

IOCCG New Task Force on Ocean Colour System Vicarious Calibration

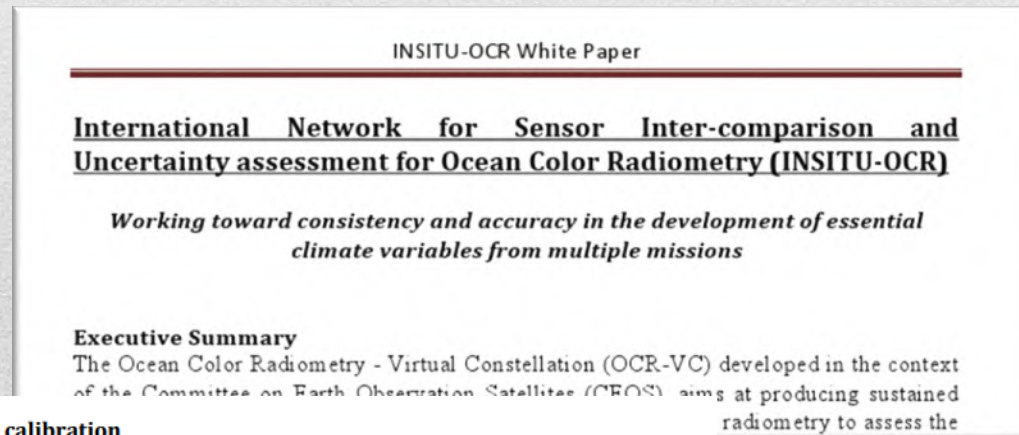
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Motivation for the OC-SVC task force

- OC-SVC is a fundamental requirement for all Ocean Colour missions
- OC-SVC allows the missions to meet stringent accuracy requirements for water radiometric products and all downstream bio-optical products
- IOCCG Working Group “Long-term Vicarious Adjustment of Ocean Colour Sensors” has had little progress but IOCCG finds the activity important

Recommendation R1.4 from the INSITU-OCR White Paper

“the adoption of a commonly agreed vicarious calibration approach, supported by sharing of processing modules, would enhance inter-mission consistency of radiometric products”



- **R1.4 Vicarious calibration**

Current target for absolute calibration uncertainty of satellite ocean color sensors is 0.5%. This stringent value is justified by the high accuracy requirements established for utilizing satellite ocean color products in climate and operational investigations. Such a level of accuracy can be achieved with vicarious calibration: the adjustment of pre-launch calibration coefficients using top-of-atmosphere (TOA) radiance predicted from *in situ* measurements through modeling of atmospheric radiative

Multiple agencies aim to maintain or establish new OC-SVC infrastructures

- NOAA: <https://coastwatch.noaa.gov/cw/field-observations/MOBY.1.html>
- NASA: https://pace.oceansciences.org/docs/PACE-SCI-PLAN-0140-VC_20190226.pdf
- ESA/CNES/EC Copernicus: [http://www.obs-
vlfr.fr/Boussole/html/home/home.php](http://www.obs-vlfr.fr/Boussole/html/home/home.php)
- JRC: <https://publications.jrc.ec.europa.eu/repository/handle/JRC105497>
- ESA: [https://frm4soc.org/index.php/activities/workshop-on-vicarious-
infrastructure/](https://frm4soc.org/index.php/activities/workshop-on-vicarious-infrastructure/)
- EUMETSAT/EC Copernicus: <https://www.eumetsat.int/OC-SVC>
- OC-SVC infrastructures are highly specialized and very expensive
- Important to ensure coordination across the Agencies!

OC-SVC methodology and uncertainties

- Seminal papers:
 - Franz, B.A., S.W. Bailey, P.J. Werdell, and C.R. McClain (2007). Sensor-independent approach to the vicarious calibration of satellite ocean colour radiometry. *Applied Optics*, 46: 5068–5082
 - Zibordi, G., Melin, F., Voss, K., Johnson, B., Franz, B., Kwiatkowska, E., Huot J-P., Wang, M., and Antoine D. (2015). System vicarious calibration for ocean color climate change applications: Requirements for in situ data. *Remote Sensing of Environment*, 159: 361-369
- Further contributions:
 - <https://www.eumetsat.int/ocean-colour-system-vicarious-calibration-tool>
- OC-SVC methodologies are highly specialized and detail dependent
- Development of the uncertainty budget is required, to link to the SI traceability of the SVC source and to establish a total uncertainty budget for each SVC site
- Important to ensure collaboration across the Agencies!

OC-SVC task force establishment & initial membership

- IOCCG 2020 recommendation to establish an OC-SVC task force
- IOCCG's email to an initial group of members from the previous working group
- Co-chairmanship: Carol Johnson (NIST) and Ewa Kwiatkowska (EUM)
- Initial membership: Davin Antoine (Curtin Uni.), Susanne Craig (NASA), Nigel Fox (NPL), Bryan Franz (NASA), Christophe Lerebourg (ACRI-ST), Constant Mazeran (SOLVO), Frederic Melin (JRC), Hiroshi Murakami (JAXA), Marie-Helene Rio (ESA), Ken Voss (U. Miami)
- Agencies are welcome to nominate new members, if desired

CEOS request for OC-SVC White Paper on planning for global OC-SVC infrastructures

- At the last 36th Meeting of the CEOS Strategic Implementation Team (SIT-36), OCR-VC received a request to develop a White Paper describing a strategy planning for global OC-SVC infrastructures
- White Paper will be the first major activity undertaken by the new OC-SVC Task Force
- Activities
 - propose a schedule (first meeting this summer)
 - propose a structure of the document (short and to the point)
 - address the main concepts and requirements
 - allocate writers (how the INSITU-OCR white paper was written? it is a very good example of a similar activity)