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Species composition abundance and biomass

Monitoring programme: Eutrophication, Biodiversity - Water column habitats  
Programme topic: Phytoplankton

## SUB-PROGRAMME: PHYTOPLANKTON SPECIES COMPOSITION, ABUNDANCE AND BIOMASS

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### REGIONAL COORDINATION

The monitoring of this sub-programme is: **fully coordinated**.

- [Common monitoring guidelines](#).
- Common quality assurance programme: [HELCOM COMBINE manual](#).
- Common database: ICES.

**PURPOSE OF MONITORING (Q4K)**

Follow up of progress towards:

|   |                           |   |
|---|---------------------------|---|
| <b>Baltic Sea Action Plan (BSAP)</b>              | Segments                  | Biodiversity<br>Eutrophication  |
|   | Ecological objectives     | Natural level of algal blooms<br>Natural distribution and occurrence of plants and animals<br>Thriving and balanced communities of plants and animals<br>No introductions of alien species from ships   |
| <b>Marine strategy framework directive (MSFD)</b> | Descriptors               | D1 Biodiversity<br>D2 Non-indigenous Species<br>D4 Food webs<br>D5 Eutrophication   |
|   | Criteria ( <u>Q5a</u> )   | 1.1 Species distribution<br>1.2 Population size<br>1.6 Habitat condition<br>1.7 Ecosystem structure<br>2.1 Abundance and state characteristics of non-indigenous species<br>4.3 Abundance/distribution of key trophic groups/species<br>5.2 Direct effects of nutrient enrichment |
|   | Features ( <u>Q5c</u> )   | Biological features:<br>A description of the biological communities associated with the predominant seabed and water column habitats.   |
| <b>Other relevant legislation (<u>Q8a</u>)</b>    | Water Framework Directive |   |

**Assessment of: (Q4k)**


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State/Impacts **X** temporal trends,  
spatial distribution,  
status classification

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Pressures

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Human activities  
causing the pressures

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Effectiveness of measures

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**Scale of data aggregation for assessments: (Q10a)**


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HELCOM assessment unit Level 1: Baltic Sea

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HELCOM assessment unit Level 2: Subbasin

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HELCOM assessment unit Level 3: Subbasins with coastal and  
offshore division

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HELCOM assessment unit Level 4: Subbasins with coastal WFD **X**  
division

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**MONITORING CONCEPTS**

| <b>Coordination</b> | <b>Elements</b><br><u>Q9a (Q5c)</u> | <b>Parameter</b><br><u>Q9a (Q5c)</u> | <b>Method</b><br><u>Q9c, Q9d</u> | <b>QA/QC</b><br><u>Q9e, 9f</u> | <b>Frequency</b><br><u>Q9h, 9i</u> | <b>Spatial<br/>resolution</b><br><u>Q9g, 9i</u> | <b>Link to<br/>HELCOM<br/>core<br/>indicators</b> | <b>Link to<br/>MSFD GES<br/>characteristics</b><br><u>Q5b</u> | <b>Spatial<br/>scope</b><br><u>Q4i</u> | <b>Monitoring<br/>started</b><br><u>Q4h</u> | <b>CPs<br/>monitoring</b> |
|---------------------|-------------------------------------|--------------------------------------|----------------------------------|--------------------------------|------------------------------------|---|---|---|--|---|---------------------------|
|---------------------|-------------------------------------|--------------------------------------|----------------------------------|--------------------------------|------------------------------------|---|---|---|--|---|---------------------------|

|                    |   |                             |  |                                       |                                     |                                     |   |  |     |  |                                |
|--------------------|---|-----------------------------|--|---------------------------------------|-------------------------------------|-------------------------------------|---|--|-----|--|--------------------------------|
| Regional (COMBINE) | Abundance of phytoplankton                      | Population size (abundance) | HELCOM COMBINE manual, <a href="#">Part C</a> , <a href="#">Annex C6</a> | <a href="#">HELCOM COMBINE manual</a> | <a href="#">See map for details</a> | <a href="#">See map for details</a> | - | 1.2.1 Population abundance/biomass<br>1.7.1 Composition and relative proportions of ecosystem components<br>2.2.2 Impacts of non-indigenous species at the level of species, habitats and ecosystem<br>4.3.1 Abundance trends of functionally important groups/species | EEZ | Coordinated monitoring started in 1979 | All HELCOM Contracting parties |
| Regional (COMBINE) | Chlorophyll-a (summer) Biomass of phytoplankton | Species abundance (biomass) | HELCOM COMBINE manual, <a href="#">Part C</a> , <a href="#">Annex C6</a> | <a href="#">HELCOM COMBINE manual</a> | <a href="#">See map for details</a> | <a href="#">See map for details</a> | - | 1.2.1 Population abundance/biomass   | EEZ | Coordinated monitoring started in 1979 | All HELCOM Contracting Parties |

## Brief description of monitoring

Full description in [HELCOM COMBINE manual](#). Detailed information on monitoring frequency and spatial resolution has not yet been collected from all countries but will be added.

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### Element / parameter

### Abundance of phytoplankton / Population size (abundance)

### Method

Sampling and analytical methods are reported per sample and per parameter respectively in the data. See [PART B](#) (General guidelines on quality assurance for monitoring in the Baltic Sea) of the [HELCOM COMBINE manual](#).

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|                            |  |
|----------------------------|--|
| <b>QA/QC</b>               | See <a href="#">PART B</a> (General guidelines on quality assurance for monitoring in the Baltic Sea) of the <a href="#">HELCOM COMBINE manual</a> . Quality assurance is a laboratory's whole sampling and analytical process from start to finish. That is an area for the scientific experts. The data centre can report what has been specified in the data: Guidelines used, method information, and Intercalibration participation etc. at a parameter level |
| <b>Frequency</b>           | Abundance of phytoplankton stations and annual (2010) frequency (unique dates per subbasin) based on reported data to ICES grouped by HELCOM Subbasin and Country.   |
| <b>Spatial Scope</b>       | Spatial scope of abundance of phytoplankton stations 2007-2011 based on reported data to ICES grouped by HELCOM Subbasin and Country.  |
| <b>Spatial resolution</b>  | Data on abundance available from: Southern Baltic Proper, Kattegat, Bothnian Bay, Bothnian Sea, Northern Baltic Proper, Western Gotland Basin, Eastern Gotland Basin and the Gulf of Gdansk, Quark, Åland Sea, Archipelago Sea, Gulf of Finland.<br><br><a href="#">See map for details</a>  |
| <b>Element / parameter</b> | <b>Phytoplankton biomass / Species abundance (biomass)</b>   |
| <b>Method</b>              | For biomass measurements, cell volume, carbon content and wet weight have been used. Biovolume could be used as a proxy for biomass. Sampling and analytical methods are reported per sample and per parameter respectively in the data. See <a href="#">PART B</a> (General guidelines on quality assurance for monitoring in the Baltic Sea) of the <a href="#">HELCOM COMBINE manual</a> .  |
| <b>QA/QC</b>               | See document HELCOM COMBINE Manual <a href="#">Part B Annex B5</a> . Quality assurance is a laboratory's whole sampling and analytical process from start to finish. The ICES data centre does not determine need for revisions of QA. That is an area for the scientific experts. The data centre can report what has been specified in the data: Guidelines used, method information, and Intercalibration participation etc. at a parameter level.              |
| <b>Frequency</b>           | Phytoplankton biomass stations and annual (2010) frequency (unique dates per subbasin) based on reported data to ICES grouped by HELCOM Subbasin and Country.  |
| <b>Spatial Scope</b>       | Spatial scope of phytoplankton biomass stations 2010 based on reported data to ICES grouped by HELCOM Subbasin and Country.  |
| <b>Spatial resolution</b>  | Data on biomass available from: Southern Baltic Proper, Gulf of Gdansk, Bothnian Bay, Bothnian Sea, the Quark, Åland Sea, Archipelago Sea, Gulf of Finland.<br><br><a href="#">See map for details</a>   |

## ASSESSMENT REQUIREMENTS

### 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.

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#### Monitoring requirements

Phytoplankton abundance, biomass and species composition vary fast and therefore monitoring requires frequent sampling. In many cases the monitoring programmes are restricted to less frequent sampling which limits the use of the data in assessing the state of phytoplankton communities. Efforts to find adequate core indicators are under way.

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#### Gaps

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### 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.

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#### Adequate data?

Yes

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#### Established methods for assessment?

Under development

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#### Adequate understanding of GES?

No

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#### Adequate capacity to perform assessments?

Nationally

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## Assessment of natural variability (Q5e)

Quantitative

### DATA PROVIDERS AND ACCESS

|   |   |
|---|---|
| <b>Data access point</b>  | HELCOM COMBINE, ICES database, National data centres  |
| <b>Data type (Q10c)</b>   | Processed Data sets   |
| <b>Data availability (Q10c)</b>   | <u>ICES database</u>  |
| <b>Data access (Q10c)</b>   | Open access to data (covered by ICES data policy)   |
| <b>INSPIRE standard (Q10c)</b>  |   |
| <b>When will data become available? (Q10c)</b>  | Data from the current data series for all countries is available from 2010/2011. The monitoring from 2013 will be reported in May 2014 and made available in November 2014. |
| <b>Data update frequency (Q10c)</b>   | Yearly<br>Every 2 years   |
| <b>Describe how the data and information from the programme will be made accessible to the EC/EEA</b> | As the data is open access it is freely available for the EEA   |
| <b>Contact points in the Contracting parties</b>  | Contact point to national monitoring programmes will be added   |
| <b>Data is used in the following Baltic Sea Environment Fact Sheets (BSEF)</b>                        | <u>Cyanobacteria biomass</u><br><u>Unusual phytoplankton event</u>  |

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|  |     |
|--|-----|
| <b>Has the data been used in HELCOM assessments?</b> | Yes |
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## REFERENCES

Lindahl, O., 1986. A dividable hose for phytoplankton sampling. In Report of the ICES Working Group on Exceptional Algal Blooms, Hirtshals, Denmark, 17-19 March 1986. ICES, C.M. 1986/L:26.

Olenina, I., Hajdu, S., Andersson, A., Edler, L., Wasmund, N., Busch, S., Göbel, J., Gromisz, S., Huseby, S., Huttunen, M., Jaanus, A., Kokkonen, P., Ledaine, I.,

Niemkiewicz, E., 2006. Biovolumes and size-classes of phytoplankton in the Baltic Sea. Baltic Sea Environment Proceedings No.106, 144pp.

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