

## Spatial transfer of Habitat Suitability Models to inform data-poor regions: a case-study of the deep-water coral species *Desmophyllum pertusum*

Internationally there is political momentum to ensure the conservation, or special management consideration, of species and/or habitats of perceived ecological importance, vulnerability, or rarity. *Desmophyllum pertusum* is a globally distributed cold-water coral species that has high conservation importance due to its reef-forming capacity, longevity, and high vulnerability to demersal fishing impacts. Current knowledge on the distribution of this species within South African waters is extremely limited due to sampling and taxonomic limitations. In the well-studied North Atlantic, predictive models of species distribution and habitat suitability have been used to fill data gaps. Lack of baseline data in the South Atlantic has hampered local predictive modelling efforts for the deep-sea environment. This study aimed to apply a modelling-based approach to predict suitable habitat for *D. pertusum* in the data-poor Cape Canyon area. Using a model transfer approach, this study applied a model constructed in the data-rich North Atlantic to identify suitability habitat for *D. pertusum* in the Cape Canyon area off the west coast of South Africa. This technique assumes that a given species has a non-random distribution within a particular environmental envelope and that the majority of individuals would occupy the optimal range. The transferred model was built using the Maximum Entropy (MaxEnt) algorithm and constructed with 227 presence and 3064 pseudo-absence points, and 200m resolution environmental grids, including bottom temperature and derived layers of the fine-scale bathymetric position index, curvature, and terrain ruggedness. The model for *D. pertusum* fitted to North Atlantic data transferred well to the study area with an area under the curve (AUC) of 0,882. Maps resulting from this model indicated that suitable habitat for *D. pertusum* is distributed around the head of the Cape Canyon. Predicted potential distribution *D. pertusum* can guide future field expeditions to verify the distribution of one of South Africa's most sensitive, but poorly mapped, coral species. This study demonstrates the usefulness of model transfer approaches to augment mapping of marine species of conservation importance in data-poor regions. This work will advance mapping of South African marine environment and can be applied to support marine spatial planning efforts and marine protected area design.