Information on data collection and structure Sedimentation-Erosion Bars Mud Motor dataset

Methods

Sedimentation Erosion Bars

The multi-annual surface-elevation change was determined with Sedimentation-Erosion Bars (SEBs). This instrument is described in (Nolte et al. 2013). The setup consists of two horizontally aligned poles inserted into the ground until they reach a stable horizon. During measurements, a 2 m-long bar with 17 holes 10 cm apart is placed on the poles and a ruler is placed through these holes to measure the distance to the soil surface. The 17 measurements from the SED to the ground are averaged, to collect a single bed level. With repeated measurements the bed level change over time can be calculated. The accuracy of the surface elevation is about 1.5 mm vertically. Additionally, the thickness of the freshly deposited soft mud layer on top of the more consolidated bed was measured for each SEB bar. The transition between soft mud and consolidated mud was determined based on the tactile resistance of the measuring stick (ruler) while placing it at the bed. In February 2015, 22 stations were established in 10 alongshore transects at the Mud Motor site on a vegetated salt marsh (Figure 1). In August 2016, 19 additional stations were placed at the 10 transects on the Mud Motor site to add stations at the bare mudflat. Simultaneously, 15 stations were established in 4 alongshore transects at a control site Zwarte Haan. The surface elevation was measured every two to three months, until August 2019. In February 2018 the ground was frozen when the surface elevation was measured. This may have resulted in an error of the measured surface elevation, as it was not possible to measure the thickness of the soft mud layer.

Vegetation

Yearly, in situ measurements of vegetation diversity and density were performed at permanent quadrats (PQ) located adjacent to the salt marsh SEB-stations (Figure 1) on both the Mud Motor site and the control site. Each plot was 2 m x 2 m and vegetation was estimated using the decimal scale of Londo (Londo 1976). The vegetation development in these PQ-plots for multiple years allowed us to compare the study area to a control salt marsh (Zwarte Haan) in order to determine the expansion rate and marsh stability. The presence and density of the plant species were used to determine the salt marsh vegetation zone for each PQ-plot. The PQs were separated into different salt marsh vegetation zones by using the Dutch SALT97 vegetation classification for salt marshes (De Jong et al. 1998). For each different vegetation zone, the sedimentation and vegetation development were calculated.

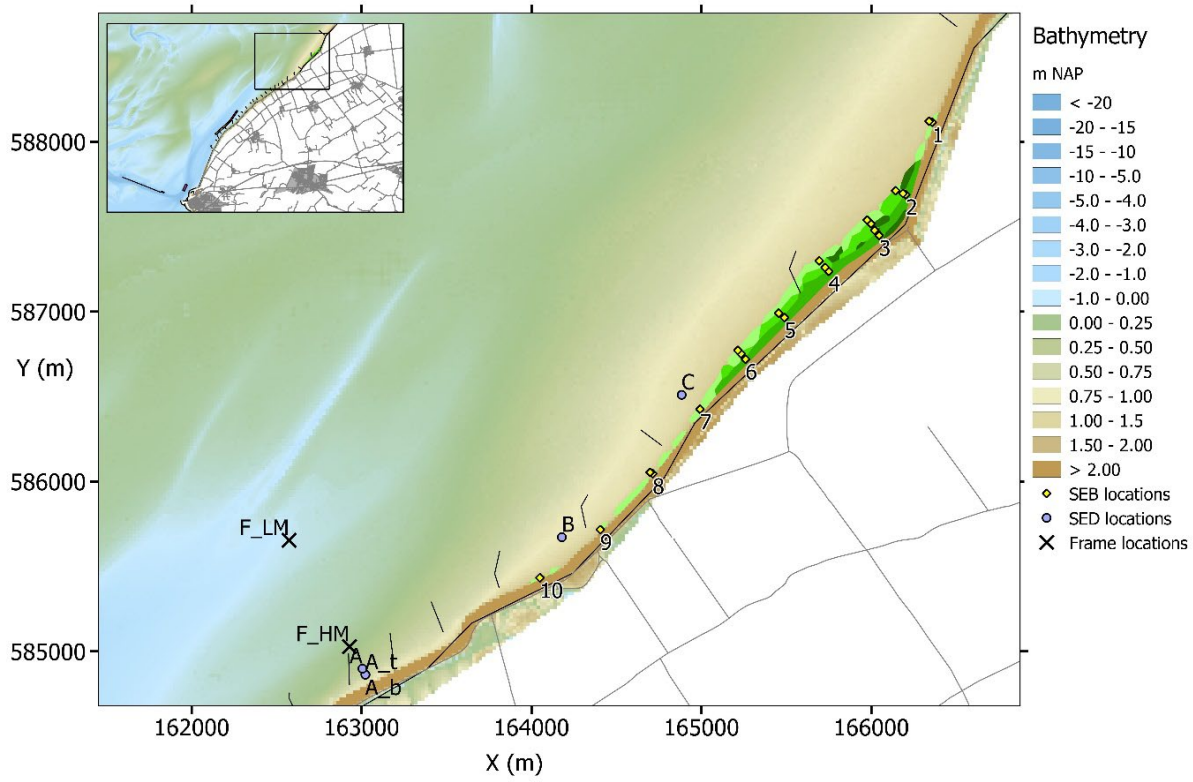

Figure 1. Measurement locations (bottom). Transects 1 to 10 show 22 Sedimentation-Erosion Bar (SEB) locations in the salt marsh, with adjacent permanent quadrats (PQ). Coordinates shown in Dutch grid EPSG:28992. Bright green colours indicate vegetation. Black lines indicate groins.

Mudmotor SEB data.csv

Column name	Description
Datum	Date of measurement
month_year	Month and year of measurement
ID	Area and ID number of Sedimentation-Erosion Bars
Pq.NR	ID number of SEB
x	X coordinate in RDnew projection
y	Y coordinate in RDnew projection
Gebied	Area, WH = Westhoek, mud motor site; ZH = Zwarte Haan, control site
maaiveld	Surface elevation in m NAP (mean sea level)
gem_2.16_cor	Average height of SEB bar above ground
Dikte.fluid.mud.cm	Thickness of the fluid mud layer in cm
Ops	Sedimentation (cm) between two measurements
sed_tijd	Time between two measurements
ops_snelheid	Sedimentation in cm/day
cum_ops	Total Sedimentation (cm) from start of measurement
2015	Salt97 vegetation classification in 2015
2016	Salt97 vegetation classification in 2016
2017	Salt97 vegetation classification in 2017
2018	Salt97 vegetation classification in 2018
2019	Salt97 vegetation classification in 2019
saltmarsh.type	Overall salt-marsh type of the SEB location

Mudmotor PQ data.csv

Colomn name	Description
PQ	Permanent quadrant number
Locatie	Area, WH = Westhoek, Mud Motor site; ZH = Zwarte Haan, control site
ID	Permanent quadrant number and area
Opnemers	Name of person taken measurement
Kaal	Percentage of bare ground
Drainage	Descriptive information on the drainage of the PQ
OM	Percentage of ground covered by organic matter
SALICEUR	Percentage cover of Salicornia europaea
SPARTANG	Percentage cover of Spartina anglica
SUAEDMAR	Percentage cover of Suaeda maritima
ASTERTRI	Percentage cover of Aster tripolium
HALIMPOR	Percentage cover of Halimione portulacoides (new name: Atriplex portulacoides)
LIMONVUL	Percentage cover of Limonium vulgare
PLANT MAR	Percentage cover of Plantago maritima
PUCCIMAR	Percentage cover of Puccinellia maritima
SPERLMAR	Percentage cover of Spergularia maritima
TRIGLMAR	Percentage cover of Triglochin maritima
AGROSSTO	Percentage cover of Agrostis stolonifera
ATRIPLIT	Percentage cover of Atriplex littorale
ATRIPPRO	Percentage cover of Atriplex prostata
ARMERMAR	Percentage cover of Armeria maritima
ARTEMMAR	Percentage cover of Artemisia maritima
SCIRPMAR	Percentage cover of Scirpus maritima (new name: Bolboeschoenus martima)
ELYMUPYC	Percentage cover of Elymus pycnanthus (new name: Elytrigia atherica)
FESTURUB	Percentage cover of Festuca rubra
GLAUXMAR	Percentage cover of Glaux maritima
JUNCUGER	Percentage cover of Juncus gerardii
PHRAGAUS	Percentage cover of Phragmites australis
Jaar	Year of measurement
totcov	Cover of all plants together
SR	Species richness
Opslibbing	Sedimentation over a year (August t0 – August t1)
height	Surface elevation in m NAP (mean sea level)
x	X coordinates in RDnew projection
y	Y coordinates in RDnew projection
Vegetatie_hoogte	Vegetation heigth in cm
type	Vegetation type in Salt97 salt-marsh typology
zonen	Vegetation zone in Salt97 salt-marsh typology