



Committee on Earth Observation Satellites

Update on IOCCG/OCR- VC Meeting Outcomes

**Paul M. DiGiacomo (NOAA), Peter Regner
(ESA), Paula Bontempi (NASA)**

SIT-30 Agenda Item #8

CEOS Action / Work Plan Reference

30th CEOS SIT Meeting

CNES Headquarters, Paris, France

31st March – 1st April 2015





Information:

- Review progress with respect to OCR-VC action items in the Work Plan 2014-2016 & 2015-2017

VC-1	List of Relevant Datasets from VCs	Q4 2014
VC-6	Vision and plan for an essential OCR-Virtual Constellation space segment (Polar and GEO)	Q4 2016
VC-7	Catalog of Cal/Val infrastructure and activities	Q2 2015
VC-8	Action Plan for GEO Blue Planet Components	Q1 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-1 – Updated (on ongoing basis) on IOCCG web site: ioccg.org
- VC-6 – Continued discussion with IOCCG; see esp. reports: 12, 13, 14
- VC-7 – Agency mapping exercise complete
- VC-8 – Update and plan provided
- VC-9 – moving forward w/modular implementation, NASA, ESA, NOAA Update
- VC-10 – Update and plans provided



□ Information

VC-1: List of Relevant Datasets from VCs

Q4 2014

- Current information is on the IOCCG website at <http://www.ioccg.org/data/sensors.html>





www.ioccg.org/data/sensors.html

Ocean-Colour Sensor Data

- [COCTS](#) - Chinese Ocean Colour and Temperature Scanner
- [CZCS](#) - Coastal Zone Colour Scanner
- [CZI](#) - Coastal Zone Imager
- [GLI](#) - Global Imager
- [GlobColour](#) - Merged GlobColour Data Set
- [HICO](#) - Hyperspectral Imager for the Coastal Ocean
- [MERIS](#) - MEdium Resolution Imaging Spectrometer
- [MISR](#) - Multi-angle Imaging SpectroRadiometer
- [MODIS - Aqua](#) - Moderate Resolution Imaging Spectroradiometer
- [MODIS - Terra](#) - Moderate Resolution Imaging Spectroradiometer
- [MOS](#) - Moderate Optoelectrical Scanner
- [OCI](#) - Ocean-Colour Imager
- [OCM](#) - Ocean-Colour Monitor
- [OCTS](#) - Ocean Colour and Temperature Scanner
- [POLDER 1](#) - POLarization and Directionality of the Earth's Reflectances
- [POLDER 2](#) - POLarization and Directionality of the Earth's Reflectances
- [SeaWiFS](#) - Sea-viewing Wide Field-of-view Sensor
- [S-NPP VIIRS](#) - Visible Infrared Imager Radiometer Suite

General Links

- [NASA Ocean Color Data Archive](#) - CZCS, SeaWiFS, OCTS, MERIS, MODIS-Aqua, MODIS-Terra, VIIRS, HICO
- [Giovanni](#) - Web-based interface for visualization and analysis of Earth Science data provided by NASA's GES DISC DAAC.
- [Ocean Colour Climate Change Initiative \(CCI\)](#) - European Space Agency
- [Ocean Productivity home page](#) - Oregon State University, USA
- [Canadian Department of Fisheries and Oceans](#) - Semi-monthly composites of the Atlantic Zone (SeaWiFS, MODIS)

[Data & Software](#) | [Home](#)

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□ Information

VC-6: Vision and plan for an essential OCR-Virtual Constellation space segment (Polar and GEO) Q4 2016

IOCCG to update the listing, specs, and details of current and planned ocean colour sensors.

A listing of current and planned ocean color sensors (Polar and GEO) can be found here:

Current - <http://www.ioccg.org/sensors/current.html>

Planned - <http://www.ioccg.org/sensors/scheduled.html>





Current Ocean-Colour Sensors

For a consolidated statement of the Earth observation programmes and plans of the world's civil space agencies, please consult the CEOS EO Handbook, as well as the CEOS Missions, Instruments & Measurement (MIM) database, available at: www.eohandbook.com.

SENSOR/ Data Link	AGENCY	SATELLITE	LAUNCH DATE	SWATH (km)	SPATIAL RESOLUTION (m)	BANDS	SPECTRAL COVERAGE (nm)	ORBIT
COCTS CZI	CNSA (China)	HY-1B (China)	11 April 2007	2400 500	1100 250	10 4	402 - 12,500 433 - 695	Polar
GOCI	KARI/KIOST (South Korea)	COMS	26 June 2010	2500	500	8	400 - 865	Geostationary
MERSI	CNSA (China)	FY-3A (China)	27 May 2008	2400	250/1000	20	402-2155	Polar
MERSI	CNSA (China)	FY-3B (China)	5 November 2010	2400	250/1000	20	402-2155	Polar
MERSI	CNSA (China)	FY-3C (China)	23 September 2013	2400	250/1000	20	402-2155	Polar
MODIS-Aqua	NASA (USA)	Aqua (EOS-PM1)	4 May 2002	2330	250/500/1000	36	405-14,385	Polar
MODIS-Terra	NASA (USA)	Terra (EOS-AM1)	18 Dec. 1999	2330	250/500/1000	36	405-14,385	Polar
OCM-2	ISRO (India)	Oceansat-2 (India)	23 Sept. 2009	1420	360/4000	8	400 - 900	Polar
VIIRS	NOAA (USA)	Suomi NPP	28 Oct. 2011	3000	375 / 750	22	402 - 11,800	Polar

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Scheduled Ocean-Colour Sensors

For a consolidated statement of the Earth observation programmes and plans of the world's civil space agencies, please consult the CEOS EO Handbook, as well as the CEOS Missions, Instruments & Measurement (MIM) database, available at: www.eohandbook.com.

SENSOR	AGENCY	SATELLITE	SCHEDULED LAUNCH	SWATH (km)	SPATIAL RESOLUTION (m)	# OF BANDS	SPECTRAL COVERAGE (nm)	ORBIT
OLCI	ESA/ EUMETSAT	Sentinel 3A	Oct 2015	1270	300/1200	21	400 - 1020	Polar
COCTS CZI	CNSA (China)	HY-1C/D (China)	2015	2900 1000	1100 250	10 10	402 - 12,500 433 - 885	Polar
SGLI	JAXA (Japan)	GCOM-C	2016	1150 - 1400	250/1000	19	375 - 12,500	Polar
COCTS CZI	CNSA (China)	HY-1E/F (China)	2017	2900 1000	1100 250	10 4	402 - 12,500 433 - 885	Polar
HSI	DLR (Germany)	EnMAP	2017	30	30	242	420 - 2450	Polar
OCM-3	ISRO (India)	OCEANSAT-3	2018	1400	360 / 1	13	400 - 1,010	Polar
OLCI	ESA/ EUMETSAT	Sentinel-3B	2017	1265	260	21	390 - 1040	Polar
VIIRS	NOAA/NASA (USA)	JPSS-1	2017	3000	370 / 740	22	402 - 11,800	Polar
Multi-spectral Optical Camera	INPE/ CONAE	SABIA-MAR	2019	200/2200	200/1100	16	380 - 11,800	Polar
GOCI-II	KARI/KIOST (South Korea)	GeoKompsat 2B	2019	1200 x 1500 TBD	250/1000	13	412 - 1240 TBD	Geostationary
OCI	NASA	PACE	2022/2023	*	*	*	*	Polar
HYSI-VNIR	ISRO (India)	GISAT-1	*(planned)	250	320	60	400-870	Geostationary (35,786 km) at 93.5°E
OES	NASA	ACE	>2020	TBD	1000	26	350-2135	Polar
Coastal Ocean Color Imaging Spec (Name TBD)	NASA	GEO-CAPE	>2022	TBD	250 - 375	155 TBD	340-2160	Geostationary
VSWIR instrument	NASA	HvSPIRI	>2022	145	60	10 nm contiguous bands	380 - 2500	LEO, Sun Sync.

* Expected to be similar to ACE



□ Information

VC-7: Catalog of Cal/Val infrastructure and activities Q2 2015

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, the IOCCG asked that each agency indicate on the spreadsheet their potential area of contribution to INSITU-OCR implementation.

At the 3-5 March 2015 IOCCG meeting, IOCCG asked the member agencies to provide an agency-based list of infrastructure and assets.

IOCCG/OCR-VC is considering *in situ* protocols and data handling as well, such as described in the recent Sentinel-3 Validation Team meeting in December 2014.

Note: Ewa Kwiatkowska (EUMETSAT) will attend the upcoming WG-Cal/Val Meeting on behalf of the OCR-VC/IOCCG



Information

VC-8: Action Plan for GEO Blue Planet Components

Q3 2015

The components to the GEO Blue Planet task are drawn from the new Blue Planet structure as per the GEO Work Plan: <http://www.earthobservations.org/docshow.php?id=129> that calls out:

C1: Sustained Ocean Observations;

C2: Sustained Ecosystems and Food Security;

C3: Ocean Forecasting;

C4: Services for the Coastal Zone;

C5: Climate and Carbon;

C6: Developing Capacity and Societal Awareness.

- IOCCG/OCR-VC agencies are and will continue to make significant contributions to all of the above components.
- OCR-VC agencies are fully in support of the GEO Blue Planet Components, and the nature of the contributions vary according to the mission of each agency (e.g., research and development contributions from ESA and NASA; enabling applications and services from EUMETSAT and NOAA).
- OCR-VC members serve in active leadership roles for several of the above components (e.g., C3 & C4/NOAA and C5/JRC), and will broadly contribute to the Blue Planet Symposium to be held in Cairns, Australia in May 2015 (hosted by CSIRO)



□ Information

VC-9: Implementation of the International Network for Sensor InTercomparison and Uncertainty Assessment for Ocean Colour Radiometry (INSITU-OCR) Q4 2015

IOCCG Executive Committee meeting in October 2014- most agencies had completed the mapping exercise

- identify agencies that had resources to put into INSITU-OCR
- identify gaps in infrastructure that agencies could collectively address.

Noted that not enough examples of inter-agency collaboration.

Noted that not all agencies had included their long-term plans on the spreadsheet. ACTIONS from IOCCG EC Meeting - Agencies were requested to submit to the IOCCG Chair a short list of actual gaps for existing/upcoming missions, a list of priorities from their perspective, as well as areas where they need help, e.g., a need for more validation sites.

Once the OCR-VC has this updated information compiled, it will be conveyed to CEOS-SIT via the OCR-VC Chairs



❑ Information (as an update - continued)

VC-9: Implementation of the International Network for Sensor InTercomparison and Uncertainty Assessment for Ocean Colour Radiometry (INSITU-OCR) Q4 2015

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

- i) (new) NASA has released and selected the vicarious calibration instrumentation competition for PACE, as a contribution to INSITU-OCR, and,
- ii) (new) ESA is planning to launch an open tender action this spring addressing the need for improved OCR in-situ instrumentation and community consensus protocols for instrument calibration and vicarious adjustments as well as establishing traceability to metrological institutes, and,
- iii) (existing) NOAA continues to fund and sustain MOBY operations (including an on-going system refresh), supporting present and upcoming (operational) missions
- iv) all agencies could contribute towards the “protocols activity” (e.g., small committee to catalogue and share information regarding *in situ* instrumentation (for calibration and validation) protocols. The IOCCG will host a website to disseminate all relevant lists and information (prototype being developed by NASA 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 efforts, fill in gaps, and better target opportunities and key players. This is an early contribution to INSITU-OCR, and this multi-agency collaboration will advance its implementation.



□ Information

VC-10: Recommend the creation of a GEO Water Quality of Practice Q2 2015

- There will be a **GEO Water Quality Summit** held April 2015 in Geneva at WMO.
- The *Summit Goal* is 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.
- The *Summit Deliverables* will be: Development of a) Strategic implementation and b) A phased action plan including baseline (goal, ample funding)funding constrained) service build-outs, with both a short-term (0-5 year) build-out plan for pilot/prototype regional service(s) and a long-term (6-10 year plan for a global-scale water quality monitoring and forecasting service, and,
- *Formation of a GEO Water Quality (GEO-WaQ) Community of Practice* bringing together relevant data providers and users who will work collaboratively to implement, utilize, maintain and enhance the regional (initially) and (ultimately) global water quality monitoring and forecasting service.



SIT-30
 CNES Headquarters, Paris,
 France
 31st March – 1st April 2015

IOCCG-20 Actions

Note: Unofficial (TBC)



Action	Brief description	Status
20/1	Vittorio Brando and Susanne Craig to submit a proposal for a WG with the mandate of revisiting parts of IOCCG Reports 3 and 5, and specifically incorporating the multi-water algorithm concept (due date: 1 June 2015).	Open
20/2	IOCCG to send an additional supporting letter to Philippe Brunet and Kurt Vandenberghe endorsing the letter sent by Rosalia Santoleri on behalf of the S3VT scientists (S. Bernard, V. Stuart).	Open
20/3	Send invitation letter to Craig Donlon inviting him to chair a panel discussion at IOCS-2015 (S. Bernard, V. Stuart).	Closed
20/4	OCR-VC to provide a redaction of where IOCCG fits into GOOS and also to correct their description of the framework for ocean observing (P. DiGiacomo, S. Bernard)	Open
20/5	Stephanie Dutkiewicz to attend the GOV MEAP-TT workshop in Halifax to represent the ocean colour modelling community.	On-going
20/6	Stephanie Dutkiewicz to prepare a proposal and draft Terms of Reference for a new IOCCG working group on “Ocean Colour Applications for Biogeochemical and Climate Modelling” by June 2015.	Open
20/7	EUMETSAT to investigate development of a Sentinel-3 multi-water demonstration product (E. Kwiatkowska).	Open
20/8	IOCCG Agencies to provide new links to publically available ocean colour data sets, or update the links currently available on the IOCCG website (Venetia Stuart to coordinate).	On-going
20/9	All IOCCG agencies to provide information to Venetia Stuart to update the timelines and specifications for the current and planned lists of ocean colour sensors on the IOCCG website. P. Bontempi, P. Regner and P. DiGiacomo to provide information to CEOS.	On-going
20/10	Paul DiGiacomo to attend the SIT-30 meeting in Paris (31 March – 1 April 2015).	Closed
20/11	Confirm new co-chairs of ECV Task Force (B. Franz, D. Antoine).	Open
20/12	Jim Yoder’s ECV presentation to be included on IOCCG website (V. Stuart).	Closed
20/13	Stewart Bernard and Giuseppe Zibordi to draft requirements for a community AOP/IOP processor for in situ data.	Open
20/14	IOCCG to send a letter to KIOST/KARI expressing appreciation for GOCI data and for the rapid development of the missions (D. Antoine, S. Bernard, V. Stuart).	Open
20/15	Ewa Kwiatkowska to consult with trainers at EUMETSAT to see how they can support IOCCG capacity building efforts.	Open
20/16	IOCCG to prepare a summary of ocean colour training opportunities, including online courses (H. Dierssen, C. Wilson, E. Kwiatkowska, S. Bernard, V. Stuart, with input from Committee members).	Open
20/17	Heidi Dierssen to prepare a brief on IOCCG-20 meeting for EOS.	On-going
20/18	Paula Bontempi to finalize dates and venue for IOCCG-21 in 2016	Open



CEOS

Second International Ocean Colour Science Meeting 2015



15-18 June



International
Ocean Colour Science
Meeting 2015

San Francisco

This is the second in a series of biennial IOCS meetings designed to foster exchange between the research community and space agency representatives. The primary focus of the IOCS meeting is to build and strengthen the international ocean colour community by providing a forum to collectively address common issues and goals. The aim is to achieve the best quality ocean colour data that meet scientific, environmental, climate and operational needs through international collaboration and scientific and technological innovation.



For more information
and a Call for Session Topics:

IOCS.IOCCG.ORG
IOCS-2015@IOCCG.ORG





□ Discussion

- **Requested distribution of ocean color radiometry satellite Level 0 or Level 1A data (as noted in IOCCG report #13); how can CEOS-SIT facilitate access to these data sets?**
- **Importance of *validation* across all agencies and why validation (as well as calibration) should be built into all ocean color radiometry missions – how do we raise visibility and sustained implementation of these crucial capabilities in support of OCR?**

