# Innovative modelling tool aids seabird conservation amid wind farm expansion



Wind farms play a pivotal role in the United Kingdom's commitment to transitioning to renewable energy and achieving net-zero emissions. The UK government has pledged to double onshore wind capacity and quadruple offshore wind capacity by the year 2030. However, the expansion of wind farms is not without its environmental challenges, particularly concerning seabird populations. These birds are at risk of colliding with turbine blades and may also be displaced from critical foraging areas as wind farms proliferate.

In response to these concerns, researchers from the University of Glasgow have developed a groundbreaking modelling tool designed to predict the spatial use of seabird colonies without the need for comprehensive satellite tracking data, which is often unavailable. This innovative tool, detailed in the journal *Methods in Ecology and Evolution*, represents a significant advancement in wildlife conservation efforts, specifically in the context of offshore wind farm planning.

PhD student Holly Niven, the lead author of the study, explained, “Accurate estimation of the impacts of offshore wind farms and other stressors on seabirds can help us make more informed decisions about offshore wind farm plans and protect the species living around our coasts.” The researchers believe that the tool could transform planning processes for offshore wind farms by enabling better protection of seabird populations without compromising renewable energy development. Moreover, they assert that the modelling technique could extend beyond seabirds, offering insights into the spatial use of other colonial wildlife, such as seals, bats, and bees.

Current methodologies for assessing the environmental impact of offshore wind farms often lack precision, which could lead to unsuitable sites being selected for development based on inaccurate seabird density assessments. For instance, areas with high bird populations might inadvertently be approved for wind farm construction, while other locations could be dismissed due to inflated estimates of seabird presence. Jason Matthiopoulos, Professor of Spatial and Population Ecology and supervisor of the study, noted, “Ironically, different environmentally positive activities such as wildlife conservation and our progress towards green energy can come into conflict with each other. Resolving these conflicts relies on good data, but equally, on state-of-the-art computer modelling techniques.”

Seabirds nest in colonies on small landmasses, such as rocky clusters along the coastline, and their foraging behaviour is closely tied to their local environment. The size of their home range – the area they rely on for feeding – is influenced by both the size of the colony and its location. Due to their central-place foraging nature, seabirds are particularly vulnerable to local environmental changes, including the installation of wind farms, which could adversely affect their populations and overall well-being.

The research underscores the necessity of integrating innovative technology in conservation efforts concurrent with renewable energy pursuits, aiming to balance ecological preservation with the transition to sustainable energy sources.

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