

## SUMMARY OF FINDINGS

### STRIVE Report No. 96

#### Assessment and Monitoring of Ocean Noise in Irish Waters

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Anthropogenic noise is now recognised as a significant pollutant in the marine environment and there is a growing interest from the scientific community, policy makers and the general public on the effects of anthropogenic noise on marine life.

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**Key Words: Noise, Marine Strategy Framework Directive, Indicator.**

#### Background

The Marine Strategy Framework Directive (MSFD) has developed criteria under Descriptor 11 Noise to define, identify and quantify anthropogenic sound sources, encompassing both low and mid frequency impulsive sound (Indicator 11.1.1) and low frequency continuous sound (Indicator 11.2.1). This report is part of a project on the assessment and monitoring of ocean noise in Irish waters, addressing both Indicators and is a key delivery on behalf of Ireland meeting obligations under MSFD. Indicator 11.1.1 addresses noise sources from seismic surveys, sonar, pile driving, acoustic deterrents and the use of explosives. Seismic surveying is the primary technique used in the search for oil and natural gas reserves and is a major sound source of concern when assessing low and mid frequency impulsive sound in Irish waters.

#### Findings/Recommendations

1. This report aims to assess the pressure of impulsive low and mid frequency sounds across the Irish EEZ by quantifying seismic activity at specific geographic locations within Irish waters, helping Ireland to fulfil requirements under MSFD. Details of seismic surveys conducted in waters under Irish jurisdiction from 2000-2011 were obtained from the Petroleum Affairs Division (PAD) of the Department of Communications, Energy and Natural Resources.
2. To quantify seismic activity methodology incorporating *bang days*, as proposed by the Technical Sub Group of MSFD Descriptor 11, was used. Bang days were defined as 'days in which data from seismic surveying were

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- acquired' assessed in cell blocks of 10 minutes latitude by 12 minutes longitude.
3. To investigate the development of seismic survey equipment, surveys conducted from 2000 to 2011 in Irish waters were categorised based on the volume of the airgun array in cubic inches. Larger volume arrays are deemed likely to produce louder noise than smaller volume arrays and so volume was used here as a proxy for noise level.
  4. Between the years of 2000 and 2011, a total of 44 seismic surveys have been conducted in waters under Irish jurisdiction. The number of active offshore authorisations has been steadily increasing since 2002 reaching a total of 42 active authorisations in 2011. The year 2011 also reported the greatest number of granted offshore authorisations indicating a potential rise in seismic activity in the coming years.
  5. Noise maps were generated across the years 2000-2011 for bang days and array volume. Analyses of seismic exploration between the years of 2000 and 2011 revealed specific areas of interest to the oil and gas industry namely quadrants Q11, Q12, Q18, Q19, Q27, Q25, Q43, Q48, Q49, Q50 and Q57. The most commonly used array volume in Irish waters between 2000 and 2011 was >3000- 4000 cubic inches. The emergence of larger volume airgun arrays occurred in 2007 and in 2011 array volumes used in seismic surveying exceeded 8000 cubic inches.

### Conclusion

This report has highlighted specific geographical areas with a greater frequency of seismic exploration and additionally highlighted specific geographical areas that have been surveyed using the larger volume arrays. This report was completed as part of a research project (2011-W-MS-6) undertaken by Galway –Mayo Institute of Technology (GMIT) which was funded by the Irish Environmental Protection Agency (EPA) Science, Technology, Research and Innovation for the Environment (STRIVE) Programme 2007– 2013 and by the Irish Government on behalf of the Department of the Environment, Community and Local Government.

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