

Ocean Color Radiance (OCR) Virtual Constellation (VC)

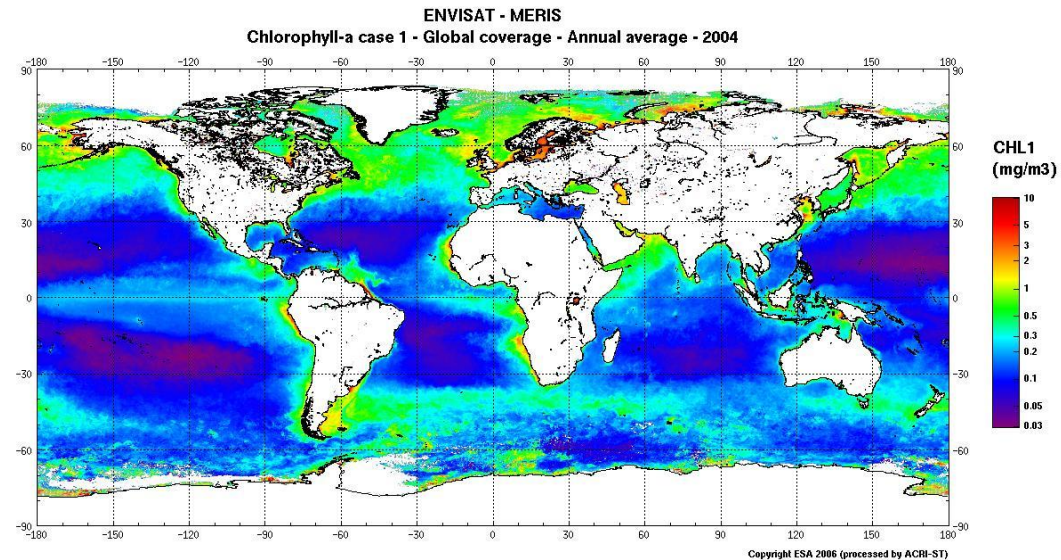
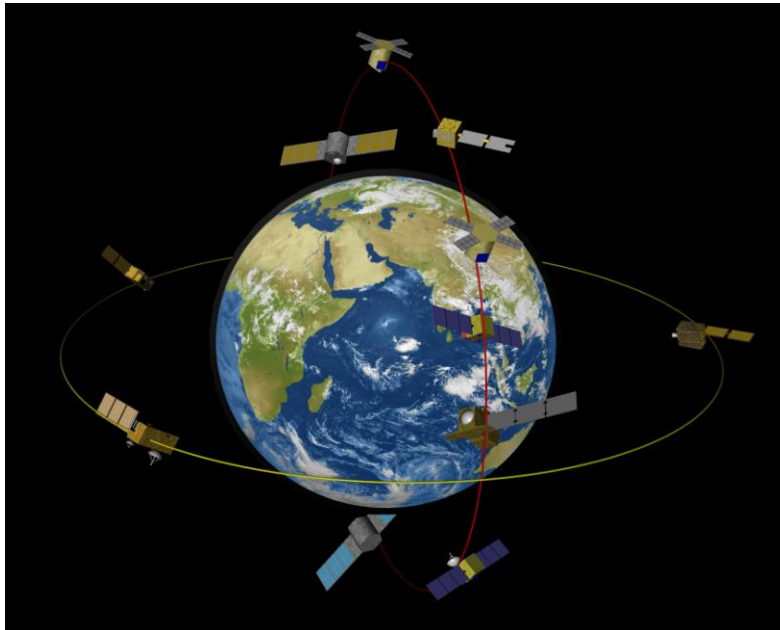


Image from ESA's GlobColour Project

What is the Mission of the OCR-VC ?

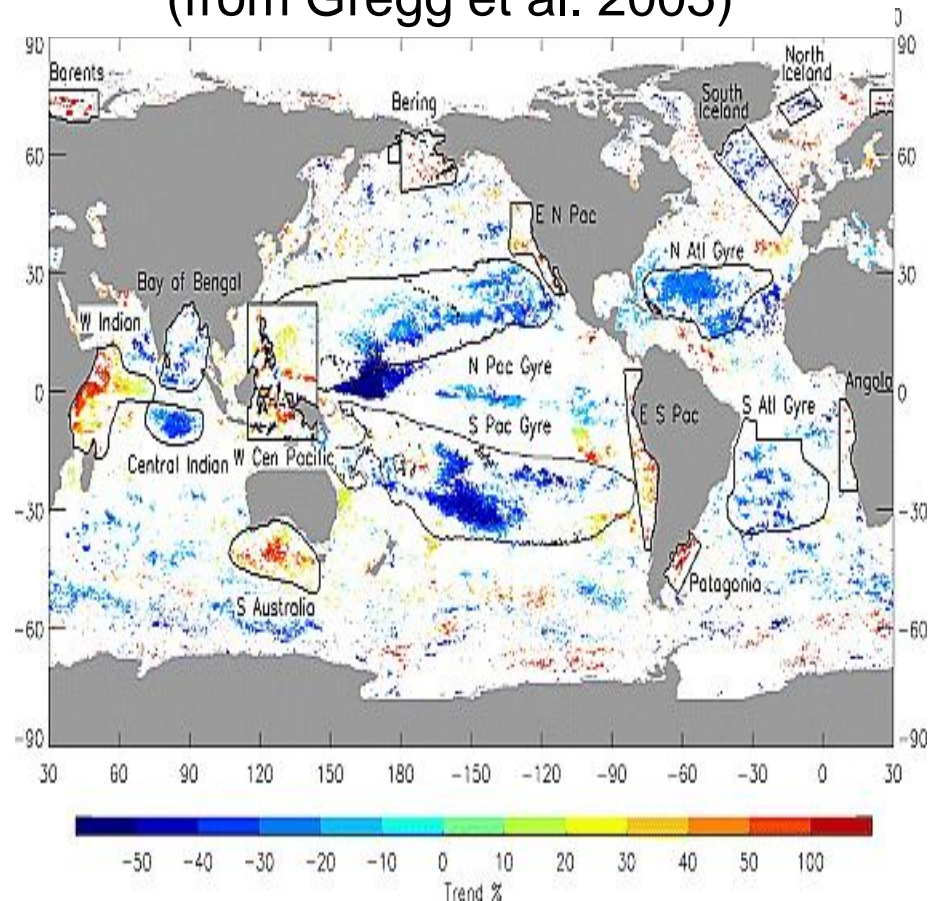
- The OCR-VC will provide long time series of calibrated ocean color radiance (OCR) ^{*1} at key wavelength bands from measurements obtained from multiple satellites.
- OCR-VC activities will include calibration, validation, merging of satellite and *in situ* data, product generation, as well as development and demonstrations of new and improved applications.
- NASA's *SIMBIOS*, ESA's *GlobColour*, POGO-GEO-GOOS's *ChloroGIN* and CSA/GEO *SAFARI* projects are examples and prototypes of programs the OCR-VC will require to meet its objectives.

¹ Ocean colour radiance (OCR) is the wavelength-dependent upwelling solar energy captured by an optical sensor looking at the sea surface. Narrow wavelength bands centered at 412, 443, 490, 510, 531, 555, 620, 670, 681 and 709 nm are the most useful for deriving current OCR data products. At satellite altitudes the relatively weak OCR signal (10-20% of incident solar or less) also has to propagate through the atmosphere before detection. To accurately determine water-leaving radiance reaching satellite altitudes requires additional OCR measurements in the near-infrared and accurate models of aerosol optical properties.

Products Derived from OCR

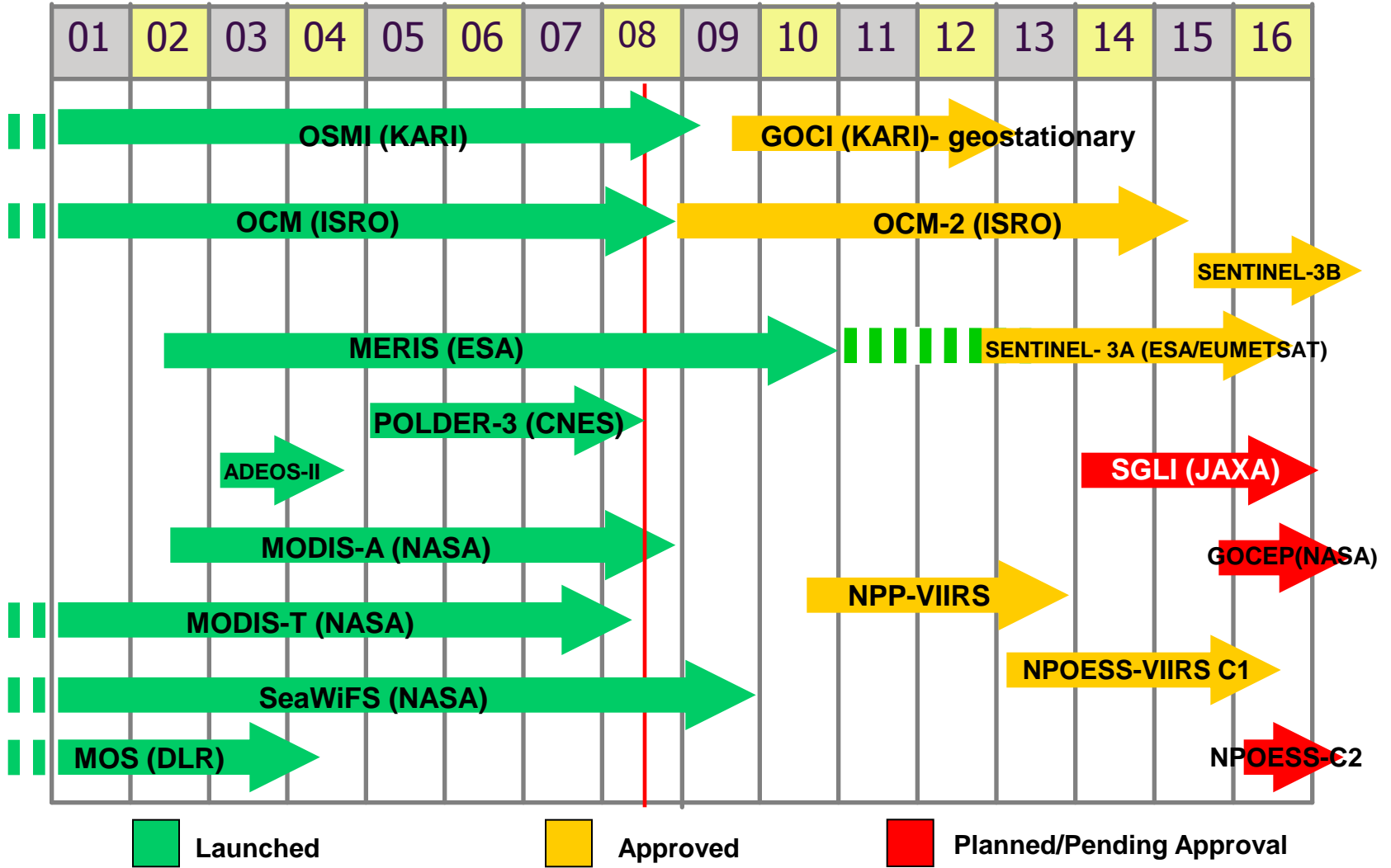
- Data products currently derived from OCR are phytoplankton chlorophyll *a*, primary production, colored organic matter (COM), particulate carbon, and suspended sediment.
- OCR data products are the **only** measurements related to biological and biogeochemical processes in the ocean that can be routinely obtained at ocean basin and global ocean scales.

Trends in Chlorophyll (1997-2003)
(from Gregg et al. 2005)



GEO and GCOS Requirements Addressed by the OCR-VC.

- Products derived from OCR are specified in the GEO 2007-2009 Work Plan, "Towards Convergence" (27 March 2008) under 4 societal benefit areas: **health, climate, agriculture and ecosystems.**
- The draft GEO 2009-2011 Work Plan endorses the OCR-VC as providing "scientific data products related to marine ecosystems and ocean biogeochemistry for near-surface global ocean and coastal waters."
- **GCOS lists** "Ocean color, and oceanic chlorophyll-a concentration derived from ocean color" as an Essential Climate Variable (ECV) for "**climate [impacts] monitoring**" as well as "**carbon-cycling** including between the ocean and the atmosphere; and ocean particulate carbon estimated from ocean color."



Ocean Colour Radiometry Missions

Leadership of the OCR-VC

- IOCCG membership includes representatives from space and other government agencies as well as representatives from scientific and operational user communities.
- We propose that the **leadership group** for the OCR-VC come from **implementing organizations**; specifically those individuals from space and other government agencies serving on IOCCG.
- To date, the following IOCCG members have confirmed that their agency will participate in the OCR-VC: Yu-Hwan Ahn, (KORDI), Paula Bontempi (NASA), Paul M. DiGiacomo, (NOAA), Nicholas Hoepffner (JRC), Milton Kampel (INPE), Hiroshi Murakami (JAXA), Rangnath R. Navalgund (ISRO), Peter Regner (ESA-ESRIN), Eric Thouvenot (CNES) and others are likely. IOCCG Chair and Exec. Scientist are *ad hoc*.
- Plan is to select 2 from the leadership group to serve as the **co-chairs** of the **leadership group** with a rotation every 2-3 years.