

***The residual sand and mud transport in
the Scheldt-estuary, based on the
calculation of the sediment balance***

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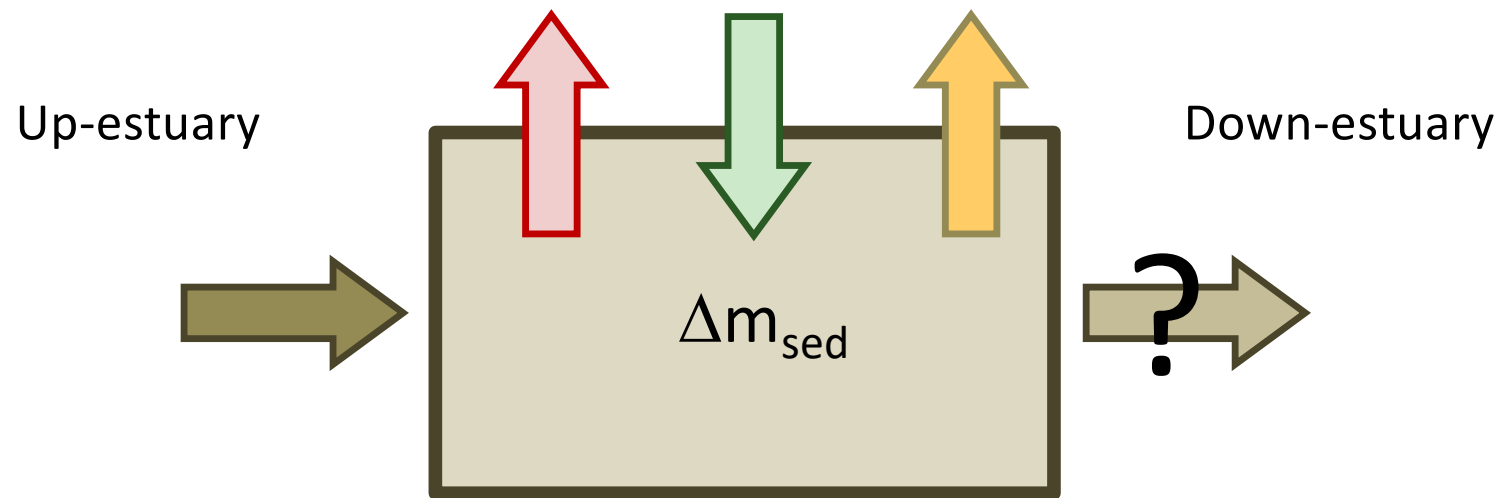
SedNet 2023, Lisbon



The Schelde-estuary

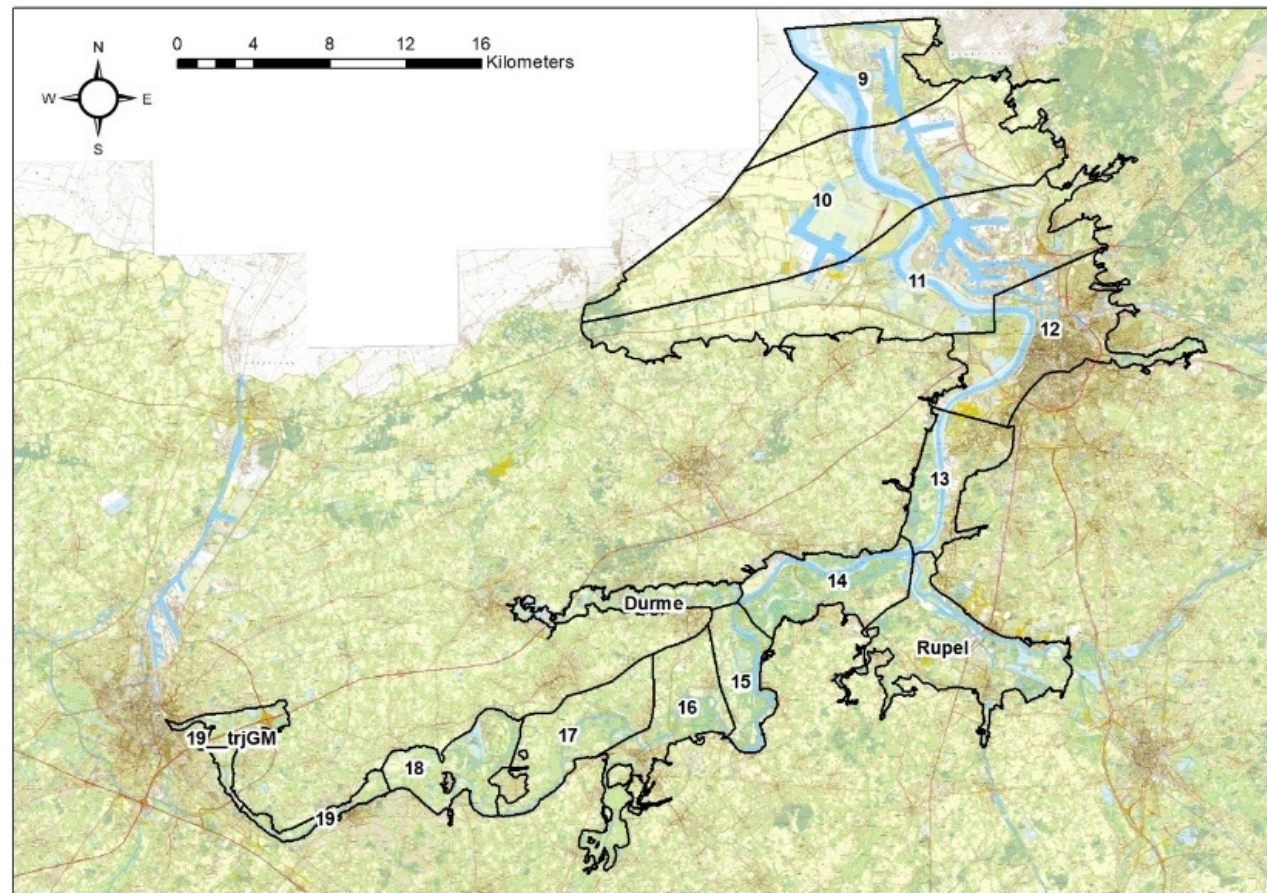


Sediment balance - concept



$$\Delta m_{\text{sed}} = \text{Import} - \text{Export} + \text{Disposal} - \text{Dredging} - \text{Extraction}$$

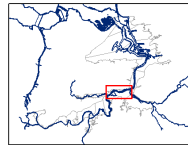
Sediment balance – spatial resolution



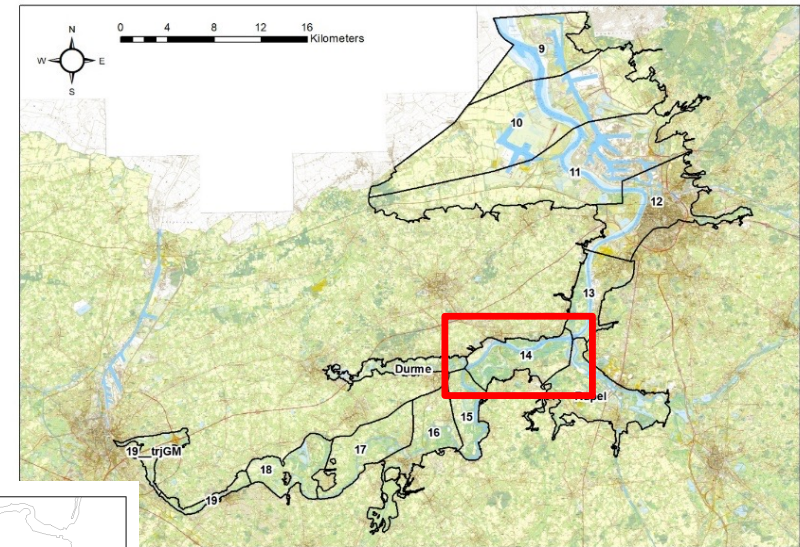
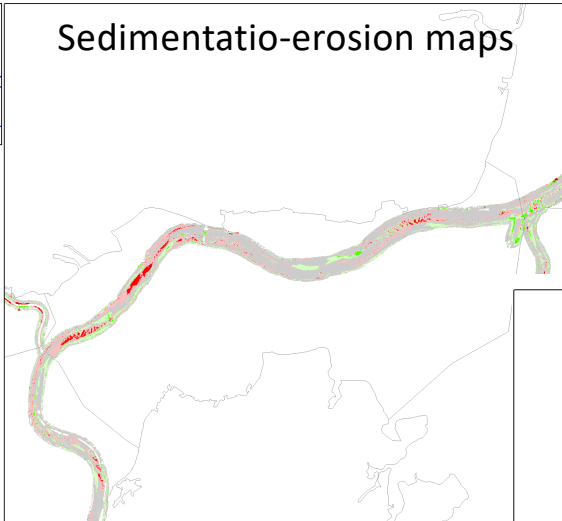
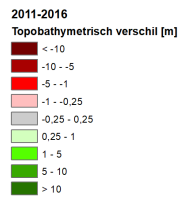
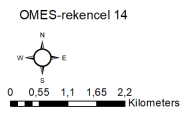
Sediment balance – data

- **Topo-bathymetry (volume)**
 - 2001
 - 2011
 - 2016
 - 2019
- **Ecotopes**
- **Bed samples (grain size distribution)**
- **Fluvial sediment import (mass)**
- **Dredging, relocation, extraction (volume or mass)**

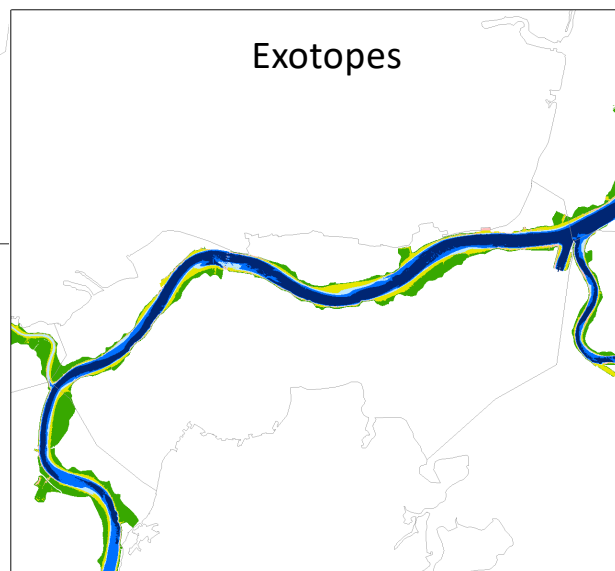
Example Data: Durme



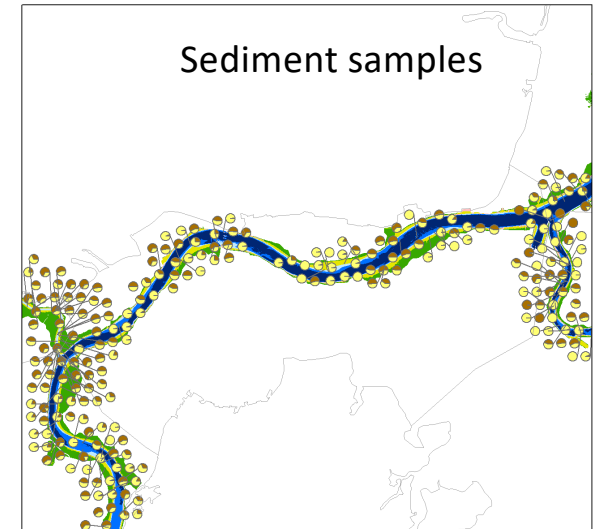
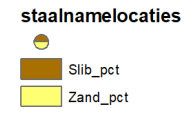
Sedimentatio-erosion maps



Exotopes



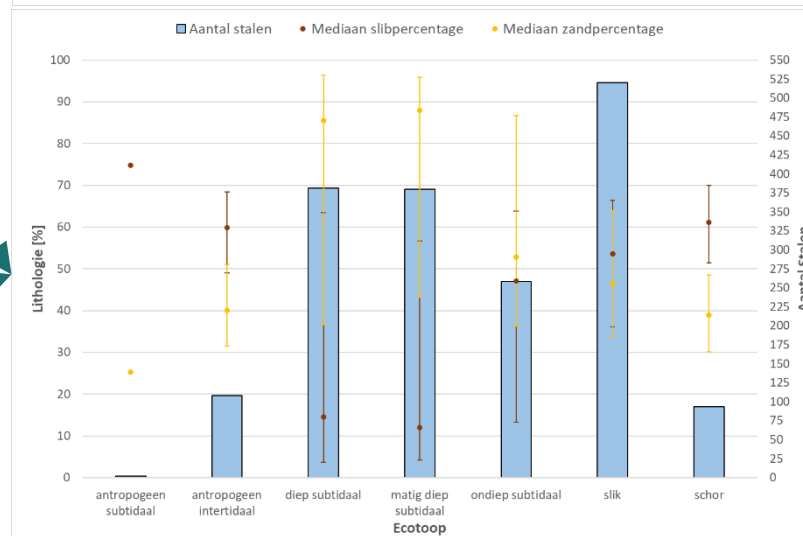
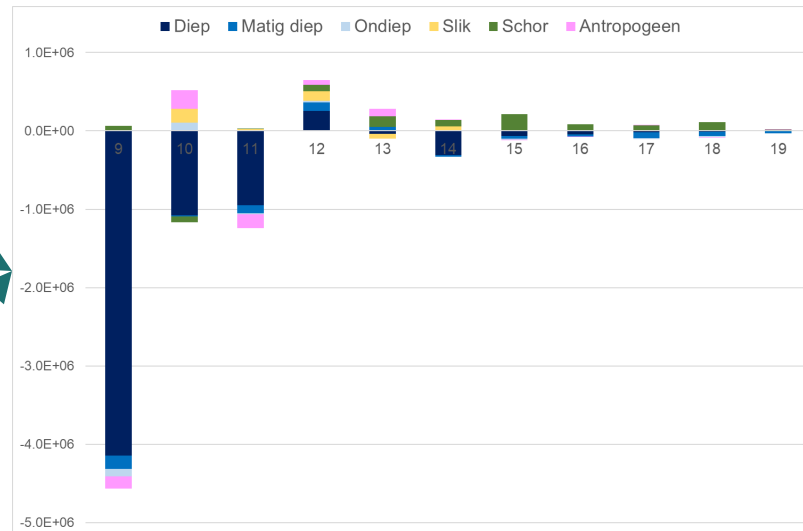
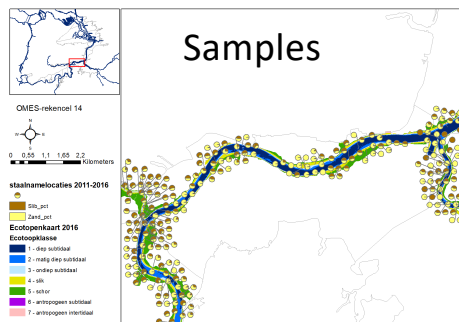
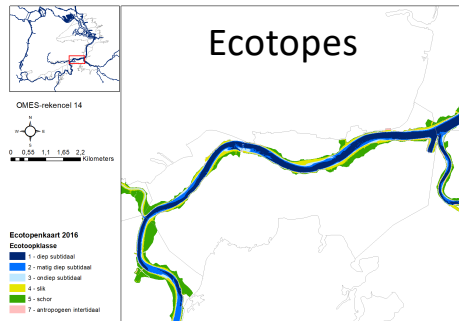
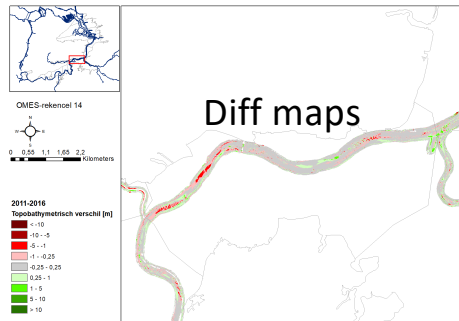
Sediment samples



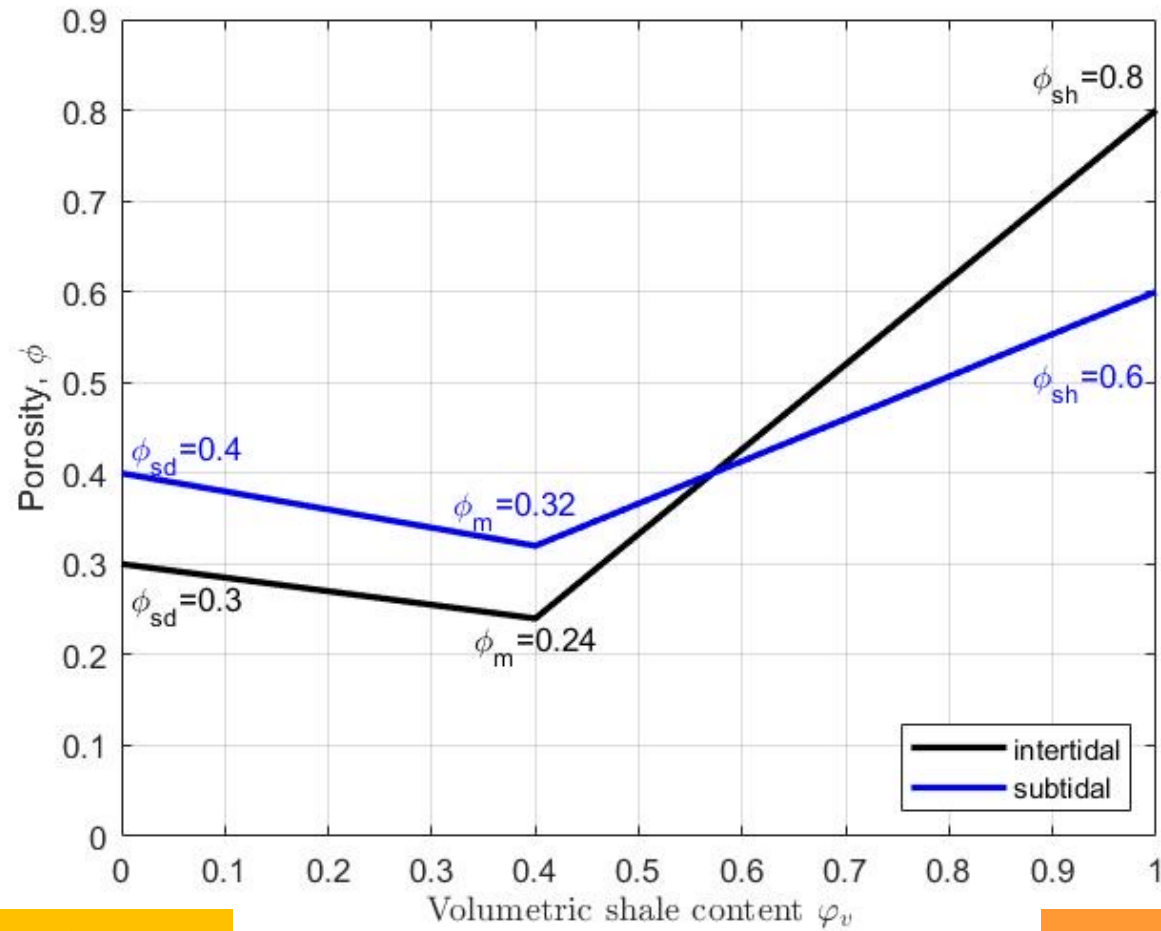
Data: sediment sampling



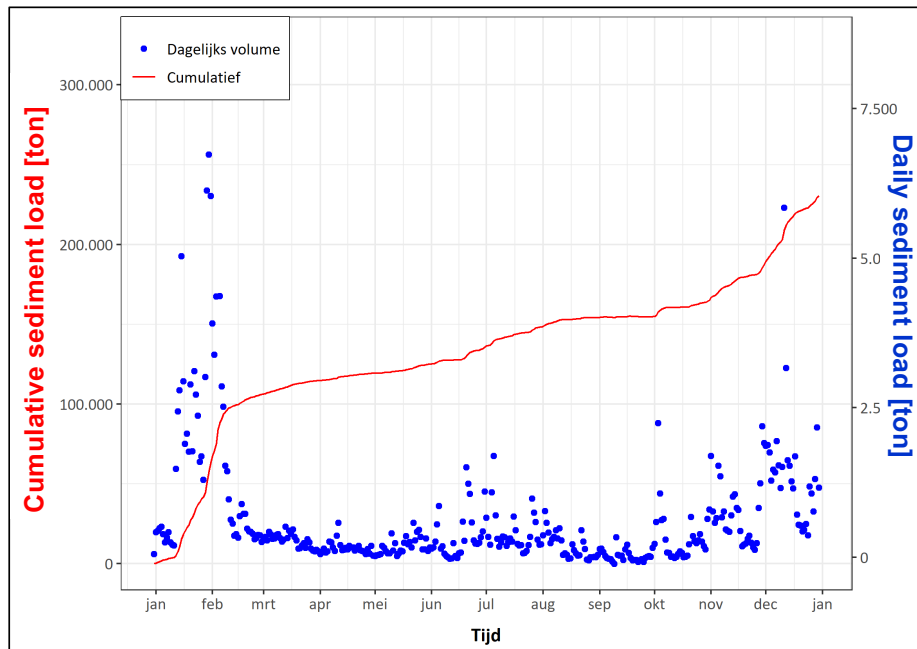
Data combination – volumes & lithologie



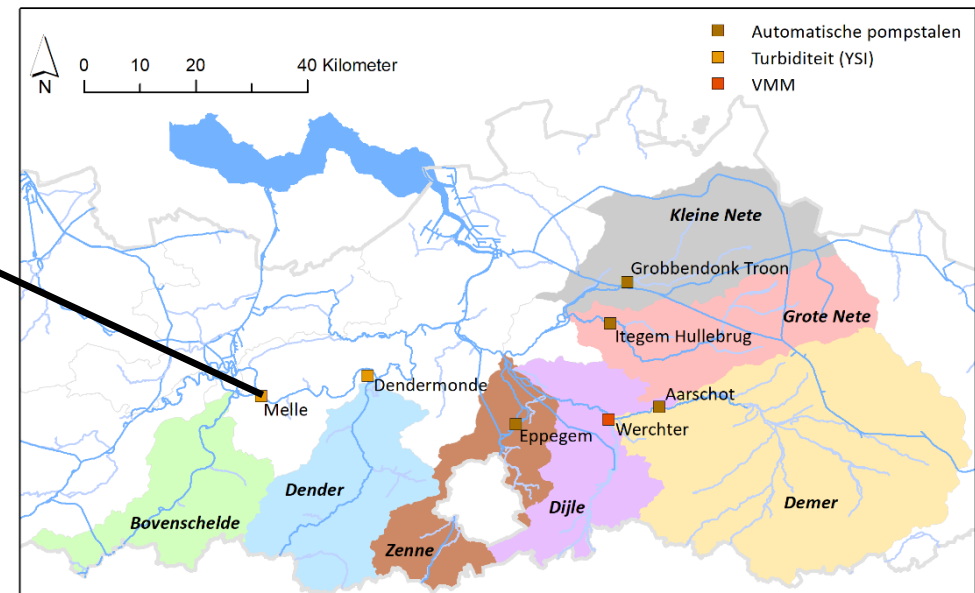
Volume to mass conversion: Kotermann et al. (1995)



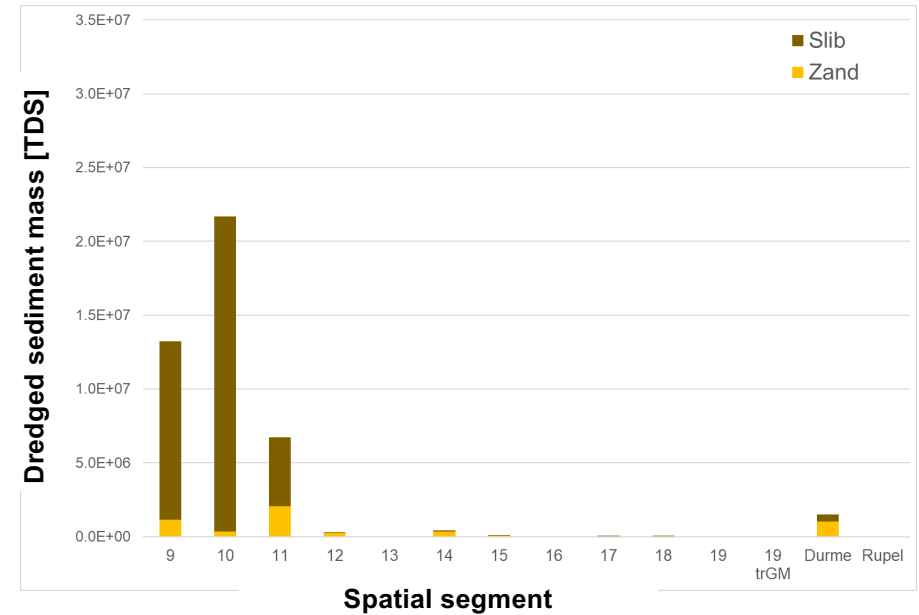
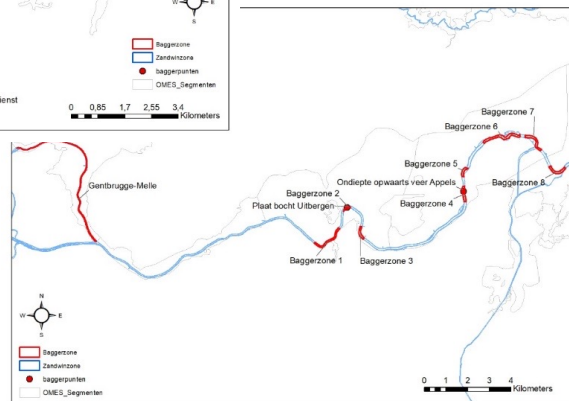
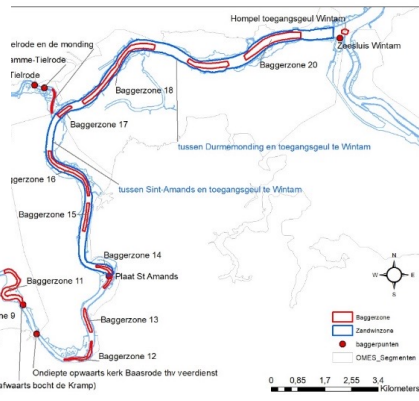
Up-estuarine boundary



Network of continuous measurements discharges and sediment concentrations (HIC, VMM)
Automatic sampling
Calibration campaigns
www.waterinfo.be



Human interventions



Conclusions

- **SAND**
 - Up-estuarine transport throughout major part of estuary
- **MUD**
 - Down-estuarine transport throughout major part of estuary
 - Important influence dredging – disposal (recirculation)
- **New insights to improve sediment management within Schelde-estuary**

Future research

- **Explain temporal (long term ~ year) variation**
 - Role of fresh water discharge
 - Role of intertidal areas (sink)
- **Importance of seasonal variation (short term ~ months)**
- **Role of docks (via locks) as sink**



Questions?

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