

Assessment of the state of marine waters – recommendations for the future

WP2 - Analysis of initial assessments

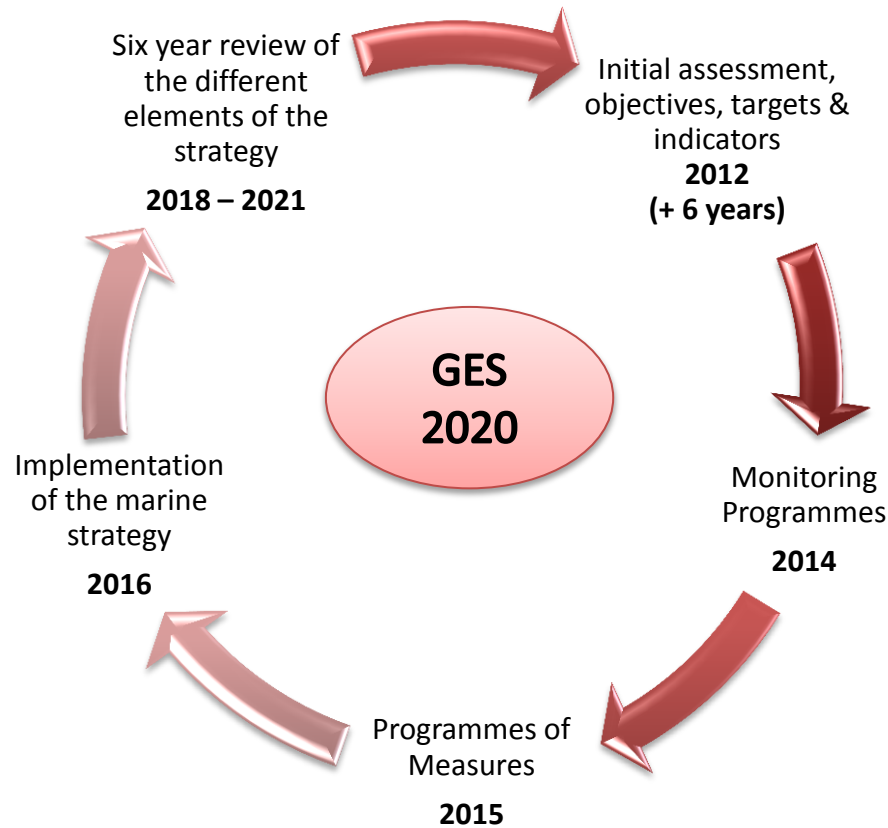
Georg Martin

Leader of WP2

Estonian Marine Institute, University of Tartu



MSFD Implementation Steps



Main elements of a Marine Strategy:

- *Initial assessment* of current environmental status of MS waters by 15 July 2012
- *Determination* of GES by 15 July 2012
- Establishment of environmental *targets* and associated *indicators* by 15 July 2012
- Establishment of a *monitoring programme* for ongoing assessment and regular updating of targets by 15 July 2014
- Development of a *programme of measures* designed to achieve or maintain GES by 2015

WP2 – Analysis of initial assessments (MSFD Article 8); responsible partner – EMI, involved partners – SYKE, LHEI, MoE-Est, SEIT, MSI, RKTL

Content – Analysis of coherence of methodologies and concepts describing environmental status and evaluation of pressures and impacts, gaps analysis and analysis to suggest harmonization of assessment schemes for different directives

Main directions of work:

- Analysis of coherence of initial assessments
- Identification of gaps in knowledge and capacity building
- Recommendations for harmonization of assessment schemes for different directives

Challenges for the analysis and harmonisation of national IA reports

- National IA reports are prepared in national languages
- Timetable, structure of the report, composition of expert panel and established procedures (e.g. Public hearing procedures, official endorsement of the reports etc.) are different
- Difference in availability and coverage of the data concerning essential features and characteristics of marine environment and predominant pressures
- High variation in level of detailness of presented data in national IA reports and that required by reporting sheets

„Roof-report“ template

Criteria	Indicator	Use of indicator	Name(s) of the indicator(s)	Source of the indicator(s)	Spatial coverage	GES boundary	Source of information	Data gaps	Knowledge gaps	Methodological gaps	Explanations	Other comments
Species distribution	Distributional range	Yes										
Species distribution	Distributional pattern	Partially										
Species distribution	Area covered by species	No										
Population size	Abundance and/or biomass											
Population condition	Demographic characteristics											
Population condition	Size/age structure											
Population condition	Sex ratio											
Population condition	Fecundity rates											
Population condition	Survival/mortality rates											
Population condition	Genetic structure											
Habitat distribution	Distributional range											
Habitat distribution	Distributional pattern											
Habitat extent	Habitat area											
Habitat extent	Habitat volume											
Habitat condition	Typical species and communities											
Habitat condition	Relative abundance and/or biomass											
Habitat condition	Physical, hydrological and chemical conditions											
Ecosystem structure	Composition and proportions of ecosystem components											
Abundance and state characterisation of non-indigenous species, in particular invasive species	Trend in abundance and temporal occurrence											
Abundance and state characterisation of non-indigenous species, in particular invasive species	Trends in spatial distribution											
Environmental impact of invasive non-indigenous species	Ratio between invasive/native species											
Environmental impact of invasive non-indigenous species	Impacts of invasive species											
Level of pressure of the fishing activity	Fishing mortality											
Level of pressure of the fishing activity	Ratio between catch and biomass index											
Reproductive capacity of the stock	Spawning Stock Biomass											
Reproductive capacity of the stock	Biomass indices											
Population age and size distribution	Proportion of fish larger than the mean size of first sexual maturation											
Population age and size distribution	Mean maximum length across all species found in research vessel surveys											
Population age and size distribution	95 % percentile of the fish length distribution observed in research vessel surveys											
Population age and size distribution	Size at first sexual maturation, which may reflect the extent of undesirable genetic effects of exploitation											
Productivity of key species or trophic groups	Performance of key predator species											
Proportion of selected species at the top of food webs	Large fish (by weight)											

Coherence of national IA reports – overview of topics and issues covered

Assessment of physical and chemical features

Variable	Trend assessment		
	EST	FIN	LAT
Topography and bathymetry of the seabed	No	No	No
Annual and seasonal temperature regime	No	Yes	Yes
Ice cover	Yes	Yes	Not done
Current velocity	No	No	Not done
Upwelling	No	No	Not done
Wave exposure	No	No	Not done
Mixing characteristics	No	No/Yes	Not done
Turbidity	Yes	Yes	Yes
Residence time	No	No	Not done
Spatial and temporal distribution of salinity	Yes	Yes	Yes
Spatial and temporal distributions of nutrients	Yes	Yes	Yes
Spatial and temporal distribution of oxygen	Yes	Yes	Yes
pH, pCO ₂	No	No	Yes

Coherence of national IA reports – problems identified

Assessment of habitat types

Variable	Gaps		
	EST	FIN	LAT
Seabed habitats	National inventories needed		Lack of data and lack of knowledge
Water column habitats			Lack of data and lack of knowledge
Physical features		Insufficient information	No tool to assess feature exists
Chemical features		Insufficient information	Insufficient information
Identification and mapping of special habitat types		Insufficient information	No information on extent and distribution
Habitats of particular reference			No information on extent and distribution

Baltic Sea Roof Report

Overview of the reporting by Baltic Sea EU member states for Articles 8, 9 and 10 of the Marine Strategy Framework Directive and HELCOM's activities as the regional coordination platform



HELCOM GEAR Group



GES-REG (Good Environmental Status through Regional Coordination and Capacity Building) is a project funded by the Central Baltic INTERREG IV A Programme 2007-2013. The main aim of the project is to support coherent and coordinated implementation of the MSFD in the central and north-eastern sub-regions of the Baltic (Gulf of Finland, northern part of the Baltic Proper and Gulf of Riga). One objective of the project is to increase the knowledge base and guidance for a coherent use of descriptors, criteria and indicators in defining GES. The project offered to analyse the coherence of the implementation of Articles 8, 9 and 10 MSFD by HELCOM EU Member States and to define gaps to be filled within the regional cooperation. The following preliminary analysis is based on the responses from Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden to a questionnaire submitted by the Project to HELCOM EU Member States.

GES REG Descriptor 1 - Biodiversity

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	<p>Insufficient spatial coverage of benthic species</p> <p>No data to assess demographic characteristics of benthos</p>	<p>Insufficient knowledge to link state with pressures</p>	<p>Method to assess demographic condition and genetic structure</p> <p>Method to assess spatial distribution and extent</p>
Estonia	<p>Insufficient spatial coverage of sessile/benthic species</p>	<p>Insufficient knowledge on habitat distribution, typical condition of species and community</p>	<p>No indicator to assess demographic condition</p> <p>No indicator for habitat volume</p>
Finland	<p>Insufficient spatial coverage of benthic species</p> <p>Population of coastal fish</p>	<p>Ecological coherence of marine protected areas</p>	

GES REG **Descriptor 2 - NIS**

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	Spatial coverage is not sufficient	Knowledge is not sufficient to assess impact of non-indigenous species	No indicator to assess impact
Estonia	No data on distribution		No indicator to assess distribution
Finland	Detection of changes in distribution	Knowledge is not sufficient to assess impact of non-indigenous species	Often taxonomical expertise is lacking Indicator of ballast water

GES REG Descriptor 3 - Fish

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	Data series are too short for coastal fish	Knowledge on population age and size distribution	Methods for all species are not developed
Estonia			No catch/biomass ratio indicator No mean and maximum length indicator
Finland	Fishing pressure on coastal fish is insufficiently covered Accurate river specific information on migratory species	Stock-specific mortality in age classes Information of maturity age and age specific length of coastal species	

Descriptor 4 – Food webs

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	Data on productivity of key species or trophic groups	Understanding of functional aspects is insufficient	Indicators on productivity, performance of key species, viable food web structure is missing
Estonia		Insufficient scientific knowledge for assessing environmental status	No indicators for abundance trends in functionally important groups
Finland	Data on demography of seals Reproduction capacity of birds Fish data are insufficient		No plankton indicator related to function of system No benthic indicator related to size structure and hard bottom

GES REG Descriptor 5 - Eutrophication

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	Spatial and temporal coverage of several key parameters is not sufficient	Species shift is not sufficiently linked to pressure	No indicators for phytoplankton and hard bottom benthos composition
Estonia	No data to assess 2 out of 4 nutrient concentration indicators		No evaluation system to assess nutrient ratios and oxygen
Finland			Indicators on N:P ratio, Concentration of organic carbon Indicator on cyanobacteria PST and DST toxins Health of bladder-wrack belt Oxygen in coastal waters

GES REG Descriptor 6 – Seafloor integrity

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	Distribution and extent of pressure is not sufficient	Understanding of physical disturbance is not sufficient	No indicators available
Estonia	Insufficient spatial data coverage on damage		No assessment guidelines for 4 indicators
Finland	Amount of dredging and disposal of the dredged material	Resilience of the impacts of dredging and disposal of material	Development of the BBI index needed Cumulative benthic index needed Index related to geological stability of the sea bed is needed

Descriptor 7 - Alteration of hydrographical conditions

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	Spatial and temporal resolution of data is not sufficient	Pressure/impact relationship is insufficiently understood	No indicator available
Estonia	Spatial coverage is not sufficient		Indicators and methods should be developed further
Finland	The proper interpretation of the descriptor is still scrutinized		

Descriptor 8 - Contaminants

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	Spatial resolution is not sufficient Not all compounds are covered	Contaminant effect on biota is not sufficiently quantified	Indicator to assess contaminant effects is available
Estonia	Spatial coverage is not sufficient		Methods need further development
Finland		Developments in biological effects of hazardous substances are needed	Indicators for phycotoxins and toxicity test for sediments should be developed

Descriptor 9 – Contaminants in seafood

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	Not all compounds are covered		
Estonia	Data are not sufficiently frequent		
Finland	Spatial coverage could be increased		

Descriptor 10 – Marine litter

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	No data on spatial and temporal distribution of litter	No knowledge on litter impact on biota	No indicator available
Estonia	Insufficient data coverage of areas	Gaps in knowledge on impacts	Methods need further development
Finland		Quality and quantity of visible litter is insufficiently known Information on micro-litter is not sufficient	

Descriptor 11 - Noise

Country	Data gaps	Knowledge gaps	Methodological gaps
Latvia	No data on introduction of energy	No knowledge on impact of introduced energy	No indicator is elaborated
Estonia	No previous data on noise	Gaps in knowledge on impact of noise on marine organisms	Gaps in methodology
Finland	No data on spatial and temporal distribution of noise	No information on impact	Indicators are in need for development

Policy instruments contributing to assessment of marine environment

- the Marine Strategy Framework Directive (MSFD),
- the Water Framework Directive (WFD),
- the Habitats Directive (HD),
- the Birds Directive (BD),
- the International Convention for the Control and Management of Ships Ballast Water & Sediments (BWM)
- HELCOM Baltic Sea Action Plan (HELCOM BSAP),
- others

MSFD	GES		Sub-GES		
WFD	High	Good	Moderate	Poor	Bad
HD	Favourable		Unfavourable-Inadequate		Unfavourable-Bad

Comparison of the policy frameworks

Directive	MSFD	WFD	HD	BD	BWM	BSAP
Time scale	to 2020	to 2015	-	-	-	to 2021
Assessment area	waters, the seabed and subsoil from the nearest point of the baseline from which the breadth of territorial waters is measured extending to the outmost reach of the area where a Member State has and/or exercises jurisdictional rights	surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters	nine biogeographical regions (Alpine, Atlantic, Black Sea, Boreal, Continental, Macaronesian, Mediterranean, Pannonian and Steppic) referred and of the European territory of the Member States to which the Treaty applies.	territory of Member States.	a) ships entitled to fly the flag of a Party; b) ships not entitled to fly the flag of a Party but which operate under the authority of a Party	Baltic Sea Area
Distribution	assessed as one area	divided to river basin districts	special areas of conservation composed of sites hosting natural habitats listed in Annex I and the habitats of the species listed in Annex II.	species mentioned in Annex I – III including their eggs, nests and habitats.	distributed by ship construction year by ballast water capacity.	assessed as one area.
Based on what is it assessed?	based on 11 qualitative descriptors	based on quality elements listed in WFD annex V	based on criteria set out in Annex III and the appearance of species listed in Annex IV	based on occurrence of species listed in annexes I - III	harmful aquatic organisms and pathogens	Based agreed preliminary indicators
How is it assessed?	Status described by GES Descriptors	based on the quality element that has the worst ecological status („One out, all out“).	based on the occurrence of the community important habitat types or animal- and plant species listed in this directive annexes	based on the occurrence status of the species listed in annexes I – III		based on the implementation status of the recommendations
How is the status classified?	good environmental status (GES) or not good environmental status (non-GES).	Divided into 5 ecological classes: high, good, moderate, poor, bad.	Protected sites of community important habitat types and/or animal- and plant species	List of species that need protection		Via implementation status: if implemented; if ongoing; if not implemented

Key messages from assessment coherence analyses

- Regional coherence is currently best achieved for eutrophication and hazardous substances.
- Regional coherence is least developed for biodiversity, food webs and non-indigenous species.
- Descriptors on marine litter and underwater noise are not adequately covered at national or regional level.
- Regional assessments, where available, have been used in large extent by all countries.
- Countries rely on definition of GES, indicators and targets already set out under existing EU, national and HELCOM commitments. Further harmonisation of approaches should be ensured through bilateral communication and regional cooperation (HELCOM).

Key messages from knowledge gap analysis

- For most of the descriptors spatial coverage of data should be improved.
- Knowledge gaps exist for many of the descriptors to link pressures with assessed indicators.
- For D2, D6, D7, D10 and D11 extensive methodological development is needed and proper data collection programmes should be established
- Data collection and assessment methodology for D8 and D 9 are in general well developed, spatial coverage of data and analysed list of compounds should be improved

Key messages from analysis of reporting requirements under different policy instruments

- For descriptors already partly covered by reporting requirements by other instruments existing methods, indicators and data collection schemes should be used
- Datasets used for reporting under different obligations should be harmonised and of equal quality
- Difference in timing of the reporting under different instruments may be a source of different interpretation of assessment results
- Differences in assessment techniques and methodology between different policy instruments should be harmonised (e.g. MSFD – WFD – HD)