Simulating the Wadden Sea Ecosystem

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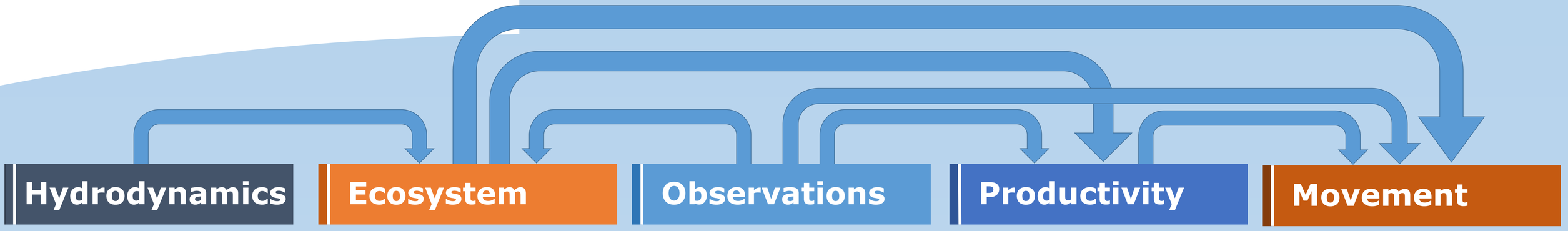


GETM

GETM is a hydrodynamic model capable of flooding and drying of land. We will set up a 200m fine grid for the entire Wadden Sea, with separate set-ups for sub-basins and specific areas of interest.

GITM

A particle tracking code capable of behaviour and life stages

General Estuarine Transport Model
General Individuals Tracking Model

ERSEM-BFM

The biogeochemical model ERSEM-BFM (NIOZ, CEFAS) was developed specifically for shallow areas with a strong benthic carbon pathway. The model includes TEP production, benthic diatoms, filter feeder larvae with a distinct pelagic phase and deposit feeders burying into the sediment to the dynamic food depth.

European Regional Seas Ecosystem Model
Biogeochemical Flux Model

SIBES

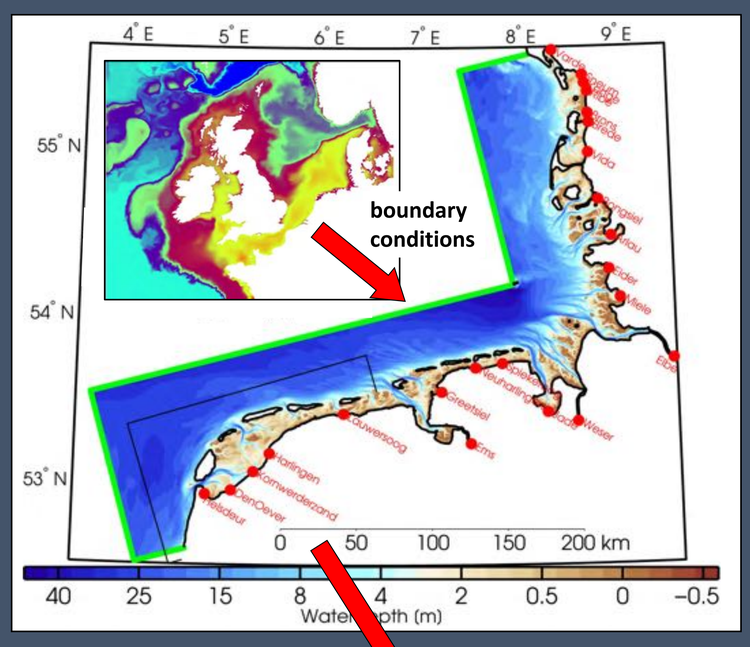
This unique dataset will inform the fine-scale modelling by providing a detailed sediment type and benthic habitat map, and defines the model's target for reproducing benthic biomass on the tidal flats in the Dutch sector. Measurements the of subtidal areas are scheduled.

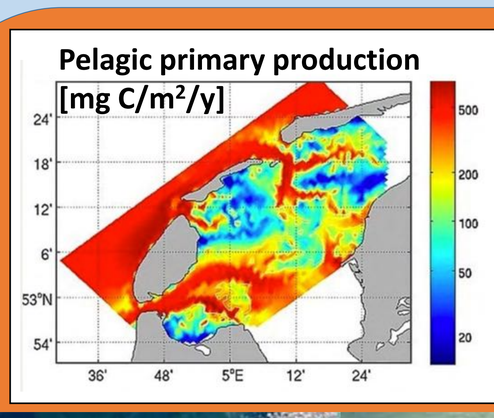
R&D

- Benthic versus pelagic productivity
- Nutrient storage capacity
- Individual and combined stressor response
- Primary production within the basins and its main drivers
- Carrying capacity of the Wadden Sea
- Use satellite data to validate production

R&D

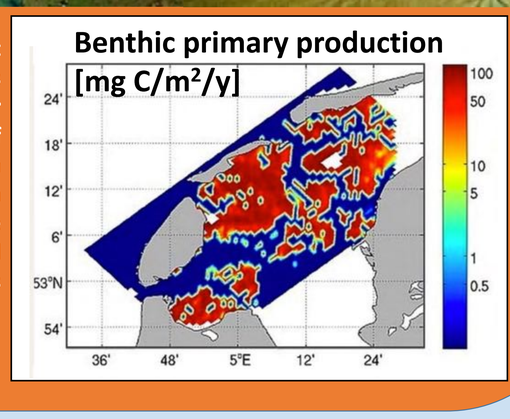
- Particle tracking of eggs and larvae: nursery function and link to bird movement
- Exchange with the North Sea: import or export of organic material?
- Net sediment import vs sea level rise
- Residence times of the basins
- Exchange between basins – seeding function

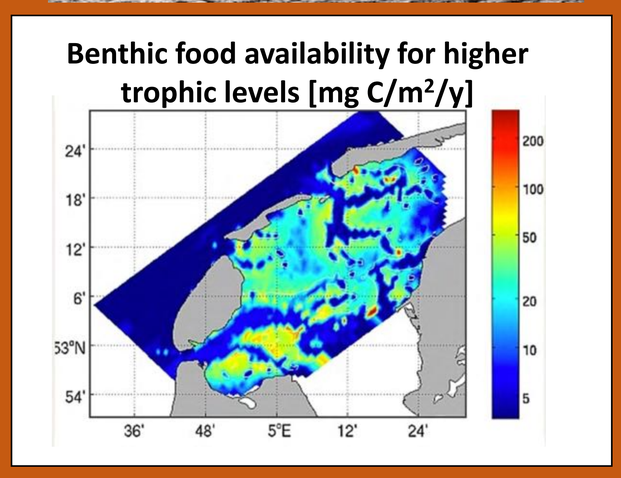




Complex models can help determine the overall connectivity of areas such as the Wadden Sea – incorporating state-of-the-art knowledge of benthic and pelagic processes

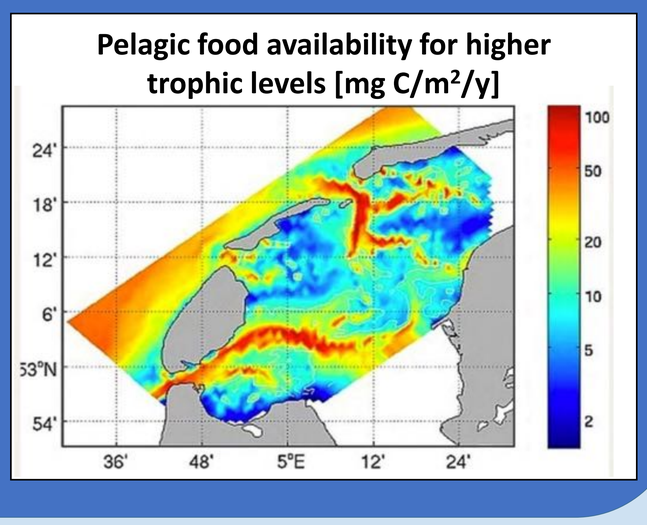
Shallow soft sediment systems are defined by their benthic pathways of nutrients and carbon – resulting in a different pressure response compared to oceanic systems

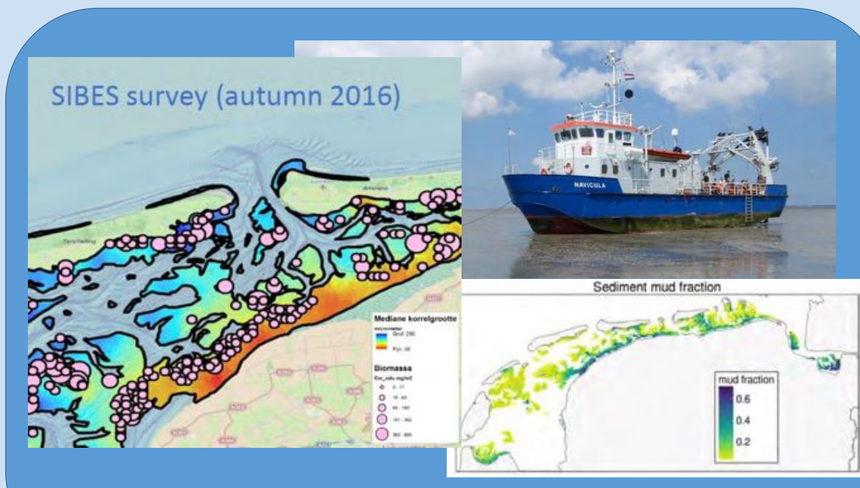




GPS tracking of birds shows within Wadden Sea movement – investigate link to food supply

Many species depend on the productivity of the Wadden Sea at different life stages





SIBES: fine scale tidal flat monitoring of benthos and sediments, on a 500m spatial grid, spanning 2008-2017 , with ~4500 locations each year

NIOZ is an institute of NWO in cooperation with Universiteit Utrecht

The Wadden Sea models are developed and maintained in collaboration with Leibniz Institute for Baltic Sea Research Warnemünde (IOW)