Spatially extended habitat modification by intertidal reef-building bivalves affects shorebird distribution



Project Wadden Engine:

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Spatial habitat modification

Reef-building bivalves like blue mussels (*Mytilus edulis*) and Pacific oysters (*Crassostrea gigas*), create hard substrate and modify the sediment by depositing large amounts of (pseudo-) faeces and reducing hydrodynamics.



In soft-bottom systems, their effects on sediment conditions can extend beyond the direct surroundings of the reefs. However, the spatially extended effects of such reef builders on the intertidal community remained largely unstudied.

Methods

We collected sediment and macrobenthos samples on a predetermined grid. Spatial distribution of shorebirds was determined with the use of a telescope mounted angulator. Our two study areas covered a reef and an associated gradient towards a sandy control area.

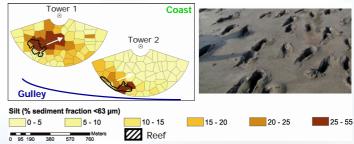




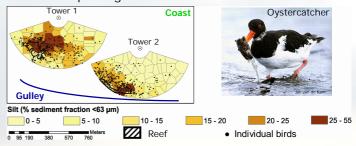
Results

We found strong spatial gradients in sediment properties. Distance from the reef, sediment properties and macrobenthos abundance simultaneously explained significant parts of the distribution of oystercatchers, curlews and bartailed godwits.

Spatial gradient in sediment conditions



Spatial gradient in shorebird distribution



Same spatial trend for curlews and bar-tailed godwits



Conclusion

Our results indicate that the spatial distribution of shorebirds can be affected by reef-builders far beyond the spatial boundaries of the reefs. This implies that bivalve reefs have a much larger ecological impact on the intertidal community than their actual size suggests.

