Time-series Measurement of Suspended Particulate Matter (SPM) in Turbid Coastal Waters

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Coasts and Climate Conflicts
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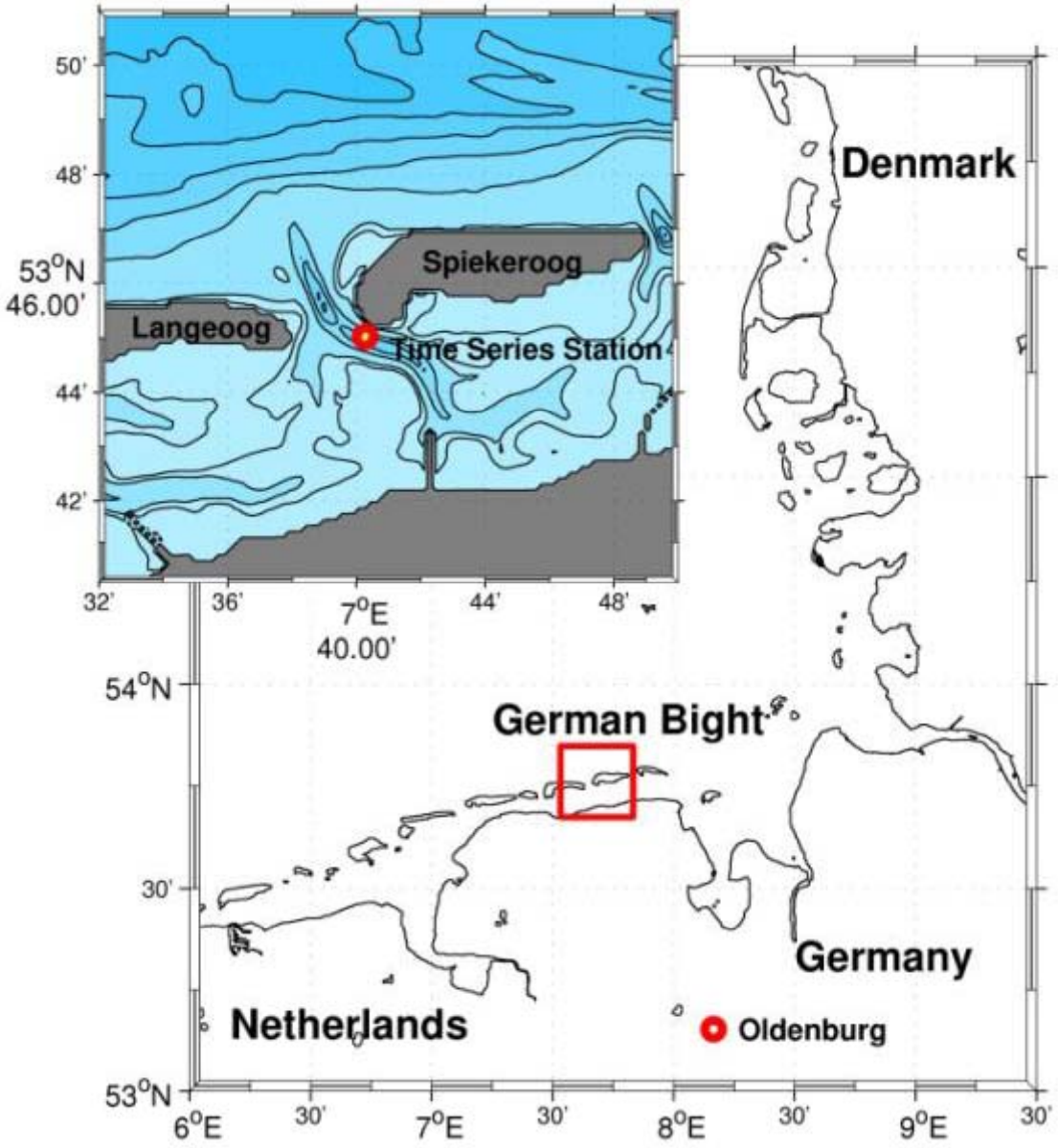
50'
48'
53°N
46.00'
44'
42'
Spiekeroog
Langeoog
Time Series Station
32'
36'
7°E
40.00'
44'
48'
54°N
30'
53°N
6°E
30'
7°E
30'
8°E
30'
9°E
30'
Denmark
German Bight
Germany
Netherlands
Oldenburg

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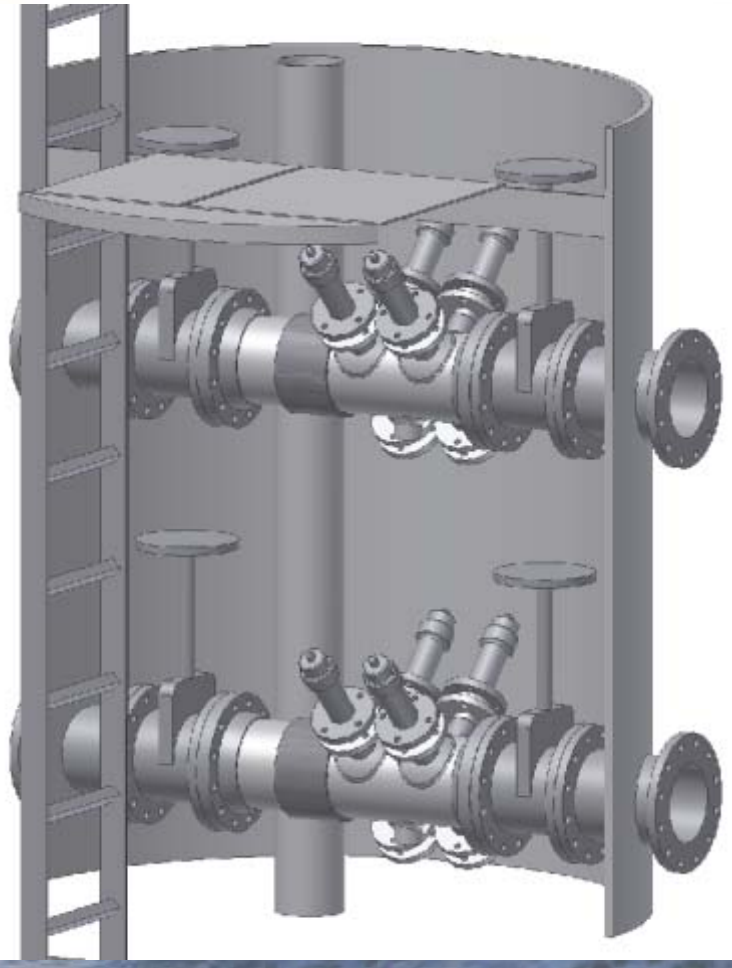


Measured 25 Parameters

Meteorology

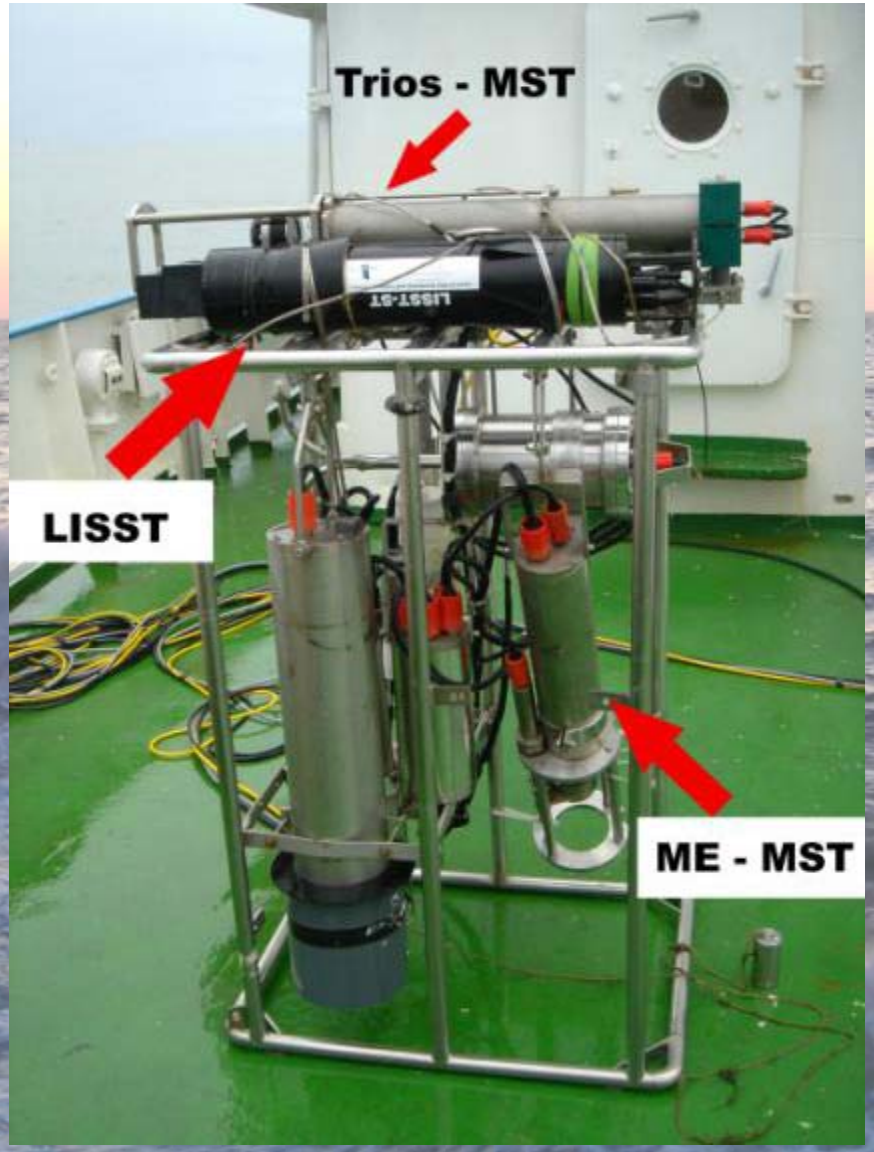
- wind speed
- wind direction
- air temperature
- air pressure
- humidity

Oceanography

- water level
- temperature, salinity at 5 depths
- dissolved oxygen at 1 depths
- daylight reflectance (Radiometer)
- spectral transmission (MST)
- currents (ISM and ADCP)
- nutrients
- yellow substance fluorescence

- Database 6 years
- Time series data of 25 parameters
- Real time data via web
- Measuring at extrem events:
  - High wind speeds (Gales)
  - Extrem high water level (Storm Surges)
  - Sea Ice

Intercalibration



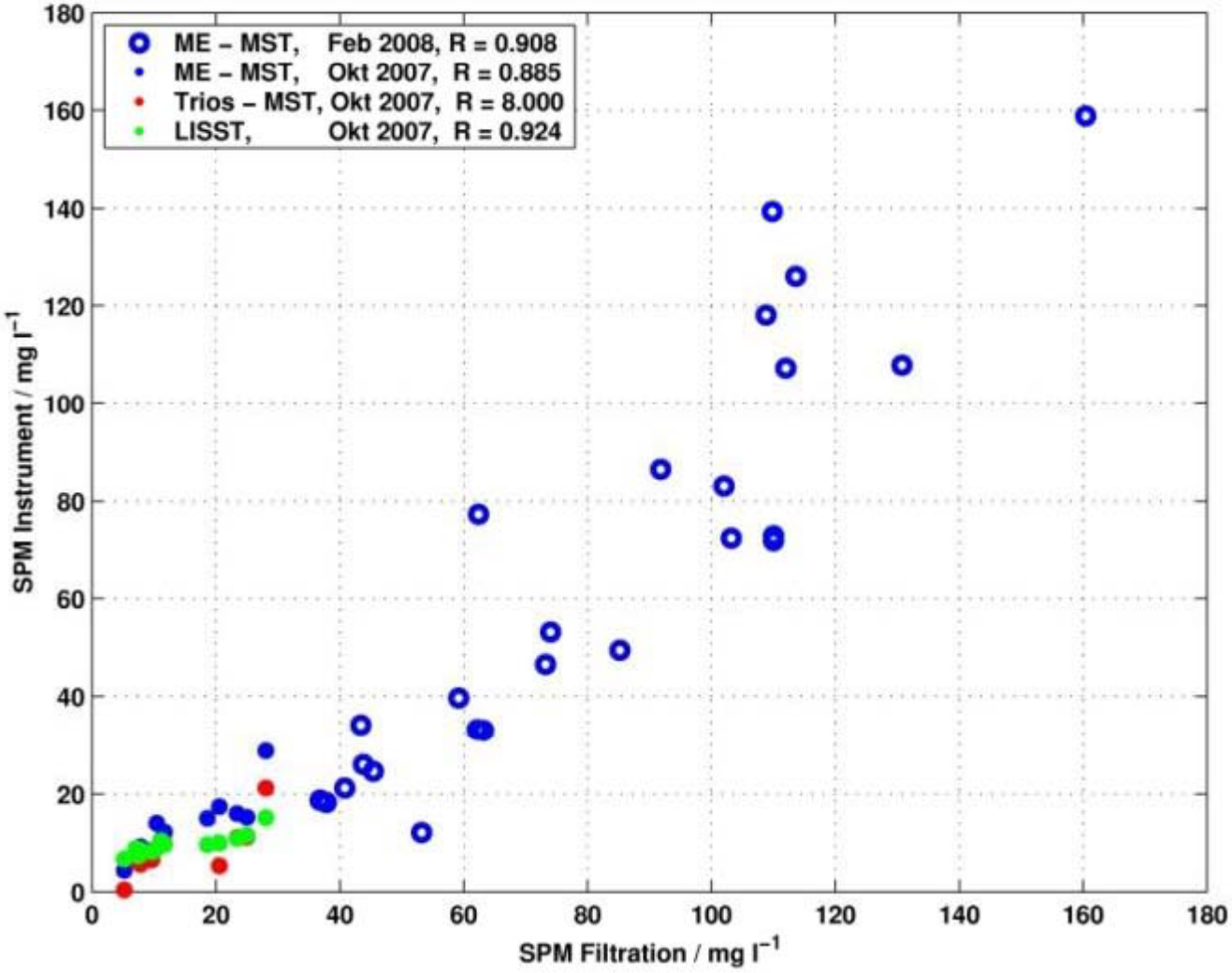
Methods

MST (Multi-Spectral Transmissometer): Particle concentrations are calculated via measuring the spectral attenuation coefficient in the water.

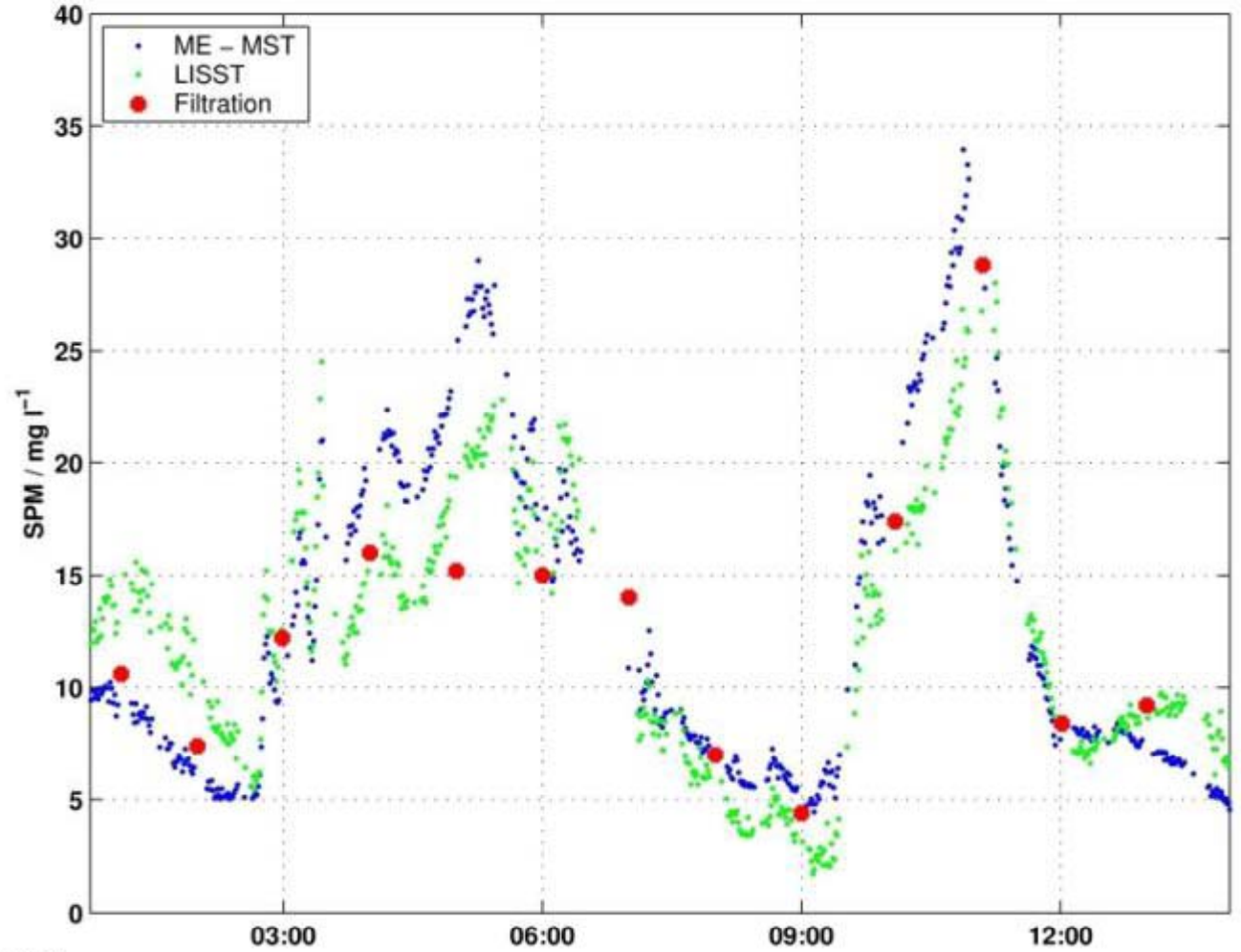
SPM (Suspended Particle Matter): Water samples are filtered, filters dried and weighed.

LISST (Laser In-Situ Scattering and Transmissometry): Particle concentrations are measured by a laser diffraction method in a range of 2.5 to 500 µm.

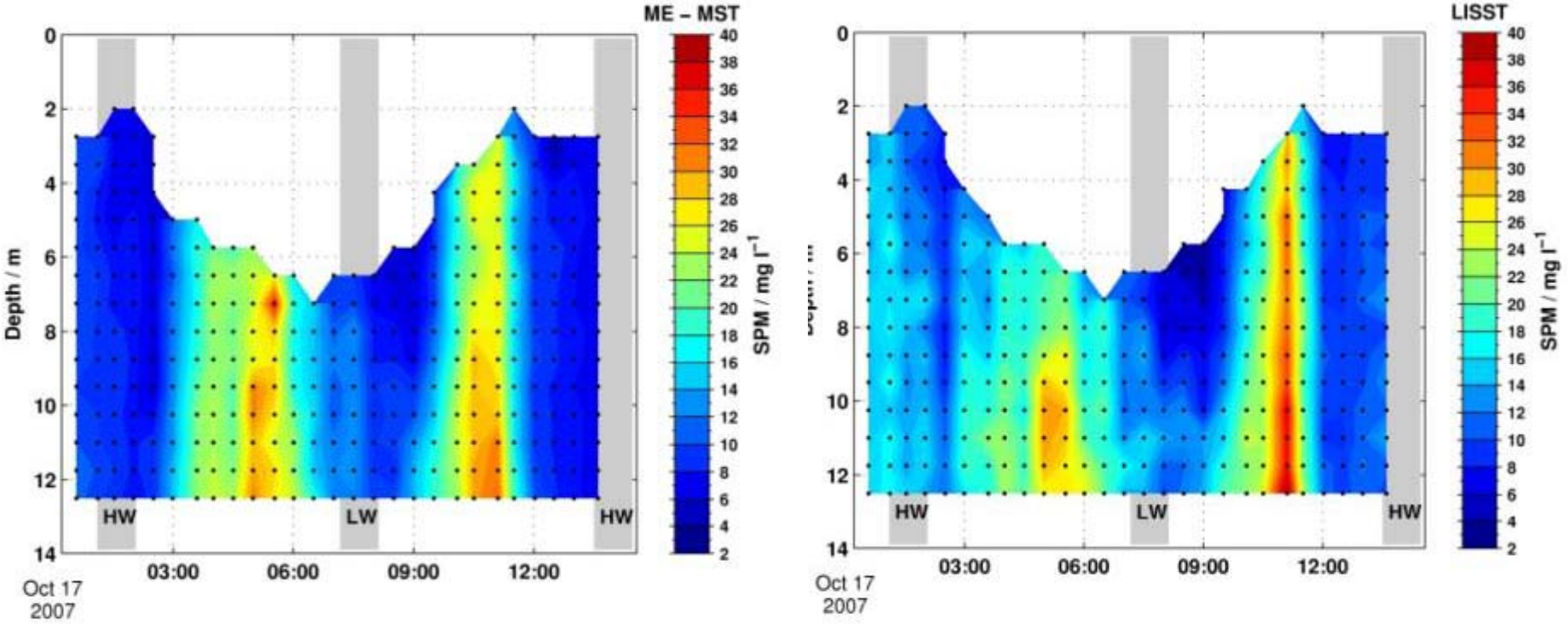
Correlation



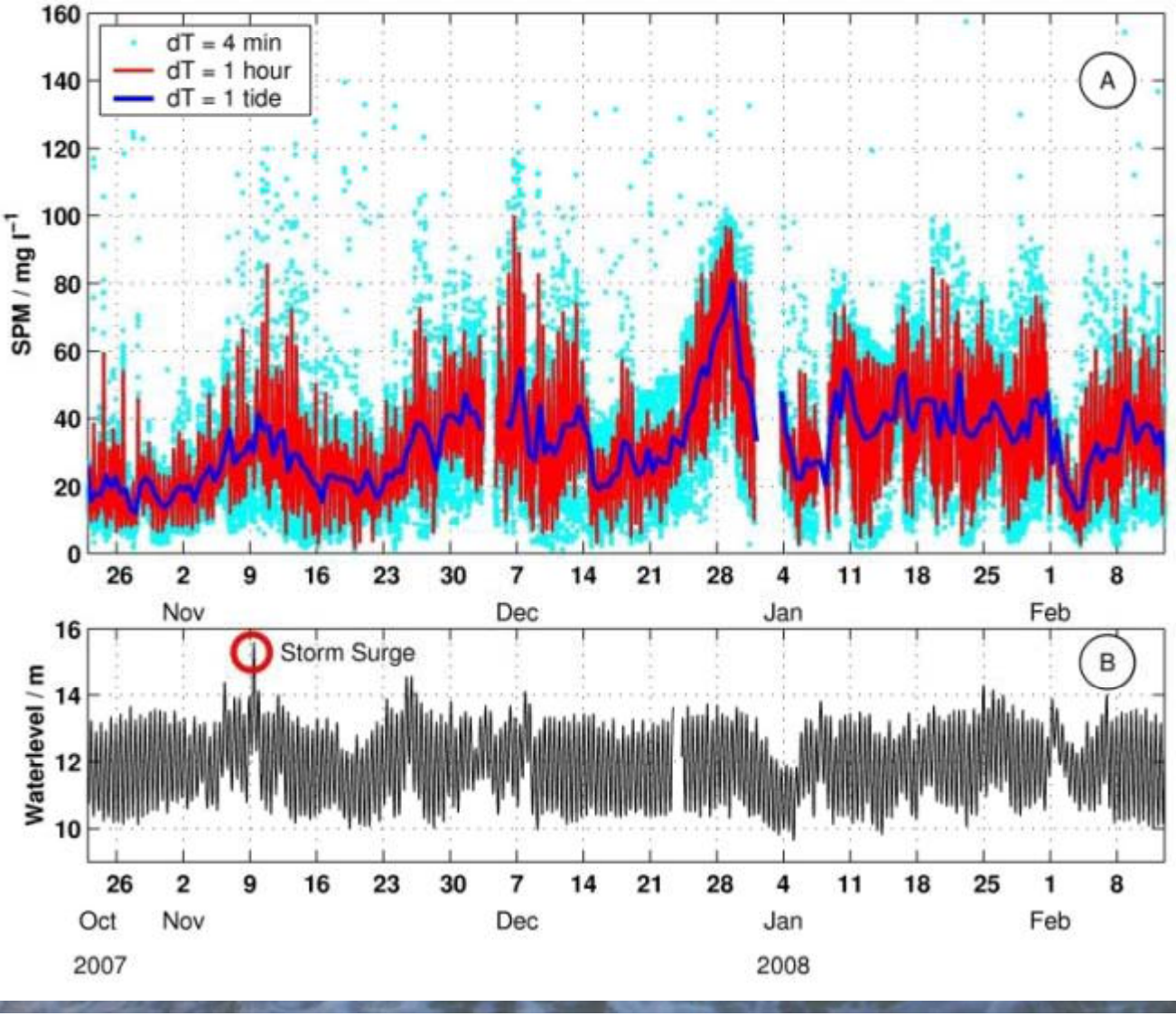
Surface SPM Concentration



Profiling measurements FK Senckenberg

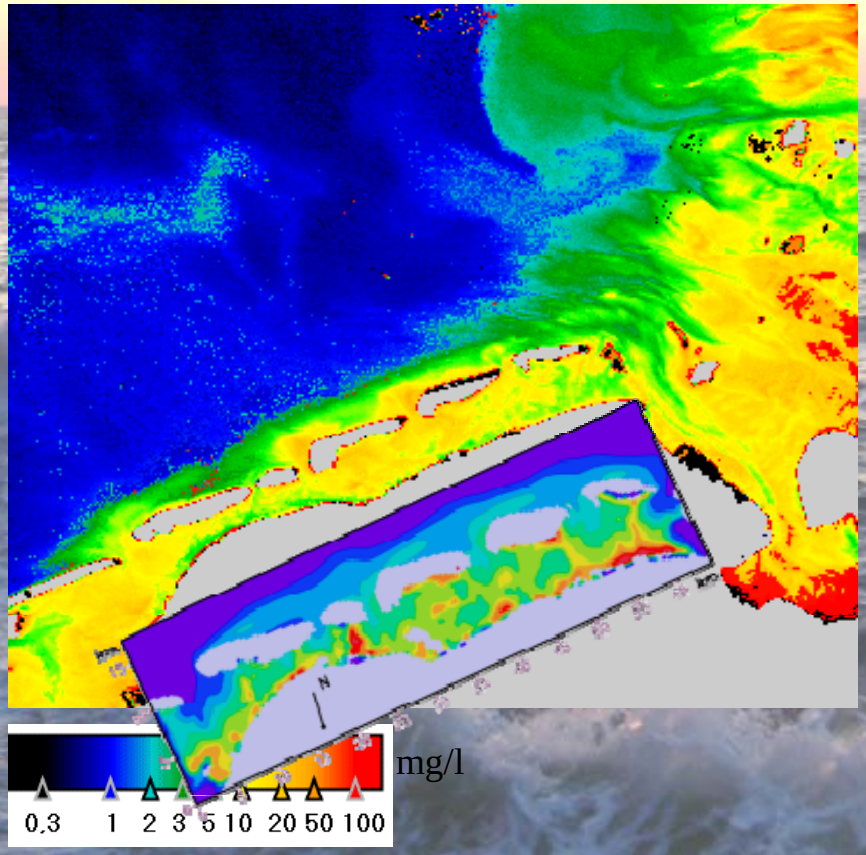


SPM Time Series Station

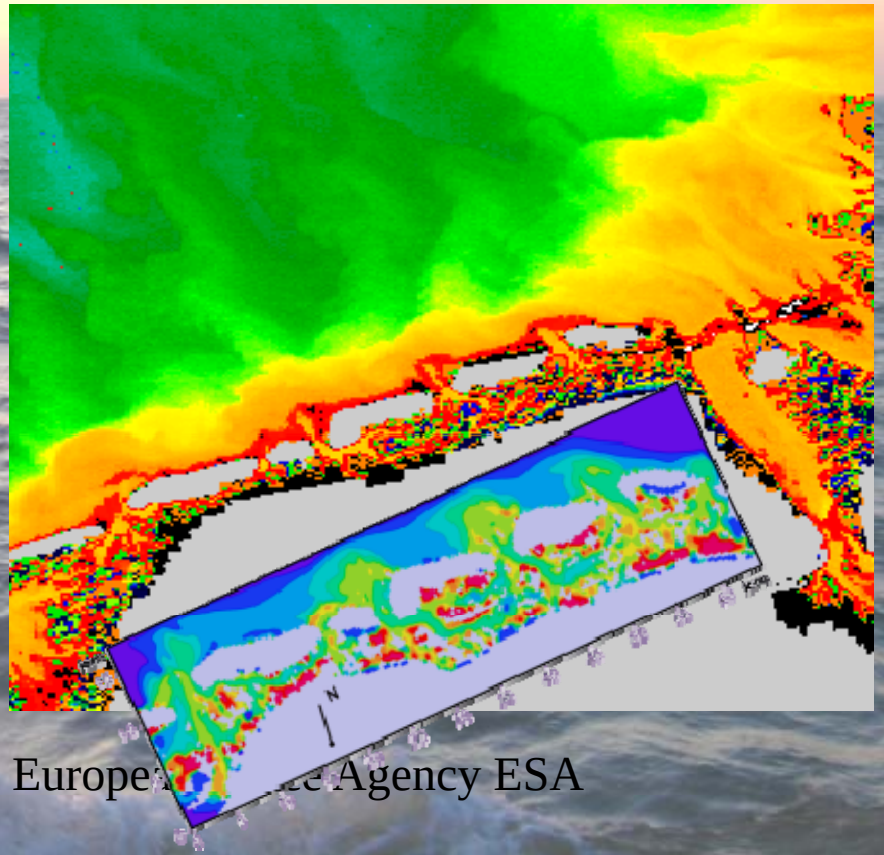


MERIS - Modelling

High water, 3 June 2004



Low water, 29 March 2004



Europe Agency ESA

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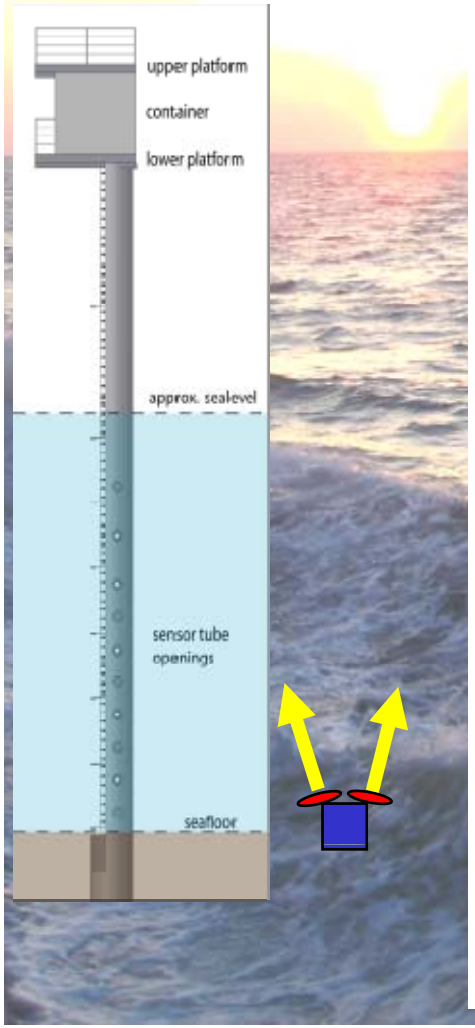
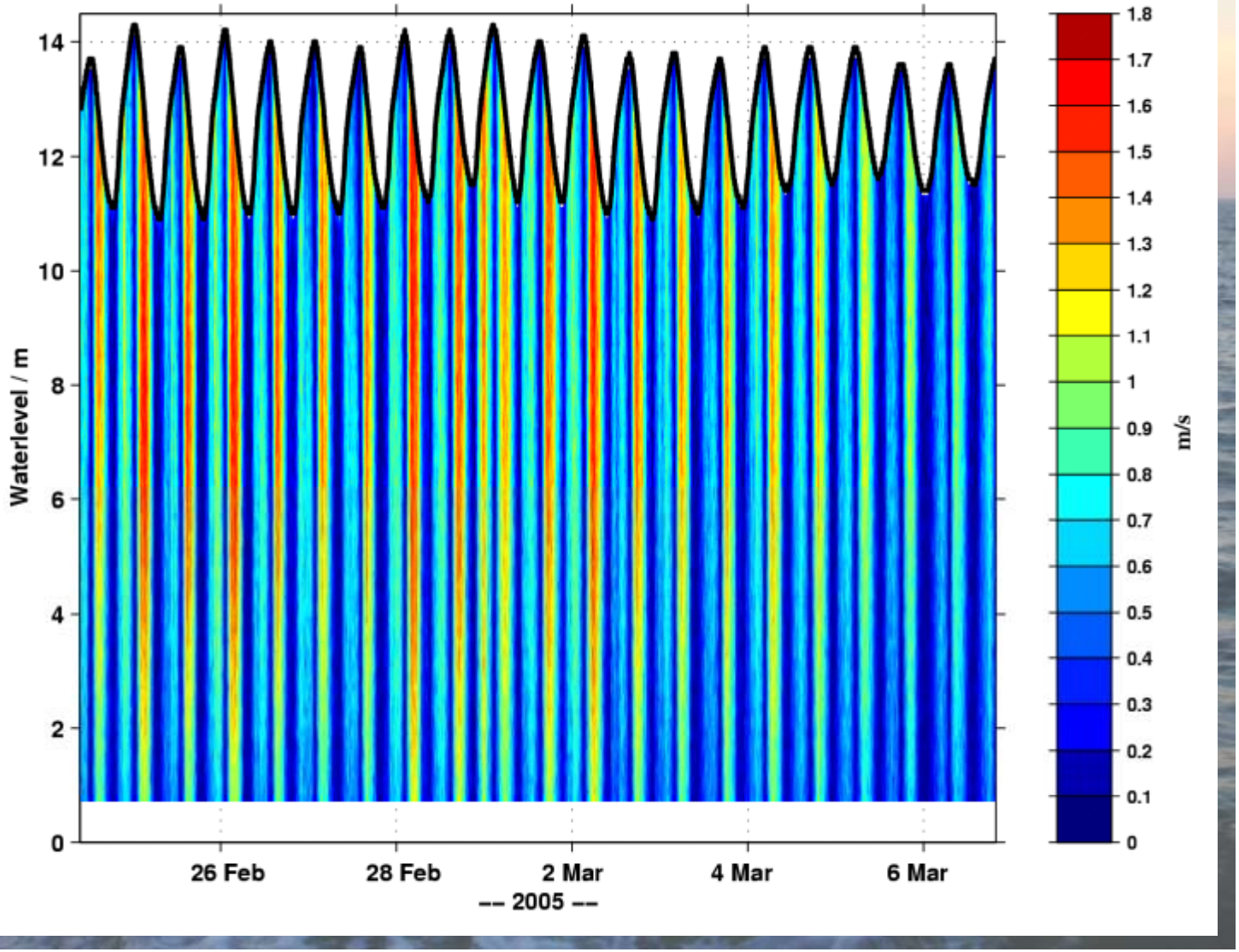
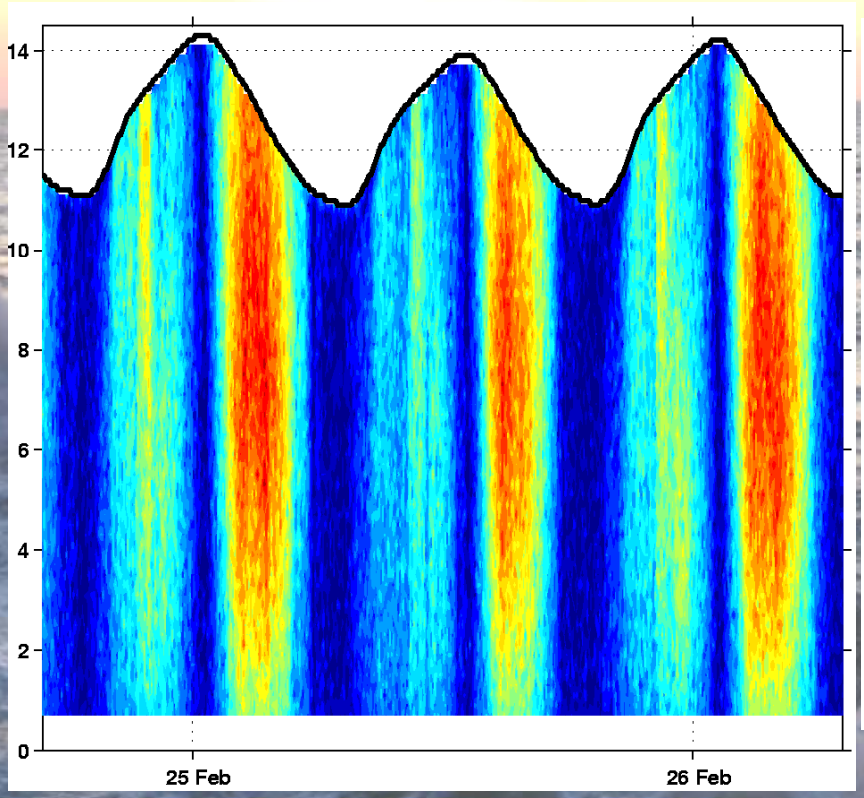
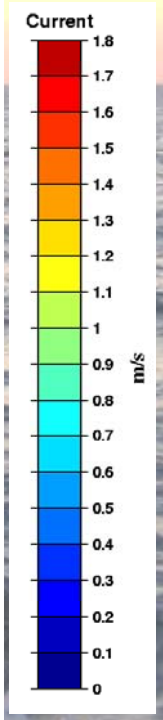
ADCP Current Speed

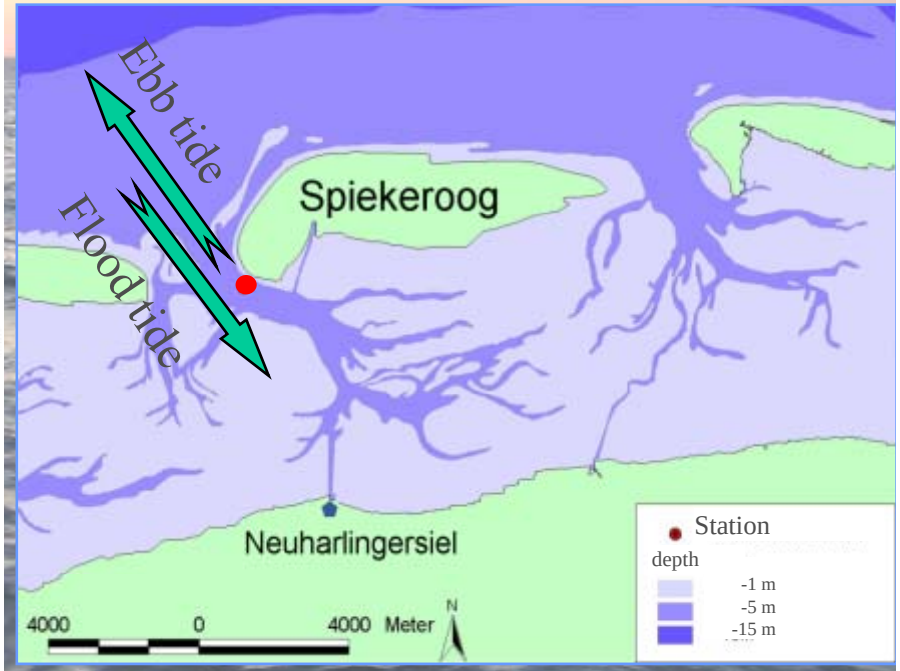




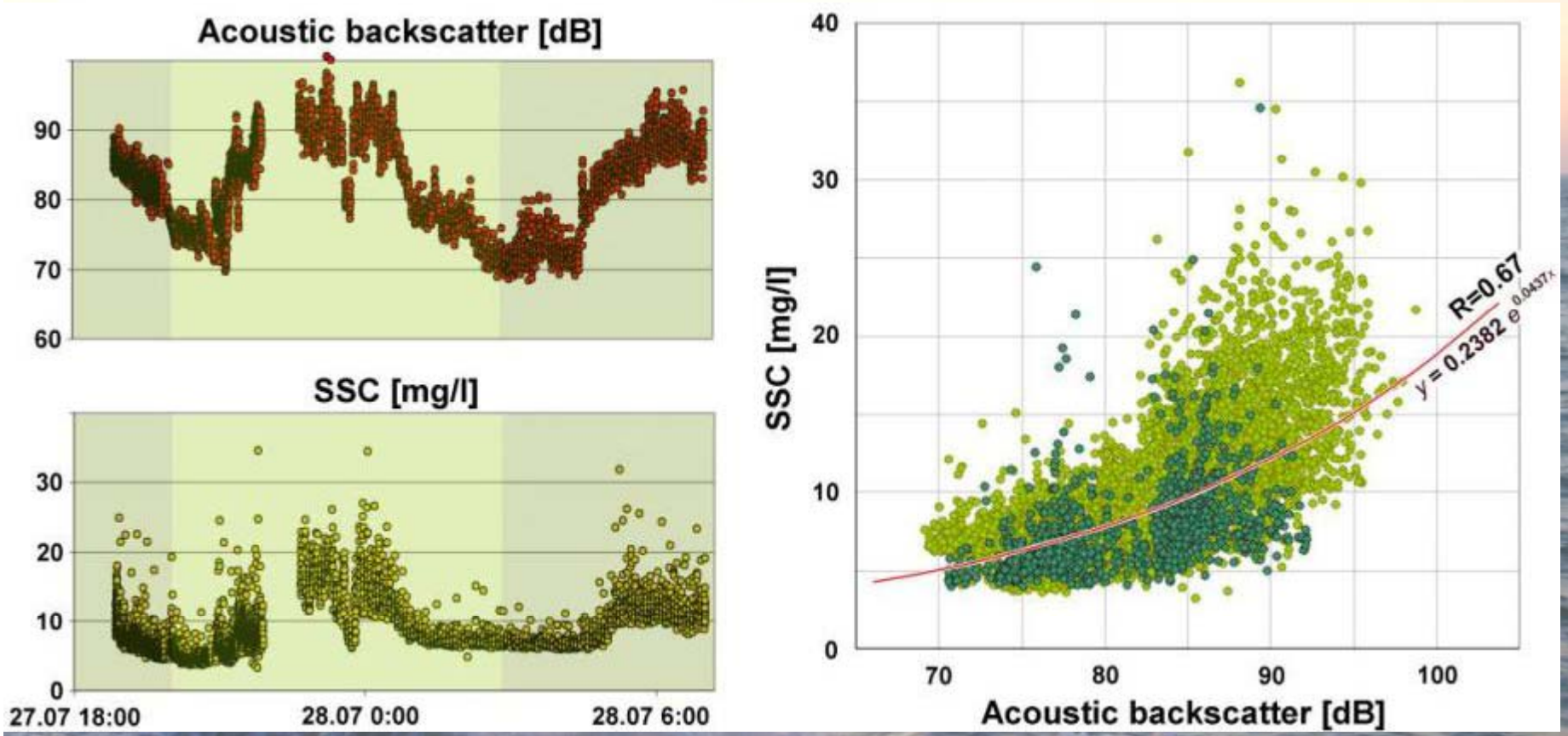
ADCP Current Speed





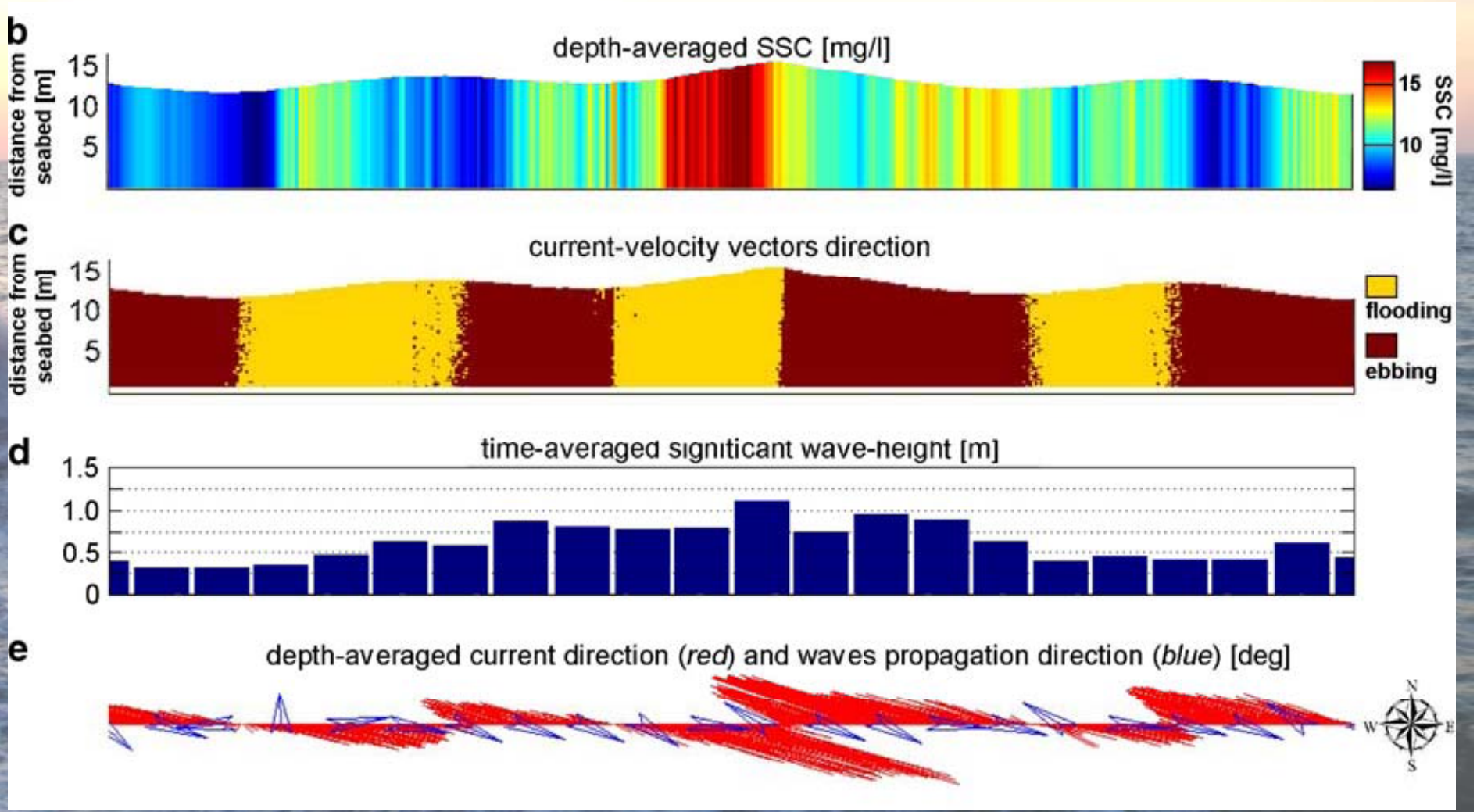


ADCP Backscatter Validation



Storm Surge "Britta"

1. Nov. 2006



Conclusions

- MST derived SPM data correspond well with SPM data derived from standard methods
- A single storm surge can have less impact on SPM dynamics than longer lasting gales
- Background data for estimating the influence of climate change on coastal sediment dynamics