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# Offshore renewable energy sites provide new habitat for marine species

**Offshore renewable energy sites** may provide new 'stepping stone' habitats for marine species, a recent study suggests. They could allow some species to spread beyond their present range and help vulnerable creatures survive in the face of climate change. However, they may also allow harmful invasive species to spread, the researchers warn, and the effects of such projects must be assessed by examining their impacts on the ecosystem as a whole.

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**Source:** Adams, T. P., Miller, R. G., Aleynik, D., *et al.* (2014). Offshore marine renewable energy devices as stepping stones across biogeographical boundaries. *Journal of Applied Ecology*. 51: 330-338 DOI:10.1111/1365-2664.12207.

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**Sources of offshore renewable energy**, such as wind farms, are a growing element of energy supply for many countries. These structures may also provide new artificial habitats for marine wildlife, allowing them to spread into areas they would not otherwise be able to access.

Although they would not provide a fully functioning ecosystem, they could be beneficial in some cases, allowing species to colonise new areas if their original habitat becomes unsuitable under climate change. However, they may also allow invasive species to spread, damaging existing habitats. As such, the potential effect of such structures on biodiversity remains a key question.

In this partly-EU funded study[1], researchers developed a new model to predict how offshore installations, such as wind, wave and tidal energy developments, would affect the spread of marine species. They specifically considered the potential effects of wind installations that are under consideration in the UK, off the coasts of Scotland and Northern Ireland. The study focused on the effects on species which have mobile larvae that drift in the open ocean before settling, such as barnacles, mussels and limpets.

The model indicated that the installations in the proposed areas could potentially act as 'stepping stones'. Species currently only found abundantly in Northern Ireland, such as the 'lined top shell' snail (*Phorcus lineatus)* and the purple sea urchin (*Paracentrotus lividus),* may be able to invade and establish on the Scottish coastline. This would primarily mean native intertidal species, such as sea snails, urchins and algae, but also potentially invasive species, such as the Pacific oyster (*Crassostrea gigas*).

The results suggested that the installations would encourage the species to disperse towards the north and that sea currents which transport larvae have more influence on spreading species than the actual dispersal distance.

Whether dispersal events alter spatial patterns of biodiversity also depends on how environmental conditions in the region are affected by climate change. Several invasive species are presently restricted from becoming established beyond southern Scotland by spawning temperature requirements. For organisms that are at the southern limit of their range in Northern Ireland, bridging dispersal barriers between suitable habitat sites will be essential in tracking suitable environmental conditions.

It is already recommended that surveys of renewable energy sites monitor the spread of invasive species and assess their effects on the wider ecosystem. However, the study's authors also advise increased monitoring for species with mobile larvae, to allow detection well before they reach foreign shorelines.

Using models similar to that used in this study could help predict the shoreline sites where invading species are most likely to arrive, they say. Such information is important, not just for conservation and protection against the damage that invasive species can do, but also for maintaining aquaculture and marina operations.

[1] ASIMUTH (Applied Simulations and Integrated Modelling for the Understanding of Toxic and Harmful Algal Blooms) and HYPOX (In Situ Monitoring of Oxygen Depletion Associated with Hypoxic Ecosystems of Coastal and Open Seas, and Land-Locked Water Bodies) are supported by the European Commission under the Seventh Framework Programmes projects. See: www.asimuth.eu and www.hypox.net MaREE (Marine Renewable Energy and the Environment) was supported by the European Regional Development Fund.