

Study of Arctic primary production with respect to changes in sea ice cover: first steps and future plans.

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The influence of the rapid changes in sea ice coverage on Arctic primary production has not been studied enough so far due to the lack of sufficient in situ measurements and gaps in satellite data in high latitudes.

To study this in more detail during my PhD studies we want to investigate the interaction between the changing sea ice coverage, other physical parameters (e.g. sea surface temperature, wind field and ocean currents) and the biomass and primary production of phytoplankton in the Arctic Ocean by using in-situ, remote sensing and modeling techniques.

Primary production (PP) is calculated using two global PP models. PP estimates obtained from the model by Antoine and Morel (1996) and Antoine et al (1996) are compared to those calculated using the Behrenfeld and Falkowski (1997) model. These models use PAR (Photosynthetically Active Radiation), SST (Sea Surface Temperature), CHL (CHLorophyll-a) as the main input parameters.

On the 21st of December on the IUP Seminar I will present the selected results my work in the University of Bremen during the last 1,5 years as well as the plans for future studies. Firstly I plan to give a short introduction to those methods of modeling primary production from the satellite data on which my work is focused on. I will also describe the state-of-the-art of the availability of CHL and PP satellite-retrieved data for the Arctic region. The results to be presented include: 1) the validation of satellite chlorophyll-a data with the field data from the cruises of Alfred-Wegener-Institute (Greenland and Kara Seas, 1999-2009); 2) the case study (based on satellite data) of the algae blooms with respect to changes in sea ice for the Greenland Sea. Future plans mainly focus on the adaptation of global primary production models for the Arctic region.

References.

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2. Antoine D., André J.M. and A. Morel (1996). Oceanic primary production: II. Estimation at global scale from satellite (Coastal Zone Color Scanner) chlorophyll, *Global Biogeochemical Cycles*, 10, 57-69.
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