Production Centre

BSH
BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Prediction of biogeochemical processes in the Baltic Sea with a new NEMO4.2.1-FABM-ERGOM model system

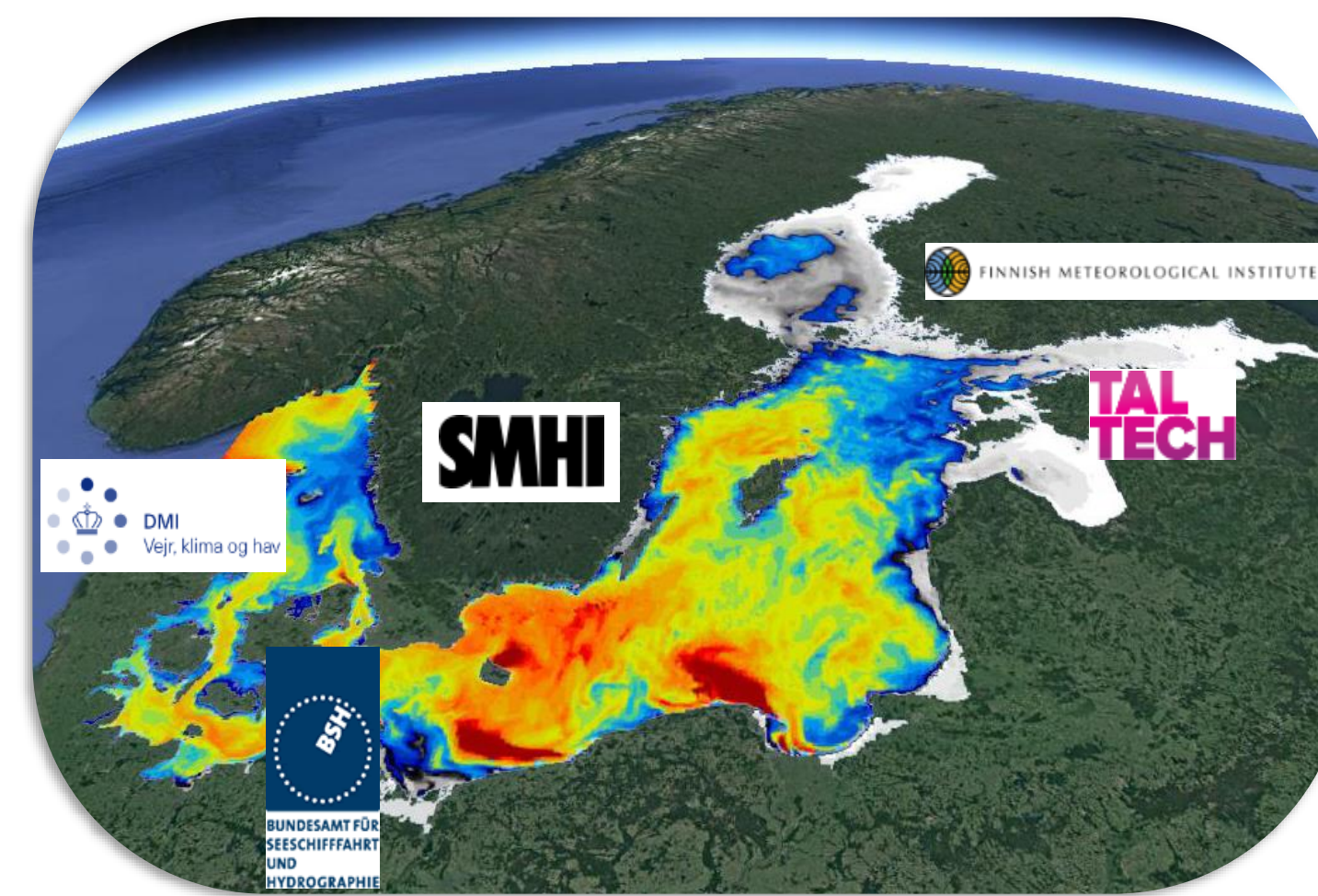Lena Spruch[1], Helen Morrison[1], Ilja Maljutenko[2]
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[2] Department of Marine Systems, Tallinn University of Technology, Estonia

COPERNICUS MARINE SERVICE
BALTIC SEA MFC
Until 31 Dec. 2024
Contract 21002L2-COP-MFC BAL-5200

Baltic Monitoring and Forecasting Centre

- 5- 10 day forecasts of physical and biogeochemical parameters for the Baltic Sea
- 17 biogeochemical variables with a resolution of 2 nautical miles (~1.8 km)
- product release in November 2024 with upgraded NEMO4.2.1-FABM-ERGOM system
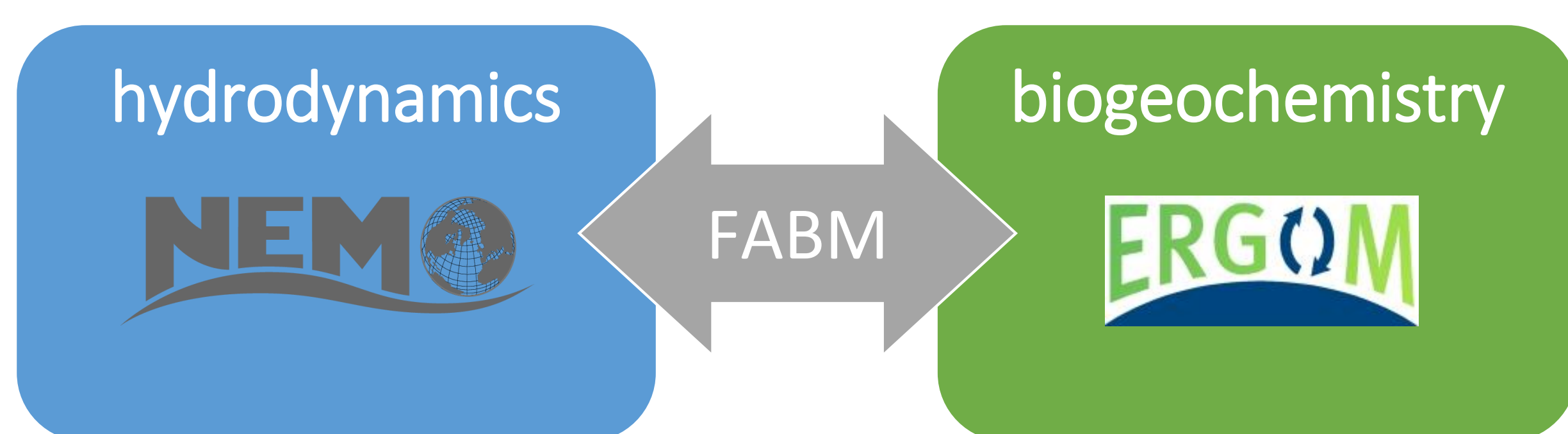- new products: coloured dissolved organic matter (CDOM), hydrogen sulphide (H_2S)

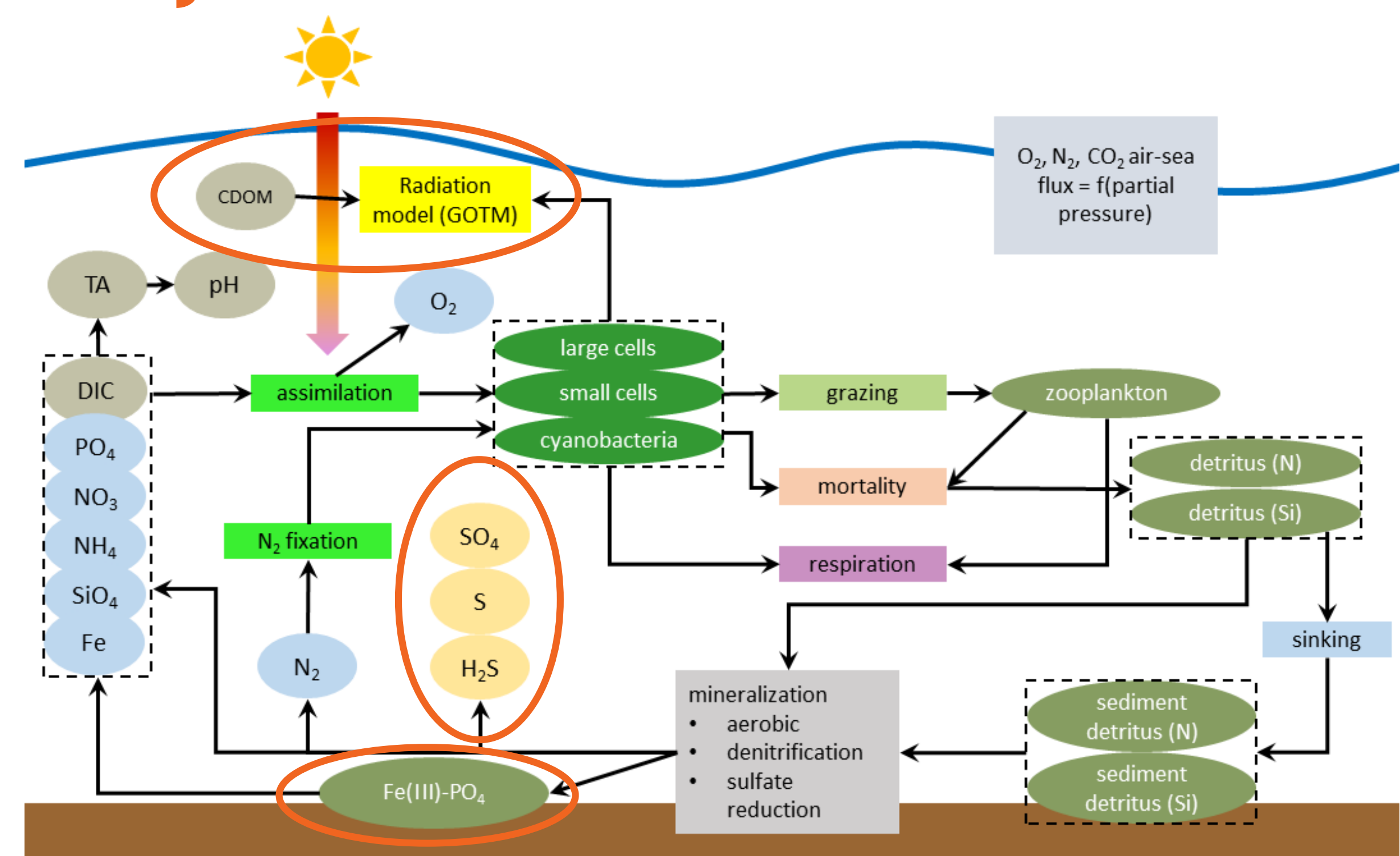**Products available at Copernicus Marine Datastore:**

new product 26.11.2024

Model System

- **NEMO** (Nucleus for European Modelling of the Ocean) version 4.2.1
- **ERGOM** (Ecological Regional Ocean Model) version based on Neumann et al. 2021
- **FABM** (Framework for Aquatic Biogeochemical Models), Bruggeman & Bolding 2024
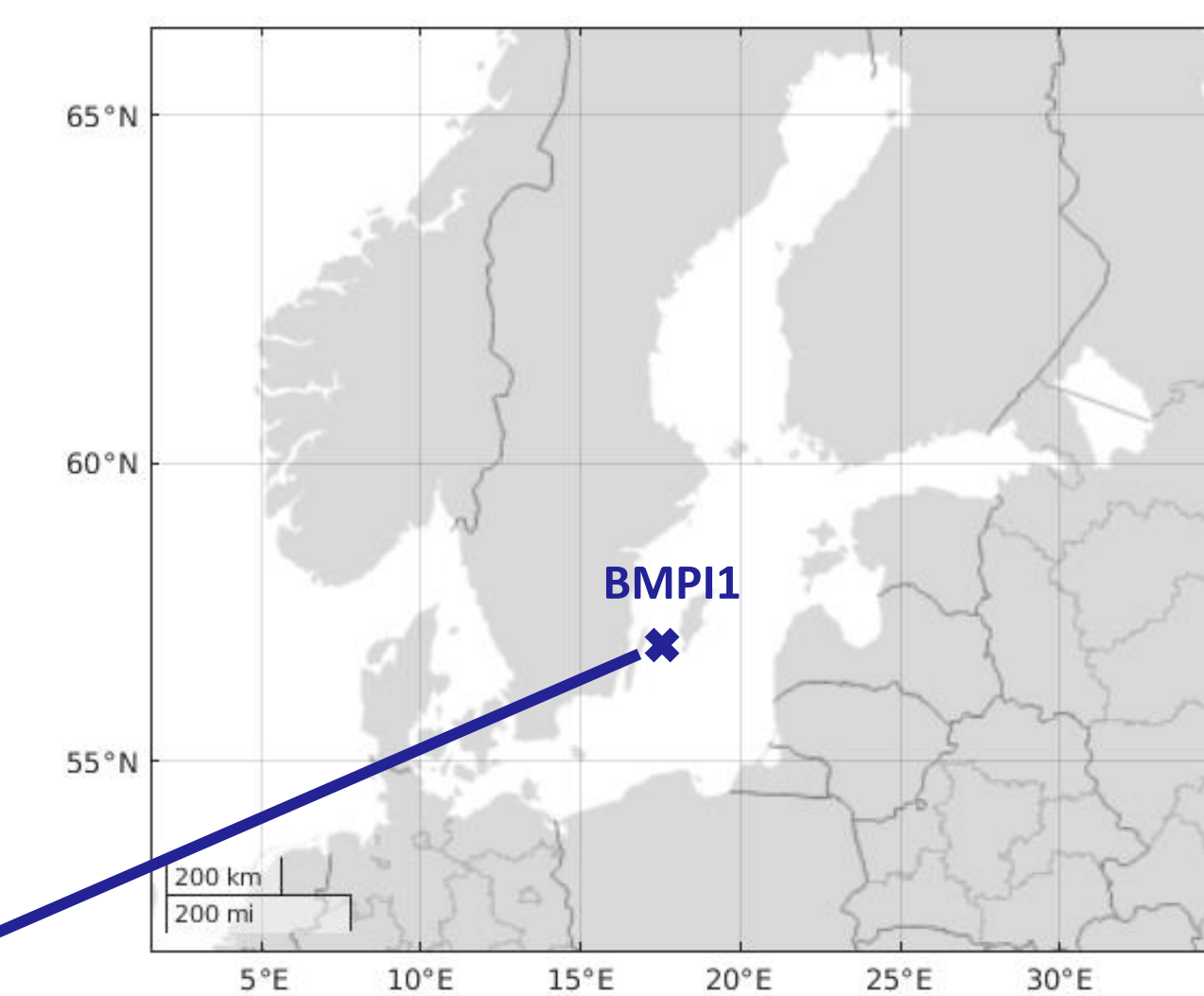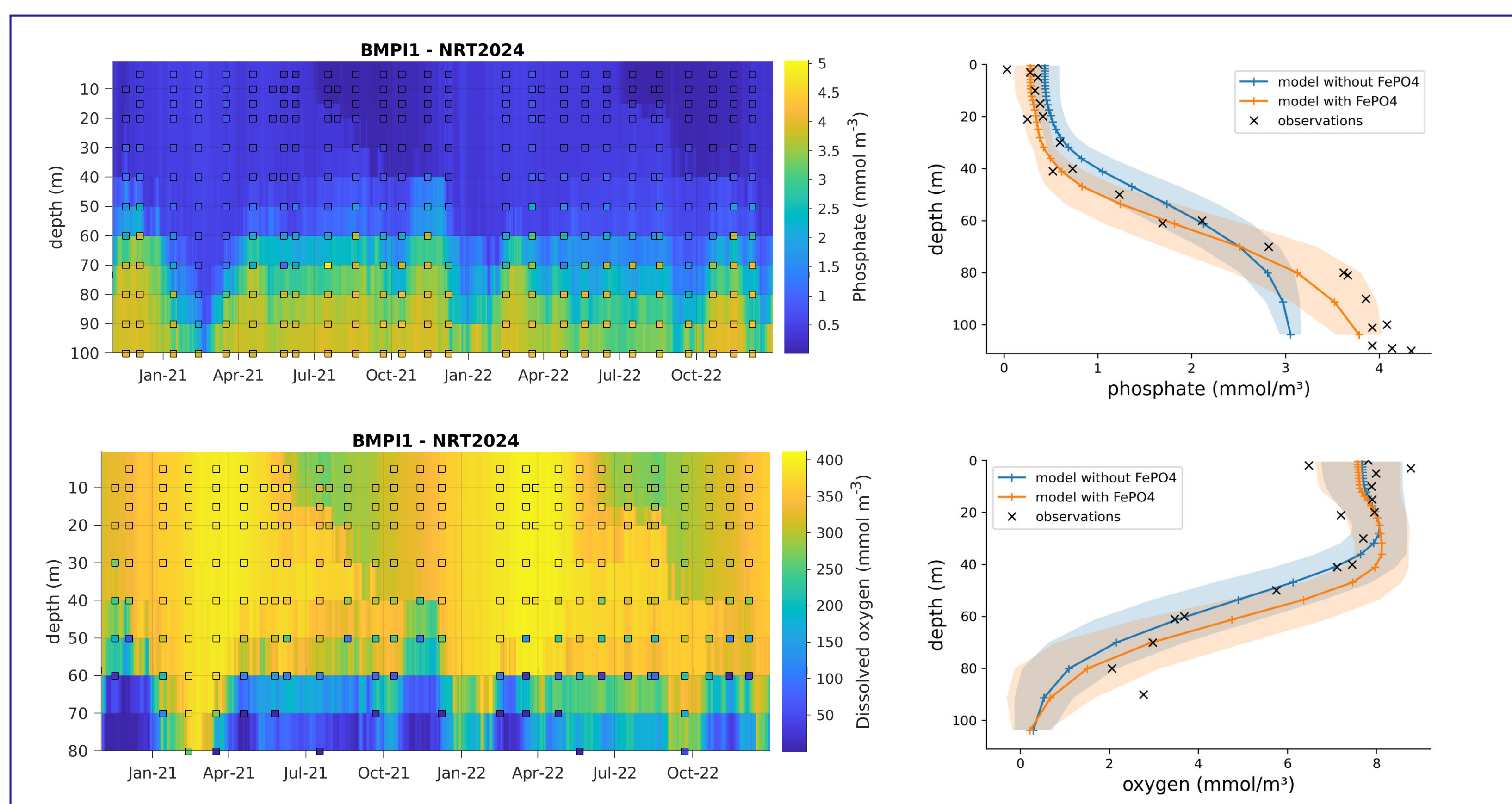
Ecosystem model ERGOM

Orange circles indicate new variables: CDOM, sulphur compounds, iron-phosphate

Validation Results

Results for deep basin with anoxic conditions in the Baltic Sea:

- improved results for phosphate and oxygen in bottom layers
- including release of iron-phosphate (FePO4) from sediments improves phosphate concentrations in anoxic regions

References

Bruggeman, J., & Bolding, K. (2024). Framework for Aquatic Biogeochemical Models (v2.1.3). Zenodo. https://doi.org/10.5281/zenodo.13124183
Neumann, T., Koponen, S., Attila, J., Brockmann, C., Kallio, K., Kervinen, M., Mazeran, C., Müller, D., Philipson, P., Thulin, S., Väkevä, S., and Ylöstalo, P.: Optical model for the Baltic Sea with an explicit CDOM state variable: a case study with Model ERGOM (version 1.2), Geosci. Model Dev., 14, 5049-5062, https://doi.org/10.5194/gmd-14-5049-2021, 2021.

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