



Document title	New soundscape maps for the development of the continuous noise section in HOLAS III
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Agenda Item	6 - Matters arising from the HELCOM Groups
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Submitted by	Executive Secretary
Reference	Outcome of PRESSURE 13-2020, para. 5.6-5.13

Background

PRESSURE 13-2020 supported the need of new soundscape maps for HOLAS III. PRESSURE also acknowledged that the continuous noise database and soundscape planning tool has been developed to ensure compatibility with current work on the topic in OSPAR in the frame of the JOMOPANS project. However, neither ICES nor HELCOM EN-Noise possess the required expertise to produce new soundscape maps needed for HOLAS III, and thus services of a private company would be needed.

In order to secure required resources, the production of these maps was included as part of the HELCOM Blues project application recently submitted to the EU MSFD call (decisions on applications to this call are expected in November 2020).

This document contains information justifying the need for new soundscape maps compatible between OSPAR Quality Status Report 2023 and HELCOM HOLAS III. The document also provides a cost-effective solution to produce such new maps in case the HELCOM Blues project application is not granted.

Action requested

The Meeting is invited to:

- Take note of the information;
- Consider and agree on the need to produce the new soundscape maps for HOLAS III as supported by PRESSURE 13-2020;
- Discuss and agree on the provision of the needed economic support in case the HELCOM Blues project application is not granted.

New soundscape maps for the development of the continuous noise section in HOLAS III

Background: HELCOM continuous underwater noise database hosted by ICES¹

Continuous underwater noise has been monitored in the Baltic Sea and in the North Atlantic as part of time-limited projects such as BIAS², JOMOPANS³ and JONAS⁴. In the Baltic Sea, the BIAS project delivered a Soundscape tool, which has been used by HELCOM in the HOLAS II assessment. Through the Baltic Sea Action Plan, and HELCOM's efforts to support its contracting parties in establishing thresholds for Good Environmental Status (GES) under the EU Marine Strategy Directive (MSFD), as well as the next holistic assessment (HOLAS III), underwater noise is recognized as a pressure on the marine environment. The HELCOM expert network on underwater noise (EN-Noise) proposed to establish a continuous noise database and transfer the hosting of the Soundscape tool to an international data platform. After a tender specification was published, ICES was selected as the preferred contractor. A contract was signed between HELCOM and ICES in 2019, for ICES to develop and host a continuous underwater noise data portal. EN-Noise, in consultation with the Secretariat oversees the implementation of this contract.

During the database development, an outline of the data structure was sent to ICES by the BIAS contact person. **The ICES data centre, along with the experts from the BIAS and [Joint Monitoring Programme for Ambient Noise North Sea \(JOMOPANS\)](#) projects developed the ICES Continuous Underwater Noise format based on the data structures used by BIAS and JOMOPANS.** The agreed format was sent to the community before being finalised.

Monitoring data supplied to the **database will be available for downloading** in HDF5 format and the user is able to filter data based on a time period, location or channel.

In addition to monitoring data, HELCOM requested the production of maps of continuous underwater noise in the entire HELCOM area. Statistical maps from the BIAS project⁵ (2014) are now available on the ICES portal⁶. The original netCDF files from BIAS have undergone further validity checks and the removal of extra dimensions, as well as renaming to agreed terminology. **The system is extensible, the possibility to adapt the standard format with additional metadata for statistical maps deriving from the JOMOPANS project, or other sources is designed in.** Users are able to filter the maps by time period, frequency, depth, exceedance level, and station. It is also possible to download the NetCDF files, which include the geodata and the corresponding metadata. The downloaded files can be viewed in a number of free applications such as QGIS, Geoserver etc.

Why are new soundscape maps needed?

The maps currently in the mapping tool were all produced as part of the BIAS project and cover the year 2014. This has implications for the usefulness of the data for future assessments, including HOLAS III. Firstly, **the maps currently available will be nearly 10 years old by the time HOLAS III is completed.** Secondly, the BIAS maps are restricted to three one-third octave bands (63 Hz, 125 Hz and 2 kHz). Current consensus regarding assessing impact, such as from the JOMOPANS project, **recommend including broader frequency ranges in assessments**, as this will allow a better match to the hearing range of the different noise-sensitive

¹ This is a summary of the update on the process of setting up the HELCOM continuous noise database and soundscape planning tool hosted at ICES. Additional information can be found in [document 5-2](#) to PRESSURE 13-2020.

² <https://biasproject.wordpress.com/>

³ <https://northsearegion.eu/jomopans/>

⁴ <https://www.jonasproject.eu/oceannoise/>

⁵ <https://biasproject.wordpress.com/>

⁶ <https://underwaternoise.ices.dk/continuous/viewonmap>

species. Thirdly, **the current maps do not allow separation of the noise sources**, which implies that the maps represent the total sound pressure level, i.e. the sum of the natural, wind-generated noise and noise from ships. The development of underwater noise indicators since the BIAS project has made it clear that significant information about potential impacts of anthropogenic noise is carried in the excess level, which is the amount by which the noise level is elevated above natural ambient by anthropogenic activities. The conclusion is therefore that updated maps are required, in order to have the best information available for HOLAS III and be consistent with the expected updated advice from EU TG-Noise regarding assessment of GES.

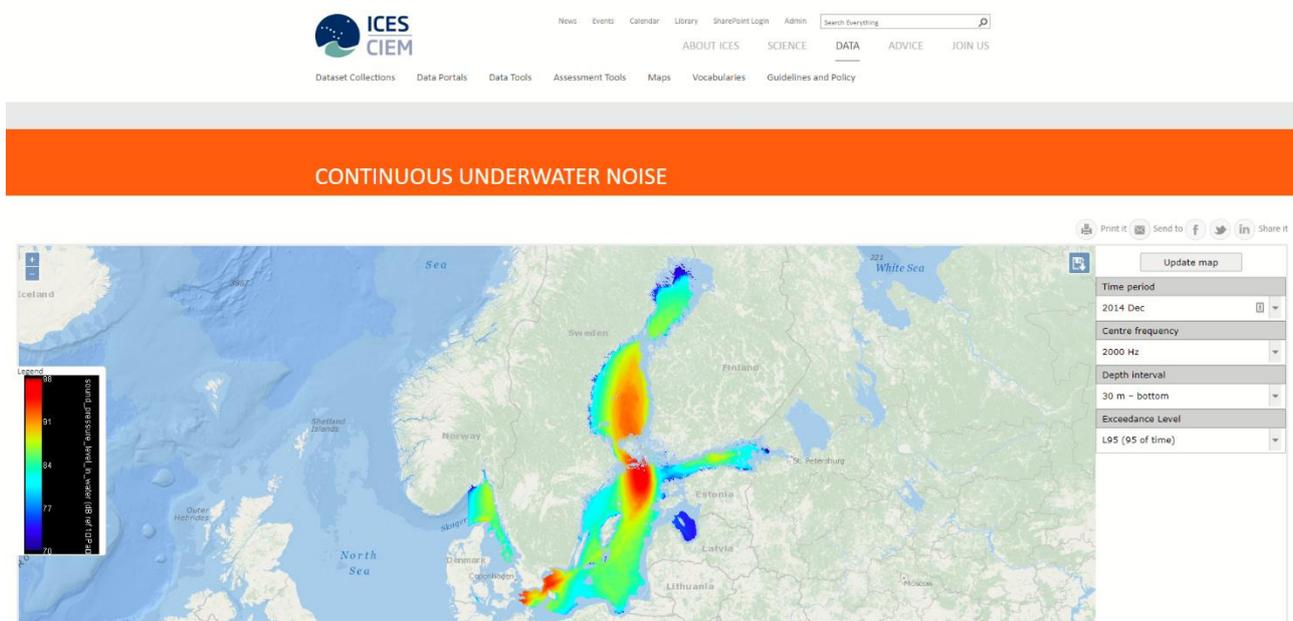


Figure 1. Continuous Underwater Noise mapping tool.

Cost estimates to produce the new soundscape maps

The production of the new soundscape maps has been included in the activity addressing underwater noise in the HELCOM Blues proposal submitted to the EU call "[DG ENV/MSFD 2020 Marine Strategy Framework Directive: Support to the preparation of the next 6-year cycle of implementation](#)". Decisions on applications to this call are expected in November 2020, thus there is a need to consider the economic implications producing these maps may have in case the HELCOM Blues proposal is not granted.

BIAS project modelling in 2014 cost more than 100 k€, as this was the first experience of this kind. Since that time modelling has decreased its costs. Thus, 1-year (2018) EU MSFD modelling (63 and 125Hz third-octave bands) actually costs approximately 690€ per 1 x 1 degree cell (marine area of 6330 km²). This cost includes calibration of the model by recorded data (1 data logger, which means one monitoring station) but excludes AIS data, to be provided by customer.

If this information is scaled to the whole Baltic Sea area, without considering increasing complexity of the model, and assuming that AIS data are provided by HELCOM, the following result will be obtained: Baltic Sea includes 377000/6330≈60 cells, which will give **an approximate price of modelling for the whole area on the range of 60x690=41 400€.**