

The assimilation of phytoplankton functional types for operational forecasting on the North-West European Shelf



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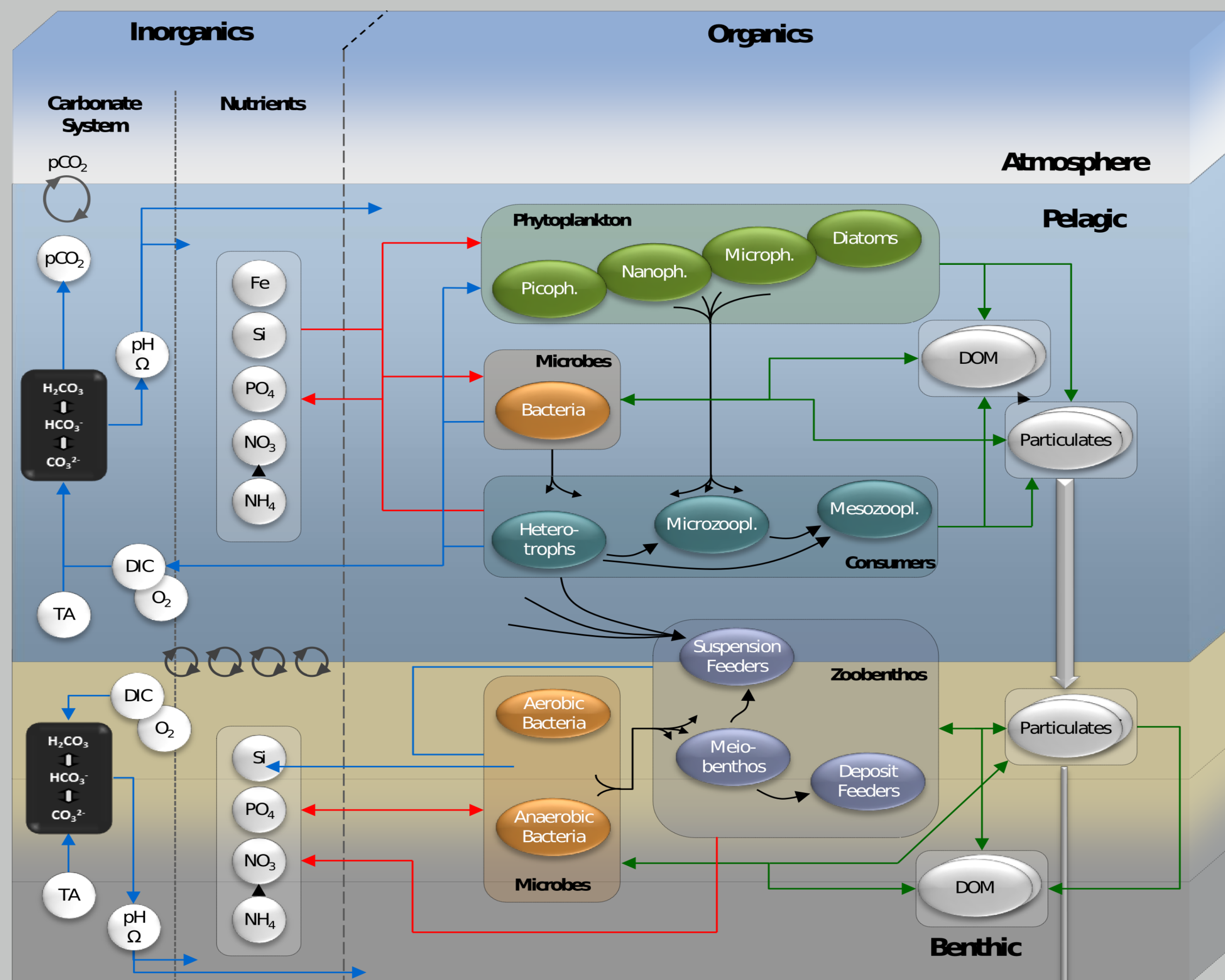
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Objectives

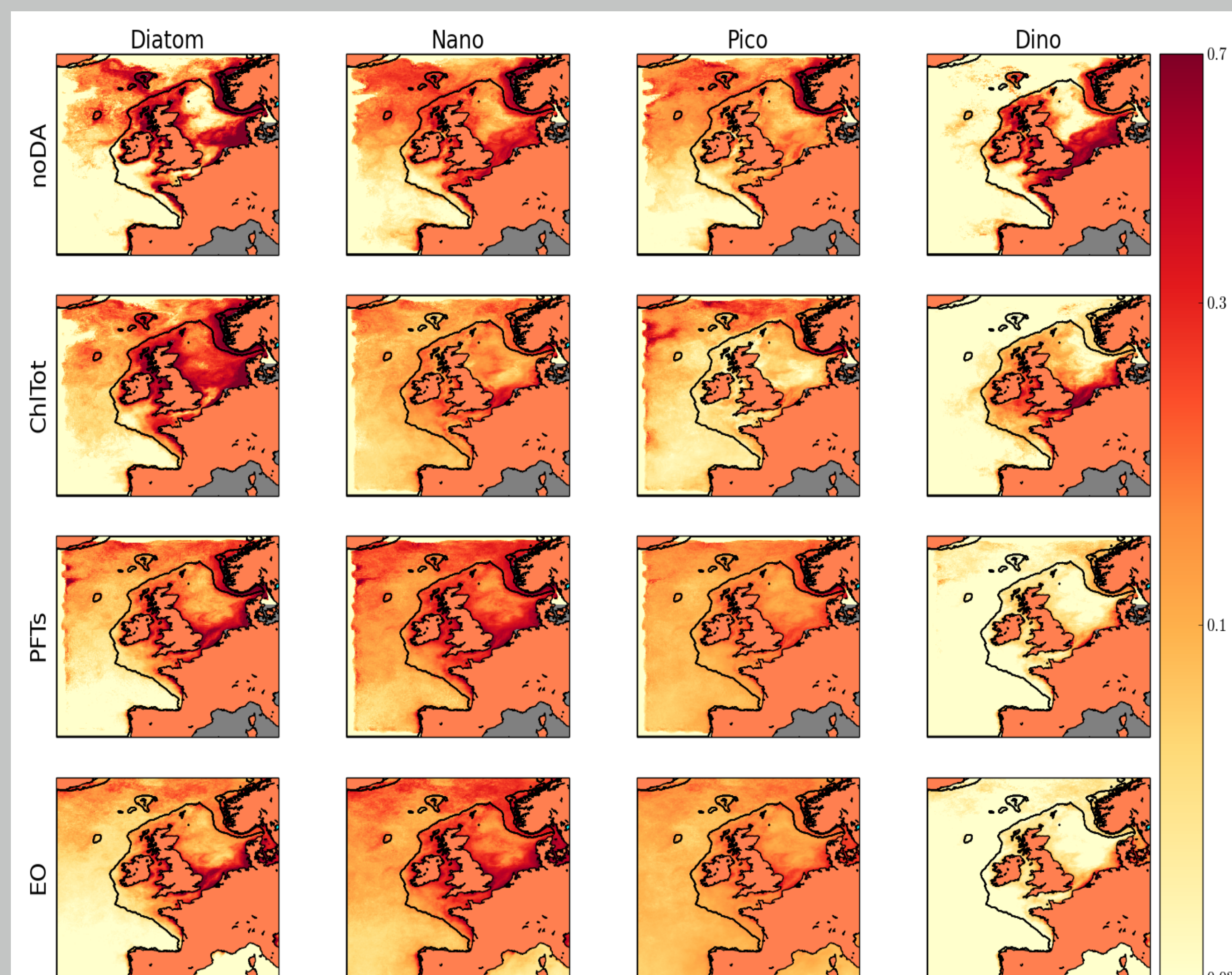
- Explore the impact of Phytoplankton Functional Types (PFTs) CCI ocean colour derived chlorophyll-a assimilation into NEMO-FABM-ERSEM coupled model on the forecasting of biogeochemistry in the North-West European (NWE) Shelf.

Introduction

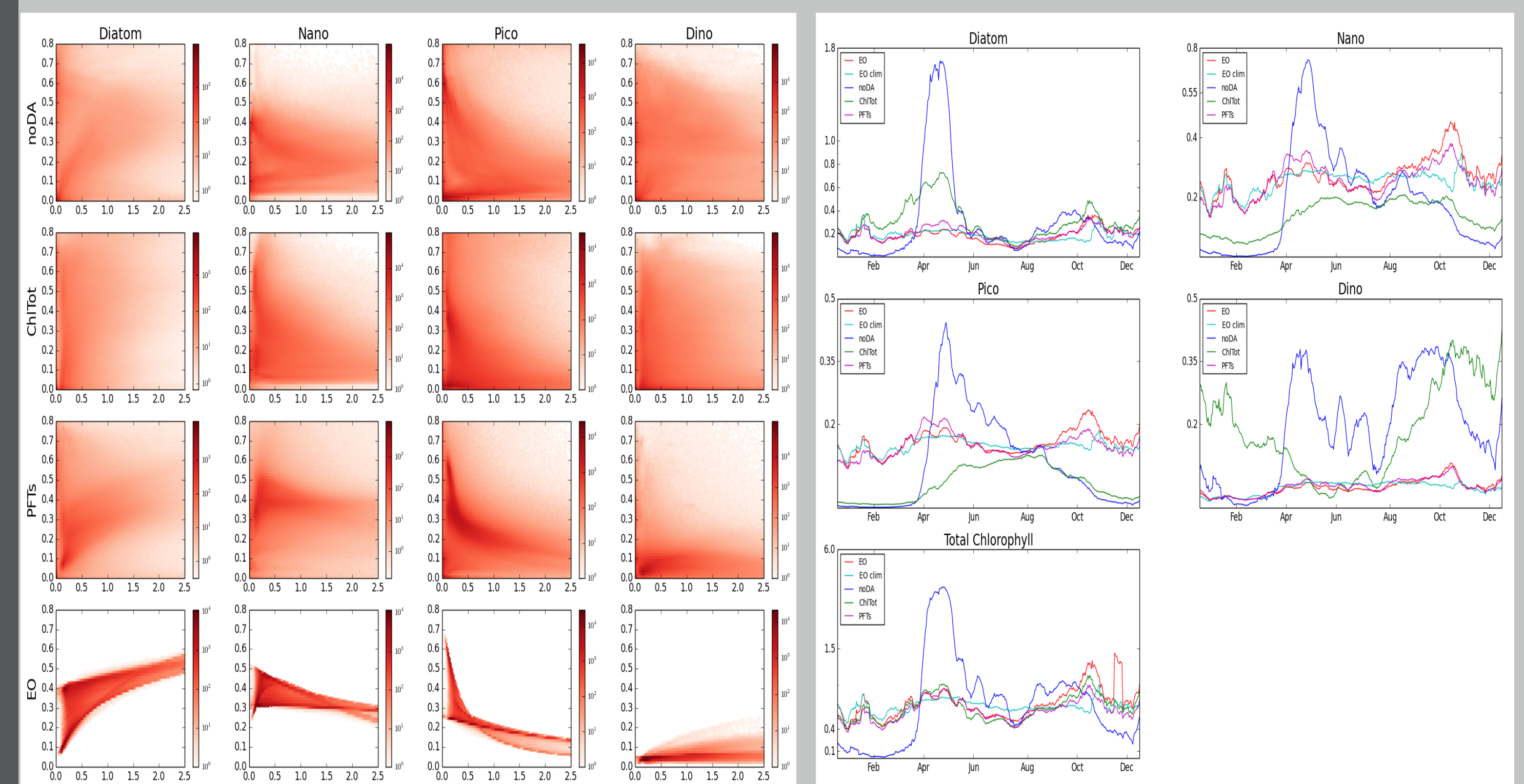


The European Regional Seas Ecosystem Model (ERSEM) represents phytoplankton in 4 functional types (nanophytoplankton, picophytoplankton, diatoms, dinoflagellates), mostly reflecting the different size of species. The different PFTs impact very differently on the ecosystem dynamics (e.g different place in food-web, different metabolic, sinking, light absorption rates). The assimilation of total chlorophyll (standard method) has limited capability to correct the phytoplankton community structure. Since the assimilation of PFTs chlorophyll can correct, apart of total chlorophyll, also phytoplankton community structure, it is expected to better represent the ecosystem state on the NWE Shelf.

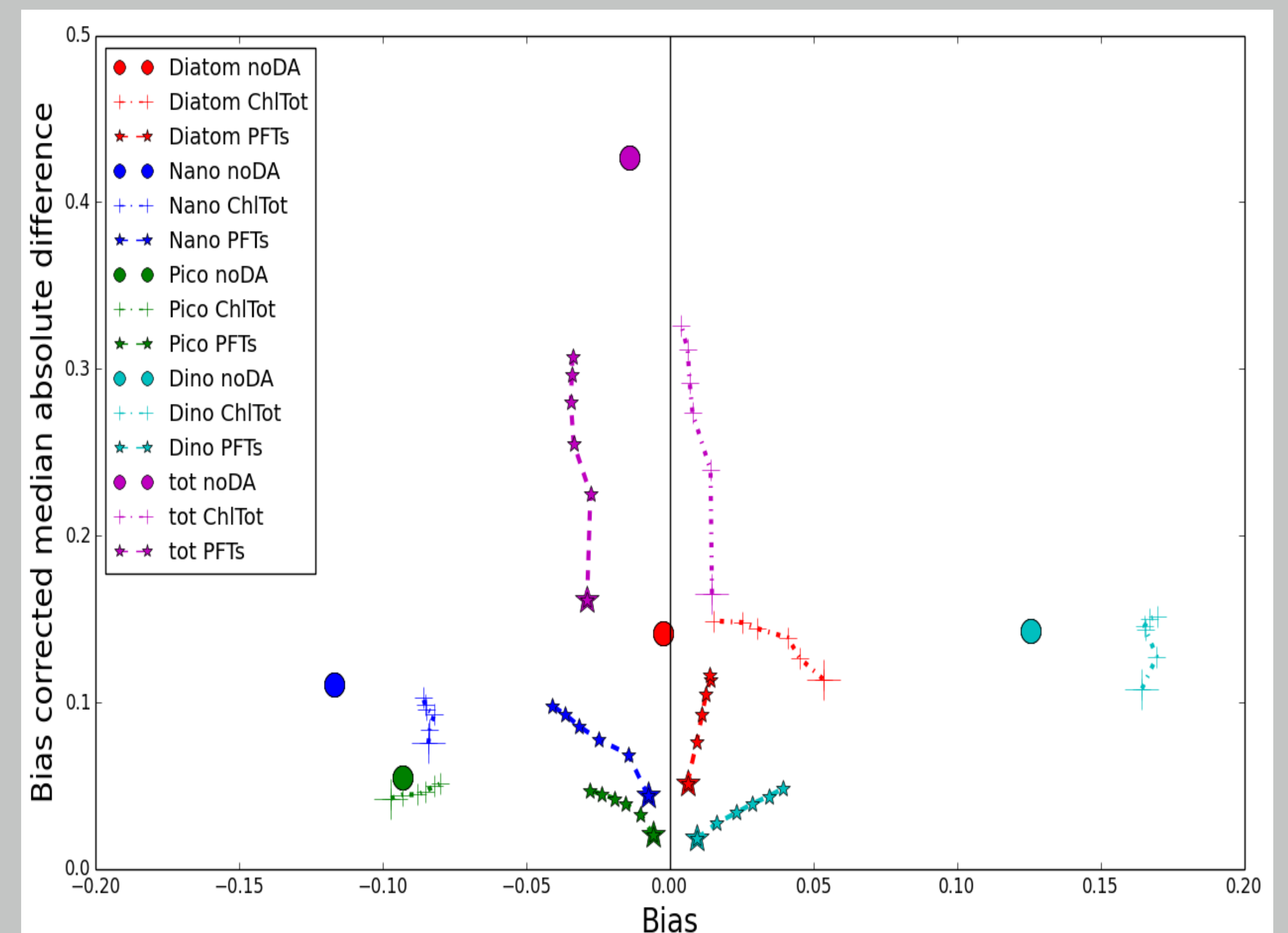
PFTs DA improves the community structure



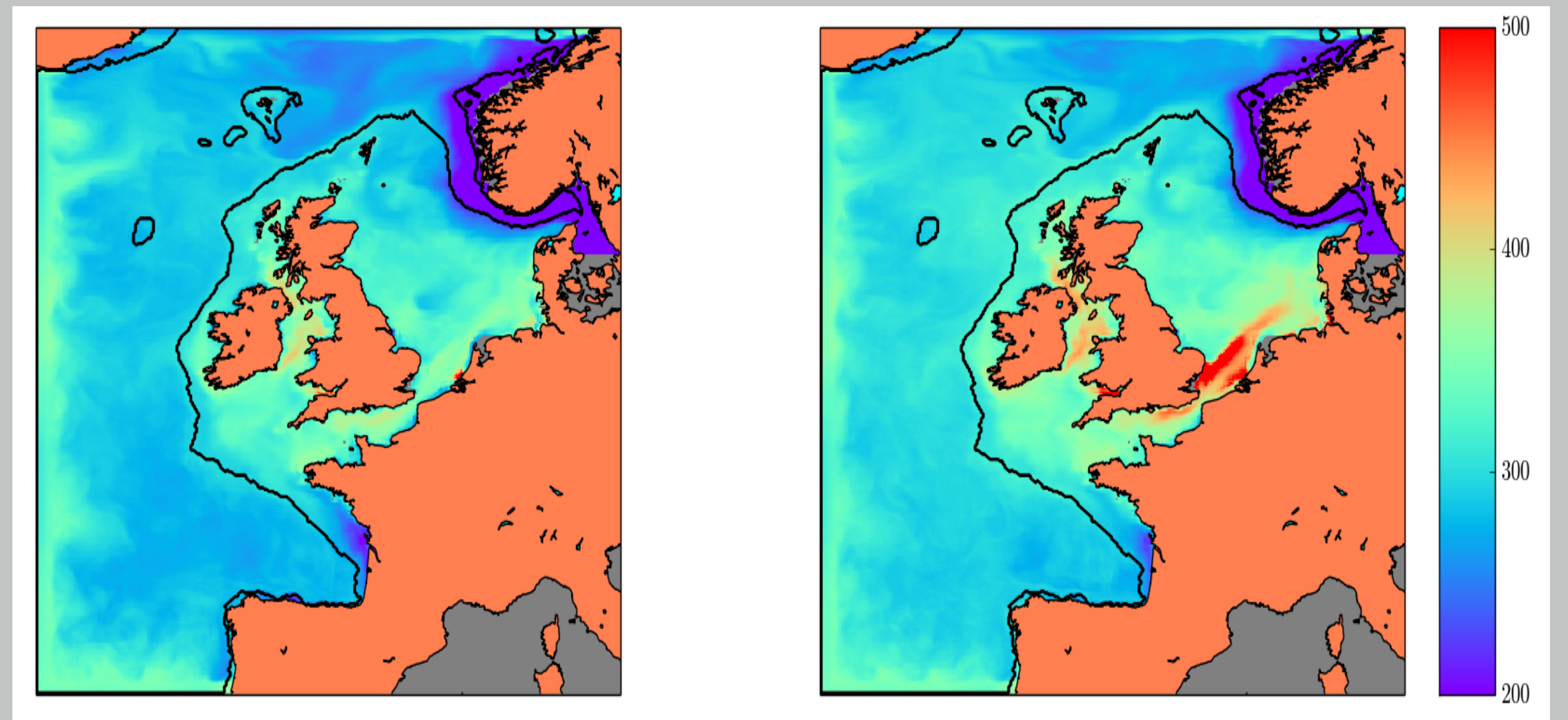
PFTs DA improves the community structure



PFTs DA improves the forecasting skill



pCO₂ indicates that PFTs DA improves carbon cycle



The 2010 annual change to pCO₂ by PFTs DA (right panel) when compared to the reference simulation (left panel). The ICES in situ data validation showed that PFTs DA improves the pCO₂ bias by 50%.

Acknowledgments

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