

Marine Environmental Mitigation Plan (MEMP)
for DY151 (SME 18/785 and 19/1086):
“Shipping Emissions in the Arctic and North
Atlantic Atmosphere (SEANA) Intensive”
and
“M-Phase: Resolving Climate Sensitivity
Associated with Shallow Mixed Phase Cloud in
the Oceanic Mid-to-High Latitudes”

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Ship: RRS *Discovery*

16/05/2022 Reykjavik, Iceland – 27/06/2022 Southampton, UK

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INTRODUCTION

The mitigation plan accompanies the EIA and is a set of recommended guidelines specific to each project, with the aim being to minimise impacts to the marine environment of the scientific activities associated with the research project. Any mitigation that is recommended for the project is described in each section.

The following document lists the recommended best-practice mitigation measures to be taken regardless of diplomatic clearance requirements, which will be incorporated into this MEMP when required. This has been prepared based on the information provided by the Principal Investigator (PI). The table at the end of this plan summarises the recommended mitigation measures, and is designed to act as a checklist to complete throughout the cruise process. This table should be completed by the PI and returned to the Marine Environment Appraiser (MEA) at the end of the cruise, including any feedback to describe which recommendations were followed and whether there were any challenges in implementing them.

POTENTIAL IMPACTS AND MITIGATION MEASURES

ACOUSTIC-BASED DATA COLLECTION

The NERC Marine Environment Interaction Plan (MEIP), on which this MEMP and associated EIA are based, follows the JNCC guidelines for mitigation for acoustic-based data collection, regardless of the geographic location of the research activities. The JNCC guidelines (JNCC, 2017) recommend that for multibeam echosounders, side-scan sonar, and sub-bottom profilers, if several different types of equipment are to be started up consecutively or interchanged during the cruise, only one pre-start search of the mitigation zone is required, only if there are no gaps of greater than 10 minutes in the data acquisition. If there is a gap of more than 10 minutes in the data acquisition, this should be treated as a new start-up.

Swath Bathymetry

Before-sea mitigation planning:

At least one member of the scientific or technical parties should be trained as a Marine Mammal Observer (MMO) (as defined in Appendix 1) and should be available during the pre-start and start-up. A non-dedicated MMO (as defined in Appendix 1) may be used. If it is not possible to have a JNCC-trained MMO, anyone may undertake this role (JNCC 2017; MEIP 2018).

At-sea mitigation measures:

Recommended best-practice mitigation guidelines are as follows:

- 60 minutes of observation focusing on the mitigation zone (500 m from the acoustic source) should be undertaken.
- If marine mammals are observed during the search, start-up should be delayed at least 20 minutes from the time of the last detection within the mitigation zone.
- A soft-start (as defined in Appendix 1) should be enacted if the equipment allows.
- Any observations of marine mammals should be recorded on the forms provided by JNCC – an MMO is only necessary before and during the start-up of equipment, and not for the whole time it is running. However, if a marine mammal is sighted by anybody during the cruise, it can be reported to and recorded by the MMO. (Recording forms can be downloaded at http://jncc.defra.gov.uk/marine/seismic_survey).
- Refer to JNCC Guidelines section 2.2 and MEIP Appendix 5 for more detail.

Post-cruise:

- Recording forms should be submitted to JNCC.

- Provide feedback describing what mitigation measures were taken.

DRAFT

APPENDIX 1: GLOSSARY OF TERMS

The following are definitions taken from the JNCC Guidelines (2017).

Marine Mammal Observer (MMO): Someone who has been on a JNCC MMO training course. This person is responsible for carrying out searches of the mitigation zone prior to the start-up of certain acoustic equipment. They may be part of the scientific/technical party or a member of the ship's crew.

Non-dedicated MMO: A JNCC trained MMO who may also have other roles on the cruise other than being MMO.

Soft-start: The gradual ramp-up in power of an acoustic source, usually over a period of 20 minutes, until it is at full power.

REFERENCES

JNCC (2017). JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys. Accessed at: http://jncc.defra.gov.uk/pdf/jncc_guidelines_seismicsurvey_aug2017.pdf

NERC (2018). Marine Environment Interaction Policy. Accessed at: <https://nerc.ukri.org/research/sites/facilities/marine/guidance/marine-environment-policy/>

MITIGATION CHECKLIST

Table 1. Timeline and check-list of mitigation measures required for project. Once completed, task should be signed off under "Completed by" and dated under "Date Completed." This table is to be completed and returned to the MEA (es.eia@durham.ac.uk) following the cruise.

Mitigation Measures	Completed by	Date Completed	Comments
SWATH BATHYMETRY			
<i>Before-sea mitigation planning:</i> 1. Nomination of MMO.			
<i>At-sea mitigation measures:</i> 1. Follow JNCC mitigation guidelines as described in MEMP/JNCC guidelines.			
<i>Post-cruise:</i> 1. Recording forms sent to JNCC.			