Historical Evolution of Mud deposition and erosion in intertidal areas of the Scheldt estuary

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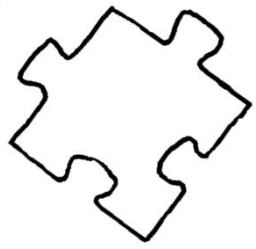
Inhoud

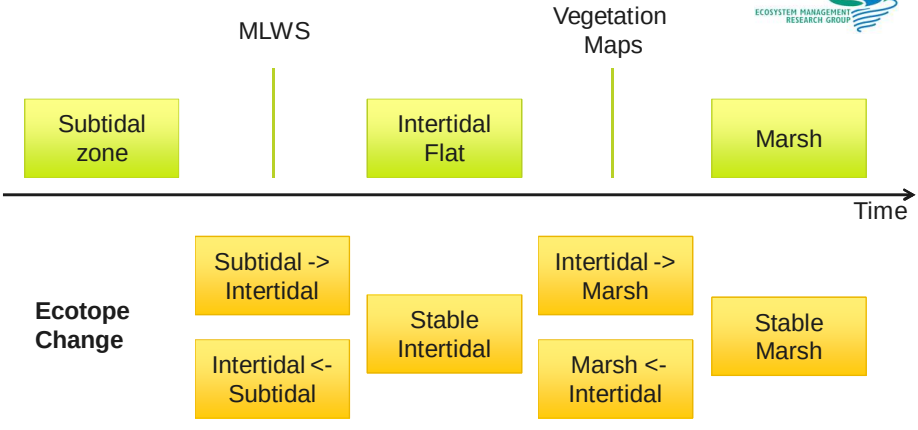
- Study Framework
- Methodology
- Results
  - Saeftinghe
  - General mass balance

Study Framework

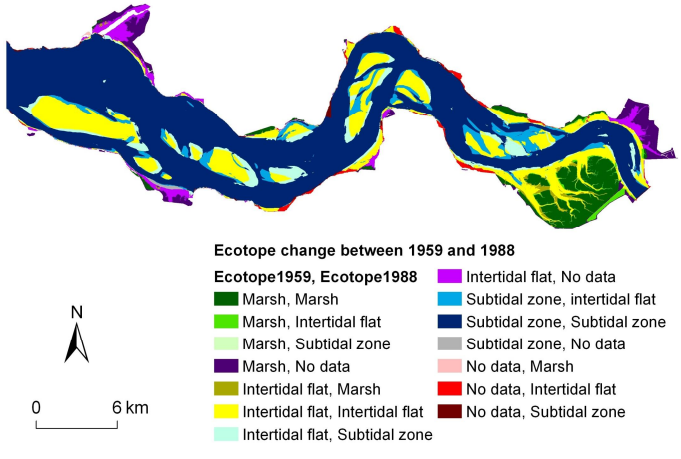
- Mud Balance of the Sea Scheldt
  - Historical evolution
  - Mass Balance [TDM/yr]
- Historical Evolution of Mud deposition and erosion in intertidal areas of the Scheldt estuary
  - How much sediment is stored /yr in intertidal areas?
  - 1 consistent methodology over entire estuary



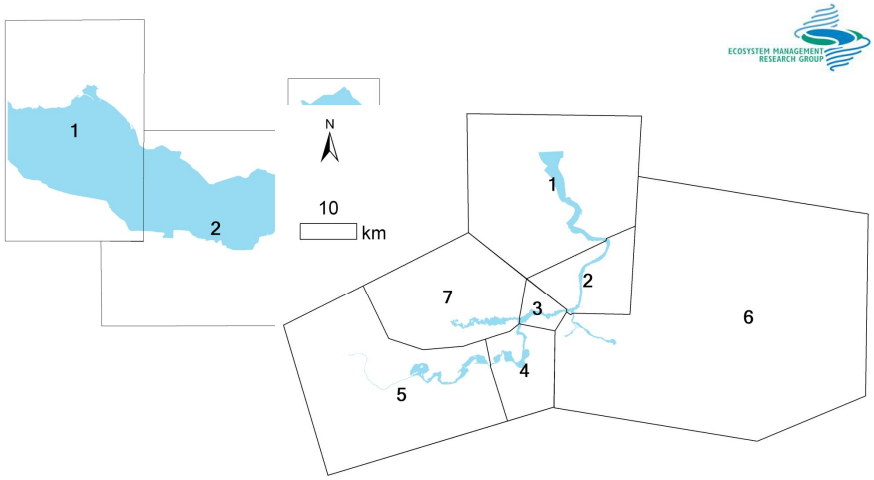
Method: Ecotopes



Ecotopes Change (1959 – 1988)



Method: Zonation

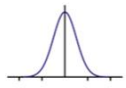
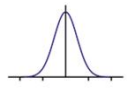


Method: overview

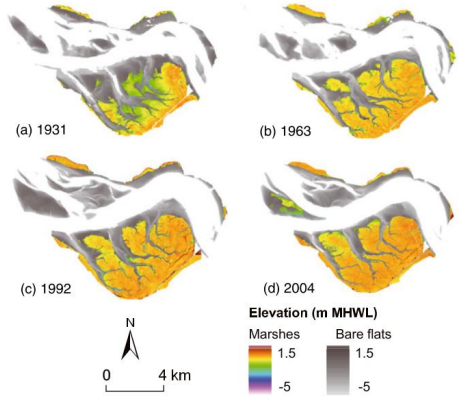
Zone (13)

Period (4)

Ecotope Change class (6)

Δ Mud Mass [TDM]	=	Δ Height [m]	x	Area [m²]	x	Mud content [%]	x	P Dry Bulk [kg/m³]
								500 +/- 100 kg/m³

Mud deposition in Saeftinghe

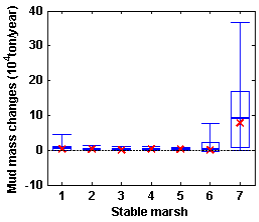


Wang, C., & Temmerman, S. (2013).

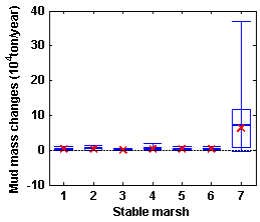
Mud deposition in Saeftinghe (zone 7)

1931 - 1963

90.000 TDS/yr



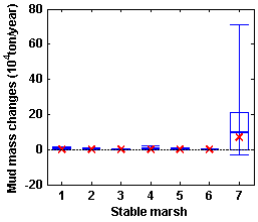
1963 - 1992



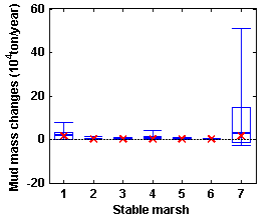
70.000 TDS/yr

1992 - 2004

90.000 TDS/yr



2004 - 2011



25.000 TDS/yr

Mud deposition and erosion in intertidal areas

Mass (ton/year)

Location	Stable marsh	Stable intertidal flat	Marsh -> Intertidal flat	Intertidal flat -> Marsh	Intertidal flat -> Subtidal zone	Subtidal zone -> Intertidal flat	All intertidal areas
Western Scheldt (1931-2010)	69,000	43,000	-11,000	22,000	-308,000	227,000	**43,000**
Sea Scheldt (1930-2011)	44,000	-5,000	1,000	20	-11,000	7,000	**36,000**

Conclusions

- Intertidal areas are a net sink of mud in both the Western Scheldt and Sea Scheldt
  - 43,000 TDM/yr for Western Scheldt
  - 36,000 TDM/yr for Sea Scheldt
- Important dynamics between intertidal & subtidal zone in the Western Scheldt
  - Gross mass fluxes one order of magnitude bigger then total net flux
- Accuracy of the method is limited in the Sea Scheldt, due to data availability

Conclusions

- A stable marsh captures about 4x more sediment TDS/ha than a stable intertidal flat
  - Sedimentation on stable marches (Saeftinge!) is more important (x1,6) than sedimentation on stable intertidal flats in the Western Scheldt.
  - But there's 2,5 times more surface area of intertidal flats on average.
- After 2004, most of the marshes in Saeftinghe are above MHWL and close to the upper limit in elevation, resulting in a slower increase in elevation and less mud deposition

Acknowledgements

- Rijkswaterstaat & INBO & HIC & aMT & UA-Ecobe group for providing data
- Divisions Maritime Access and Sea Scheldt as partners in the Mud Balance research

Technical Report

Wang, C.; Temmerman, S.; Vanlede, J.; Vandenbruwaene, W.; Verwaest, T.; Mostaert, F. (2014). **Mud balance Sea Scheldt: Subreport 6 - Historical evolution (1930-2011) of mud deposition/erosion in the intertidal areas of the Scheldt estuary**. Version 4.0. WL Rapporten, 00_029. Flanders Hydraulics Research & University of Antwerp, Ecosystem Management research group: Antwerp, Belgium.