IOCCG Working Group Title:

Hyperspectral optical measurements and their inversions to water constituents

Scientific and programmatic background and rationale
Hyperspectral optical data are now more frequently collected both in the field and from airborne sensors (e.g. PRISM, HyspIRI Flight Campaigns, AVIRIS). The first hyperspectral measurements from space were collected with SCIMACHY (2002-2012) and HICO (2009-2014). It is expected that future hyperspectral missions, including PACE, GEOCAPE and EnMAP missions, will transform the way we currently look at oceans and lead to much improved understanding of ocean biology. The current knowledge of what can be achieved and the limitations of those hyperspectral sensors remain largely unknown and require assessment. Various projects worldwide have made measurements which have been used to derive products. Along with these, challenges have been uncovered. It is important that the various efforts and associated challenges be discussed and summarized so that the community can be most efficient in stepping in the new era of hyperspectral satellite remote sensing.

The rationale for this working group is to assess the efforts that have been done and identify the strategies for the upcoming years in the area of hyperspectral optical data so that our community can prepare most efficiently and our efforts be focused on the identified gaps. By gathering international experts of various relevant expertize we will summarize the state-of-the art and the remaining challenges.

Terms of reference
The Working Group will focus initially on the following five questions. These questions will serve as a basis for additional questions.

1) What is the current status and limitations of aircraft and satellite hyperspectral remote sensing?
2) What are the current products derived from hyperspectral data? What are the associated challenges?
3) What is the current status of in situ data for Cal/Val and algorithm development? What are the current gaps?
4) What advances in atmospheric corrections have we made using hyperspectral data? How can we further improve the corrections?
5) What are the current and potential applications of hyperspectral remote sensing?

Proposed Membership

Cecile S. Rousseaux, Chair (NASA/USRA, USA)
Emmanuel Boss (University of Maine, USA)-PACE
Julia Uitz (Observatoire Océanographique de Villefranche, France)
Astrid Bracher (AWI, Germany)
Curt Davis (Oregon State University, USA)-HICO
Giuseppe Zibordi (European Commission Joint Research Centre, Italy)-In situ/Cal
Yu-Hwan Ahn (Korea Ocean Satellite Center, Korea)- GOCI
Hiroshi Murakami (Japan Aerospace Exploration Agency, Japan)-in situ
Oleg Kopelevich (Shirshov Institute of Oceanology, Russia)
Curtis Mobley (Sequoia Scientific Inc., USA)
Stewart Bernard (Council for Scientific and Industrial Research, South Africa)
Mark Dowell (European Commission Joint Research Centre, Italy)
Nick Hardman-Mountford (CSIRO, Australia)
David Antoine (Curtin University, Australia)
Heidi Dierssen (University of California, USA)
Kevin Turpie (NASA/UMBC, USA)
Martin Bergeron (Canadian Space Agency, Canada)

Draft time line
July 2016-September 2016:
Contact various participants and confirm their willingness to participate
Identify any other member that the working group think can contribute to the discussion and report

October 2016-March 2017:
Solidify terms of references through 1-2 teleconferences and email exchanges
List of targeted material/tables/syntheses
Draft outline of report
Organize a meeting at the next Ocean Science meeting (15-19 May 2017, Lisbon, Portugal)

April 2017-June 2017:
Two-day meeting. The first day will include presentations from the various participants on their areas of expertise. On the second day we will identify the various writing tasks
Draft outline of each of the chapter of the report

July 2017-December 2017:
Writing of the IOCCG report

January 2018-July 2018:
Finalize the redaction of the IOCCG report
Publish the report