

# Earth Observation Supports Assessment of Carbon Dynamics in the Baltic Sea

**BALTIC+ SeaLaBio  
Newsletter**

**Targeting improved  
quantification of carbon  
transport from land to sea**

**New water quality  
information and EO data  
methods available**

**SeaLaBio Partners:**



**BALTIC+ Sea-Land biogeochemical linkages (SeaLaBio)**

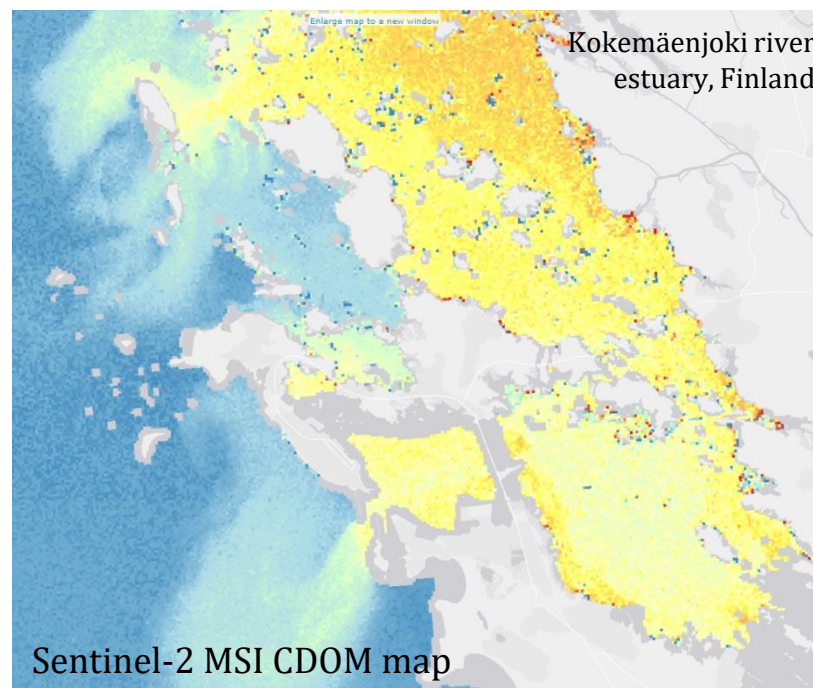


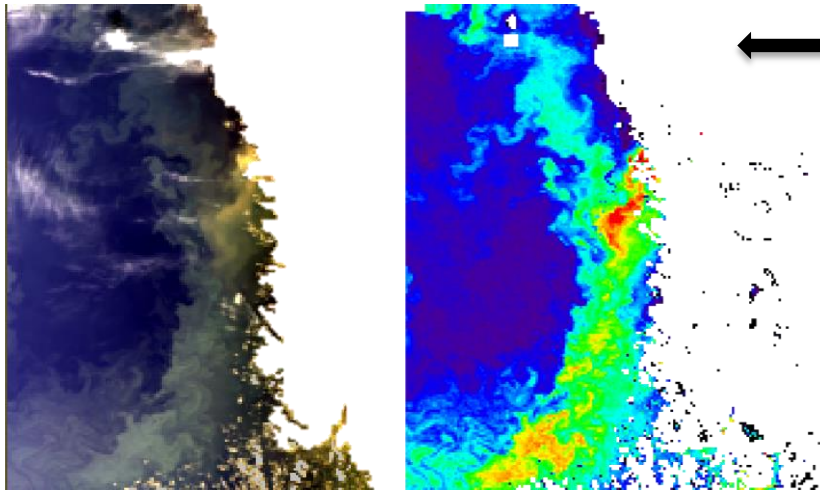
**eo science for society**

## Key results of the SeaLaBio project

- A new **method to correct for atmospheric effects** on satellite data was developed (Baltic+ AC). This will improve the satellite observation accuracy in the Baltic Sea.
- **CDOM absorption** can now be estimated with good accuracy using satellite data (Sentinel-3) that covers the whole Baltic Sea on the same time.
- The biogeochemical ERGOM model was improved with **enhanced estimation of light conditions**, by using satellite based CDOM absorption values as input.
- The analysis showed clear linkages between CDOM and Total Organic Carbon (TOC) that can be used to generate information and better knowledge on **carbon loads from rivers**.

*Colored Dissolved Organic Matter (CDOM) contains carbon and is a strong absorber of sunlight*

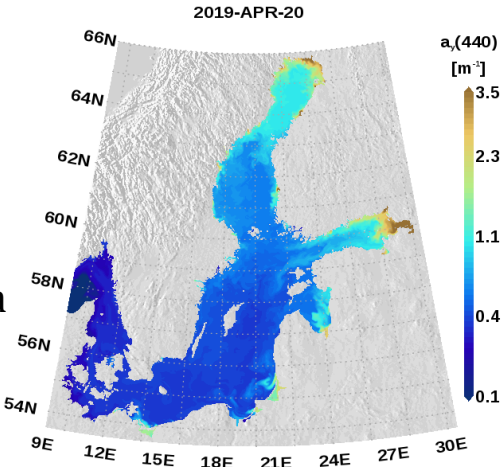




True color image and resulting reflectance image at 443 nm after removal of atmospheric effects around Kokemäenjoki river estuary

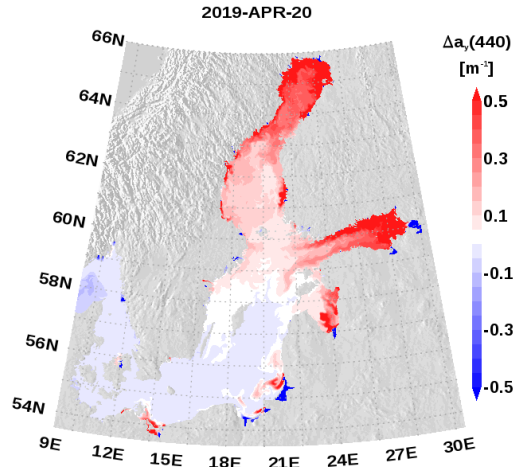
- Good performance proven by:
- Valid reflectance levels in various conditions encountered in the Baltic Sea
  - Smooth images and no artifacts
  - Good signal contrast

New ERGOM simulated CDOM absorption map, using satellite based CDOM as a new input variable



Difference to earlier ERGOM simulated CDOM using salinity approximation

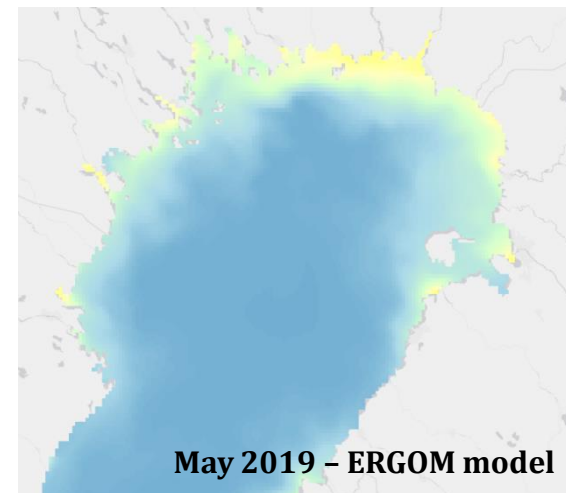
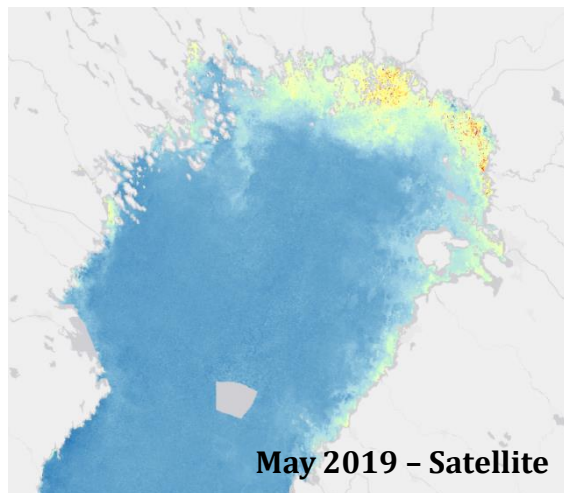
Large impact in northern Baltic Sea and river estuaries



## New water quality information and EO methods available

- Monthly CDOM maps (2016-19) are available for public use on TARKKA:  
[www.syke.fi/tarkka/en](http://www.syke.fi/tarkka/en) →
- Baltic+ AC satellite data processor available in GITHUB

## Available information and EO processors



## Road ahead towards better carbon cycle understanding

**For more information, visit:**

<https://www.syke.fi/projects/BalticSeaLaBio>

**Or contact:** Sampsa Koponen -  
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## Future developments

We propose ...

...modifications to national monitoring programs to get more in situ data that supports the development of EO methods...

...closer integration of EO data and models for improving the monitoring of carbon dynamics in the Baltic Sea...

...to analyse the relationship between EO based CDOM absorption and concentrations of dissolved and total organic carbon in river outlets