

Andrew Whitham CASP Fieldwork Awards 2025 – Winner

Applicant: Lydia Brown

Project title: Onshore Quaternary Sediments: Analogues for Supporting Offshore Wind Foundations

Award: £2,813

Scientific question and rationale:

Renewable energy from offshore wind in the North Sea has increased rapidly. However, ground models remain largely based on geotechnical data. My research studentship aims to advance the development of ground models through integration of geotechnical and geological datasets. I have identified a major gap in the industry workflow - the absence of Quaternary geological analogues to condition ground models. Onshore field analogues could be crucial in reducing uncertainty in lateral heterogeneity, which is difficult to detect in geotechnical datasets, and thus improve business decision-making. I propose to demonstrate the utility of onshore field analogues in providing better dimensional constraints on subsurface heterogeneity, and therefore improve the economics and sustainable development of offshore windfarms.

I have identified the Quaternary geology of the northern Isle of Man as an appropriate analogue for the Dogger Bank, which will be the world's largest offshore windfarm. The Isle of Man Quaternary geology boasts glaciogenic sediment-landform assemblages, glacio-tectonic structures and transgressive coastal deposits associated with late-Devensian glaciation. I request £2812.98 to cover fieldwork expenses for myself and one field assistant to document the small- and large-scale lateral and vertical heterogeneity within these deposits using sedimentary logging and photogrammetric models and answer the question: "How can onshore Quaternary analogues improve geological modelling of complex Quaternary stratigraphy for offshore wind design?". My PhD is partially funded by offshore windfarm operators, and I would lead a follow-up field workshop to demonstrate the importance of incorporating field analogues into their geological interpretation and resulting geotechnical evaluation for complex offshore sites.

Specific objectives and deliverables:

- Map large scale lateral structural variability with glaciogenic landforms assemblages and associated glaciotectonism north of Bride.
- Sedimentological logging and photogrammetric model of exposures at Kirk Michael to establish vertical and lateral heterogeneity within glacial and post-glacial deposits.
- To influence workflows in offshore wind operators to increase the geological input to ground models.

Proposed work plan:

- August 2025: 7 Days fieldwork within the Isle of Man with one field assistant.
- Post fieldwork integration of field data with photogrammetric models
- Present findings to industry sponsors SSE, Vattenfall and RWE, and at BSRG, QRA.

Proposed expenditure, including details of any other sources of funding:

Ferry (Liverpool to Douglas) x2: 460; Car Hire (Enterprise): £338.98; Food (£45pppd) x2: £630

Accommodation (Regency Hotel 6 Nights) x2: £1260; Fuel: £200 = Total: £2812.98

There are no other sources of funding as my PhD is only partially funded by industry partners (the rest by a limited University of Leeds award).