



SATURN

Developing Solutions to Underwater Radiated Noise

www.SaturnH2020.eu

What is the SATURN project about?

SATURN is a European research project examining solutions to the problem of underwater radiated noise caused by shipping and other vessels. We aim to fill gaps in scientific knowledge surrounding the issue of underwater radiated noise by:



Examining the Sources

Establishing which sounds are most detrimental to aquatic species and how they are produced and propagated.



Determining the Impacts

Identifying the short-term and cumulative long-term impacts of noise from shipping and boats on fish, invertebrates, and marine mammals in rivers and the ocean



Developing Solutions

Determining the most promising options for measuring and reducing the negative impacts of ship noise that can be applied to current and future vessels

What is Underwater Radiated Noise (URN)?

Although an important contributor to the EU economy, the dramatic growth in international maritime trade over the past two decades has increased aquatic noise pollution in the form of Underwater Radiated Noise (URN). URN is produced by all types of vessels, from large ships that generally emit low frequency acoustic energy (<10kHz), to smaller recreational vessels that emit higher frequency sound (10-100kHz) in shallower coastal areas or in rivers and lakes.

Sound travels faster and farther underwater than in air, so the majority of aquatic species rely on sound for vital life functions such as communication, foraging, and avoiding predators. The sound emitted by ships and boats, however, can interfere with these functions, and lead to changes in an animal's behaviour, physical development, and anatomy.

Thankfully, there are a number of ways we can reduce URN, including slowing down ships, rerouting shipping lanes to avoid sensitive areas, and implementing sound mitigation technologies on vessels.





What will SATURN deliver?

SATURN will examine how noise can be harmful to individual animals and whole populations, which sounds are the most harmful, what the mechanisms are by which sound is produced, and which technologies best reduce the most harmful sounds. To achieve these aims, we will:

))) Develop Standards & Methods

for terminology, methodology, tools and metrics that measure the impacts of noise from shipping and boats. This includes spatially mapping particle motion, quantifying URN in shallow water, and defining standards for sound exposure experiments to ensure lab results can be translated to field populations.

))) Quantify Ship Underwater Radiated Noise

as an essential first step towards quantifying the dose and frequency range of noise to which animals can be exposed. Although the technology for measuring and predicting URN from naval platforms and research vessels is well developed, its application to other vessel types will be better understood.

))) Quantify Sound Exposure at Individual and Population-Level

using state-of-the-art miniature tags attached to marine mammals, which will give us a better understanding of where, when, and how wild animals are exposed to ship noise.

))) Quantify Individual & Population-level Responses

by assessing the impact of URN on representative aquatic species, including invertebrates, migratory fish, and three species of marine mammals. Both acute and cumulative effects will be measured.

))) Develop and Assess Mitigation Solutions

by evaluating which are the most feasible and effective methods to mitigate the effects of URN exposure. The benefits and costs of these solutions will be weighed up and presented in terms of capital and operational expenditures.

))) Engage Stakeholders & Raise Awareness

by involving a multidisciplinary stakeholder group in all stages of the project and continuously communicating our research and raising awareness of the issue of URN.

Our Consortium

SATURN is a multidisciplinary consortium that brings together expertise from disciplines such as bioacoustics, maritime engineering, shipping, and other fields to engage stakeholders to develop solutions to the problem of URN. Our consortium is made of 20 partner institutions from across Europe, with coordination by University College Cork at MaREI, the SFI Centre for Energy, Climate, and Marine.

 Contact us at saturn@ucc.ie.

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