Evolution of Marine Noise Pollution Management

CNR-ISMAR

Abstract*—This paper will review landmarks in American and European marine noise science and management, reflecting a changing scientific and regulatory focus from acute, near-field effects on beaked whales to impacts on a wider range of species and their "acoustic habitat" over broader temporal and spatial scales. Increases in the scale of noise associated with human activities has led to greater levels of research and management. Although mitigation within the United States and Europe is principally aimed at reducing risk from acute effects of individual activities, regulators are moving in significant ways towards cumulative, multi-sectoral impact management. Solutions to be discussed include source-quieting methods and technologies for commercial shipping, pile driving, and seismic survey noise; spatial management through the use of programmatic and strategic environmental assessments, particularly for active sonar; and noise budget caps-for example, as a potential outcome of the European Union (EU) Marine Strategy Framework Directive. This paper also will identify the most pressing data needs for conservation management, including data on impacts (e.g., the impacts of offshore windfarm construction and operation on baleen whales), effective mitigation methods and technology (such as noise reduction standards for individual commercial ships), and cumulative effects (including impacts of chronic stress on cetacean morbidity, survival, and reproduction).

I. Introduction

This document provides a paper-style view of the Research Object (RO) "*Evolution of Marine Noise Pollution Management*"[1] generated . The RO has been created, managed and preserved via ROHub platform [1]. Please refer to [2] for a general introduction to the RO concept, to [3] for a detailed description of the RO model, and to [4] for more information about ROHub platform.

The RO is of type *"Bibliographic", which is intended mainly for the aggregation of bibliographic resources, bibliographic references, or documents (e.g., grey literature) that are a relevant to a specific topic.* [2].

Additionally, this RO has been enriched automatically with the following annotations:

- concepts (most frequently mentioned in the RO): *effects, management, methods, impacts, Management, European Union, impact, technologies*
- domains (fields of knowledge in which the main concepts are commonly used): *marine biology, ecology*
- frequent expressions (most frequently mentioned noun phrases): *outcome of the European Union, impact management*
- named entities (most frequently mentioned):
  - Places: *United States of America*

[1] *http://sandbox.rohub.org/rodl/ROs/cnr-biblio-resource-88-1/*

[2] See RO types definitions at http://w3id.org/ro/earth-science#

II. Resources

The resources encapsulated by the RO are summarized in table I

TABLE I
Research Object Resources

name	size	type
bibliographic-entry-111.txt	1.5 KB	BibliographicResource

Acknowledgment

The Research Object was uploaded to ROHub by *Generation Service*. ROHub portal development was supported by EVER-EST EU project (HORIZON 2020 grant 674907).

References

[1] The Research Object Management Platform - ROHub http://www.rohub.org/.

[2] K. Belhajjame, O. Corcho, D. Garijo, J. Zhao, P. Missier, D. Newman, R. Palma, S. Bechhofer, E. García Cuesta, J. M. Gómez-Pérez, S. Soiland-Reyes, L. Verdes-Montenegro, D. De Roure, and C. Goble "Workflow-Centric Research Objects: First Class Citizens in Scholarly Discourse", Proceedings of Workshop on the Semantic Publishing, SePublica Crete, Greece 28 May 2012.

[3] Belhajjame K., Zhao J., Garijo D., Gamble M., Hettne K., Palma R., Mina E., Corcho O., Gómez-Pérez J. M., Bechhofer S., Klyne G., Goble C. "Using a suite of ontologies for preserving workflow-centric research objects", Journal of Web Semantics: Science, Services and Agents on the World Wide Web Available online 11 February 2015 ISSN 1570-8268.

[4] Palma R., Corcho O., Gómez-Pérez J. M., Mazurek, C. "ROHub - A Digital Library of Research Objects Supporting Scientists Towards Reproducible Science". In Semantic Publishing Challenge of Proc. Extended Semantic Web Conference (ESWC) Crete, Greece 25-29 May 2014