Background
Overwash and inundation are able to cause large-scale coastal changes that can range from the breaching of islands to vertical accretion of sediments (Donnelly et al., 2006). Vertical sediment accretion might aid in mitigating the effects of sea level rise and subsidence (Oost et al., 2012), and therefore the restoration of washovers is being considered. Within this project we aim to characterize overwash conditions on barrier islands in the Wadden Sea.

Research questions
• What are the flow- and wave conditions during an overwash event?
• How do waves transform across the island during overwash or inundation?

Field observations
From November 2014 until the end of January 2015, ten pressure sensors, three acoustic doppler velocimeter (ADV) and three optical backscatter sensors were deployed on the low-lying (max height ~ 1.70m, relative to NAP) eastern end of the Dutch barrier island Schiermonnikoog. Here, only results from the pressure sensors are shown.

Results

Boundary conditions

Water levels

Wave heights

Conclusions
• Water levels are fluctuating across the island with time and tidal stage. The effect of wave set-up, which might drive strong cross-shore flows (see poster of D. Wesselman), is visible in the observations.
• Low frequency wave heights typically decrease as waves propagate across the island.
• High frequency waves show frequently increases after initial dissipation.

Some questions to address in future work
• What is the flow velocity during overwash?
• What are the underlying mechanisms that are causing the observed wave height pattern?
• What are the sediment transport rates and mechanisms during overwash?
• What is the morphological response of the spit to overwash?