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The **ECHOES project** (*Effect of climate change on bird habitats around the Irish Sea*) is an **INTERREG** funded project between Wales and Ireland addressing how climate change will impact coastal bird habitats of the Irish Sea and what effect this could have on our society, economy, and shared ecosystems.

As part of this project, BTO Cymru tagged 36 **Eurasian Curlew *Numenius arquata*** in three locations (Figure 1) - the Cefni and Dyfi estuaries (north & mid Wales, UK) and Ballyteige Burrow (Ireland), over two winters (2020/21, 2021/22) to identify relationships with the landscape and environmental variables such as tides.

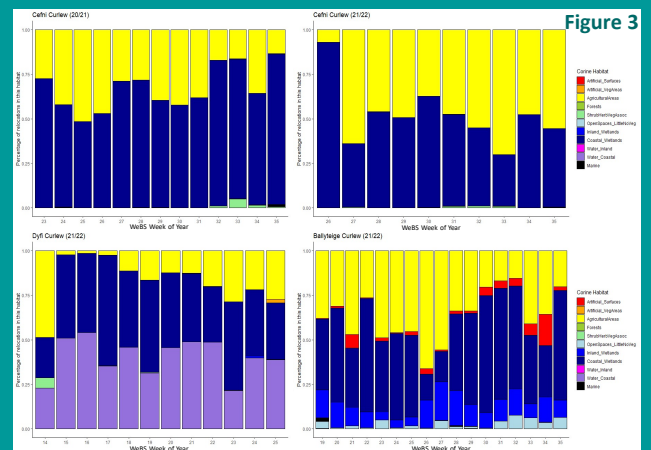
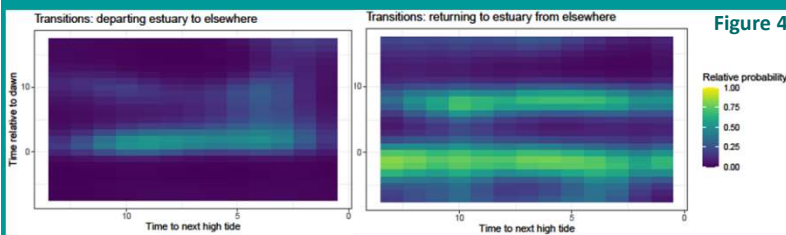
With the ultimate aim to predict the effects of climate change on coastal bird populations, we started by looking at **habitat preferences** and how these link to environmental conditions spatially and temporally.



Habitat association with Corine 2018 classifications showed visual differences between the birds on the three sites, with the **northern Welsh and Irish sites appearing more similar to each other** in habitat use, than the mid-Wales site (Fig.3) when compared on a weekly basis.

Taking this further, a **Resource Selection Function (RSF)** approach is then being developed (modelled in R) and applied to all Curlew with enough relocations to study ($n = 35$) across the three sites. Resulting preferences are then taken and modelled against other environmental variables to build up a picture of why Curlew move between habitats making several relationships become clearer.

In Figure 4 we present one of these - the probability of a north Wales Curlew transitioning to and from an estuary given the time relative to dawn and the time to next high tide. This indicates that Curlew are **much more likely to leave within a couple of hours after dawn** and almost never at night. They are also **likely to move within a few hours before high tide**. There are fewer signals for arrivals onto an estuary.



By taking RSFs results into further analysis that include environmental and spatiotemporal variables, we can infer behavioural patterns and preferences of Curlew across our study sites. Despite individual variation between birds, differences between the three sites were detectable and these models are being developed further with other relevant environmental variables (e.g. tide height, NDMI, distance to coastline, weather) to be able to understand more generally applied predictions of Curlew behaviours. We will also be joining our results with a Species Distribution Model and Climate Change Projections that are being produced by two of our project partners to predict **how Curlew will respond to climate change** induced changes to their habitats and investigate particular scenarios pertinent to the species around the Irish Sea.

If you are interested in learning more about our project, please contact us at katharine.bowgen@bto.org or info@echoesproj.eu. The ECHOES partnership consists of British Trust for Ornithology, Aberystwyth University, Compass Informatics, Geo Smart Decisions and University College Cork.