MPhil / PhD to assess spatial and temporal approaches to managing scallop fisheries to achieve good environmental status with a viable commercial fishery.

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We have an opportunity for a funded PhD at Bangor University in collaboration with Welsh Government and Heriot Watt University. The PhD will undertake research and modelling to support management decisions for the Welsh scallop fishery, in particular spatial, temporal and rotational fishery management options to support both the fishery and good Environmental Status. Full funding is expected to be confirmed in autumn 2025, but it may necessary for the student to initially enrol on a 2 year MPhil, with an expectation to upgrading to a full PhD once funding is confirmed.

Bangor University Sustainable Fisheries Research Group:

Bangor University has carried out research to support sustainable Welsh fisheries since 2012 and we currently have a project to support fisheries management for Welsh scallop, whelk, crab, lobster and bass fisheries. Research includes: gathering of key biological data such as growth and maturity; ecosystem considerations such as evaluation of Good Environmental Status; fishery independent surveys to support stock assessment; improving fishery dependant data collection; development of fishery assessments. The sustainable fisheries research group is a vibrant and active research group including masters and PhD students, early career researchers and academic members of staff.

Heriot-Watt University - Marine Sustainability, Policy and Conservation Evidence group:

The Lyell Centre, Heriot-Watt University has supported research to improve the sustainability of fisheries across the UK working closely with the fishing industry, NGOs and Government bodies. Research focuses on improving the understanding and reducing the impacts of fishing on the seabed, modelling different scenarios of sustainable management of the fishery and understanding the basic biology of scallop stocks. There are currently approximately 50 PhD students in the Lyell Centre with a team of strong fisheries conservation group of academics and post-doctoral researchers.

The Project:

Effective fisheries management is important for biological, ecological, economic and social sustainability, with well managed fisheries providing higher sustainable food yields and lower environmental impacts. Following the UK Fishery Act (December 2020) all fisheries across the UK will be developing new Fisheries Management Plans that aim to deliver across all pillars of sustainability. In England and Wales the King Scallop FMP was published in 2023 and the implementation phase is now underway. This research will provide an important evidence base to the Welsh Scallop FMP and the fisheries future management.

The scallop fishery in Wales occurs in three main regions: Liverpool Bay, Caernarfon Bay and Cardigan Bay, with Cardigan Bay by far the most significant in terms of landings. Cardigan Bay has areas which are open to commercial fishing, and also a large area that includes a previously productive scallop ground that has been closed to fishing since 2009. Bangor University has carried out an annual fishery independent scallop survey since 2012, both in open and closed areas. This survey includes scallop dredge sampling and camera surveys gathering data on abundance, age, size, maturity, meat yield and bycatch. In addition, we have carried out beam trawl surveys at various time points to understand the benthic community in both open and closed areas. During the PhD there will be the opportunity to take part in these annual surveys to collect further data to support the study. In addition, we have extensive collaborations with scallop fishery researchers across the UK and Europe and there would be potential to utilise wider datasets where appropriate. The project also has access to fisheries dependant data such as landings and Vessel Monitoring System (VMS / iVMS) data.

Aims and objectives:

1. Model scallop distributions, productivity and habitat suitability. Utilising empirical datasets described above, collecting new datasets during the annual surveys and gleaning data for publicly available datasets the student will model scallop distributions and habitat suitability to understand the fragmented and patchy nature of scallops and predict where the most productive scallops grounds are likely to be found in Cardigan Bay.
2. Understand scallop population growth rates in relation to different environmental conditions. This information is important when considering rotational fisheries.
3. Understand scallop recruitment, prediction of pre-recruits into the fishery and movement of pre-recruits. This information is important to understand how pre-recruit data can be utilised within fishery management and rotational management, and would influence the timing of the annual surveys.
4. Model natural seafloor disturbance and compare to intensities of scallop fishing seen in Cardigan Bay. Predict areas where there are productive scallop beds (objective 1) overlap with natural levels of disturbance that are greater than that

seen through scallop dredging to inform spatial management options for the fishery.

5. Utilise all the above to provide management options for the Welsh Scallop fishery, in particular the suitability of rotational or other innovative approaches to improve fisheries and ecological sustainability.

The successful candidate is expected to start in October 2025 and funding is currently available for 2 years and includes a stipend of approximately £20,000 2025/26 and £21,000 2026/27. It is expected that further funding will be secured before the start of the PhD for a further 1.5 years. The student will be based at Bangor University, but funding is available to allow for some time spent at Heriot Watt University with Michel Kaiser. All home student fees are funded, as well as access to the annual Welsh scallop survey for data collection.

Currently this Mphil / PhD is funded by Welsh Government with additional funding sources to be secured.

To register your interest in this PhD please email Natalie Hold n.hold@bangor.ac.uk

Key References:

https://www.tandfonline.com/doi/full/10.1080/23308249.2025.2530412

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https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.13278

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https://www.int-res.com/abstracts/meps/v480/meps10198

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https://bioone.org/journals/journal-of-shellfish-research/volume-43/issue-3/035.043.0301/Implementation-Of-A-Marine-Rotational-Harvest-Area-in-the-Bay/10.2983/035.043.0301.full

https://academic.oup.com/icesjms/article/80/5/1351/7125901

http://sustainable-fisheries-wales.bangor.ac.uk/documents/Welsh%20waters%20scallop%20surveys%20and%20stock%20assessment.pdf

International Students:

The current funding does not cover international student fees or visa costs, therefore the student will need to be able to cover these additional costs themselves. There is a requirement to start in Autumn 2025 and so any visa's need to be in place for that start. Please email to discuss.