

Status and Prospective of Operational Ocean Color Products from the NOAA CoastWatch Okeanos System

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The status and future of the NOAA CoastWatch Okeanos operational ocean color product system are summarized in this paper. In recent years, the NOAA CoastWatch Okeanos system has been providing a series of high quality ocean color operational products for our user communities, e.g., 1 km daily and bi-monthly mean chlorophyll concentrations, and chlorophyll concentration anomaly compared to 61-day averages from MODIS/AQUA. The 1 km daily, bi-monthly, and anomaly products of remote sensing reflectance at 667 nm are also available for MODIS/AQUA. The products are generated respectively using the NASA NIR and the NOAA NIR-SWIR algorithms. Figure 1 displays examples of operational ocean color products generated in the CoastWatch Okeanos operational system by using the NASA NIR algorithm (<http://oceancolor.gsfc.nasa.gov/>). The products have been beneficial in assessing water quality and tracking potentially harmful algal blooms in order to protect public health. For example, the chlorophyll concentration product has been used to understand and predict the harmful algal blooms in the Gulf of Mexico by the NOAA Center for Operational Oceanographic Products and Services (CO-OPS). Recent efforts also continue to provide more MODIS/AQUA ocean color products to user community. The chlorophyll frontal operational products are expected to be available in June 2013. Operational products of Global *Emiliana huxleyi* (Ehux) bloom distribution may be available in 2013 if any NOAA operational users are identified. Figure 2 shows example of NOAA NIR-SWIR chlorophyll-a product and upcoming chlorophyll frontal and Ehux products. More importantly, all existing operational products will be extended to NPP Visible/Infrared Imager Radiometer Suite (VIIRS) and other upcoming ocean color sensors in the next few years. Therefore, it is expected that our future operational ocean color product system offers more valuable information for federal, state, and local marine scientists, as well as coastal resource managers and fisheries managers.

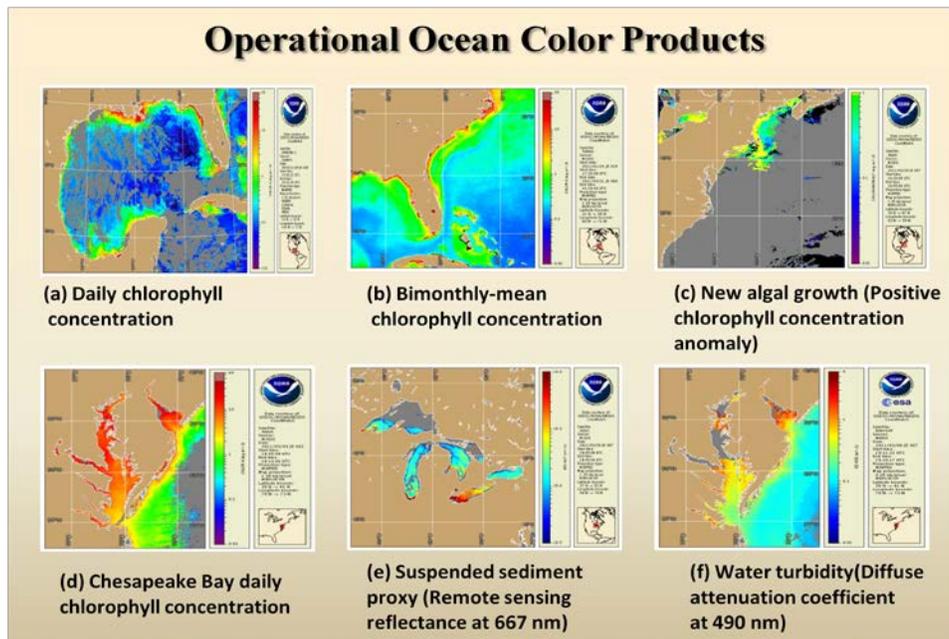


Figure 1 NOAA operational ocean color products retrieved from MODIS/Aqua satellite observations, generated in the CoastWatch Okeanos operational system by using the NASA 12gen NIR algorithm (<http://oceancolor.gsfc.nasa.gov/>). (a) Daily chlorophyll concentration. (b) Bimonthly-mean chlorophyll concentration. (c) New algal growth (positive chlorophyll concentration anomaly). (d) Chesapeake Bay daily chlorophyll concentration. (e) Suspended sediment proxy (remote sensing reflectance at 667 nm). (f) Water turbidity (diffuse attenuation coefficient at 490 nm).

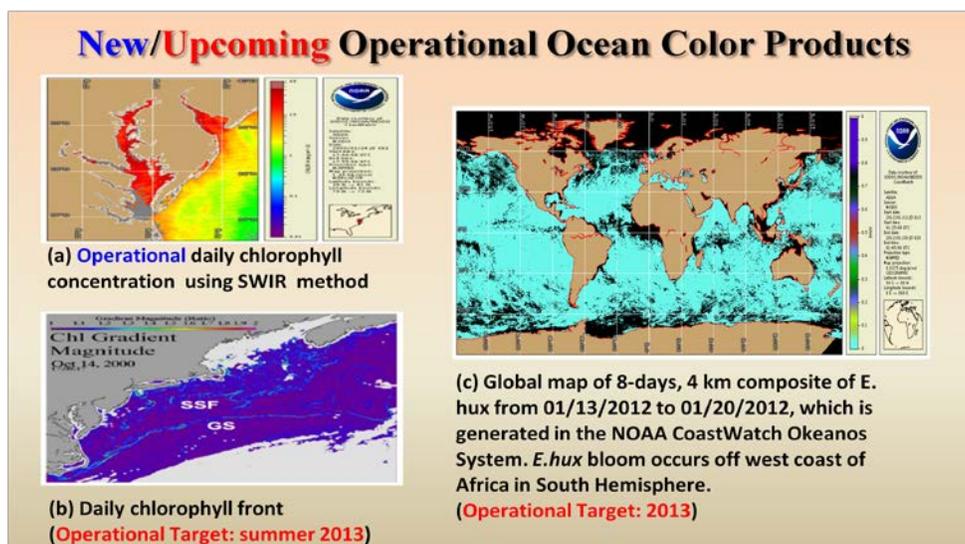


Figure 2 New operational and pre-operational ocean color products retrieved from MODIS/Aqua satellite observations in the CoastWatch Okeanos system. (a) Operational daily chlorophyll concentration by using the NIR SWIR method (Wang *et al.*, 2009). (b) Pre-operational daily chlorophyll frontal products by using the BOA-SNRA algorithm (Belkin and O'Reilly, 2009; Belkin *et al.* 2013). (c) Pre-operational global map of 8-days, 4 km composite of *E. hux* by using the Ehux algorithm (Brown and Yoder, 1994).

References:

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