WAD was? WAD can we do?

Nature-based solutions elevate barrier islands

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Behavior of barrier islands under SLR

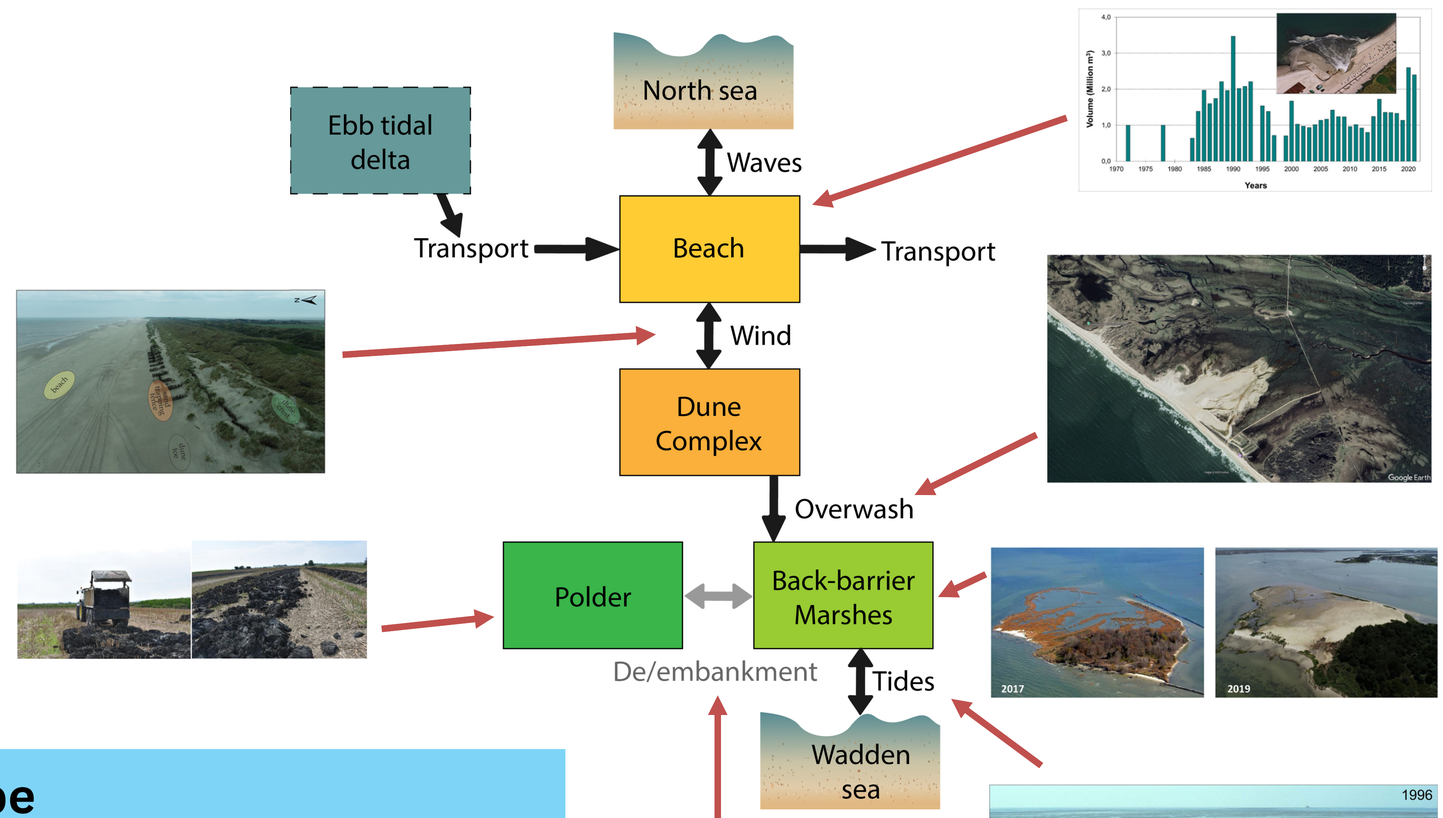
Problem Definition

1. Under enhanced sea-level rise (SLR) barrier islands will experience retrograding behavior
2. Cultural developments have fixed the islands: Coastal Squeeze

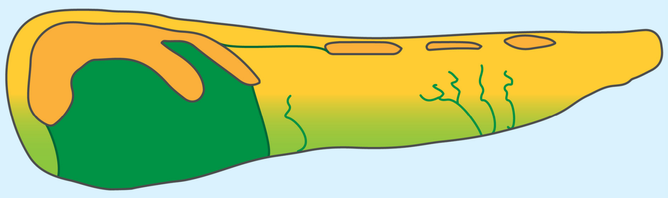
Together, these lead to increased risk of island drowning

Are the current measures temporary?

- Protecting the islands with hard structures excludes them from the natural sediment flows
- Opening the system: can natural behavior counteract coastal squeeze?



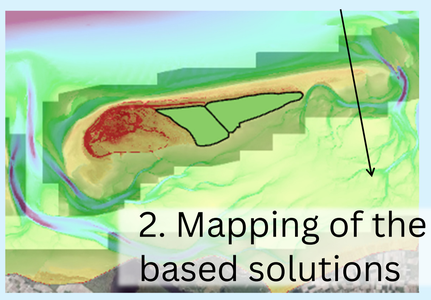
Barrier island archetype



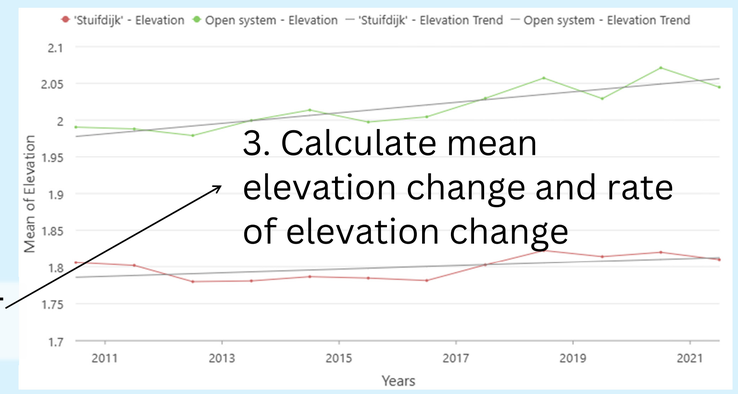
- Based on *Löffler et al. (2011)* and *Davis (1994)*
- Geomorphic stock-flow sediment flux model
- Management solutions can be divided into three classes:
  1. Enhancing the inflows
  2. Decreasing the outflows
  3. Suppletion of the geomorphic unit

Methods

1. Trilawatt topography raster (Milbradt & Pineda Leiva, 2025)



2. Mapping of the nature-based solutions



3. Calculate mean elevation change and rate of elevation change

Develop future scenarios

- Learn from near-future/implemented land-sea interface management solutions and stakeholders
- Learn from sediment models and history (WP1)

numerical modelling

1. Study the response for different solutions (physical solution space)
2. Generate adaptation pathways and scenarios for the Wadden Sea area

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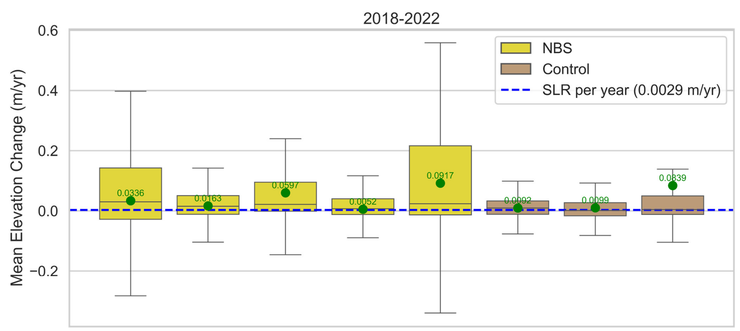

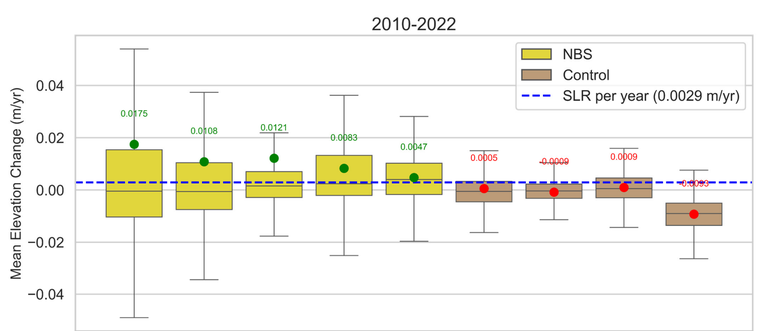

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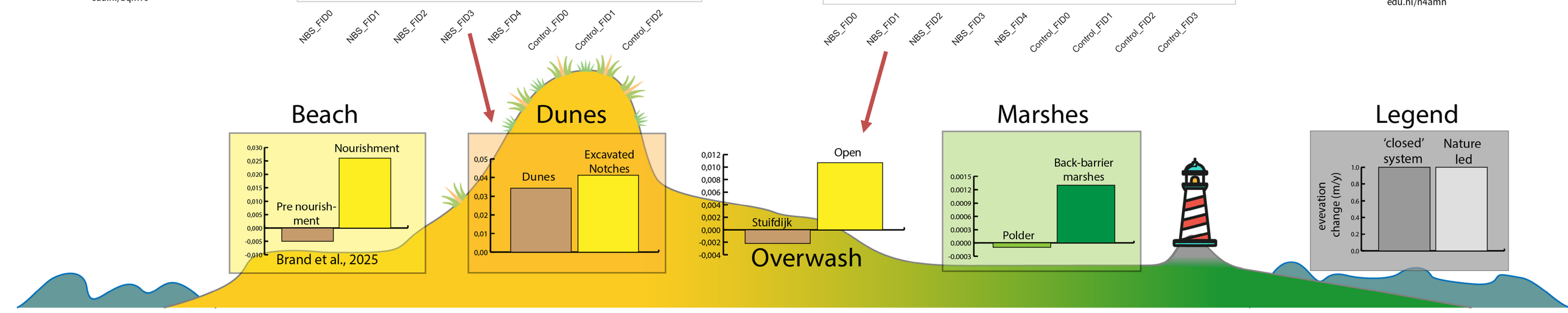

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References: