



Mediterranean Action Plan
Barcelona Convention



Gaps and difficulties relative to EO7 indicator assessment

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Main principles of E07 indicator assessment

E07 indicator: *Location and extent of the habitats impacted directly by hydrographical alterations*

- 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 hydrographical alterations
 - By crossing hydrographical alterations and habitat maps



(1) 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.

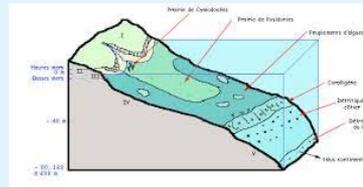
- Cross-shore structures on locations with long-shore sediment transit can induce strong changes in coast morphology.
- Water outlet can be small in size but deliver important fresh water volume.



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

Proposal

- 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...



(2) 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



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

Proposal: 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.



(3) 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.



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

Proposal: 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



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

Proposal: The base-line hydrodynamic conditions are defined by:

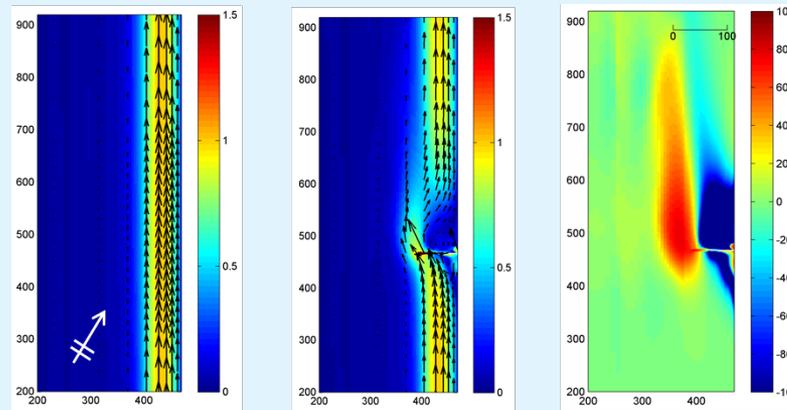
- For sandy/with sediment transit sites: quantitative assessment of sediment transport rate and turbidity, actual evolution tendencies (stability, erosion, accretion of the coast) and rate of change (ex: coast retreat of x meter/year).
- Temperature and salinity actual conditions if the new structure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



(4) 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 %)

(4) 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.



(5) 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.**



(5) 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...



(6) 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



(7) Data required relative to EO1 Biodiversity (1/1)

Proposal: 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



Conclusion

Several gaps and difficulties have been identified relatively to EO7 indicator assessment.

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.



Thank you



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