

MASTS Dynamics and Properties of Marine Systems Theme Case Study

Faroe-Shetland Channel and West of Scotland Marine Protected Area Summary Report

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17th -19th November 2020

Report to the Marine Alliance for Science and Technology for Scotland (MASTS)

1) Workshop Introduction

The Dynamics and Properties of Marine Systems Theme within MASTS supported a Case Study on the Atlantic approaches to the Scottish continental shelf and slope, coordinated by University of Edinburgh, Marine Scotland Science and JNCC. This case study includes the Faroe-Shetland Channel (FSC) region and the West of Scotland Marine Protected Area (MPA).

a. **The Faroe-Shetland Channel (FSC)**

Separating the Faroese and Scottish continental shelves, the FSC is one of three regions in the Atlantic Ocean where water masses exchange with the Arctic Mediterranean, creating complex hydrographic conditions with five different water masses. The presence of warmer Atlantic and cooler Arctic waters within the FSC enables the presence of a multitude of key deep-sea habitats and species (such as ocean quahogs, sponges, and polychaetes). In 2014, the Faroe-Shetland Sponge Belt and North-east Faroe-Shetland Channel Nature Conservation Marine Protected Areas (NCMPAs) were designated to help protect these habitats. The FSC is also a region of economic importance: shipping, fishing and hydrocarbon extraction take place within the channel and telecommunication cables cross it. Over the years, data from the region have been gathered by a wide range of governmental, academic and industrial institutions. With several key projects coming to an end, it is timely to consolidate the knowledge available from the FSC and identify outstanding research priorities.

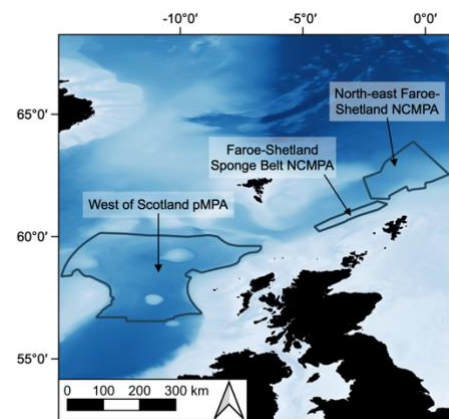


Figure 1 Case Study Area Geographic Extent

b. **The West of Scotland MPA (WoS MPA)**

The West of Scotland MPA is 107,773 km² in size. It covers a diverse marine landscape to the west of Scotland; from the steep gradient of the continental slope across the sediment plains of the Rockall Trough, to the slopes of George Bligh Bank and Rockall Bank including two isolated seamounts (Anton Dohrn and Rosemary Bank). The deep seas around Scotland are home to some of the most vulnerable habitats and species on earth with deep-sea ecosystems providing a range of benefits to society, including nutrient cycling and carbon storage. The MPA is designated for both habitat (including coral gardens and deep-sea sponge aggregations) and species features (including orange roughy and leafscale gulper sharks), ten of which are on the OSPAR list for threatened and/or declining species & habitats.

c. **Case Study Workshop**

An online workshop took place between the 17th and 19th of November to explore the following key aims:

- Consolidate the available scientific knowledge available in the region
- Identify knowledge and research gaps, including but not limited to climate change, anthropogenic pressures, and the distribution and life history characteristics of cetaceans, benthic habitats and deep-sea fishes as well as the natural capital and ecosystem services these provide
- Explore options to drive forward research in these areas through the development of a deep-sea science advancement plan
- Develop collaborations across disciplines and sectors to seek future funding

2) Workshop Participants

In alphabetical order:

Lydia Bach (U. Glasgow)
Elena Balastrì (SFF)
Bee Berx (MS)
Brian Bett (NOC)
Grant Campbell (MSS)
Neil Campbell (MSS)

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Pete Chaniotis (JNCC)
 Alice Cornthwaite (JNCC)
 Jim Drewery (MSS)
 Alejandro Gallego (MSS)
 Hjalmar Hatun (Havstovan/Faroe Marine Research Institute)
 Elly Hill (JNCC)
 Penny Holiday (NOC)
 Kerry Howell (U. Plymouth)
 Veerle Huvenne (NOC)
 Clare Johnson (SAMS)
 Georgios Kazanidis (UEDIN)
 Eirian Kettle (JNCC)
 Jenn Lawson (JNCC)
 Ellen Last (JNCC)
 Fionnuala McBreen (JNCC)
 Katherine Needham (U. Glasgow)
 Les Noble (U. Aberdeen)
 Joey O'Connor (JNCC)
 Oliver Peppe (BGS)
 Berit Rabe (MSS)
 Laura Robson (JNCC)
 Margaret Stewart (BGS)
 David Stirling (MSS)
 Johanne Vad (UEDIN)
 Nienke Van Geel (SAMS)
 William Austin (U. St Andrew)

3) Workshop Programme

17/11/2020	14-16	Plenary session	Introduction	Welcome to the Workshops	B. Berx	
				Agenda, Housekeeping (Zoom-iquette)		
				Objectives and outputs of the workshops		
				Presentation FSC followed by discussion		J.Vad
				Presentation WoS followed by discussion		A. Cornthwaite
				Workshop Outputs		A. Cornthwaite
				Feedback on schedule moving forward		B. Berx
18/11/2020	10-12	Breakout session	Themed discussions	Data (observational programmes and surveys)	B. Rabe	
	14-16	Breakout session	Themed discussions	Modelling (from hydrodynamic to species distribution)	J. O'Connor	
				Natural Capital & Conservation	E. Hill	
				Human Activities & Impacts	G. Kazanidis	
19/11/2020	10-13	Plenary session	Closing remarks	Welcome	J. Vad	
				Synthesis Breakout group 1	J. Vad	
				Synthesis Breakout group 2	A. Cornthwaite	
				Synthesis Breakout group 3	B. Berx	
				Discussion		
				A look back on outputs	B. Berx	
				Discussion		
				Closing remarks	A. Cornthwaite	
				Cross theme outputs: proposal 'brokerage' session	B. Berx	

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4) Summary of workshop discussions

a. Summary – Day 1

The introductory session on Day 1 of the workshop was an opportunity to set the scene to both regions, and explain to participants how the workshop would take place. During Day 2, the workshop was organised around four themed discussions and participants were split into three breakout groups to allow for efficient online interaction. A short summary of what was discussed during each breakout groups were then given in plenary at the end of each themed session. Initial ideas for workshop outputs were also considered and included: (1) a briefing note to policy makers, (2) a position paper, (3) outline of research questions and priorities.

b. Summary – Day 2

Themed Discussion 1: Data

The first breakout session of the workshop was dedicated to Data. During this session, all three breakout groups discussed the various observational programmes and surveys taking place within the FSC and WoS MPA. Three main points of discussion arose during the session across all three breakout groups:

1. Large amounts of data and physical samples remain to be analysed, particularly from the FSC. These datasets need processing which require time and funding. Some difficulty in accessing the dataset persist and the idea of creating a new database for relevant samples was mentioned.
2. The need for PhD projects or maybe a NERC DTP programme focussed on the FSC and WoS areas was highlighted. These projects (which could be linked to the United Nations Decade for Ocean Science for Sustainable Development) could make use of the data and samples collected and not yet analysed (mentioned above) and would allow for better collaborations across institutions.
3. New technologies including gliders, eDNA sampling and acoustics monitoring were highlighted as key for future surveying efforts in both areas and would contribute to closing some of the knowledge gaps identified in both areas.

Themed Discussion 2: Models

The second breakout session of the workshop was focussed on modelling efforts undertaken in both areas. Three main points of discussion were highlighted across all groups during this session:

1. There is a need for further collection of multibeam data to improve the benthic habitat modelling.
2. There is a difference between the spatial resolution provided by oceanographic models and the spatial resolution needed for habitat suitability modelling. This is not specific to the WoS and FSC areas, but it does mean that modelling of shifts occurring due to Climate Change is difficult.
3. In addition, there is a lack of knowledge of the physiological resilience of deep-sea organisms to change in environmental conditions with Climate Change. Further experimental work is needed to better understand the impacts of Climate Change on deep-sea ecosystems.

Themed Discussion 3: Natural Capital and Conservation

During the third session of the workshop, all three groups discussed the need for further deep-sea ecosystem valuation and how natural capital assessment can be used for management decisions.

Overall, talks in all three breakout groups focussed on three main points:

1. It is difficult to value natural assets from the FSC and WoS without a better understanding of the ecosystem services provided by deep-sea ecosystems in both areas. This linked the discussion of theme 3 back to the previous sessions on data and modelling.
2. Natural capital valuation and conservation of deep-sea areas will require increased awareness in the general public of deep-sea ecosystems. The need for effective public engagement and ocean literacy were highlighted.

Themed Discussion 4: Human Activities and Impacts

During the final workshop session of Day 2, breakout groups discussed how human activities lead to multiple impacts on the marine environment but can also provide collaborative opportunities for data collections and monitoring. Two key points emerged through the breakout discussions:

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1. Climate change might worsen anthropogenic impacts even if the scale of activities taking place in the area stay constant.
2. Infrastructures from industries could be used to collect measurements for long-term monitoring efforts.

c. Summary – Day 3

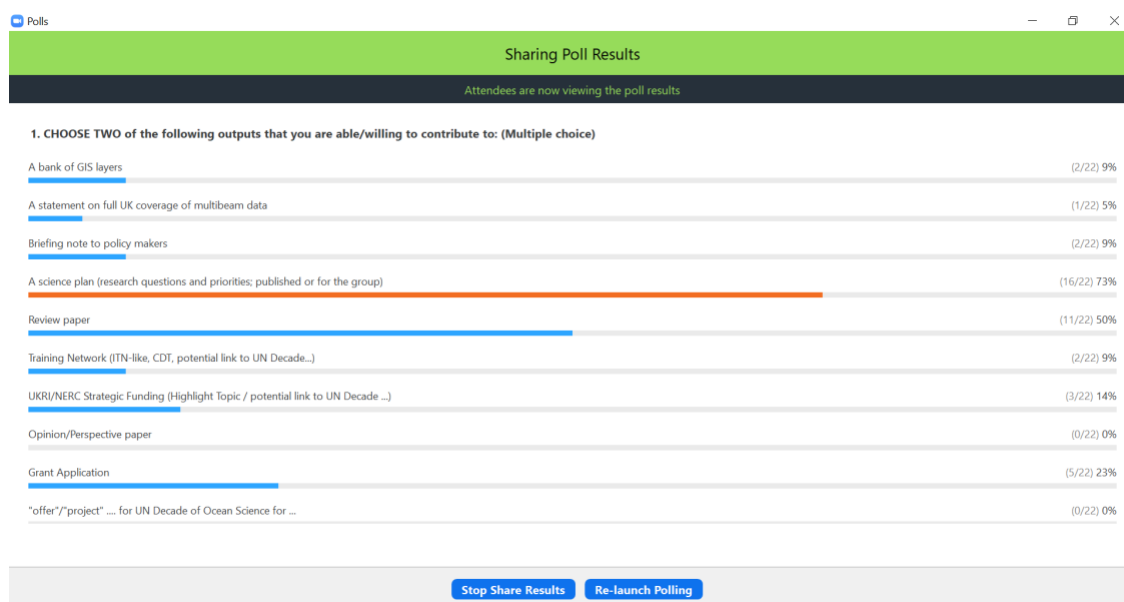
Synthesis

Following the fruitful discussions on Day 3, the first session on Day 3 provided all attendees with a summary of the discussions from each breakout group. This provided an opportunity to identify and highlight any re-occurring discussion points.

Outputs

Throughout the workshop multiple output options were identified. A series of polling questions were run during the session to identify:

- a) the scale of outputs (e.g. the two regions separately or combined) and
- b) the two outputs participants were willing and able to contribute to



It was overwhelmingly decided that the two regions should be considered together (to cover the entire FSC/WoS geographical area including Wyville Thomson Ridge). Whilst it was highlighted that different outputs may be suitable for different scales, there was little interest in individual outputs for the FSC and the WoS.

For the polls used to identify the outputs participants were willing & able to contribute to there was a clear preference in the polling results for:

- a set of research questions and priorities
- a review paper

Cross theme outputs: proposal 'brokerage' session

The aim of this session was to provide the opportunity for attendees to further discuss opportunities and ideas for collaboration. The session was well received by the participants and most stayed connected until the end of the brokerage sessions. The discussions were mostly focussed on ideas for future projects, how already collected samples and data could be analysed and collaborations in the deployment/recovery of equipment at sea.

5) Acknowledgements

We would like to thank Hannah Ladd-Jones for her assistance in organising the workshop and the logistics on running the workshop virtually.