Monitoring programme: Contaminants
Programme topic: Concentration of contaminants

SUB-PROGRAMME: CONTAMINANTS IN SEDIMENT

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REGIONAL COORDINATION

The monitoring of this sub-programme is: **partly coordinated**

- Common monitoring guidelines in COMBINE manual, ISO/IEC 17025, Guidelines for determination of chlorinated hydrocarbons in sediment, Guidelines for determination of PAH in sediment and other guidelines (see References).
- Common quality assurance programme: HELCOM COMBINE manual, ISO/CEN standards and QUASIMEME.
  Radioactive substances: MORS Guidelines defines methodologies for sample treatment, analysis and intercomparison. Reported data is manually quality assured by the HELCOM Secretariat and results are reported and verified in annual MORS EG meetings.
- Common databases: COMBINE, MORS.

There is no current plan for coordinated monitoring of contaminants in sediments, other than radionuclides. Under the Water Framework Directive, no EQS values have so far been set in sediments. However, countries are encouraged to perform long term trend analysis of concentrations of persistent substances that tend to accumulate in sediment, in order to ensure that such concentrations do not significantly increase (such as Hg, PAHs, HCHs, HCB, PBDE, TBT, PCB, PFOS, PCDD/F, HBCDD).

PURPOSE OF MONITORING (Q4K)

Follow up of progress towards:

Baltic Sea Action Plan (BSAP)	Segments	Hazardous substances
	Ecological objectives	Concentrations of hazardous substances close to natural levels Radioactivity at pre-Chernobyl level
Marine strategy framework directive (MSFD)	Descriptors	D8 Contaminants
	Criteria (Q5a)	8.1 Concentration of contaminants
	Features (Q5c)	Other features: A description of the situation with regard to chemicals, including chemicals giving rise to concern, sediment contamination, hotspots, health issues and contamination of biota (especially biota meant for human consumption)
Other relevant legislation (Q8a)	Water Framework Directive	

Assessment of: (Q4k)

State/Impacts	X	temporal trends, spatial distribution, status classification
Pressures		
Human activities causing the pressures		
Effectiveness of measures		

Scale of data aggregation for assessments: (Q10a)

HELCOM assessment unit Level 1: Baltic Sea	X
HELCOM assessment unit Level 2: Subbasin	X
HELCOM assessment unit Level 3: Subbasins with coastal and offshore division	
HELCOM assessment unit Level 4: Subbasins with coastal WFD division	

MONITORING CONCEPTS TABLE

Coordination	**Elements** Q9a (Q5c)	**Parameter** Q9a (Q5c)	**Method** Q9c, Q9d	**QA/QC** Q9e, 9f	**Frequency** Q9h, 9i	**Spatial resolution** Q9g, 9i	**Link to HELCOM core indicators**	**Link to MSFD GES characteristics** Q5b	**Spatial scope** Q4i	**Monitoring started** Q4h	**CPs monitoring**
Regional (COMBINE)	PCBs	Concentration of chemical/nutrient/pollutant in/on seabed substrate	HELCOM COMBINE Manual, Part D. ISO/IEC 17025 and other guidelines (see References)	HELCOM COMBINE manual , ISO/CEN standards and QUASIMEME	Other	See map for details		8.1.1 Concentration of the contaminants measured in the relevant matrix	EEZ	DE: 2000, 2008 DK: 1999 with some interuptions in the mid 2000's SE: 2000, infrequently through the 2000's PL: 1998	DE, DK, PL, SE

Regional (COMBINE)	PAH	Concentration of chemical/nutrient/pollutant in/on seabed substrate	HELCOM COMBINE Manual, Part D. ISO/IEC 17025 and other guidelines (see References)	HELCOM COMBINE manual Annex B13, Appendix 1 and 2, ISO/CEN standards and QUASIMEME	Other, LT: 1 time per year (summer)	See map for details	8.1.1	EEZ, Terittorial waters, Transitional waters	LT: 2007	DE, DK, LT, PL, SE
Regional (COMBINE)	tributyltin (TBT)	Concentration of chemical/nutrient/pollutant in/on seabed substrate	HELCOM COMBINE Manual, Part D. ISO/IEC 17025 and other guidelines (see References)	HELCOM COMBINE manual, ISO/CEN standards and QUASIMEME	Other	See map for details	8.1.1	EEZ	DE: 2000, 2004, 2008 DK: 1999 with a few gaps LT: 2011 LV: 2011 SE: 2000 - 2004, 2008	DE, DK, FI, LT, LV, SE
Regional (COMBINE)	Metals	Concentration of chemical/nutrient/pollutant in/on seabed substrate	HELCOM COMBINE Manual, Part D. ISO/IEC 17025 and other guidelines (see References)	HELCOM COMBINE manual Part B, Annex B13, Appendix 3 and 4, ISO/CEN standards and QUASIMEME	Other	See map for details	8.1.1	EEZ	DE: 2000 DK: 1999 LT: 2007, data also from 2004 LV: 2007, data also from 2004 SE: 2000	DE, DK, LT, LV, SE

National	Furans	Concentration of chemical/nutrient/pollutant in/on seabed substrate	Different approaches e.g. CEMP manual, ICES guidelines, ISO/CEN standards (see References)	Other	Other		8.1.1	EEZ	DK: 2007	DK
Other	Hg, Cd, As, Pb, Zn, Ni, Cr, Cu, Co	Concentration of chemical/nutrient/pollutant in/on seabed substrate	ISO 5667-15, ISO/IEC 17025, ISO 5667-19 and ISO 5667-12	ISO/IEC 17025	One-off	Stations in the Gulf of Finland	8.1.1	EEZ	2014	EE
Regional (MORS)	Radionuclides: Gamma-emitters	Concentration of chemical/nutrient/pollutant in/on seabed substrate	MORS Guidelines	MORS Guidelines	Yearly	See map for details	8.1.1	EEZ	1984	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.

Element / parameter	**PCBs / Concentration of chemical/pollutant in/on seabed substrate**
Method	Sampling and analytical methods are reported per sample and per parameter respectively in the data. See HELCOM COMBINE manual.
QA/QC	Quality assurance is a laboratory's whole sampling and analytical process from start to finish. See HELCOM COMBINE manual.

Frequency	Varies from 1-2 to 24 samples/station/year, depending on country**.** DE: • BSH: May/Jun, annually • IOW: Jun/Jul, annually • LLUR: Jul/Aug, every 2nd year • LUNG: Jul/Aug/Sep, every 3rd year
Spatial Scope	EEZ / Whole Baltic Sea for assessment
Spatial resolution	Measured in the following HELCOM sub basins: Kiel Bay, Kattegat, Southern Baltic Proper, The Sound, Great Belt, Bay of Mecklenburg and Little Belt. See map for details

Element / parameter	**TBT / Concentration of chemical/pollutant in/on seabed substrate**
Method	Sampling and analytical methods are reported per sample and per parameter respectively in the data. See HELCOM COMBINE manual.
QA/QC	Quality assurance is a laboratory's whole sampling and analytical process from start to finish. See HELCOM COMBINE manual.
Frequency	Varies from 1-2 to 24 samples/station/year, depending on country**.**
Spatial Scope	EEZ / Whole Baltic Sea for assessment. Bothnian Sea, Gulf of Finland.
Spatial resolution	Measured in: Kiel Bay, Kattegat, Southern Baltic Proper, Great Belt, Bay of Mecklenburg, Little Belt, The Sound. See map for details

Element / parameter	**Metals / Concentration of chemical/pollutant in/on seabed substrate**

Method	Sampling and analytical methods are reported per sample and per parameter respectively in the data. See HELCOM COMBINE manual.
QA/QC	Quality assurance is a laboratory's whole sampling and analytical process from start to finish. See HELCOM COMBINE manual - Part B, Annex B13, Appendix 3 and 4,
Frequency	Varies from 1-2 to 24 samples/station/year, depending on country**.** DE: • BSH: Mar, annually • IOW: Jun/Jul, annually • LLUR: Jul/Aug, every 2nd year • LUNG: Jul/Aug/Sep, every 3rd year
Spatial Scope	EEZ / Whole Baltic Sea for assessment
Spatial resolution	Measured in: Bay of Mecklenburg, Southern Baltic Proper, Kiel Bay, Kattegat, The Sound, Great Belt, Little Belt. See map for details

Element / parameter	**Other contaminants / Concentration of chemical/pollutant in/on seabed substrate**
Method	Sampling and analytical methods are reported per sample and per parameter respectively in the data. See HELCOM COMBINE manual.
QA/QC	Quality assurance is a laboratory's whole sampling and analytical process from start to finish. See HELCOM COMBINE manual.
Frequency	Varies from 1-2 to 24 samples/station/year, depending on country**.**
Spatial Scope	EEZ / Whole Baltic Sea for assessment

Spatial resolution	All other contaminants in sediment are measured in: Kiel Bay, Kattegat, Southern Baltic Proper, The Sound, Great Belt, Bay of Mecklenburg, Little Belt. For CEMP: furans are monitored in: Kattegat and Skagerrak, TBT only in Kattegatt. National monitoring is only reported for Denmark and Germany, of which furans are monitored in Great Belt, Kiel Bay, Little Belt. TBT is measured in Bay of Mecklenburg, Kiel Bay, Little Belt, Great Belt. Metals are reported from Great Belt Kiel Bay Bay of Mecklenburg Little Belt. All the remaining national contaminants data is reported from Great Belt, Kiel Bay, Bay of Mecklenburg and Little Belt.

Element / parameter	**Radionuclides / Concentration of chemical/pollutant in/on seabed substrate**
Method	Obligatory radionuclides: Gamma-emitters: K-40, Cs-137 and other γ-emitters identified in the γ-spectrum. Voluntary radionuclides: Sr-90; Pu-239, 240; Am-241; natural radionuclides (e.g. Po-210). Sampling and analytical methods are reported per sample and per parameter respectively in the data. See MORS Guidelines.
QA/QC	Quality assurance is a laboratory's whole sampling and analytical process from start to finish. MORS Guidelines defines methodologies for sample treatment, analysis and intercomparison. Reported data is manually quality assured by HELCOM secretariat and results reported and verified in annual MORS EG meeting.
Frequency	Annual
Spatial Scope	EEZ / Whole Baltic Sea for assessment
Spatial resolution	See map for details

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.

Monitoring requirements	Core indicators rely primarily on monitoring data from biota, secondarily from sediments and lastly from water. Under the Water Framework Directive, no EQS values have so far been set in sediments. However, countries are encouraged to perform long term trend analysis of concentrations of persistent substances that tend to accumulate in sediment, in order to ensure that such concentrations do not significantly increase (such as Hg, PAHs, HCHs, HCB, PBDE, TBT, PCB, PFOS, PCDD/F, HBCDD). To this end, sediments are suitable for revealing past recent history of contaminants.
Gaps	Assessment of gaps has not been carried out.

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?	Adequate for determination of state but not for temporal changes.
Established methods for assessment?	Yes
Adequate understanding of GES?	Yes, thresholds are available for many substances.
Adequate capacity to perform assessments?	Nationally

Assessment of natural variability (Q5e)

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DATA PROVIDERS AND ACCESS

Data access point	Contaminants: ICES DOME Radioactive substances: HELCOM MORS
Data type (Q10c)	Processed Data sets
Data availability (Q10c)	Contaminants: ICES database Radioactive substances: HELCOM MORS
Data access (Q10c)	Open access
INSPIRE standard (Q10c)	
When will data become available? (Q10c)	Contaminants: Annually Radioactive substances: Annually
Data update frequency (Q10c)	Yearly
Describe how the data and information from the programme will be made accessible to the EC/EEA	
Contact points in the Contracting parties	Contact point to national monitoring programmes will be added
Has the data been used in HELCOM assessments?	Yes, e.g. BSEP120B Hazardous substances in the Baltic Sea.

REFERENCES

HELCOM COMBINE Manual

Common Implementation Strategy for the Water Framework Directive (2000/60/EC). Guidance Document No. 25. European Commission 2010. Guidance on chemical monitoring of sediment and bioa under the Water Framework Directive, Technical Report 2010.3991. ISBN 978-92-79-16224-4.

DIN EN ISO 5667-15, 2009. Water quality -- Sampling -- Part 15: Guidance on the preservation and handling of sludge and sediment samples

DIN EN ISO/IEC 17025, 2005: General requirements for the competence of testing and calibration laboratories

IOC Manual of Quality control Procedures

ISO 5667-19, 2004: Water quality -- Sampling -- Part 19: Guidance on sampling of marine sediments

ISO 5667-12: Water quality -- Sampling -- Part 12: Guidance on sampling of bottom sediments

ISO 13877:1998

MORS Guidelines

QUASIMEME