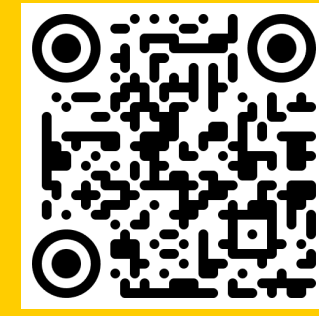




Quick Reaction Force (QRF) Egmond aan Zee

Measurements of dune erosion and hydrodynamics during storm seasons

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Introduction

Along the Dutch coast dune erosion is common during heavy storms from the north-west.

The volume of eroded dune sand varies strongly:

- per storm
- per storm season
- in alongshore direction

A mix of drivers of dune erosion:

- storm intensity
- storm chronology
- pre-storm bar-beach-dune (bio)geomorphology

Problem: lack of measurements

Aim: To unravel the effect of storm chronology for the long-term (bio)geomorphodynamics of the bar-beach-dune system.

Approach

Field site	Egmond aan Zee (Holland coast) 6 km alongshore (RSP 37-43) 1 km cross-shore
Bathymetry	sonar-equipped jetski every 50 m alongshore sandbar crests
Topography	Mobile Laser Scanner & GPS embryo dune troughs
Waves	7 locations alongshore pressure sensors all winter
Currents	3 locations alongshore ADVs deployed before storm
Model	Xbeach BOI Egmond model calibrated using field data



Observations



After storm Pia, 22 December 2023: alongshore-variable dune erosion



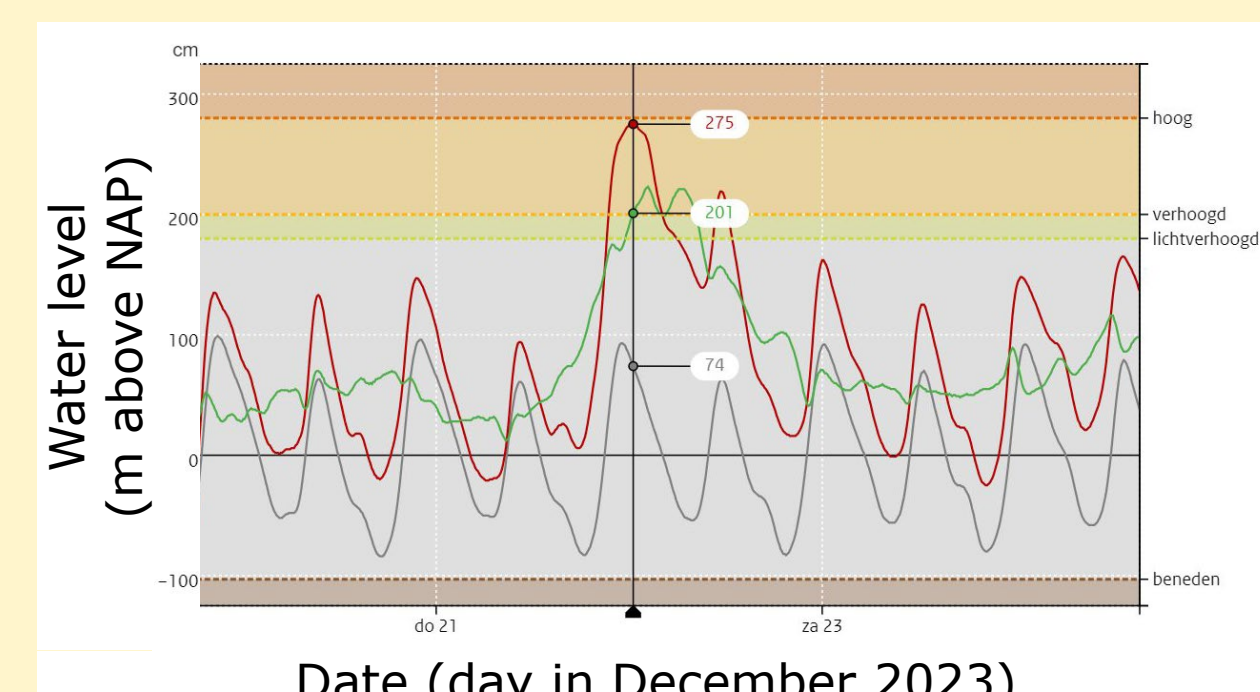
Storm sequence 2023 – 2024

1) 24-11-'23
 $H_s = 5-6$ m
Peak water level = 210 cm NAP
→ Upper beach eroded
→ Paved way for storm Pia



1 December 2023, RSP 40.000

2) Pia, 22-12-'23
 $H_s = 5-6$ m
Peak water level = 300 cm NAP
→ Dune erosion



Source: <https://rwsos.rws.nl/viewer/>

Next steps

Measurements of dune erosion during storm
→ Laser scanner
→ Video cameras

Explore role of vegetation
→ Map vegetation cover from orthophotos & satellite
→ Link to type of erosion

Xbeach modelling
→ See abstracts Merijn Niemeijer & Bart van der Waal

Upscaling of observations to Dutch coast
→ Satellite
→ Connection with DeltaEnigma

Acknowledgments

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