

BIOMONDO



Towards Earth Observation supported monitoring of freshwater biodiversity

The European Space Agency (ESA) activity called Biodiversity+ Precursors is a contribution to the joint EC-ESA Earth System Science Initiative launched in February 2020 to jointly advance Earth System Science and its response to the global challenges that society is facing at the onset of this century. BIOMONDO is the ESA Biodiversity+ Precursor project focused on freshwaters and biodiversity in lakes and rivers.



Project partners



ESA Biodiversity+ Precursors

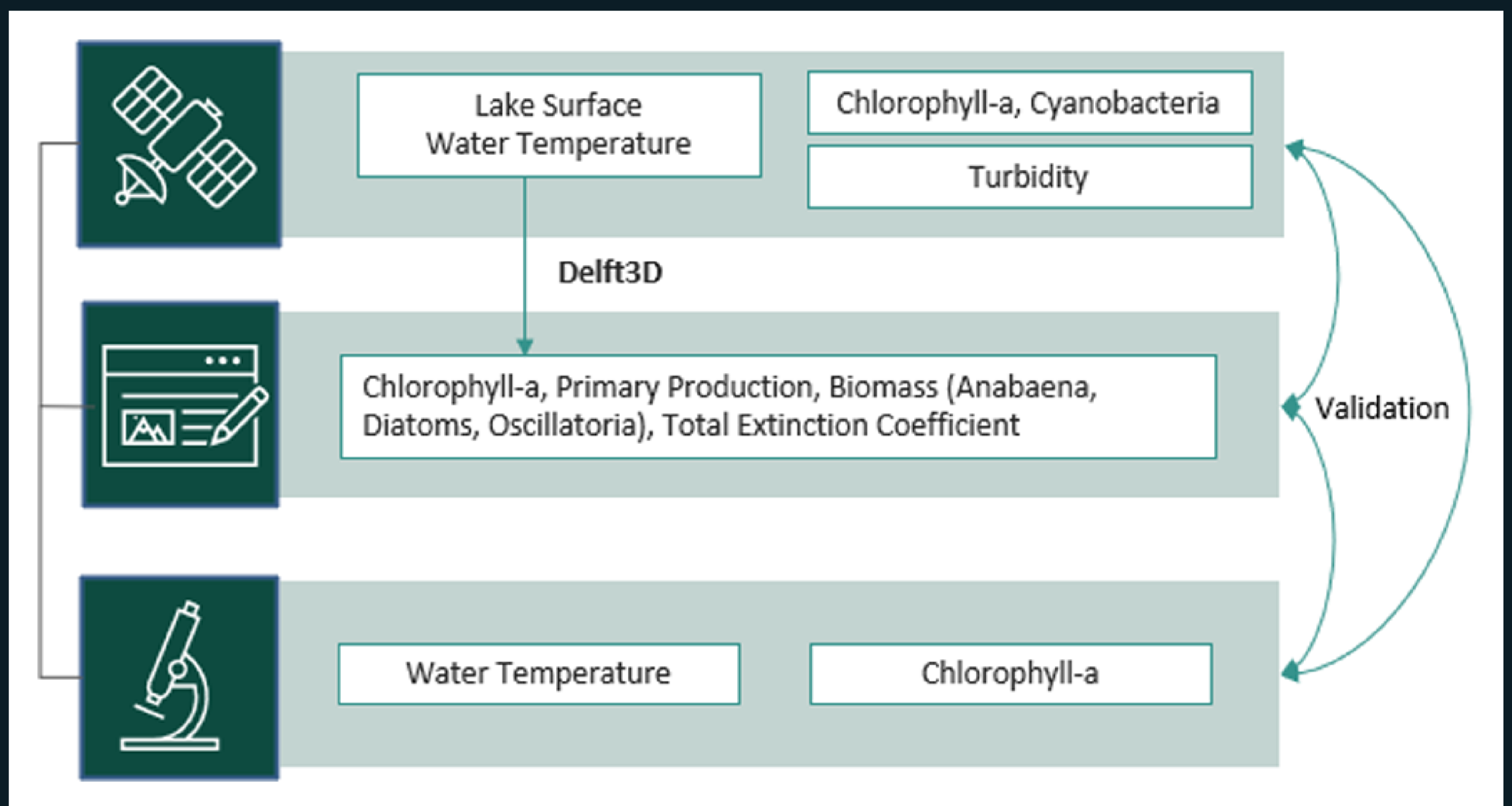


BIOMONDO Pilots

The purpose of the biodiversity pilot studies is to explore if Earth Observation products in combination with models and in situ data can support freshwater biodiversity monitoring and management.

▼ Pilot 1 – Eutrophication

Exploring the impact of eutrophication and other habitat changes on the water quality.



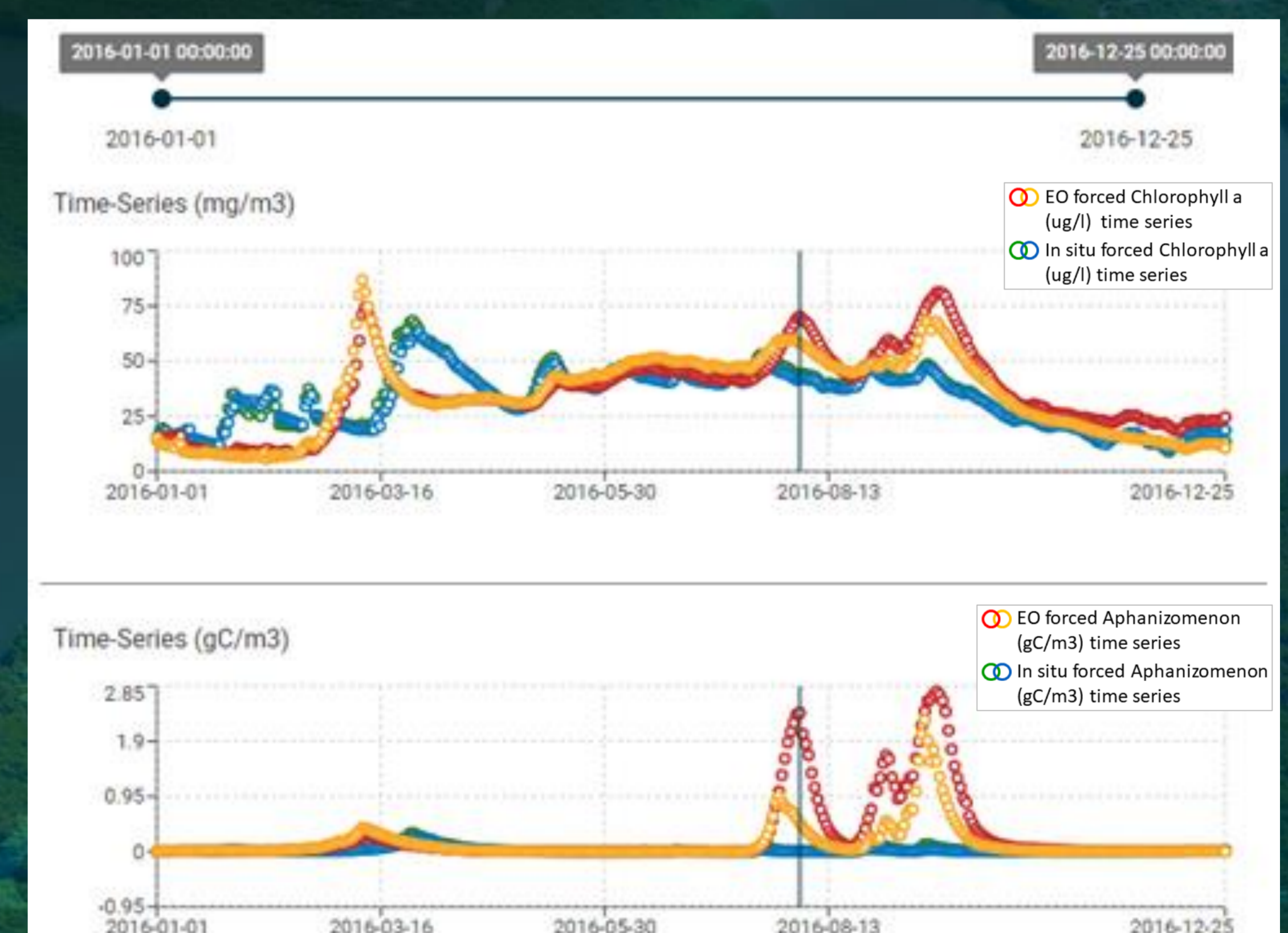
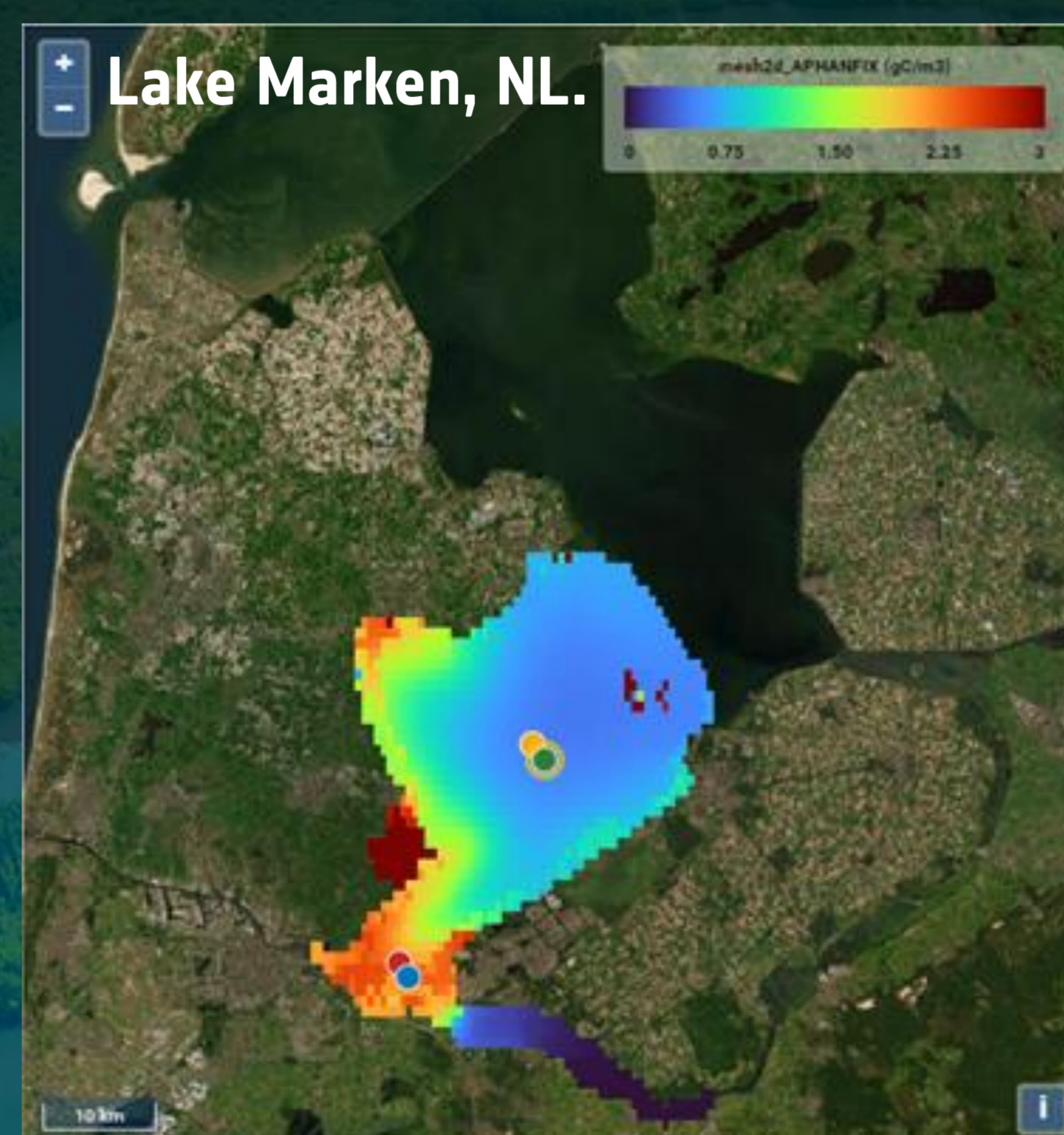
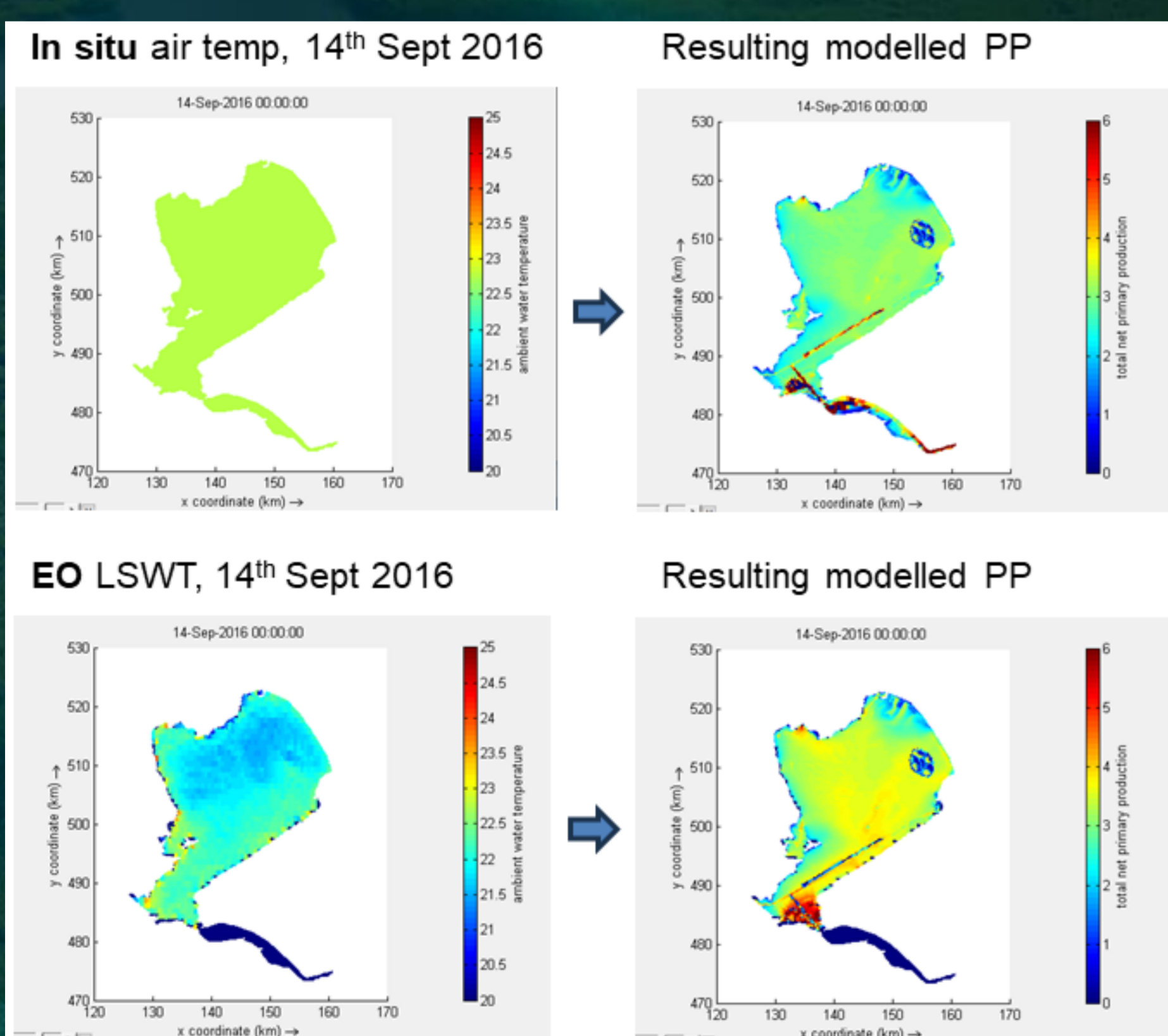
► Pilot 2 – Heat tolerance

Exploring the impact of changes in water temperature and heat waves on freshwater fish diversity.

► Pilot 3 – Connectivity

Monitoring river connectivity effect by dams, and their changes and impact on biodiversity.

EO products forcing hydrodynamical-water quality models



Primary Production

The original in situ measured air temperature was replaced with EO based Lake Surface Water Temperature (LSWT) to force Deltares Delft3D model for estimation of primary production (PP). To describe in water conditions, LSWT products provide better input to the hydrodynamic part of the Delft3D model than the in-situ data.

Chlorophyll-a & algal composition

The original in situ measured air temperature was replaced with EO based Lake Surface Water Temperature (LSWT) to force Deltares Delft3D model for estimation of algal composition. The top graph shows modelled Chl a for two locations in Lake Marken during 2016 and the difference when EO LSWT (red and orange) and in situ (green and blue) is used as forcing. The lower graph shows how the resulting abundance of the cyanobacteria species Aphanizomenon changes when EO is used instead of in situ. The results are available for several species, and it is possible to analyze changes in level, spatial patterns and temporal trends in algal composition.