; - to follow all the habitats of interest that could be potentially impacted. <p>At first, the spatial scale (in cross-shore and long-shore directions) to be used should be about 10 to 50 times the characteristic length of the structure. Depending on the first results obtained for this area, the area should be enlarged or zoomed in around the structure.</p> <p>It should be highlighted if monitoring was performed in sensitive areas, such as marine protected areas, spawning, breeding and feeding areas and migration routes of fish, seabirds and marine mammals, since they are priority.</p>	
<p>Temporal Scope guidance</p> <p>To correctly assess changes in time on habitats induced by constructions, different monitoring timescales are proposed:</p> <ul style="list-style-type: none"> o Before construction, initial state assessment (baseline conditions): Monitoring should provide the initial hydrodynamics conditions surrounding the future construction. o During construction: monitoring should ensure that impacts due to works are limited in space and in time. o After construction, short term changes (0 to 5 years after): at least yearly up to 5 years. During this period, strong changes should happen on hydrographical, morphological and habitats conditions. The monitoring frequency should be high* enough to assess these changes. It should be annual (at the same period of year) and provide, each year, the changes in hydrodynamic conditions (assessed by comparing present and initial conditions). o After construction (5 to 10 years after): at least biennium to 10 years. Same as before with a lower* monitoring frequency as the changes should be lower. o Long term changes (10 to 15 years after construction) Same as before with a lower* monitoring frequency as the changes should be lower. <p>* The monitoring frequencies to be used in these different phases should depend on the intensity of changes in hydrographical and morphological conditions occurring on the site (case by case).</p>	
Data analysis and assessment outputs	
Statistical analysis and basis for aggregation	
<p>Expected assessments outputs</p> <p>All the outputs that came out of the monitoring (I.e. trend analysis, distribution maps, etc.) should be listed, along with source(s) where they can be found.</p> <p>The outputs to be reported are (map and GIS data):</p> <ul style="list-style-type: none"> - The area and location where the future structure will be built; - The area and location where alterations in hydrographical conditions are expected to occur and those areas where alterations are actually occurring; - The area and location of the habitats of interest potentially impacted by these alterations; - The area and location of these habitats of interest previously identified for the whole analysis unit (to assess the proportion of total habitats that are altered). 	

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For the area and location where the future structure will be built, additionally to the surface representation of the structure, some information has to be provided as attributes of the GIS layer. The following attributes are proposed:

<i>Country</i>	<i>Locality / District</i>	<i>ID of the structure</i>	<i>Role of structure</i>	<i>Type of structure</i>	<i>Materials</i>	<i>Extend on the sea floor (in m², ha or km²)</i>
<i>Specify the country</i>	<i>Specify the location of the structure</i>	<i>The ID must be unique to identify the structure. It could be a number or a numbered code using letters from the previous column</i>	<i>Harbour, coastal defense, marine energy, ...</i>	<i>Quay, groynes, wind farm,...</i>	<i>Concrete, rockfill, ...</i>	<i>Area of the structure on sea floor. The used unity has to be provided in the name of the field</i>

If the structure is composite (in terms of type, materials, ...), several GIS surface objects could be defined.

For the area and location of expected hydrographical alterations, additionally to the surface representation of these alterations, some information has to be provided as attributes of the GIS layer. The following attributes are proposed:

<i>Country</i>	<i>Locality / District</i>	<i>ID of the structure</i>	<i>Nature of expected hydrographic alterations</i>	<i>Data used</i>	<i>Method of alterations assessment</i>	<i>Level of assessment confidence</i>	<i>Extend of hydrographical alteration (in m², ha or km²)</i>
<i>Specify the country</i>	<i>Specify the location of the structure</i>	<i>The ID must be unique to identify the structure. It could be a number or a numbered</i>	<i>Waves/currents attenuation; anthropic changes of bathymetry; changes in sediment transit inducing erosion/sedimentation;</i>	<i>Data provided by EIA; dredging/disposal scheme; ...</i>	<i>Modeling; expert judgment; Analogy with similar and close site;...</i>	<i>Low/Medium/Good</i>	<i>Area of the structure on sea floor. The used unity has to be provided in the name of the field</i>

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		<i>code using letters from the previous column</i>					
<p>If different extend of hydrographical alterations can be identified (in terms of nature, intensity, ...) several GIS surface objects could be defined.</p> <p>For each GIS data layer produced, a metadata file must be added. This file must provide information on: creation date of the GIS data, GIS data author, contact information, source agency, map projection and coordinate system, scale, error, explanation of symbology and attributes, data dictionary, data restrictions, and licensing (see for instance INSPIRE Directive).</p>							
<p>Known gaps and uncertainties in the Mediterranean</p> <p>There are general difficulties, not particular to the Mediterranean context, that can be identified for this EO7:</p> <ul style="list-style-type: none"> - Lack of coherence in definitions, standard approaches in the development and application of indicators and in the assessment of impacts, together with lack of methodological standards. - Lack of knowledge and understanding on the link between physical pressures and biological impacts and on the cumulative impacts. <p>Another difficulty comes from the hydrographical alterations that EO7 indicator should assess. These alterations, around a particular coastal construction, often change in intensity, in area and indeed in time, depending on the off-shore hydrographical conditions (calm weather/extreme event; seasonality of waves height and directions; local wind conditions...) and on the morphologic history of the site (the present state is due to the succession of these different conditions). So, a work to define which hydrographical conditions and temporal scale have to be used to assess hydrographical alterations by numerical modelling must be carried out.</p> <p>Like everywhere, there is certainly a lack of physical characteristics data in the Mediterranean Sea (bathymetric data, seafloor topography, current velocity, wave exposure, turbidity, salinity, temperature, etc.), that will be the main problem to implement this indicator, in particular to define the base-line conditions. To identify these lacks, a global and clear inventory of existing and available data in Mediterranean Sea should be done.</p> <p>Nevertheless, data can be collected from regional models (bathymetry, hydrodynamics, salinity, temperature). These data with coarse resolution will need to be refined close to the location of the new structure.</p> <p>In case of no sufficient data, the use of assessment methods needing less data (empirical formulae, expert judgment, comparison with similar sites) should be considered, as well as acquisition/monitoring of missing data, promoting regional cooperation.</p>							
Contacts and version Date							
Key contacts within UNEP for further information							