

The International Ocean Colour Coordinating Group and The Ocean Colour Virtual Constellation

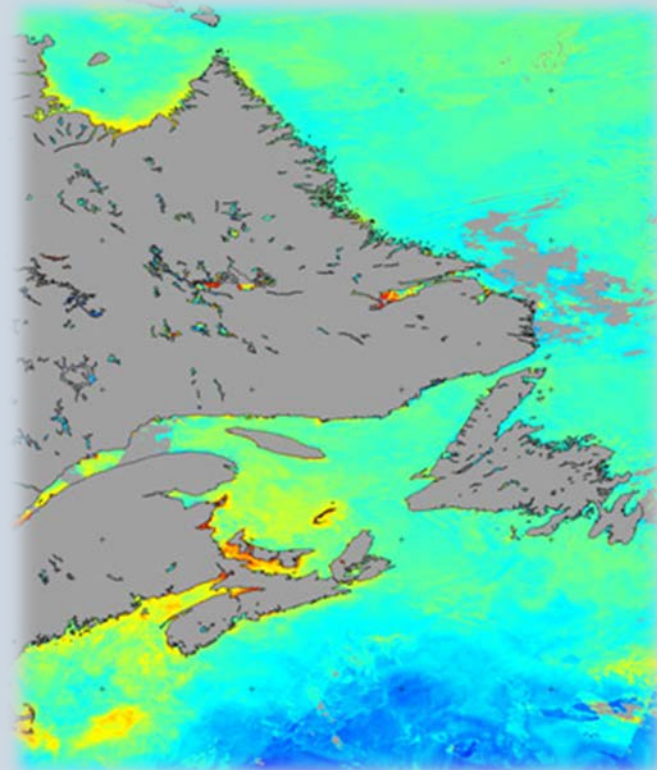
CEOS WGCV-39, 6-8 May 2014

IOCCG

<http://www.ioccg.org/>

International Ocean Colour Coordinating Group

- Established in 1996 to promote the application of ocean-colour data at the world scale through coordination, liaison between providers and users, training, advocacy and provision of expert advice
- Project Office at the Bedford Institute of Oceanography, NS, Canada
- Committee consists of ~25 members including:
 - Space Agency Representatives** who are experts in ocean colour, contribute financially and carry out the decisions endorsed by the group
 - Research Scientists** who research current and emerging scientific and societal benefit areas and make recommendations



*ESA MERIS Chlorophyll, 3-9 Sept 2010
(image courtesy Cesar Fuentes-Yaco,
DFO, Canada)*

IOCCG Mandate

To provide a common voice for the user community

Liaise with space agencies

Advanced training courses to foster expertise in using ocean-colour data

Facilitate free and open access to ocean-colour data from all agencies

Ensure continuity and quality of the ocean-colour data stream

Advocate the importance of ocean-colour data to the global community (informative website, newsletters, brochures, IOCCG reports...)





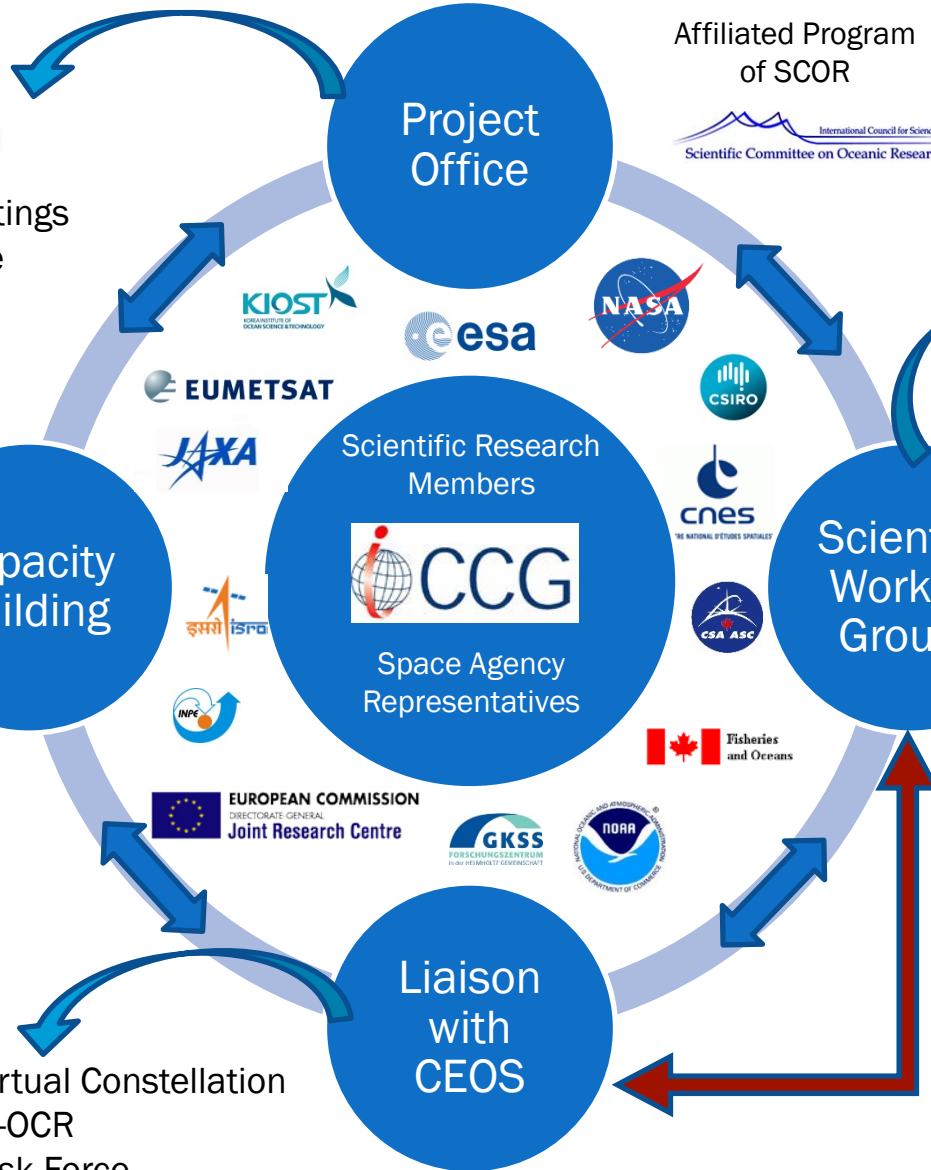
- Annual Committee Meetings
- Comprehensive Website
- News Bulletins

- Advanced Summer Lecture Series
- Introductory courses
- Over 500 students from 86 countries trained

Associate member of CEOS





- OCR-Virtual Constellation
- INSITU-OCR
- ECV Task Force
- Sensor Calibration Task Force



- IOCCG Report Series
- 15 IOCCG Reports plus Handbook

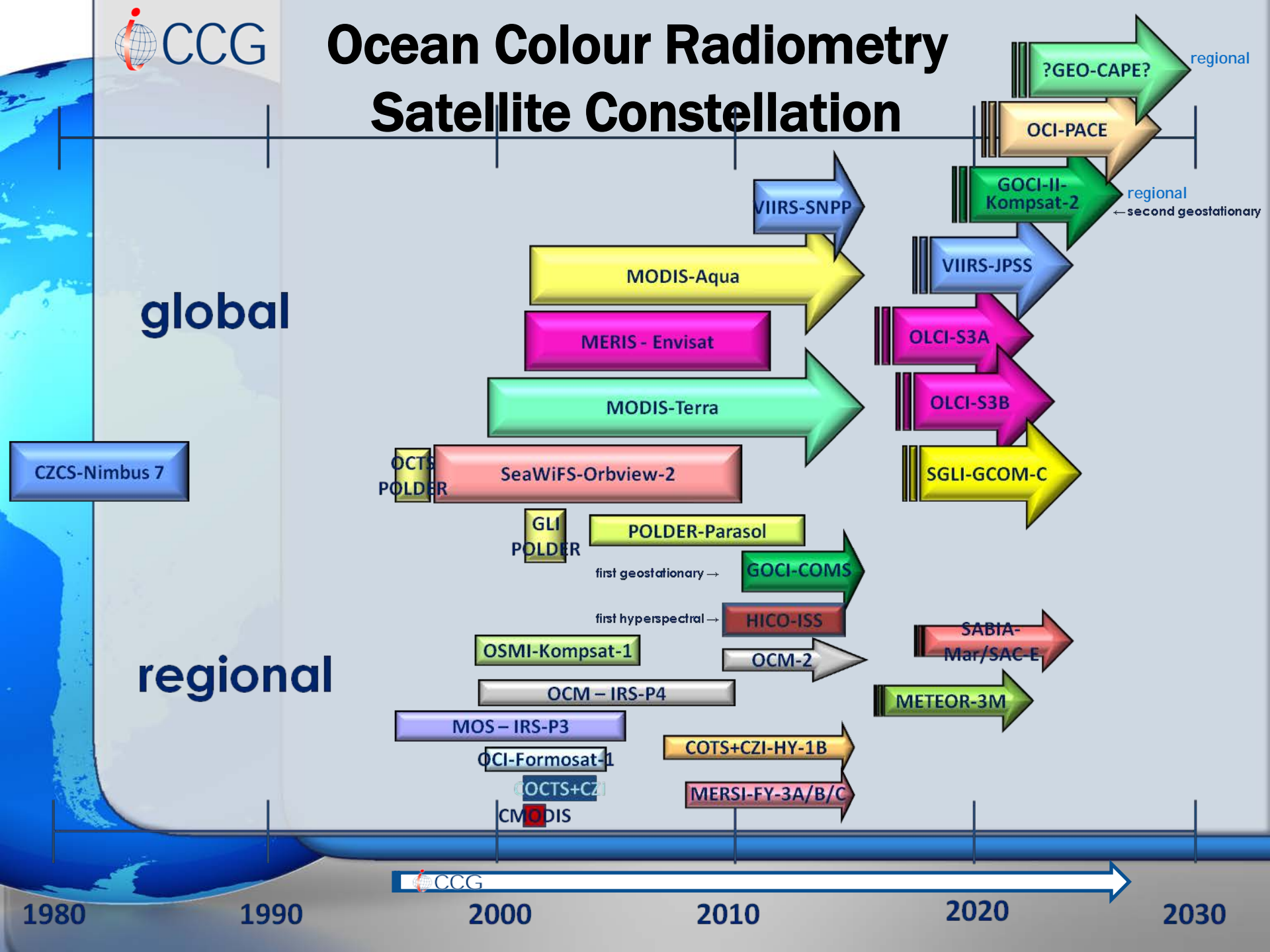
Widely cited, definitive works (15 published to date, plus handbook). Available on IOCCG website at www.ioccg.org/reports_ioccg.html

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- Report 1 *Minimum Requirements for an Operational Ocean-Colour Sensor (1998)*
 - Report 2 *Status and Plans for Satellite Ocean-Colour Missions (1999)*
 - Report 3 *Remote Sensing of OC in Coastal and Other Waters (2000)*
 - Report 4 *Ocean-colour, Level-3, binned data products (2004)*
 - Report 5 *Remote Sensing of IOPs: Fundamentals and Algorithms (2006)*
 - Report 6 *Ocean-Colour Data Merging (2007)*
 - Report 7 *Why Ocean Colour? The Societal Benefits of Ocean-Colour Technology (2008)*
 - Report 8 *Remote Sensing in Fisheries and Aquaculture (2009)*
 - Report 9 *Partition of the Ocean into Ecological Provinces (2009)*
 - Report 10 *Atmospheric Correction (2010)*
 - Report 11 *Bio-Optical Sensors on Argo Floats (2011)*
 - Report 12 *Ocean-Colour Observations from a Geostationary Orbit (2012)*
 - Report 13 *Mission Requirements for Future Ocean-Colour Sensors (2012)*
 - Report 14 *In-flight Calibration of Satellite Ocean-Colour Sensors (2013)*
 - Report 15 *Phytoplankton Functional Types from Space (2014)*

Handbook

Handbook of Satellite Remote Sensing Image Interpretation: Applications for Marine Living Resources Conservation and Management (2011)

Ocean Colour Radiometry Satellite Constellation



global

regional

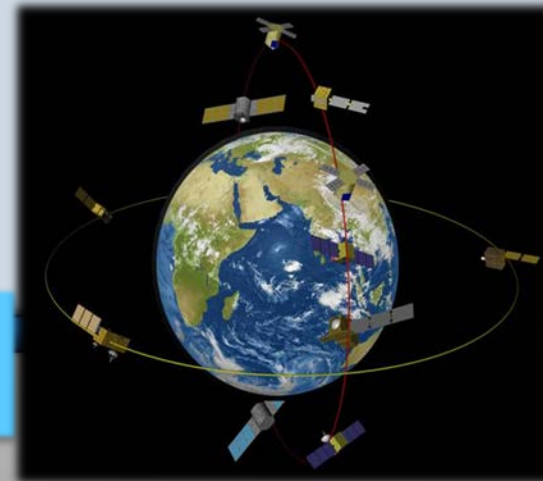
Ocean Colour Radiometry Virtual Constellation (OCR-VC)

Established by IOCCG through CEOS to provide a long time series of calibrated ocean colour radiances from measurements obtained from multiple satellites

Goals of the OCR-VC

- 1) To ensure the continuity of the ocean colour time series – CDR / ECVs
- 2) To provide high quality data sets through a concerted inter-agency effort on activities related to sensor inter-comparison (International Network for Sensor Inter-comparison and Uncertainty Assessment, **INSITU-OCR**)
- 3) Data harmonization, support implementation of ECVs (IOCCG Task Force on **ECV Assessment**)
- 4) Facilitate timely and easy access to data
- 5) Capacity building and outreach

All space agencies on the IOCCG Committee contribute to the OCR-VC



Envisioned INSITU-OCR Components

Mission Feedback

- Science community input
- Comparison with other appropriate products
- New Missions
- Protocol development

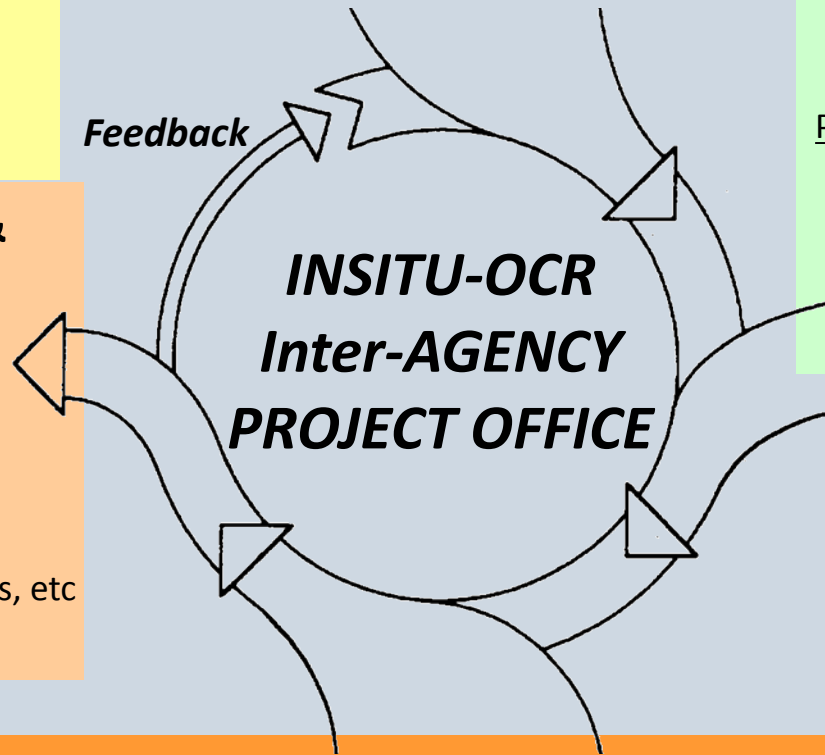
Improved Products & Algorithms

- Reprocessing due to improvements in calibration, masks, binning schemes, product compatibilities, etc.
- New products from bio-geochemical, atmospheric fields, etc
- Data distribution interface

Satellite data processing software

- SeaDAS & BEAM for ACE, OCM-2, MERIS, OLCI, SGLI, GOCI, PACE, etc.

Satellite Data from Calibrated Sensors



Product & Algorithm Validation

- Atmospheric & bio-optical algorithm validation & development (INSITU-OCR PIs & project staff)
- Match-up analysis via Aeronet OC sites, satellite QC, time series eval., Bio-Argo, ChloroGIN etc.
- **Earth System/Climate Model data assimilation**

Calibration Strategy

Pre-launch

- Lab. characterization & calibration (SI-traceable)
- Solar calibration (transfer-to-orbit)

Post-launch (operational adjustments)

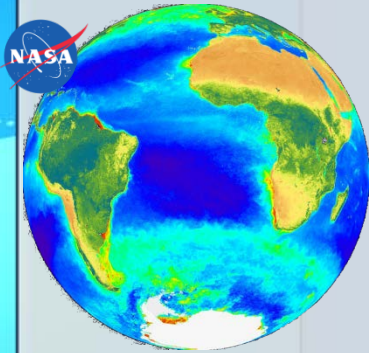
- Solar calibration (daily, every 2 weeks)
- Lunar calibration (monthly)
- Multiple sites L_{wn} time series for vicarious calib. (ISRO, MOBY-C)

In Situ Data

- Collection of required bio-optical and atmospheric measurements (INSITU-OCR PIs)
- *in situ* instrument calibration (Project round robin SI-traceable, IOPs, AOPs)
- Data collection following NASA Ocean Optics protocols
- Archive of calibrated QC *in situ* data (SeaBASS)
- Calibrated instrument pool
- Development of new instrumentation

Within the OCR-VC Framework

INSITU-OCR White Paper



International Network for Sensor Inter-comparison and Uncertainty Assessment for Ocean Colour Radiometry produced a White Paper with recommendations on:

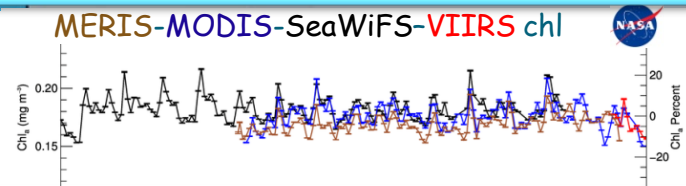
- space sensor radiometric calibration, characterization and temporal stability
- development and assessment of satellite products
- in situ data generation and handling
- information management and support

Task Force on ECV Assessment

Provides guidance on the generation of better, long-term OCR climate data records

Task Force on Satellite Sensor Calibration

Facilitates collaboration to maximize the accuracy and stability of OCR data records from individual missions



Coordination of In Situ Measurement Protocols

Coordinates and revises in situ measurement protocols

INSITU-OCR White Paper recommendations relevant to WGCV

1.0 Space Sensor Radiometric Calibration, Characterization and Temporal Stability

- R1.1 Comprehensive pre-launch instrument calibration/characterization
- R1.2 Open access to calibration and characterization data
- R1.3 Permanent working group on satellite sensor calibration
- R1.4 Vicarious calibration
- R1.5 Support for calibration teams
- R1.6 Assess and correct for instrument degradation

2.0 Development and Assessment of Satellite Products

- R2.1 Distribution of calibrated and uncalibrated data
- R2.3 Product uncertainties
- R2.6 Long-term field measurement programs
- R2.7 Validation protocols

http://www.ioccg.org/groups/INSITU-OCR_White-Paper.pdf

3.0 In Situ Data

- R3.1 Improving traceability of in situ measurements
- R3.8 General coordination of field campaigns

4.0 Information Management and Support

- R4.2 Processing capabilities for calibration and validation activities

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

Towards the implementation of INSITU-OCR by IOCCG

Agency mapping exercise

- listing of available/planned agency assets, infrastructures and resources for OCR cal/val (INSITU-OCR White paper)
- implementation of minimum mission requirements for global sensors and data harmonization (IOCCG Report #13)

Ongoing activities

- (new) NASA competitive selection for vicarious calibration instrumentation for PACE
- (new) ESA upcoming release of open tender addressing improved OCR in-situ instrumentation and community consensus protocols for instrument calibration and vicarious adjustments as well as establishing traceability to metrological institutes
- (existing) NOAA funding of MOBY operations (including on-going system refresh)
- (upcoming) joint contributions towards the “protocols activity”

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

