

## **THE SLOVENIAN INITIATIVE IN UNDERWATER NOISE STUDIES**

### **Introduction**

The sound naturally present in the underwater environment is produced by wind, waves and thunder, as well as by animals. Human activities cause additional sounds, perceived as underwater noise, which can cause additional pressure on the marine ecosystem. Underwater noise is caused by numerous human activities such as shipping, sonars, pile driving, dredging activities, offshore windfarms and oil and gas exploration activities. These sources can emit underwater noise at frequencies within the spectrum used by marine animals for communication and orientation. Excessive noise can cause physical, physiological and behavioural effects on the marine fauna in the area of its generation.

Noise levels in the Slovenian sea are influenced mainly by marine traffic, coastal construction and tourism. Sound propagation in the water is influenced by the shape of the seabed and the type of substrate on the sea floor. The Slovenian sea is very shallow, so that reflections of noise from the seafloor and the sea surface (echo), add up to noise levels higher than those from the actual noise input. Dolphins living in the area have been observed to change their behaviour during the tourist season, keeping their distance from the coast, probably in response to the increased numbers of smaller vessels. The impact on marine mammals, fish and other organisms is still under investigation.

### **Activities in the field of underwater noise in Slovenia**

The Slovenian Ministry of the Environment and Spatial Planning is responsible for implementation of the European Union's Marine Strategy Framework Directive – MSFD (Directive 2008/56/EC, hereinafter referred to as the Marine Directive) in Slovenia, which sets the framework for implementing measures of the European Community in the field of marine environment policy. The aim of the Marine Directive is to protect more effectively the marine environment across Europe and achieve a Good Environmental Status (GES) for the marine waters by 2020. Each Member State has to prepare a Marine Strategy for its marine waters that includes an initial assessment, determination of GES and environmental targets, together with establishment of monitoring and a program of measures by 2015. One of the descriptors important in achieving the GES of marine waters is underwater noise, which was also covered by Slovenian environmental legislation after adoption of the Marine Directive.

The Institute for Water of the Republic of Slovenia coordinated the preparation of an expert basis for the first six-year period of the implementation of the Marine Directive, involving the participation of a number of professional institutions. In the period 2011–2015, the first short-term measurements of underwater noise were made in Slovenia and, from 2015 onwards, they were carried out on a continuing basis at the stationary underwater noise measurement station that was installed on the lighthouse of Debeli Rtič, at the Slovenian coast.

In June 2016, the Institute for Water of the Republic of Slovenia prepared the technical basis for the Program of Measures for Descriptor 11 – underwater noise. In July 2017, the Government of the Republic of Slovenia adopted, in accordance with the Marine Directive, the Program of Measures that also includes measures to limit and control the introduction of underwater noise as the last step in the first implementation cycle of the Marine Directive.

Representatives of the Institute for Water of the Republic of Slovenia have been involved in the European Union's Technical Group on Underwater Noise and other forms of Energy (the EU's TG Noise) since adoption of the Marine Directive in 2008. TG Noise produced the Monitoring Guidance for Underwater Noise in European Seas in 2014. This guidance provided EU Member States with the information needed to set up monitoring in their marine waters, as required in the MSFD.

The Institute for Water of the Republic Slovenia collaborates in the QUIETMED project – a Joint program on noise (D11) for the implementation of the Second Cycle of the MSFD on the Mediterranean Sea. The project is co-financed by the European Union, in which ten partners from eight EU countries collaborate: Spain, France, Italy, Slovenia, Monaco, Malta, Croatia and Greece. The coordinator of the project is Centro Tecnológico Naval y del Mar from Spain. The proposal aims at stronger coordination between member states that share marine regions and sub-regions, in order to increase the conservation status and the level of protection of the marine species of the Mediterranean Sea against damage caused by the underwater noise resulting from anthropogenic activities. The QUIETMED project aims to improve the level of coherence and the comparability of the implementation of the second cycle of the Marine Directive (MSFD) as regards Descriptor 11 – underwater noise implementation in the Mediterranean Sea Basin Region by enhancing cooperation among Member States, the Barcelona Convention and other third non-EU countries. Common approaches will be set to the GES and the definition of thresholds, guidance on methodologies and policy recommendations for the review of the national assessment and the environmental targets and a regional joint register on impulsive noise.

For more information about the QUIETMED project, please consult the following document and web site:

- QUIETMED project presentation
- QUIETMED project official web site: <http://www.quietmed-project.eu/>