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Richel: the birth of an island

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Introduction

Richel is a sand flat in the Dutch Wadden Sea, close to Vlieland (Fig. 1). It was first mapped in 1796 and through history has been recorded as unvegetated.

Recently, a vegetated dune field has formed, which may be the beginning of the transition from a sand flat to an island. This poster documents the first combined survey of geomorphology and vegetation development on Richel.



Figure 1. Richel (RI) on a bathymetric map of the area

Methods

- bathymetric data
- oblique photos from an airplane for seal counting (2001 – 2015)
- georectified aerial photos (2003 – 2010)
- RTK DGPS measurements (2011 – 2014)
- vegetation species list and vegetation relevés (2014)
- groundwater salinity (2014)

Results

In 2008, the first vegetation tussocks became visible, meaning that first vegetation establishment was around 2006. The vegetated area increased until 2011. Between 2011 and 2014, the shape stayed the same but vegetation density increased.

In 2014, the dune field was dominated by Sand Couch (*Elytrigia juncea*), and thus belongs to the Natura 2000 habitat type H2110 'Embryonic shifting dunes'. It contained at least 18 other plant species (Table 1).

Table 1. Plant species on Richel in 2014.

dune species	driftline species	salt-marsh species
<i>Elytrigia juncea</i>	<i>Cakile maritima</i>	<i>Salicornia</i> spp.
<i>Ammophila arenaria</i>	<i>Salsola kali</i>	<i>Suaeda maritima</i>
<i>Senecio vulgaris</i>	<i>Tripleurospermum maritimum</i>	<i>Atriplex prostrata</i>
<i>Sonchus arvensis</i>	<i>Honckenya peploides</i>	<i>Puccinellia maritima</i>
<i>Hippophae rhamnoides</i>	<i>Crambe maritima</i>	<i>Plantago maritima</i>
		<i>Polygonum aviculare</i>
	<i>Tetragonia tetragonioides</i> (Pallos) Kuntze	<i>Cirsium arvense</i>



Groundwater salinity ranged from 0.1 to 5.1 ‰, i.e. fresh to brackish, creating conditions that allow the establishment of Marram grass and thus further growth of the dunes. Maximum elevation was +2.39 m NAP.

Black-backed gull (*Larus fuscus*) and herring gull (*Larus argentatus*) breed in the dune field. The sand flat and dune field are the most important pupping site for grey seal (*Halichoerus grypus*) in the Netherlands, with 457 pups in 2014.

Conclusions

On Richel, an embryonic dune field has developed that harbours various plant and animal species. The area has the potential to develop into a full 'small island' with dunes and salt marsh such as Rottumerplaat (NL) or Mellum (D), or it may erode away. The development will depend on the future number and intensity of storms, and the sand budget of Richel.

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