



OCEAN COLOUR REMOTE SENSING IN HIGH LATITUDE AREAS

Co-Chairs: Emmanuel Devred (U. Laval), Maria Tzortziou (CCNY), Toru Hirawake (Hokkaido U.), Antonio Mannino (NASA GSFC), & Rick Reynolds (SIO, UCSD)

The Earth's Polar Seas are crucial for regulating our planet's climate and are particularly sensitive to global warming. In addition to these regions being critically important to our understanding and modeling of key physical and biogeochemical processes, environmental change in high latitude areas is increasingly affecting society in a variety of ways. Ocean colour remote sensing provides a unique tool for monitoring changes in marine and coastal ecosystems, biology, and biodiversity at relatively low cost and across spatial and temporal scales. The use of space-based ocean colour observations at high-latitude regions, however, is hindered by a number of difficulties and intrinsic limitations. These include winter darkness, low sun elevation, persistence of clouds and fog, pixel 'contamination' by ice, specific bio-optical properties, and small-scale spatial variability

Despite these challenges, ocean colour remote sensing has provided valuable spatial and temporal large-scale information on the state of the marine ecosystems of the Antarctic and Arctic. This splinter session will offer a forum for discussion of the successes and the different challenges associated with remote sensing of the Southern and Arctic Oceans. In particular the following topics will be addressed: the need for integrative observational and modeling approaches, recent findings from past oceanographic field campaigns, which and where new observations are needed, and possible integration of passive and active remote-sensing observations from various platforms.

This session will build on a new IOCCG Working Group report on Polar Seas to provide future direction and strategies for carrying out state-of-the-art research and applications using ocean colour remote sensing in high latitude areas.

Part I: *Past field campaigns in Polar Seas: State-of-the-art, challenges, and gaps in existing datasets and remote sensing algorithm approaches*

- 09:30-09:35** **Introduction and overview**
Antonio Mannino (NASA GSFC)
- 09:35-09:45** **Environmental challenges for polar remote sensing: surface to top-of-atmosphere**
Knut Stamnes (Stevens Institute of Technology)
- 09:45-09:55** **Bio-optical relationships in high-latitude seas**
Rick Reynolds (SIO, UCSD)
- 09:55-10:05** **Space-based estimates of marine primary production in polar waters**
Kevin Arrigo (Stanford U.)
- 10:05-10:15** **Using remote sensing observations to address the role of calcifiers in high-latitude seas**
Barney Balch (Bigelow)
- 10:15-10:25** **Ocean colour algorithms and datasets developed within the framework of the GRENE (Green Network of Excellence) Program**
Toru Hirawake (Hokkaido U.)
- 10:25-10:45** **Discussion**
- 10:45-11:00** **Coffee Break**

Part II: *Future oceanographic field campaigns in high-latitude areas, and needs for new remote sensing approaches and capabilities*

- 11:00-11:10** **The green edge project, tracking ice-edge bloom in a changing Arctic**
Emmanuel Devred (U. Laval)
- 11:10-11:20** **Remote sensing of ocean colour in the Arctic using airborne hyperspectral sensors**
Heidi Dierssen (U. Connecticut)
- 11:20-11:30** **"Arctic-ColourS: Coastal Land Ocean Interactions in the Arctic" - A field campaign scoping study funded by NASA's OBB (Ocean Biology and Biogeochemistry) Program**
Maria Tzortziou (CCNY)
- 11:30-11:40** **"ICESOCC: Interdisciplinary Coordinated Experiment of the Southern Ocean Carbon Cycle" - A NASA OBB funded field campaign scoping study**
Greg Mitchell (SIO, UCSD)
- 11:40-12:15** **Discussion**