

Estuarine, Coastal and Shelf Science

Drivers of mangrove distribution at the high-energy, wave-dominated, southern African range limit

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Abstract

Mangrove distribution patterns at regional scales are influenced by additional factors besides temperature and rainfall regimes. This study identified abiotic drivers of mangrove area cover along the high-energy, wave-dominated coastline of South Africa. This is one of the southernmost locations globally for mangroves. A structural equation model (SEM) was used to delineate relationships between multiple variables that represented climatic and geomorphological drivers of current mangrove distribution patterns. Floodplain area, inlet stability, and the flow regime of the estuary were identified as significant predictors of mangrove area. The results of this study confirm that for this region mangrove distribution is controlled by coastal topographical features and estuarine dynamics rather than temperature minima. This is similar to other high-energy, wave-dominated coasts of Australia, Brazil, and New Zealand. Future research should, therefore, incorporate regional-scale factors that restrict current distributions as they could inform on potential limitations to expansion, particularly for southern hemisphere range limits.