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Intergovernmental
Oceanographic
Commission

Analysis of existing marine assessments in Europe (North East Atlantic, Baltic Sea, Mediterranean and Black Sea)

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Preparatory document for the UN Regional Regular Process (UNRRP) meeting

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1. Introduction

There is a growing awareness both of the key role European seas already play as a driver of Europe's prosperity and their potential for providing greater well-being (e.g. EEA 2010[1]). Over recent years, Europe has progressively undergone a transition towards an ecosystem-based approach that stresses the need to conserve ecosystem structure and functioning, to manage ecosystems within the limits of their functioning and to carry out management at appropriate spatial and temporal scales. All these aspects require sound scientific information and practical knowledge and that information must be provided to the decision-makers in a form they can use. In particular, the regular assessment of the status and future threats to the marine ecosystems and their implications for human well-being, is essential for sound decision making. Marine environmental assessments have increasingly become in the last decades an integral part of national, regional and global programmes for managing marine and coastal areas. The rise of integrated EU environmental legal instruments along with relevant initiatives in the framework of the regional sea Conventions and related protocols gave a real impetus to improve monitoring (in frequency and quality) of the status of the marine environment and to increase the understanding of the human–environment interactions as testified by the recent UN marine Assessment of Assessments - AoA[2.]

The present report looks over the most recent and updated available assessments and the current knowledge on immediate and long-term concerns and threats to the European Sea coastal and marine ecosystems with a special attention for determining the knowledge gaps that require specific focus in the future in the context of the UN Regional Regular Process (UNRRP).

The UNRRP Workshop for Europe (NE Atlantic, Baltic Sea, Mediterranean and Black Sea) will be hosted by Belgium in June 2012 (Brussels, 27-29 June 2012). As a basis for discussion, the report is intended to provide an overview of the relevant marine assessments in the region which could contribute to the UN Regular Process based on the GRAMED database and further additional assessments (covering 2008-2012).

The present report focuses on the maritime areas covered by the four European seas conventions and cover assessments of the state of the marine environment, including socio-economic aspects, but will not encompass policy evaluations and guideline documents. The report is intended to provide a first appraisal of the progresses related to marine assessments at global, regional and national level that have been produced after the first AoA report and the completion of the GRAMED database[3] and to provide a brief overview of the gaps related to the issues that constitute the 4 building block of the UNRP outline.

2. Setting the scene: European seas

Europe’s oceans and seas are very diverse but all face similar environmental challenges and are subject to increasing pressures and competing usages. The attempts to address the environmental state of Europe’s seas also vary in architecture, funding, and effectiveness.

The European maritime area is significant as the total area under the jurisdiction of European states is larger than the total land area of the EU. European marine regions[4] include the North-east Atlantic (NEA), the Mediterranean, Black and Baltic seas (Figure 1) — and support many important activities such as shipping, fishing, offshore wind energy, oil, gas and mineral extraction and tourism[5]. The geographical coverage and the main characteristics of these so important and different marine areas are presented in Table 1.

[1] EEA, 2010: The European Environment State and Outlook SOER - Thematic assessment – Marine and coastal. Environment. European Environment Agency, Copenhagen.

[2] UNEP and IOC-UNESCO 2009: An Assessment of Assessments, Findings of the Group of Experts. Start-up Phase of a Regular Process for Global Reporting and Assessment of the State of the Marine Environment including Socio-economic Aspects.

[3] Even if the database is still in progress, most of the templates and documents have been registered before 2009.

[4] The Arctic oceans are excluded in the present report

[5] EEA, 2010: The European Environment State and Outlook SOER - Thematic assessment – Marine and coastal. Environment. European Environment Agency, Copenhagen.

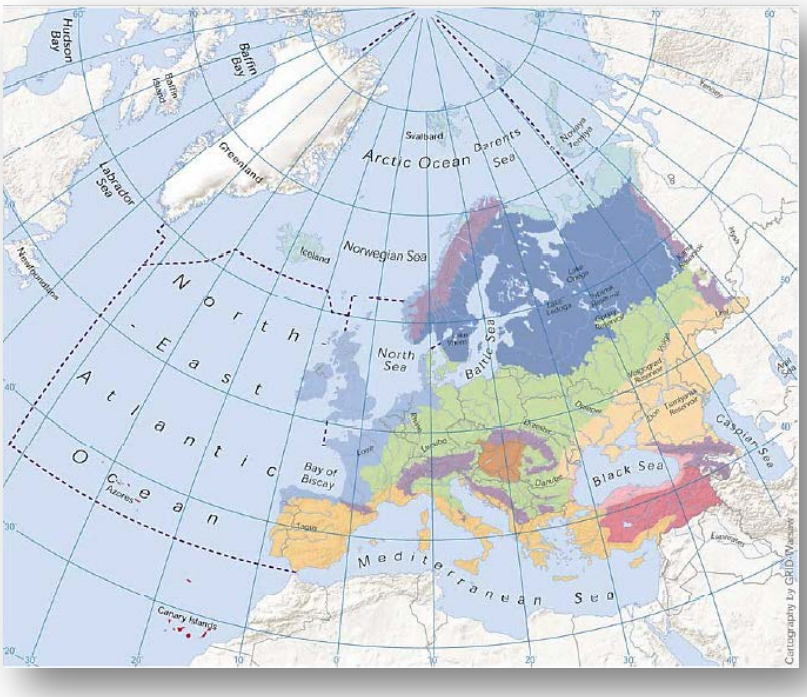

Figure 1: Map of the Seas under the EU member states jurisdiction

AoA Region (Number)	Coverage	Main features	Map	Related Regional Sea Programme
North East Atlantic Ocean (9)	The North East Atlantic Ocean extends across the northern Atlantic and includes the coastal states of the European Union. This region covers three Large Marine Ecosystems: Iberian Coastal, Celtic-Biscay Shelf, and the North Sea (LME# 24, 25 and 22).	The North-east Atlantic Ocean, which includes the European part of the Atlantic, also defined as area 3, 4 and 5 by the OSPAR convention, is a vast area of about13.5 million km^2 which includes a diverse range of environmental conditions and different ecosystems. It is a highly productive area that hosts the most valuable fishing areas of Europe and many unique habitats and ecosystems. It is also home to Europe's largest oil and gas reserves.		OSPAR
Baltic Sea (3)	The Baltic Sea region includes the Baltic Sea Large Marine Ecosystem (LME#23) and involves 9 countries (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, and Sweden) as well as the European Union (EU).	The Baltic is the largest brackish water system in the world. Its marine area has a surface area of 415,000 km$^{2.}$ The Baltic Sea is semi enclosed with low salinity due to restricted water exchange with the North East Atlantic and large river run-off. The Baltic Sea is shallow (mean depth 52 m, maximum depth 459 m). As a result, the marine environment is very vulnerable to land-based pollution. Its north and northeast extremities are frozen over for part of the year. The sea is connected to the Atlantic Ocean via the Kattegat Strait, Skagerrak Strait, and the North Sea. The Baltic Sea has become an inner sea of the EU (apart from small shore parts of Russia in Petersburg and Kaliningrad).		HELCOM

Mediterranean Sea (7)	The region includes the Mediterranean Sea Large Marine Ecosystem (LME#26) and the Sea is almost completely enclosed by Europe, Africa, and Asia. The riparian countries and territories constitute are 22	The Mediterranean is the largest semi-enclosed European sea with a surface area of 2.5 million km^2. The sea is oligotrophic with high salinity due to high evaporation rates and low river run-off. Oligotrophy increases from west to east. The sea has restricted water exchange with the Atlantic and Black Sea. It is the most biologically diverse sea in Europe. The Mediterranean is the world's leading tourist destination and also a major shipping channel, with almost a third of all international cargo traffic passing through it. Aquaculture (fish farming) is well established, and the fishing industry is a significant source of employment. The Mediterranean sea is also commonly subdivided into four distinct sub-regions namely (i) Western Mediterranean Sea, (ii) Adriatic Sea, (iii) the Ionian Sea and the Central Mediterranean Sea and (iv) the Aegean-Levantine Sea.		Barcelona Convention
Black Sea (4)	The Black Sea region is bordered by 6 countries: Bulgaria, Georgia, Romania, Russian Federation, Turkey, and Ukraine, and includes the Black Sea Large Marine Ecosystem (LME#62).	The Black Sea has a surface area of 461,000 km^2. Though almost enclosed, the Black Sea is deep with restricted water exchange with the Mediterranean. Its waters are anoxic at depths below 150–200 meters (about 87% of the Black Sea is entirely anoxic). It is connected to the Mediterranean Sea by the Bosporus and the Sea of Marmara, and to the Sea of Azov by the Strait of Kerch. An important feature of the Black Sea is an unusually high river discharge into the relatively small semi-enclosed Sea. The Black Sea drainage basin covers nearly third part of Europe. With a huge catchment area and low oxygen levels, the Black Sea is highly sensitive to anthropogenic impacts the water is an extremely vulnerable environment.		Black Sea Commission

Table 1: Synthetic presentation of the main features of European seas. Source: UNEP and IOC-UNESCO 2009[6] and EEA 2010[7]

3. Marine assessments in a context of growing human pressures

Many of Europe's environmental issues, such as climate change, biodiversity loss or unsustainable resource use are closely linked and have a complex and often global character that span the societal and economic spheres and impair important ecosystem services[8]. The EU objective of halting biodiversity loss by 2010 has not been met in either the coastal or the marine environment, and marine biodiversity in the environment continues to decline. Human activities are recognized as the key drivers of these disruptive changes.

Many definitions of assessment exist. A marine environmental assessment usually involves a formal process by which information is collected, evaluated, and undertaken to assess the state of knowledge[9]. Marine Assessments respond to information needs and emerging issues and may help to determine how to safeguard the long-term productivity of marine ecosystems, direct us towards more sustainable uses, and provide options for more effective sea/ocean governance.

The definition used by the UNRG, based on Mitchell et al., (2006) is functional in terms of assumptions or prescriptions about what an assessment should contain and its use for marine assessment is being widespread (e.g. EEA AoA[10], Marine Board ESF 2010[11]). Assessments are therefore defined in the present

[6] UNEP and IOC-UNESCO 2009: An Assessment of Assessments, Findings of the Group of Experts. Start-up Phase of a Regular Process for Global Reporting and Assessment of the State of the Marine Environment including Socio-economic Aspects.

[7] EEA 2010: The European Environment State and Outlook SOER - Thematic assessment – Marine and coastal. Environment. European Environment

[8] EEA 2010 10 messages for 2010 - Marine ecosystems, . Environment. European Environment

[9] GESAMP, 1994: Guidelines for Marine environmental assessments, IMO, London.

[10] EEA 2011: Europe's Environment Assessment of Assessments (EE-AoA), European Environment Agency, Copenhagen.http://www.eea.europa.eu/themes/regions/pan-european/europes-environment-an-assessment

report in consistence with the AoA process, as formal efforts to assemble selected knowledge with a view towards making it publicly available in a form intended to be useful for decision making[12].

For marine ecosystem management to precede successfully, it is essential to have access to the necessary information and data on regional and sub-regional scales. Fortunately, in recent years, the body of information, derived from numerous sources, describing and quantifying pressures and trends on the coastal and marine waters has grown. As correctly highlighted by the AoA EEA, many more assessments are now found at trans-country regional levels covering transboundary environmental issues.

Furthermore, at the European level, pan-European and EEA level assessments are very important and the multilateral environmental agreements also produce assessments, the most recent example being the second assessment of the UNECE transboundary rivers and international lakes convention. There are also many existing reports and databases available on coastal and marine environments through organizations such as UNEP, GEF, IUCN, ICES, CIESM, FAO as well as under the framework of Regional seas conventions that constitute the bulk of the information and reports for the present report.

4. The marine Assessment of Assessments and the GRAMED database

The first Assessment of Assessments (AoA) of the state of the marine environment (marine AoA[13]), launched in 2005 by the UN General Assembly resolution 60/30, is part of the Start-up phase of the UN regular process and is considered a pioneer in laying the foundations for the development of a Regular Process for global reporting and assessment.

The GRAMED[14] Database has been developed by UNEPWCMC as a key informative tool to support the marine Assessment of Assessments. Initially developed to support the work of the Group of Experts charged with carrying out the AoA, the database has been developed with the aim to provide key support to a future regular process for the global reporting and assessment of the state of the marine environment. The GRAMED is a dynamic database which provides fully access to the largest existing collection of information on assessments, scientific research studies and data holdings related to the marine and coastal environment at the national, regional and supra-regional scale. To date it is still the only database of its kind freely available through the web worldwide. The GRAMED focus is mainly on activities and related scientific activities at the national, regional and global scale which could provide particular lessons or information on assessment processes or products as a contribution to the Assessment of Assessments.

This database represents a valuable starting point for gathering together information on assessments, research studies data holdings, and other activities that have, or are being undertaken in the marine environment at several scales until about 2008-2009. The GRAMED database contains at the time of the present report information about 1023 activities. The structure of the database reflects the data provided through over 250 templates developed by members of the Group of Experts and other experts during the AoA process. The basic structure of the GRAMED template is presented in Table 2.

This database started from the 2003 document "Global Marine Assessments: A survey of global and regional marine environmental assessments and related scientific activities" and gather assessments carried out until 2008-2009.

European seas represents 4 out of the 21 regions delineated for the AoA process by the Group of Experts and 230 assessments and data holdings are recorded in the GRAMED database for the 4 European seas. The number of assessments for the European seas represent a relevant share of the total number of registered assessments with about 22,5 % of the total number of assessments recorded. Across the 4 seas, the distribution of assessments is uneven. NE Atlantic ocean and the Mediterranean sea have the major number of assessments with respectively 78 assessments i.e 7,6 % each of the total number of assessments for the world ocean. The Black sea is the less represented sea with only 18 assessments recorded (Figure 2).

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[11] Marine Board-ESF 2010: Science dimensions of an Ecosystem Approach to Management of Biotic Ocean Resources (SEAMBOR)

[12] Mitchell, R.B. Clark, W.C. Cash, D.W. and Dickson, N.M. 2006: Global Environmental Assessments: Information and Influence Cambridge: MIT Press.

[13] UNEP and IOC-UNESCO 2009: An Assessment of Assessments, Findings of the Group of Experts. Start-up Phase of a Regular Process for Global Reporting and Assessment of the State of the Marine Environment including Socio-economic Aspects.

[14] http://www.unep-wcmc-apps.org/gramed/

Template
Scale
Region:
Name of Assessment:
Acronym:
Full Reference:
Full Text Reports/Output URL:
Assessment reviewed by GoE member:
Classification/Type of Activity:
Organisation:
Justification/Context of the Assessment:
Objectives of the Assessment:
Status of Activity:
Is the assessment repeated:
Start Date:
Finish Date:

Table 2: Template format included in the GRAMED database for individual assessments

Assessments are primarily carried–out at the regional scale (83% for Europe seas versus 49% for all regions – see Figure 4). On average broad assessments represents 32% of the assessments for the Europe, which is very close to the global average (31%). The Black Sea has the higher number of broad assessments with 56% while 28 % of assessments are classified as “Narrow Assessment” (Figure 3). In fact only 5 assessments are registered in the database as narrow assessment for the Black Sea, which is rather low and could reflect a lack of regional accessible and meaningful detailed studies of the activities and pressures affecting the Black Sea ecosystem (see the Marine AoA).

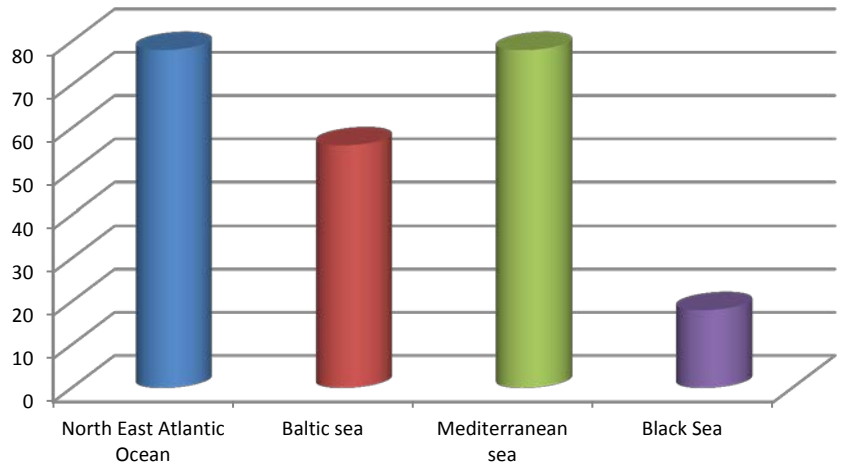

Figure 2: Number of assessment listed in GRAMED database for the NE Atlantic, Baltic, Mediterranean and Black seas.

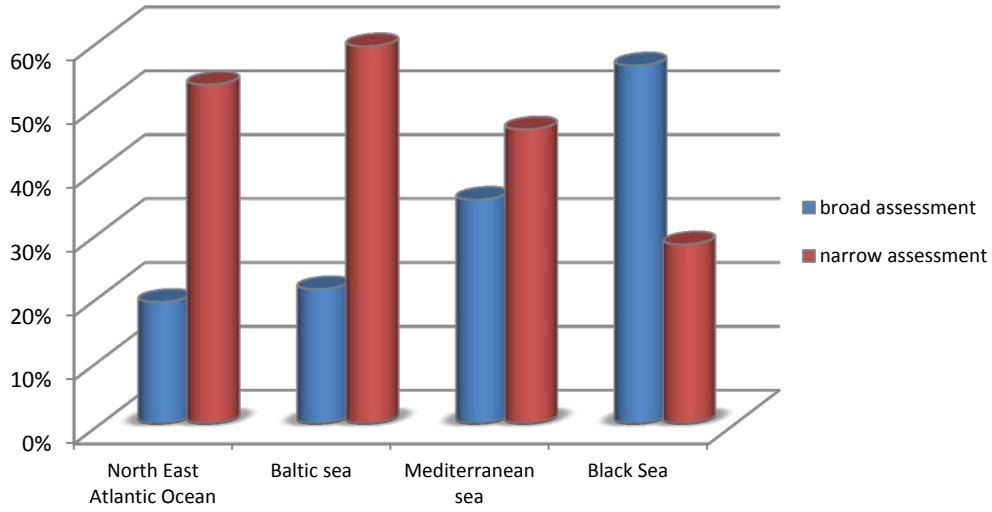

Figure 3: Classification of assessments over all assessments for Europe's seas

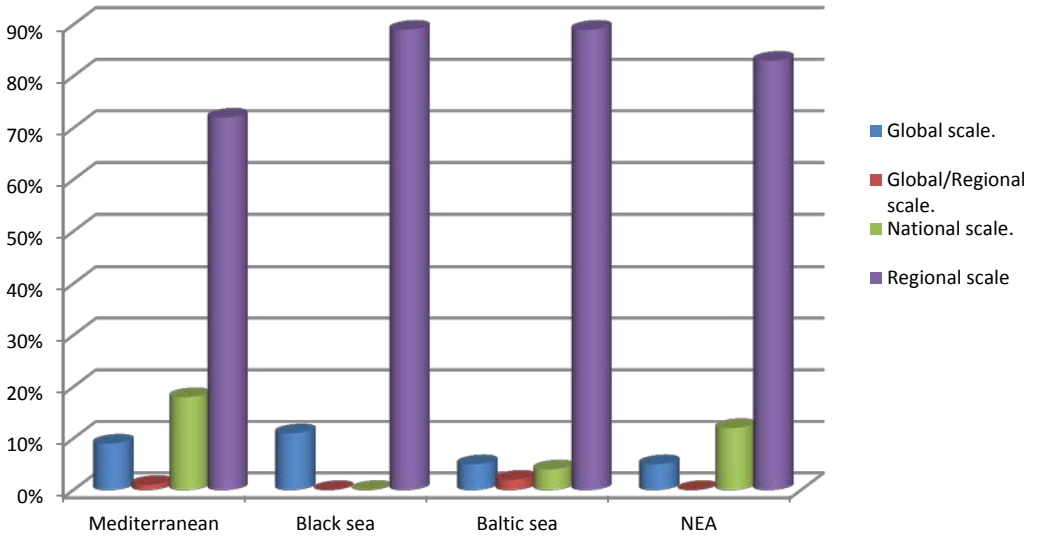

Figure 4: percentage of scale over assessments for European seas

5. Methodology – approach taken

The present report is based on a desk-based research over May and June 2012. The methodology relies upon a regional approach to look across relevant marine assessments for the 4 European marine areas. Main sources of information are existing national and transnational assessments on the state and impacts of key marine issues in the Seas under European member states jurisdiction. The report uses the GRAMED database as a key primary information source. The analysis then restricts itself to looking at the most recent and complete assessments with the goal of providing a brief overview of those assessments produced after the first AoA report and the completion of the GRAMED database. The report focused therefore on the assessment produced over the period 2008-2012. A screening of the structure, objectives, data sources, geographical coverage, gaps and issues covered by the assessment is proposed by means of specific individual templates. The completed templates presented in the Annex 2 will be used as an informative tool to make a first appraisal of progresses in assessment procedures across regional seas and current existing uncertainties in scientific knowledge and assessment processes.

The collection of the main documents and information that may complete the GRAMED database and be useful for the UNRRP is mainly based on an a targeted Web-based research. The focus has been given to assessments not listed nor analysed in the GRAMED database. A preliminary list of all assessment reports registered in the GRAMED database for European seas was firstly constructed (the complete list may be found in Annex 1) and then the list was confronted to the most recent assessments accessible through the

internet. At the regional sea level, priority was given to assessments that integrated several thematic areas and/or covered large geographical areas. Most assessments considered were conducted from 2008 to 2012.

Web-seach engine such as *google scholar* and *scirus* in support of main international organisation and regional sea programme websites (EC, OSPAR, HELCOM, UNEP/MAP, PAR/RAC, BSC, EEA, IUCN, ICES, CIESM) along with some scientific publications repositories (JRC Publications repository[15], *Ressources documentaire du Plan Bleu*, Archimer[16], Marine Institute Open Access Repository[17], Census of Marine Life Bibliographic Database[18]) have been extensively used. Cross-check between institutional websites and scientific publications repositories have been done to avoid missing relevant recently published reports.

Initially emphasis was placed on documents and reports dealing with cross-sectoral analysis at regional level but was later broadened to include sectoral/thematic analysis (narrowed assessments) considered pertinent to the assessment of the coastal/marine environment. Sub-regional, National-level and EU-project activities have been incorporated where relevant and particular lessons could be drawn. Due to the large amount of existing assessments, relevant reports and state-and-trends analysis even over a so brief period 2008-2012 (which again demonstrates the dynamic character of the Assessment practice over Europe), a selection procedure has then been applied largely inspired on the EEA-AoA methodology.

Parameters used for prioritisation include the following:

- give priority to documents that broadly meet the three main conditions encompassed in the definition of assessment (Mitchell, et al. 2006) namely that the piece of work is 'formal', it assembles 'selected knowledge' and it is 'publicly available'.
- give priority to most recent assessments reports (i.e. published from 2008 onwards) and to cross-sectoral (or cross –issues) approaches;
- give priority to assessment reports with the most comprehensive geographical coverage at regional levels – that is to say the whole Mediterranean, Black sea, NEA, and Baltic basin or both;
- give priority to assessment reports (including thematic assessments) covering emerging issues such as marine litter, climate change, ecosystem services in coherence with the 4 building blocks of the UNRP outline;
- give priority to Regional SoE reports and ecosystems-based assessment focusing on the coastal and marine environment.

Due to time restrictions, Data holdings have not been taken into considerations. The collected assessments and related documents have been examined at the individual assessment level using a common template that focuses mainly on the analysis of the assessment product. All the 63 completed templates are presented in Annex 2.

In order to provide a certain degree of consistency, we used the same terminology as used in the GRAMED database as regards the classification of assessments and the scales (also considering the scale definition included in the Marine AoA). Main terminology used in the present report is reported in Table 3.

The template that we used for individual assessments has been designed in order to include parameter that may respond to the information requested in the Appendix I of the Guidelines for Capacity Building Workshops on the Regular Process, namely:

(a) Agency conducting the specific assessment;

(b) Major intended users of the assessment, and the uses for which it was intended;

(c) Spatial and temporal scale of the assessment, and frequency of assessment cycle;

(d) Issues covered by the assessment;

(e) Types of data, experiential knowledge, indicators and the reasons for their selection, and other information sources contributing to the assessment;

(f) Where trends of component information sets have been deduced, the methods employed;

(g) Where an effort has been made to integrate different types of information, particularly social, economic and ecological information, the extent of, and methods for, such integration;

[15] http://publications.jrc.ec.europa.eu/repository/

[16] http://archimer.ifremer.fr/search.jsp

[17] oar.marine.ie

[18] http://db.coml.org/comlrefbase/

(h) Sources of any evaluation benchmarks, reference levels or ecotoxicological assessment criteria used in the assessment;

(i) Extent and sources of any forecasts, projections, and scenarios used in the assessment; and

(j) If data-assessment limitations (such as data-extrapolation errors, uncertainties and/or information gaps) were addressed in the assessment, a description of how this was done.

Terminology	Definition
Assessment Product	The product includes both the expert reports and underlying data and information used in the analyses. There may be additional outputs like a summary for decision-makers, alternative future scenarios, products geared for different user communities or briefings for the public and the media.
Global	All the world's oceans
Regional	Any existing regional division, including AoA regions
Supra-regional	Any geographical unit extending beyond a region but not global
Sub-regional	Sub-division of a regional unit into smaller units.
National	Ocean areas under coastal states' jurisdiction;
Supra-regional	Description of a geographic area spanning more than one region
Assessment	Assessments are formal efforts to assemble selected knowledge with a view toward making it publically available in a form intended to be useful for decision making
Narrow Assessment	Assessments narrow in scope that focus on a particular aspect of the marine environment, such as fisheries or climate change. This does not relate to geographic coverage and may cover national, regional and global scales, as in the Reefs at Risk assessment. However it is focusing on only one aspect of the marine environment.
Broad assessment	Assessments measuring multiple parameters of the ecosystem to give an overall picture of health, such as biological, physical and socio-economic data gathering. This is a "general" assessment, in that it focuses on more than one aspect of the marine environment and may look at some of the linkages between various components.

Table 3: Terminology used in the present report. Source: GRAMED database and the marine AoA report

The main limitation of this exercise lies with the process of using Web-based operations to gather information on and for assessments. These include the absence on the Internet of information that may be available in hard copy only, the fact that websites may not be updated in a timely fashion or even outdated after project or programme completion and that some of the available information is open to subjective interpretation. The report has been written and edited using an extensive amount of information obtained via the Internet and caution should be taken as websites are not always stable and even after a relatively short time much information (databases, documents) is no longer accessible or has been updated. Internet links were last checked as indicated before, during the report completion (May-June 2012).

6. Main findings of the marine AoA for European seas

The reports provide a valuable overview and analysis of the nature and extent of the marine assessment practices over world maritime regions, addressing challenges that face marine and coastal systems. In particular, as regard the assessment products, the report specially focused on the following categories of information concerning ecosystem status and trends:

a. Water Quality;

b. Living Marine Resources;

c. Habitat Characterizations and Impacts;

d. Lower Trophic Levels in the Food Web (i.e. primary and secondary productivity) ;

e. Protected Species;

f. Social and Economic Conditions with respect to the Marine Environment.

The main findings of the marine AoA for the European seas, are presented in Table 4 which presents a brief synthesis of the Regional Summaries included in the Annex IV of the AoA report.

Regional sea	Assessment framework	Main findings from AoA
NE Atlantic (NEA)	• International Council for the Exploration of the Sea (ICES); • OSPAR Convention; • International fisheries management bodies in the region including the North East Atlantic Fisheries Commission (NEAFC), the North Atlantic Salmon Commission (NASCO), the International Control Commission for Atlantic Tuna (ICCAT) and the European Union (EU).	• A substantial amount of assessment work is undertaken also at the national level, which flows through to the regional assessment work.; • The ICES/OSPAR systems operate major data repositories and focus on ecosystem data. • The ICES systems cover fisheries statistics from NEA fishing countries and oceanography related data governmental and non-government marine research establishments. • There is very little international collection of socio-economic data apart from data collected by the European Commission for its purposes. • ICES assessments of the commercial fish stocks in the North East Atlantic cover all significant stocks; • There is a high quality and a high level of knowledge of commercial fish stocks • The OSPAR QSR 2000 gave a comprehensive assessment of all aspects of the marine environment. It covered the whole of the North East Atlantic region, including the high seas, although in less detail than the coastal waters • The development by ICES/ OSPAR of ecological quality objectives (EcoQOs) will be fundamental to improving the integration of future assessments by providing a way of reading across from one field to another.
Baltic sea	• International Council for the Exploration of the Sea (ICES); • Helsinki Convention (HELCOM); • HELCOM's five main groups: HELCOM MONAS, HELCOM LAND, HELCOM HABITAT, HELCOM MARITIME, HELCOM, RESPONSE; • Global Environment Facility (GEF), and the Baltic Sea Regional Project (BSRP); • Baltic NEST Institute.	• The ICES/ HELCOM systems collect, gather and distribute numerous environmental data for the Baltic sea; • Pollution loads into the Baltic Sea are regularly monitored and reported by HELCOM; • All contracting Parties to the Convention carry out regular monitoring activities in the Baltic Sea and report the results and findings; • A large dataset is also available at the Baltic Nest Institute; • There is a long history of assessments in the Baltic Sea region; • Good available expertise and the interaction between marine science, monitoring and assessments is on-going; • The readability of HELCOM holistic assessments has increased significantly over the years, and can be seen as reviews intended for non-specialists. The annual indicator facts sheets contain up-to-date information.
Mediterranean sea	• Mediterranean Action Plan (MAP) and the Barcelona Convention and its related Protocols • MEDPOL (Mediterranean Pollution Monitoring and Research Programme). • The Mediterranean Commission on Sustainable Development (MCSD); • the Six MAP Regional Activity Centres (RACs). • CIESM (International Commission for the Scientific Exploration of the Mediterranean Sea) that provides the scientific framework for the exploration of the Mediterranean • Food and Agriculture Organization's (FAO) General Fisheries Commission for the Mediterranean (GFCM). • IUCN	• MAP Technical Reports provide an enormous capital of knowledge on many environmental aspects of the Mediterranean Sea; • In the framework of the MED POL programme numerous documents dealing with various aspects of pollution research and monitoring have been published • MEDPOL documents cover the whole of the Mediterranean Sea but some also cover certain sub-regional aspects; • Very few documents deal with socio-economic aspects of the marine environment; • There is little data on socio-economic aspects and even less on the inter-relation of these two categories; • There is no central data repository in the Mediterranean region; • The Transboundary Diagnostic Analysis (TDA[19]) for the Mediterranean Sea is an important integrated assessment; • Further important assessments include MAP 2003 Assessment of Transboundary Pollution Issues in the Mediterranean Sea[20]; European Lifestyles and Marine Ecosystem (ELME[21]) – Priority Issues in the Mediterranean Environment; EEA, 2006: Priority Issues in the Mediterranean Environment[22]; and MAP/WHO 2007: Assessment of the State of Microbial Pollution of the Mediterranean Sea[23] ();

[19] UNEP/MAP/MED POL 2004: Transboundary Diagnostic Analysis (TDA) for the Mediterranean Sea. UNEP/MAP, Athens, 282 pp

[20] MAP 2003: Assessment of Transboundary Pollution Issues in the Mediterranean Sea. (UNEP(DEC)/MED WG.228/Inf.7), MAP, Athens, 316 pp

[21] Langmead, O., McQuatters-Gollop, A. and Mee, L.D. (eds.) 2007: European Lifestyles and Marine Ecosystems: Exploring Challenges for Managing Europe's Seas (ELME). University of Plymouth Marine Institute, Plymouth, UK, 43 pp

[22] EEA 2004: Priority Issues in the Mediterranean Environment. European Environment Agency, EEA Report No. 4/2006, 87 pp

		• The Mediterranean Sea and the riparian region have very good capacity for the preparation of assessments relevant to the state of the marine environment.
Black sea	• Global Environment Facility (GEF); • Black Sea Environment Programme (BSEP) and its successor; and • GEF Black Sea Ecosystem Recovery Project (BSERP). • CIESM (International Commission for the Scientific Exploration of the Mediterranean Sea) • ICPDR (International Commission for the Protection of the Danube River) • Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS).	• There is a large amount of available environmental data mostly resulting from national studies as well as numerous scientific c publications • Socio economic data are particularly weak in the Black Sea region, although the limit on available material is much less pronounced in the Danube basin because of the efforts of the ICPDR. • There are no comprehensive studies on the economic and social costs of environmental degradation in terms of the loss of human welfare. • The 2007 TDA[24] is the most up-to-date assessment of the overall situation in the Black Sea, examined causal chains and covers the entire marine area and the pressures on it from land-based activities. • Although not strictly marine, the ICPDR Roof report[25] (ICPDR 2004) is a good example of an integrated assessment of a river basin district • Fisheries assessments produced by FAO-GFCM have mostly relied on national statistics. • There is a lack of validated information on fishing effort, catches and discards • There is a limited studies of the impacts of current environmental degradation on human welfare..

Table 4: Main findings of the marine AoA report for the NEA, Baltic, Mediterranean and Black seas.

7. Overview of existing marine assessments 2008-2012

Since 2000, the quantity of environmental and socio-economic assessments has increased notably over Europe. Knowledge about Environmental issues has expanded rapidly. In particular at the European level, where the increasing frequency of national "state of environment" reports, sustainable development indicators and statistic-based analysis allow to fill former data gaps and the information has become more timely and complete. Many more assessments are also available at trans-national or regional levels covering for regional seas and sub-regions such as the Adriatic basin. The Regional Seas programmes provide indeed a relevant framework for assessment, in particular thanks to high levels of expertise and a long history of undertaking assessments in marine and coastal environments. Monitoring under convention-based processes are generally well-established. Major recent processes at international level and regional agreements constitute a positive context and a relevant trigger for national, sub-national and regional assessments activities. In parallel, the European Commission (EC) and EU policies play a catalytic role in inspiring member states or accession countries for implementing in sustainable development actions and measures as the EC is actively promoting the integration of sustainable development and environmental concern into policies.

This trend towards more regular and comprehensive assessments is on-going at global but also sub-regional (Europe in particular) and regional level. The following sections are based on the filled-templates that cover the main assessments produced mainly at global, regional and national level over 2008-2012 and that may be found in Annex 1. Overview of the all assessments used in the present inventory is presented in Table 5.

Global level

Over recent years, relevant global environmental assessments have been recently produced covering coastal and marine systems, and including extensive compilation of information based on multiple sources, documenting growing pressures, the state of the oceans, the main threats or specific ecosystems status. Particularly, these comprehensive assessments have been produced translating a growth in concern related to unsustainable pressures on marine organisms and an increased appreciation that biodiversity loss will have major impacts for ecosystem services and hence, for human well-being. Relevant collective efforts, such as the third Global Biodiversity Outlook[26], the fourth Global Environment Outlook[27] and the OECD

[23] MAP/WHO 2007: Assessment of the State of Microbial Pollution of the Mediterranean Sea. Meeting of MED POL National Coordinators, UNEP(DEPI)/MED WG. 316/Inf. 5.

[24] BSERP 2007: Black Sea Transboundary Diagnostic Analysis. GEF Black Sea Ecosystem Recovery Project, Istanbul

[25] ICPDR 2004: Danube Basin Analysis (WFD Roof Report 2004). International Commission on the Protection of the Danube River, Vienna,

[26] CDB, Convention on Biological Diversity 2010: Global Biodiversity Outlook 3. Montréal, 94 pages.2007

[27] UNEP, 2007: Global Environment Outlook, GEO4, Environment for Development. UNEP, Nairobi, , Kenya

Environmental Outlook to 2030[28] provide a valuable global overview of biodiversity status and threats derived from anthropogenic activities and pressures in the near future. The recent Living Planet Report[29] also clearly enhanced the current unsustainable pressures on world environment and reported a global decline of the Living Planet Index (LPI - which provides information on trends in the abundance of the world's vertebrates) of almost 30 per cent over 1970 - 2007 period. As regards marine biodiversity, the recently completed Census of Marine Life[30] is so far, the largest global inventory of biodiversity and distribution of known marine species in 25 regions from Antarctica to the Arctic including the Mediterranean, the Baltic, the Atlantic Europe but excluding the Black Sea. The census, which clearly states that the marine biodiversity is threatened, is a reference basis for measuring large scale future changes.

It is also worth noticing the World Atlas of Seagrasses[31], not yet included in GRAMED, that is still the most comprehensive compilation of existing information on the distribution area of seagrasses in various regions of the world, documenting some 177,000 km^2 of Seagrass and providing a rough estimate of the global coverage on the order of 500,000 km^2.

In 2010, FAO also published its updated State of World Fisheries and Aquaculture (SOFIA[32] - published every two years) that provides an comprehensive global view of capture fisheries and aquaculture, including inland fisheries and all relevant policy issues and reports. The last version in 2010 also includes a section on "climate change implications for fisheries and aquaculture," which details on current scientific knowledge, the ecological and physical impacts of climate change, fishers and their communities and aquaculture. According to the FAO, 32 per cent of the world's fish stocks are estimated to be over-exploited, depleted or recovering.

The Economics of Ecosystems and Biodiversity (TEEB[33]) report that was released in fall 2010 at the CBD COP10 in Nagoya is also a major progress in drawing attention to the global economic benefits of biodiversity and the growing costs of ecosystem degradation. However, despite their huge importance, goods and services provided by marine and coastal ecosystems have received less attention than those provided by terrestrial ecosystems.

Regional Level

At the supra-regional level, of particular relevance is the recently published "European Environment State and Outlook" - SOER[34] report which has a specific thematic assessment dedicated to marine and coastal environments over Europe. Indeed, the European Environmental Agency (EEA) reports on the status of the European seas by means of broad indicator based reporting every 5 or 10 years. An updated integrated report focusing specifically on the state of the coasts is expected for 2012/2013.

The 2010 SOER marine thematic assessment is a comprehensive reference report that covers multiple aspects of the marine environment and land-sea interface in all four European marine regions. It lends support to the need of an ecosystem-based approach for managing the marine and coastal environment by reporting updated data and information extracted from a several sources. The synthetic report EEA "10 key messages"[35] is also relevant in drawing the attention on particular challenging aspects and flagship issues such as climate change impacts or alien species.

As regards the Black Sea, a "State of Pollution of the Black Sea" report is prepared and published every five years based on the data collected through the coordinated pollution monitoring and assessment programme, and the next assessment is expected over 2012/2013. In addition, the Transboundary Diagnostic Analysis (TDA) for the Black sea (2007[36]) is also an essential document that gathers existing information and analyses causal chains, linking pressures and changes to the state of the environment as shown in the marine AoA. The BSC published in 2008 the updated broad assessment "State of the Environment of the

[28] OECD, 2008: OECD Environmental Outlook to 2030. OECD, Paris

[29] WWF, 2010: Living Planet Report 2010 Biodiversity, biocapacity and development. WWF Gland, Switzerland.

[30] http://www.coml.org/

[31] Green E.P and Short F.T. 2003: World Atlas of Seagrasses. Prepared by the UIMEP World Conservation Monitoring Centre

[32] FAO 2010: State of World Fisheries and Aquaculture (SOFIA) http://www.fao.org/docrep/013/i1820e/i1820e00.htm

[33] TEEB 2010 Synthesis Report Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB http://www.teebweb.org

[34] EEA 2010: The European Environment State and Outlook SOER - Thematic assessment – Marine and coastal. Environment. European Environment Agency, Copenhagen. http://www.eea.europa.eu/soer

[35] EEA 2010 10 messages for 2010 - Marine ecosystems, European Environment Agency.

[36] GEF 2007: Black Sea Transboundary Diagnostic Analysis TDA, UNEP, Global Environmental Facility Black Sea Environmental Programme publication, Istanbul

Black Sea[37:] (2001-2006/7)". The report included in GRAMED, completes and updates the state of the environment of the Black Sea Report in 2002 and includes relevant information that reflect significant progresses in assessing the status of the enclosed sea. In particular, the report include information on Catch per unit effort (CPUE) statistics to support total catch data and fishery statistics and a relevant insight of socio-economic pressures and impacts along with a first evaluation of the values associated with the environmental goods and services provided by the Black Sea. Over the last 15 years the Black Sea has attracted special attention from the international community after the sea ecological collapse and economic decline. After the Black Sea ecological crisis was confirmed, worldwide numerous publications appeared and there is now a growing evidence that the ecosystem is undergoing a slight recovery. However, maybe due to, in a certain extent, the end of the emergency situation, the production of studies and assessments covering main issues over the region seems to have slow down and only few relevant assessments have been produced over the period 2008-2012. It is however important to mention the recent thematic document "*Marine Litter of the Black Sea"*[38] published in 2009 under the Black Sea Commission framework. The report gathers existing data and focus on policies, activities, and institutional arrangements concerning the Marine Litter in the Black Sea region and proposes several actions and recommends in particular their well-timed inclusion into the Strategic Action Plan.

In the Mediterranean, recent advancements include IUCN assessments on biodiversity[39][40] and RAC/SPA's regional reviews[41] that provide relevant information on the state of knowledge, temporal and spatial biodiversity trends and threats along with spatial identification of conservation hot spots and endangered species. These assessment testify also relevant progresses in biodiversity understanding at regional level.

Over the years, under the Barcelona Convention, several efforts have been made to provide systematic information on the state of the environment and development in the Mediterranean, the latest ones in 2009[42] and in 2012[43]. 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 Mediterranean region[44].

Further relevant assessments focusing on climate change issues and related impacts on the Mediterranean include recent UNEP/MAP publications such as the RAC/SPA, 2010 report "Impact of climate change on marine and coastal biodiversity in the Mediterranean Sea: Current state of knowledge"[45]. Magnan *et* al., (2009[46]) in turn provide a thorough overview of major climatic evolutions predicted for the Mediterranean over the century including temperatures, rainfall regimes and variation of sea level. In addition, it represents a general framework for the implementation of adaptation in the Mediterranean context, based on a number of important clarifications and accompanied by operational recommendations.

Since July 2008, the Contracting Parties to the Barcelona Convention have been committed to progressively apply the Ecosystem Approach to manage human activities. As part of that effort, the Contracting Parties have laid the foundations for formulating policy by identifying priority issues that are common to all sub-regions and by highlighting gaps in understanding created by lack of monitoring or inconsistent monitoring. Since then, an in-depth assessment to determine priority issues, the ecological objectives and indicators have been agreed with contracting parties. The UNEP/MAP Initial Integrated Assessment of the Mediterranean sea[47] represents an initial broad assessment of information on ecology, status, and pressures affecting coastal and marine ecosystems of the Mediterranean, based on existing information available at the regional level and for the Mediterranean marine sub-regions. The findings of the assessment clearly support Contracting Parties and Mediterranean countries towards the implementation of the Ecosystem Approach.

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[37] BSC, 2008: State of the Environment of the Black Sea (2001-2006/7). Edited by Ternel Oguz - Commission on the Protection of the Black Sea Against Pollution (BSC) 2008-3, Istanbul, Turkey – The report is included in the GRAMED database.

[38] http://www.blacksea-commission.org/_publ-ML.asp

[39] Cuttelod, A., García, N., Abdul Malak, D., Temple, H. and Katariya, V. 2008. The Mediterranean: a biodiversity hotspot under threat. In: J.-C. Vié, C. Hilton-Taylor and S.N. Stuart (eds). The 2008 Review of The IUCN Red List of Threatened Species. IUCN Gland, Switzerland.

[40] Abdul Malak, D. et al., 2011: Overview of the Conservation Status of the Marine Fishes of the Mediterranean Sea. Gland, Switzerland and Malaga, Spain: IUCN.

[41] UNEP/MAP/RAC-SPA 2010b: The Mediterranean Sea Biodiversity: state of the ecosystems, pressures, impacts and future priorities.

[42] UNEP/MAP-Plan Bleu 2009: State of the Environment and Development in the Mediterranean, SOED,

[43] UNEP MAP 2012: State of the Mediterranean coastal and marine environment - Highlights for policy makers

[44] UNEP MAP 2012: State of the Mediterranean coastal and marine environment - Highlights for policy makers

[45] UNEP-MAP-RAC/SPA, 2010: Impact of climate change on marine and coastal biodiversity in the Mediterranean Sea: Current state of knowledge

[46] Magnan A., Garnaud B., Billé R., Gemenne F., Hallegatte S., 2009: The future of the Mediterranean: from impacts of climate change to adaptation issues, IDDRI series, 43p.

[47] UNEP MAP 2012: Initial Integrated Assessment of the Mediterranean sea – fulfilling step 3 of the ecosystem approach process

Last but not least the "Economic value of sustainable benefits rendered by the Mediterranean marine ecosystems" published by the Plan Bleu in 2010[48] catalyses the surge of interest in integrating economic evaluation into environmental assessment and in assessing ecosystems services provided by marine ecosystems in the Mediterranean in line with recent inputs from the Millennium Ecosystem Assessment and the more recent TEEB.

As for the Baltic sea, a number of important thematic and broad assessments have been produced over the last 5 years. In particular within the Regional sea convention framework, HELCOM continues with collecting information and producing indicator reports, thematic assessments of specific issues and periodic general assessments of the whole Baltic marine environment as a basis for the policy decisions on managing the most impacting human activities.

The Baltic Sea Action Plan was adopted by HELCOM in 2007 and according to the Plan, tools and methodologies need to be developed for evaluating the status and trends related to the marine environment. Straightforward assessment of the occurrence and inputs, as well as uses and sources, of hazardous substances in the Baltic Sea region is also required.

Particularly the broad report HELCOM "Initial Holistic Assessment of the Ecosystem Health of the Baltic Sea 2003-2007"[49] is an important achievement as it is the first comprehensive assessment of the ecosystem health of the entire Baltic sea, including associated economic costs and benefits at stake (where feasible, aggregated monetary values for the Baltic Sea have also been presented). The assessment is a baseline document that addresses full systems and that will be used in the future to assess progresses and the effectiveness of the implementation of the measures of the HELCOM Baltic Sea Action Plan. The assessment also covers a number of aspects of Good Environmental Status.

HELCOM environmental Indicator Fact Sheets[50] also provide information on the recent state of and trends in the Baltic sea environment and cover to date the following issues: hydrographic variations (temperature, salinity, inflows and runoff); inputs and concentrations of nutrients and hazardous substances; plankton blooms and species composition; radioactivity and illegal oil discharges.

Another important regional assessment is the 2008 BALTEX[51] Assessment of Climate Change for the Baltic Sea Basin that provides an up-to-date overview of the latest scientific findings in regional climate research on the Baltic Sea basin that includes past and current climate change, projected futures of anthropogenic climate change and observed and projected impacts on terrestrial and marine ecosystems.

As regards the OSPAR marine area, the main progress is the production of the OSPAR Quality Status Report (QSR) 2010[52] integrated report. The QSR is a key comprehensive report that assesses the quality of the marine environment for the whole North-East Atlantic based largely on the work under the Assessment and Monitoring Programme (JAMP). QSR 2010 follows the QSR 2000 published and reflects the collective effort made by Contracting Parties over the period 1998 to 2008 to manage, monitor and assess the many pressures on NEA sea ecosystems and related impacts. It assesses the quality status of the marine environment and provides an evaluation of the measures taken and planned for marine environment protection along with the identification of priorities for action. QSR 2010 covers climate change, fisheries and main human uses and impacts in addition to OSPAR's five core thematic strategies (biodiversity and ecosystems, eutrophication, hazardous substances, offshore oil and gas and radioactive substances). The layout and content of the QSR 2010 is driven by a change in target audience, with a major focus on policy makers, managers and the public, rather than the scientific community. The QSR 2010 still not thoroughly explores the social and environmental aspects other than as drivers of environmental pressures and is structured around the main pressures and impacts rather than on ecological characteristics as per the MSFD (see ODEMM 2010[53]). Apart from the QSR reports, OSPAR continues to effectively collect the necessary information and produce regularly updated thematic assessments of specific issues and general assessments of marine environment of the NEA as shown in Table 5 as a basis for sound policy decisions on managing the human activities.

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[48] Mangos, A., Bassino, J-P., Sauzade, D. 2010: The economic value of sustainable benefits rendered by the Mediterranean marine ecosystems – Plan Bleu

[49] HELCOM, 2010: Ecosystem Health of the Baltic Sea 2003–2007: HELCOM Initial Holistic Assessment. Balt. Sea Environ. Proc. No. 122.

[50] http://www.helcom.fi/BSAP_assessment/ifs/en_GB/cover/

[51] BACC - BALTEX (Baltic Sea Experiment) 2008: Assessment of Climate Change for the Baltic Sea Basin

[52] OSPAR 2010: Quality status report qsr2010.ospar.org

[53] ODEMM 2011 The NE Atlantic: Additional information on status of threat-ened ecological characteristics relevant to the Marine Strategy Framework Directive ODEMM - Options for Delivering Ecosystem-basedMarine Management (Knights AM, Piet G., Breen P., Goodsir F. and LA Robinson) http://www.liv.ac.uk/ODEMM/

National level

The European Union recently increased its commitment to the protection of oceans and seas and in parallel, the body of information, derived from numerous sources, describing and quantifying pressures and trends on the coastal and marine waters has grown. In particular, the objective of combating pollution and achieving good environmental status (GES) of European seas has been recently enhanced through the Marine Strategy Framework Directive (MSFD - 2000/60/EC). The Directive that came into force in 2008, constitutes an important cornerstone of the EU's maritime policy and will exert a strong legislative framework for producing new assessments at member states level under directives obligations.

The Directive sets out high-level eleven descriptors of GES which cover all the key aspects of the marine ecosystem and main human pressures on them. They relate to biological diversity, non-indigenous species introductions, commercially exploited fish and shellfish populations, food webs, human-induced eutrophication, sea floor integrity, impacts on hydrographical conditions, concentrations of contaminants, contaminants in fish and other seafood, marine litter and underwater noise. The MSFD requires therefore comprehensive assessments of how humans use the marine environment and the development of action plans and explicit measures to achieve a GES by 2020.

The reports mentioned before at regional level, are primarily assessments at the scale of the convention waters or sub-region in question (e.g. Baltic Sea basins, four Mediterranean marine sub-regions Greater North Sea and Black Sea), that typically do not cover specific assessments at the scale of individual Member States waters. Regional reports may help to meet the MSFD's requirements in relation to the required initial assessments, but alone will not be sufficient to fulfil their Member States assessment obligations.

Member States' "initial assessments" to be prepared under the Art. 8 of the MSFD in 2012 will possibly not provide a complete assessment of all the relevant pressures and impacts on the marine environment as most monitoring programme do not fully meet MSFD purposes and appropriate assessment tools in spite of on-going progresses, are insufficient to ensure appropriate coverage of all aspects of the Directive. Initial assessments are likely, for the most part, to gather information generated from existing European (WFD, Habitat directive, Nitrates Directive, Bathing Waters Directive), regional or national level commitments. The most recent and integrated regional and sub-regional reports that will be of key importance for EU Member States in their initial assessments include:

- Quality Status Report 2010 for the North-East Atlantic;
- Initial Holistic Assessment of the Baltic marine environment (HELCOM HOLAS);
- Wadden Sea Quality Status Report 2009 (Common Wadden Sea Secretariat);
- Assessment of the Mediterranean Sea for the four Mediterranean sub-regions (UNEP-MAP road map for implementing the Ecosystem approach); and
- Assessments of the Black Sea (BSC).

Member States "Initial assessments" in their definitive forms are not yet available and only some draft versions or preliminary step reports may be found on the internet. The only "initial assessment" included in the Templates is the assessment for the Dutch part of the North-Sea[54].

Recent legislative improvement also includes the New European legislation on bathing water was adopted in 2006. The "New Bathing Water Directive" updates the measures of the 1975 legislation and foresee to simplify the management and surveillance methods. The New Directive based on scientific knowledge on protecting health and the environment lays down provisions for more sophisticated monitoring, assessment and classification of bathing water quality. The EEA produces an Annual summary report of bathing water quality in EU Member States every year. The last report analysis information and monitoring results for 2011[55] (see Table 5).

Due to the limited scope of the present report, not all the assessments, particularly those produced at level such as national reports or more generic reports like Sustainable Development reports that often include a relevant "marine" or "coastal" section, have been included in the individual templates (see Annex 2). However, a selection of possible environmental reports and assessments that may be relevant for the UNRRP are presented in the ANNEX 3 as an additional source of information. The annex includes a table with the title of the document, the related geographical scale and the source of information (web links).

[54] Deltares 2011: Initial Assessment Implementation of the Marine Strategy Framework - Directive for the Dutch part of the North Sea

[55] EEA 2012: European bathing water quality in 2011 EEA Report - No 3/2012

Scale	Region	Classification	Title	Organisation	Note	Corresponding chapters of the Outline of the First Global Integrated Marine Assessment
Supra-regional	Europe	Broad assessment	ICES 2003: Environmental status of the European seas – German Ministry for the Environment, Nature Conservation and Nuclear Safety	ICES	*Not included in Gramed*	*4, 5, 6, 11, 15, 17, 18, 20, 21, 22, 25, 27, 35, 36*
Supra-regional	Europe	Broad assessment	EEA 2006: The changing faces of Europe's coastal areas, EEA Report No 6/2006 European Environment Agency, Copenhagen	EEA	*Not included in Gramed*	*4, 11, 12, 20, 21, 26, 27*
Supra-regional	Europe	Narrow assessment	ESF, 2007: Impacts of Climate Change on the European Marine and Coastal Environment Ecosystems Approach - Position Paper 9	ESF	*Not included in Gramed*	*4, 5*
Supra-regional	Europe	Broad assessment	EEA 2010: Marine and coastal environment - SOER 2010 thematic assessment	EEA	*New assessment*	*4, 5, 6, 11, 15, 17, 18, 20, 21, 22, 25, 27, 35, 36*
Supra-Regional	Europe	Narrow assessment	EEA 2011: Hazardous substances in Europe's fresh and marine waters — An overview EEA Technical report No 8/2011	EEA	*New assessment*	*17, 20, 21*
Supra-regional	Europe	Narrow assessment	ESF 2011: Climate Change and Marine Ecosystem Research - Synthesis of European Research on the Effects of Climate Change on Marine Environments CLAMER project deliverable 1.2	Marine Board-ESF	*New assessment*	*4, 5*
Supra-regional	Europe	Narrow assessment	EEA 2012: European bathing water quality in 2011 EEA Report - No 3/2012	EEA	*New assessment*	*20*
Global	World Ocean	Narrow assessment	Greenpeace 2006: Plastic Debris in the World's Oceans	Greenpeace	*Not included in Gramed*	*25*
Global	World Ocean	Narrow assessment	UNEP, 2009. Marine Litter: A Global Challenge. Nairobi: UNEP.	UNEP	*New assessment*	*25*
Regional	NE Atlantic	Narrow assessment	EEA 2002: Europe's biodiversity - biogeographical regions and seas - The North-east Atlantic Ocean - huge, deep and heavily exploited	EEA	*Not included in Gramed*	*6, 11, 12, 34, 35, 36*
Regional	NE Atlantic	Narrow assessment	OSPAR 2009: Eutrophication Status of the OSPAR Maritime Area - Second OSPAR Integrated Report	OSPAR	*Updated assessment*	*20*
Regional	NE Atlantic	Narrow assessment	OSPAR 2009: Marine litter in the North-East Atlantic Region. Assessment and priorities for response	OSPAR	*New assessment*	*17, 25*
Regional	NE Atlantic	Narrow assessment	OSPAR 2009: Assessment of the impacts of shipping on the marine environment	OSPAR	*New assessment*	*17, 18*
Regional	NE Atlantic	Narrow assessment	OSPAR 2009: Assessment of climate change mitigation and adaptation.	OSPAR	*New assessment*	*4, 5, 22*

Regional	NE Atlantic	Narrow assessment	ICES advice 2008, book 1: Chapter 1.5.5.1, An assessment of the changes in the distribution and abundance of marine species in the OSPAR maritime area in relation to changes in hydrodynamics and sea temperature.	OSPAR	*New assessment*	*4, 5, 6, 11*
Regional	NE Atlantic	Narrow assessment	OSPAR 2009: Assessment of impacts of offshore oil and gas activities in the North-East Atlantic	OSPAR	*Updated assessment*	*19, 21*
Regional	NE Atlantic	Broad assessment	OSPAR 2010: Quality status report	OSPAR	*Updated assessment*	*4, 5, 6, 11, 15, 17, 18, 19 20, 21, 22, 23, 25, 26, 27, 34, 35, 36*
Regional	NE Atlantic	Narrow assessment	OSPAR 2009: Impacts of climate change on the North-East Atlantic ecosystem – monitoring and assessment series	OSPAR	*New assessment*	*4, 5, 6*
Regional	NE Atlantic	Narrow assessment	OSPAR 2009: Status and trend of marine chemical pollution - Hazardous Substances Series	OSPAR	*Updated assessment*	*17, 19, 20, 21*
Regional	NE Atlantic	Broad assessment	OSPAR, 2009: Trend analysis of maritime human activities and their collective impact on the OSPAR maritime area	OSPAR	*New assessment*	*11, 12, 17, 18, 21, 23, 25, 27*
Regional	Wadden Sea	Broad assessment	Common Wadden Sea Secretariat, 2010: The Wadden Sea Quality Status Report - Synthesis Report 2010. Wadden Sea Ecosystem No. 29 (Wim J. Wolff, Jan P. Bakker, Karsten Laursen, Karsten Reise)	Common Wadden Sea Secretariat,	*New assessment*	*6, 11, 12, 15, 17, 18, 19, 20, 21, 22, 25, 27, 35, 36*
National	Dutch part of the North Sea	Broad assessment	Deltares 2011: Initial Assessment Implementation of the Marine Strategy Framework - Directive for the Dutch part of the North Sea - Background document 1 (of 3)	Deltares	*New assessment*	*4, 5, 6, 11, 12, 15, 17, 19, 20, 21, 22, 23, 25, 27, 35, 36*
Regional	Baltic sea	Narrow assessment	EEA 2002: Europe's biodiversity - biogeographical regions and seas - The Baltic Sea - the largest brackish sea in the world.	EEA	*Not included in the Gramed database*	*6, 11, 34,35, 36*
Regional	Baltic sea	Narrow assessment	HELCOM 2007: Marine litter in the Baltic Sea Region - Assessment of the Marine Litter problem in the Baltic region and priorities for response.	HELCOM	*Not included in Gramed*	*17, 25, 27*
Regional	Baltic sea	Narrow assessment	HELCOM 2007: Towards a Baltic sea unaffected by eutrophication - HELCOM Overview	HELCOM	*Not included in Gramed*	*20*
Regional	Baltic sea	Narrow assessment	HELCOM 2011: Fifth Baltic Sea Pollution Load Compilation (PLC-5) - Baltic Sea Environment Proceedings No. 128.	HELCOM	*Updated assessment*	*17, 18, 20, 21*
Regional	Baltic sea	Narrow assessment	Baltic Nest Institute 2012: External nutrient loads to the Baltic Sea, 1970-2006 Technical Report No. 5	Baltic Nest Institute	*New assessment*	*20*

Regional	Baltic sea	Broad assessment	HELCOM 2010: Towards a tool for quantifying anthropogenic pressures and potential impacts on the Baltic Sea marine environment. A background document on the method, data and testing of the Baltic Sea Pressure and Impact Indices (Baltic Sea Environment Proceedings No. 125)	HELCOM	*New assessment*	*11, 12, 17, 20*
Regional	Baltic sea	Narrow assessment	Baltic Environmental Forum 2000: 2nd Baltic state of the Environment report based on environmental indicators.	Baltic Environmental Forum	*Not included in the Gramed database*	*11, 15, 17, 19, 20, 21, 22*
Regional	Baltic sea	Narrow assessment	BACC - BALTEX (Baltic Sea Experiment) 2008: Assessment of Climate Change for the Baltic Sea Basin	BALTEX (Baltic Sea Experiment)	*New assessment*	*4, 5, 6, 11, 20, 35*
Regional	Baltic sea	Broad assessment	HELCOM 2010: Ecosystem Health of the Baltic Sea HELCOM Initial Holistic Assessment - Baltic Sea Environment Proceedings No. 122.	HELCOM	*New assessment*	*6, 11, 12, 17, 18, 19 20, 21, 22, 23, 25, 26, 27, 34, 35, 36*
Regional	Baltic sea	Narrow assessment	HELCOM 2010: Hazardous substances in the Baltic Sea - An integrated thematic assessment of hazardous substances in the Baltic Sea - Baltic Sea Environment Proceedings No. 120B.	HELCOM	*Updated assessment*	*20, 21, 22, 23,*
Regional	Baltic sea	Narrow assessment	HELCOM 2010: Maritime Activities in the Baltic Sea An integrated thematic assessment on maritime activities and response to pollution at sea in the Baltic Sea region - Baltic Sea Environment Proceedings No.123	HELCOM	*New assessment*	*17, 19, 21, 22*
Regional	Baltic sea	Narrow assessment	OCEANA 2012: Fisheries management in the Baltic Sea - How to get on track to a sustainable future in Baltic fisheries.	OCEANA	*New assessment*	*11, 15*
Regional	Mediterranean	Narrow assessment	EEA, 2002: Europe's biodiversity - biogeographical regions and seas -Seas around Europe - The Mediterranean sea - blue oxygen-rich, nutrient-poor waters	EEA	*Not included in Gramed*	*6, 11, 20, 34, 35*
Regional	Mediterranean	Narrow assessment	UNEP MAP/RAC-SPA 2003: Effects of fishing practices on the Mediterranean Sea: Impact on marine sensitive habitats and species, technical solution and recommendations.	UNEP MAP/RAC-SPA	*Not included in Gramed*	*11 and Part VI*
Regional	Mediterranean	Narrow assessment	IUCN 2008. Maritime traffic effects on biodiversity in the Mediterranean Sea: Review of impacts, priority areas and mitigation measures. Ameer Abdulla, PhD, Olof Linden, PhD (editors).	IUCN	*New assessment*	*17, 18, 25, 36*
Regional	Mediterranean	Broad assessment	UNEP MAP 2012: Initial Integrated Assessment of the Mediterranean sea – fulfilling step 3 of the ecosystem approach process	UNEP/MAP	*New assessment*	*6, 11, 17, 18, 20, 27, 34, 35, 36*
Regional	Mediterranean	Narrow assessment	UNEP-MAP-RAC/SPA. 2010. Fisheries conservation management and vulnerable ecosystems in the Mediterranean open seas, including the deep sea.	UNEP-MAP-RAC/SPA	*New assessment*	*11 and Part VI*

Regional	Mediterranean	Narrow assessment	MWO, Mediterranean Wetland Observatory 2012: Mediterranean Wetlands Outlook. First Mediterranean Wetlands Observatory report – Synthesis for decision makers	Tour du Valat / Mediterranean Wetlands Observatory (MWO)	*New assessment*	*34, 35, 36*
Regional	Mediterranean	Narrow assessment	UNEP/MAP MEDPOL 2011: Hazardous substances in the Mediterranean - A spatial and temporal assessment - Consultation Meeting to Review MED POL Monitoring Activities	UNEP/MAP MEDPOL	*New assessment*	*20*
Regional	Mediterranean	Narrow assessment	Cuttelod, A., García, N., Abdul Malak, D., Temple, H. and Katariya, V. 2008. The Mediterranean: a biodiversity hotspot under threat.	IUCN	*New assessment*	*34, 35, 36*
Regional	Mediterranean	Narrow assessment	UNEP/MAP-MED POL/WHO 2008 : Assessment of the state of microbial pollution in the Mediterranean Sea.	UNEP/MAP-MED POL/WHO:	*Updated*	*12, 20, 21*
Regional	Mediterranean	Narrow assessment	Coll,M., Piroddi, C., Steenbeek, J., et al., 2010: The biodiversity of the Mediterranean Sea: estimates, patterns, and threats. PLoS ONE 5 (8)	PLoS ONE	*New assessment*	*34, 35, 36*
Regional	Mediterranean	Narrow assessment	UNEP/MAP/MEDPOL Releases, emissions and sources of pollutants in the Mediterranean region - An assessment of 2003-2008 trends	UNEP MAP/MEDPOL	*New assessment*	*20*
Regional	Mediterranean and Black sea	Narrow assessment	FAO 2009: Regional study on small tunas in the Mediterranean including the Black Sea including the Black Sea,	FAO	*New assessment*	*11, 12, 36*
Regional	Mediterranean	Narrow assessment	Abdul Malak, D. et al. 2011 : Overview of the Conservation Status of the Marine Fishes of the Mediterranean Sea	IUCN	*New assessment*	*34, 35, 36*
Regional	Mediterranean	Broad assessment	Mangos, A., Bassino, J-P., Sauzade, D. 2010: The economic value of sustainable benefits rendered by the Mediterranean marine ecosystems – Plan Bleu	Plan Bleu	*New assessment*	*11, 12, 27, 36, 43*
Regional	Mediterranean	Broad assessment	UNEP MAP/Plan Bleu 2008: The Blue Plan's Sustainable development outlook in the Mediterranean,	UNEP MAP/Plan Bleu	*New assessment*	*4, 5, 6, 8, 11, 12, 17, 20, 21, 22, 25, 26, 27, 28, 36*
Regional	Mediterranean	Broad assessment	UNEP/MAP-Plan Bleu 2009: State of the Environment and Development in the Mediterranean.	UNEP MAP/Plan Bleu	*New assessment*	*4, 5, 6, 8, 11, 12, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 36*
Regional	Mediterranean	Narrow assessment	IDDRI, 2009: The Future of the Mediterranean: from impacts of climate change to adaptation issues	IDDRI	*New assessment*	*4, 5, 27*
Regional	Mediterranean	Narrow assessment	UNEP-MAP RAC/SPA 2010: The Mediterranean Sea Biodiversity: state of the ecosystems, pressures, impacts and future priorities.	UNEP-MAP RAC/SPA	*New assessment*	*34, 35, 36*
Regional	Mediterranean	Narrow assessment	UNEP-MAP-RAC/SPA, 2010. Impact of climate change on marine and coastal biodiversity in the Mediterranean Sea: Current state of knowledge..	UNEP-MAP-RAC/SPA, 2010	*New assessment*	*4, 5, 6, 11, 17, 35, 36*

Regional	Mediterranean	Narrow assessment	UNEP MAP 2012: State of the Mediterranean coastal and marine environment - Highlights for policy makers	UNEP MAP	*New assessment*	*4, 6, 11, 12, 17, 20, 21, 34, 35, 36,*
Regional	Mediterranean	Narrow assessment	Plan Bleu 2010: Maritime Transport of Goods in the Mediterranean. Plan Bleu, Valbonne, 2010 (Blue Plan Papers 7).	Plan Bleu	*New assessment*	*17, 18*
Regional	Mediterranean	Narrow assessment	Abdul Malak, D. et al. 2011: Overview of the Conservation Status of the Marine Fishes of the Mediterranean Sea. Gland, Switzerland and Malaga, Spain	IUCN	*New assessment*	*34, 35, 36*
Regional	Mediterranean	Narrow assessment	UNEP/MAP, MEDPOL 2011: Assessment of the status of marine litter in the Mediterranean	UNEP MAP, MEDPOL	*New assessment*	*25, 36*
Regional	Black Sea	Narrow assessment	EEA, 2002: Europe's biodiversity - biogeographical regions and seas: The Black Sea an oxygen-poor sea. by Zaitsev Yu.P., B.G. Alexandrov, N.A. Berlinsky, & A. Zenetos. Environmental issue report Published by EEA (European Environment Agency) Copenhagen 2002	EEA	*Not included in Gramed*	*06, 11, 20, 34, 35*
Global	Black Sea	Broad assessment	Heileman, S., W. Parr, and G. Volovik. 2009: Chapter V-8 Black Sea LME in Sherman, K. and Hempel, G. (Eds). The UNEP Large Marine Ecosystem Report: A perspective on changing conditions in LMEs of the world's Regional Seas. UNEP Regional Seas, Report and Studies No. 182. United Nations Environment Programme. Nairobi, Kenya, pp 839.	UNEP	*New Assessment*	*04, 06, 11, 15, 20*
Regional	Black Sea	Narrow assessment	Black Sea Commission 2009: Marine Litter in the Black Sea Region. Black Sea Commission.	Black Sea Commission.	*New Assessment*	*25*
Regional	Black Sea	Narrow assessment	GFCM 2010: Draft document on the Alien Species in the Mediterranean and the Black Sea (By Bayram Ozturk) – Scientific Advisory Committee, Twelfth Session Budva, Montenegro, 25-29 January 2010. *GFCM:SAC12/2010/Dma.1*	GFCM	*New Assessment*	*11, 17, 36*
Regional	Black Sea	Narrow assessment	GFCM 2008: Strengthening Cooperation in the Black Sea - Thirty-Second Session -Rome, Italy, 25-29th February 2008.	GFCM	*New Assessment*	*11, 15, 36*
Regional	Black Sea	Narrow assessment	GFCM 2012: Background Document on the Black Sea Fisheries Preliminary Version- First meeting of the GFCM Working Group on the Black Sea. Constanta, Romania, 16-18 January 2012	GFCM	*New Assessment*	*11, 15, 36*

Not included in Gramed*: stands for an assessment produced before 2008 but that was no included in the Gramed database*
New assessment**:** means that the assessment is not included has been published after 2008 and that is not either an updated assessment.
Updated assessment: recent updated assessment of an assessment included in Gramed (part of a monitoring cycle).

Table 5: Overview of assessments analysed in the individual templates for the 4 seas

8. Gap analysis

Based on the information collected through the individual templates, the following section contains for each of the four marine regions, a gap analysis related to the knowledge gathered and issues covered by recent assessments. This review draws on available data and information analysed by scanning the recent existing literature (2008-2012), but does not attempt to provide a comprehensive synopsis of information on all aspects related to the European marine areas nor to give a complete picture of the state of the supra-regional environment. The proposed overview is based on the analysis of the assessments collected and reviewed by mean of individual templates and due to the complexity and the range of challenging issues, represents only a first subjective appraisal of the main gaps related to the issues included in the 4 building blocks of the UNRP outline namely (i) ecosystem services from the marine environment (other than provisioning services); (ii) food security; (iii) Marine biological diversity and habitats and (iv) human activities impacting on the marine environment.

Every issue that covers the Global Reporting and Assessment of the State of the Marine Environment, includes numerous complex and interlinked sub-issues. For instance "Coastal, riverine and atmospheric inputs from land" (future chapter 19[56]) includes Municipal waste water (including the impact of major cities and of cruise ships in harbours) industrial discharge, Agricultural runoff and emissions, Eutrophication etc. For each issue, the most salient issue that was addressed by the assessments has been considered as representative of the category. For instance, in that case Eutrophication has been used as "representative" of the "Coastal, riverine and atmospheric inputs from land" category. When no issue was considered prevailing, the combination of several sub-issues addressed in several chapters of the assessments have been considered to obtain an appraisal. The chapter 3 of the marine AoA and related findings for Europe's seas, has been used as the basic informative entry point. The following analysis, in spite of its evident shortcomings, foresees to provide a basis for discussing and highlighting information gaps or overlaps that require specific attention within the framework of the UNRRP.

In order to get a certain level of consistency, the same evaluation criteria used for the Assessment of Assessments (marine AoA chapter 3) are used to conduct the gap analysis (i.e. extensive; good; some; none; unknown). Tables 6-9 covered mostly all the issues of the UNRP outline. Due to time constraints, specific analysis of the issues is provided as an example only for Eutrophication and nutrient enrichment issue.

Region/theme	Hydrological cycle	Sea/Air interaction	Primary production & Cycling of nutrients,	Carbonate production	Aesthetic & cultural, ecosystem services
NE Atlantic					**?**
Baltic Sea					**?**
Mediterranean					
Black Sea					

Table 6: Gap analysis Ecosystem Services

[56] http://www.un.org/Depts/los/global_reporting/global_reporting.htm

Region/*theme*	*Capture fisheries*	*Aquaculture*	*Seaweeds*	*Social and economic aspects*
NE Atlantic	●	?	◕	◕
Baltic Sea	●	?	◔	◕
Mediterranean	◕	◕	?	◔
Black Sea	◕	◔	?	◔

Table 7: Gap analysis - Food Security

Region/*theme*	*Coral*	*Seagrass and eel-grass beds*	*Saltmarsh*	*Deep sea*	*Migratory species*	*Endangered species*
NE Atlantic	◔	◔	◔	◔	◔	◔
Baltic Sea	◔	◔	◔	◔	◔	◔
Mediterranean	◔	◔	◕	◔	◔	◔
Black Sea	◔	◔	◔	◔/○	◔	◔

Table 8: Gap analysis – Marine Biological diversity and habitats

Region/theme	Shipping	Ports	Submarine cables and pipelines	Inputs from land	Offshore hydrocarbon industries	Other marine-based energy industries
NE Atlantic	◕	◕	◕	●	◕	◕
Baltic Sea	◕	◕	◔	●	◕	◕
Mediterranean	◕	◕	○	◕	◕	◔
Black Sea	◕	◕	○	◕	◕	○

Region/theme	Offshore mining industries	Marine debris	Land/sea physical interaction	Tourism and recreation
NE Atlantic	◕	◔	◕	◕
Baltic Sea	◔	◔	◕	◕
Mediterranean	○	◔	◕	◕
Black Sea	?	◔	◔	◔

Table 9: Gap analysis – Human activities impacting the marine environment

● extensive ◕ good ◔ some ○ none ? Unknown – Not enough information available through the collected assessment reports

Eutrophication

Marine eutrophication is a major issue of concern in European regional seas (e.g. EEA, 2010[57]) and is generally well monitored and documented, back-up by the European legislation and the sea convention protocols or strategies. However, different structures of the seas, feedback mechanisms and pressures such overfishing interact to create specific regional responses to nutrient over-enrichment. Monitoring and comparing the eutrophic state of Europe's seas is further complicated by the different indicators and assessment methods used across the regions. Over the years considerable efforts have been put into a compilation of consistent estimates of nutrient as sound assessment of eutrophication requires knowledge of the long-term dynamics of nutrient inputs. In order to tackle the problem, satellite remote sensing of chlorophyll concentration is increasingly used to provide timely estimates of the biological productivity, being complemented by in-situ measurements for validation purposes.

European policies largely address the Eutrophication issue. In particular, from 2012, the Marine Strategy Framework Directive requires all Member States to monitor eutrophication in their seas using consistent indicators and similar collecting data methods. In addition, Regional sea Conventions (Barcelona, Bucharest, OSPAR and HELCOM) consider struggling against eutrophication an important objective and monitoring and assessing the conditions of waters a key task to be regularly carried out. The Baltic Sea Action Plan (BSAP) in 2007 recognizes for instance the need to reduce nutrient inputs to a maximum allowable level and corresponding country-wise nutrient reduction requirements for nitrogen and phosphorus in order to achieve a good environmental status by 2021. Marine eutrophication is considered responsible of various disruptive effects such as green tides, phytoplankton blooms, deep-water anoxia and changes in fish population. According to HELCOM, eutrophication continues to be of major concern in most areas of the Baltic Sea and good environmental status has not been reached yet[58]. In addition, the Baltic sea, unlike the other European regional seas, suffers from cyanobacterial blooms, a phenomenon more typical of eutrophic freshwater environments[59]. Capacity assessment including scenarios, indicator based monitoring and reporting and trend analyses on eutrophication is high, as witnessed by the HELCOM 2011: Fifth Baltic Sea Pollution Load Compilation (see Table 5). Although the degree of detailed information varies, monitoring and assessment of eutrophication and oxygen deficiency are commonly well addressed by Baltic Sea countries. HELCOM like other regional sea conventions has to deal with whatever data officially provided by the contracting parties, ending up with certain gaps and inconsistencies in the data sets (e.g. HELCOM, 2011[60]). The 2012 Baltic Nest Institute 2012[61] is a valuable source of supporting information as it attempted to fill the gaps in and correct possible sources of inconsistencies.

Although relatively nutrient poor, eutrophication hotspots are found throughout the Mediterranean sea such as in the Adriatic basin and specific coastal and adjacent offshore areas and is considered a priority issue in in the coastal zone of Mediterranean (e.g. EEA 2006[62]). Prevention of the Human-induced eutrophication is one of the UNEP MAP "Ecological Objectives" for the Mediterranean agreed in 2008 in the framework of the adoption of the roadmap for implementing ecosystem approach. However, coordinated eutrophication assessment is still hampered over the region by inconsistent reporting methods between countries and sometimes inconclusive data for determining eutrophic status. In particular, Mediterranean countries in most cases undertake classical monitoring activities but not all the countries monitor all parameters required by the MED POL strategy. The majority followed national or other strategies. In a number of countries, national eutrophication assessment methods are performed under EU directives or conventions obligations. The TRIX index has already been used in some European countries for classification of trophic status, due to its simplicity of application.

The Northern Adriatic hotspot appears to be recovering as a result of nutrient load abatement policies. Although improvements in sea water have been reported also in the Black Sea, this has mainly been linked to the post-Soviet economic decline and agricultural practice changes. Coincident with the current trend of recovery of economies in the region, there is risk that pollution discharges will again increase, particularly from agricultural diffuse sources. The recent EU directives exert a strong legislative framework for

[57] EEA 2010: 10 messages for 2010 Marine ecosystems, EEA, Copenhagen, 2010

[58] HELCOM, 2010: Ecosystem Health of the Baltic Sea 2003–2007: HELCOM Initial Holistic Assessment. Balt. Sea Environ. Proc. No. 122

[59] Langmead, O., McQuatters-Gollop, A. and Mee, L.D. (eds.) 2007: European Lifestyles and Marine Ecosystems: Exploring Challenges for Managing Europe's Seas (ELME). University of Plymouth Marine Institute, Plymouth – included in GRAMED database.

[60] HELCOM, 2011. Fifth Baltic Sea Pollution Load Compilation (PLC-5). Balt. Sea Environ. Proc. No. 128, 217 pp – included in the Templates.

[61] Baltic Nest Institute 2012: External nutrient loads to the Baltic Sea, 1970-2006 Technical Report No. 5

[62] EEA, 2006a: Priority issues in the Mediterranean environment, European Environment Agency Report No 4/2006 – included in the GRAMED database

implementing change within the Danube region and parts of the Black Sea leading to improved monitoring procedures and enforcement of regulations.

In the Black sea, the Danube River is considered the largest single source of pollutant inputs into the Black Sea, and especially for nutrient's. The 2005 GIWA assessment[63] provides relevant information on Eutrophication process and trends and analyses the causes behind eutrophication. Root causes of eutrophication in the Black Sea Basin are identified and the report recognizes that its impacts have been amplified by other factors such as overfishing. The Transboundary Diagnostic Analysis for the Black sea[64] is also an essential document that gathers information on pollution and analyses causal chains. The report broadly assesses the environmental status of the Black Sea and includes estimates of sectoral pressures, particularly those associated with nutrient fluxes and eutrophication. However many gap persist in the Black Sea related to pollution inputs form land and the pollution loads data are very incomplete, BOD5 being the only parameter (apart from nutrients) that is routinely monitored from major point sources and rivers. In addition, diffuse source pollution are not assessed in the region due to lack of information.

Eutrophication in the north-East Atlantic is rather restricted to semi-enclosed seas and coastal waters, such as the southern North Sea[65]. Eutrophication is one of the five OSPAR's core thematic strategies and sets out the objective to combat eutrophication in the OSPAR maritime area. In 1997, the OSPAR Commission adopted the so called Common Procedure for the identification of the eutrophication status of the Maritime Area of the OSPAR Convention. High quality assessment are regularly produced as witnessed by the QSR 2010 assessment (see Table 5). Five assessment parameters and their assessment levels as defined by the Common Procedure have been developed to form an integrated set of Ecological Quality Objectives (EcoQO) for eutrophication for the North Sea [66]

However, separating the effects of eutrophication from the combining effect of natural and anthropogenic pressures (such as climate shifts and overfishing) is still very challenging in assessing eutrophication impacts.. In that context, monitoring programmes under the Marine Strategy Directive are expected to greatly contribute to better understand cross- effects and help policy-makers prioritise their actions.

9. Conclusion

Environmental challenges are increasing in scale and implications, as grows the demand for scientific knowledge to inform and support sound decision making. Hopefully, environmental Assessment is an evolving and dynamic field as witnessed by the plethora of recent reports and publications on a variety of coastal and marine environmental issues over Europe and beyond.

The present report foresaw to inventory and suggest new and recent marine assessments that may be relevant for the UN Regional Regular Process for Europe. This inventory may also be a contribution in order to update the GRAMED database, that turned out to be a meaningful informative tool to support marine assessment-related activities. The report also gave an insight on the evolution over the last 5 years and included a first attempt to provide a gap analysis across the 4 regional European seas. However, considering the high differences between regions in terms of the quality, quantity and availability of information, socio-economic setting and environmental conditions, the achievement of comparability is particularly challenging.

The use of individual templates provide relatively consistent information on assessment products that allow to appraise the extent and comprehensiveness of assessments across regions. However the analysis would require a further systematic expert judgment process to get an accurate vision of the prevailing gaps related to the issues tackled by the 4 building blocks of the UNRP outline.

In the light of the information provided by the individual templates, the following commonalities between assessments and broad weaknesses can however be identified over the last 5 years:

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[63] Borysova, O., Kondakov, A., Paleari, S., Rautalahti-Miettinen, E., Stolberg, F. and D. Daler, 2005: Eutrophication in the Black Sea region; Impact assessment and Causal chain analysis. GIWA, University of Kalmar, Kalmar, Sweden – included in GRAMED database

[64] GEF 2007: Black Sea transboundary diagnostic analysis. Programme Coordinating Unit, Global Environmental Facility (GEF) Black Sea Environmental Programme publication – included in GRAMED database

[65] Langmead, O., McQuatters-Gollop, A. and Mee, L.D. (eds.) 2007: European Lifestyles and Marine Ecosystems: Exploring Challenges for Managing Europe's Seas (ELME). University of Plymouth Marine Institute, Plymouth – included in GRAMED database.

[66] http://www.ospar.org/content/content.asp?menu=00190303000000_000000_000000

- No assessment can be considered fully exhaustive as they typically capture a particular understanding of complexes issues at a certain time. The capacity to produce and update thematic (narrow) assessments report on a regularly basis is therefore of key importance. The regional sea conventions (OSPAR, Helsinki, Barcelona and Bucharest Conventions) gave rise to regional action plans which give specific goals and targets for the regional sea and produce regular assessment mechanisms;
- Assessment capacity is generally strong over Europe and many high quality updated assessment have been recently produced. Integrated (broad) assessments are available for the 4 regional seas reflecting progresses in addressing more deeply effects of multiple stressors combining at global and regional scales;
- As a general rule, over recent assessment marine water quality and pollution related assessments along with pressure analysis are prevailing followed by assessments related to living marine resources;
- Most of the assessments surveyed had clearly stated objectives while the process that is under and a clear conceptual framework of the assessment approach are often not clearly specified;
- Assessments generally well identify main drivers of human development and associated pressures that, along with natural processes, affect the state and trends of the marine environment. However, fewer still fully incorporate multiple pressures from the anthropogenic use of the marine resources and related cross-effects. Thematic assessments (pressure based) are prevailing and quantitative impact assessments of multiple human threats and related impacts on marine habitats have rarely been conducted at a Regional level. Regional assessments of human-driven impacts may consider that threats on habitats do not act in isolation;
- An ecosystem approach to the management of the marine environment has received considerable attention over recent years. However, integration level of socio-economic issues appears to be still weak in spite of some recent progresses;
- Assessment of impacts of human activities is be still too much based on qualitative information and information. In particular gaps in the knowledge related to biodiversity and habitats appear to be a major constraint;
- A major challenge facing the regional assessment practices, is the lack of information on both cumulative and synergistic effects. For instance, climate variations and ecosystem perturbations are both key threatening processes driving the regional loss in biodiversity. Yet too little is known about synergistic effects on biological populations due to the complexity of underlying processes.

10. Annexes

Annex 1: List of the GRAMED assessments for the European Seas;

Annex 2: Completed templates for individual assessments for the North Atlantic, Baltic, Mediterranean and Black Seas;

Annex 3: Other potential relevant assessments and source of information.