

Home / Action areas / Monitoring and assessment / Monitoring Manual / Inputs /  
Contaminant inputs from landbased sources

Monitoring programme: Contaminants  
Programme topic: Inputs

## SUB-PROGRAMME: CONTAMINANT INPUTS FROM LANDBASED SOURCES

### TABLE OF CONTENTS

[Regional coordination](#)

[Purpose of monitoring](#)

[Monitoring concepts](#)

[Assessment requirements](#)

[Data providers and access](#)

[References](#)

### REGIONAL COORDINATION

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

- Common monitoring guidelines: Waterborne Pollution Load Compilation (PLC) guidelines for monitoring and reporting of data.
- Common quality assurance programme: recommendations included in the PLC Guidelines.
- Common database: PLC database - presently being modernized by HELCOM PLUS project to improve data quality assurance and access via an online application.

### PURPOSE OF MONITORING (Q4K)

## Follow up of progress towards:

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>Baltic Sea Action Plan (BSAP)</b>              | Segments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Hazardous substances                                           |
|                                                   | Ecological objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Concentrations of hazardous substances close to natural levels |
| <b>Marine strategy framework directive (MSFD)</b> | Descriptors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | D8 Contaminants                                                |
| <b>Other relevant legislation (Q8a)</b>           | Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy<br><br>1998 Aarhus Protocol on Persistent Organic Pollutants (POPs) and Kiev Protocol on Pollutant Release and Transfer Registers of the UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP)<br><br>Directive 2008/1/EC of the European Parliament and the Council concerning integrated pollution prevention and control<br><br>Minamanta Convention on Mercury |                                                                |

## Assessment of: (Q4k)

|                                        |          |                                       |
|----------------------------------------|----------|---------------------------------------|
| State/Impacts                          |          |                                       |
| Pressures                              | <b>X</b> | temporal trends, spatial distribution |
| Human activities causing the pressures | <b>X</b> | temporal trends, spatial distribution |
| Effectiveness of measures              | <b>X</b> | temporal trends, spatial distribution |

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

|                                                                              |          |
|------------------------------------------------------------------------------|----------|
| HELCOM assessment unit Level 1: Baltic Sea                                   |          |
| HELCOM assessment unit Level 2: Subbasin                                     |          |
| HELCOM assessment unit Level 3: Subbasins with coastal and offshore division |          |
| HELCOM assessment unit Level 4: Subbasins with coastal WFD division          |          |
| Other: HELCOM PLC Sub-division                                               | <b>X</b> |

**MONITORING CONCEPTS TABLE**

| Coordination | Elements<br><u>Q9a (Q5c)</u> | Parameter<br><u>Q9a (Q5c)</u>                                      | Method<br><u>Q9c, Q9d</u>   | QA/QC<br><u>Q9e, 9f</u> | Frequency<br><u>Q9h, 9i</u>      | Spatial<br>resolution<br><u>Q9g, 9i</u>                                      | Link to<br>HELCOM<br>core<br>indicators | Link to<br>MSFD GES<br>characteristics<br><u>Q5b</u> | Spatial<br>scope<br><u>Q4i</u> | Monitoring<br>started<br><u>Q4h</u> | CPs<br>monitoring                                         |
|--------------|------------------------------|--------------------------------------------------------------------|-----------------------------|-------------------------|----------------------------------|------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------------------|--------------------------------|-------------------------------------|-----------------------------------------------------------|
| PLC          | Cd                           | Input level of chemical/nutrient/pollutant from land-based sources | <u>PLC Water Guidelines</u> | Other                   | min. 12 times a year recommended | ~300 monitored rivers and estimated 23 unmonitored areas in the BS catchment |                                         | 8.1.1 Concentration of contaminants                  | WFD TW                         | 1994                                | Not all CPs, i.e., several years missing of different CPs |
| PLC          | Hg                           | Input level of chemical/nutrient/pollutant from land-based sources | <u>PLC Water Guidelines</u> | Other                   | min. 12 times a year recommended | ~300 monitored rivers and estimated 23 unmonitored areas in the BS catchment |                                         | 8.1.1 Concentration of contaminants                  | WFD TW                         | 1994                                | Not all CPs, i.e., several years missing of different CPs |
| PLC          | Pb                           | Input level of chemical/nutrient/pollutant from land-based sources | <u>PLC Water Guidelines</u> | Other                   | min. 12 times a year recommended | ~300 monitored rivers and estimated 23 unmonitored areas in the BS catchment |                                         | 8.1.1 Concentration of contaminants                  | WFD TW                         | 1994                                | Not all CPs, i.e., several years missing of different CPs |
| PLC          | Cd                           | Input level of chemical/nutrient/pollutant from land-based sources | <u>PLC Water Guidelines</u> | Other                   | 12 times a year recommended      | Direct MWWTPs (>10.000 PE) either individually or as aggregated              |                                         | 8.1.1 Concentration of contaminants                  | WFD TW                         | 1994                                | Not all CPs, i.e., several years missing of different CPs |

|     |    |                                                                    |                             |       |                             |                                                                 |                                     |        |      |                                                           |
|-----|----|--------------------------------------------------------------------|-----------------------------|-------|-----------------------------|-----------------------------------------------------------------|-------------------------------------|--------|------|-----------------------------------------------------------|
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| PLC | Pb | Input level of chemical/nutrient/pollutant from land-based sources | <u>PLC Water Guidelines</u> | Other | 12 times a year recommended | Direct MWWTPs (>10.000 PE) either individually or as aggregated | 8.1.1 Concentration of contaminants | WFD TW | 1994 | Not all CPs, i.e., several years missing of different CPs |
| PLC | Zn | Input level of chemical/nutrient/pollutant from land-based sources | <u>PLC Water Guidelines</u> | Other | 12 times a year recommended | Direct MWWTPs (>10.000 PE) either individually or as aggregated | 8.1.1 Concentration of contaminants | WFD TW | 1994 | Not all CPs, i.e., several years missing of different CPs |
| PLC | Cu | Input level of chemical/nutrient/pollutant from land-based sources | <u>PLC Water Guidelines</u> | Other | 12 times a year recommended | Direct MWWTPs (>10.000 PE) either individually or as aggregated | 8.1.1 Concentration of contaminants | WFD TW | 1994 | Not all CPs, i.e., several years missing of different CPs |
| PLC | Ni | Input level of chemical/nutrient/pollutant from land-based sources | <u>PLC Water Guidelines</u> | Other | 12 times a year recommended | Direct MWWTPs (>10.000 PE) either individually or as aggregated | 8.1.1 Concentration of contaminants | WFD TW | 1994 | Not all CPs, i.e., several years missing of different CPs |

|     |    |                                                                    |                                      |       |                                                     |                                                                 |                                     |        |      |                                                           |
|-----|----|--------------------------------------------------------------------|--------------------------------------|-------|-----------------------------------------------------|-----------------------------------------------------------------|-------------------------------------|--------|------|-----------------------------------------------------------|
| PLC | Cr | Input level of chemical/nutrient/pollutant from land-based sources | <a href="#">PLC Water Guidelines</a> | Other | 12 times a year recommended                         | Direct MWWTPs (>10.000 PE) either individually or as aggregated | 8.1.1 Concentration of contaminants | WFD TW | 1994 | Not all CPs, i.e., several years missing of different CPs |
| PLC | Cd | Input level of chemical/nutrient/pollutant from land-based sources | <a href="#">PLC Water Guidelines</a> | Other | Large point sources: 12<br>Small point sources: 2-6 | Direct INDUSTRY either individually or as aggregated            | 8.1.1 Concentration of contaminants | WFD TW | 1994 | Not all CPs, i.e., several years missing of different CPs |
| PLC | Hg | Input level of chemical/nutrient/pollutant from land-based sources | <a href="#">PLC Water Guidelines</a> | Other | Large point sources: 12<br>Small point sources: 2-6 | Direct INDUSTRY either individually or as aggregated            | 8.1.1 Concentration of contaminants | WFD TW | 1994 | Not all CPs, i.e., several years missing of different CPs |
| PLC | Pb | Input level of chemical/nutrient/pollutant from land-based sources | <a href="#">PLC Water Guidelines</a> | Other | Large point sources: 12<br>Small point sources: 2-6 | Direct INDUSTRY either individually or as aggregated            | 8.1.1 Concentration of contaminants | WFD TW | 1994 | Not all CPs, i.e., several years missing of different CPs |
| PLC | Zn | Input level of chemical/nutrient/pollutant from land-based sources | <a href="#">PLC Water Guidelines</a> | Other | Large point sources: 12<br>Small point sources: 2-6 | Direct INDUSTRY either individually or as aggregated            | 8.1.1 Concentration of contaminants | WFD TW | 1994 | Not all CPs, i.e., several years missing of different CPs |

|     |    |                                                                    |                                      |       |                                                     |                                                      |                                     |        |      |                                                           |
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| PLC | Cu | Input level of chemical/nutrient/pollutant from land-based sources | <a href="#">PLC Water Guidelines</a> | Other | Large point sources: 12<br>Small point sources: 2-6 | Direct INDUSTRY either individually or as aggregated | 8.1.1 Concentration of contaminants | WFD TW | 1994 | Not all CPs, i.e., several years missing of different CPs |
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## Brief description of monitoring

| Element / parameter | Annual total loads of heavy metals / Input level of chemical/nutrient/pollutant from land-based sources                                                                                                                                                                                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Method</b>       | The methodology for data collection is based on combination of monitored discharges and concentration measurements at fixed stations and estimates of unmonitored areas based on surface areas and loads of respective monitored areas. Flow data on a daily basis and concentrations from a few samples to once a month and as maximum weekly samples.                                                   |
| <b>QA/QC</b>        | There are gaps in time series of national reporting which haven't been amended by experts. No official information about the uncertainty of provided heavy metal load data have been sent to the Data manager by the HELCOM Contracting Parties and hence further work on uncertainty is required. In many cases heavy metal concentrations are below the limit of detections and therefore not reported. |

|                           |                                                                                                                                                                                                                                                                   |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frequency</b>          | Frequency 1/year to 1/week. An <a href="#">overview of monitoring by the Contracting Parties in 2012</a> was compiled by the PLC-6 project.                                                                                                                       |
| <b>Spatial Scope</b>      | PLC monitoring takes place in the terrestrial catchment area and covers inputs to the entire Baltic Sea. Coverage of most of the catchment of the Baltic Sea: Monitored rivers and unmonitored areas and direct point source loads.                               |
| <b>Spatial resolution</b> | Reported by country, sub-basin and river catchment. Point sources as either as aggregated by sub-basin and by country or by river catchment and as best point sources are reported individually with known location. This varies between the Contracting Parties. |

## 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.

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Monitoring requirements</b> | <p>Data on waterborne inputs of hazardous substances are needed to assess the amount of inputs to the Baltic Sea. These can be used to identify pollution hot spots and to assess the effectiveness of measures taken to reduce pollution loads (e.g. implementation of BSAP, HELCOM Recommendations, WFD river basin management plans and other international requirements). The data are presently used for HELCOM pollution load assessments and the intention is, in the near future, to develop a core pressure indicator on inputs of contaminants.</p> <p>Pressure data should also be useable for HELCOM holistic assessments (i.e. pressure index).</p> |
| <b>Gaps</b>                    | <p>Typically missing are:</p> <ol style="list-style-type: none"> <li>1) individual parameters of some sources (not analyzed by the CPs as they are not nationally mandatory parameters or obliged to be reported by the polluter)</li> <li>2) National reporting for loads on unmonitored areas has not been established and no reporting occurred.</li> </ol>                                                                                                                                                                                                                                                                                                   |

## Targets - Adequacy for assessment of progress with targets (Art. 10) (Q6b)

This section indicates whether the programme provides suitable and sufficient data and information to enable assessment of progress towards achievement of the relevant environmental targets (using indicators identified by MS under Art. 10).

|                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suitable and sufficient data?                                                                     | No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Established methods for assessment?                                                               | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Adequate capacity to perform assessments?                                                         | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Will the data and information collected enable the regular updating of targets?<br>( <u>Q6c</u> ) | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Description of targets ( <u>Q6d</u> )                                                             | <p>There has been no formal agreement on targets for waterborne inputs of hazardous substance. Contracting Parties report total inputs of selected hazardous substance on an annual basis. These data have been assessed in the periodic PLC reports (e.g. PLC-4 and PLC-5). A core indicator on inputs of hazardous substances should be developed - once targets are agreed on, appropriate figure(s) could be produced.</p> <p>It should be noted however that data quality is questionable and hence the uncertainty high. No sufficient emission assessment or deposition modeling exist for numerous substances.</p> |
| Gap-filling date targets ( <u>Q6e</u> )                                                           | Currently no concrete plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Plans for targets ( <u>Q6f</u> )                                                                  | There is a need to develop a HELCOM core indicator on inputs of contaminants and associated targets for such indicator. The contaminants input indicator may combine atmospheric and waterborne inputs into one report. There is no time table for development of such indicator or associated target.                                                                                                                                                                                                                                                                                                                     |

## Measures - nature of the activity and/or pressure covered by the programme (spatial distribution, frequency of activity)

How the monitoring is considered adequate to identify which activities and pressures that are causing environmental degradation and how it can help identifying new measures (Q7b)



|                                                                                |                                                                                                                 |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Spatial distribution/extent of activity                                        | The PLC monitoring programme covers inputs of selected hazardous substances from the Baltic Sea catchment area. |
| Intensity of activity                                                          | Annual reporting of total inputs by countries to the PLC data manager                                           |
| Temporal changes in activity                                                   | Data series covering waterborne inputs since 1994 (with data missing from some countries for some years)        |
| Type of activity (within broad category f, e.g. fisheries, tourism/recreation) | Inputs from via rivers and point sources (e.g. industry, WWTP)                                                  |

## Measures - Adequacy dor assessments of measures (Art. 13) (Q7e)

The monitoring supports assessment of follow up measures.

|                                                |                            |
|------------------------------------------------|----------------------------|
| Adequate data?                                 | Yes                        |
| Established methods for assessment?            | No                         |
| Adequate understanding of GES?                 | No                         |
| Adequate capacity to perform assessments?      | Yes                        |
| Addresses activities/pressures?                | Yes                        |
| Addresses effectiveness of measures?           | Yes                        |
| Gap-filling date Activities and Measures (Q7f) | Currently no concrete plan |

## Assessment of natural variability (Q5e)

No systematic trend analysis has been made on waterborne inputs of heavy metals due to the poor quality of data.

## DATA PROVIDERS AND ACCESS

|                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data access point</b>                                                                              | <u>HELCOM PLC</u>                                                                                                                                                                                                                                                                                                                                                             |
| <b>Data type (Q10c)</b>                                                                               | Processed datasets, modelled data: Total inputs are estimated based on measurements, modelling is used for periodic assessments of e.g. estimating inputs from unmonitored                                                                                                                                                                                                    |
| <b>Data availability (Q10c)</b>                                                                       | The <u>HELCOM PLUS project</u> is modernizing the PLC database and developing a web application to allow for improved access to the PLC data (to be ready in late 2016)                                                                                                                                                                                                       |
| <b>Data access (Q10c)</b>                                                                             | Open access                                                                                                                                                                                                                                                                                                                                                                   |
| <b>INSPIRE standard (Q10c)</b>                                                                        |                                                                                                                                                                                                                                                                                                                                                                               |
| <b>When will data become available? (Q10c)</b>                                                        | Data series from 1994, annual reporting deadline is on 31 October.                                                                                                                                                                                                                                                                                                            |
| <b>Data update frequency (Q10c)</b>                                                                   | Yearly                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Describe how the data and information from the programme will be made accessible to the EC/EEA</b> | Currently an MS Access database containing the data is hosted by the Database Manager Finnish Environment Institute (SYKE). The ongoing HELCOM PLUS project is working to transfer the database to an SQL database and building a web interface to allow for reporting and quality checking of the data as well as open access for viewing and downloading approved datasets. |
| <b>Contact points in the Contracting parties</b>                                                      | Contact point to national monitoring programmes will be added                                                                                                                                                                                                                                                                                                                 |
| <b>Has the data been used in HELCOM assessments?</b>                                                  | Yes                                                                                                                                                                                                                                                                                                                                                                           |

## REFERENCES

Review of the Fifth Baltic Sea Pollution Load Compilation for the 2013 HELCOM Ministerial Meeting (2013) (BSEP 141)

Fifth Baltic Sea Pollution Load Compilation (PLC-5) An Executive Summary (BSEP 128A)

Fifth Baltic Sea Pollution Load Compilation (2011) (BSEP 128)

Recommendation 26-2 Compilation of waterborne pollution load (PLC Water)

IMAGE RIGHTS