JOMOPANS Newsletter - 2020

Interreg North Sea Region Jomopans
European Regional Development Fund

EUROPEAN UNION

The second year of Jomopans is completed. Time to look back and ahead.

Jomopans started in 2018 with very ambitious plans, that could only be met through intense co-operation of the Jomopans project partners. At this time I can conclude that we are still on schedule on most of the tasks we defined and that on some tasks we are even performing better than anticipated.

At the well-attended Midterm Event in London at the Royal Society, the Jomopans team was praised on these results. The attendees engaged in discussions on underwater noise and the challenges for the future. These discussions extended to the breaks and the list of topics can keep us busy for many years after Jomopans finishes. The event also increased the expectations for the remainder of the project and as a project team we will work hard to meet these expectations.

In the last year all work on modelling and measurements will come together and the results will be presented in the GES tool we are now building. In this newsletter we will inform you on these activities.

I hope you enjoy this newsletter and keep on following us.

On behalf of the Jomopans project team,
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Combining Models and Measurements

Work is underway within WP6 (Combining Models and Measurements) to validate the sound maps produced by WP4 (Modelling) for the preliminary monitoring period in 2018. Predictions of sound levels recorded at 7 JOMOPANS monitoring sites are being compared to the field measurements, and the project partners are working together to understand the reasons for differences between the models and measurements. So far, the sound levels are somewhat underestimated at low frequencies (<500 Hz) and overestimated above this frequency, with uncertainties in the sediment properties likely to

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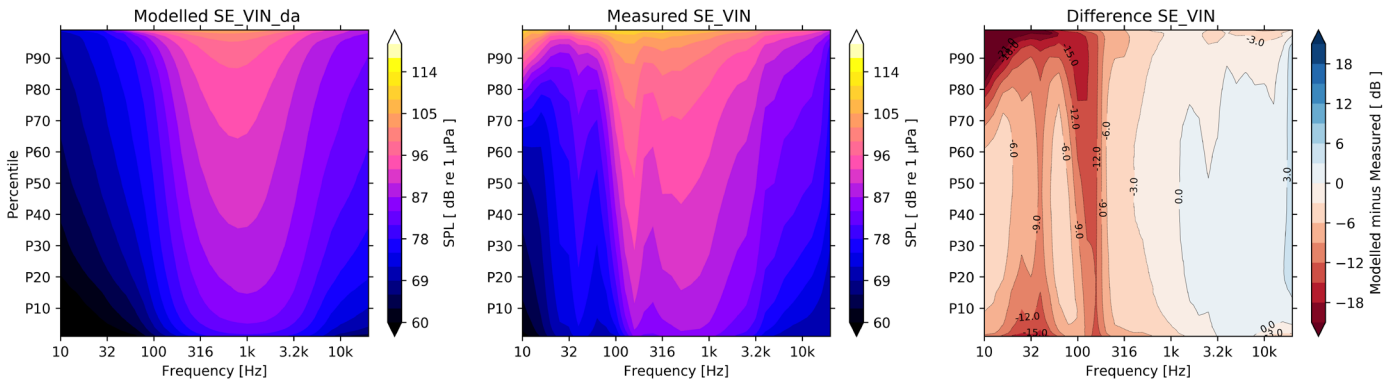

Figure 1. Left: modelled sound level (dB re 1 µPa) by frequency and percentile; middle: modelled sound level (dB re 1 µPa) by frequency and percentile; right: dB difference between model and measurements – note that negative values indicate that the model is underestimating relative to the field measurements, and vice versa.

be the major cause of model deviation (Fig. 1). Analysis has also been undertaken to separate out the periods when ships are passing the monitoring stations, so that the performance of the wind model and ship noise model can be assessed separately. Initial results suggest that the model is performing better when ships are not nearby, which may be expected since there is more uncertainty in predicting ship source levels compared to wind noise. The corrections to the sediment model mentioned above may also improve these results. The next step is for the noise models to be optimised in light of these field measurements, and then to produce a calibrated set of sound maps. A second round of validation will then quantify the final level of confidence in the modelled sound maps.

GES-tool development

The JOMOPANS online GES tool is beginning to take shape. The tool will be the principal means of accessing the results of the JOMOPANS soundscape modelling. It will furthermore make it possible to evaluate the soundscapes, either on their own (pressure indicators), or by combining the spatial information about the ship noise with maps of distribution or habitats of selected marine mammals and fish, in assessment of risk of impact.

Both pressure and impact risk indicators are aimed at assessing masking of animal communication sounds by ship noise. This is done by calculating how much the ship noise elevates the total noise level above the wind and wave generated natural ambient noise, referred to as the *excess level* (Fig. 2). If furthermore the temporal statistics of the excess level is evaluated a measure of the dominance of the ship noise over natural ambient is obtained. The dominance expresses how much of the time the soundscape is dominated by ship noise rather than natural wind and wave noise and although it is in itself not a direct measure of Good Environmental Status (GES), it is a fair assumption that they are strongly correlated. An increase in the dominance of the ship noise is thus indicative of conditions getting worse for vociferous animals, as masking by ship noise increases and communication ranges thereby decreases.

The risk based assessment, where animal habitats and distributions are taken into consideration, is a form of spatial weighting of the dominance measure. By this weighting with animal density or habitat, emphasis is put on areas, which are more important to the animals, and times of the year, where they are more sensitive (typically breeding season).

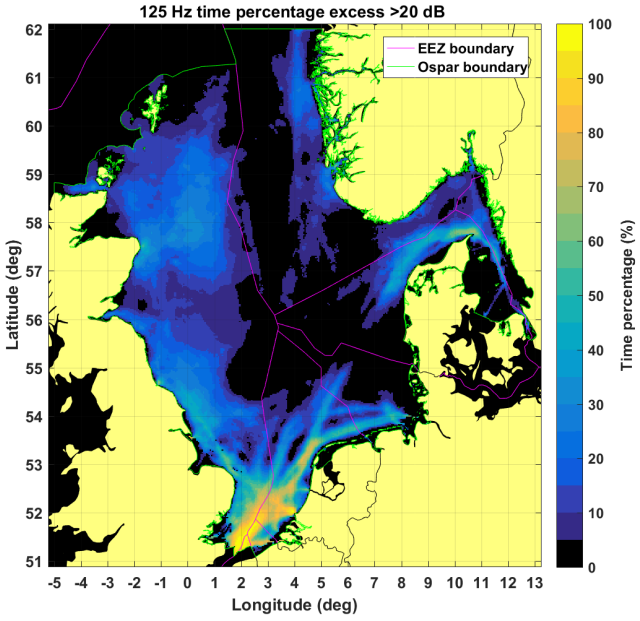

Figure 2. Left: Calculated Excess level, the time in percentage, when the ship noise elevates the total noise level more than 20 dB above the wind and wave generated natural ambient noise for the 1/3 octave band 125 Hz during January in 2019. Note however, the break of the shipping lane, west of Denmark. This is due to gaps in the AIS data and will be corrected in the future work