

Shoreface nourishments in the Wadden Sea (the Netherlands)

COASTAL DEFENCE DISASTROUS FOR MARINE LIFE ?

The ecological approach to the Ameland shoreface nourishment proved to be successful in both preserving nature values and safe guarding the coast from coastal erosion.

FROM OUR FIELD REPORTERS

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Climate change and the expected sea level rise have made coastal defence a hot topic in most countries. To ensure protection against coastal erosion, a 'dynamic' maintenance with natural materials, like beach and shoreface nourishment, is often chosen. But although protection of the hinterland is important, man should also strive to protect the natural balance of the coastal ecosystem.

Nursery area

The shallow coastal area is a valuable ecosystem that provides nursery grounds for many juvenile flatfish. The species are adapted to this highly dynamic environment, and are thus used to some turbulence during their lifetime.

Impact study

A study was undertaken in the Wadden Island Ameland to assess whether a 'natural' coastal protection can be carried out in balance with nature conservation.

Fish and epibenthos survive large-scale nourishments

The trend in average species number and average density of epibenthos and fish is variable over the years. However, reference and impact area follow the same trend, so no negative impact could be observed.



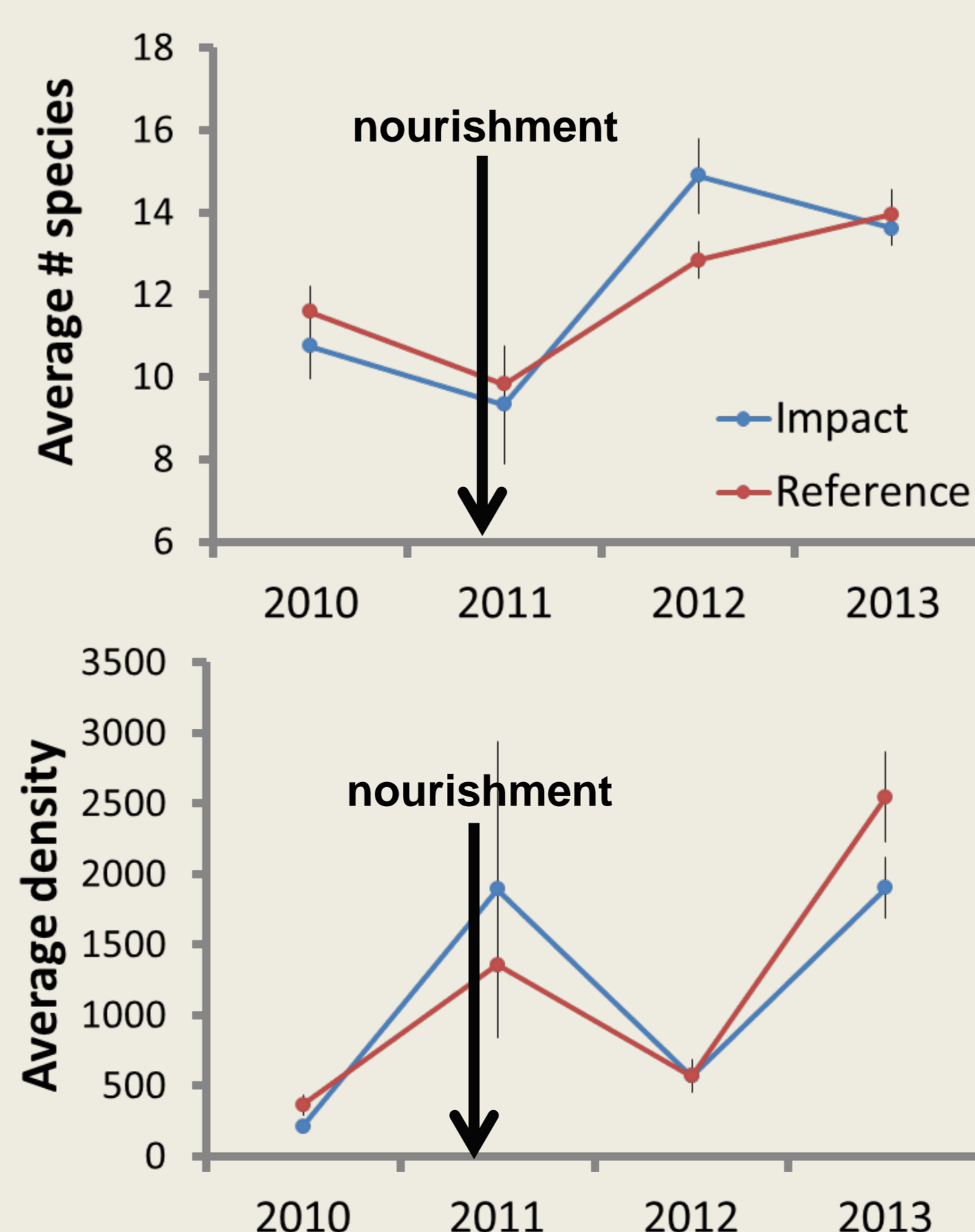
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Both epibenthos and fish survived the large-scale nourishment!

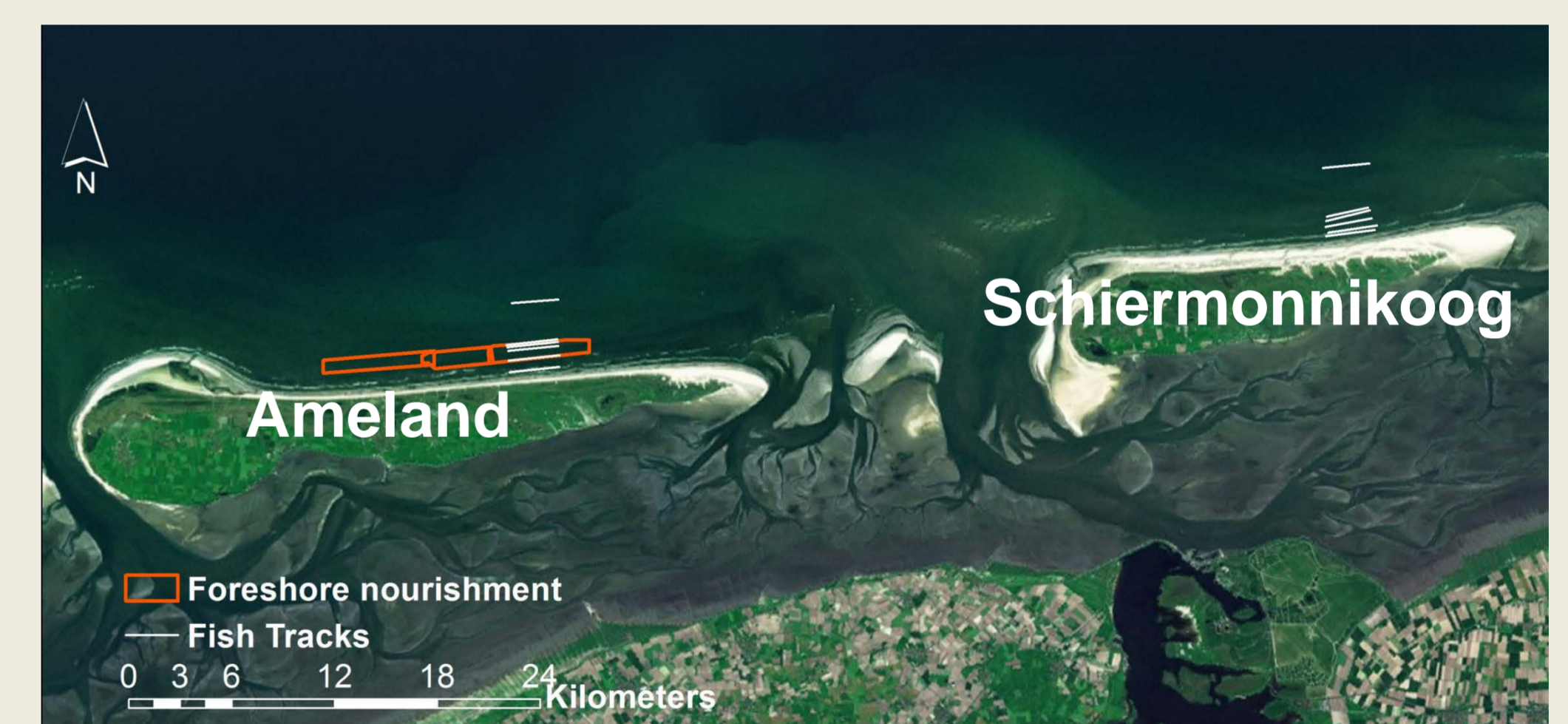
When looking at the entire shallow coastal fish and epibenthos community, no substantial negative effects could be detected either, except for a small decrease in juvenile plaice in the impact area.

Ecological approach is the way to go

Reference and impact area show the same trend for average number of species and average density (# per 1000 m²), proving no impact by the shoreface nourishment.



Facts & Figures



- In total 4.7 million m³ sand was 'rainbowed' on the foreshore of Ameland (Wadden Sea, the Netherlands).
- Nourishment was performed in an ecological manner, i.e. different construction phases and using sediment resembling the natural coastal sediments.
- Last phase of shoreface nourishment finished in 2011.
- A BACI (Before/After – Control/Impact) design was used to assess the impact of the foreshore nourishment on epibenthos and demersal fish communities.
- Samples were collected with a beamtrawl (3m, 22 mm mesh size), once before the nourishment in 2010 and during three consecutive years after shoreface nourishment, both in the impact area Ameland and the adjacent reference area Schiermonnikoog.
- In total 120 fish tracks were collected and 42 different species of fish and epibenthos were encountered.
- Brown shrimp, common swimming crab, shore crab, juvenile plaice, lesser pipefish and gobies dominated the shallow coastal community.