



Document title	Draft guidelines for physical oceanography
Code	2MA-11
Category	CMNT (LATE)
Agenda Item	2MA – Revision of HELCOM monitoring
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Submitted by	Sweden
Reference	

Background

HELCOM guidelines for hydrography and hydrochemistry are currently being revised. In accordance with STATE & CONSERVATION 2-2015 (para 2MA.3), Lead Country Sweden submits a draft input to the development of guidelines for physical oceanography.

The draft document is based on a partial update of [the sub-programme Water column physical characteristics](#) in the HELCOM Monitoring manual.

Action requested

The meeting is invited to

- consider the proposed update for the sub-programme Water column physical characteristics in the HELCOM Monitoring manual,
- propose how the information could be used in further development of guidelines.

Guidelines for physical oceanography

1 Brief description of monitoring

Detailed information on monitoring frequency and spatial resolution has not yet been collected from all countries but will be added.

Element / parameter **Physical oceanography / Sea level**

Method

Measured by mareographs on the shore (mainly based on pressure measurements). Circulation modelling using 3D numerical models (HIROMB, HBM, NEMO).

QA/QC

The first check is automatic and the second step is manual. Service to the device is made regularly. Described in the Copernicus Marine Service (MyOcean) publication: [Quality information document for near real time in situ products](#) and recommended by [EuroGOOS](#).

Frequency

Continuous measurements, time step 1-60 minutes (1 hour).

Spatial Scope

Along the coastline.

Spatial resolution

Approximately 200 mareographs in the Baltic Sea: [BOOS Stations](#)

Waves / Significant wave height, period and direction

Element / parameter

Method

Wave measurements using wave buoys. Modelling of wave characteristics using numerical models (WAM; SWAN).

QA/QC

Routines of institutes. Will be described in Copernicus Marine Service in the year of 2017.

Frequency

Period and direction – continuous (statistical parameters with a time step 1 hour).

Spatial Scope

Period and direction – whole Baltic Sea, can be used also for sub-basins.

Spatial resolution

Period and direction; numerical modelling – 3 nm.

Approximately 20 buoys and fixed platforms: [BOOS Stations](#)

Wave Climate in the Baltic: [Waves Baltic Sea Environmental Fact Sheet](#).

Currents/ Current speed and direction

Element / parameter

Method

Current measurements using moored current meters.

Described in EUROGOOS publication (in the MyOcean project): Quality information document for near real time in situ products: Circulation modelling using 3D numerical models (HIROMB, HBM, NEMO).

QA/QC

Described in the Copernicus Marine Service (MyOcean) publication: [Quality information document for near real time in situ products](#) and recommended by [EuroGOOS](#).

Frequency

Continuous, time step 1 hour.

Spatial Scope

Whole Baltic Sea, can be used also for sub-basins.

Spatial resolution

Direction and speed; numerical modelling – 1 nm.

A few observation sites are available, see [BOOS Stations](#).

2 Assessment requirements

2.1 Monitoring requirements and gaps

Monitoring is to be carried out to fulfill assessment requirements of HELCOM ecological objectives that are specified through HELCOM core indicators. The requirements on monitoring can include number of stations, the sampling frequency and replication.

Monitoring requirements	<p>Monitoring of waves, currents and sea level has to be conducted in relevant spatial and temporal resolution, e.g. coastal sea level stations (tide gauges) are placed at an appropriate distance from each other in all Baltic sub-basins, wave buoys – at least 1-2 buoys in each Baltic sub-basin, current measurements, at least in the sea areas connecting the Baltic Sea and North Sea as well as different Baltic Sea sub-basins. Numerical models are used for all listed parameters to be able to assess the spatial distribution and temporal trends at the Baltic Sea and its sub-basin scales. Monitoring (and modelling) is conducted in the frames of BOOS and Copernicus Marine Service provision (a permanent service since May 2015).</p> <p>Waves monitoring gives a reliable overview of the parameters but it does not cover all sub-basins (Gulf of Riga) or parts of them (Baltic Proper); currents monitoring is done mostly in the southwestern Baltic Sea.</p>
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Gaps

Good temporal and spatial coverage in Poland coastal waters. There was proposed to set up 1 (one) new station between Poland and Sweden.

2.2 Adequacy for assessment of GES (Q5d)

Monitoring should provide adequate data and information to enable the periodic assessment of environmental status, and distance from and progress towards GES as required by MSFD under Article 9 and 11.

Adequate data?	Yes
Established methods for assessment?	Yes
Adequate understanding of GES?	Irrelevant
Adequate capacity to perform assessments?	Yes

2.3 Assessment of natural variability (Q5e)

Quantitative. Numerical modelling is used, e.g. reanalysis for long enough periods. For observation data since 1978, see [Copernicus Marine Service products](#).

3 Data providers and access

	<p>Baltic Operational Oceanographic System (BOOS) Copernicus Marine Service: access to data from BOOS Stations SeaDataNet: access to historical data EMODnet Physics Portal: access to last two months data, data availability for historical data Swedish data: open and accessible (in Swedish) Swedish Meteorological and Hydrological Institute (SMHI) Danish data: Danish Meteorological Institute (DMI) German data: Federal Maritime Administration (BSH) Polish data: Institute of Meteorology and Water Management (IMGW) Finnish data: open and accessible (in Finnish) Finnish Meteorological Institute (FMI) Finnish Environment Institute (SYKE)</p>
Data access point	
Data type (Q10c)	<p>Processed Modelled data</p>
Data availability (Q10c)	<p>BOOS Stations EMODnet Physics</p>
Data access (Q10c)	<p>Which data that are open and accessible are shown on the BOOS Stations Programs such as EMODnet Physics Portal, Copernicus Marine Service and SeaDataNet have a free and open data policy. Sweden, Denmark , Finland and Germany have a free and open policy for almost all data. Polish data are restricted, it depends on purpose and users.</p>
INSPIRE standard (Q10c)	Hydrography
When will data become available? (Q10c)	Already available
Data update frequency (Q10c)	Depends on measurement method / device
Describe how the data and information from the programme will be made accessible to the EC/EEA	<p>In-situ data is available via EMODnet Physics Portal and Copernicus Marine Service Modelled data is available via Copernicus Marine Service</p>
Contact points in the Contracting Parties	Contact point to national monitoring programmes will be added
Has the data been used in HELCOM assessments?	Yes
Data is used in the following Baltic Sea Environment Fact Sheets (BSEF)	Wave climate in the Baltic Sea

4 REFERENCES