Geophysical Research Abstracts
Vol. 16, EGU2014-13216-1, 2014
EGU General Assembly 2014

In-situ databases and comparison of ESA Ocean Colour Climate Change Initiative (OC-CCI) products with precursor data, towards an integrated approach for ocean colour validation and climate studies

Vanda Brotas (1), André Valente (1), André B. Couto (1), Mike Grant (2), Andrei Chuprin (2), Thomas Jackson (2), Steve Groom (2), and Shubha Sathyendranath (2)

(1) University of Lisbon, Centre of Oceanography, Lisbon, Portugal, (2) Plymouth Marine Laboratory, Plymouth, United Kingdom

Ocean colour (OC) is an Oceanic Essential Climate Variable, which is used by climate modellers and researchers. The European Space Agency (ESA) Climate Change Initiative project, is the ESA response for the need of climate-quality satellite data, with the goal of providing stable, long-term, satellite-based ECV data products. The ESA Ocean Colour CCI focuses on the production of Ocean Colour ECV uses remote sensing reflectances to derive inherent optical properties and chlorophyll a concentration from ESA's MERIS (2002-2012) and NASA's SeaWiFS (1997 - 2010) and MODIS (2002-2012) sensor archives.

This work presents an integrated approach by setting up a global database of in situ measurements and by inter-comparing OC-CCI products with pre-cursor datasets.

The availability of in situ databases is fundamental for the validation of satellite derived ocean colour products. A global distribution in situ database was assembled, from several pre-existing datasets, with data spanning between 1997 and 2012. It includes in-situ measurements of remote sensing reflectances, concentration of chlorophyll-a, inherent optical properties and diffuse attenuation coefficient. The database is composed from observations of the following datasets: NOMAD, SeaBASS, MERMAID, AERONET-OC, BOUSSOLE and HOTS. The result was a merged dataset tuned for the validation of satellite-derived ocean colour products. This was an attempt to gather, homogenize and merge, a large high-quality bio-optical marine in situ data, as using all datasets in a single validation exercise increases the number of matchups and enhances the representativeness of different marine regimes.

An inter-comparison analysis between OC-CCI chlorophyll-a product and satellite pre-cursor datasets was done with single missions and merged single mission products. Single mission datasets considered were SeaWiFS, MODIS-Aqua and MERIS; merged mission datasets were obtained from the GlobColour (GC) as well as the Making Earth Science Data Records for Use in Research Environments (MEaSUREs).

OC-CCI product was found to be most similar to SeaWiFS record, and generally, the OC-CCI record was most similar to records derived from single mission than merged mission initiatives. Results suggest that CCI product is a more consistent dataset than other available merged mission initiatives.

In conclusion, climate related science, requires long term data records to provide robust results, OC-CCI product proves to be a worthy data record for climate research, as it combines multi-sensor OC observations to provide a >15-year global error-characterized record.