

SEAI National Energy Research, Development & Demonstration Funding Programme

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SHELLWISE – offshore renewables, underwater acoustics, and marine invertebrate health

Project Overview

The SHELLWISE project (24/RDD/1177) considers the potential negative (or neutral) impacts of noise pollution and vibration from offshore wind turbines on marine shellfish health, and will model underwater sound propagation from offshore wind farms.

Through SHELLWISE, we will close a sizeable knowledge gap for marine environmental impact assessments, helping to streamline the planning and development process for near and offshore wind farms through scientific guidance that reduces current uncertainties.

Problem Statement

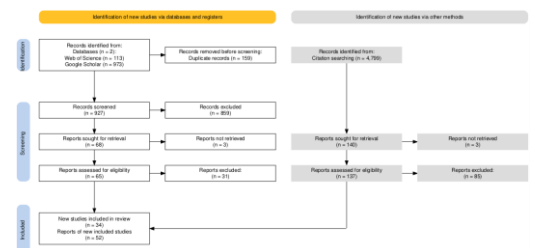
With expectations to generate 7GW from offshore wind energy systems by 2030, concerns remain regarding the immediate and long-term environmental impacts of offshore wind developments beyond perceived nuisance noise.

This matters because current policy and legislation focusses on mammals, and neglects fish and shellfish. Finfish, crustaceans, and molluscs represent the most financially important seafoods for Ireland.

There is an information deficit with respect to how invertebrates (shellfish) perceive sound, how sound travels underwater from source, and if anthropogenic (human-made) noise leads to pathology. Herein, we present up-to-date results from the SHELLWISE project and its alignment to relevant policy.

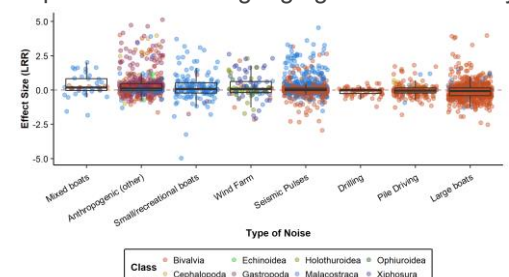
Research Methodologies

We conducted a meta-analysis following the PRISMA approach (see image below). Briefly, key search terms and *a priori* inclusion/exclusion criteria for literature were established. Over 5,800 articles were screened, yielding 86 articles in the final dataset. Each article was harvested for relevant biological information, and a series of statistical models were run to test for potential relationships between noise exposure and shellfish health-related decline.



Research Outcomes

Preliminary analysis reveals statistically 'significant' changes in marine shellfish when exposed to varied sources of anthropogenic noise. Source of noise (image below), target species, animal age, and whether data was derived from laboratory or field work are all important factors in gauging noise 'sensitivity'.



Policy Recommendations

Policy Readiness Level 1&2, 'Issue/problem identified'. Outcomes directly apply to COMMISSION DECISION (EU) 2017/848 and Level of Onset of Biologically adverse Effects used for Environmental Impact Assessments.