

PhD project opportunity!

How does climate change influence dynamics between saline and freshwater coastal wetlands?

Supervisors: Dr Katherine Selby (University of York), Prof Laurence Jones (UKCEH), Dr Marina Pugh & Dr Anissia Halwyn (Natural England) & Dave Bromwich (Lincolnshire Wildlife Trust)



Highly species rich dune slack wetland

This project is part of the NERC-funded Centre for Doctoral Training, ECOWILD. For more details on the PhD projects to start in 2025, and for a full list of projects offered under this programme, please visit: <https://ecowild.site.hw.ac.uk/>

Climate change has multiple and complex impacts on coastal wetlands. Sea level rise will increase the height of the fresh groundwater table, but coastal erosion will lower it. At the same time, management decisions about coastal defences may change the boundary between fresh and salt. The dynamics between freshwater and saline habitats will be increasingly fluid in future, and the conservation implications of this are unclear. The project will use a mix of palaeo-ecological and ecological techniques to understand from past habitats what future conditions might look like. The supervisory team consists of experts on dune ecology, palaeo-environmental reconstruction and nature conservation bodies to establish evidence-based guidance on coastal wetland management.

This project will investigate the effects of climate change on coastal wetlands using the Lincolnshire Coastal Grazing Marshes and other sites as a living laboratory, where removal of sea banks, re-excavated dune slacks and managed realignment have created a dynamic fresh/saline interface which will cause changes in the vegetation, invertebrate and wetland vertebrate communities.

Using field and laboratory techniques, it will examine current hydrological and ecological changes and those in the past, to understand the interplay between freshwater and saline controls on the ecology of these systems in order to inform future conservation and management strategies developed by Natural England (NE) and Lincolnshire Wildlife Trust (LWT). The project will address two key questions:

1. Is there evidence in the palaeo-ecological record of a fluctuating and dynamic brackish interface, before shoreline protection and coastal defences enforced a separation of freshwater and saline habitats?
2. What are the key biological and hydrological markers and can they help understand ecological responses to the current rapidly changing conditions?

You will gain an understanding in key ecological and hydrological processes affecting biological communities in dune slacks, saltmarsh and grazing marsh. You will learn palaeo-ecological techniques such as diatom analysis to establish pH, salinity and trophic status. Field work will involve taking sediment cores and water sampling. Laboratory skills will include diatom identification, preparation of samples for radiometric dating, analysis of water and soil samples. The data will be used to understand the timing and impact of shifts between saline and freshwater conditions over time. You will also have the opportunity to develop your presentation skills at conferences and written skills through publishing scientific papers.

This project will be based at the University of York (lead supervisor Dr Katherine Selby), with visits to UK Centre for Ecology & Hydrology (UKCEH) in Bangor (co-supervisor Prof Laurence Jones) and 3 months working with Natural England, the CASE partner. Fieldwork will be primarily in Lincolnshire, but will make use of other relevant coastal sites e.g. in Scotland or Wales.

ESSENTIAL SKILLS: Field-based skills; Laboratory skills; Data analysis.

We recognise that not every talented researcher will have had the same opportunities to advance their careers. We therefore will account for any particular circumstances that applicants disclose (e.g. parental leave, caring duties, part-time jobs to support studies, disabilities etc.) to ensure an inclusive and fair recruitment process.

Links to the full list of projects advertised under this CDT, can be found here:

<https://ecowild.site.hw.ac.uk/phd-training/>

For more details, contact Katherine Selby katherine.selby@york.ac.uk & Laurence Jones lj@ceh.ac.uk

How to apply: You must apply via the ECOWILD website: <https://ecowild.site.hw.ac.uk/how-to-apply/>

The closing date for applications is 9th January 2025 and applicants must be available to start in October 2025.