Geophysical Research Abstracts
Vol. 18, EGU2016-3945-1, 2016
EGU General Assembly 2016

Application of in situ observations, high frequency radars, and ocean color, to study suspended matter, particulate carbon, and dissolved organic carbon fluxes in coastal waters of the Barents Sea – the NORDFLUX project

Malgorzata Stramska (1,2), Knut Yngve Børsheim (3), Jagoda Białogrodzka (2), Agata Cieszyńska (2), Dariusz Ficek (4), and Marzena Wereszka (2)

(1) Institute of Oceanology of the Polish Academy of Sciences, (3) Institute of Marine Research, (2) University of Szczecin, (4) Pomeranian Academy in Slupsk

There is still a limited knowledge about suspended and dissolved matter fluxes transported from coastal regions into the open sea regions in the Arctic. The land/sea interface is environmentally important and sensitive to climate change. Important biogeochemical material entering the oceans (including carbon) passes through this interface, but too little is known about the efficiency of this transport. Our goal in the NORDFLUX program is to improve quantitative understanding of the environmental feedbacks involved in these processes through an interdisciplinary study with innovative in situ observations. Completed work includes two in situ experiments in the Norwegian fiord (Porsangerfjorden) in the summers of 2014 and 2015. Experiments used research boat for collection of water samples and in situ bio-optical data, an autonomous glider, mooring with T S sensors, and a high frequency radar system. We have used these data to derive spatial maps of water temperature, salinity, surface currents, chlorophyll fluorescence, dissolved organic matter (DOM) fluorescence, and inherent optical properties (IOPs) of the water. The interpretation of these data in terms of suspended matter concentration and composition is possible by in situ 'calibrations' using water samples from discrete hydrographic stations. Total suspended matter (TSM), particulate carbon (POC and PIC), and dissolved organic carbon (DOC) concentrations together with measured water currents will allow us to estimate reservoirs and fluxes. Concentrations and fluxes will be related to physical conditions and meteorological data. An important aspect of this project is the work on regional ocean color algorithms. Global ocean color (OC) algorithms currently used by NASA do not perform sufficiently well in coastal Case 2 waters. Our data sets will allow us to derive such local algorithms. We will then use these algorithms for interpretation of OC data in terms of TSM concentrations and composition and DOC. After deriving these algorithms, we will analyze historical satellite imagery to assess multiyear trends in concentrations of various water components. This work is still in progress, specific and more detailed results are presented as posters during this meeting.

This work was funded by the Norway Grants (NCBR contract No. 201985, project NORDFLUX). Partial support for MS comes from the Institute of Oceanology (IO PAN).