Document title	HELCOM and OSPAR indicators – coordinated development efforts
Code	4-4
Category	INF
Agenda Item	4 - Activities of relevant HELCOM projects or processes
Submission date	26.10.2015
Submitted by	Secretariat

Background

The two Regional Seas Conventions HELCOM and OSPAR are developing indicators for assessing the status in the respective marine region. The RSCs have a history of cooperation on common issues and also within the indicator work commonalities are being identified with the aim of joining efforts and benefiting from the expertise and progress being done in the respective RSC. As the seas have different characteristics and the challenges to tackle differ, the indicators will naturally not be the same in all instances. In relation to that, there might be more emphasis on, and specific solutions favoured for some indicators in one region (case of eutrophication in the Baltic Sea), while other indicators might have found their way to the final set in the other.

During the indicator development in the respective RSCs, cooperation has occurred for various indicator themes through organized workshops, cross-invitations of experts to meetings, as well as on an ad hoc basis.

In October 2014 a joint meeting was organized with the express purpose of comparing biodiversity indicators and identifying concrete opportunities for cooperation. This so 'COREBAM' meeting resulted in a communication paper with indicator comparisons and concrete proposals for further work. Many of the identified points have since been taken forward.

Water bird indicators were among the ones identified as relevant for cooperation. Bird experts will come together in the first meeting of the JWG Bird as a joint OSPAR-HELCOM-ICES group on 9-13 November 2015, to ensure future good cooperation on the topic.

Indicators evaluating the impact on benthic biotopes were also identified as having potential for synergies. The HELCOM BalticBOOST project has budgeted for inviting OSPAR representatives to the two workshops related to development of principles for defining environmental targets for seabed habitats, a project activity that is closely linked to the development of the Cumulative impact indicator and for which continued development will be taken forward in coordination with BalticBOOST.

For hazardous substances, cooperation on indicator development between the OSPAR MIME group and the new HELCOM Expert Network on Hazardous Substances (ToR to be agreed at State&Conservation 3-2015) has been identified as important and relevant. The experts from the respective conventions have not yet had opportunities for organized joint meetings, but this is an option to explore, in addition to a plan in HELCOM to consider OSPAR assessment protocol for use in the Baltic Sea.

The emerging topics regarding indicators for marine litter and underwater noise have been identified as opportunities for cooperation that could achieve high comparability of the eventual indicator evaluations between marine regions. The joint meeting of OSPAR ICG-Noise, HELCOM EN-Noise and EU TG-Noise held on 30 September 2015 provided an opportunity for discussions among the Baltic Sea and North Sea countries

on a joint registry. As OSPAR has been advanced with development of the registry, to be hosted at ICES, HELCOM can benefit from this arrangement by joining in. Contracting Parties in a HELCOM Meeting (Pressure Working Group) supported the joint registry and actions are planned accordingly. A joint regional registry will provide the basis for comparable data and indicators.

Action required

The Meeting is invited to take note of the information.

HELCOM and OSPAR indicators – coordinated development efforts

The comparison of indicators included in this document is prepared based on the latest available lists of indicators under development in HELCOM and OSPAR with the aim to form the basis for upcoming assessments. In this document 'IA2017' refers to the OSPAR intermediate assessment and 'HOLAS II' refers to the HELCOM second holistic assessment.

The comparison includes all HELCOM core and pre-core indicators and all OSPAR common- and priority candidate indicators. In cases where one RSC have considered a candidate indicator that is comparable to the previously mentioned (common/core) indicators for the other RSC, the candidate has also been provided for information even though that candidate indicator may not be included in the upcoming respective assessments.

Concluding on the comparability of indicator results requires comparison of indicator parameters, the approach for assessing GES, and a comparison of the assessment protocols and underlying data to be included in the indicator. Although no detailed analysis have been carried out at this time, the indicators listed in Table 1 are likely to result in comparable indicator evaluations, in particular if their further development is coordinated.

Many HELCOM and OSPAR indicators are also based on similar elements or functions of the marine environment. These indicators are listed in Table 2. Due to different approaches in monitoring and assessment, the indicator evaluations are however not necessarily comparable.

Indicator development work is still ongoing in both conventions. Therefore it is often not possible to finally conclude on the exact level of inter-regional comparability. Comments on current similarities and differences are provided in this document with the aim to support further regional and inter-regional indicator based assessment work, however without prejudging on the essence of these differences which is subject to expert evaluation.

This document has been grouped:

Table 1. Indicators that will likely generate comparable indicator evaluations 4

Table 2. Indicators based on similar elements and functions although that may not necessarily generate comparable indicator evaluations 6

Annex 1. Full list of HELCOM indicators 11

Annex 2. Full list of OSPAR indicators 13

Table 1. Indicators that will likely generate comparable indicator evaluations

OSPAR indicator	stage of development	HELCOM indicator	stage of development	**Comment**
B1 - Marine bird abundance	common (region II, III, IV)	Abundance of waterbirds in the wintering season	core	The comparability of evaluations is likely to be high. Onshore - comparability high. Offshore - in HELCOM monitoring guideline agreed in 2015, in OSPAR no common method agreed. JWG Bird to discuss monitoring methods and assessment protocols.
B1 - Marine bird abundance	common (region II, III, IV)	Abundance of waterbirds in the breeding season	core	The comparability of evaluations is likely to be high. JWG Bird to discuss monitoring methods and assessment protocols.
B5- Marine bird bycatch M6 - Marine mammal bycatch	*candidate* common (region II)	Number of drowned mammals and waterbirds in fishing gears *see above*	core (pressure indicator) *see above*	As the indicators are poorly developed due to lack of monitoring data in both RSCs, it is difficult to fully estimate the comparability, however in principle the indicators ought to be highly comparable and further development could strive for comparability between concepts and approached to define sustainable fisheries. Currently no agreed monitoring concept exists for by-catch in any fisheries, for neither OSPAR nor HELCOM. Assessment approach could aim to be the same concept but area specific thresholds. No data arrangements exist. HELCOM concept based on numbers of birds and mammals by-caught, whereas OSPAR concept based on by-catch rate. Rate could be calculated in HELCOM based on numbers if combined with abundance measurements. *see above.*
BH3 - Physical damage of predominant and special habitats	common (region II, III, IV)	Cumulative impact on benthic biotopes	pre-core	Indicator development still on-going, however the potential for high comparability of indicator evaluations has been identified. The two indicators use comparable spatial layers for pressure (e.g. based on VMS data). Potential for common approach for assessment protocol and GES boundaries exist that would include considering antagonistic, cumulative and synergistic effects in a similar manner. Comparability could be strengthened by use of same terms and assessment methods.
NIS - Rate of new introductions of NIS	common (region II, III, IV)	Trends in arrival of new non-indigenous species	core	Indicator evaluations are considered to be comparable as the same concepts are applied.
Metals biota - Metal (Hg, Cd, Pb) concentrations in biota	common (region II, III, IV)	Metals (Cd, Hg, Pb)	core	Likely high comparability between indicators. HELCOM expert network on hazardous substances will currently be reviewing the option of using the same assessment protocol for hazardous substance data reported to ICES COMBINE databased that has been developed by OSPAR MIME. Applying the same assessment protocols would increase comparability of the indicator evaluations.

Metals sedim - Metal (Hg, Cd, Pb) concentrations in sediment	common (region II, III, IV)	*as above*	*as above*	Likely high comparability, although the HELCOM indicator is only evaluating sediment concentrations as a secondary evaluation.
PBDE sediment - PBDE concentrations in sediment	common (region II, III, IV)	Polybrominated biphenylethers (PBDE)	core	Likely high comparability, although the HELCOM indicator is only evaluating sediment concentrations as a secondary evaluation. HELCOM expert network on hazardous substances will currently be reviewing the option of using the same assessment protocol for hazardous substance data reported to ICES COMBINE database that has been developed by OSPAR MIME. Applying the same assessment protocols would increase comparability.
PAHs biota - PAHs concentrations in biota (excluding fish)	common (region II, III, IV)	Polyaromatic hydrocarbons (PAH) and their metabolites	core	Likely high comparability. HELCOM expert network on hazardous substances will currently be reviewing the option of using the same assessment protocol for hazardous substance data reported to ICES COMBINE databased that has been developed by OSPAR MIME. Applying the same assessment protocols would increase comparability.
Beach litter	common (region II, III, IV)	Beach litter	pre-core	High comparability of indicator evaluations expected. Methodologies can be aligned. Development work on-going in both RSCs.
Litter on the seafloor	common (region II, III, IV)	Litter on the seafloor	*candidate*	Ongoing development work in both RSCs. High comparability expected where fisheries trawl surveys exist, however the coverage of the surveys is limited in the Baltic Sea, unclear if HELCOM indicator will be included in HOLAS II.
Impulsive noise	common (region II, III, IV)	Distribution in time and space of loud low- and mid-frequency impulsive sounds	*candidate*	On-going work, high comparability expected. Development of the indicator closely linked to development of the joint regional registry, coordination during the continued development needed.

Table 2. Indicators based on similar elements and functions although that may not necessarily generate comparable indicator evaluations

OSPAR indicator	Stage of development	HELCOM indicator	Stage of development	**Comment**
M3- Seal abundance and distribution	common (region II)	Population trends and abundance of seals	Core	Both indicators evaluate abundance of seals that perform similar roles in the respective sea areas. However, monitoring programmes vary regarding frequency and parameters. HELCOM uses annual monitoring data, OSPAR monitoring data varies more in frequency between CPs, resulting in different assessment protocols and differences in concept. Regional specific species in Baltic – ringed seal.
See above	*See above*	Distribution of Baltic seals	core	Both indicators evaluate distribution of seals, however the level of similarity of the indicators is unclear, and potentially the HELCOM core indicator concept would be more comparable with the OSPAR M1 candidate indicator (see Annex2) concept, however that candidate indicator is currently not being developed with the aim of inclusion in IA 2017.
M5 - Grey seal pup production	common (region II, III)	Reproductive status of marine mammals	core	Both indicators evaluate grey seal populations, however the indicator concepts differ significantly. OSPAR indicator derived from live pup counts. HELCOM derived post-mortem from female seals. These data are difficult to harmonise to produce directly comparable indices of productivity. Also OSPAR grey seal pup production is mainly used as a measure of population size. HELCOM is considering a future candidate indicator 'Seal pup weight at weaning' which would be based on a more comparable concept, however this indicator is unlikely to be included in HOLAS II.
M4 – Cetacean abundance and distribution	common (region II, III, IV)	*Harbour porpoise distribution and abundance*	*candidate*	Both indicators evaluate abundance and distribution of cetaceans, however only one species of cetacean occurs in the Baltic Sea at very low densities and it is currently not clear how this influences the similarity of the indicators. HELCOM indicator planned to rely primarily on passive acoustic monitoring data due to very low density of animals. In OSPAR aerial survey data are planned to be used. HELCOM indicator currently in very early stages of development and it is unclear if it will be included in HOLAS II.
B3 - Breeding status of marine birds	common (region II, III, IV)	Abundance of waterbirds in the breeding season- *including parameter on breeding success which has not been developed*	*(core)*	OSPAR indicator looks at breeding success in a wide range of species to highlight impacts on food supply. Indicator could be applicable in HELCOM as a concept but monitoring of breeding success is not widely conducted in HELCOM (limited to local uncoordinated programmes) and has so far only been taken forward as a supporting parameter of the abundance indicator and thus it is not clear to which level the indicator evaluations could be compared.

FC2 - OSPAR EcoQO proportion of large fish (LFI) (FW3) Demersal	common (region II, III)	Proportion of large fish in the off-shore community (LFI)	core	Comparability of the indicator evaluation of demersal community LFI is theoretically high, however the HELCOM indicator also includes the pelagic community which is not included in the OSPAR indicator. Survey data for demersal community held at ICES DATRAS. The assessment protocol for the HELCOM indicator has been modified from the OSPAR developed protocol to suit the environmental conditions of the Baltic Sea. The comparability of indicator evaluations would need to be clarified during continued development work.
FC3 - Mean maximum length of demersal fish and elasmobranchs	priority candidate	Maximum length fish in the pelagic community (ML)	pre-core	The metric is similar but different assessment elements are considered. OSPAR indicator considers demersal community while HELCOM indicator considers pelagic community. HELCOM is considering to include the demersal community, which would make the indicator concepts and evaluations more similar.
FW7 - Fish biomass and abundance of dietary functional groups	candidate	Abundance of key coastal fish functional groups	core	The concepts of the indicators are similar in that they address functional groups. However, the indicators relate to different fish communities, and rely on very different type of data. OSPAR indicator will not contribute to IA 2017.
FC1 - Fish abundance	common (region II, III)	Abundance of key coastal fish species	core	Both indicators evaluate fish abundance, however the concepts and the fish species included differ significantly. OSPAR suite of species are selected based on sensitivity to fishing. HELCOM single coastal local species are selected as representative species for the coastal community and perform a key function in the ecosystem.
BH2 – Condition of benthic habitat defining communities. (Multi-metric indices)	common (region II, III, IV)	State of the soft-bottom macrofaunacommunity (BQI)	core	OSPAR uses different indicators to evaluate different pressures. The HELCOM indicator integrates all pressures affecting the status of the benthic community. Due to differences in environmental conditions, the indicators have been developed differently and indicator results are not considered to be directly comparable although the same elements of the marine environment are considered.
FW 6 - Biomass, species composition and spatial distribution of zooplankton	*candidate*	Zooplankton mean size and total stock	core	Comparability considered to be high, as concepts are similar and monitoring data are similar. However, OSPAR indicator not included in IA 2017. (The HELCOM indicator is not considered comparable to the OSPAR indicator PH2 (Annex 2) as the underlying indicator concept is different and size data is not available on OSPAR level).
PH 1 - Changes of plankton functional types (life form) index ratio **(incl. FW5 covering trophic elements)**	common (region II, III, IV)	Diatoms/ dinoflagellates index	pre-core	Some aspects of the indicator concepts are similar, however similarity is still questionable as it is currently not clear if the indicators will evaluate the same functional element of the respective marine area.

BH4 - Area of habitat loss	priority candidate	Distribution, pattern and extent of benthic biotopes	pre-core	Development on-going. Potential comparability for the concept of the extent part of the HELCOM indicator to the OSPAR indicator. If specific biotopes are selected that perform the same function in respective region, then indicator results may be comparable. OSPAR indicator will not contribute to IA 2017.
BH5 - Size-frequency distribution of bivalve or other sensitive/indicator species	candidate	Population structure of long-lived macrozoobenthic species	core	Still under development in both RSCs. Concept across RSCs could be similar although specific species included could be different. Same target setting concept could possibly be used. Unlikely to contribute in full to HELCOM HOLAS II, not to contribute to OSPAR IA 2017.
Winter nutrient concentrations (DIN and DIP)	common (region II, III, IV)	DIP concentration, winter period	core	In OSPAR DIN concentrations are assessed, whereas in HELCOM two indicators (DIN and DIP) are used. Both measure winter concentrations at the surface. In areas with salinity gradient, OSPAR normalizes DIN for salinity while HELCOM does not normalize, and this might cause some differences in the outcome.
See above	*See above*	DIN concentration, winter period	core	In OSPAR DIN and DIP are combined as a ratio in one indicator, whereas in HELCOM two indicators are used. Both measure winter concentrations at the surface. In areas with salinity gradient, OSPAR normalizes for salinity while HELCOM does not normalize, and this might cause some differences in the outcome
Chlorophyll concentration	common (region II, III, IV)	Chlorophyll -a concentration, summer period	core	OSPAR uses 90th percentile chl-a during growth season, HELCOM monitors during summer months leaving thus out the spring bloom period which is the time as the most intense biomass-production (the spring season is evaluated using a different indicator). It would need to be further clarified if the same aspect of the marine environment is evaluated using these different approaches in the respective RSCs as the environmental conditions are different.
Oxygen	common (region II, III, IV)	Oxygen debt below halocline	core	Both indicators evaluate oxygen conditions, however the indicator concepts differ significantly. OSPAR uses concentrations of oxygen in the bottom water during the growing season. HELCOM uses a specific indicator describing the lack of oxygen compared to saturated values, in attempt to discard hydrographic effects.
Nutrient inputs in water and air	common (region II)	Inputs of nitrogen and phosphorus to the basins (pressure core indicator)	core (pressure)	Both indicators evaluate input of nutrients, however the indicator concepts differ significantly. OSPAR relates current loads of total N and P with relevant background loads or reference conditions, or in the absence of these, to those from previous years. HELCOM relates current loads of total N and P to an agreement on maximum allowable inputs. Without a comparable reference point the results of these indicators cannot be directly compared.

Input metal - inputs of Hg, Cd and Pb via water and air	common (region II)	*Atmospheric deposition of heavy metals on the Baltic Sea & Atmospheric emissions of heavy metals in the Baltic Sea region*	*BSEFS*	Datasets may have high comparability. HELCOM has not developed a comparable indicator, however the trend monitoring data provided through EMEP as a Baltic Sea Environment Fact Sheet (BSEFS) is planned to be used in HOLAS II pressure assessment (inputs), and in addition some information from PLC-6 assessments might be used. Although there are not two similar indicators, there are similar data planned for inclusion in the respective assessments.
PBDE biota - PBDE concentrations in biota	common (region II, III, IV)	Polybrominated biphenylethers (PBDE)	core	The indicators evaluate the same substance in biota. However, the similarity of the indicator results may not be high if different concepts are used for the target setting. HELCOM expert network on hazardous substances will currently be reviewing the option of using the same assessment protocol for hazardous substance data reported to ICES COMBINE database that has been developed by OSPAR MIME. Applying the same assessment protocols would increase comparability.
PCBs biota - PCB concentrations in biota	common (region II, III, IV)	Polychlorinated biphenyls (PCB) and dioxins and furans	core	Possibly comparable evaluations. HELCOM expert network on hazardous substances will currently be reviewing the option of using the same assessment protocol for hazardous substance data reported to ICES COMBINE database that has been developed by OSPAR MIME. Applying the same assessment protocols would increase comparability.
Imposex/intersex	common (region II, III, IV)	TBT and imposex	core	Possibly comparable evaluations. HELCOM expert network on hazardous substances will currently be reviewing the option of using the same assessment protocol for hazardous substance data reported to ICES COMBINE database that has been developed by OSPAR MIME. Applying the same assessment protocols would increase comparability.
PAHs sediment - PAHs concentrations in sediments bile metab - Bile metabolites of PAHs	common (region II, III, IV) candidate	Polyaromatic hydrocarbons (PAH) and their metabolites *see above*	core *see above*	Both indicators evaluate PAHs, however the HELCOM indicator focusses on evaluating biota and only evaluates sediment as a secondary element. OSPAR candidate indicator not to be included in IA 2017. In HELCOM the bile parameters are developed as part of the overall core indicator.
PCBs sediment - PCB concentrations in sediment	common (region II, III, IV)	Polychlorinated biphenyls (PCB) and dioxins and furans	core	Both indicators evaluate PCBs, however the HELCOM indicator focusses on evaluating biota and only evaluates sediment as a secondary element.
LMS - Lysosomal membrane stability (LMS)	candidate	Lysosomal membrane stability (LMS)	pre-core	Both indicators evaluate the same biological effect. However, the indicators is not to be included in OSPAR IA 2017
fish disease - Externally visible fish diseases	candidate	Fish disease index	pre-core	Both indicators evaluate the same biological effect. However, the indicators is not to be included in OSPAR IA 2017

micronuclei - Micronuclei (MN)	candidate	Micronucleus test	pre-core	Both indicators evaluate the same biological effect. However, the indicators is not to be included in OSPAR IA 2018

Annex 1. Full list of HELCOM indicators

This annex provides a full list of indicators in HELCOM, including candidate indicators not included in the comparison with OSPAR indicators.

Core indicators
Abundance of coastal fish key functional groups
Abundance of key coastal fish species
Abundance of salmon spawners and smolt
Abundance of sea trout spawners and parr
Abundance of waterbirs in the breeding season
Abundance of waterbirds in the wintering season
Distribution of Baltic seals
Population trends and abundance of seals
Nutritional status of marine mammals
Reproductive status of marine mammals
Number of drowned mammals and waterbirds in fishing gear
Zooplankton mean size and total stock
Trends in arrival of new non-indigenous species
Hexabromocyclododecane (HBCDD)
Metals
Polybrominated biphenyl ethers (PBDE)
Perfluorooctane sulphonate (PFOS)
Radioactive substances: Cesium-137 in fish and surface waters
White-tailed eagle productivity
Population structure of long-lived macrozoobenthic species
Proportion of large fish in the community
State of the soft-bottom macrofauna community
Polyaromatic hydrocarbons (PAH) and their metabolites
Polychlorinated biphenyls (PCB) and dioxins and furans
TBT and imposex
Inputs of nitrogen and phosphorous to the basins
Pre-core indicators
Cumulative impact on benthic biotopes
Distribution, pattern and extent of benthic biotopes
Lower depth limit distribution of the macrophyte community
Acetylcholinesterase inhibition
Diclofenac concentration
Estrogenic-like chemicals and effects
Lysosomal membrane stability (LMS)
Reproductive disorders: Malformed eelpout and amphipod embryos
Fish disease index
Micronucleus test
Oil-spills affecting the marine environment
Diatoms/dinoflagellates index
Seasonal succession of functional phytoplankton groups
Maximum length fish in the pelagic community
Beach litter

Continuous low frequency anthropogenic sound Total nitrogen concentration Total phosphorous concentration Cyanobacterial surface accumulations Phytoplankton spring bloom intensity based on chl-a
Candidate core indicators (living list with no level of agreement)
Harbour porpoise distribution and abundance Biomass ratio of opportunistic and perennial macroalgae Phytoplankton species assemblage clusters based on environmental factors EROD activity Litter on the seafloor Microlitter in the watercolum Distribution in time and space of loud low- and mid-frequency impulsive sounds

Annex 2. Full list of OSPAR indicators

This annex provides an overview of the current list of indicators in OSPAR. This information has been provided by the OSPAR Secretariat.

The source of the information is "ICG MSFD(2) 15/03/01, Annex 1". The overview was prepared for the OSPAR meeting ICG MSFD common indicators WebEx, held 19 October 2015.

Status of common and candidate indicators & assessment values

Update to progress on the common/ candidate indicators due to deliver to the IA2017

	Common indicator
	Priority candidate indicators (in Regions other than where it is already common)

Indicator	Explanation / title	Region I	Region II	Region III	Region IV	Region V
D1 Mammals 1	Distribution seals					
D1 Mammals 3	Seal abundance and distribution					
D1 Mammals 4	Cetacean abundance and distribution					
D1 Mammals 5	Grey seal pup production					
D1 Mammals 6	Marine mammal bycatch					
D1 Birds 1	Marine bird abundance					
D1 Birds 2	Breeding success of kittiwake					
D1 Birds 3	Breeding status of marine birds					
D1 Birds 4	Non-native/invasive mammal presence on island seabird colonies					
D1 Birds 5	Marine bird bycatch					
D1 Birds 6	Distribution marine birds					
D1 Fish Ceph 1	Fish abundance					
D1 Fish Ceph 2	OSPAR EcoQO proportion of large fish (LFI)					
D1 Fish Ceph 3	Mean maximum length of demersal fish and elasmobranchs					
D1 Fish Ceph 4	By-catch rates of Chondrichthyes					
D1 Fish Ceph 5	Conservation status of elasmobranch and demersal bony-fish species (IUCN)					
D1 Fish Ceph 6	Proportion of mature fish					
D1 Fish Ceph 7	Distributional range					
D1 Fish Ceph 8	Fish distributional pattern					
D1/6 BentHab1	Typical species composition					
D1/6 BentHab2	Condition of benthic habitat defining communities. (Multi-metric indices)					
D1/6 BentHab3	Physical damage of predominant and special habitats					
D1/6 BentHab4	Area of habitat loss					
D1/6 BentHab5	Size-frequency distribution of bivalve or other sensitive/indicator species					
D1 PelHab 1	Changes of plankton functional types (life form) index Ratio					
D1 PelHab 2	Plankton biomass and/or abundance					
D1 PelHab 3	Changes in biodiversity index (s)					
D2 NIS	Rate of new introductions of NIS					
D4 FoodWeb 1	Reproductive success of marine birds in relation to food availability					
D4 FoodWeb 2	Production of phytoplankton					

Indicator	Explanation / title	Region I	Region II	Region III	Region IV	Region V
D4 FoodWeb 3	Size composition in fish communities (LFI)					
D4 FoodWeb 4	Changes in average trophic level of marine predators (cf MTI)					
[1]						
D4 FoodWeb 6	Biomass, species composition and spatial distribution of zooplankton					
D4 FoodWeb 7	Fish biomass and abundance of dietary functional groups					
D4 FoodWeb 8	Biomass trophic Spectrum					
D4 FoodWeb 9	Ecological Network Analysis diversity)					
D5 nutrient input water & air	Nutrient inputs in water and air					
D5 nutrient input water	Nutrient inputs in water					
D5 nutr conc	Winter nutrient concentrations					
D5 chlorophyl	Chlorophyll concentration					
D5 Phaeocystis	Species shift/indicator species: Nuisance species Phaeocystis					
D5 oxygen	Oxygen					
D7 area affect	Extent of area affected – physical					
D7 habit affect	Spatial extent of habitats affected					
D7 habit functi	Changes in habitat functions					
D8 input metal	Inputs of Hg, Cd and Pb via water and air					
D8 metals (biota)	Metal (Hg, Cd, Pb) concentrations in biota					
D8 metals (sedim)	Metal (Hg, Cd, Pb) concentrations in sediment					
D8 PCBs (biota)	PCB concentrations in biota					
D8 PCBs (sedim)	PCB concentrations in sediments					
D8 PAHs (biota excluding fish)	PAHs concentrations in biota					
D8 PAHs (sedim)	PAHs concentrations in sediments					
D8 Organotin (biota)	Organotin concentrations in biota					
D8 Organotin (sedim)	Organotin concentrations in sediments					
D8 PBDE (biota)	PBDE concentrations in biota					
D8 PBDE (sedim.)	PBDE concentrations in sediments					
D8 HCB (biota)	HCB (hexachlorobenzene) concentrations in biota					
D8 HCBD (biota)	HCBD (hexachlorobutadiene) concentrations in biota					
D8 HCBD (sedim)	HCBD (hexachlorobutadiene) concentrations in sediments					
D8 imposex	Imposex/intersex					
D8 fish disease	Externally visible fish diseases					
D8 LMS	Lysosomal stability (LMS)					
D8 bile metab	Bile metabolites (of PAHs)					
D8 micronuclei	Micronuclei (MN)					
D8 EROD	EROD					
D10 on beach	Beach litter					
D10 on seabed	Litter on the sea floor					
D10 in Fulmar	Fulmar litter ingestion (impact and floating litter)					
D10 microplastic	Microplastics					
D11 impulsive	Impulsive noise					
D11 ambient	Ambient noise					

[1] ' D4 FoodWeb 5 "change of plankton functional type" was merged with D1 Pelagic Habitat 1. "Changes of plankton functional types (life form) index Ratio" and therefore deleted as a D4 Food web indicator by OSPAR 2015'