**PROJECT PROPOSAL FORM**

Making the Most of Masters aims to improve collaboration between employers and universities by providing opportunities for postgraduate students to undertake work based projects as an alternative to a traditional university dissertation. Projects should address a real need within the host organisation and be beneficial to both host and student.

The Marine Alliance for Science and Technology for Scotland (MASTS), pools the majority of Scotland's marine research capacity. MASTS members provide Masters courses in a range of marine related disciplines and many of their students are keen to undertake applied projects outside of academia.

**Notes on Topic Selection**

A relevant academic will work with your organisation to refine your proposed topic and ensure it meets both your needs and the academic requirements of the student. Projects should typically be achievable within a 12–16 week timeframe (including writing the final report).

Your proposed project could be:

- A specific project title or topic for the student to deliver;
- A general idea of a business need which requires further development;
- A core research theme to be developed by the student into a bespoke project;
- An intended outcome for the organisation.

The level of detail you provide will determine the extent to which further discussion may be required with the relevant programme director to ensure suitability.

desk-based/data studies that will easily facilitate remote working and remote supervision are welcome, as well as in person and/or experimental based projects where appropriate.

**What's Next?**

Please send your completed form to the MASTS Programme Coordinator & Deputy Dean of Grad School, Dr Emma Defew (masts@st-andrews.ac.uk) before the deadline.

Following submission of the form, it will be channeled to the leaders of the various Masters programmes that operate within the MASTS community and a representative from the most relevant programme or department will get in touch to discuss the project scope, delivery and the selection of an appropriate student. If more than one student expresses an interest in your project, you will need to ensure discussions take place to enable the most suitable student to be matched with your project. The projects themselves usually won't start until May or June.

**MASTS - Making the Most of Masters – Project Proposal Form**

**Name and address of Organisation:**
NatureScot
Great Glen House, Leachkin Road, Inverness, IV3 8NW.

**Name of the key contact in Organisation:**
Kelly Saunders

**Contact e-mail and phone number:**
Kelly.Saunders@nature.scot

**Title of proposed project:**

Assessing the effectiveness of management measures in the South Arran MPA

**Project outline and intended outcomes:**

Monitoring within the marine environment is a fundamental part of marine conservation, allowing practitioners to assess the condition of habitats and species, and to take stock of the effectiveness of management measures. In Scotland, the monitoring of benthic habitats uses a range of metrics that measure the extent of the habitat, the density or live/dead coverage of supporting species, and the diversity of the associated infaunal and epifaunal community. However, currently metrics that consider the functional diversity of habitats are not considered.

Biological Trait Analysis (BTA) is a metric that assesses the functioning of biological communities, by focusing on the characteristics of species rather than solely on their taxonomic identity. The benefit of this metric is that it utilises data already collected during monitoring (i.e. infaunal data from cores and grabs). Previous work exploring linkages between different habitat types highlighted the potential of BTA (James et al., 2023). This MSc project will take this work further to assess if it can be used to look at the effectiveness of management measures.

The project will focus on the South Arran Marine Protected Area (MPA), where management measures have been in place for dredging and trawling since 2016. Infaunal data from sediment cores is available from 2014 and 2023, allowing for the project to compare the infaunal community from before and after the management measures were put in place. A study has been carried out to investigate differences in diversity of the infaunal community (Purdue et al., 2025). Species diversity appears to be higher in 2023 since 2014, although the statistical analysis of this was limited.

This project is suited for someone with experience with statistical analysis. Code is available to assist the student with BTA; however, the student is welcome to

develop this code further if this interests them. Whilst the project's focus is BTA, the student could also do SIMPER analysis and cluster analysis to compare core data from 2014 and 2023. Whilst SIMPER and cluster analysis was carried out for the 2023 data (Purdue et al., 2025), no comparisons of these analyses were made between the two sampling years. There is also potential for the student to look at differences in epifaunal data (Doggett et al., 2025) to see if differences in functional diversity can be measured.

The project has high impact as it will help inform future monitoring and analysis by NatureScot. Furthermore, the project will also help assess the effectiveness of management measures and if change can be detected within a few years of measures being put in place.

**References**

Doggett, M., Baldock, L., and Owen, N. 2025. 2023 South Arran dive survey: comparison with imagery data from 2014 and recommendations for monitoring method optimisation. NatureScot Research Report 1372.

James, K., Kamphausen, L., Cunningham, S. & Kent, F. 2023. Exploring biological trait analysis and inter-habitat linkages in three seabed habitat PMFs in Scotland. *NatureScot Research Report No. 1213*.

Purdue, E., Pears, S., and Worsfold, T. 2025. 2023 South Arran dive survey: infaunal and PSA analyses of diver-collected sediment samples from the South Arran MPA. NatureScot Research Report 1373.

**Any additional comments e.g. details of specific disciplines required, methods to be used, travel involved, where the work would take place (i.e. at the host site or at the University), whether you foresee any Intellectual Property or confidentiality issues (and if so, what form might these take?):**

This project suits a student who has a background in statistical analysis. It would be beneficial if the student has been introduced to analyses such as SIMPER analysis, cluster analysis and multidimensional scaling (MDS; such as PCA, CCA etc.). Some support can be offered by NatureScot, and code has been developed for a previous project, however the student should be comfortable problem solving and using websites such as Stack Overflow to work through issues. The MSc is desk based and can be carried out at the University.

This project will allow the student to gain a good understanding of Scotland's MPA network, including the different types of management available. It is suited for someone who is looking for a career in marine conservation, whether that through management/advice or through research.

We plan to host a MSc student seminar at the end of August 2026 at NatureScot's HQ in Inverness. We invite the student to present their research at this seminar and meet with relevant colleagues as well as other MSc students carrying out projects within NatureScot. We plan that travel and subsistence could be covered for this journey, although this will be confirmed nearer the time.