A GLOSSARY OF TERMS COMMONLY USED IN THE MARINE STRATEGY FRAMEWORK DIRECTIVE

Technical Report from DCE – Danish Centre for Environment and Energy No. 16 2013

AARHUS
UNIVERSITY
DCE – DANISH CENTRE FOR ENVIRONMENT AND ENERGY

[Blank page]

A GLOSSARY OF TERMS COMMONLY USED IN THE MARINE STRATEGY FRAMEWORK DIRECTIVE

Technical Report from DCE – Danish Centre for Environment and Energy No. 16 2013

Jesper H. Andersen[1]
Jens Würgler Hansen[1]
Samuli Korpinen[2]
Miia Mannerla[2]
Johnny Reker[3]

[1] Aarhus University, Department of Bioscience
[2] HELCOM Secretariat
[3] Danish Nature Agency

AARHUS
UNIVERSITY
DCE – DANISH CENTRE FOR ENVIRONMENT AND ENERGY

Data sheet

Series title and no.:	Technical Report from DCE – Danish Centre for Environment and Energy No. 16
Title:	A glossary of terms commonly used in the Marine Strategy Framework Directive
Authors:	Jesper H. Andersen[1)], Jens Würgler Hansen[1)], Samuli Korpinen[2)], Miia Mannerla[2)], Johnny Reker[3)]
Institutions:	[1)] Aarhus University, Department of Bioscience; [2)] HELCOM Secretariat; [3)] Danish Nature Agency
Publisher:	Aarhus University, DCE – Danish Centre for Environment and Energy ©
URL:	http://dce.au.dk/en
Year of publication:	February 2013
Editing completed:	January 2013
Referees:	Peter Henriksen, Aarhus University, Bioscience and Poul Nordemann Jensen, DCE
Financial support:	Funded by the Danish Nature Agency (NST, formerly the Danish Agency for Spatial and Environmental Planning), German Federal Environment Agency (UBA), Norwegian Climate and Pollution Agency (KLIF) and Swedish Agency for Marine and Water Management (SwAM) via the HARMONY project
Please cite as:	Andersen, J.H., Hansen, J.W., Mannerla, M., Korpinen, S. & Reker, J. 2013: A glossary of terms commonly used in the Marine Strategy Framework Directive. Aarhus University, DCE – Danish Centre for Environment and Energy, 32 pp. Technical Report from DCE – Danish Centre for Environment and Energy No. 16. http://www.dmu.dk/Pub/TR16.pdf,

Abstract: This glossary of terms commonly used in the Marine Strategy Framework Directive is meant as an interpretation manual supporting the work leading to publication in 2012 of so-called Initial Assessments of Member States marine waters and in 2016 of Marine Strategies, the latter being management plans on how to achieve good environmental status. The MSFD glossary is based on existing definitions from the Directive and the common implementation process. In some cases definitions from the Convention on Biological Diversity (CBD) or regional marine conventions (HELCOM and OSPAR) have been included.

Keywords:	Marine Strategy Framework Directive, descriptors, characteristics, ecosystem-based management, North Sea, Skagerrak, Kattegat
Layout:	Anne van Acker
Front page photo:	Bubbles of air in sea water. Photo: Metsähallitus, Finland
ISBN:	978-87-92825-85-8
ISSN (electronic):	2245-019X
Number of pages:	32
Internet version:	The report is available in electronic format (pdf) at http://www.dmu.dk/Pub/TR16.pdf

Contents

[Blank page]

Preface

This glossary of terms commonly used in the Marine Strategy Framework Directive (abbreviated to MSFD) (Anon. 2008a) is a product of the HARMONY project and meant as an interpretation manual supporting the work leading to publication in 2012 of Initial Assessments of EU Member States marine waters.

HARMONY, or in full "Development and demonstration of Marine Strategy Framework Directive tools for harmonization of the initial assessment in the eastern parts of the Greater North Sea subregion", is a project aimed towards development of informed marine assessments and management tools for the North Sea.

The overall objective of HARMONY, which started in September 2010 and ends in December 2012 is to develop and demonstrate tools for harmonization of the MSFD initial assessment in the eastern parts of the Greater North Sea subregion. The challenges of the HARMONY project are twofold. The first challenge is to establish an overview of ecological information and harmonize it across the eastern parts of the Greater North Sea subregion and thus support Member States in the implementation of the MSFD. The second challenge is to understand and quantify the spatial distribution and intensity of human activities in order to evaluate the trade-off between impacts and safeguarding of marine ecosystems and thus support the implementation of the MSFD. HARMONY will in particular focus on:

- Developing and testing tools for characterisation and assessment of 'environmental status', including thematic tools for integrated assessment of 'eutrophication status', 'chemical status' and 'biodiversity status'.

- Developing and testing tools for characterization of cumulative human pressures and impacts.

- Collaborating and communicating with relevant institutions and organisation and disseminating the results to partners, neighbouring countries and the public.

You can read more about the HARMONY project on:
http://harmony.dmu.dk.

1 Introduction

The EU Marine Strategy Framework Directive (MSFD), or in full "Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)", entered into force on the 15th of July 2008 (Anon. 2008a).

The MSFD focuses on implementing an ecosystem-based approach to the management of human activities and the collective pressures affecting the marine environment. The MSFD itself does not provide a definition of the ecosystems approach though many different organisations (UN Convention on Biological Biodiversity, HELCOM, OSPAR, etc.) provide definitions.

At the Conference on the Development of a European Strategy for the Protection and Conservation of the Marine Environment, Køge, Denmark, 4-6 December 2002 the European stakeholders adopted the following definition:

> Ecosystem-Based Management (noun): is "*the comprehensive integrated management of human activities based on best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of the marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity*".

In principle, the MSFD covers all European marine waters including coastal waters (the latter only in regard to issues not dealt with by the Water Framework Directive (WFD) and has as an overarching aim the reaching or maintenance of "good environmental status" in all European marine waters by 2020. In order to reach this goal a timeline with a set of milestones is defined by the Directive. These are:

- Define criteria and methodological standards for identifying "Good Environmental Status" by 15th July 2010.
- Prepare an initial assessment by 15th July 2012.
- Determine Good Environmental Status by 15th July 2012.
- Establish environmental targets and associated indicators by 15th July 2012.
- Establish and implement a monitoring programme by 15th July 2014.
- Develop a programme of measures by 2015 and operationalize the programme by 2016.
- Member States shall by 2020 at the latest take the necessary measures to achieve "Good Environmental Status".

In a short-term perspective, an important part of this work is the development of Initial Assessments of Member States marine water to be published for public consultation in the beginning of 2012 and agreed and published in summer 2012.

An initial assessment shall as a minimum include the following three elements:

1. An analysis of the essential qualities and characteristics and current environmental status of marine waters based on the indicative lists in Table 1 in the Directives Annex III and the physical chemical properties, habitat types, biological properties and hydromorphology.

2. An analysis of the predominant pressures and impacts, including human activities, on environmental conditions:

    i) based on the indicative lists in Table 2 of Annex III and the various pressures, their qualitative and quantitative composition as well as temporal trends
    ii) include the most important cumulative and synergistic effects, and
    iii) take into regard relevant assessments prepared pursuant to applicable Community legislation.

3. An economic and social analysis of the state of water use and of the cost of degradation of the marine environment.

Hence, the objectives of this report, which aims to support the upcoming work on Initial Assessment (or their equivalents) in Denmark, Germany, Norway and Sweden, are:

- to identify terms in the MSFD which might be unclear or open for interpretation, and

- to compile a glossary of terms commonly used in the MSFD, including those that are already defined by the Directive (article 3).

The glossary of terms commonly used in the MSFD in Chapter 3 is based upon existing definitions from the Directives article 3 plus:

- Identification of terms related to characteristics (see Table 1, which is equivalent to MSFD Annex III, table 2, and includes an overview of terms considered in need of being defined).

- Identification of terms related to pressures and impacts (see Table 2, which is equivalent to MSFD Annex III, table 2, and includes an overview of terms considered in need of being defined).

- Identification of terms related to qualitative descriptors (see Table 3, which is equivalent to MSFD Annex 1).

Table 1. Indicative list of characteristics, cf. MSFD Annex 3, table 1 (Anon. 2008a). Terms defined in this glossary are underlined.

Physical and chemical features	• Topography and bathymetry of the seabed, • annual and seasonal temperature regime and ice cover, current velocity, upwelling, wave exposure, mixing characteristics, turbidity, residence time, • spatial and temporal distribution of salinity, • spatial and temporal distribution of nutrients (DIN, TN, DIP, TP, TOC) and oxygen, • pH, pCO_2 profiles or equivalent information used to measure marine acidification.
Habitat types	• The predominant seabed and water column habitat type(s) with a description of the characteristic physical and chemical features, such as depth, water temperature regime, currents and other water movements, salinity, structure and substrata composition of the seabed, • identification and mapping of special habitat types, especially those recognised or identified under Community legislation (the Habitats Directive and the Birds Directive) or international conventions as being of special scientific or biodiversity interest, • habitats in areas which by virtue of their characteristics, location or strategic importance merit a particular reference. This may include areas subject to intense or specific pressures or areas which merit a specific protection regime.
Biological features	• A description of the biological communities associated with the predominant seabed and water column habitats. This would include information on the phytoplankton and zooplankton communities, including the species and seasonal and geographical variability, • information on angiosperms, macro-algae and invertebrate bottom fauna, including species composition, biomass and annual/seasonal variability, • information on the structure of fish populations, including the abundance, distribution • and age/size structure of the populations, • a description of the population dynamics, natural and actual range and status of species of marine mammals and reptiles occurring in the marine region or subregion, • a description of the population dynamics, natural and actual range and status of species of seabirds occurring in the marine region or subregion, • a description of the population dynamics, natural and actual range and status of other species occurring in the marine region or subregion which are the subject of Community legislation or international agreements, • an inventory of the temporal occurrence, abundance and spatial distribution of non-indigenous, exotic species or, where relevant, genetically distinct forms of native species, which are present in the marine region or subregion.
Other features	• A description of the situation with regard to chemicals, including chemicals giving rise to concern, sediment contamination, hotspots, health issues and contamination of biota (especially biota meant for human consumption), • a description of any other features or characteristics typical of or specific to the marine region or subregion.

Table 2. Indicative list of pressures and impacts cf. MSFD Annex III, table 2 (Anon. 2008a). Terms defined in this glossary are underlined.

Physical loss	• Smothering (e.g. by man-made structures, disposal of dredge spoil), • sealing (e.g. by permanent constructions).
Physical damage	• Changes in siltation (e.g. by outfalls, increased run-off, dredging/disposal of dredge spoil), • abrasion (e.g. impacts on the seabed of commercial fishing, boating, anchoring), • selective extraction (e.g. exploration and exploitation of living and non-living resources on seabed and subsoil).
Other physical disturbance	• Underwater noise (e.g. shipping, underwater acoustic equipment), • marine litter.
Interference with hydrological pressures	• Significant changes in thermal regime (e.g. by outfalls from power stations) • significant changes in salinity regime (e.g. by constructions impeding water movements, water abstraction).
Contamination by hazardous substances	• Introduction of synthetic compounds (e.g. priority substances under Directive 2000/60/EC which are relevant for the marine environment such as pesticides, antifoulants, pharmaceuticals, resulting, for example, from losses from diffuse sources, pollution by ships, atmospheric deposition and biologically active substances), • introduction of non-synthetic substances and compounds (e.g. heavy metals, hydrocarbons, resulting, for example, from pollution by ships and oil, gas and mineral exploration and exploitation, atmospheric deposition, riverine inputs), • introduction of radio-nuclides.
Systematic and/or intentional release of substances	• Introduction of other substances, whether solid, liquid or gas, in marine waters, resulting from their systematic and/or intentional release into the marine environment, as permitted in accordance with other Community legislations and/or international conventions.
Nutrient and organic matter enrichment	• Inputs of fertilizers and other nitrogen – and phosphorus-rich substances (e.g. from point and diffuse sources, including agriculture, aquaculture, atmospheric deposition), • inputs of organic matter (e.g. sewers, mariculture, riverine inputs)
Biological disturbance	• Introduction of microbial pathogens, • introduction of non-indigenous species and translocations, • selective extraction of species, including non-target catches (e.g. by commercial and recreational fishing).

Table 3. Qualitative descriptors for determining good environmental status, cf. MSFD Annex 1 (Anon. 2008a). Terms defined in this glossary are underlined.

1.	Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.
2.	Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems.
3.	Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock
4.	All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.
5.	Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters.
6.	Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.
7.	Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems.
8.	Concentrations of contaminants are at levels not giving rise to pollution effects.
9.	Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards.
10.	Properties and quantities of marine litter do not cause harm to the coastal and marine environment.
11.	Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.

2 MSFD Glossary

Abrasion
The erosive action that occurs when rock particles of varying sizes are dragged over or hurled against a surface (Allaby 2004).

Abundance
The relative representation of a species in a particular ecosystem or within a particular habitat. It is usually measured as the number of individuals found per area (fauna) or volume (e.g. phytoplankton) or as a combination of spatial cover and biomass (flora).

Age distribution
Distribution/percentage of the total population at each age category.

Age/size structure
- see 'Age distribution' and 'Size distribution'.

Acidification
Decrease in pH which occurs when (1) the capacity of the soil or water bodies to resist or neutralise acidifying atmospheric deposition begins to decline (www.environment.fi) or when (2) high primary production skews the bicarbonate equilibrium in the water and increase pH.

Anchoring
The disturbance of seabed and associated habitats and communities by anchored (mooring) ships or boats. Anchoring is more intensive in special mooring areas.

Angiosperms
Plants of the large subdivision Angiospermae that comprises those that have flowers and produce seeds enclosed within a carpel, including herbaceous plants, shrubs, grasses, and most trees (Soanes & Stevenson 2004).

Antifoulants
Substances applied to ships hulls to prevent fouling of biota (Soanes & Stevenson 2004). Previously antifouling chemicals contained tributyltin (TBT) that was banned in 2001 by IMO (Antifouling Convention). Nowadays antifouling chemicals contain substituting compounds such as copper. Antifouling can also be achieved by special surface structures on ship hulls.

Atmospheric deposition
Deposition of nutrients, heavy metals, and other pollutants from the atmosphere (HELCOM 2009).

Baseline
The value of state at a specific point in time against which subsequent values of state are compared. Baselines act as yardstick against which thresholds or trends for GES (Good Environmental Status) can be set. Baselines can be de-

rived from i) reference state/conditions, ii) a known state in the past, such as the beginning of a time series (e.g. the Large Fish Indicator used 1983 as a first valid data point in the time series) or iii) as a present state. A baseline can be considered a type of 'reference point' (as referred to in Annex IV of the Directive), though the term 'reference point' should not be confused with 'reference state or reference conditions' as defined above (OSPAR 2011).

Bathymetry
The study of water depth and structure of river bed or sea floor.

Benthic
Adjective describing subjects or organisms associated with the substrate surface of aquatic systems – see also 'Benthos'.

Benthos
Organism attached to or living on, in or near the seabed, river bed or lake floor (HELCOM 2009).

Biodiversity
- see 'Biological diversity'.

Biologically active substances
A substance capable of inducing a change in the structure or functioning of organisms. Endocrine disrupter that causes feminization is an example of such a substance.

Biological diversity
The variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (CBD 1992).

Biota
The animal or plant life of a particular region, habitat, or geological period (Soanes & Stevenson 2004).

Birds Directive
Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Anon. 2009a).

Boating
A form of leisure activity by vessels usually smaller than 15 metres. Includes also water sports and sailing boats.

Chemical
A distinct compound or substance composed of elements, especially one which has been artificially prepared or purified (Soanes & Stevenson 2004).

Climatic conditions
Refer to temperature, humidity, atmospheric pressure, wind, rainfall, atmospheric particle count and other meteorological elements in a given region

over a long period of time. Climate can be contrasted to weather, which is the present condition of these same elements and their variations over shorter time periods.

Commercial fishing
Commercial fishing is the activity of capturing wild fish and other seafood for commercial profit.

Fishing for the commercial purpose
- see 'Commercial fishing'.

Community
In biological terms, a community is a group of interacting organisms sharing a common habitat.

Contaminants
Hazardous substances (pesticides, heavy metals, pharmaceuticals or persistent organic pollutants (POPs)) that cause harmful effects to the ecosystem when they end up in the marine environment (HELCOM 2010a) (- see 'Hazardous substances').

Contamination
Presence of a contaminant (- see 'Contaminants') in the physical environment or biota (HELCOM 2010a).

Criteria
The MSFD defines criteria as "criteria means distinctive technical features that are closely linked to qualitative descriptors". The eleven descriptors for describing GES (Good Environmental Status) have been further developed through the identification of 29 criteria in Part B of the annex to the September 2010 Commission Decision document. For instance Descriptor 1 on "Biodiversity" consists of 7 criteria further divided into 14 indicators. To avoid confusion between the use of the term "criteria" in this specific context and its use in other respects (such as the criteria used to guide indicator selection), it is recommended that these specific criteria be referred to as "GES criteria". In this context, 'GES criteria' refer to particular aspects of biodiversity (just considering Descriptor 1 for the purposes of this document), that require their status to be assessed, through the application of appropriate indicators, to determine whether each aspect meets good environmental status or not. Thus the *population size* of a particular species or functional group of species is a criterion by which to judge whether that aspect of biodiversity in a particular region meets good environmental status or not. Similarly, the *habitat extent* is a criterion to judge whether the habitat in a specified region meets GES or not (OSPAR 2011).

Deposition
The dropping of material which has been picked up and transported by wind, water, or other processes (HELCOM 2009).

Diffuse sources
Sources of pollution that have no specific point of discharge. Agriculture is a key source of diffuse pollution (EEA 2011).

DIN
Dissolved inorganic nitrogen. The sum of nitrate, nitrite and ammonium i.e. nitrogen that can be absorbed by plants (HELCOM 2009).

DIP
Dissolved inorganic phosphorous. The chemical form in which phosphorous can be absorbed by plants (HELCOM 2009).

Distribution
The geographical area(s) within which species and habitats can be found.

Distribution and abundance of species
- see 'Abundance' and 'Distribution'.

Diversity
Species and habitat richness of an area – see also 'Biological diversity'.

Dredge spoil
Material dredged (sucked, grappled or dug) from the seabed to be placed elsewhere.

Ecosystem
A biological environment consisting of all the organisms living in a particular area, as well as all the non-living, physical components of the environment with which the organisms interact, such as air, soil, water and sunlight (OSPAR 2010).

Ecosystem component
A part of biological diversity representing a specific biological entity (e.g. a species, species group, population, community or habitat type/biotope). A standardised set of components (functional groups of species and predominant habitats types) is recommended for use to assess biodiversity (OSPAR 2011).

Ecosystem degradation
The deterioration of the environment through depletion of resources; the destruction of ecosystems function and the extinction of life within the ecosystem - any change or disturbance to the ecosystem perceived to be deleterious or undesirable.

Energy
A thermodynamic quantity equivalent to the capacity of a physical system to do work; the units of energy are joules – energy can take a wide variety of forms.

Environmental status
The overall state of the environment in marine waters, taking into account the structure, function and processes of the constituent marine ecosystems together with natural physiographic, geographic, biological, geological and climatic factors, as well as physical, acoustic and chemical conditions, including those resulting from human activities inside or outside the area concerned (Anon. 2008a).

Environmental target
A qualitative or quantitative statement on the desired condition of the different components of, and pressures and impacts on, marine waters in respect of each marine region or subregion. Environmental targets are established in accordance with the MSFD Article 10 (Anon. 2008a).

Eutrophication
Despite a widespread common European understanding of causes and effects, there is no mutually agreed definition of coastal eutrophication. However, within the European Union (EU) there has been a sound tradition of focusing the measures on the sources causing eutrophication. Consequently, eutrophication has been defined in relation to sources and/or sectors. For example, in the Urban Waste Water Treatment Directive, eutrophication has been defined as "the enrichment of water by nutrients, especially nitrogen and/or phosphorus, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of water concerned" (Anon. 1991a). The Nitrates Directive has an almost identical definition specifically emphasizing losses of nitrates from agriculture (Anon. 1991b).

Nixon (1995) defined eutrophication as "an increase in the rate of supply of organic matter to an ecosystem". This definition is short and emphasizes that eutrophication is a process, not a trophic state. Nixon also noted that various factors may increase the supply of organic matter to coastal systems, but the most common is clearly nutrient enrichment. The supply of organic matter to an ecosystem is not restricted to pelagic primary production, even though such an interpretation makes the definition very operational. The supply of organic matter to a system includes primary production of higher plants and benthic microalgae as well as inputs of organic matter from adjacent waters or from land via rivers or point sources. Having such a broad interpretation of the term 'supply' makes the definition difficult to use in a monitoring and management context.

Despite the definitions in existing European directives, the implementation of the EU Water Framework Directive (WFD) (Anon. 2000) revealed a need for a common understanding and definition of eutrophication as well as a stronger co-ordination between directives dealing directly or indirectly with eutrophication. Hence, the European Commission convened a process aiming for a development of a pan-European conceptual framework for eutrophication assessment in the context of all European waters and policies (Anon. 2009b). This process did not lead to a common European definition of eutrophication, but it revealed that if 'undesirable disturbance' is understood as 'unacceptable deviation from reference conditions', the pan-European defi-

nition will be coherent with the normative definitions *sensu* the WFD (Andersen et al. (2006)). Accepting this, a pan-European definition of eutrophication, would be:

"*the enrichment of water by nutrients, especially nitrogen and/or phosphorus, and organic matter, causing an increased growth of algae and/or higher forms of plant life to produce an unacceptable deviation in structure, function and stability of organisms present in the water and to the quality of water concerned, compared to reference conditions*".

The above suggested definition includes causative factors (nutrient enrichment), primary effects (increased growth) and secondary effects (sometimes referred to as 'undesirable disturbance') and thus mirrors the Commission's Decision Paper on criteria (Anon. 2010). In addition, it gives room for interpretation, in particular in regard to what an 'acceptable deviation' is. The definition also enables classification of 'eutrophication status'. Using this concept as a basic assessment principle, a eutrophication quality objective or target (EutroQO) is defined as an indicator in acceptable distance (AcDev) from the reference condition (RefCon), EutroQO = RefCon ± AcDev (Andersen et al. 2004, HELCOM 2006, HELCOM 2009, Andersen et al. (2011)). As an additional feature, the definition also acknowledges that eutrophication has both quantitative and qualitative perspectives, an aspect not directly included in Nixon's (1995) definition.

Exploited fish
Fish, which are considered to have some trade value, and therefore fished commercially.

Fertilizers
Substances that provide plants with nutrients or alter soil fertility. Main fertilizers are nitrogen, phosphorus and potassium.

Food webs
Networks of feeding interactions between consumers and their food. The species composition of food webs varies according to habitat and region, but the principles of energy transfer from sunlight and plants through successive trophic levels are the same. This descriptor addresses the functional aspects of marine food webs, especially the rates of energy transfer within the system and levels of productivity in key components (Rodgers et al. 2010).

Functional groups of species
An ecologically relevant set of species, applied here in particular to the following (highly) mobile species groups: birds, reptiles, marine mammals, fish and cephalopods. Each functional group represents a predominant ecological role (e.g. offshore surface-feeding birds, demersal fish) within the species group. Referred to in EU COM decision (Part B, species) and in the TG1-report (as 'ecotype') (OSPAR 2011).

Genetically distinct forms of native species
Organisms, present in an area as a result of only natural processes, belonging to the same species but being genetically different.

Geographic conditions
Describe the natural environment and how the vegetation and life, soil, water, and landforms are produced and interact.

Good environmental status (GES)
The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations, i.e.:

(a) the structure, functions and processes of the constituent marine ecosystems, together with the associated physiographic, geographic, geological and climatic factors, allow those ecosystems to function fully and to maintain their resilience to human-induced environmental change. Marine species and habitats are protected, human-induced decline of biodiversity is prevented and diverse biological components function in balance;

(b) hydro-morphological, physical and chemical properties of the ecosystems, including those properties which result from human activities in the area concerned, support the ecosystems as described above. Anthropogenic inputs of substances and energy, including noise, into the marine environment do not cause pollution effects.

Good environmental status shall be determined at the level of the marine region or subregion as referred to in Article 4, on the basis of the qualitative descriptors in Annex I. Adaptive management on the basis of the ecosystem approach shall be applied with the aim of attaining good environmental status (Anon. 2008a).

Habitat
An ecological or environmental area that is inhabited by either a particular species of animal, plant or other type of organism or a community.

Habitats Directive
A European Union directive concerning wildlife and nature conservation adopted in 1992 as an EU response to the Berne Convention – formally known as 'Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora' (Anon. 1992).

Habitat type
A land or aquatic unit consisting of an aggregation of habitats having equivalent structure, function, and response to disturbance.

Harmful algal blooms
Blooms of phytoplankton that result in harmful effects such as the production of toxins that can affect human health, oxygen depletion and harm or kills of fish and invertebrates, for example, by damaging or clogging gills (OSPAR 2010).

Hazardous substances
Substances or groups of substances being toxic, persistent and liable to bioaccumulation, and other substances or groups of substances which give rise to an equivalent level of concern (Anon. 2000). Hazardous substances are either naturally occurring substances, such as heavy metals, or intentionally or unintentionally formed anthropogenic compounds (HELCOM 2010a) (– see 'Contaminants').

Heavy metals
Metals that have a density greater than 5 g/cm^3 (Allaby 2004). Lead, cadmium, and mercury are particularly harmful in the water ecosystem (HELCOM 2010a).

Hotspots
Hotspots can be defined in various ways. 'Pollution hotspots' refer to places where a major pollutant source (e.g. an industrial plant) is present. 'Biodiversity hotspots' refer to areas or regions having a high biodiversity. In the MSFD Directive, the term is used in Annex III, Table 1, where it refers to chemicals.

Human consumption
Eaten by humans. In the MSFD, it refers to consumption of marine biota, e.g. molluscs, crustaceans, fish, birds, and marine mammals. In another context it may refer to human flesh eaten by man, cannibalism.

Human-induced eutrophication
- see 'Eutrophication'.

Hydrocarbons
A naturally occurring or synthetic compound that contains carbon and hydrogen (Allaby 2004). E.g. crude oil consists of hydrocarbons. Many chlorinated hydrocarbons are persistent organic pollutants (POPs) (– see 'POPs').

Hydrographical conditions
Description of the physical conditions, boundaries, flow, and related characteristics of the earth's surface waters.

Index
An index represents the aggregated measurement, or calculated derivative of several different 'parameters', usually determined across different biodiversity components. In ecology, indices are frequently used to inform on biological variety in any given area or point in time. The degree of variety can be assessed on various levels, e.g. at the level of species, genes or habitats. Most commonly, such indices are determined at the level of species, e.g. the Shannon-Wiener-Index representing species diversity. This index is calculated using the species abundance 'parameters' for all species in any given sample and total of all individuals included in the sample. Within the MSFD assessments indices may be applied as complex indicators.

Indicator
Indicators under the MSFD are considered to be specific attributes of each GES (Good Environmental Status) criterion that can either be qualitatively described or quantitatively assessed to determine whether each criterion meets good environmental status, or to ascertain how far each criterion departs from GES.

In the framework of the MSFD, indicators are to be applied for two different tasks:

Firstly, for the assessments required under this directive, state and pressure indicators are used to assess differences between actual state and desired state (GES). Here, the indicators given in the EU Commission Decision on criteria and methodological standards (acc. Art. 9) form the basis. The indicators under several descriptors in this guidance (in particular D1 and D4) cannot be considered operational until specific and representative biodiversity components (e.g. species and habitats) as well as more specific metrics have been defined for each indicator.

Secondly, indicators are to be applied to reflect progress in achieving environmental targets. The indicators to be developed under Art. 10 (associated with environmental targets) may be identical to the indicators of the EU COM decision on GES. However, the development of additional indicators, in particular pressure indicators, may be necessary (e.g. indicating vectors of non-indigenous species or by-catch of seabirds and marine mammals).

Given the complexity of biodiversity, both in its range of character and the number of aspects that contribute to an assessment of state, it is common practice to use a set of indicators to assist in monitoring and assessment programmes and to help simplify this complexity. There are a variety of different types of indicators: state (including impact), pressure and response. These help limit the number of parameters that need to be monitored to those which can most effectively represent wider functional and structural aspects of the ecosystem. Where possible, state indicators should closely respond (in space and time) to a particular anthropogenic pressure (by responding to the impact of the pressure) and hence be linked to associated management requirements.

The assessment of environmental state provided by one or more indicators should allow inferences to be made on the wider state of biodiversity components in that ecosystem. State means the actual (measured or otherwise assessed) environmental condition (e.g. of a species, species functional group, community or habitat) in a given geographical area. The assessment of state can be derived by taking direct measurements of the particular biodiversity component ('state indicators') or indirectly by measuring the prevailing anthropogenic pressures ('pressure indicators'). In this latter case, impacts of these pressures on biodiversity must be known. For assessments of ecosystem state simple indicators (e.g. the size of a bird population) or more complex indicators (e.g. the ratio of multiple phytoplankton taxa) can be applied.

State indicators (which reflect impacts from anthropogenic pressures) have been widely evaluated by ICES expert groups. There are a number of criteria that may be considered when determining the utility and applicability of this type of indicator:

- Sensitivity, e.g. does the indicator allow detection of any type of change against background variation or noise?
- Accuracy, e.g. is the indicator measured with a low error rate?
- Specificity, e.g. does the indicator respond primarily to a particular human pressure, with low responsiveness to other causes of change?
- Simplicity, e.g. is the indicator easily measured?
- Responsiveness, e.g. is the indicator able to act as an early warning signal?
- Spatial applicability, e.g. is the indicator measurable over a large proportion of the geographical scale to which it is to apply; e.g. if the indicator is used at a UK level, is it possible to measure the required parameter(s) across this entire range or is it localised to one small scale area?
- Management link, e.g. is the indicator tightly linked to an activity which can be managed to reduce its negative effects on the indicator, i.e. are the quantitative trends in cause and effect of change well known?
- Validity, e.g. is the indicator based on an existing body or time series of data (either continuous or interrupted) to allow a realistic setting of objectives?
- Communication, e.g. is the indicator relatively easy to understand by non-scientists and those who will decide on their use?

Additionally, it is usually necessary to consider the effort (cost) of implementing such indicators.

In general, the geographical scale for the application of indicators needs to be defined since environmental conditions may be different between and within marine regions (OSPAR 2011).

Invertebrate bottom fauna
Animals without backbone living on the surface of the substrate or within the sediment of aquatic systems.

Listed features
Species or habitat types which are listed under Community legislation (e.g. Birds and Habitats Directive) or international conventions (for protection). Table 1 of Annex III to the Directive refers to these habitat types as 'special'. For descriptors and criteria assessing biodiversity state (in particular Descriptor 1), listed features shall be linked to specific indicators (OSPAR 2011).

Macro-algae
Plants that lack true roots, stems, leaves, and flowers. They mostly live attached to hard substrate (HELCOM 2009).

Mammals
Animals with backbone characterized by the possession of hair, three middle ear bones, and mammary glands functional in mothers with young.

Marine litter
Marine litter is any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment (Galgani et al. 2010).

Marine region
A sea region which is identified under Article 4. Marine regions and their subregions are designated for the purpose of facilitating implementation of this Directive and are determined taking into account hydrological, oceanographic and biogeographic features (Anon. 2008a).

Marine strategy
The strategy to be developed and implemented in respect of each marine region or subregion concerned as laid down in Article 5, MSFD (Anon. 2008a).

Marine waters
Waters, the seabed and subsoil on the seaward side of the baseline from which the extent of territorial waters is measured extending to the outmost reach of the area where a Member State has and/or exercises jurisdictional rights, in accordance with the UNCLOS, with the exception of waters adjacent to the countries and territories mentioned in Annex II to the Treaty and the French Overseas Departments and Collectivities; and coastal waters as defined by Directive 2000/60/EC, their seabed and their subsoil, in so far as particular aspects of the environmental status of the marine environment are not already addressed through that Directive or other Community legislation (Anon. 2008a).

(Microbial) pathogens
Any microorganism that causes disease (Allaby 2004).

Mixing
Mixing of sea water occurs in response to forcing by the wind, by tides or by currents or when surface water temperature increases or decreases to the level of the deep water. Mixing often results in a surface mixed layer having homogeneous temperature and salinity. This layer may be separated from the water below it by a jump in temperature or salinity, known as a thermocline or halocline, respectively.

Nitrogen
A chemical element that constitutes about 80 % of the atmosphere by volume. Nitrogen is an important part of proteins and is essential to living organisms (HELCOM 2009).

Non-indigenous species
An introduced, alien, exotic, non-indigenous, or non-native species, or simply an introduction, is a species living outside its native distributional range, which has arrived there by human activity, either deliberate or accidental.

Non-synthetic substance
A compound which is of natural origin, either a chemical element or a molecule or polymer.

Non-target species
A species facing human actions (e.g. fishing or hunting) while not being the primary target of that activity. Non-target species are usually referred to in the by-catch of fishing.

Nutrient enrichment
The increase of concentrations of nitrogen and phosphorus in the water ecosystem (HELCOM 2009).

Nutrient
A chemical element which is involved in the construction of living tissue of by both plants and animals. The most important in terms of bulk are carbon, hydrogen and oxygen, with other essential elements including nitrogen, potassium, calcium, sulphur and phosphorous (HELCOM 2009).

Organic matter
Once-living material (typically with high carbon content), mostly of plant origin (HELCOM 2009).

Outfall
The discharge point of a waste stream into a body of water; alternatively it may be the outlet of a river, drain or a sewer where it discharges into the sea, a lake or the like.

Oxygen deficiency
A situation where the demand for oxygen has exceeded its supply, leading to low concentrations of oxygen. Low oxygen concentrations are normally found in the water close to the sea bottom (HELCOM 2009).

Parameter /Metric
A parameter or metric is a measureable single characteristic of a species, habitat or community (e.g. number of individuals, biomass in g/dry weight, sediment particle size diameter in mm). Parameters of this nature can be used as simple indicators, and indeed several such metrics are included in the list of indicators provided in the EU COM decision document (e.g. indicator 1.2.1, population biomass; Anon. 2010).

pCO2
The partial pressure of carbon dioxide in air or liquid. The partial pressure of a gas is a measure of thermodynamic activity of the gas's molecules. Gases dissolve, diffuse, and react according to their partial pressures, and not necessarily according to their concentrations.

Permanent alteration
A change that will remain within a relevant time scale – may be irreversible.

Persistent organic pollutants
- see 'POPs'.

Pesticides
Any substance or mixture of substances intended for preventing, destroying, repelling or mitigating pests such as insects or plant pathogens. Pesticides include herbicides, insecticides and biocides.

pH
A measure of the acidity or basicity of an aqueous solution.

Pharmaceuticals
Drugs or cosmetics that are usually not removed or degraded in waste water treatment. In the marine environment pharmaceuticals may act as hormonally active agents (endocrine disrupters) (– see 'Contaminants').

Phosphorus
A non-metallic chemical element (HELCOM 2009) that is an essential nutrient for all living organisms (Allaby 2004).

Physiographic
The study of processes and patterns in the natural environment like atmosphere, biosphere and geosphere.

Phytoplankton
Plant plankton and primary producers (i.e. drifting, more or less microscopic, phytosynthetic organisms) of aquatic systems (HELCOM 2009).

Point sources
Identifiable and localised point of emissions to air and discharges to water (OSPAR 2010).

Pollution
The direct or indirect introduction into the marine environment, as a result of human activity, of substances or energy, including human-induced marine underwater noise, which results or is likely to result in deleterious effects such as harm to living resources and marine ecosystems, including loss of biodiversity, hazards to human health, the hindering of marine activities, including fishing, tourism and recreation and other legitimate uses of the sea, impairment of the quality for use of sea water and reduction of amenities or, in general, impairment of the sustainable use of marine goods and services (Anon. 2008a).

Pollution effects
- see 'Pollution'.

POPs
Persistent organic pollutants or POPs are compounds that are resistant to environmental degradation (– see 'Contaminants').

Population dynamics
Studies of short- and long-term changes in the size and age composition of populations, and the biological and environmental processes influencing those changes. Population dynamics deals with the way populations are affected by birth and death rates, and by immigration and emigration, and studies topics such as ageing of populations or population decline.

Population
A population is all the organisms that both belong to the same species and live in the same geographical area. The area that is used to define the population is such that inter-breeding is possible between any pair within the area and more probable than cross-breeding with individuals from other areas. Normally breeding is substantially more common within the area than across the border.

Predominant habitat type
Habitat category referred to in Table 1 of Annex III to the Directive. Widely occurring and broadly defined habitat types (e.g. shelf sublittoral sand or mud) that are typically not covered by other legislation (see 'Special habitat types').

Pressure
The mechanism (physical, chemical or biological) through which a human activity has a direct or indirect adverse effect on any part of the ecosystem, e.g. physical disturbance to the seabed (OSPAR 2011).

Priority substances
Substances listed in the EU Priority Substance Directive (Anon. 2008b).

Radionuclides
A radionuclide is an atom with an unstable nucleus, which is a nucleus characterized by excess energy which is available to be imparted either to a newly-created radiation particle within the nucleus, or else to an atomic electron. The radionuclide, in this process, undergoes radioactive decay, and emits gamma ray(s) and/or subatomic particles. These particles constitute ionizing radiation. Radionuclides may occur naturally, but can also be artificially produced (http://en.wikipedia.org/wiki/Radionuclide).

Reference state / Reference conditions
The value or range of values of state at which impacts from anthropogenic pressures are absent or negligible. Values used to define the reference state should be directly linked to the GES (Good Environmental Status) criteria used for assessment. They will vary in relation to prevailing physiographic and geographic conditions and may vary over time in relation to changing climatic conditions (OSPAR 2011).

Region
'Marine region' means a sea region which is identified under Article 4 (MSFD). Marine regions and their subregions are designated for the purpose of facilitating implementation of the MSFD directive and are determined taking into account hydrological, oceanographic and bio-geographic features. Member States can also designate subdivisions within marine regions and subregions (Anon. 2008a).

Regional cooperation
Cooperation and coordination of activities between Member States and, whenever possible, third countries sharing the same marine region or subregion, for the purpose of developing and implementing marine strategies (Anon. 2008a).

Regional sea convention
Any of the international conventions or international agreements together with their governing bodies established for the purpose of protecting the marine environment of the marine regions referred to in Article 4, such as the Convention on the Protection of the Marine Environment of the Baltic Sea, the Convention for the Protection of the Marine Environment of the North-east Atlantic and the Convention for the Marine Environment and the Coastal Region of the Mediterranean Sea (Anon. 2008a).

Reproductive capacity
The potential for reproduction of a population under favourable environmental conditions.

Reptiles
Animals characterized by laying shelled eggs (most of them), and having skin covered in scales and/or scutes. They are tetrapods (either having four limbs or being descended from four-limbed ancestors). Reptiles are classically viewed as having a ”cold-blooded” metabolism.

Residence time
The average amount of time a particle spends in a particular system. In an aquatic context residence time is the average time a water molecule stays within an area, which depends on both the amount of water in the system and the rate of water exchange.

Riverine inputs
The input of nutrients or other pollution that enter the marine environment from the riverine load.

Run-off
The flow of water (from rain, snowmelt, or other sources) over land.

Safe biological limits
Limits (reference points) for fishing mortality rates (F_{pa}) and spawning stock biomass (B_{pa}), beyond which the fishery is unsustainable (OSPAR 2010). Other criteria that indicate when a stock is outside safe biological limits include age structure, distribution of the stock and exploitation rates.

Salinity
The mass fraction of salts in water (HELCOM 2009).

Seabed
The bottom of the sea, including the sediment.

Seabirds
Birds that have adapted to life within the marine environment, e.g. dependant on the sea as a source of food.

Sediment
Sediment is naturally-occurring material that is broken down by processes of weathering and erosion, and is subsequently transported by the action of fluids such as wind, water, or ice, and/or by the force of gravity acting on the particle itself.

Sea-floor integrity
Structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected (Rice et al. 2010).

Sealing
Sealing of habitats may occur by blocking by constructions on the shore or above the habitat.

Selective extraction
Human activity for extraction (sucking, grappling, digging) of seabed resources, such as sand, gravel, sea shells, maerl, boulders or aggregations.

Shellfish
Term for exoskeleton-bearing aquatic invertebrates used as food, including various species of molluscs, crustaceans, and echinoderms. Although most kinds of shellfish are harvested from saltwater environments, some kinds are found only in freshwater.

Siltation
Tiny particles of organic and inorganic matter that sink down in the water column and cover the sea floor (HELCOM 2010b).

Size distribution
Distribution/percentage of the total population in each size interval.

Special habitat types
Referred to in Table 1 of Annex III to the Directive as types identified under other Community legislation or international conventions ("as being of special scientific or biodiversity interest", see 'listed features') (OSPAR 2011).

Species
A group of organisms capable of interbreeding and producing fertile offspring. While in many cases this definition is adequate, more precise or differing measures are often used, such as similarity of DNA, morphology or ecologi-

cal niche. Presence of specific locally adapted traits may further subdivide species into subspecies.

Smothering
To be concealed or suppressed. In the context of the MSFD: physical loss caused by human activities e.g. man-made structures, disposal of dredge spoil, etc.

Structure and function
Physical components and functional process of an ecosystem.

Sub-division
– see 'Region'.

Subregion
– see 'Region'.

Substance
Any chemical compound or mixture.

Substrate
A substrate is the surface a plant or animal lives upon. The substrate can include biotic or abiotic materials. For example, encrusting algae that lives on a rock can be substrate for another animal that lives on top of the algae.

Synthetic compounds
Man-made compounds either produced intentionally or originating as side-products.

Thermal regime
The temperature range occurring naturally in the site under the present climatic conditions.

TN
Total nitrogen which includes dissolved inorganic and organic nitrogen and organically bound nitrogen (HELCOM 2009).

TOC
Total organic carbon which includes dissolved organic carbon and organically bound carbon.

TP
Total phosphorous which includes dissolved inorganic and organic phosphorous and organically bound phosphorous (HELCOM 2009).

Translocations
Purposeful activity to transfer non-native species, sub-species or genetic variants to an area.

Turbidity
The degree to which the water loses its transparency due to the presence of suspended particulates (OSPAR 2010).

Underwater noise
Man-made noise in water that interfere with aquatic animal imaging, navigation and communication.

Upwelling
The rise of sea water from depths to the surface, typically bringing nutrients to the surface (HELCOM 2009).

Water column
The vertical column of water extending from the sea surface to the seabed (OSPAR 2010).

Wave exposure
Wave exposure or fetch is defined by the breadth of open water leading to a coast and can have big impact on coastal communities. If large, there is more room available for wave-generating energy. Storms out in the open ocean produce effects which can be felt on coasts hundreds of miles away. If a coastline is sheltered, as in an estuary or bay, then these effects are not felt. The waves have less distance to travel and so are less developed.

Zooplankton
Small planktonic animals in fresh- or sea-water with almost none or no swimming capacity. They are, therefore, primarily transported randomly by water movements (Ærtebjerg et al. 2003).

3 Acknowledgements

This MSFD glossary is a product of the HARMONY project, which has been initiated and funded by Denmark, Germany, Norway and Sweden.

The authors would like to thank Peter Henriksen and Lotta Ruokanen for valuable suggestions and comments.

4 References

Allaby, M. (2004): Oxford Dictionary of Ecology. Oxford University Press. 440 pp.

Andersen, J.H., Conley, D.J. & Hedal, S. (2004): Palaeo-ecology, reference conditions and classification of ecological status: The EU Water Framework Directive in practice. - Marine Pollution Bulletin 49: 282-290.

Andersen, J.H., Schlüter, L. & Ærtebjerg, G. (2006): Coastal eutrophication: recent developments in definitions and implications for monitoring strategies. - Journal of Plankton Research 28(7): 621-628.

Andersen, J.H., Axe, P., Backer, H., Carstensen, J., Claussen, U., Fleming-Lehtinen, V., Järvinen, M., Kaartokallio, H., Knuuttila, S., Korpinen, S., Laamanen, M., Lysiak-Pastuszak, E., Martin, G., Møhlenberg, F., Murray, C., Nausch, G., Norkko, A., & Villnäs, A. (2011): Getting the measure of eutrophication in the Baltic Sea: towards improved assessment principles and methods. - Biogeochemistry 106: 137-156.

Anon. (1991a): Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC). - Official Journal L 135.

Anon. (1991b): Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources. - Official Journal L 375.

Anon. (1992): Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. - Official Journal L 206.

Anon. (2000): Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for community action in the field of water policy. - Official Journal of the European Union L 327:1-72.

Anon. (2008a): Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). - Official Journal of the European Union L 164:19-40.

Anon. (2008b): Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council. - Official Journal of the European Union L 348:84-97.

Anon. (2009a): Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.

Anon. (2009b): Common Implementation Strategy for the Water Framework Directive (2000/60/EC). Guidance Document No. 23. Guidance Document on Eutrophication Assessment in the Context of European Water Policies. ISBN 978-92-79-12987-2. Technical Report - 2009 - 030. 136 pp.

Anon. (2010): Commissions decision of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters. - Official Journal of the European Union L232:14-24.

CBD (1992): Convention on Biological Diversity, United Nations 1992.

EEA (2011): Online-Environmental Terminology and Discovery Service (ETDS) (http://glossary.eea.europa.eu/terminology/). Site visited March 3, 2011.

Galgani, F., Fleet, D., Van Franeker, J., Katsanevakis, S., Maes, T., Mouat, J., Oosterbaan, L., Poitou, I., Hanke, G., Thompson, R., Amato, E., Birkun, A. & Janssen, C. (2010): Task Group 10 Report. Marine litter. JRC European Commission, Ifremer, and ICES. EUR 24340 EN - 2010. 48 pp.

HELCOM (2006): Development of tools for assessment of eutrophication in the Baltic Sea. - Baltic Sea Environmental Proceedings No. 104. 62 pp.

HELCOM (2009): Eutrophication in the Baltic Sea. An integrated thematic assessment of the effects of nutrient enrichment in the Baltic Sea region. - Baltic Sea Environmental Proceedings 115B. 148 pp.

HELCOM (2010a): Hazardous substances in the Baltic Sea. An integrated thematic assessment of hazardous substances in the Baltic Sea. - Baltic Sea Environmental Proceedings 120B. 118 pp.

HELCOM (2010b): Ecosystem Health of the Baltic Sea 2003-2007: HELCOM Initial Holistic Assessment. - Baltic Sea Environmental Proceedings 122. 63 pp.

Nixon, S.W (1995): Coastal marine eutrophication: a definition, social causes, and future concerns. - Ophellia 41: 199-219.

OSPAR (2010): Quality Status Report 2010. OSPAR Commission. London. 175 pp.

OSPAR (2011): ICG-COBAM Summary Record 11/4/1-E. OSPAR Commission.

Rice, J., Arvanitidis, C., Borja, A., Frid, C. , Hiddink, J. , Krause, J., Lorance, P., Ragnarsson, S.Á., Sköld, M. & Trabucco, B. (2010): Marine Strategy Framework Directive - Task Group 6 Report. Seafloor integrity. JRC European Commission and ICES. EUR 24334 EN - 2010. 73 pp.

Rodgers, S., Casini, M., Cury, P., Heath, M., Irigoien, X., Kuosa, H., Scheidat, M., Skov, H., Stergiou, K., Trenkel, V., Wikner, J. & Yunev, O. (2010): Task Group 4 Report. Food webs. JRC European Commission and ICES. EUR 24343 EN - 2010. 55 pp.

Soanes, C. & Stevenson, A. (Eds.) (2004): Concise Oxford English Dictionary. Eleventh edition. Oxford University Press.

Ærtebjerg, G., Andersen, J.H. & Hansen, O.S. (Eds.) (2003): Nutrients and eutrophication in Danish marine waters. A challenge for science and management. National Environmental Research Institute. 126 pp.

A GLOSSARY OF TERMS COMMONLY USED IN THE MARINE STRATEGY FRAMEWORK DIRECTIVE

This glossary of terms commonly used in the Marine Strategy Framework Directive is meant as an interpretation manual supporting the work leading to publication in 2012 of so-called Initial Assessments of Member States marine waters and in 2016 of Marine Strategies, the latter being management plans on how to achieve good environmental status. The MSFD glossary is based on existing definitions from the Directive and the common implementation process. In some cases definitions from the Convention on Biological Diversity (CBD) or regional marine conventions (HELCOM and OSPAR) have been included.

ISBN: 978-87-92825-85-8
ISSN: 2245-019X