MULTI-SYNC

Multi-scale synergy products for advanced coastal water quality monitoring

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From ocean color to water quality assessment

Monitoring of Eutrophication

Daily snapshot of CHL (MERIS MEGS 7.5)

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

CHL time series for the Belgan W01 station used to assess phytoplankton dynamics
Traditional and new ‘OC’ sensors

**S3plus:** MERIS, MODIS, VIIRS, Sentinel-3

**S2Plus:** Landsat-8, Sentinel-2, Proba-V, Pleiades

**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

GEO: SEVIRI

MODIS $\rho_w$ 0.6$\mu$m product (1km resolution daily)

SEVIRI $\rho_w$ 0.6$\mu$m product (3x6km resolution 15min)
Traditional and new ‘OC’ sensors

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SEVIRI $\rho_w$ 0.6$\mu$m 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