JOMOPANS Good Environmental Status (GES) Tool User's Guide

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Version	Author	Released	Contact
V1.5	Emily T. Griffiths	April 2022	emilytgriffiths@ecos.au.dk

It is live!

The JOMOPANS project is pleased to announce that our Good Environmental Status (GES) Tool is up and running at https://jomopansgestool.au.dk. There are three major functions of the tool: downloading Data Files, viewing Maps and Layers, and using our GES Calculator Tool.

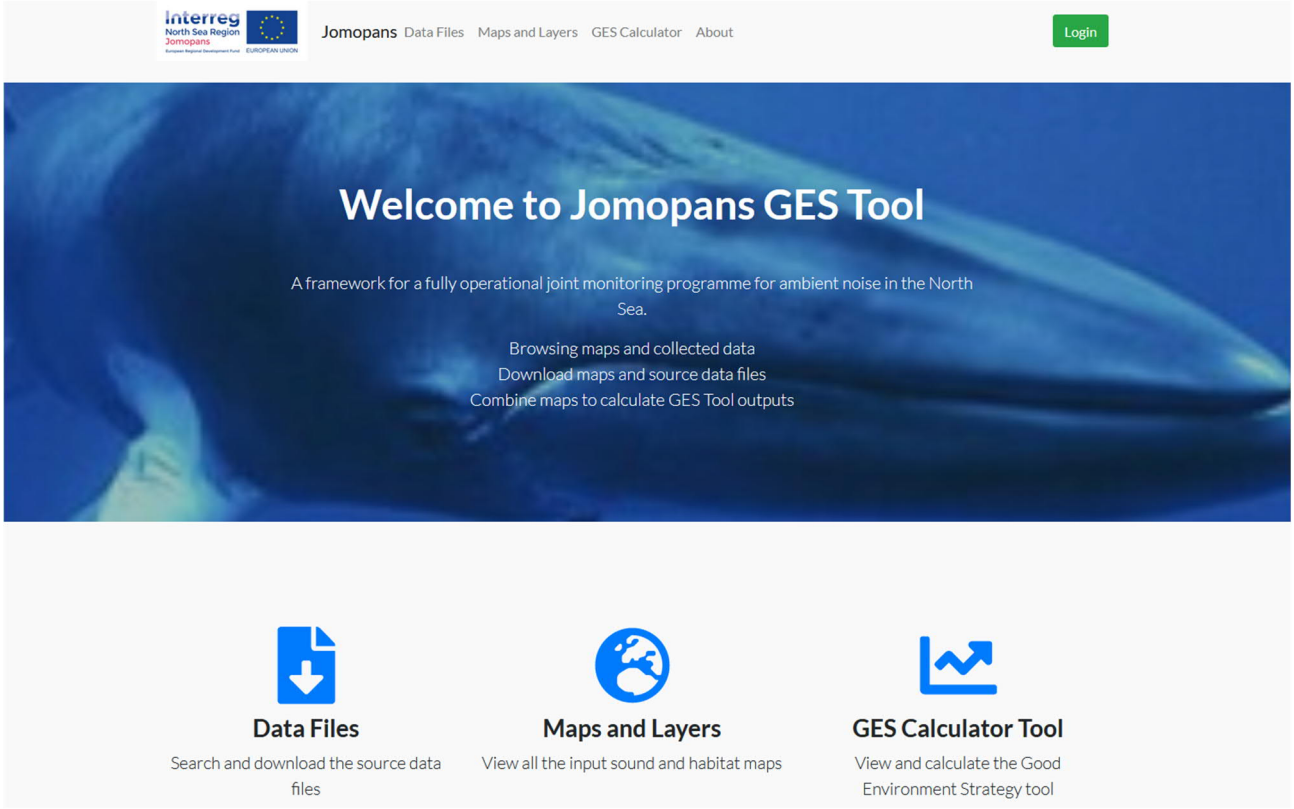

Figure 1. JOMOPANS GES Tool homepage.

Data Files

In the Data Files tab, all of our North Sea soundscape maps for 2019 by month are freely available to download. Under the annual tab, we also have provided regional area maps, such as Dogger Bank and Danish Waters, as well as distribution or density maps for important North Sea species. From Waggitt. et al. 2020, we have formatted their density maps for cetaceans, such as harbor porpoise, and sea birds, such as northern gannet. JOMOPANS partner, Institute of Marine Research (IMR) in Norway provided distribution and spawning maps for various fish species, such as cod and plaice.

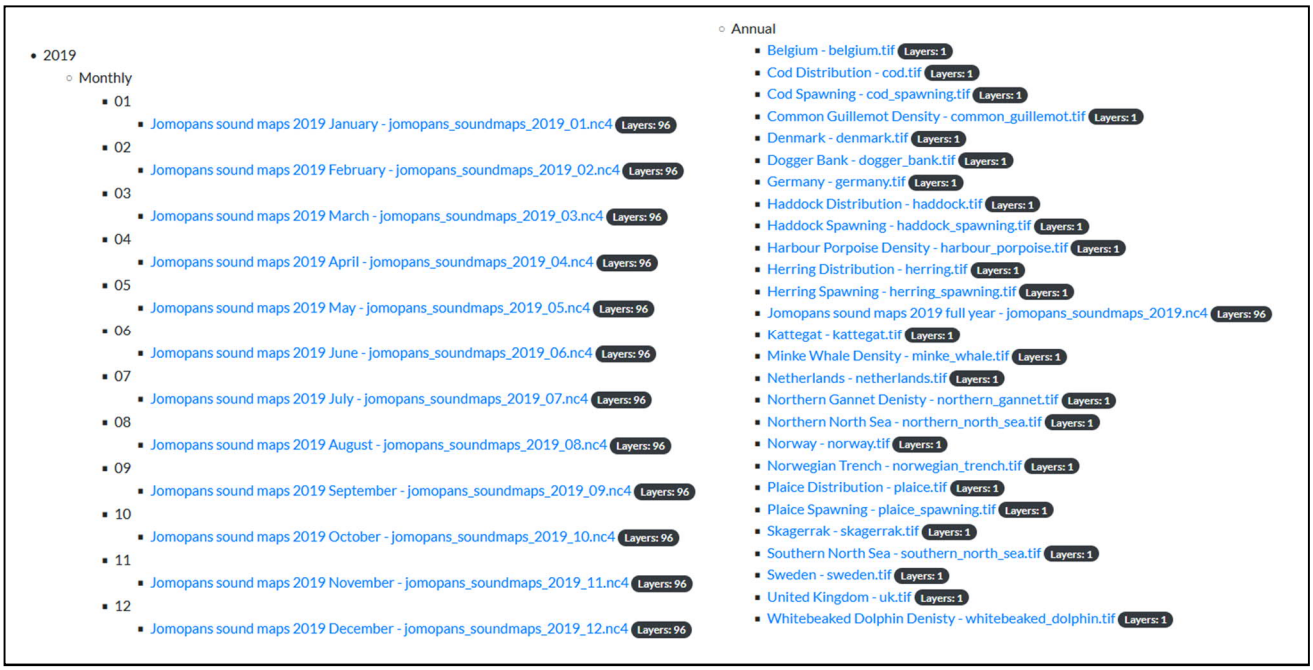

Figure 2. List of files available to download and view in the GES Tool.

Maps and Layers

In the Maps and Layers tab, users can view all of the Data Layers. For example, a sound dominance map for the month of June.

Note: In order to view the dominance maps, the Data Period must be set to 'Monthly', as the maps are presented by month. In order to view the species or area maps, the Data Period must be set to Annual. This is because the area maps are stable throughout the year, and the provided species maps are general density/species range maps for the entire year. To view cetacean and bird maps, you should select 'Species Density' in Data Measure, as these maps came from Waggitt. et al. 2020 density estimates. To view the fish maps, select 'Area Mask' as these are flat range maps for both the spawning areas and general distribution.

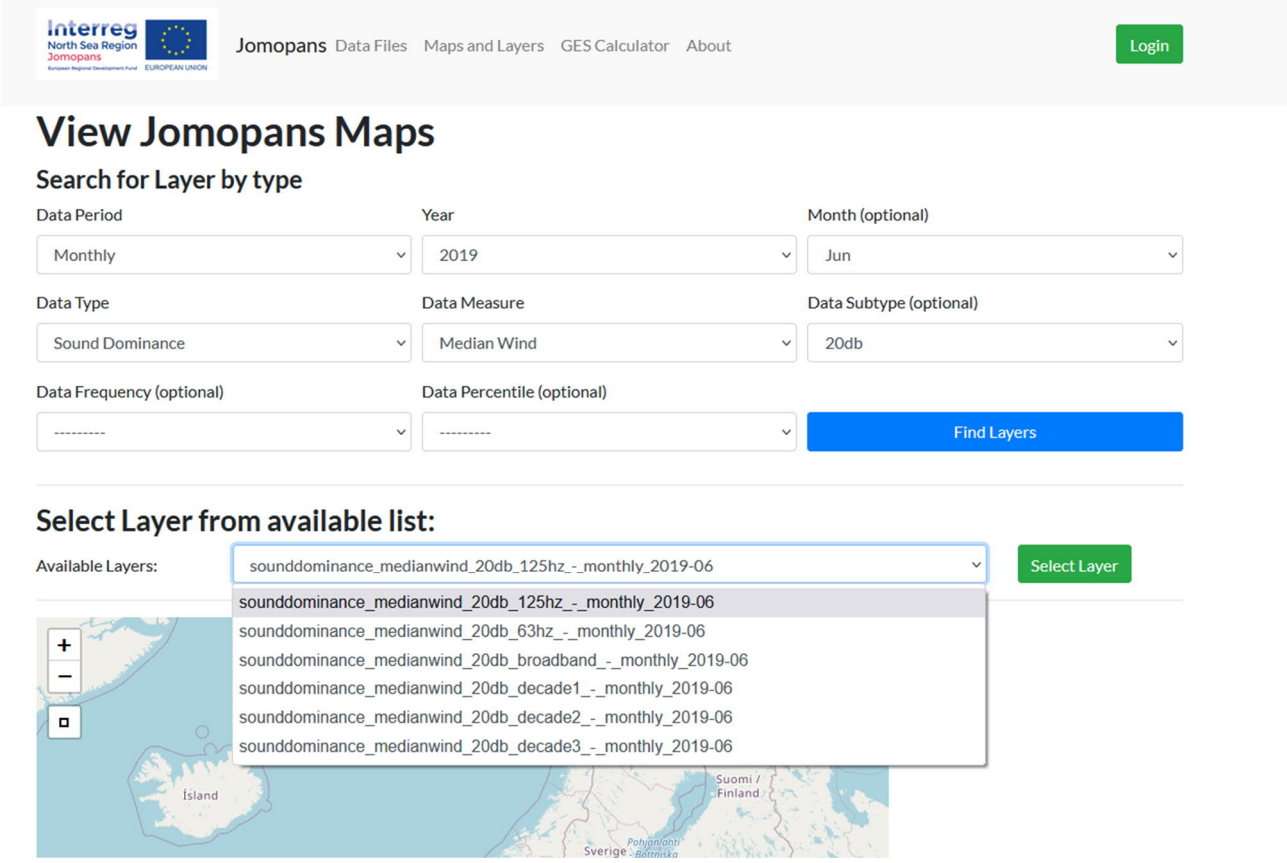

Figure 3. JOMOPANS map layer page, selecting a sound dominance map for the month of June. This map uses the median wind as the reference ambient, with an excess noise threshold of 20dB at the 125 Hz third-octave level.

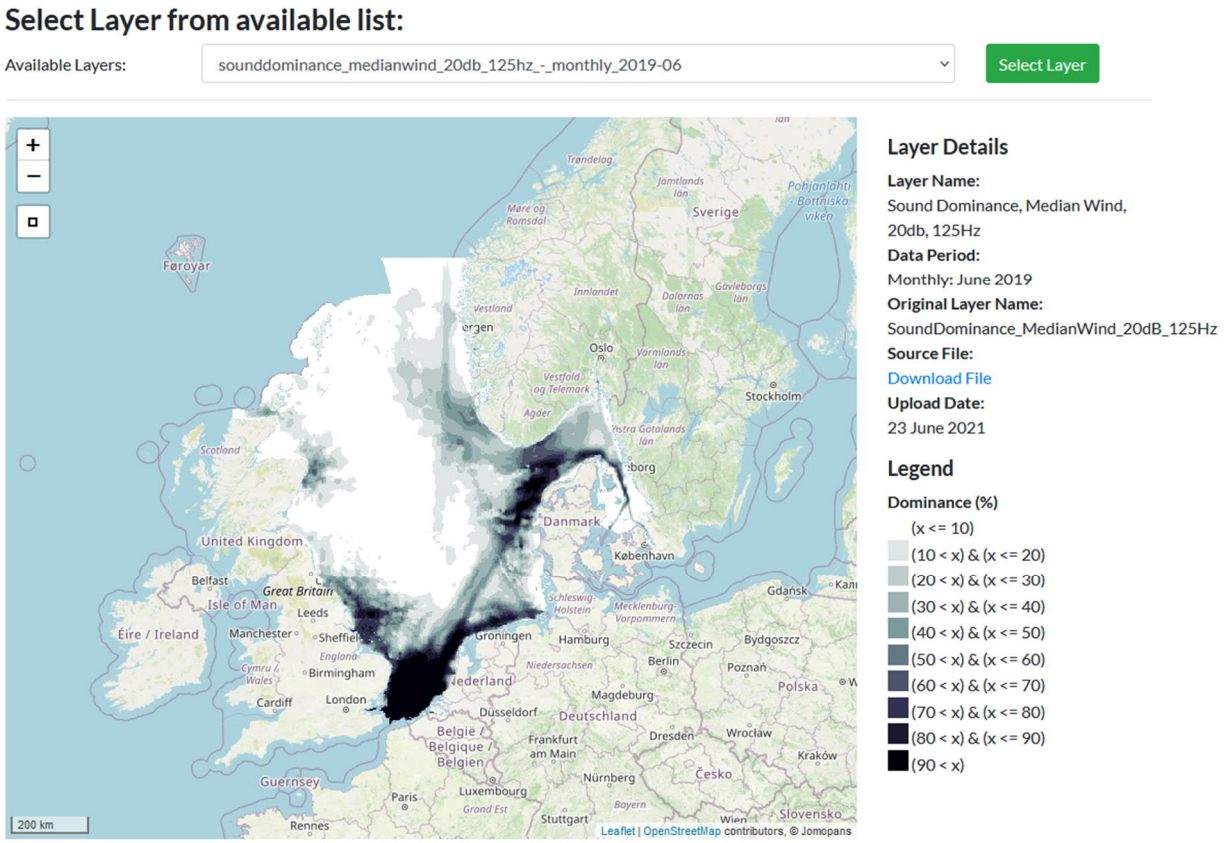

Figure 4. Display of map selected in Figure 3.

GES Tool

With the Good Environmental Status (GES) Tool, we can look at specific areas in the North Sea, such as the Southern North Sea, specific species distributions, such as harbor porpoise, and apply different noise dominance maps to those overlapping areas to calculate the total. In this example, the dominance layer models the median wind noise at the 125 Hz third-octave level, with a noise excess of 20 dB for the month of August in 2019.

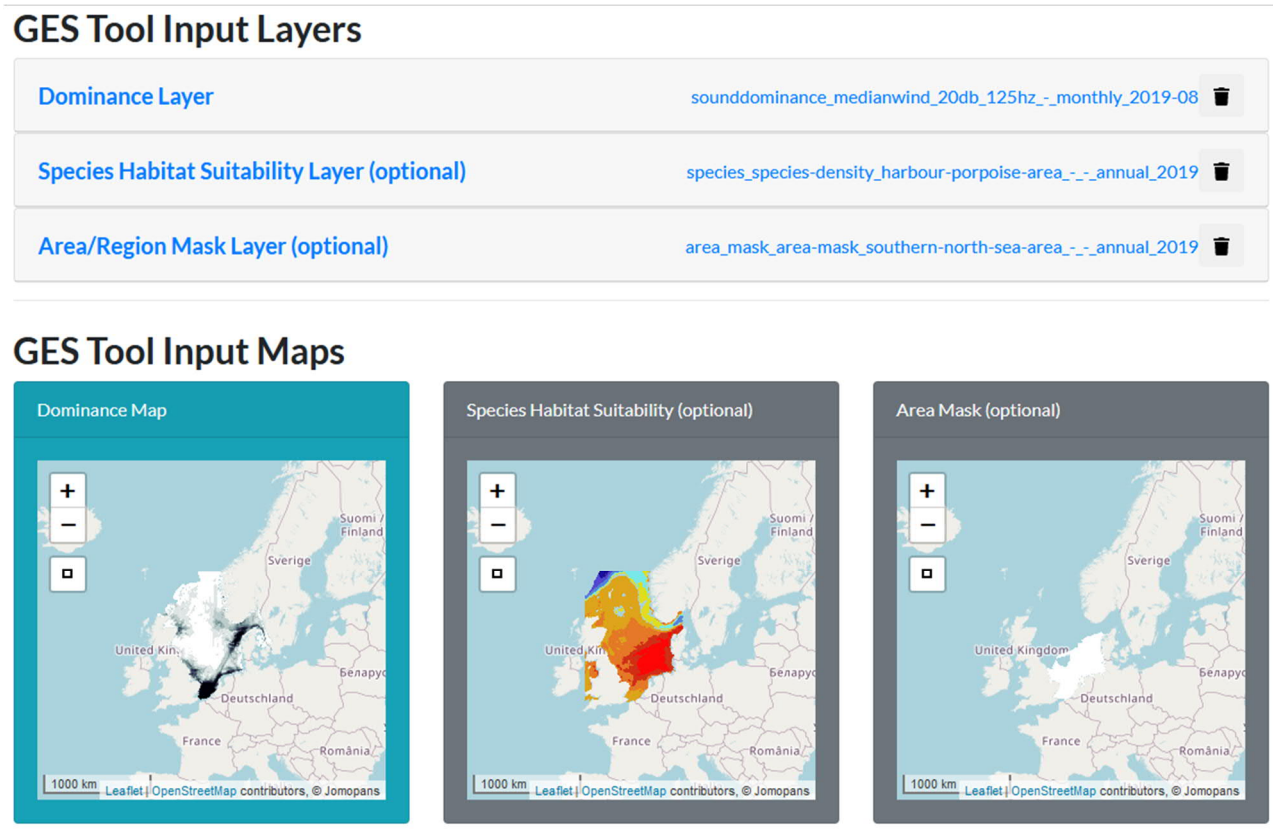

Figure 5. Choosing different layer, one dominance, one species, and one area, to run within the GES tool.

With these conditions, the pressure index for harbor porpoise in the southern North Sea is 0.25. In additional to this index number, there are three plots to help explain the context for the pressure index value:

- Dominance Histogram: Distribution of dominance in grid cells of the assessment area.
- Cumulative Distribution Function (CDF): A cumulative sum of the affected area from the high end of the distribution.
- The Pressure Curve: derived from the CDF. This is a very condensed expression of the conditions in the area under assessment.

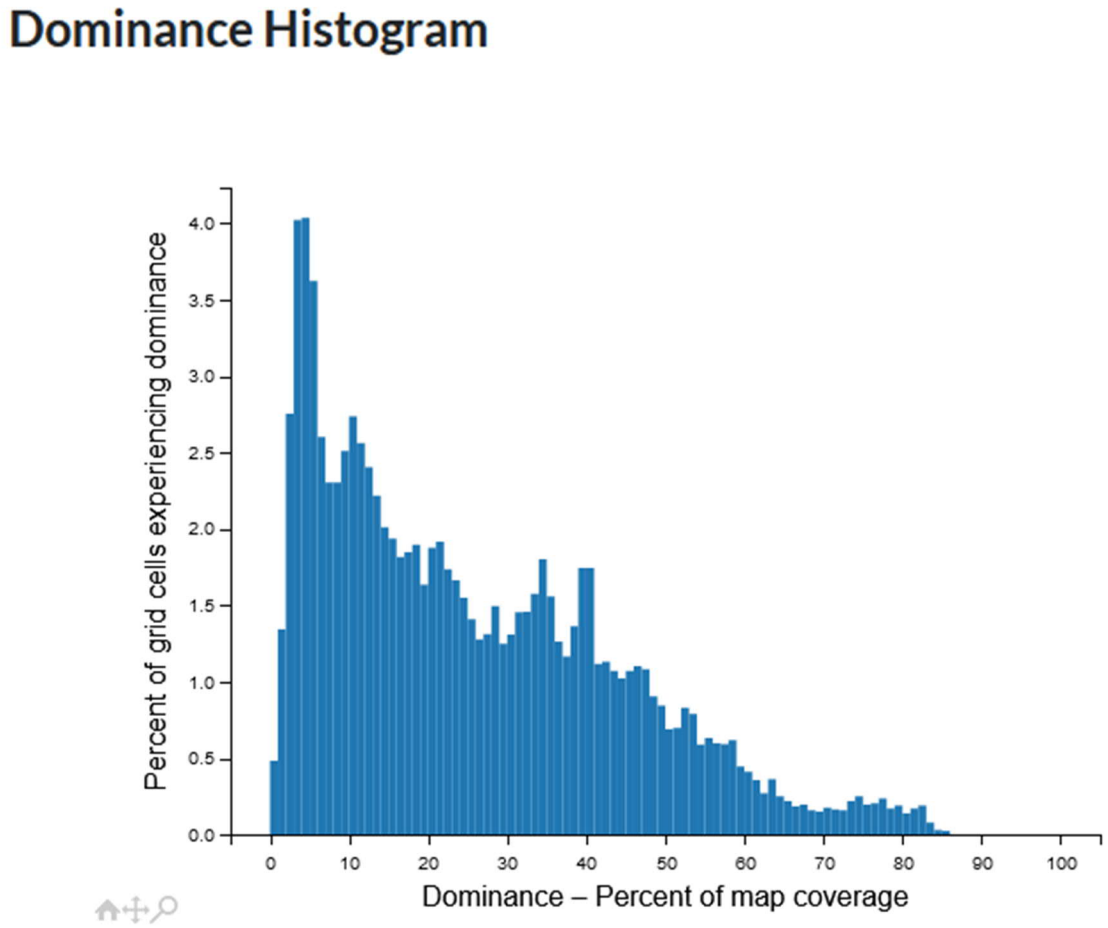

Figure 6. Dominance Histogram: Distribution of dominance in grid cells of the assessment area.

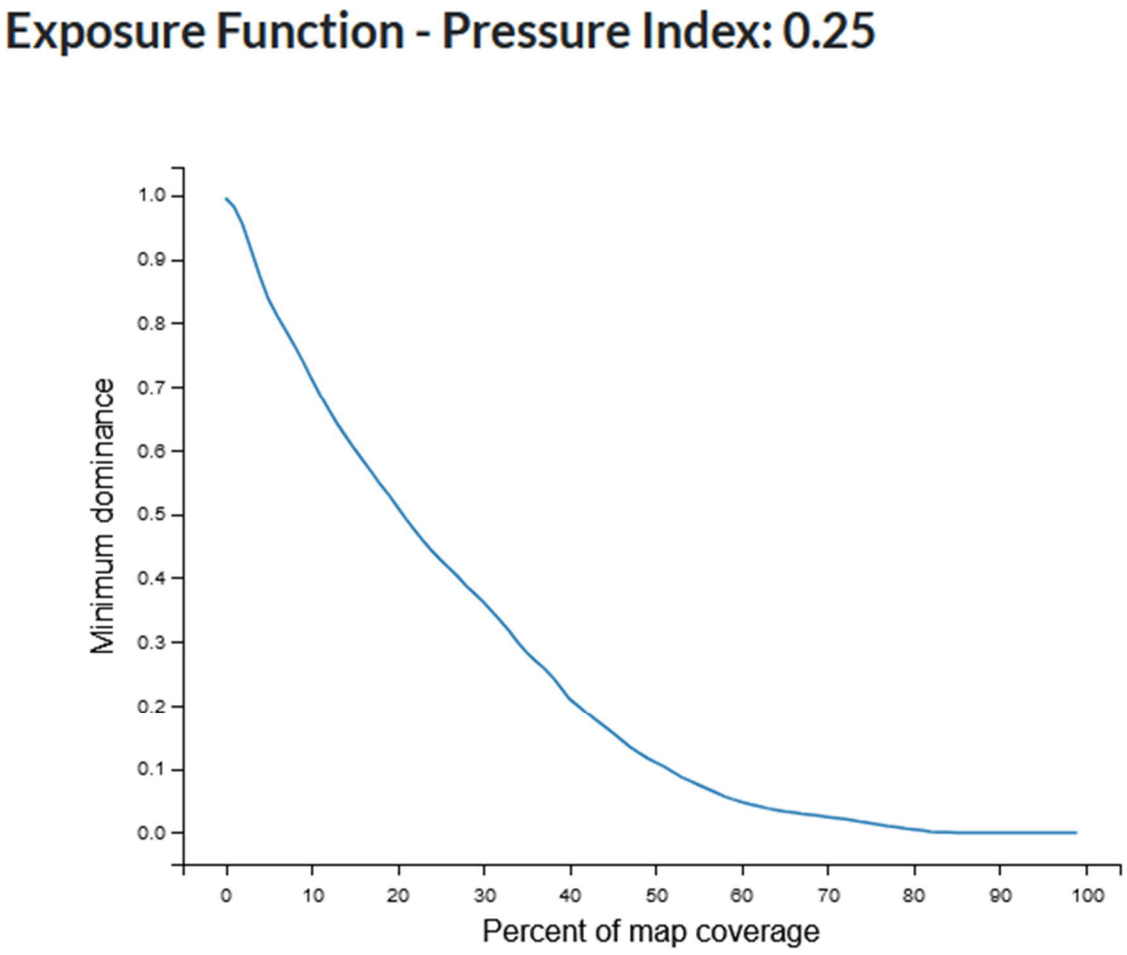

Figure 7. The Pressure Curve: derived from the Cumulative Distribution Function. This is a very condensed expression of the conditions in the area under assessment.

Reference:

Waggitt, J. J., Evans, P. G., Andrade, J., Banks, A. N., Boisseau, O., Bolton, M., ... & Hiddink, J. G. (2020). Distribution maps of cetacean and seabird populations in the North-East Atlantic. *Journal of Applied Ecology*, *57*(2), 253-269.