Using Species Distribution Models to predict king scallop (Pecten maximus) distribution along the East coast of Scotland.

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The need for integrated and robust marine spatial planning is becoming an ever more important aspect of coastal and offshore activates, particularly in regard to resource conflicts. The North Sea is a hotspot for anthropogenic developments and resource extraction, where progress within the marine renewable sector may further exacerbate conflict and require sound spatial management for mitigation. To this end an understanding of how king scallop fishing activity may be displaced due marine wind farms is highly relevant. By implementing a range of Species Distribution Models this study aims to predict the patterns of abundance and distribution of the king scallop Pecten maximus from empirical survey data and abiotic characteristics. It is hypothesised that a relatively small suite of ecologically significant predictors, such as sediment type and mean current velocities, will be associated with scallop distribution around Scotland. Model techniques that will be considered include Generalised Additive Models, decision tree regression and Maximum Entropy based models. The resultant output will form the basis of a king scallop distribution map as well as a spatially explicit habitat suitability index that may be integrated into marine management and assessments.

Keywords: SDM, king scallop, marine spatial management, machine learning algorithms

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