Discussion

WHY do we need phytoplankton types (PFT/PSC) products?

Can you think of other applications of phytoplankton types products in the context of large-scale biogeochemical and ecological research? Climate change?

What are applications with direct social and economic impact? (coastal management, HABs, fisheries- forecast system)

Which different spatial and temporal scales are needed for specific applications? HABs (daily), fisheries (weekly), modeling (monthly for climate; physiology hours?)

What are applications for PFTs (phytoplankton functional types) versus PSC (phytoplankton size classes)?

Can we already study changes, variability and trends of phytoplankton types with the current products?

What efforts are needed to improve the PFT algorithms towards an operational use?
(What is missing to develop reliable ocean colour PFT algorithms)?

Validation:
Is the validation protocol valid for phytoplankton types validation?

What is the variability of phytoplankton types in space and time?
Are phytoplankton types changing on smaller time scales than total chl-a?
Is it adequate to validate with in-situ- 1 day matchup within 3x3?

How to improve the global validation of PFT with HPLC pigments?
How can we validate the HPLC data?

How to get funding for in-situ data for phytoplankton types validation activities new missions?

Discussion

Intercomparisons: What can we do beyond current activities?

PFT Data sets:
Have we appropriately defined the requirements of new sensors (which bands, how many) in order to derive phytoplankton types?

Which PFT data sets are still missing?

Actions and Recommendations

Actions and recommendations to th science community

We need validated products with uncertainty: sensitivity testing of algorithm, in-situ validation, intercomparisons to catch temporal and spatial variability.

We need adaptations to all available sensors and also upcoming sensors. Data sets for upcoming missions should also include adaptions to hyperspectral data

We need to merge the information of all sensors to one PFT product

We should try/use synergistic approaches.

We should agree on temporal and spatial scale of PFT satellite data sampling depending on the application

Actions and recommendations to agencies

Support in-situ HPLC, some other PFT parameters and optical data acquisition and processing for running and upcoming missions (MODIS, VIIRS, OLCI)

Support HPLC PFT validating with other data sets

Support PFT algorithm validation and intercomparisons activities with funding

Support activities to merge different techniques and multi-mission data sets

Support development of PFT methods to hyperspectral data sets, including satellite and in-situ (gliders, buoy,...) measurements.