

**STIFTUNG ALFRED-WEGENER-INSTITUT FÜR POLAR- UND MEERESFORSCHUNG
(AWI)
IN DER HELMHOLTZ-GEMEINSCHAFT**

In the Helmholtz-University Young Investigators Group PHYTOOPTICS at the AWI (start mid Oct 2011 or later):

Master thesis on optical characteristics of coloured dissolved organic matter from different oceanic regions (Arctic, Antarctic, Tropical Ocean and North Sea)

Phytoplankton primary production and coloured dissolved organic matter (CDOM) photo-oxidation have opposing impacts on carbon fluxes in the ocean. The balance between the two processes may be significantly affected in the near future by climate change. This is especially true for regions like the coastal and Arctic Ocean where, due to anthropogenic changes, the input of terrestrial dissolved and particulate organic matter is increasing. Both components are sources for CDOM. There is a need to assess the amount of loading by terrestrial CDOM versus the contribution from marine CDOM and quantify the influence of both on phytoplankton photosynthetic activity, which is an indicator of phytoplankton health.

The fluorescence signal can especially be seen in reflectance data at the Fraunhofer lines, the wavelengths where, due to strong absorption by molecules in the photosphere, the solar irradiance is nearly zero. This thesis focuses on investigating the absorption and fluorescence properties of coloured dissolved organic matter from different oceanic regions which will give a fundamental contribution for development of hyperspectral ocean colour satellite retrievals focusing on fluorescence signals. Such satellite retrievals enable an alternative approach to assess CDOM concentrations from space with no interference to phytoplankton biomass which so far limits the outcome of common ocean colour retrievals.

In detail, it is planned to measure the absorption and fluorescence properties of CDOM in field samples from different environments (from the coastal North Sea and Malaysian waters, and the open polar oceans). Most of the samples have been collected during 3 cruises in 2011, but also own sampling by the master student during a coastal cruise in the German Bight of the North Sea is planned. Specifically it shall be assessed if differences in loading by terrigenous dissolved organic matter (tDOM) versus marine DOM causes differences in the measured absorption and fluorescence spectra.

If you are interested, please contact

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