



# Attachment 4.1: Alignment with NMPF Objectives

A MISSING-Link between continental shelves and the deep sea: Addressing the overlooked role of land-detached submarine canyons.

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## 1. Introduction

The National Marine Planning Framework (NMPF) is Ireland's marine spatial plan and sets out a long-term vision for sustainable use of the marine area, prepared using an ecosystem-based approach and informed by the best available knowledge. The proposed maritime usage is strongly aligned with the objectives and approach of Ireland's NMFP, and in particular with the overarching "Environment – Ocean Health" high-level objective and Ocean Health Policy 1, which links to policies on biodiversity, water quality, sea-floor and water column integrity and marine litter, and will contribute to relevant Marine Strategy Framework Directive (MSFD) targets. In the following text we outline some of the synergies identified with specific NMPF objectives and policies as well as how the proposed research project is consistent with the others. or consent application.

Our proposed project's primary purpose is scientific environmental monitoring and characterisation of deep-sea canyons and channels in Irish waters (Whittard Canyon and Gollum Channel). It will:

- Improve understanding of natural particle, nutrient, carbon and pollutant transport from the shelf to the deep sea.
- Provide baseline and process-based data for key deep-sea habitats that are currently poorly understood.
- Directly support implementation of the MSFD and related EU environmental directives, which the NMPF explicitly uses as a foundation for its Environmental – Ocean Health objective.

### 1.1. Link to Overarching Objective – Ocean Health

Because the activity is research-led, time-limited, low-impact and reversible, and is expressly designed to support good environmental status (GES) assessment and management, we consider that is consistent with the NMPF's overarching environmental objective.

Our proposed project aims will assist in providing a more detailed environmental characterisation in key deep-sea sites in Irish waters that will provide significant benefits associated high level objective "Environmental Ocean Health (Policy1)", which is particularly well-aligned with UN Sustainable Development Goal 14 (Life Below Water) and the Marine Strategy Framework Directive (MSFD) of the European Union (Directive 2008/56/EC) and Commission Decision (ED) 2017/848. These policies, goals and directives underpin Ireland's MSFD, which aims to determine, achieve and maintain Good Environmental Status (GES) based on 11 qualitative condition descriptors, which in turn inform the environmental aspects of maritime spatial planning under Directive 2014/89/EU. Our proposed project will provide new data that align with several of these condition descriptors, which are important for the assessment of GES and are outlined below.

**Descriptor 1 (Marine biodiversity):** The MSFD objective is to ensure that "The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions". Our project will acquire high resolution seafloor maps (using an Autonomous Underwater Vehicle that will provide unprecedented resolution of the seafloor) and video surveys (using a Remotely Operated Vehicle) that can be used as the basis for detailed habitat mapping within important deep-sea features – namely the submarine canyons of Whittard Canyon and Gollum Channel that provide important physical habitats and that are known to host important deep-sea biodiversity. These can be compared against previous surveys to ascertain whether or how health and biodiversity has changed and to provide a new high quality baseline to compare with future surveys. This

biodiversity includes cold-water coral species that locally occur on hard substrate within the planned study areas, with activities being carefully planned to ensure that the placement of moorings and physical sampling does not interact with such organisms and their habitats. We recognise that Ireland is seeking to improve its knowledge of deep-sea habitats through a (e.g. through Integrated Mapping for the Sustainable Development of Ireland's Marine Resource (INFOMAR) and we will provide data that we acquire to contribute towards this initiative, which links to Ireland's Habitats Directive and informs marine spatial planning. Our proposed project links closely to the Objective 5 of Ireland's National Biodiversity Action Plan 2017-2021 that aims to "conserve and restore biodiversity and ecosystem services in the marine environment" with a specific goal aiming to "implement measures to achieve good ecological and environmental status of marine and coastal habitats as required by the Habitats, Directive, Water Framework Directive and Marine Strategy Framework Directive (MSFD) and in line with the OSPAR Convention (Convention for the protection of the marine environment in the North-East Atlantic)".

**Descriptor 6 (Seabed integrity):** The MSFD objective is that "Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected". The proposed project will involve detailed video surveys of the seafloor within Whittard Canyon that will provide scientifically valuable datasets that can be used to provide a baseline – and shallow seafloor sediment sampling (using box coring or multicoring) will acquire samples that will be analysed to assess the levels of organic carbon and nutrients that are important to understand the services provided by the seafloor to deep-sea ecology. The quantification of organic carbon content in seafloor sediments is also important to ascertain the role deep-sea settings such as canyons play in sequestering carbon, which links to the MSFD Policy on climate change, which recognises the need to understand the service played by the seafloor in locking up carbon.

**Descriptor 7 (Hydrographical conditions):** The MSFD objective is to ensure that "permanent alteration of hydrographical conditions does not adversely affect marine ecosystems". In order to assess this, there is first a need to characterise the ranges in background natural hydrographical conditions, yet such monitoring or measurement in deep-sea settings such as Whittard Canyon and Gollum Channel is sparse and even when performed, is rarely close to the seafloor nor over a sustained period of time. The proposed project will undertake first of their kind measurements of near-seafloor currents (vertically resolved from 0-30 m above seafloor at 5 locations in Irish waters) to make unique measurements of internal tides and turbidity currents that transport nutrients, natural sediment, pollutants and oxygenated waters between shallow and deep waters, and modulate the local temperature. These measurements will provide scientifically valuable data that will update the understanding of these deep sea sites and inform future planning and decision making.

**Descriptor 8 (Contaminants) and Descriptor 10 (Marine litter):** The MSFD objectives include ensuring "concentrations of contaminants are at levels not giving rise to pollution effects", "concentration of contaminants in marine matrices assessed in accordance with OSPAR Coordinated Environmental Monitoring Programme (CEMP) do not exceed OSPAR Environmental Assessment Criteria (EAC) and concentrations are not increasing", "properties and quantities of marine litter do not cause harm to the coastal and marine environment", "the composition, amount and spatial distribution of litter in the coastline, and on the seabed, are at levels that do not cause harm to the coastal or marine environment" and "the composition, amount and spatial distribution of litter in the coastline, and on the seabed, are at levels that do not cause harm to the coastal or marine environment". For all of these, there is a need to build an evidence base but this is currently sparse in the deep-sea. Recent studies have proven that deep-sea canyons and channels can be the focal point for pollutant and litter transport and accumulation, but with little understanding of sources, pathways and locations

of pollution/litter accumulation on the seafloor. Commission Decision 2017/848 stated that establishing that the “properties and quantities of marine litter do not cause harm to the coastal and marine environment” is central to determining good environmental status. The MSFD states “The extent of the marine litter problem and the harm it causes to the environment has yet to be fully established and is subject to ongoing research, although the scale of marine litter pollution is concerning”. Commission Decision 2017/848 also requires micro litter to be considered, building on the EU Joint Research Council (JRC) report Harm Caused by Marine Litter. Through seafloor mapping and sampling, our proposed project aims to address this knowledge gap and develop a new understanding that will feed into assessment of contaminant (including microplastics) and litter type and concentration in the deep sea, its spatial extent relative to key seafloor ecosystems and habitats, how it is transported and its ultimate fate. Our proposed project links directly to Objective 2 of Ireland’s National Biodiversity Action Plan 2017-2021 that aims to “strengthen the knowledge base for conservation, management, and sustainable use of biodiversity” with a specific goal to “conduct research into the threat posed to Ireland’s marine biodiversity by marine litter including microplastics...”.

**Descriptor 11 (Energy including underwater noise):** The MSFD aims to ensure that the “introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment”. Our proposed project will involve the use of directional, high frequency acoustic sources that generate some underwater noise and as a result, we have sought advice from the Derogation Administration Team of the National Parks and Wildlife Service to apply for a derogation licence, and will demonstrate compliance with applicable legal requirements, such that we mitigate significant adverse impacts on noise sensitive marine fauna.

## **1.2. Link to Overarching Objective – Economic – Thriving Maritime Economy**

Our project will be a short-lived one with no permanent structures installed, with no interactions with other economic activities. We will report information around seafloor currents that can pose a hazard to subsea telecommunications cables, which will be shared through our existing research collaborations with the European Subsea Cables Association and International Cable Protection Committee which will help to ensure the design of more resilient and robust telecommunications cable connections to Ireland.

## **1.3. Link to Overarching Objective – Social – Engagement with the Sea**

Our project will be far from shore and will not have any impacts on public access, landscape or seascape. The project will increase the understanding of the marine environment, particularly poorly understood deep-sea settings, acquiring data that will promote conservation management, and providing new data that can be used across all levels of education.

## **2. Other Considerations:**

### **2.1. Non-Indigenous Species (NIS) under Ocean Health Policy 1.**

- The project does not involve movement of live organisms, ballast water discharge, aquaculture, or other vectors that typically introduce non-indigenous species.
- Vessels, gliders, moorings and AUV/ROV systems can be managed under existing good practice (e.g. hull-fouling and biosecurity protocols), so risk of NIS introduction is extremely low.
- Sampling and video surveys may provide incidental data on non-native species presence or absence, supporting MSFD Descriptor 2 assessments.

Hence the project is functionally neutral to slightly positive with regard to NIS policy objectives.

## **2.2. Water quality, contaminants and pollutant pathways**

- The core objective includes characterising transport of pollutants, including microplastics, from shelf to deep sea, directly supporting MSFD water quality and contaminant descriptors.
- Sediment coring and water-column sampling (using CTD, turbulence sensors and samplers on gliders and AUV) will quantify the distribution and fate of pollutants, nutrients and organic carbon, providing data needed to understand cumulative impacts and to manage pressures.
- The project does not involve discharge of pollutants or chemicals beyond routine, tightly controlled ship operations governed by MARPOL and standard research vessel procedures.
- The focus on microplastics and other pollutants directly supports national efforts to address marine litter and contaminant targets under the MSFD, which the NMPF explicitly seeks to achieve.

We hope that the project can assist with strengthening policy implementation capacity on water quality and pollution, rather than adding new pressure.

## **2.3. Seafloor and water column integrity**

- Oceanographic moorings are:
  - Temporary (approx. 12-month deployment).
  - Localised (five sites, each a short ~30 m vertical line).
  - Without surface expression, minimising navigational interactions.
  - Designed to rest on the seabed with a small footprint anchor and suspended instruments.
- Gliders, AUV (Autosub5) and MPUS operate throughout the water column and are designed not to contact the seafloor, flying above it during mapping and video surveys.
- Sediment coring causes localised, small-scale disturbance only at specific sampling stations and is standard practice in environmental science. The total removed volume (11.1 m<sup>3</sup>) is negligible in the context of the scale of Whittard Canyon and Gollum Channel.
- By deploying ADCPs, sediment traps and turbulence sensors, the project will quantify natural sediment transport and seabed process dynamics, improving understanding of how to maintain seafloor and water-column integrity under future pressures.

Thus, we consider that the work is proportionate, reversible, and will support evidence-based management of seafloor and water-column integrity.

## **2.4. Marine litter and underwater noise**

- All instruments (moorings, gliders, AUV, MPUS) are designed for full recovery at the end of each deployment; there is no intentional abandonment of equipment.
- Operational procedures can ensure that no plastics, packaging or other materials are deliberately discharged, in line with MARPOL and best practice.
- The project's focus on microplastics transport directly advances understanding of marine litter pathways to the deep sea, supporting MSFD Descriptor 10.

## **2.5. Underwater noise**

- The project uses standard scientific echosounders, sonars and acoustic profilers (ADCPs, multibeam, side-scan, sub-bottom profiling), which:

- Are short-term and intermittent during survey lines.
- Are similar in nature and intensity to widely accepted survey practices.
- No high-power seismic airgun arrays or explosive sources are proposed.
- Deep-water operations in canyon systems further reduce overlap with many sensitive coastal receptors.
- These activities can be scheduled and operated consistent with best practice for underwater noise minimisation, supporting Ocean Health Policy 1's expectation that developments address acoustic pressures.

As such, the project keeps additional noise and litter pressures low and temporary, while providing data to manage them better in future.

## **2.6. Marine data, monitoring and decision-making**

The NMPF explicitly highlights the importance of Ireland's Marine Atlas and other data platforms to support evidence-based marine planning and to meet MSFD, Water Framework Directive and other reporting requirements.

The project can contribute to that evidence base because it will:

- Generate high-resolution physical, chemical and biological data in areas where existing information is sparse.
- Provide longer-term time series from moorings and gliders, complementing ship-based snapshots.
- Produce interpreted maps of seafloor morphology, habitats and sediment pathways relevant to future marine spatial planning, potential MPAs or other conservation measures.
- Is funded by a reputable public research body (UK NERC) and undertaken by established marine research organisations, aligning with the NMPF's emphasis on science-informed management and collaboration.

## **2.7. Co-existence with other marine users and navigational safety**

The proposed project:

- Has no permanent structures; all moorings, gliders and AUV deployments are temporary.
- Uses mooring systems with no surface expression, minimising interactions with shipping and fishing.
- Will typically be accompanied by standard Notices to Mariners and appropriate charting information, helping other sea users plan around temporary activities.
- Operates largely sub-surface and offshore, away from the most intensively used navigation and coastal recreation areas.

Accordingly, the project is fully compatible with NMPF objectives around safe, efficient and co-ordinated use of the marine area.

## **2.8. Contribution to international and transboundary commitments**

The NMPF sits within a broader framework of EU and international obligations, including the MSFD, the MSP Directive, and UN Sustainable Development Goal 14 (Life Below Water).

The proposed project can:

- Support Ireland's ability to determine, achieve and maintain Good Environmental Status under the MSFD, by providing data across multiple descriptors (biodiversity, contaminants, litter, seafloor integrity, noise).
- Contributes to SDG 14 through improved knowledge of deep-sea ecosystems and pollutant pathways.
- Involves transboundary scientific cooperation between UK and Irish interests in shared marine areas, consistent with the NMPF's emphasis on co-operation with neighbouring states on marine environmental issues.

### **3. Conclusions**

The proposed maritime usage:

- Is environmental research-focused, low-impact, temporary and reversible.
- Should assist with contributing to Ireland's ability to protect and restore ocean health, especially in deep-sea habitats that currently lack detailed data.
- Supports implementation of the MSFD, MSP Directive and SDG 14, which underpin the NMPF.
- Is clearly consistent with, and supportive of, Environmental – Ocean Health Policy 1 and associated NMPF policies on biodiversity, non-indigenous species, water quality, seafloor and water column integrity, marine litter and underwater noise.