



Document title	Outcome
----------------	---------

Agenda item 0. Introduction.

- 0.1 With reference to the decision by the Tenth Meeting of HELCOM Expert Group on Monitoring of Radioactive Substances in the Baltic Sea ([Outcome of MORS EG 10-2020](#), paragraph 8.2-4), the Eleventh Meeting of HELCOM Expert Group on Monitoring of Radioactive Substances in the Baltic Sea (MORS EG 11-2021) was held online.
- 0.2 The Meeting was attended by delegations from Denmark, Estonia, Finland, Germany, Lithuania, Poland and Sweden as well as a representative of the International Atomic Energy Agency (IAEA). The Meeting took note of absence of Latvia and Russia. The list of participants is attached as Annex 1.
- 0.3 The Meeting was chaired by Ms. Tamara Zalewska, Chair of the HELCOM MORS Expert Group. Mr. Joni Kaitaranta, HELCOM Data Coordinator, acted as secretary of the Meeting.
- 0.4 The meeting documents are available in meeting document library and presentations in the presentations library in the meeting site: <https://portal.helcom.fi/meetings/MORS%20EG%2011-2021-898/default.aspx>

Agenda Item 1 Adoption of the Agenda

Documents: 1-1, 1-2

1. The Meeting adopted the Agenda.

Agenda Item 2 Information by the Secretariat, the Contracting Parties and IAEA

Documents: 2-1

2. The meeting took note of the status of the update of the Baltic Sea Action Plan (BSAP), being a priority for the HELCOM working groups, and note the drafting will continue in the Ad-hoc Drafting Group for the Updated Baltic Sea Action Plan (DG BSAP) and DG BSAP Segment Teams based on the guidance by HELCOM 42-2021.
3. The Meeting took note of the HOLAS III preparation and assessment phase timelines (HOLAS III assessment phase 2.0), including a proposal as to which HELCOM meetings would be invited to endorse and approve the various deliverables as outlined in [HELCOM 41-2021 document 5-4](#).
4. The meeting took note of the important HOLAS III deadlines for MORS EG work
 - Threshold value/ methodology changes to be reported to the Secretariat by 7 September 2021
 - Reporting of 2021 data to the Secretariat by end of May 2022
5. The meeting took note that indicator data is needed for the assessment of Cs-137 in seawater and biota.
6. The meeting requested the Contracting Parties to report 2021 data by end of May 2022. The meeting took note of the following information on readiness to provide Cs-137 monitoring data earlier than the regular reporting deadline for CPs present in the meeting:
 - a. Denmark: Should be possible
 - b. Estonia: Should be possible
 - c. Finland: Should be possible
 - d. Germany: Challenging due to sampling in winter biota, for seawater possible

- e. Lithuania: Should be possible
- f. Poland: Should be possible
- g. Sweden: Need to confirm, might not be possible

Agenda Item 3 Scientific reports by the Contracting Parties and IAEA

Documents: 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, 3-9

- 3.1 The Meeting took note of the information on Danish data from 2020 as presented by Mr. Sven Nielsen (Document 3-8).
- 3.2 The Meeting took note of the Nature Communication paper “An unknown source of reactor radionuclides in the Baltic Sea revealed by multi-isotope fingerprints” <https://www.nature.com/articles/s41467-021-21059-w>
- 3.3 The Meeting took note of the results on monitoring of radionuclides in the Baltic Sea 2020 from Estonia as presented by Ms. Jana Mihkelson (Document 3-5).
- 3.4 The Meeting took note of the results on monitoring of radionuclides in the Baltic Sea 2020 from Finland as presented by Mr. Vesa-Pekka Vartti (Document 3-9).
- 3.5 The Meeting took note of the results of German biota MORS monitoring as presented by Mr. Marc-Oliver Aust (Document 3-5).
- 3.6 The Meeting took note of the results of German Baltic Sea monitoring of radionuclides in seawater, marine sediment and marine suspended matter in 2018, 2019, and 2021 as presented by Ms. Stefanie Schmied (Document 3-6, Presentation 3-2).
- 3.7 The meeting took note of that for German seawater and sediment monitoring, no monitoring was possible in 2020 due to Covid pandemic. The survey was postponed to March 2021.
- 3.8 The Meeting took note of the results of radiological monitoring in the Lithuanian part of the Baltic Sea during 2020 as presented by Ms. Rasa Morkuniene (Document 3-1).
- 3.9 The Meeting took note of the monitoring results on the concentrations of Cs-137 and Sr-90 in seawater the Polish sector of the Baltic Sea in 2020 as presented by Mr. Michal Saniewski (Document 3-2).
- 3.10 The Meeting took note of the monitoring results on the concentrations radionuclides in biota in the Polish sector of the Baltic Sea in 2020 as presented by Ms. Tamara Zalewska (Document 3-3).
- 3.11 The Meeting took note of the results of Sweden on biota, seawater and sediment monitoring for 2019 and results from Tvären project in Studsvik as presented by Ms. Maria Lüning and Mr. Mats Eriksson (Document 3-7).
- 3.12 The Meeting took note that it might not be possible to deliver Swedish 2021 monitoring data by end of May 2022 due to reorganization and time required for analysis and quality checks.
- 3.13 The meeting took note of the reorganization of SSM organizational structure and that it might be reflected in the Swedish representation in MORS EG in following meetings.
- 3.14 The Meeting took note of the potential of producing reference material of Tvären sediments due to wide variety of activity levels of artificial radionuclides including actinides (Pu-, Cm- Am- Np- and U-isotopes) and fission and activation products (e.g. Sr-, Eu-, Cs-, Co-isotopes).

Agenda Item 4 Data collection, databases and ongoing monitoring programme

Documents: 4-1, 4-2, 4-3, 4-4, 4-5

- 4.1 The Meeting reviewed [MORS Guidelines](#). The latest update to the guideline was carried out based on MORS EG 10-2020 meeting (Guideline updated in 23.6.2020).

- 4.2 The Meeting discussed the present status of the HELCOM MORS monitoring programme and notified that there is no immediate change needs.
- 4.3 The meeting took note of the availability of MORS Environmental and Discharge database files and reporting formats from HELCOM Metadata catalogue:
- Environment
 - o Database: <http://metadata.helcom.fi/geonetwork/srv/fin/catalog.search?node=srv#/metadata/7ee4916b-6d84-4c80-9bea-e8f8572c368a>
 - o Reporting template: http://metadata.helcom.fi/geonetwork/srv/eng/resources.get?uuid=7ee4916b-6d84-4c80-9bea-e8f8572c368a&fname=MORS_ENVIRONMENT_Reporting_form.xlsx&access=public
 - Discharge:
 - o Database: <http://metadata.helcom.fi/geonetwork/srv/fin/catalog.search?node=srv#/metadata/91e90ecc-e09a-4eaf-a722-558e581f59a6>
 - o Reporting template: http://metadata.helcom.fi/geonetwork/srv/eng/resources.get?uuid=91e90ecc-e09a-4eaf-a722-558e581f59a6&fname=MORS_DISCHARGE_Reporting_form.xlsx&access=public
- 4.4 The meeting agreed that the **Contracting Parties are requested to review the guideline and provide any change requests within two weeks after the meeting, by 11 June 2021.**
- 4.5 The meeting took note that the nuclide list of discharge database will be updated by STUK. **STUK was invited to send info to the Secretariat by June 2021.**
- 4.6 The Meeting considered the MORS environmental data compilation 2020 as presented by the Secretariat (Document 4-2 and attachments), and the Contracting Parties were requested to check that all the reported and available national data is reported to the MORS database.
- 4.7 The meeting agreed that the reported code list amendments will be added to the guideline by the Secretariat during June 2021.
- 4.8 The Meeting took note and considered the annual report of the MORS environmental data 1984-2019, compiled by the HELCOM Secretariat (Document 4-3 and attachments 4-3Att1-7).
- 4.9 Finland informed on Cs-137 concentration of sample BSTUK2019001 and confirmed that concentration is 3 times higher than normal or expected value but that sample information indicates that the sample was not of best condition. The K-40 values of the same sample were within normal range.
- 4.10 The meeting agreed that sample BSTUK2019001 should be included in the database.
- 4.11 The meeting welcomed the information that the Secretariat would develop and compile a list of quality control steps that would be applied of submission from 2021 onwards and provide suggestion for quality control steps to MORS EG 12-2022 meeting.
- 4.12 The Meeting agreed that **Contracting Parties will check and validate the 2019 environmental data as well as Cs-137 in seawater and fish for 2016-2019 and report any observed inconsistencies to the Secretariat within two weeks after the meeting, by 11 June 2021.**
- 4.13 The Meeting took note of the presentation of a look at data in the MORS ENVIRONMENT 2020 Database by Denmark, Mr. Sven Nielsen (Document 4-5Rev1).
- 4.14 The Meeting thanked Denmark for finding the inconsistencies and reporting to MORS group. The found inconsistencies are:
- For certain samples, biota types and tissue types have inconsistencies (e.g. wrong tissue type reported for fish or plant)
 - For certain samples, there is incorrect basis of measurements (F for BIO02)

- Dry weight values reported for herring samples recorded in 1990's should be converted to wet weight when used with other data based on wet weight
 - For seawater, certain number of samples contain suspicious salinity, temperature and dry weight values
 - For seawater, some tritium and Cs-137 values are suspicious
- 4.15 The Meeting requested Secretariat to correct the tissue codes and other errors when possible and to contact data providers if needed.
- 4.16 **The Meeting requested Secretariat to carry out detailed quality control to the reported historical data in Environment database version 2021 and to come back to any observed inconsistencies by MORS EG by end of the year 2021.** The priority of work should focus on HOLAS III assessment data from 2016-2019 but also look into issues with historical data, if possible.
- 4.17 The Meeting considered the inventory of discharge data from 1998-2019 reported until 19 May 2021 as presented by Mr. Vesa-Pekka Vartti, STUK (Document 4-4Rev1, Presentation 4-4).
- 4.18 The Meeting agreed that the **Contracting Parties will check and validate the 2019 discharge data and report any observed inconsistencies to data consultant STUK within two weeks after the meeting, by 11 June 2021.**
- 4.19 The Meeting agreed that the verified and updated database files for environment and discharges will be made publicly available after two weeks verification period via HELCOM metadata catalogue.
- 4.20 The Meeting took note of the information on the progress of IAEA's MARIS database and updated user interface (<https://maris.iaea.org/explore>) as well as complete rehaul of the user interface and a huge volume of data that has been added as informed by the IAEA.

Agenda Item 5 Analytical quality assurance, reliability of data and intercalibrations

Documents: 5-1, 5-2

- 5.1 The Meeting took note of the information by Finland (Document 5-2, Presentation 5-2) on results of MORS Intercomparison exercise which show good quality of the analytical results on Sr-90 and Cs-137.
- 5.2 The Meeting took note of the IAEA presentation (Document 5-1) on proficiency test exercises and planned intercomparison exercises relevant to the HELCOM MORS EG activities.

Agenda Item 6 Indicator reports, fact sheets and assessments

Documents: 6-1

- 6.1 The Meeting recalled the updating intervals of HELCOM Baltic Sea Environment Fact Sheets (BSEFS), as agreed in HELCOM MORS EG 9-2019 ([Outcome](#), para 6.9):
- [Total amounts of the artificial radionuclide caesium -137 in Baltic Sea sediments](#): will not be updated anymore and the information could be updated and included in the next Thematic assessment on Radioactivity
 - [Liquid discharges of Cs-137, Sr-90 and Co-60 into the Baltic Sea from local nuclear installations](#): will continue to be updated as recommended by State & Conservation. The Meeting agreed that a proper update interval would be every third year.
- 6.2 The meeting took note of the information from Finland that the liquid discharges BSEFS was updated in 2020 and next update would occur in 2023.
- 6.3 The meeting reviewed the liquid discharges BSEFS and suggested that a table on both active facilities and those under construction should be included in the fact sheet and that it should be mentioned in the results

paragraph and metadata description in the report that the reported values are reported by nuclear installations to the authority and not necessarily regularly quality assured by authorities.

6.4 The meeting was of the opinion that the procedures for validating the discharge data provided by installations in different Contracting Parties could be presented by Contracting Parties and discussed in MORS EG 12-2022.

6.5. The meeting was of the opinion that the next periodic assessment on radioactivity would be prepared to present more thorough assessment than the indicator report and requested Secretariat to come back to the needs of HELCOM on the matter. The issue could be discussed in MORS EG 12-2022.

6.6 The Meeting took note of the latest version (2018) of the core indicator “Radioactive substances: Caesium-137 in fish and surface seawater” (as available online at the HELCOM indicator site: <http://www.helcom.fi/baltic-sea-trends/indicators/radioactive-substances-caesium-137-in-fish-and-surface-seawater/>).

6.7 The meeting recalled MORS EG 10B-2021 meeting considerations on threshold value approach (Outcome, para 3.7):

“The meeting thanked the core group for preparing the Document 3-1 and was of the opinion that the following amendments would be required:

- General chapter should give the reasoning for changing threshold values: updated BSAP, MSFD, etc.
- Statement that the aim is to protect both humans and non-human biota and biota is protected when human dose rate criteria are applied
- Justification for using the selected criteria
- Back-calculating to human doses would be included in the document“

6.8 The Meeting took note of the presentation by the Threshold value core group (Document 6-1) on revised threshold proposal based on input from MORS EG 10B-2021 meeting.

6.9 The Meeting agreed on the suggested threshold values set for safety standards, which were the following when rounded values are used:

- **For fish: 20 Bq kg⁻¹ w.w. for fish.**
- **For seawater: 40 Bq m⁻³**

6.10 The Meeting thanked the Threshold value core group for the work done in deriving methodology and for the improved proposal.

6.11. The Meeting agreed that for the HOLAS III core indicator report, the approach would be to have safety standard-based threshold values for the threshold for failing/achieving good environmental status and to maintain pre-Chernobyl concentrations as target value in the indicator assessment:



6.12 The meeting was of the opinion that for indicator report there should be distinction in presenting the results to classify assessment units that are below threshold value and below target value.

6.13 The meeting agreed that for presenting to State & Conservation, the document could be simplified to be understandable for non-experts and to contain an executive summary to summarize the suggestion in one page.

6.14 The meeting agreed that the updated version of Document 6-1 would be circulated to MORS EG for commenting via correspondence by the Threshold core group by 14 June 2021. MORS EG member should

provide any final comments by 30 June 2021. Final text and summary should be ready by Threshold core group mid-July 2021. The document should contain following updates:

- Executive summary to be added
- Updated figures

6.15 The meeting agreed to go on with the proposed methodology and updated version of Document 6-1 can be submitted to State & Conservation 15-2021 meeting by 7 September.

Agenda Item 7 Future work

7.1 The Meeting took note that there is no need to plan extra meetings.

7.2 The Meeting agreed that the MORS EG 12-2022 meeting would be hosted either as online meeting or as physical meeting if pandemic situation allows.

7.3 The Meeting was informed by IAEA that they will inform to the Secretariat about the possibilities of hosting and possible date of the MORS EG 12-2022 meeting.

7.4. The Meeting took note that tentatively next host for 2023 would be Germany.

Agenda Item 8 Other business

8.1 The Contracting Parties and IAEA were invited to check and update the list of HELCOM MORS EG contact addresses, Annex 1 of outcome.

Agenda Item 9 Outcome of the Meeting

9.1 A draft outcome of the Meeting will be prepared by the Secretariat for consideration and approval by MORS EG 11-2021.

Annex 1. Contacts / list of participants.

Name	Organization	E-mail address
Denmark		
Sven Nielsen	Technical University of Denmark	spni@env.dtu.dk
Estonia		
Jana Mihkelson	Environmental Board	jana.mihkelson@keskkonnaamet.ee
Finland		
Vesa-Pekka Vartti	STUK - Radiation and Nuclear Safety Authority	vesa-pekka.vartti@stuk.fi
Germany		
Stefanie Schmied	Federal Maritime and Hydrographic Agency (BSH)	stefanie.schmied@bsh.de
Marc-Oliver Aust	Thünen-Institute of Fisheries Ecology	marc-oliver.aust@thuenen.de
Lithuania		
Rasa Morkuniene	Radiation Protection Centre	rasa.morkuniene@rsc.lt
Poland		
Tamara Zalewska *	Institute of Meteorology and Water Management - National Research Institute	tamara.zalewska@imgw.pl
Michał Saniewski	Institute of Meteorology and Water Management - National Research Institute	michal.saniewski@imgw.pl
Sweden		
Maria Luning	Swedish Radiation Safety Authority	maria.luning@ssm.se
Mats Eriksson	Linköping University	mats.k.eriksson@liu.se
IAEA		
Mai Khanh Pham	International Atomic Energy Agency (IAEA)	m.pham@iaea.org
HELCOM Secretariat		
Joni Kaitaranta	HELCOM Secretariat	joni.kaitaranta@helcom.fi
Deborah Shinoda	HELCOM Secretariat	deborah.shinoda@helcom.fi

* chair

