

Development Phases towards an operational impulsive sound indicator - An initial proposal for discussion

The topic summary detailed in INDICATOR WS 1-2019 document (<https://portal.helcom.fi/meetings/INDICATOR%20WS%201-2019-616/MeetingDocuments/11-%20Future%20work%20on%20HELCOM%20indicators%20-%20Underwater%20noise.pdf>) describes the development work and potential obstacles for future progress on the HELCOM indicator for Impulsive noise as follows:

Development work

A harmonized approach needs to be furthered by considering national developments and revisiting monitoring guidelines to develop the approach fully. Aspects such as how different sources are monitored and reported should be addressed, in doing so ensuring an assessment of current status can be compared to existing evaluations. A broader updated assessment, with all available data, will evaluate how comparable reporting across the region is and where gaps in data exist. To support better data collection and reporting, the reporting format to the registry of impulsive events has recently been updated based on two years of reporting experience. However, further work is needed on the registry so that it better facilitates the indicator assessment (e.g. information of frequency spectrum), and approaches to carry out indicator evaluation directly from the database should also be explored. Furthermore, the indicator metric (impact days) needs to be developed to include a biological relevance component, and such a metric needs to be adapted to relevant species, the specific amounts in question, and may also need to be revised dependent on specific source (e.g. activity). Such developments may also need to consider temporal aspects such as duration of noise event and event-free recovery periods, and also address how temporal and spatial reporting needs to be appropriately applied so that all noise-generating events are suitably scaled to one another (i.e. a single large but short event does not become overemphasized in assessments). A workshop dedicated to discussion on monitoring standards, appropriate reporting, and impact assessment would be valuable.

Potential obstacles

Specific source types are commonly not reported to the noise registry due to e.g. data restrictions, lack of data, or matters of national security. Thus the data made available to date are generally very limited and could present significant issues for carrying out a full assessment. While addressed above in development issues, harmonised monitoring and reporting may also act as a potential obstacle. Additionally, the current processes at the EU level and this HELCOM process for indicator development may not have matching timelines (e.g. for threshold value development). The noise registry may also require further development to expand the parameters to be collected to reflect developments taking place.

Proposed Development Phases

Phase 1.1 (2019-2020): initial, minimal operationalization/survey to CP's on progress on reporting data to the registry/collection and discussion of open issues and necessary additional work

One of the obstacles was that the data availability in the impulsive noise registry to date is very limited and a completion of event reporting is crucial for a comprehensive indicator development. The progress on integration of significantly more data in the noise registry and e.g. on rarely or not reported sound sources, will likely not occur within the given timeline. Aiming at a fast

operationalization, a possible phase I approach could be to integrate only the most completely reported sound sources types in the assessment and evaluation of the indicator functionality according to this exemplary data basis. The choice of source types should be agreed among experts.

Additionally, HELCOM CP's (data submitting institution) should be asked to provide feedback on their progress on completing their reporting to the noise registry, on obstacles that hinder the progress and on support requests to HELCOM about requested help to overcome such obstacle. A proposal or a survey is attached and could be distributed to HELCOM CP's prior to the INDICATOR WS II.

Additional questions that might be of importance for the indicator development and which could be discussed by experts or be answered within the scope of workshops or thematic studies:

1. Reconsider the temporal indicator metric of impact days and developed it an adequate manner, assuring that the biological relevance for different species in dependence on specific temporal impact duration can also be investigated further. The relevance of event duration and event free recovery periods should be discussed within the scope of advancing the indicator. Which differences exists regarding the different event types?
2. Is it necessary to consider frequency content and dependence, e.g. of mid and low frequency type separately?
3. How comparable are different event types in terms of pressure according to their level classification?
4. Which ideas for the further purpose and use of the indicator exist? Is information contained in the registry used as efficiently and completely as possible?
5. Which possibilities for assessing the impacts on population level exists?

Phase 1.2 (2020-2021): Approaches for dealing with non-available information/evaluation of the information gain

Develop strategies to compensate for required information (e.g. specific event types) that are permanently unavailable. This includes approaches to include information on specific source types due to estimates or extrapolation of secondary information or side effects.

Evaluate, if the information gained by the proposed indicator correctly reflects and agrees with comprehensive results obtained from other information sources, such as other regional and national evaluations.

Phase 2. (2021 and beyond): Comprehensive approach using the maximum achievable information gain based on data contained in the noise registry

Based results obtained in phase I and II, the indicator is suited to address more complex but very important matters such as seasonality, mitigation measures and frequency component among others. The functional indicator will be suited to inform about the approach and achievement of GES. It will additionally be suited to inform about the effects/changes in pressure due to implemented political and technical measures.