STATE OF THE MEDITERRANEAN MARINE AND COASTAL ENVIRONMENT

2012

HIGHLIGHTS FOR POLICY MAKERS



UNEP

MAP

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The Mediterranean Sea is complex in its ecology and its social dimensions. Twenty-one countries border the basin of this heavily used and highly valued sea. The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) provides a critical framework for setting standards and targets acceptable to all the Contracting Parties, as well as for sharing necessary information. As Contracting Parties to the Barcelona Convention, the Mediterranean countries, together with the European Union, are determined to meet the challenges of protecting the marine and coastal environment of the Mediterranean while boosting regional and national plans to achieve sustainable development.

The main objective of the Barcelona Convention, its protocols and strategies, is to effect real changes that will improve the environment in the Mediterranean Sea area. To achieve that objective, it is essential to determine whether progress is being made and to identify where better performance is needed.

STATE OF THE MEDITERRANEAN ENVIRONMENT REPORTING

Under Article 26 of the Barcelona Convention, the Contracting Parties have committed themselves to report to the Secretariat on legal, administrative, or other measures undertaken by them to implement the Barcelona Convention and its Protocols, as well as on the effectiveness of these measures and the problems encountered. In addition, the Contracting Parties agreed, under Article 15, to provide public access to information on the State of the Environment in fields where the Barcelona Convention and its Protocols apply. In addition, in 2008 the Contracting Parties to the Barcelona Convention asked the Secretariat to periodically report on the state of the environment.

This reporting process should provide information about trends in the Mediterranean environment and serve as feedback to improve the effectiveness of work undertaken within the framework of the Mediterranean Action Plan (UNEP/MAP) – Barcelona Convention. The information collected, combined with data derived from other regional initiatives provides a foundation for assessing the state of the environment in the Mediterranean basin.

The ultimate goal for state of the environment reporting in the Mediterranean is to move towards a report-once approach, in which data are collected according to mutually agreed standards so that they can be used for multiple purposes, including national needs, requirements of other conventions, needs of other policy frameworks such as the European Union and more.

Over the years, several efforts have been made to provide systematic information on the state of the environment and development in the Mediterranean, the latest one in 2009.

These reports, which focus on fields of activity and thematic areas falling within the scope of MAP, contain a wealth of information that has contributed to greater awareness of environmental issues in the region.

FINDINGS OF THE INITIAL INTEGRATED ASSESSMENT OF THE MEDITERRANEAN ECOSYSTEM

The **Ecosystem Approach** goes beyond examining single issues, species, or ecosystem functions in isolation. Instead, it recognizes ecological systems for what they are: rich mixes of elements that interact with each other continuously. This understanding is particularly important for coasts and seas, where the nature of water keeps systems and functions connected. The barriers that limit the distribution of living organisms are gradual and shift over time at a much faster pace than in terrestrial ecosystems. A commercially valuable fish species may depend on a range of widely separated habitats over its lifespan, depending on whether it is young or adult, feeding, spawning, or migrating. This is only one example of how human well-being and economies are inextricably linked to healthy natural habitats that retain the capacity to deliver essential functions.

Since July 2008, the Contracting Parties to the Barcelona Convention have been committed to progressively apply the Ecosystem Approach to manage human activities with the goal of effecting real change in the Mediterranean environment. As part of that effort, the Contracting Parties have laid the groundwork for formulating policy that addresses priority issues and improves understanding of management needs.

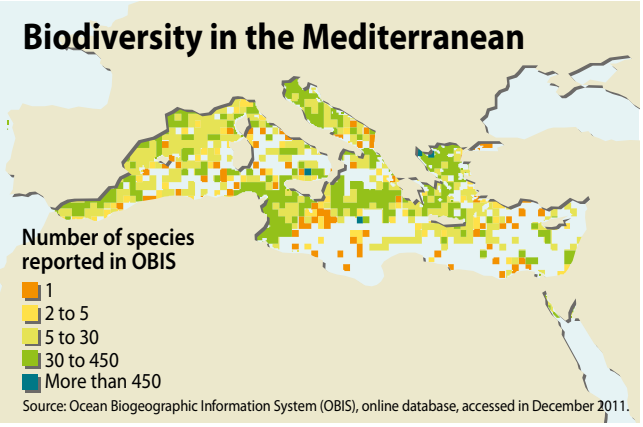
The Ecosystem Approach process provides a road-map for the future. The vision and the strategic goals of the ecosystem approach were agreed by Contracting Parties in 2008. Since then, an in-depth assessment to determine priority issues, the ecological objectives and indicators have been agreed upon by Contracting Parties. The next steps will be to further define concrete and targets associated with these Ecological Objectives and indicators, and to develop Good Environmental Status for the Mediterranean. Finally these will form the basis for the development of a monitoring strategy and the elaboration of specific management plans and actions that will ensure that ecological objectives and strategic goals are met, moving the Mediterranean countries effectively towards their vision for marine and coastal management.

Vision

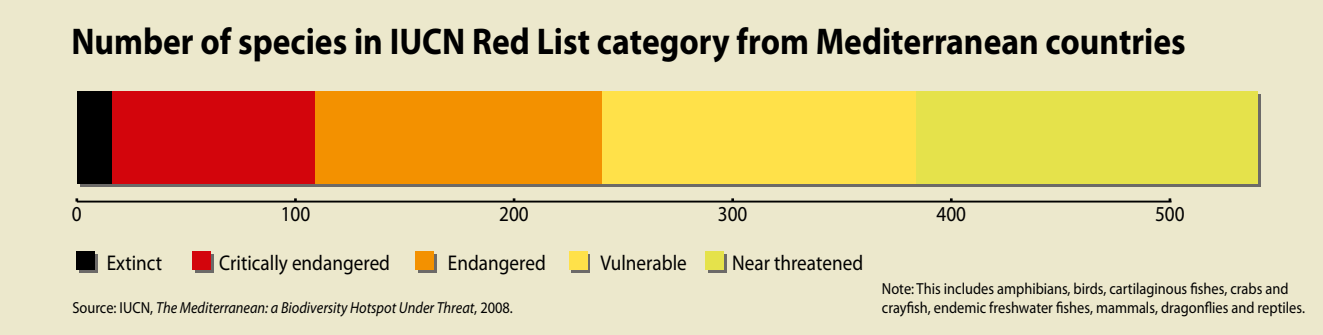
"A healthy Mediterranean with marine and coastal ecosystems that are productive and biologically diverse for the benefit of present and future generations"

Strategic goals

- To protect, allow recovery and, where practicable, restore the structure and function of marine and coastal ecosystems thus also protecting biodiversity, in order to achieve and maintain good ecological status and allow for their sustainable use.
- To reduce pollution in the marine and coastal environment so as to minimize impacts on and risks to human and/or ecosystem health and/or uses of the sea and the coasts.
- To prevent, reduce and manage the vulnerability of the sea and the coasts to risks induced by human activities and natural events.



The UNEP/MAP Barcelona Convention Initial Integrated Assessment was completed in 2011. It contains information on the overall nature of ecosystems in the Mediterranean, including physical and ecological characteristics, pressures that affect the state of the marine environment, conditions or state of the coastal and marine ecosystems, and expected response of ecosystems if trends continue. The goals of the Initial Integrated Assessment are to define the major basin-wide priority issues and to determine where adequate information to support management already exists or is being gathered. The Initial Integrated Assessment also identifies knowledge gaps in order to guide scientific research and monitoring efforts by Mediterranean countries.



The major findings of the Initial Integrated Assessment are:

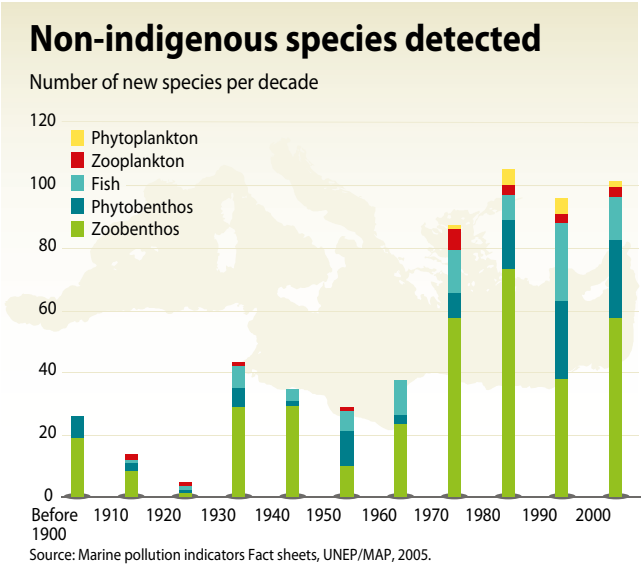
1. Coastal and marine habitats deliver valuable ecosystem services of benefit to all inhabitants of the Mediterranean. A wide range of natural habitats like rocky bottoms and seagrass meadows provide these services. For some services, such as fisheries resources and tourism, economic values are relatively easy to ascertain. Other valuable services provided by Mediterranean ecosystems are waste assimilation, transport, buffering the land from storms, and maintaining the ecological balances that make life on Earth possible.

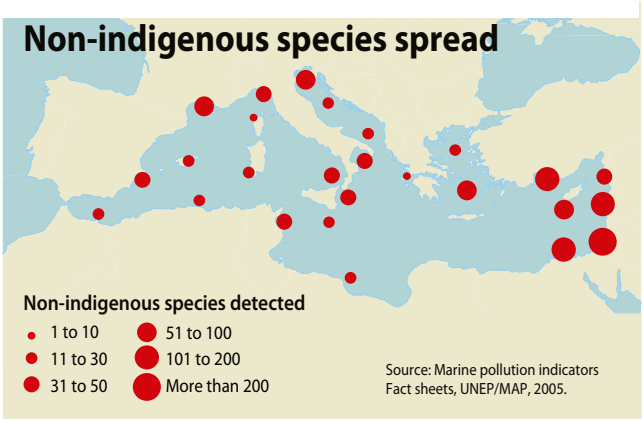
2. Despite compelling evidence of the importance of services delivered by Mediterranean coastal and marine systems, the Initial Integrated Assessment reveals that ecosystem degradation continues. The pressures and impacts, which vary in severity from region to region, include:

- **coastal development and sprawl**, driven by urbanization and tourism development, leading to habitat loss and degradation, and erosion/shoreline destabilization;
- **overfishing**, and incidental or by-catch, affecting community structure, ecological processes, and delivery of ecosystem services;
- **destructive fishing**, including bottom trawling and other fishing methods that result in benthic disturbance;
- **contamination** of sediments and biota caused by pollution, primarily from urbanization and industry, but also from antifoulants and atmospheric inputs of hazardous compounds;
- **nutrient over-enrichment**, leading sometimes to eutrophication and hypoxia, but more regularly to ecological imbalances (reduced water quality and growth of algae);
- **disturbance and pollution caused by maritime industries**, including fisheries, shipping, energy, aquaculture, and desalination (operational as well as accident-related);
- **invasive species** spread, in many cases mediated by climate change; and,
- **degradation of transitional or estuarine areas**, which serve as critical nursery areas for commercial fisheries and also support unique assemblages of species.

3. Changes in conditions are apparent from 5 years ago:

- Improvements in water quality are discernible in many places, thanks to strategic efforts to reduce pollutant loading. Quantities of hazardous substances such as DDT and heavy metals are declining in most areas.



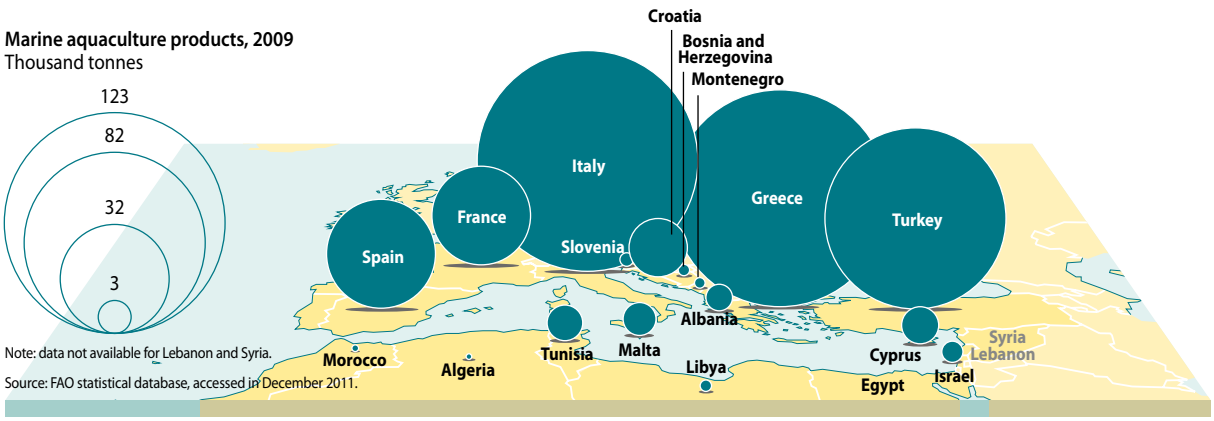


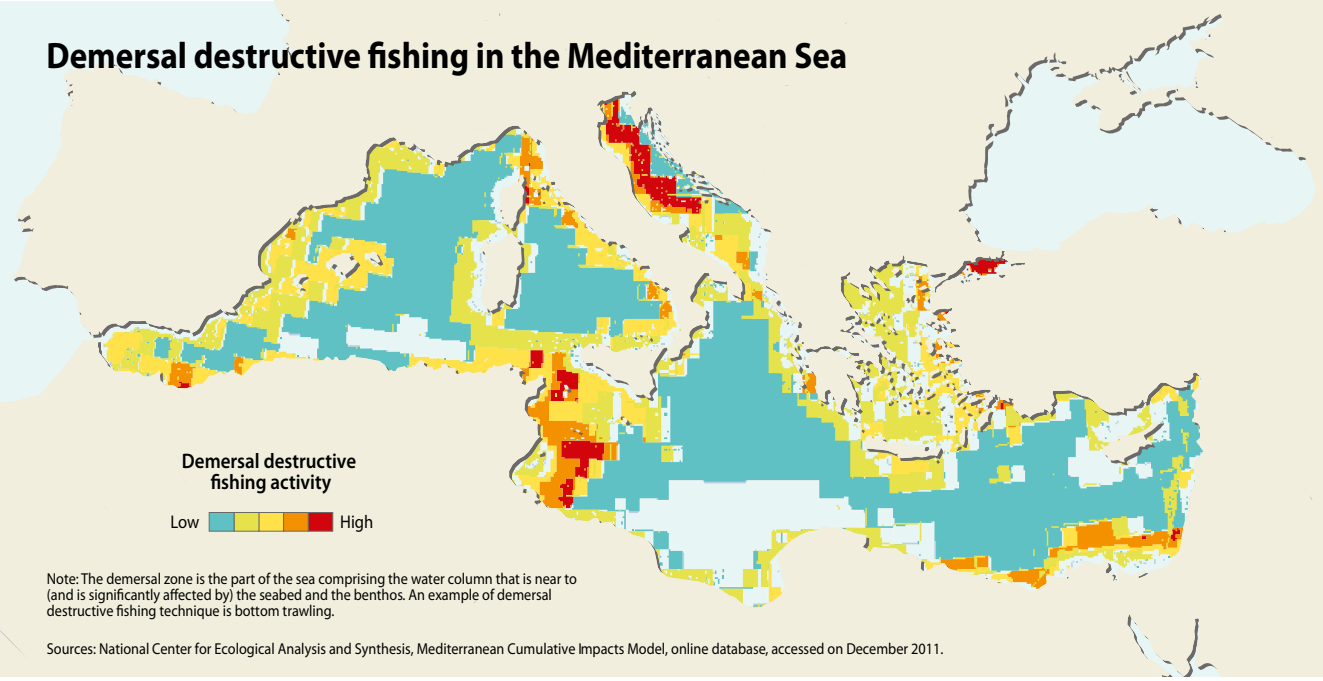
- New issues are emerging which warrant attention:
  - desalination and its effects;
  - aquaculture, including the grow out operations for bluefin tuna; and,
  - cumulative risks due to reduced access and availability of space for multiple conflictive uses.

4. There are significant gaps in data and information:

- the gap concerning the ability to uniformly assess pressures and states, in order to formulate responses;
- the limited knowledge of drivers of change in ecosystems; and,
- the strong bias towards understanding the ecology and human impacts on shallow water environments, particularly rocky bottoms and intertidal areas, as well as seagrass meadows.

Marine aquaculture in the Mediterranean and Black seas



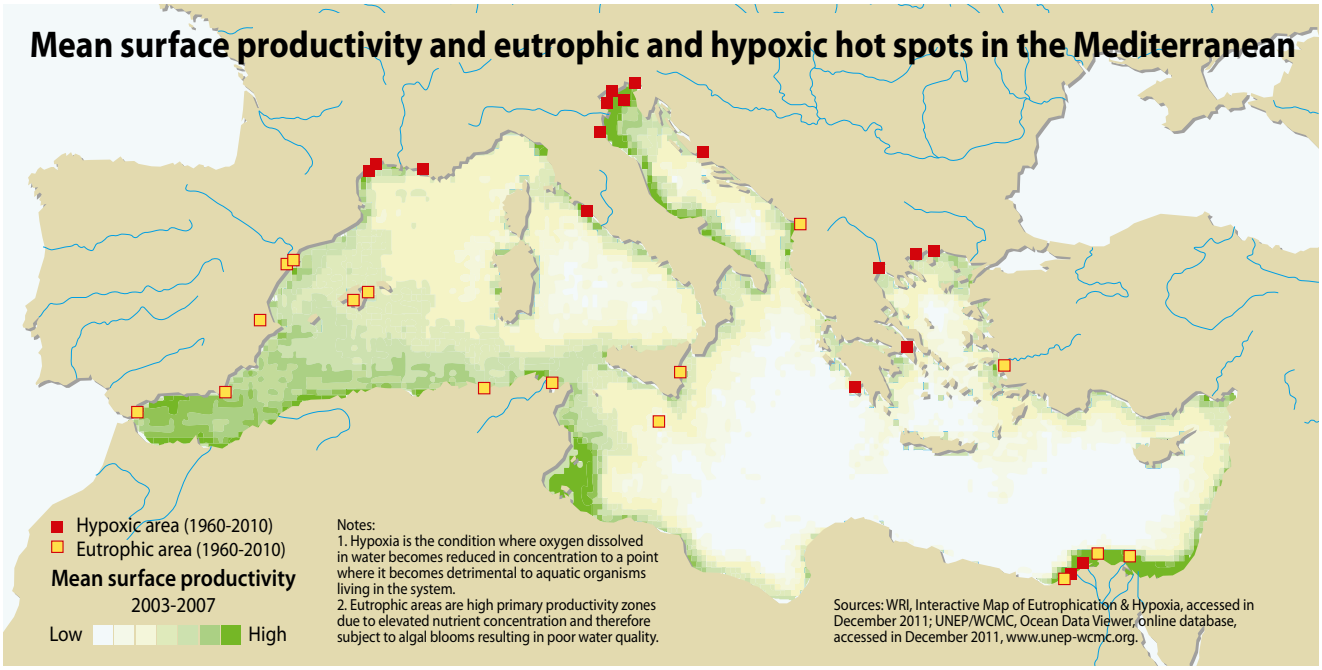


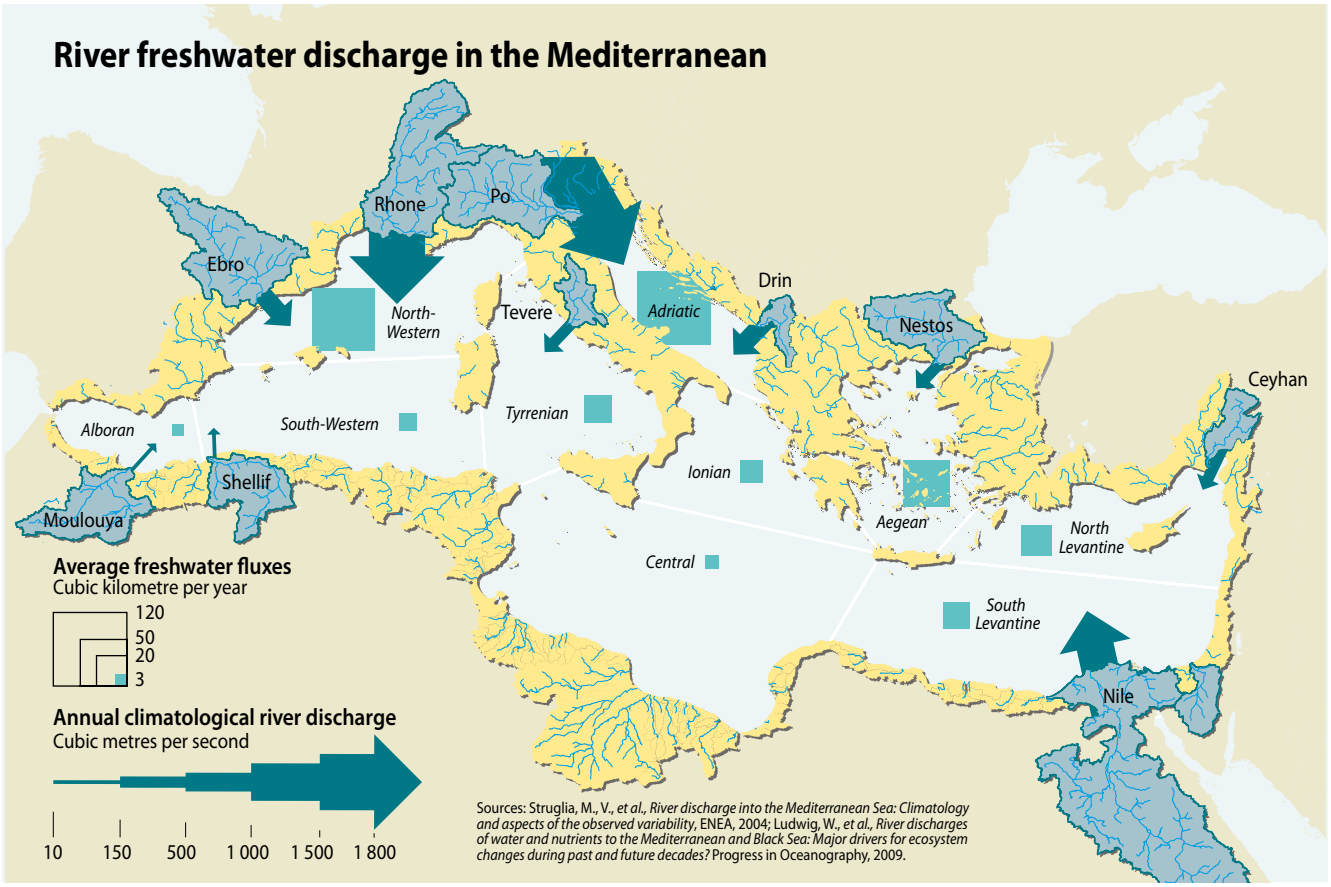
Additionally, the Initial Integrated Assessment provides information on ecologically important, biologically diverse, or vulnerable areas, and the potential biodiversity loss that is a priority issue across the Mediterranean region.

During 2011 – as information from the Initial Integrated Assessment became available – the Contracting Parties to the Barcelona Convention developed a set of ecological objectives, operational objectives, and indicators, which reflect Mediterranean priorities and are coherent with the European Union's Marine Strategy Framework Directive. Ecological objectives were defined through an intensive process of consultation led by the UNEP/MAP Secretariat fully owned by the Contracting Parties and with participation of MAP Partners and technical experts.

As a result, an adaptive and integrated strategy for the implementation of the Ecosystems Approach in the Mediterranean will aim to achieve the following **ecological objectives**:

- **Biological diversity** is maintained or enhanced. The quality and occurrence of coastal and marine habitats and the distribution and abundance of coastal and marine species are in line with prevailing physiographic, hydrographic, geographic, and climatic conditions.
- **Non-indigenous species** introduced by human activities are at levels that do not adversely alter the ecosystem.
- Populations of select **commercially exploited fish and shellfish** are within biologically safe limits, exhibiting a population age and size distribution that is indicative of a healthy stock.
- Alterations to components of **marine food webs** caused by resource extraction or human-induced environmental changes do not have long-term adverse effects on food web dynamics and related viability.
- Human-induced **eutrophication** is prevented, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algal blooms, and oxygen deficiency in bottom waters.

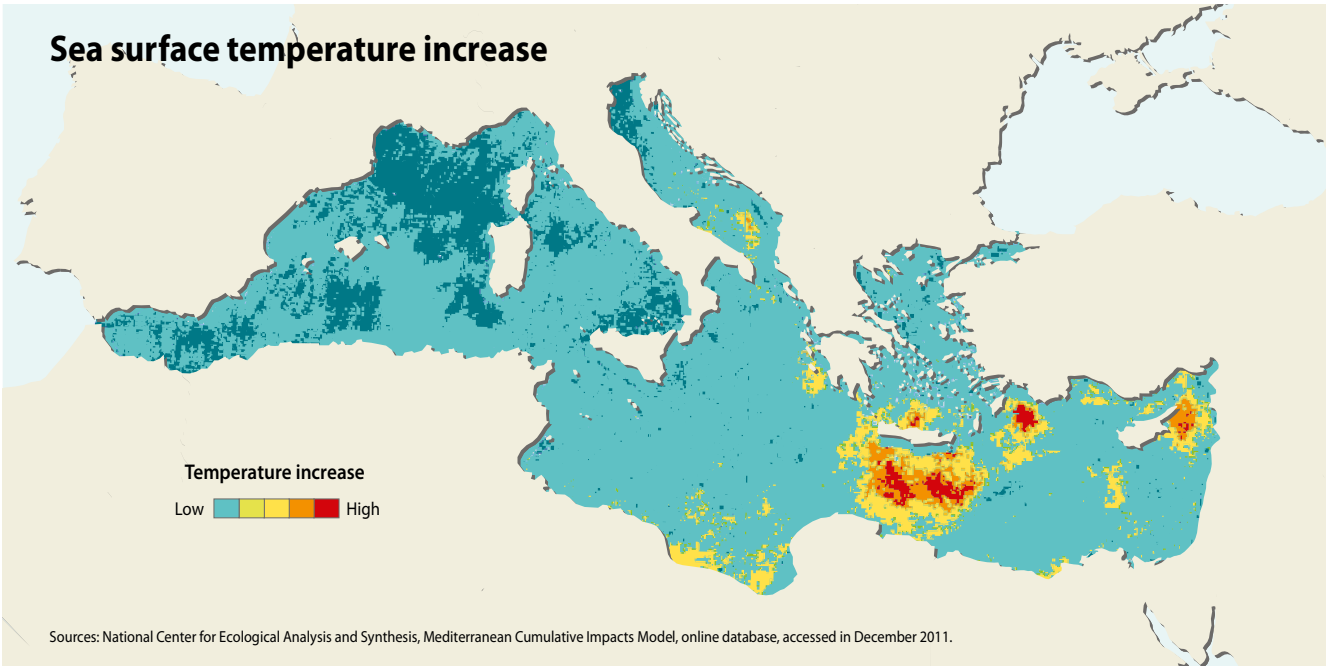




- **Sea-floor integrity** is maintained, especially in priority benthic habitats.
- Alteration of **hydrographic conditions** does not adversely affect coastal and marine ecosystems.
- The **natural dynamics of coastal areas** are maintained and coastal ecosystems and landscapes are preserved.
- **Contaminants** cause no significant impact on coastal and marine ecosystems and human health.
- **Marine and coastal litter** does not adversely affect coastal and marine environments.
- **Noise** from human activities causes no significant impact on marine and coastal ecosystems.

Recommendations for proceeding to the next steps on the Ecosystem Approach roadmap will focus on two types of policies:

- sectoral policies that can flow from priorities established through the Ecosystem Approach process, focusing in particular on the Ecological Objectives agreed to by the Parties; and,
- policies that will establish a systematic, comprehensive, holistic, and efficient regime for monitoring the state of the Mediterranean environment and environmental trends in a way that will support science-based decision making.



STATE OF THE MEDITERRANEAN MARINE AND COASTAL ENVIRONMENT – 2012

MAP's ecological objectives were broadly discussed and agreed on by the Contracting Parties and developed in concert with other regional marine assessment and management efforts. They provide a solid foundation for the next State of the Mediterranean Marine and Coastal Environment Report (Med SoER).

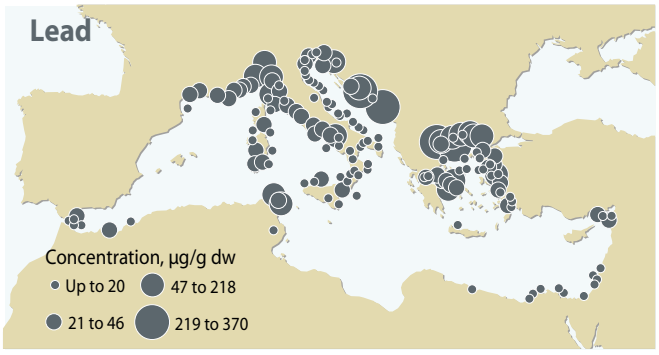
The main source of information for the Med SoER is the Initial Integrated Assessment. The Contracting Parties provided snapshot and trend information for the Initial Integrated Assessment on the physical, chemical, and biological features of the Mediterranean Sea. The report compiles and summarizes an abundance of scientific information on Mediterranean sub-regions.

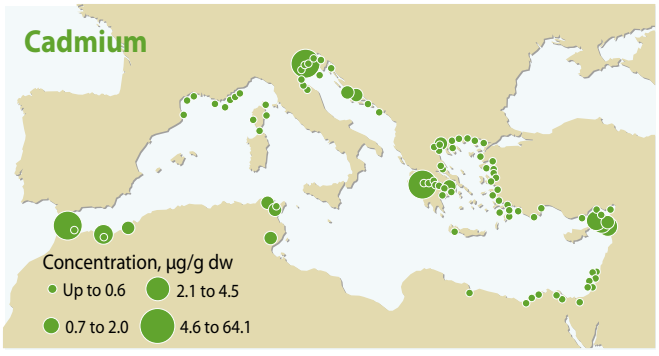
The Initial Integrated Assessment has been prepared under the auspices of UNEP/MAP led by the Coordinating Unit and with the active participation of MAP components, particularly MEDPOL, SPA/RAC and BP/RAC, who carried out the sectoral regional and sub-regional reports on which the Assessment is based. It also benefited from the contributions of regional and national consultants, and was revised by country-designated experts, commented on by countries' officials, and peer-reviewed by the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP). It will be published by UNEP/MAP and distributed widely.

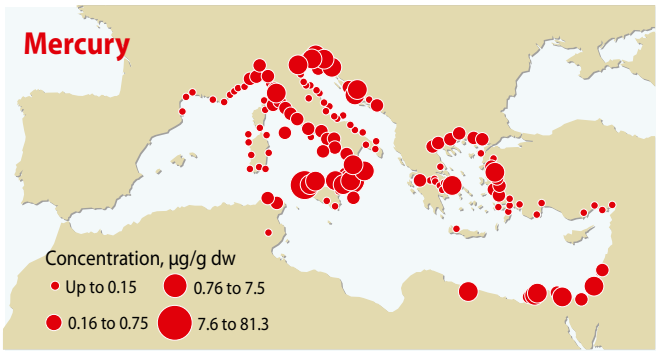
Goals have been set according to UNEP's Guidelines for the Preparation of National Report on the State of the Marine En-

Mean concentrations of trace metals

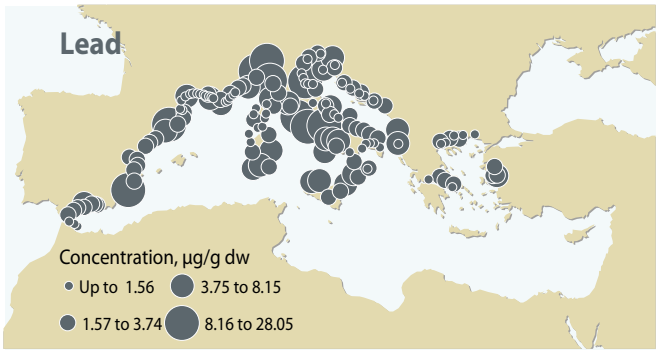
In sediments

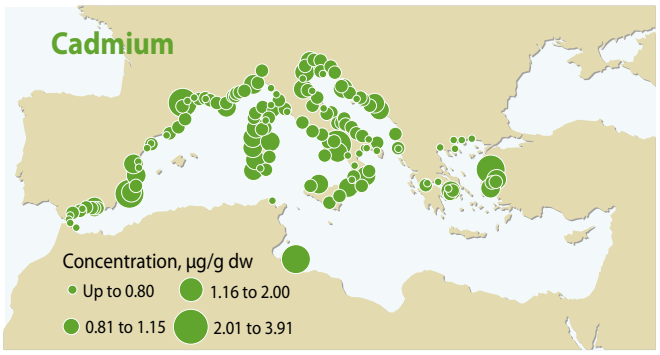


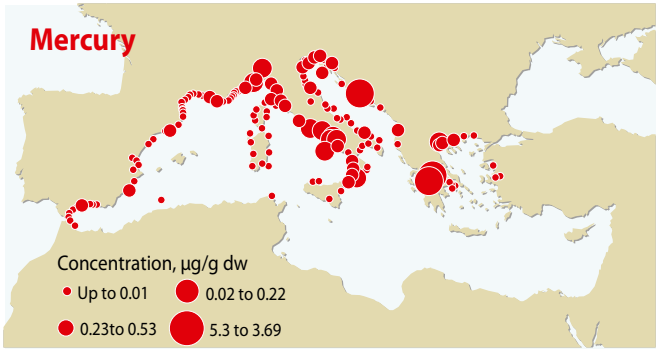




In Blue Mussels (*Mytilus galloprovincialis*)

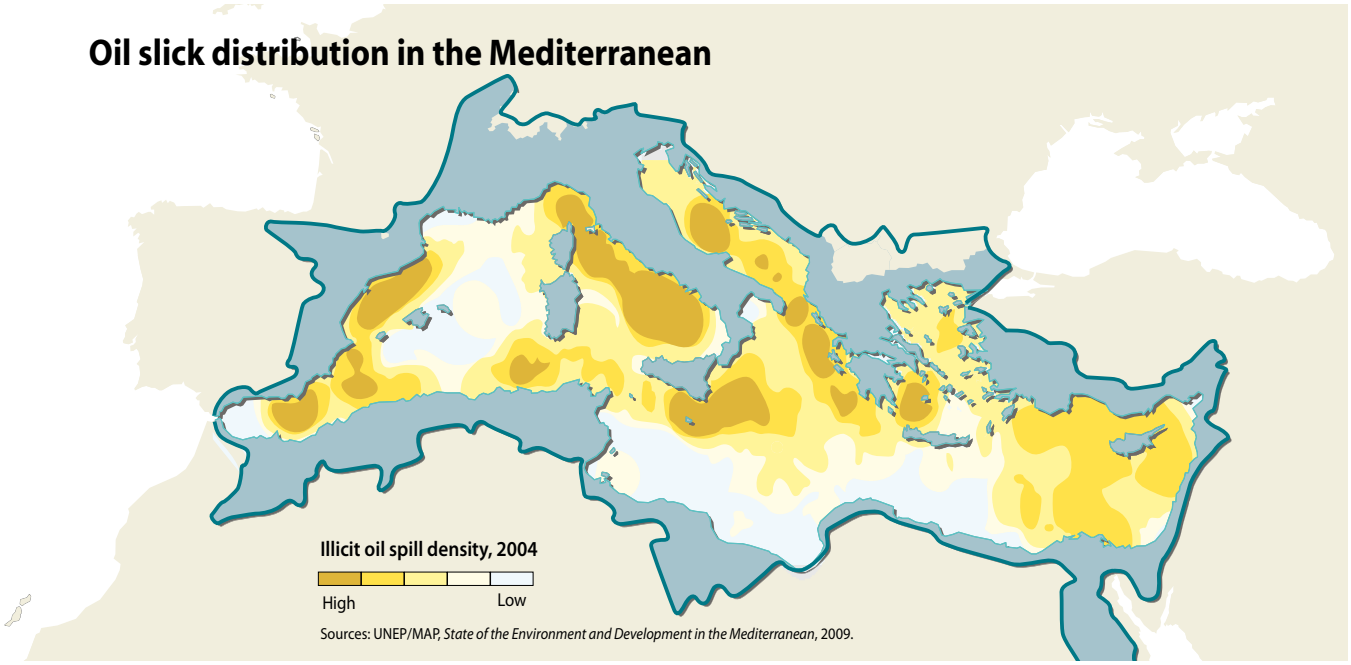






Note: Information is only shown where concentration measurements were reported by the coastal States.

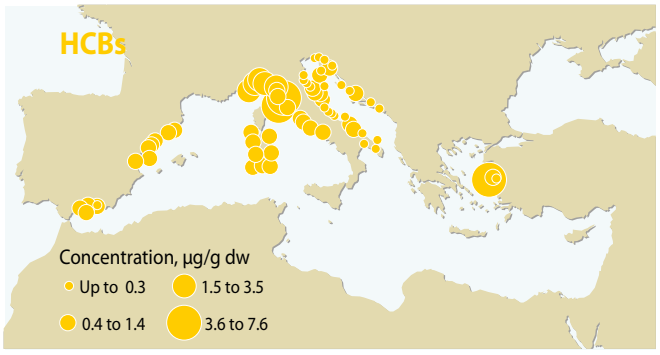
Oil slick distribution in the Mediterranean

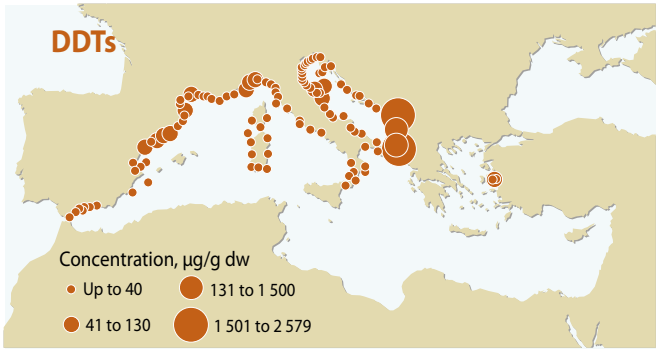


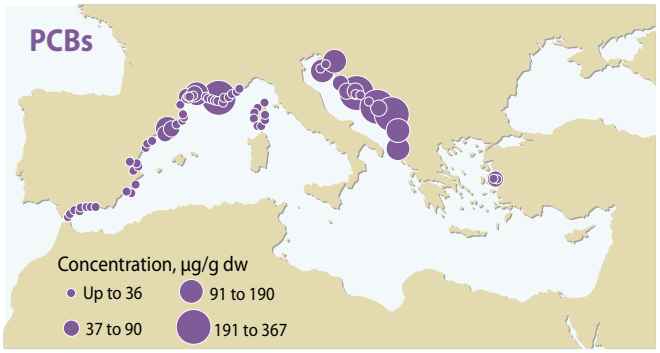
Sources: UNEP/MAP, *State of the Environment and Development in the Mediterranean*, 2009.

Mean concentrations of Persistent Organic Pollutants (POPs)

In Blue Mussels (*Mytilus galloprovincialis*)







Source: *Hazardous substances in the Mediterranean: A spatial and temporal assessment*, UNEP/MAP-MEDPOL, 2011.

vironment and taking into consideration the specific circumstances of the Mediterranean. They are:

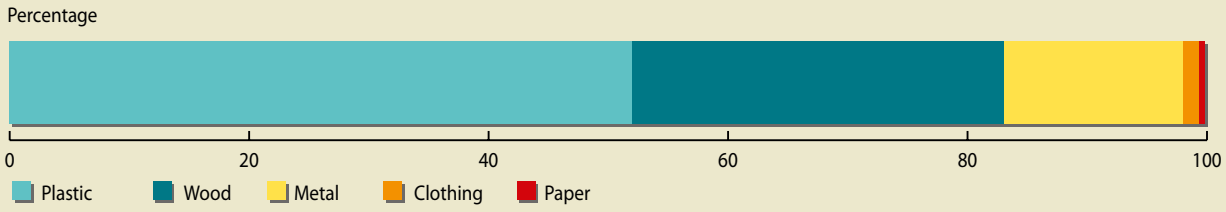
- to present the current picture of drivers, pressures, and state of marine and coastal Mediterranean environments, with an emphasis on recent changes in environmental conditions and an overview of the impacts of human activities;
- to highlight regional concerns and emerging issues that present major challenges, as identified by Mediterranean countries and UNEP/MAP; and,
- to depict future avenues for continued application of the Ecosystem Approach to the management of human activities that may affect the Mediterranean environment, in order to meet these challenges at the national level as well as in regional and global contexts.

The Driver-Pressure-State-Impact-Response framework is reflected in the organization of the report, with:

- an introduction that provides an overall idea of the major drivers (any natural or human-induced factor that directly or indirectly causes a change in an ecosystem) in the Mediterranean region, together with some background characterization of the Mediterranean Basin;
- a section focusing on the major pressures;
- a section on the state of the major ecological characteristics of the Mediterranean; and,
- a final part devoted to highlighting the major findings on the state of the marine and coastal environment, analyzing the major information gaps, and discussing future avenues for application of the Ecosystem Approach.

The report emphasizes the first three elements of the Driver-Pressure-State-Impact-Response framework, based on information collected for the IIA about the state of the Mediterranean marine environment and the pressures on it. This focus on drivers, pressures, and state lays the groundwork for further application of the Ecosystem Approach. It provides a

Major types of marine litter in the Mediterranean



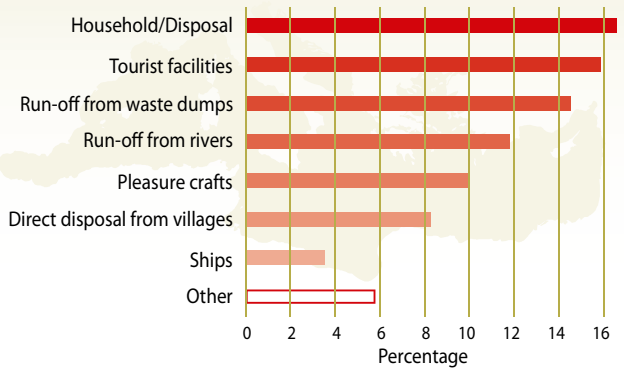
Source:UNEP/MAP, MEDPOL, *Assessment of the Status of Marine Litter in the Mediterranean*, 2011.

comprehensive, accessible reference for use in defining Good Ecological Status and establishing targets. The process of establishing targets and associated implementation plans will entail thorough consideration of environmental and socio-economic impacts of human activity, as well as analysis of the efficacy of past and ongoing responses to these impacts. The results of these analyses of impacts and responses will be built into future iterations of Med SoER.

Feeding the results of Ecosystem Approach monitoring into reporting on the state of the coastal and marine environment will benefit both processes. Systematic and regular reporting on the ecological objectives imposed by the cyclical character of the Ecosystem Approach:

- stimulates research on the impacts of specific pressures;
- provides analysis of trends for evaluation of management responses;
- ensures that future recommendations flowing from State of Environment reports will be oriented towards management; and,

Sources of marine litter



Source: UNEP/MAP - BP/RAC, 2009.

- contributes to the report-once approach, fulfilling the internal reporting obligations of the States towards the Barcelona Convention and its Protocols and programmes, as well as towards other frameworks (e.g., European Union's Marine Strategy Framework Directive).

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