The influence of pile driving noise on harbour porpoises

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The harbour porpoise (*Phocoena phocoena*) is the most common marine mammal in the Belgian part of the North Sea and is protected by both national and EU law. In the North Sea, the harbour porpoise is considered under threat because of high bycatch levels and increasing noise pollution. Impulsive pile driving noise originating from the construction of offshore wind farms has been shown to affect porpoises up to distances of 20 km from the noise source. Driven by high porpoise densities in Belgian waters, a pile driving ban is in force from the start of January up to the end of April. However, The Netherlands have the Borssele offshore wind farm at only one kilometre away from the Belgian offshore wind farm zone, and do not enforce such an embargo. Considering the high mobility of harbour porpoises, there is a need for improved insights into the impact of pile driving noise on porpoises which can serve as a basis for an objective evaluation of the respective legal regimes.

From May to September 2016 pile driving was taking place at the Nobelwind wind farm located on the Bligh Bank in Belgium. In this period, porpoise activity was recorded using passive acoustic monitoring (C-PODs), at various distances from the construction site (1 – >15 km). In this study we compare porpoise detections before, during and after pile driving with the focus on the influence of repeated pile driving events. In addition to porpoise monitoring data, noise measurements and noise levels are extrapolated for the different locations. The data for this study were obtained from the RBINS wind farm monitoring programme and the VLIZ Lifewatch observatory.

Keywords: harbour porpoise; underwater noise; pile driving; passive acoustic monitoring