

# UNEP-MAP and its Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean: Indicators

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# The Mediterranean Action Plan and Barcelona Convention: Adopted in 1976, revised in 1995

Four major pillars:

- ✓ Marine & Coastal Environment and Sustainable Development;
- ✓ Barcelona Convention and 7 Protocols,
- ✓ Mediterranean Trust Fund (MTF),
- ✓ Institutional set up: Contracting Parties bodies & Secretariat + Regional Activity Centers (RACs)

## 22 Contracting Parties

- ✓ Morocco, Algeria, Tunisia, Libya, Egypt, Israel, Lebanon, Syria, Turkey, Cyprus, Greece, Albania, Montenegro, Croatia, Bosnia and Herzegovina, Slovenia, Italy, Malta, Monaco, France, Spain and the European Union.

# Status of Ratifications of the Barcelona Convention and its Protocols



# UNEP/MAP and its Regional Activity Centers (RACs)

UNEP/MAP Secretariat, Athens Greece & the  
Program on Pollution (MEDPOL)

Priority Actions Program (PAP/RAC): Coastal  
Zone Management, Croatia, Split

Sustainable Consumption & Production  
(SCP/RAC), Barcelona, Spain

Plan Bleu: Sustainable Development, Sophia-  
Antipolis, France

Specially Protected Areas (RAC/SPA), Tunis,  
Tunisia

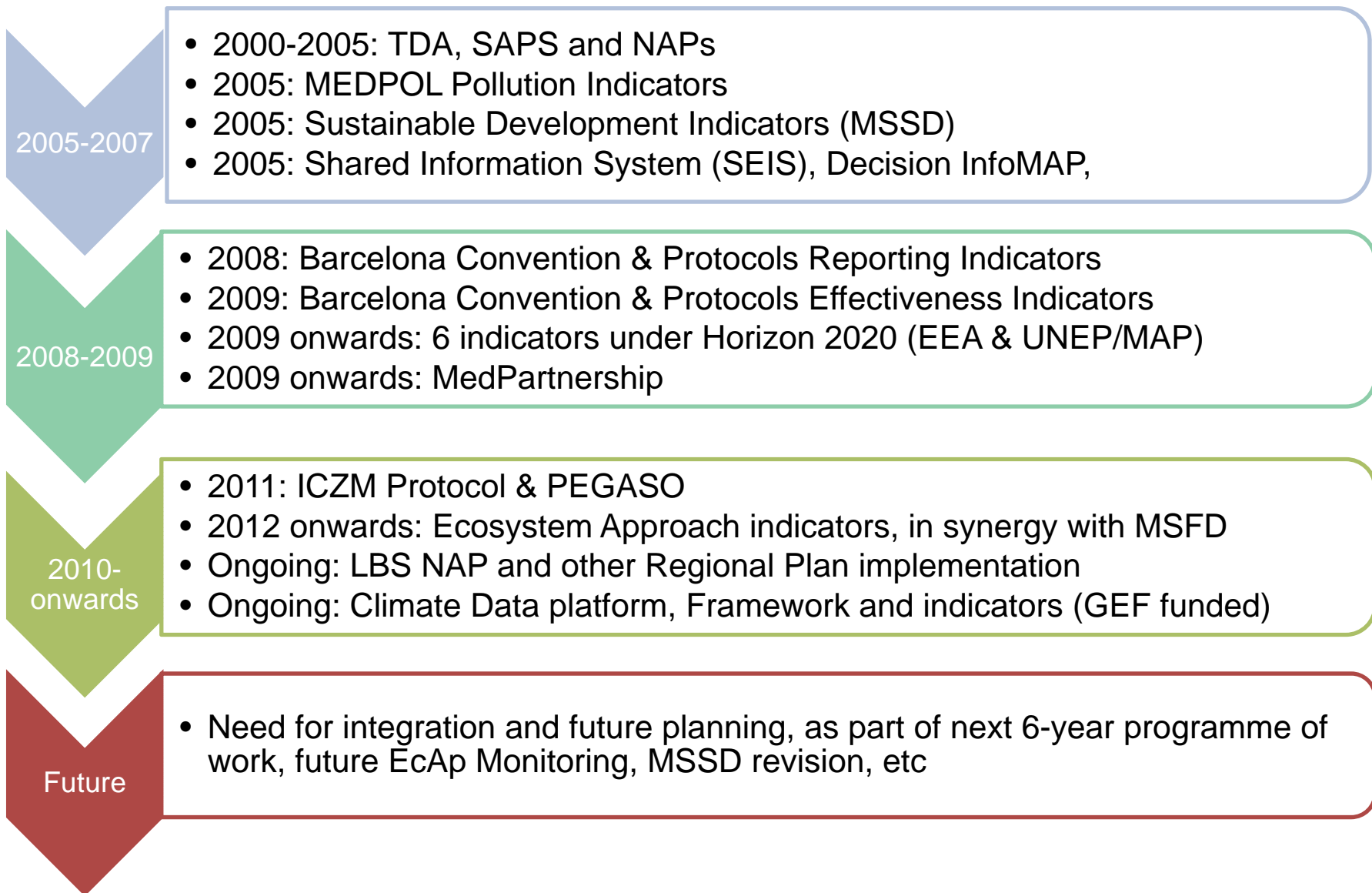
Regional Marine Pollution Emergency Response  
Centre for the Mediterranean Sea (REMPEC)



Regional Activity Centre  
for Sustainable Consumption  
and Production



# UNEP/MAP's main work on indicators



# Barcelona Convention & Protocols Reporting



- 15<sup>th</sup> CoP, 2008: New Reporting format for the Implementation of the Barcelona Convention and its Protocols:
  - Barcelona Convention, Dumping Protocol, Prevention and Emergency Protocol, LBS and Activities Protocol, SPA and Biodiversity Protocol, Offshore Protocol, Hazardous Waste Protocol

Part I Legal measures

Question 1: Has the Party, in accordance with Article 14 of the Barcelona Convention, adopted legislation implementing the provisions of the LBS Protocol as listed in Table I below?

**Table I - Legal measures**

Related Article	No	Description of the obligations	Status of implementation					Difficulties/Challenges					
			Please tick the most appropriate answer					Please tick the most appropriate answer					
			Yes	No	Under development	Other	Not applicable	Policy framework	Regulatory framework	Financial resources	Administrative management	Technical capabilities	Public participation
Art. 5 para.2 NAPs/SAP	1	Measures to eliminate pollution from LBS activities particularly regarding the phasing out of inputs of the substances listed in Annex I that are toxic, persistent and liable to bioaccumulate, using BAT, BEP and Cleaner Production.	<i>Title, reference, date of enacting legal act</i>					Remarks/Comments					
			Remarks/Comments										
Art. 5 para. 5 Risk	2	Measures to reduce to a minimum the risk of pollution caused by accidents	<i>Title, reference, date of enacting legal act</i>					Remarks/Comments					
			Remarks/Comments										

# Barcelona Convention & Protocols

## Reporting Indicators



Protocol	Effectiveness Indicators
<b>Dumping Protocol</b>	<ol style="list-style-type: none"> <li>1. Total number of permits</li> <li>2. Total waste quantity dumped for each category</li> <li>3. Number of inspection</li> <li>4. Number of non-compliances cases</li> <li>5. Number of non-compliance cases in which sanctions were applied</li> </ol>
<b>LBS Protocol</b>	<ul style="list-style-type: none"> <li>Total number of authorizations</li> <li>Total load of pollution discharged for all sectors</li> <li>Total load of pollution discharged for all substances</li> <li>Number of NAPs projects completed</li> <li>Number of inspections per point source</li> <li>Number of non-compliances cases</li> <li>Number of non-compliance cases in which sanctions were applied</li> </ul>
<b>Specially Protected Areas and Biodiversity</b>	<ul style="list-style-type: none"> <li>Number of SPAs established</li> <li>Total of surface of SPAs</li> <li>Number of SPAs with management plan adopted</li> <li>Number of SPAMIs</li> <li>Number of species as per the annex II of the Protocol covered by protection measures</li> <li>Number of known endangered and threatened species in the country</li> <li>Number of inspections</li> <li>Number of non-compliance cases</li> <li>Number of non-compliance cases in which sanctions were applied</li> </ul>

# Barcelona Convention & Protocols Effectiveness Indicators



- 16<sup>th</sup> CoP, 2009: Testing MAP effectiveness indicators.

## Barcelona Convention

ARTICLE	"NARRATIVE", ACTIONS/CRITERIA	OBJECTIVES	INDICATORS	RELEVANCE	AVAILABILITY	TARGETED TRENDS	YEAR	TARGETS
	Status of Ratification and the entry into force of MAP legal instruments	Obligations under the Convention and its Protocols are legally binding for those Contracting Parties that have ratified them and for which these legal instruments are in force	1) Ratio of the number of Contracting Parties for which MAP legal instruments are in force over the total number of Contracting Parties	2	2, National Reports	Increase		
			2) Number of MAP legal instruments entered into force	2	2, National Reports	Increase		
Article 14	According to Article 14, the Contracting Parties shall adopt legislation to implement the Convention and its Protocols.	To provide information on the legal /regulatory aspects of the implementation of the Convention and its Protocols	3) Ratio of the number of the provisions of the Convention and its Protocols implemented through the adoption of legal and regulatory measures to the total number of provisions identified in the reporting format over the number of the Contracting Parties	2	2, National Reports	Increase		
Article 4	According to article 4 of the Convention, the Contracting Parties should pledge themselves to pursue the protection of the marine environment and national resources of the Mediterranean seas area as an integral part of the development process	To provide information on the integration of the protection of the environment of the Mediterranean sea area into domestic sustainable and or sectorial development policies	4) Ratio of the number of the Contracting parties that have incorporated key priorities of the Barcelona Convention and its protocols and related commitments into their domestic policies over the total number of the Contracting Parties.	2	2, national reports	Increase		
Several articles	A number of provisions of the Barcelona Convention and its Protocols provide for the Contracting Parties to designate competent authorities	To provide information on the status of the institutional aspects of implementation of the Convention and its Protocols	5) Ratio of the number of the Contracting Parties that have established the necessary institutions or designated competent authorities to implement the Convention and its Protocols over the total number of the Contracting Parties	1	2, National Reports	Increase		



# Plan Bleu's Sustainable Development Indicators

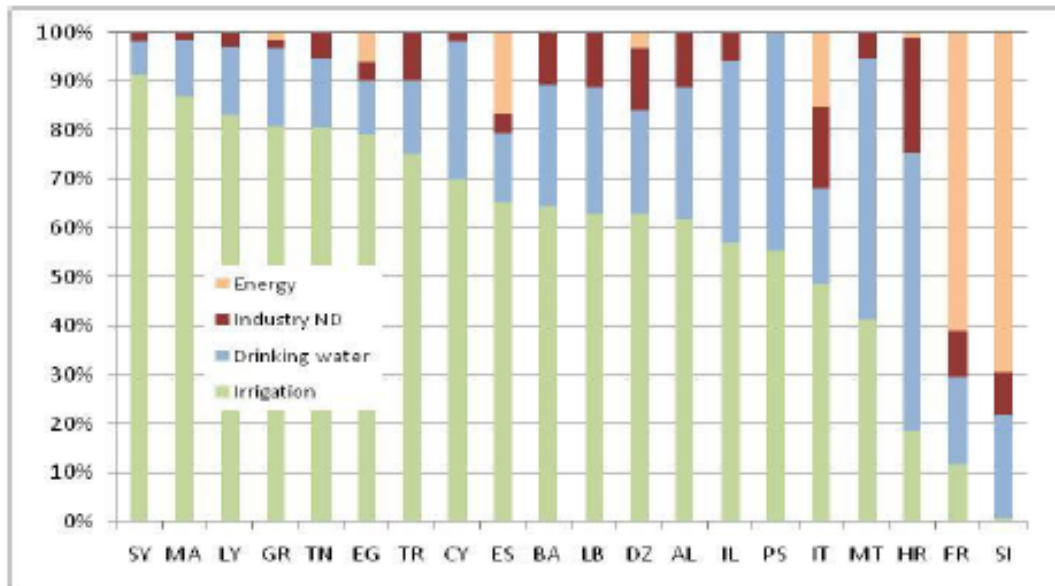


- Mediterranean Strategy for Sustainable Development (MSSD) adopted in 2005 , including 34 priority indicators:
  - Water, Energy, Transport, Coastal protection, Urban development, Agriculture and rural development, Tourism
- Outlook Report 2005, State of Environment and Development Report: 2009
- MSSD Assessment (2005-2010)
- 2014: Revision of the MSSD and indicators underway



<http://planbleu.org/en/activites/developpement-durable>

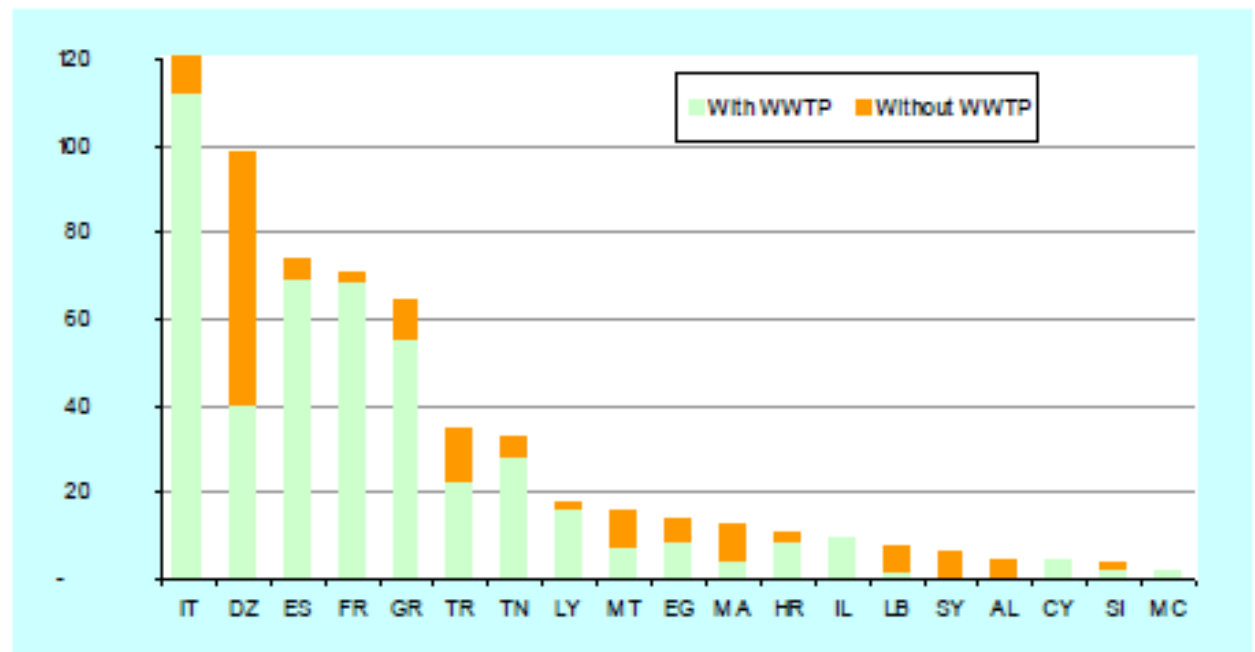
Water demand by sector (period 2005-2010)



*From Plan Bleu's 2013 Indicator update report*

Source: Plan Bleu from national sources

Number of coastal cities of more than 10 000 inhabitants with and without a waste water treatment plant, 2003



# GEF IW funded Large Marine Ecosystem projects



- 1997-2005: First GEF funded Large Marine Ecosystem (LME) Project. Causal Chain analysis, and Strategic Action Programmes (SAPs) to identify of regional and national targets and activities;

Transboundary Diagnostic Analysis  
Adopted 1997

SAP-MED Adopted 1997  
NAPs for countries  
Adopted 2005

SAP-BIO  
Adopted 2003  
Including NAPs

*Adopted and costed regional and national actions  
Includes policy reforms*

*SAP Bio to be revised  
(2012-2014)  
SAP Med complemented  
By Regional Plans  
(BOD, Mercury, POPs)  
NAPs review/revision  
(2013-2015)*

- 2009-2015: Second phase to implement the two SAPs and the Integrated Coastal Zone Management (ICZM) Protocol

# MEDPOL's Pollution Indicators



- Between 2003 and 2005: Transboundary Diagnostic Analysis (TDA), Strategic Action Programme for pollution from land-based sources (SAP-Med) and National Action Plans (NAPs)
- 36 Pollution Indicator factsheets developed & tested:
  - Biochemical Oxygen Demand in effluents and Chemical Oxygen Demand in effluents
  - Chlorophyll a and Dissolved oxygen
  - Halogenated hydrocarbons in effluents and biota
  - Heavy metals in effluents, Cadmium, Mercury
  - Nitrate and other forms of Inorganic Nitrogen in transitional, coastal and marine waters, Nutrients in effluents
  - PH, Salinity, Temperature, transparency
  - Biomarkers/biological affect indicators (Acetylcholinesterase activity in mollusc cells, Frequency of micronuclei, Lipofuscin lysosomal accumulation in molluscs and fish cells)
- Real data and trends available since 1999, on contaminants, nutrients, and point source releases.

# Horizon 2020



- 2010 onwards: Horizon 2020 for the de-pollution of the Mediterranean (<http://www.h2020.net/>)
- Investments for Pollution Reduction (PR); Capacity Building (CB) for achieving H2020 objectives; Review, Monitoring and Research (RMR).



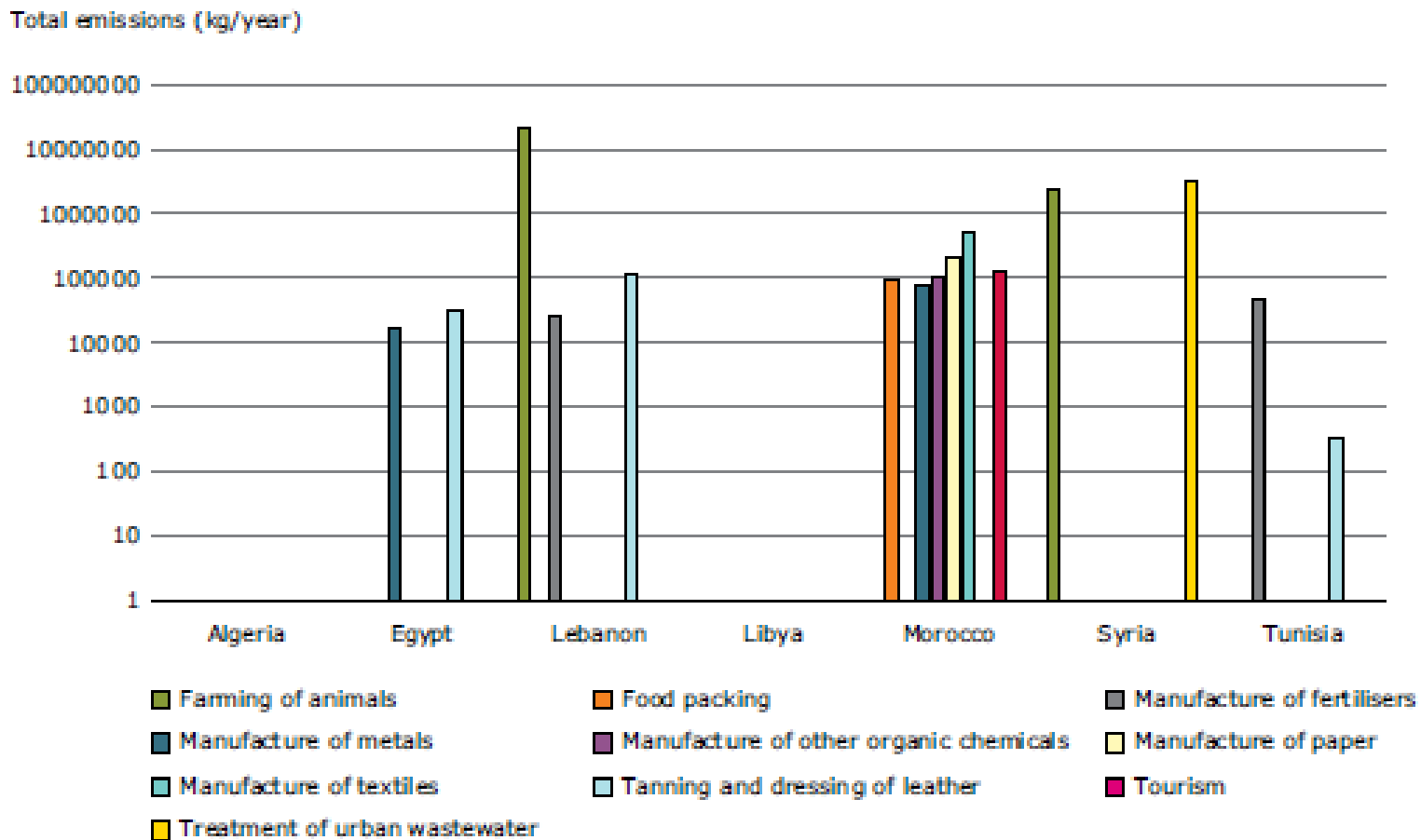
# Shared Information System (SEIS)



- 15<sup>th</sup> COP, 2005: InfoMAP, Shared Information System for the Mediterranean (with UNEP, GEOSS work and EEA)
- The ENPI-SEIS project aims to promote the SEIS, through the development of national and regional environmental information systems in line with the EU approach.
- <http://enpi-seis.ew.eea.europa.eu/>
- <http://mdr.eionet.europa.eu/>
- 2014: 6 indicators Fact sheets (EEA and UNEP/MAP)
- June 2014:P Joint Report



**Figure 5.17 Loads of emissions for total nitrogen per country and per sector, 2008**



**Note:** ENP-South: Algeria, Egypt, Israel, Lebanon, Libya, Morocco, Palestine, Syria, and Tunisia.

**Source:** UNEP/MAP MED POL NBB database 2008.

# Pollution NAP and Regional Plan's indicators



- 2003 NAP's to be revised. Draft guidelines for updating NAPs presented in March 2014. Tentative list of indicators included
- Initial exercise in June 2014 to rank indicators for potential inclusion in NAP revision. Approach considered:
  - a) MAP effectiveness indicators adopted in COP 16*
  - b) MAP reporting system adopted by COP 15*
  - c) MSSD indicators, 2005*
  - d) Indicators with regards to other relevant policy frameworks, mainly Horizon 2020 Initiative and IWRM (Integrated Water Resources Management)*
  - e) Indicators agreed in the framework of relevant MEA.*
- Work is ongoing and expected a restricted list of indicators (10-15) to assess implementation of NAPs and regional plans: BOD, Mercury, Marine Litter and POPs. In synergy with Horizon 2020 indicators



# Climate Variability & ICZM Platform



- 2011: Regional Assessment of Climate Variability and Change monitoring
- 2014: National/Regional review of monitoring programs and available data on climate variability and coastal zone management
- Development of a Framework on Climate Change Adaptation under the umbrella of the MSSD revision: Indicators to be developed.
- 2014-2015. Information platform on Climate Change in the Mediterranean Sea under development, with GRID-Geneva.

## ICZM Protocol

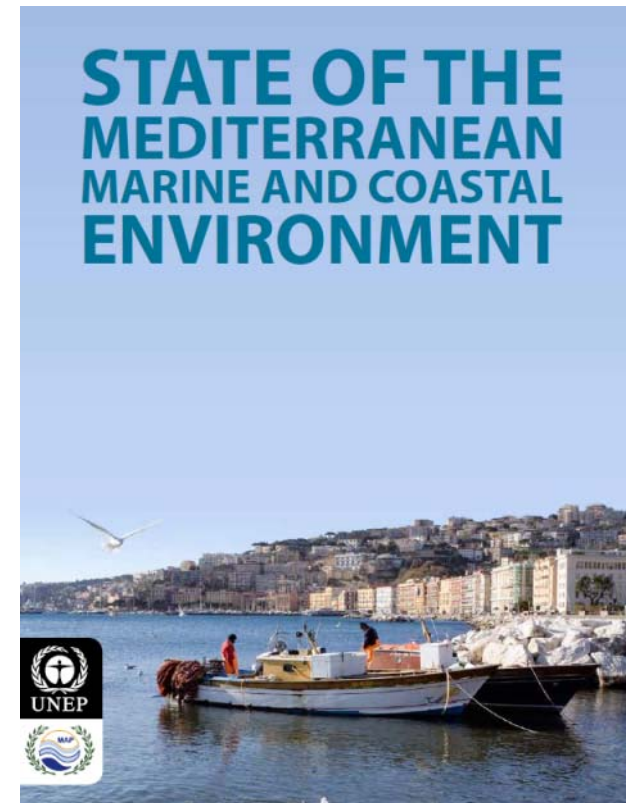
- 2011: ICZM entered into force
- 2011: PEGASO project to develop a shared Integrated Coastal Zone Management (ICZM) Governance Platform
- 2013: Starting from the PEGASO indicator set of 67 indicators a sub-set (**core-set**) of 26 indicators was identified.

[http://www.coastalwiki.org/wiki/PEGASO\\_project\\_Indicators\\_for\\_Integrated\\_Coastal\\_Zone\\_Management\\_in\\_the\\_Mediterranean\\_and\\_Black\\_Seas#ICZM\\_indicators\\_review:\\_current\\_status](http://www.coastalwiki.org/wiki/PEGASO_project_Indicators_for_Integrated_Coastal_Zone_Management_in_the_Mediterranean_and_Black_Seas#ICZM_indicators_review:_current_status)

# Ecosystem Approach



- 2011: Coordinated work of MAP & RACS to prepare the “Integrated Assessment of the Mediterranean”.
- 2012: First State of the Mediterranean Marine & Coastal Environment Report (building upon Plan Bleu’s previous reports)
- CoP 17, 2012: Seven step roadmap adopted, along with Ecological Objectives and indicators
- 2012-2014: Correspondence Groups on GES and Targets (COR-GEST), Monitoring (COR-MON) and Economic and Social Analysis (COR-ESA)
  - *Biodiversity & Fisheries, Pollution and Litter, Coast and Hydrography*
- 2014-2015: Assessment of gaps and needs
- 2015: Integrated Monitoring & Assessment Programme and guidelines



*To be produced every 4 years  
including data from EcAp  
indicators*

## Ecological Objective 1. Biological Diversity

<i>Ecological Objective</i>	<i>Operational Objectives</i>	<i>Indicators</i>
<p><b><u>Biological diversity is maintained or enhanced.</u></b> 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.</p>	1.1 Species distribution is maintained	1.1.1 Distributional range change 1.1.2 Area covered by the species (for sessile/benthic species)
	1.2 Population size of selected species is maintained	1.2.1 Population abundance 1.2.2 Population density
	1.3. Population condition of selected species is maintained	1.3.1 Population demographic characteristics (e.g. body size or age class structure, sex ratio, fecundity rates, survival/ mortality rates)
	1.4 Key coastal and marine habitats are not being lost	1.4.1 Potential / observed distributional range of certain coastal and marine habitats listed under SPA protocol
		1.4.2 Distributional pattern of certain coastal and marine habitats listed under SPA protocol
		1.4.3 Condition of the habitat-defining species and communities

## Ecological Objective 2: Non-indigenous species

<i>Ecological Objective</i>	<i>Operational Objectives</i>	<i>Indicators</i>
<p><b><u>Non-indigenous species</u></b> introduced by human activities are, to the maximum extent possible, at levels that do not adversely alter the ecosystem</p>	2.1 Non-indigenous species introductions are minimized to the maximum extent possible	2.1.1. Spatial distribution, origin and population status (established vs. vagrant) of non-indigenous species
		2.1.2 Trends in the abundance of introduced species, notably in risk areas
	2.2. The impact of particularly invasive species on ecosystems is limited	2.2.1 Ecosystem impacts of particularly invasive species 2.2.2 Ratio between non-indigenous invasive species and native species in some well studied taxonomic groups

## Ecological Objective 3: Commercially exploited fish

<b>Ecological Objective</b>	<b>Operational Objectives</b>	<b>Indicators</b>
Populations of selected <u>commercially exploited fish</u> and shellfish are within biologically safe limits, exhibiting a population age and size distribution that is indicative of a healthy stock	3.1 Level of pressure by known commercial fisheries is kept within biologically safe limits	3.1.1 Total catch by operational unit
		3.1.2 Total effort by operational unit
		3.1.3 Catch per unit effort (CPUE) by fishery
		3.1.4 Ratio between catch and biomass index (hereinafter catch/biomass ratio).
		3.1.5 Fishing mortality
	3.2 The reproductive capacity of stocks is maintained	3.2.1 Age structure determination (where feasible)
[3.2.2 Spawning Stock Biomass (SSB)]		

## Ecological Objective 4: Food webs

<b>Ecological Objective</b>	<b>Operational Objectives</b>	<b>Indicators</b>
Alterations to components of <u>marine food webs caused by resource extraction</u> or human-induced environmental changes do not have long-term adverse effects on food web dynamics and related viability	4.1 Ecosystem dynamics across all trophic levels are maintained at levels capable of ensuring long-term abundance of the species and the retention of their full reproductive capacity	4.1.1 Production per unit biomass estimates for selected trophic groups and key species, for use in models predicting energy flows in food webs
	4.2 Normal proportion and abundances of selected species at all trophic levels of the food web are maintained	4.2.1 Proportion of top predators by weight in the food webs
		4.2.2 Trends in proportion or abundance of habitat-defining groups 4.2.3 Trends in proportion or abundance of taxa with fast turnover rates
		4.2.3 Trends in proportion or abundance of taxa with fast turnover rates

## Ecological Objective 5: Eutrophication

Ecological Objective	Operational Objectives	Indicators
<p><u>Human-induced eutrophication</u> is prevented, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algal blooms and oxygen deficiency in bottom waters.</p>	<p>5.1 Human introduction of nutrients in the marine environment is not conducive to eutrophication</p>	5.1.1 Concentration of key nutrients in the water column
		5.1.2 Nutrient ratios (silica, nitrogen and phosphorus), where appropriate
	<p>5.2 Direct effects of nutrient over-enrichment are minimized</p>	5.2.1 Chlorophyll-a concentration in the water column
		5.2.2 Water transparency where relevant
		5.2.3 Number and location of major events of nuisance/toxic algal blooms caused by human activities
	<p>5.3 Indirect effects of nutrient over-enrichment are minimized</p>	5.3.1 Dissolved oxygen near the bottom, i.e. changes due to increased organic matter decomposition, and size of the area concerned*

## Ecological Objective 6: Sea-floor integrity

Ecological Objective	Operational Objectives	Indicators
<p><u>Sea-floor integrity</u> is maintained, especially in priority benthic habitats</p>	<p>6.1 Extent of physical damage to the substrate is kept within acceptable limits</p>	6.1.1 Distribution of bottom impacting activities anchoring
		6.1.2 Area of the substrate affected by physical alteration due to the different activities
	<p>6.2 Impact of benthic disturbance in key benthic habitats is minimized</p>	6.2.1 Impact of bottom impacting activities <sup>12</sup> in priority benthic habitats
		6.2.2 Change in distribution and abundance of indicator species in priority habitats

## Ecological Objective 7: Hydrographic conditions

<i>Ecological Objective</i>	<i>Operational Objectives</i>	<i>Indicators</i>
<p><b><u>Alteration of hydrographic conditions</u></b> does not adversely affect marine ecosystems.</p>	<p>7.1 Impacts to the marine and coastal ecosystem induced by climate variability and/or climate change are minimized</p>	7.1.1 Large scale changes in circulation patterns, temperature, pH, and salinity distribution
		7.1.2 Long term changes in sea level
	<p>7.2 Alterations due to permanent constructions on the coast and watersheds, marine installations and seafloor anchored structures are minimized</p>	7.2.1. Impact on the circulation caused by the presence of structures
		7.2.2 Location and extent of the habitats impacted directly by the alterations and/or the circulation changes induced by them: footprints of impacting structures
		7.2.3 Trends in sediment delivery, especially in major deltaic systems
<p>7.3 Impacts of alterations due to changes in freshwater flow from watersheds, seawater inundation and coastal freatic intrusion, brine input from desalination plants and seawater intake and outlet are minimized</p>		7.2.4 Extent of area affected by coastal erosion due to sediment supply alterations
		7.3.1. Trends in fresh water volume delivered to salt marshes, lagoons, estuaries, and deltas; desalinisation brines in the coastal zone
		7.3.2. Location and extent of the habitats impacted by changes in the circulation and the salinity induced by the alterations
		7.3.3 Changes in key species distribution due to the effects of seawater intake and outlet

## Ecological Objective 8: Coastal Ecosystems

Ecological Objective	Operational Objectives	Indicators
The natural dynamics of <u>coastal areas are maintained and coastal ecosystems</u> and landscapes are preserved	8.1 The natural dynamic nature of coastlines is respected and coastal areas are in good condition	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 <sup>[1]</sup>
		8.1.4 Length of coastline subject to physical disturbance due to the influence of manmade structures
	8.2 Integrity and diversity of coastal ecosystems, landscapes and their geomorphology are preserved	8.2.1 Change of land-use <sup>[2]</sup>
		8.2.2 Change of landscape types
		8.2.3 Share of non-fragmented coastal habitats

## Ecological Objective 9: Contaminants

Ecological Objective	Operational Objectives	Indicators
<p><b><u>Contaminants</u></b> cause no significant impact on coastal and marine ecosystems and human health</p>	9.1 Concentration of priority <sup>[1]</sup> contaminants is kept within acceptable limits and does not increase	9.1.1 Concentration of key harmful contaminants in biota, sediment or water
	9.2 Effects of released contaminants are minimized	9.2.1 Level of pollution effects of key contaminants where a cause and effect relationship has been established
	9.3 Acute pollution events are prevented and their impacts are minimized	9.3.1 Occurrence, origin (where possible), extent of significant acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution
	9.4 Levels of known harmful contaminants in major types of seafood do not exceed established standards	9.4.1 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood <sup>[2]</sup>
		9.4.2 Frequency that regulatory levels of contaminants are exceeded
	9.5 Water quality in bathing waters and other recreational areas does not undermine human health	9.5.1 Percentage of intestinal enterococci concentration measurements within established standards
		9.5.2 Occurrence of Harmful Algal Blooms within bathing and recreational areas



## Ecological Objective 10: Litter

Ecological Objective	Operational Objectives	Indicators
<p><b><u>Marine and coastal litter</u></b> do not adversely affect coastal and marine environment<sup>[1]</sup></p>	<p>10.1 The impacts related to properties and quantities of marine litter in the marine and coastal environment are minimized</p>	<p>10.1.1 Trends in the amount of litter washed ashore and/or deposited on coastlines, including analysis of its composition, spatial distribution and, where possible, source</p>
		<p>10.1.2 Trends in amounts of litter in the water column, including microplastics, and on the seafloor</p>
	<p>10.2 Impacts of litter on marine life are controlled to the maximum extent practicable</p>	<p>10.2.1 Trends in the amount of litter ingested by or entangling marine organisms, especially mammals, marine birds and turtles<sup>[2]</sup></p>

## Ecological Objective 11: Energy and noise

Ecological Objective	Operational Objectives	Indicators
<p><b><u>Noise from human activities</u></b> cause no significant impact on marine and coastal ecosystems</p>	<p>11.1 Energy inputs into the marine environment, especially noise from human activities is minimized</p>	<p>11.1.1 Proportion of days and geographical distribution where loud, low and mid-frequency impulsive sounds exceed levels that are likely to entail significant impact on marine animals</p>
		<p>11.1.2 Trends in continuous low frequency sounds with the use of models as appropriate</p>

# Need for integration and future planning



Barcelona Convention & Protocols: reporting and effectiveness

MSSD Indicators & Climate

EcAp Indicators  
MEDPOL indicators  
Biodiversity indicators

National and Regional Plans:  
SAPs, ICZM, Pollution NAPs,  
Marine Litter, BOD, POPs, etc

- 2014-2015 is key biennium for revised and more integrated planning and monitoring: EcAp Monitoring plan in preparation, MSSD revision, 6 year programme of work, climate framework
- Need to bring together defining Drivers, Pressures, State, Impact and Response. To start thinking about quantifying and analyzing interactions driver/pressures/state. *Quality Status Report by 2023*
- Process also to be supported by data in other initiatives and projects. InfoMAP is needed to make available online.

# Thank you

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