Bed level changes at saltmarsh-mudflat transitions

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Nature-based flood defence

- 1/3 of the dike rings do not meet the safety standard (> 1000 km)
- Increasing dike height is not a sustainable solution
- Need for innovative solutions
Marshes in front of dikes
- Additional safety
- Dynamic behavior (growth and decay)
- Stability during extreme events?
The marsh width

- What are the bed level dynamics of a marsh?
- Does this differ in sheltered and exposed sites?
Measuring bed level dynamics

- Sediment elevation dynamics (SED) - sensors: continuous measurements
1. SED sensor
SED data

1. SED sensor
2. Raw data
SED data

1. SED sensor
2. Raw data
3. Pre-processed data
SED data

1. SED sensor
2. Raw data
3. Pre-processed data
4. Approximation
Measuring bed level dynamics

- Sediment elevation dynamics (SED) - sensors: continuous measurements
- Erosion pins: discontinuous
Spatial patterns $Esa$
Spatial & temporal patterns $E_{sa}$

![Graph showing spatial and temporal patterns of $E_{sa}$](image-url)
Sheltered \((Ssa)\) vs. Exposed \((Esa)\) sites

**Graph A:**
- Elevation in mm+NAP
- Distance to marsh edge in m
- Sites labeled: 1. \(E_{sa}\) (Zuidgors)
- 50mm

**Graph C:**
- Sites labeled: 3. \(S_{sa}\) (Paulina)

*BE SAFE*
Discussion

- Clay vs. Sand
- Erosion is not the biggest during the largest storms
- Within vegetation vs outside vegetation
- Physics vs. Ecology
Thank you.