COOL

CARBON FROM EARTH OBSERVATION BETWEEN OCEAN AND LAND

WWW.COASTALCARBON-COOL.ORG

Funded by: esa European Space Agency [ESA]

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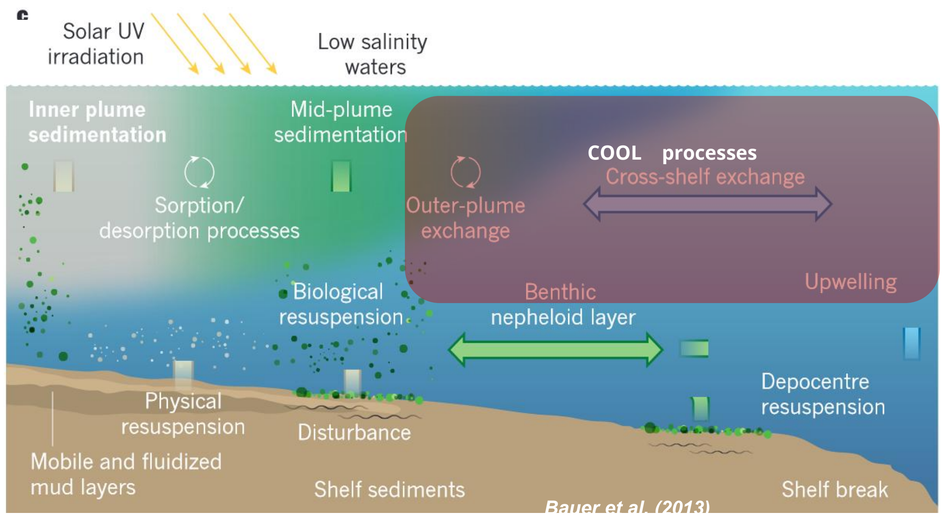
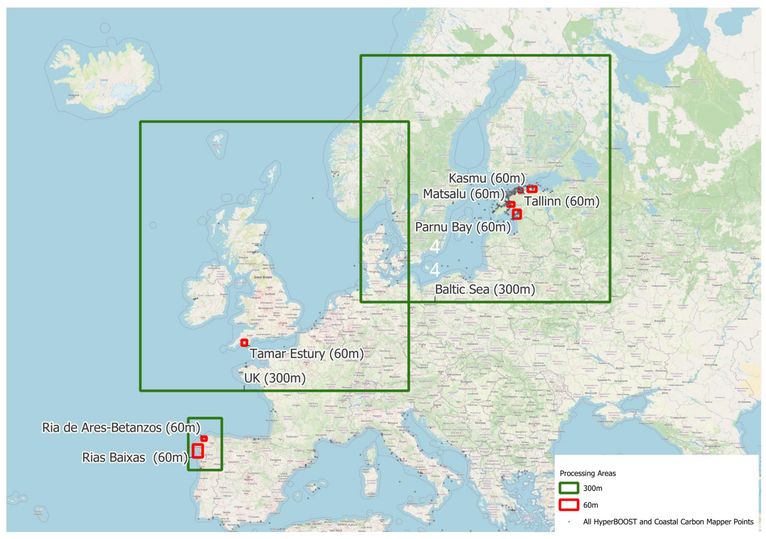
COOL aims to address limitations in satellite observations of coastal ocean by further developing satellite retrieval algorithms for different carbon pools and fluxes at high spatial and temporal resolution to improve understanding of highly dynamic coastal processes. **COOL** will deliver a harmonised coastal carbon EO dataset for DOC, POC, Primary production and PIC **daily at 300 m from OLCI and 60 m** from MSI in selected areas.

Coastal carbon processes



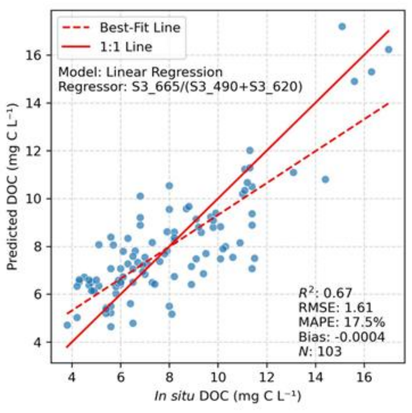
Case studies



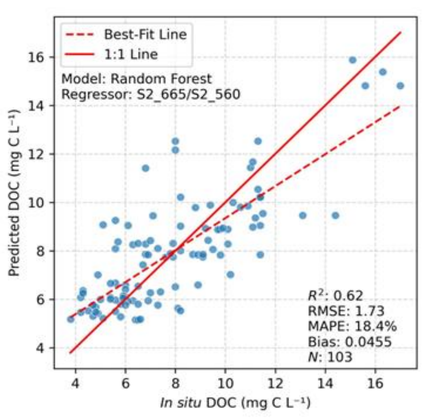
Carbon algorithms

Dissolved organic Carbon (DOC)

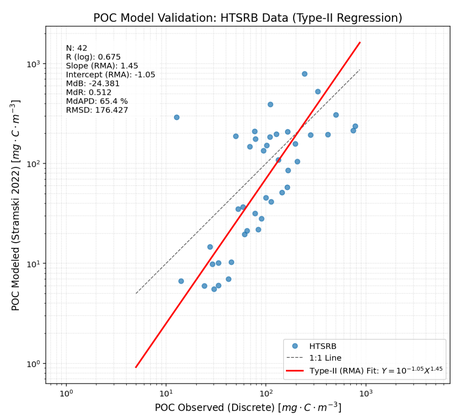
Sentinel-3 OLCI



Sentinel-2 MSI

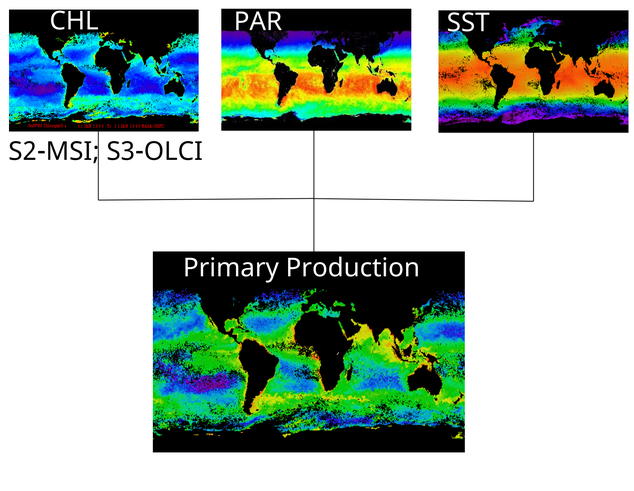


Particulate Organic Carbon (POC)



Stramski et al. (2023)

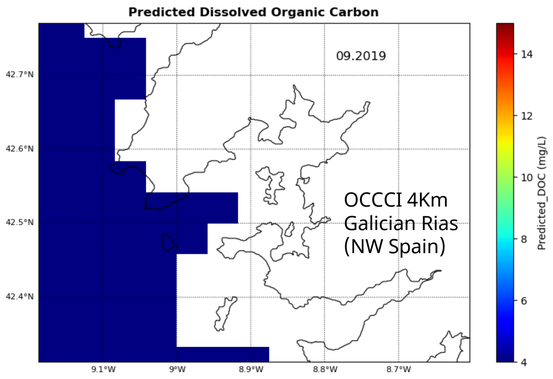
Primary production (PP)



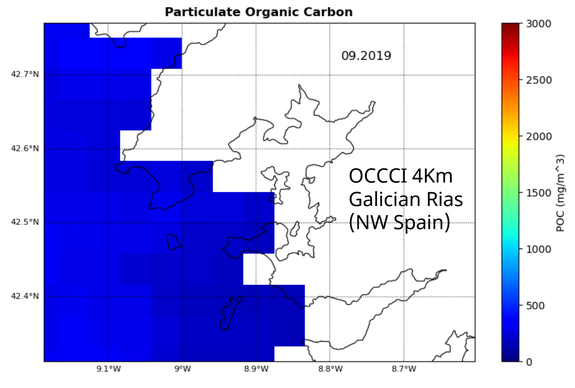
Smyth, Tilstone, Groom (2005)

Carbon products

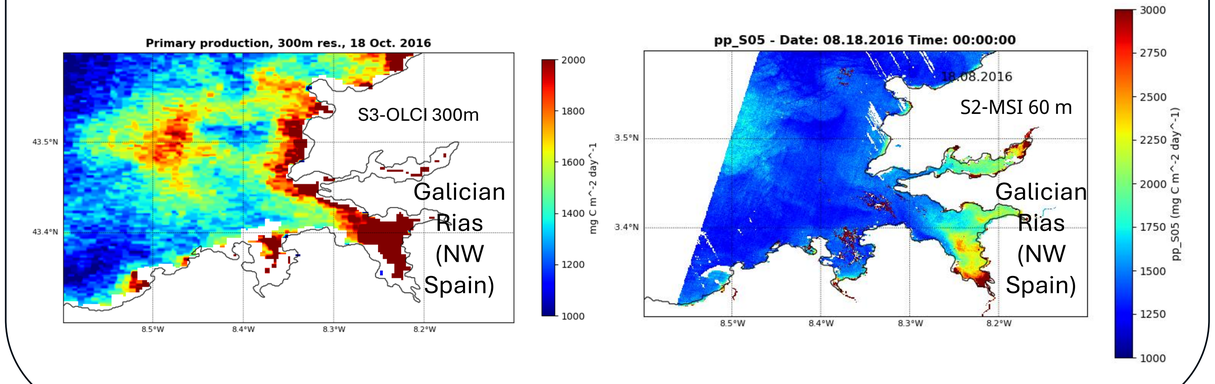
Dissolved organic Carbon (DOC)



Particulate organic Carbon (POC)



Primary production (PP)



Next steps

- Production and validation of coastal carbon datasets for all regions
- Science case studies to improve understanding of carbon cycling in regions under river influence and regions with seasonal coastal upwelling

Recommendations

1-2 year:

- Assess uncertainties in EO-based coastal carbon products
- Investigate computation of C budgets in selected coastal areas.

5-year:

- Develop and deploy algorithms at global coastal ocean
- Investigate the contribution of plankton to coastal C

10-year:

- Investigate impacts of climate change through climate-quality datasets for the coastal ocean.

REFERENCES
Smyth, T. J., Tilstone, G. H., and Groom, S. B.: Journal of Geophysical Research: Oceans, 110, https://doi.org/10.1029/2004JC002784, 2005.
Stramski, D., Constantin, S., and Reynolds, R. A.: Remote Sensing of Environment, 286, 113360, https://doi.org/10.1016/j.rse.2022.113360, 2023.