

Challenges for the marine environment in the Mediterranean. A possible approach: the European Marine Strategy Framework Directive

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Abstract

The Mediterranean is a semi enclosed sea considered as a hot-spot for biodiversity. Its ecosystems are subjected to strong pressures due to human activities and climate change. An ecosystem approach is needed to address these challenges. The European Marine Strategy Framework Directive (MSFD) which aims to achieve good environmental status by 2015 is part of this logic. The MSFD concerns a wide range of descriptors including physical, chemical and biological parameters in order to assess the status and the various forcing exerted on ecosystems. In the Mediterranean Sea, an added challenge is to establish with non-European countries a shared view at the scale of eco-regions.

Résumé

La Méditerranée est une mer semi fermée aux caractéristiques particulières. Dotée d'une biodiversité très riche, ses écosystèmes sont soumis aux pressions importantes exercées par les activités humaines et le changement climatique. Une approche écosystémique est nécessaire pour affronter ces défis. La Directive Cadre européenne sur la Stratégie Marine (DCSM) s'inscrit dans cette logique et propose une démarche visant à atteindre le bon état écologique du milieu marin à l'horizon 2015. La DCSM s'appuie sur un panel élargi de descripteurs concernant des paramètres physiques, chimiques et biologiques et permettant de caractériser l'état et les pressions sur les écosystèmes. En Méditerranée, un enjeu est d'établir à l'échelle des écorégions une vision partagée avec les pays non européens.

Of all the waters that border European coasts, the Mediterranean is a particular sea with very specific characteristics. It is almost completely landlocked and acts as a concentration basin fed by Atlantic and Black Sea surface water. Twenty-one countries have a coastline on the Mediterranean Sea (400 million inhabitants). Its nutrient-poor waters are home to a wide range of species, approximately 30% of which are endemic. With shorter cycles (the water body is renewed in a few decades compared to a few centuries for the world's oceans), the Mediterranean is

used as a veritable laboratory for the observation of major trends affecting the marine environment under the effect of anthropogenic and climate forcing. The Mediterranean Sea is subject to a high level of pressure in connection to human activity resulting from increases in coastal populations, maritime traffic, tourism and the development of industrialization. This increasing pressure results in the destruction and deterioration of coastal habitats, over-use of certain marine resources, an increase in accidental and chronic pollution (urban wastewater, industrial waste, refuse, pesticides, new chemical contaminants, etc.), and the introduction of alien species. The decline of coastal Mediterranean ecosystems is a significant risk for the services they perform for populations of riparian countries. Sustainably preserving the Mediterranean's capacity to provide such services requires an overall approach. Transport via ocean currents, exchanges through the atmosphere and migrating species all create interactions which make the impact of these disruptions to ecosystems felt across the entire basin.

To meet these challenges, scientific and technical projects should be conducted on a Mediterranean scale with a view to making progress in our knowledge of how its ecosystems operate, to attempting to anticipate its reactions to anthropogenic disturbances and ultimately to contributing to management, protection and restoration measures for natural marine areas. This approach is consistent with the Barcelona Convention and Horizon 2020, and specifically with the European strategy to protect the Mediterranean. It is necessary to curb and control pressure on the environment. Dialogue and coordination between players and the use of shared methodologies and homogenous databases play a key role in achieving this.

To reach that objective of protecting and preserving marine ecosystems, the European Commission has recently – in 2008 - adopted the Marine Strategy Framework Directive (MSFD, [1]), which applies to European Countries, is not limited to coastal waters and concerns offshore marine ecosystems. The MSFD follows the European Water Framework Directive or (WFD, [2]) from 2000 which aims to achieve by 2015 a "good ecological status" of inland and coastal waters. WFD concerns marine waters for a coastal strip of 1 nautical mile wide (except in respect of chemical status for which it concerns territorial waters) and has made mandatory the setting up of monitoring and control programs taking into account physicochemical, biological (phytoplankton and phycotoxins, benthos) parameters as well as chemical contaminants (list of 33 priority substances).

The main objective of the Marine Strategy Framework Directive is to achieve or maintain good environmental status of the marine environment no later than 2020. The waters under the jurisdiction of European states (except overseas) are concerned. Marine regions and sub-regions to be considered homogeneously are defined. And so in the Mediterranean Sea, four sub-regions were identified: the western Mediterranean, Adriatic, Ionian Sea, and Aegean Sea. An ecosystem approach is recommended taking into account the watersheds and socio-economic factors. Given this directive is very new, work on its implementation is just beginning. But a program to monitor environmental conditions and pressure has to

be defined by 2015. The MSFD concerns a wide range of parameters. Descriptors selected for determining good environmental status are:

1. Biological diversity, quality of habitats
2. Levels of non-indigenous species introduced by human activities
3. Status of populations of commercially exploited fish and shellfish
4. Marine food webs
5. Human-induced eutrophication (harmful alga blooms, impacts on ecosystems)
6. Sea-floor integrity and benthic ecosystems
7. Permanent alteration of hydrographical conditions, effect on marine ecosystems
8. Concentrations of contaminants
9. Contaminants in fish and other seafood for human consumption
10. Properties and quantities of marine litter
11. Introduction of energy, including underwater noise in the marine environment.

Further work will be necessary to properly define relevant indicators and value them. To reach the aim of assessing the status of marine ecosystems in a meaningful way, it is obvious that it will be difficult to carry out these tasks without a good knowledge of the functioning of the ecosystems. Another important point in the Mediterranean region, in line with the Barcelona Convention, is to think at the eco-region level and therefore to define a strategy involving non-European countries in the process of implementing the MSFD.

REFERENCES

[1] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

[2] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

