

News on GlobColour

In 2005, the International Ocean Colour Coordinating Group (IOCCG) convened a working group to examine the state of the art in ocean colour data merging, which showed that the research techniques had matured sufficiently for creating long multi-sensor datasets (IOCCG, 2007). As a result, ESA initiated and funded the DUE GlobColour project (<http://www.globcolour.info/>) to develop a satellite based ocean colour data set to support global carbon-cycle research. It aims to satisfy the scientific requirement for a long (10+ year) time-series of consistently calibrated global ocean colour information with the best possible spatial coverage.

The three year project kicked-off in November 2005 under the leadership of ACRI-ST (France). The objective is to produce a global daily ocean colour data set with the best possible coverage by merging together data from the three most capable sensors: SeaWiFS on GeoEye's Orbview-2 mission, MODIS on NASA's Aqua mission and MERIS on ESA's ENVISAT mission.

In setting up the GlobColour project, three user organisations were invited to help. Their roles are to specify the detailed user requirements, act as a channel to the broader end user community and to provide feedback and assessment of the results. The International Ocean Carbon Coordination Project (IOCCP) based at UNESCO in Paris provides direct access to the carbon cycle modelling community's requirements and to the modellers themselves who will use the final products. The UK Met Office's National Centre for Ocean Forecasting (NCOF) in Exeter, UK, provides an understanding of the requirements of oceanography users, and the IOCCG bring their understanding of the global user needs and valuable advice on best practice within the ocean colour science community.

The first year was a feasibility demonstration phase that was successfully concluded at a user consultation workshop organised by the Laboratoire d'Océanographie de Villefranche, France, in December 2006. Error statistics and inter-sensor biases were quantified by comparison with in-situ measurements from moored optical buoys and ship based campaigns, and used as input to the merging.

The second year was dedicated to the production of the time series. In total more than 25 Tb of input (level 2) data have been ingested and 14 Tb of intermediate and output products created, with 4 Tb of data distributed to the user community. Quality control (QC) is provided through the Diagnostic Data Sets (DDS), which are extracted sub-areas covering locations of in-situ data collection or interesting oceanographic phenomena. The Full Product Set (FPS) covers global daily merged ocean colour products in the time period 1997-2006 and is freely available for use by the worldwide science community at http://www.globcolour.info/data_access_full_prod_set.html.

The GlobColour service distributes global daily, 8-day and monthly data sets at 4.6 km resolution for, chlorophyll-a concentration, normalised water-leaving radiances (412, 443, 490, 510, 531, 555 and 620 nm, 670, 681 and 709 nm), diffuse attenuation coefficient, coloured dissolved and detrital organic materials, total suspended matter or particulate backscattering coefficient, turbidity index, cloud fraction and quality indicators. Error statistics from the initial sensor characterisation are used as an input to the merging methods and propagate through the merging process to provide error estimates on the output merged products. These error estimates are a key component of GlobColour as they are invaluable to

the users; particularly the modellers who need them in order to assimilate the ocean colour data into ocean simulations. See the Product User Guide (PUG) for further details on the GlobColour products

http://www.globcolour.info/CDR_Docs/GlobCOLOUR_PUG.pdf.

An intensive phase of validation has been undertaken to assess the quality of the data set. In addition, inter-comparisons between the different merged datasets will help in further refining the techniques used. Both the final products and the quality assessment were presented at a second user consultation in Oslo on 20-22 November 2007; presentations are available on the GlobColour WWW site

In 2008, the project will continue merging MERIS and MODIS ocean colour data, with a global daily delivery in NRT to primarily support operational oceanography. In the future this will feed into the European Community funded Marine Core Service that will start to provide, in 2008, a suite of services to support Europe's decision makers. Future availability of MERIS ocean colour data will be assured with the launch of the first Sentinel-3 satellite in 2012. GlobColour's merged ocean colour dataset will be provided in future by the Ocean Colour Thematic Assembly Centre (OC TAC) whose main objective is to bridge the gap between space agencies providing ocean colour data and GMES marine applications. The OC TAC will deliver core ocean colour products, annotated with pixel level quality control flags and reliable error estimates, at global to regional European scales consolidating European efforts and maximising their impact.

