MULTI-SYNC

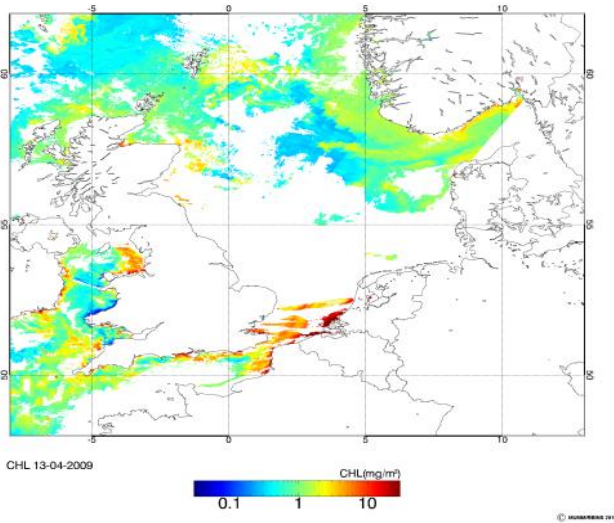## Multi-scale synergy products for advanced coastal water quality monitoring
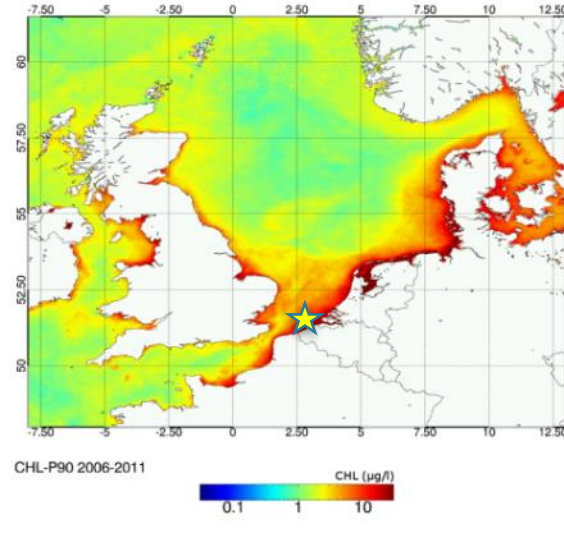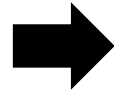

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BEODAY 2018

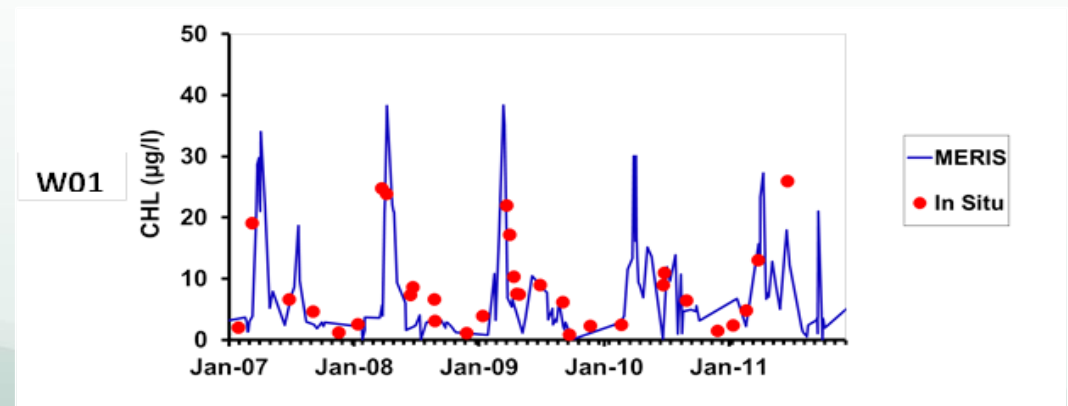# From ocean color to water quality assessment

Monitoring of Eutrophication

Multi-temporal composit of CHL product covering the whole North Sea
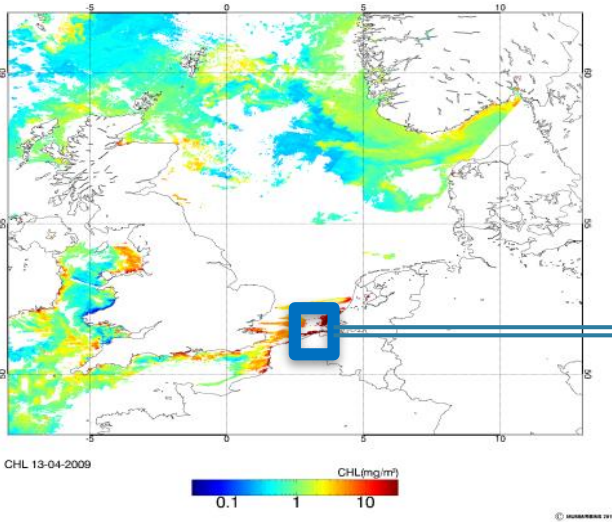

Daily snapshot of CHL (MERIS MEGS 7.5)

CHL

CHL time series for the Belgan W01 station used to asses phytoplankton dynamics

Traditional and new 'OC' sensors
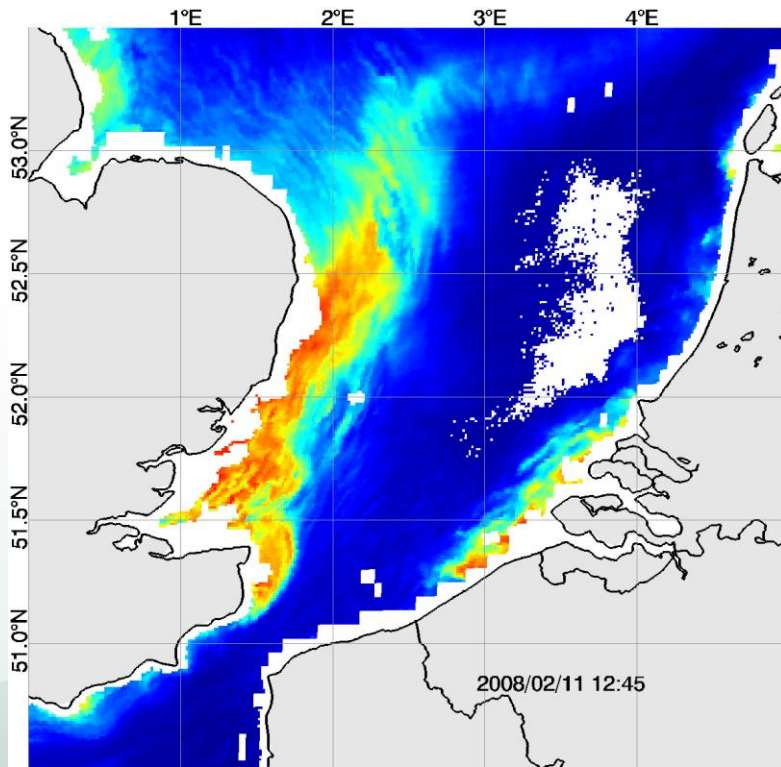
**CHL product
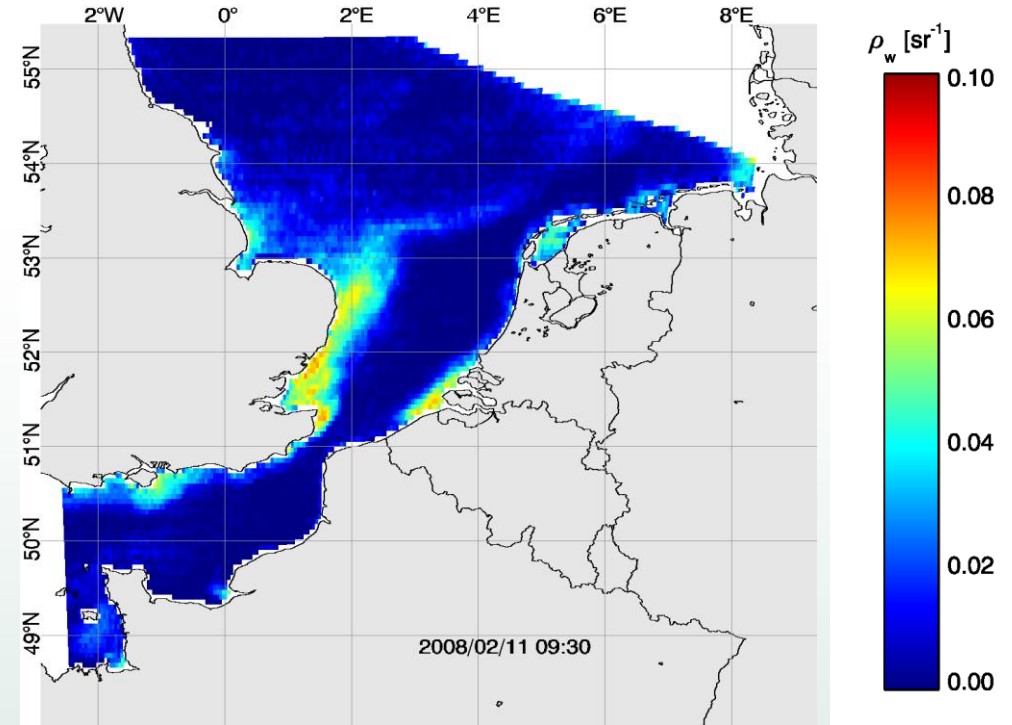(1km resolution / daily)**

**S2 RGB and SPM product
(10m resolution / 5-10**

Traditional and new 'OC' sensors

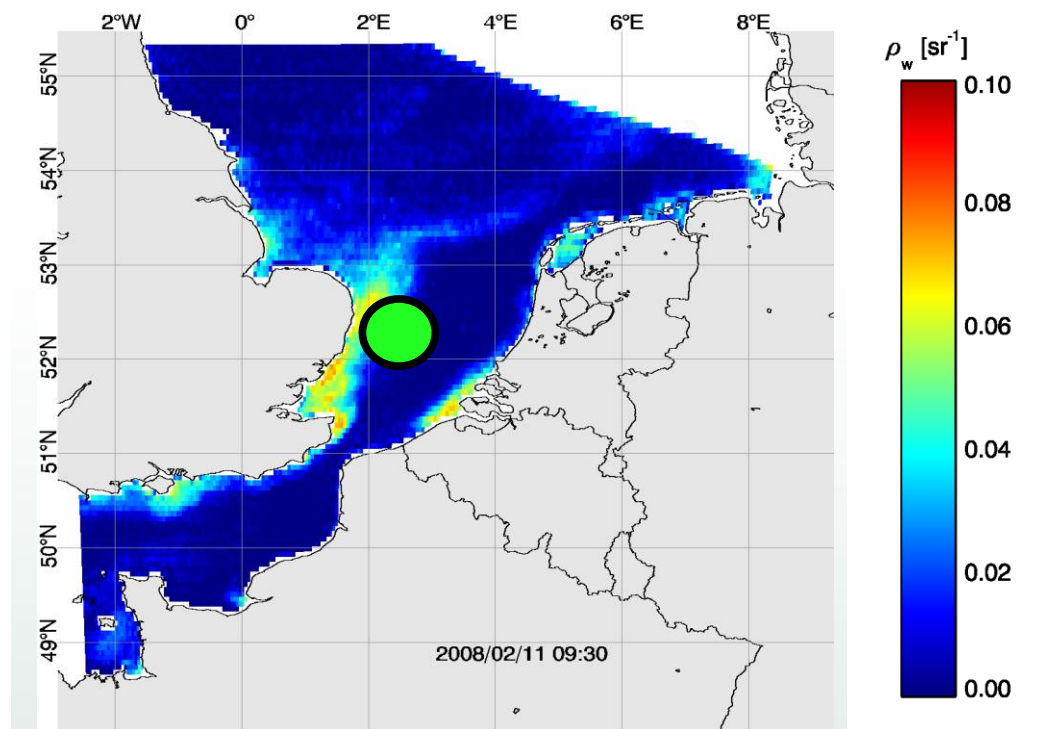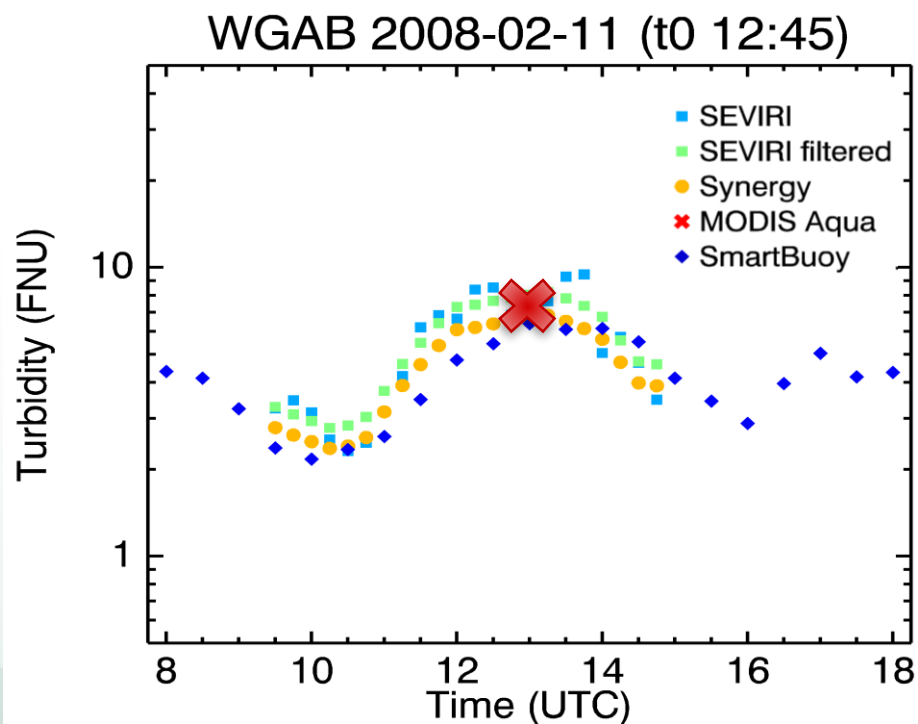S3plus: MERIS, MODIS, VIIRS, Sentinel-3

MODIS ρ_w 0.6μm
product (1km resolution daily)

GEO: SEVIRI

SEVIRI ρ_w 0.6μm
product (3x6km resolution 15min)

# Traditional and new 'OC' sensors

GEO: SEVIRI

WGAB 2008-02-11 (t0 12:45)

SEVIRI ρ_w 0.6μm
product (3x6km resolution 15min)

MULTI-SYNC: general objective

To develop **advanced ocean colour products** (i.e. Rrs, TSM, Turb, Chl) through the **synergetic use of multi-scale EO data** and an **adapted DINEOF (***Data Interpolating Empirical Orthogonal Functions***) approach** taking advantage of:

- Spectral characteristics of S3plus sensors
- Spatial resolution of S2plus sensors
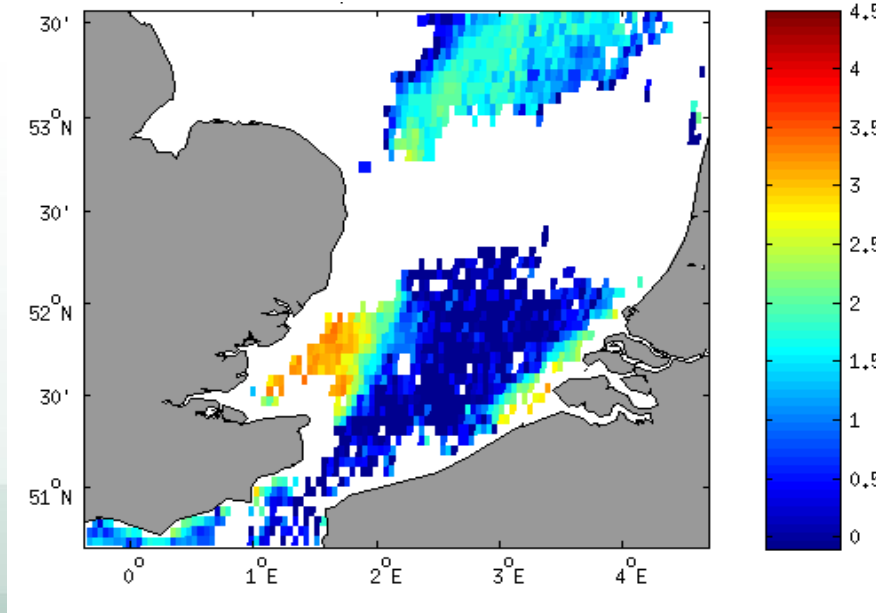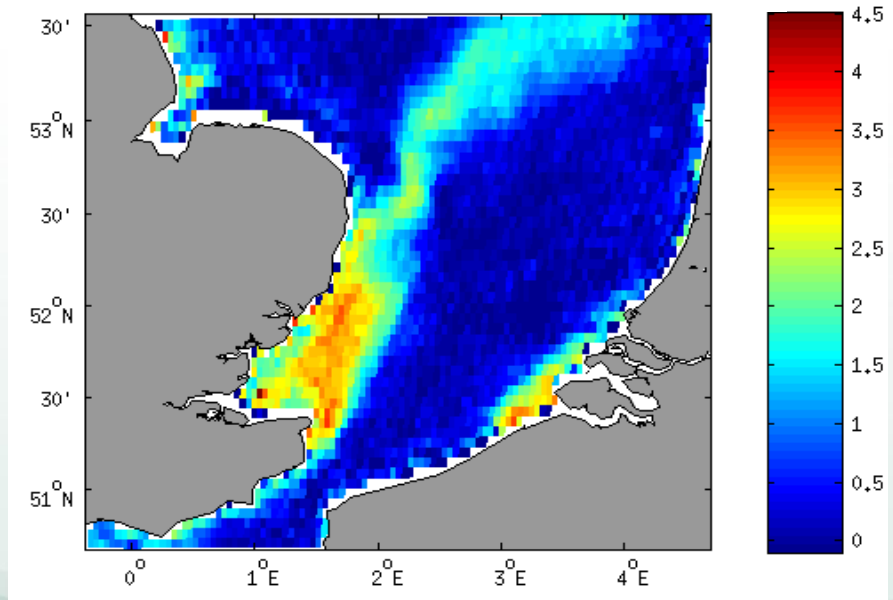- Temporal resolution of GEO sensors
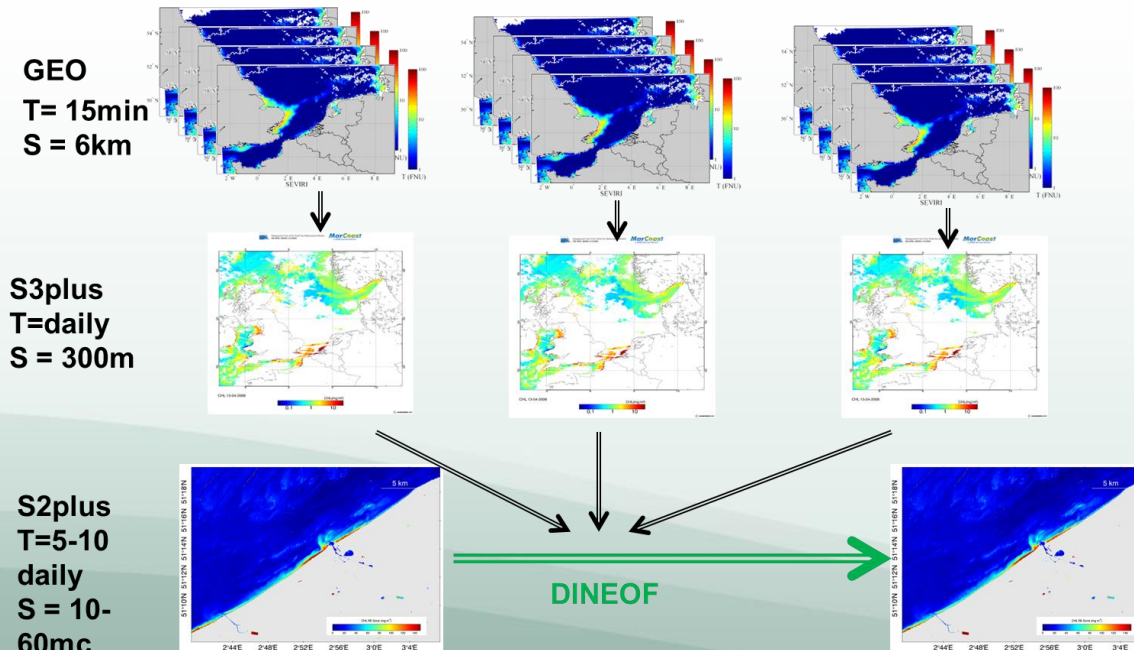
DINEOF
Data Interpolating Empirical Orthogonal Functions

- Technique to **fill in missing data** in geophysical data sets, based on an EOF decomposition

- Spatio-temporal coherence exploited to calculate missing values

- Developed for S3+ and GEO data

SEVIRI SPM (1/9/2008)

DINEOF filled SPM

DINEOF
Data Interpolating Empirical Orthogonal Functions

- Adaptation of DINEOF needed for high spatial resolution S2+ satellite data

- How to exploit the synergy between the S3plus, S2plus and GEO datasets
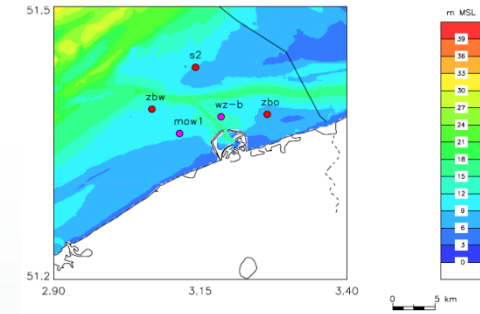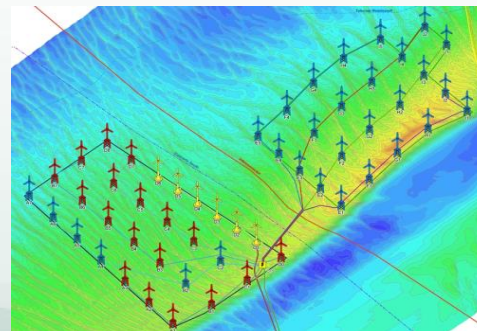
- Apply to three case studies

Case studies: valorisation of results

1. Eutrophication assessment for European Directives (MSFD / WFD)
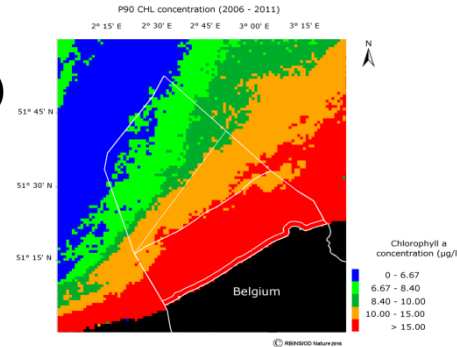
2. Sediment transport monitoring near the harbour of Zeebrugge to support dredging operations

3. Water quality monitoring in the Belgian offshore wind farms to support aquaculture

Thank you for your attention

Pléiades, 0.5-2M resolution