Committee on Earth Observation Satellites

Update on OCR-VC Activities & Actions

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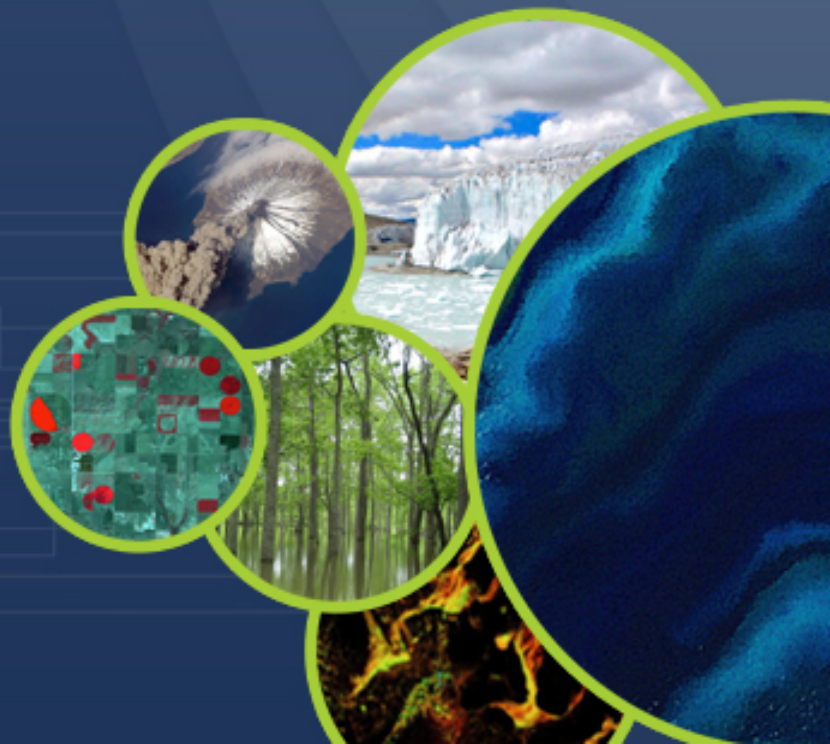
OCR-VC Update to IOCCG-21

Santa Monica, CA, USA

2 March 2016



Ocean Colour Radiometry - Virtual Constellation (OCR-VC):

- Progress review with respect to OCR-VC action items in the Work Plan

VC-7	Catalog of Cal/Val infrastructure and activities	Q2 2015
VC-8	Action Plan for GEO Blue Planet Components	Q4 2015
VC-9	Implementation of the International Network for Sensor InTercomparison and Uncertainty Assessment for Ocean Color Radiometry (INSITU-OCR)	Q1 2015
VC-10	Recommend the creation of a GEO Water Quality of Practice	Q2 2015

- VC-7: Agency mapping exercise complete; IOCCG discussing information.
- VC-8: Overall Blue Planet Implementation plan forthcoming in 2016; active CEOS engagement underway (including request for a CEOS rep for 3rd Blue Planet Symposium to be held in the U.S. in Spring 2017
- VC-9: Moving forward w/modular implementation; gaps/challenges exist
- VC-10: Water Quality Community of Practice created; implementation plans now being formulated

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- Note: Sentinel-3A successfully launched 16 Feb 2016 - first of four Ocean and Land Colour Imagers providing a sustained operational OCR capability to 2030. Complemented by four Sentinel-2 instruments that also have a significant contribution to coastal OCR (S2A was launched June 2015 and S2B will launch later in 2016)

VC-7: Catalog of Cal/Val infrastructure and activities

- In 2014, IOCCG undertook a relevant "agency mapping" exercise that included consideration of available, and planned, international agency assets and resources for OCR cal/val, as a first step towards implementation of the International Network for Sensor Inter-comparison and Uncertainty assessment for Ocean Colour Radiometry (INSITU-OCR) by IOCCG member agencies.

- At the 3-5 March 2015 IOCCG meeting, a first round of discussion took place, with a focus toward the modular approach to implementation. This information has since been collated and assessed for gaps.

- At the 1-3 March 2016 IOCCG-21 meeting, and in preparation for the upcoming CEOS SIT meeting (18-21 April 2016), IOCCG will finalize inventory for VC infrastructure and discuss collaborations, identify priorities to focus on, etc.

- Ewa Kwiatkowska (EUMETSAT) attended the WG-Cal/Val Meeting on behalf of the OCR-VC/IOCCG in 2015, and will continue representing the OCR-VC in these meetings with a permanent seat on WGCV plenaries and through WGCV's review and endorsement of relevant IOCCG recommendations.

VC-8: Action Plan for GEO Blue Planet Components

IOCCG/OCR-VC agencies are and will continue to make significant contributions to all Blue Planet components:

- C1. Developing capacity and societal awareness
- C2. Sustained ocean observations
- C3. Data access and visualization
- C4. Ocean forecasting
- C5. Healthy ecosystems and food security
- C6. Services for the coastal zone
- C7. Ocean climate and carbon
- C8. Integrated maritime services

GEO Blue Planet Initiative

VC-8: Action Plan for GEO Blue Planet Components

- Agency contributions vary based on agency mission and scientific focus (basic versus applied research).

- OCR-VC agencies play active leadership role in the GEO Blue Planet Implementation, with P. DiGiacomo designated the CEOS Blue Planet Expert, and will represent CEOS at the Third Blue Planet Symposium in June 2017.

- OCR-VC members serve in active leadership roles for several of the above components (e.g., C4 & C6/NOAA and C7/JRC) as well as on the Blue Planet Steering Committee (CSIRO, JRC, NOAA).

VC-8: Action Plan for GEO Blue Planet Components

- CEOS members (CSIRO, NOAA et al.) are now working to organize the 3rd Blue Planet Symposium to be held in Spring 2017 at U.S. location TBD.

- NOAA (NESDIS/STAR) & CSIRO have also partnered to Co-Host the GEO Blue Planet Secretariat, which will be located in College Park, Maryland USA and Dutton Park, Queensland, Australia. This can be considered as a significant contribution by CEOS agencies to advancement of Blue Planet.

- ESA planning an Oceans training course in the next two years; also, the DRACON Sino-European activities will include significant training that will be nurtured across a wide variety of Case-2 water projects in Sino and European waters.

VC-9: Implementation of the International Network for Sensor InTercomparison and Uncertainty Assessment for Ocean Color Radiometry (INSITU-OCR)

- Following on to the agency infrastructure mapping exercise (to be brought to conclusion in spring 2016), IOCCG will use agency *in situ* calibration and validation asset information to identify priority needs and gaps in infrastructure that agencies could collectively address and work with CEOS to address these in a collective manner.

- Sustaining current operational activities and establishing new efforts (e.g., pilot investments and projects) to move the OCR-VC and INSITU-OCR forward is a very high priority.

- An example of the implementation of the INSITU-OCR beyond heritage capabilities includes NASA supporting three new projects (2014-2017) in the areas of the vicarious calibration instrumentation for future ocean color missions

VC-9: Implementation of the International Network for Sensor InTercomparison and Uncertainty Assessment for Ocean Color Radiometry (INSITU-OCR)

- ESA introduced the concept of Fiducial Reference Measurements (FRM) into its work for satellite calibration and validation - the FRM4OCR is the OCR component of that (additional projects address Altimetry and SST) – to be selected

- ESA has sponsored the Atlantic Meridional Transect (AMT) activity as a fundamental platform for FRM delivery in the context of Copernicus OCR. A first pilot - Sept 2016.

- NOAA continues to fund and sustain MOBY operations (including an on-going system refresh), supporting present and upcoming (operational) missions.

- NOAA held an initial multi-agency VIIRS validation cruise in November 2015, then a second cruise occurred in December 2015, and it is anticipated that this will continue to be an annual event in support of VIIRS and other sensors.

VC-9: Implementation of the International Network for Sensor InTercomparison and Uncertainty Assessment for Ocean Color Radiometry (INSITU-OCR)

- Additionally, all agencies will be asked to contribute towards the “protocols activity” (e.g., an open opportunity to share information regarding *in situ* instrumentation (for calibration and validation) protocols, lead by NASA and beginning in March 2016.

- The IOCCG will host a website to disseminate all relevant lists and information (see NASA prototype at oceancolor.gsfc.nasa.gov/cms/ioccg_proto_main).

- Goal: enable communication about the refinement of *in situ* measurement protocols and to reduce redundancy in field efforts, fill in measurement gaps, share data (modular implementation approach), and better target opportunities for collaboration. Multi-agency collaboration will advance its implementation.

VC-10: Recommend the creation of a GEO Water Quality Community of Practice

- A GEO Water Quality (GEO-WaQ) Community of was created in 2015 - bringing together relevant data providers and users who will work collaboratively to implement, utilize, maintain and enhance the global water quality monitoring and forecasting service.

- A Water Quality Community of Practice Meeting is tentatively planned for June 8-10th in Koblenz, Germany, to focus on the WQ Summit Goal to define specific requirements of the water quality observing system components and develop a plan to implement an integrated, global end-to-end water quality monitoring and forecasting service.

VC-10: Recommend the creation of a GEO Water Quality Community of Practice

- Additionally, topics of interest for the Meeting include:
  - Update from GEO Secretariat: actions, work planning and reporting;
  - Review of past year's WQ CoP activities;
  - Water Quality CoP organization structure, governance and working groups;
  - Survey of global projects and existing data systems;
  - Project updates from community (e.g. GloboLakes, GLaSS, Copernicus Inland WQ service, CyAN);
  - Working group breakout sessions to identify and prioritize projects/activities that support the work packages of those projects.

- The IOCCG WG on "Earth Observations in Support of Global Water Quality Monitoring" are preparing an IOCCG Report which will identify current and future user data, product and information needs and requirements, assess space-based and *in situ* observing capabilities and need for associated modeling and data assimilation activities, identify supporting research and development activities, and identify best practices and new & improved data streams and products. Planned for final review/approval in late 2016.

OCR-VC Issues for CEOS Plenary:

- Ready access to L0 or L1A ocean color radiometry data remains a challenge and item of significant concern for the OCR-VC.

- CEOS-SIT, at the OCR-VC's request, sent out a letter in July 2015 to those agencies that (plan to) have ocean color missions requesting they consider distribution of Level 0 and Level 1A mission data.

- Formal replies were (only) received from ESA and NOAA (note that NASA already fulfills this requirement), and via email from CNES. The NOAA and CNES responses were in the affirmative regarding access to these data; ESA indicated there was no plan or resources to deliver these data – but there is pressing interest from the community for this level of data

- OCR-VC would be most appreciative if all relevant CEOS agencies could respond as to their plans/intentions regarding access to L1A (really as close to L0 as feasibly possible) ocean color data, and more so that this general issue is discussed during plenary to advance free, open, routine & timely data exchange of these data.