Breakout Workshop:

Inland and coastal water remote sensing: current status and future directions in the correction of adjacency effects.

Co-Chairs:

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Scope and Goals

The Global Climate Observation System (GCOS) includes Ocean Color (OC) and Lakes among the Essential Climate Variables (ECVs) to support the work of the United Nations Framework Convention of Climate Change (UNFCCC). Their actual application to climate monitoring foresees goal measurement uncertainties lower than 5% and 10% for OC and Lakes radiometric products, respectively. These requirements are particularly challenging in coastal and inland waters, whose optical complexity resides on the simultaneous presence of non-covarying in-water optically active components (i.e., pigments, colored dissolved organic matter and suspended sediments), high turbidity and potential contributions from bottom and nearby land. Nonetheless, the economic and environmental importance of lakes and coastal zones is widely acknowledged, while their habitats are extremely sensitive to the impacts of climate variability and change.

In general, standard algorithms for the processing of satellite data assume an infinite water surface, thus neglecting the presence of nearby land when inland and coastal waters are imaged. As a consequence, the radiance reflected by the land and then propagated by the atmosphere in the field-of-view of a satellite sensor observing a water target represents a perturbation leading to uncertainties in satellite products. This phenomenon, called adjacency effects (AE), always occurs in the presence of a scattering medium overlaying a non-homogeneous surface, while its impact varies over space and time. The workshop aims at gathering the scientific community to review state-of-the-art knowledge on the quantification of AE in satellite imagery from inland and coastal water regions, to identify potential gaps/opportunities for its operational correction, and to individuate areas of collaboration.

The overarching goal is to provide recommendations to the space agencies, the community, and the IOCCG Committee to enhance the quality of satellite water products in complex but critical inland and near shore coastal waters.

Key Questions

1. Which parameters should be utilized to quantify AE in satellite data from coastal and inland waters? This will aim at establishing a consensus in the parameters utilized to quantify AE in satellite data from inland and coastal waters.

2. Which is the state-of-the-art knowledge on the impact of AE in satellite data from coastal and inland waters? This will aim to overview available tools for the quantification of AE, and to identify key AE dependencies, feasible approximations, as well as aspects that still need to be addressed.

3. Which are the current available algorithms for the operational correction of AE in satellite data from coastal and inland waters? Which existing gaps, development directions and areas of collaborations can be envisaged? This will aim at inventorying current potential algorithms for the operational correction of AE in satellite radiometric data from coastal and inland waters. It will additionally aim to identify gaps and research needs, as well as areas of collaborations (with specific focus on AE algorithm inter-comparison and validation with in-situ data).