LATE SPRING BIO-OPTICAL FEATURES AROUND SVALBARD, ARCTIC SEA

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Polar regions are issued due to global warming, the warming related to climate change is currently observed by remote sensing which have gave us almost recent global information of the change. Change of marine ecosystem can be inferred from ocean color remote sensing. However, optical properties in high latitude are different from that in mid latitude like temperate water region. Hence, to develop the accuracy of ocean color remote sensing in Arctic Sea, we have assessed ocean around Ny-Alesund, Svalbard sampling bio-optics and phytoplankton since 2006. Chlorophyll-a retrieved from MODIS/AQUA is compared with sampled chlorophyll-a around Ny-Alesund. There are bits of under- and over- estimating according to the mass of chlorophyll-a, such as 1 mg m-3. And water-leaving radiances retrieved from MODIS/AQUA are underestimated by 35% according to in-situ water-leaving radiances. Hence using sampled data of up-to-now, a new experimental algorithm of chlorophyll-a is developed. However, our sampling area did not covered off shore of Svalbard, there is still uncertainty to retrieve chlorophyll-a concentration of off sea

COLORS OF RED TIDES: EXPERIMENTAL STUDIES ON COLOR OF PHYTOPLANKTON

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Reflectance of phytoplankton was examined using unialgal cultures of *Micromonas pusilla* (prasinophyte), *Dunaliella tertiolecta* (green algae), *Chaetoceros sociale* (diatoms), *Heterosigma akashiwo* (raphidophyte), Prorocentrum minimum simulated reflectance was determined by spectral photoradiometer and small water tank in a dark room. Reflectance was then converted to the CIE chromaticity coordinates (x, y) and plotted on CIE chromaticity diagrams. Absorption coefficient of each phytoplankton was compared with spectral reflectance. Reflectance of each phytoplankton species was well correlated with the absorption coefficient, especially at high concentration. Influence of back scattering was obvious at a certain range of spectra where reflectance was disaccord with absorption. Spectral reflectance of each species showed its own characteristics in the optical properties, and they are different each other. (dinoflagellate), *Synechoccocus* sp. (cyanobacteria), and *Rhodomonas salina* (cryptophyte). This difference was considered to represent class-specific optical properties of phytoplankton.

A LOOK-UP-TABLE APPROACH FOR SELECTING SEMI-ANALYTIC MODEL COEFFICIENTS USED IN SHALLOW WATER INVERSION

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Semi-analytical equations are widely used in hyperspectral remote sensing to retrieve inherent optical properties (IOPs), bathymetry and benthic cover over shallow water coastal environments. The equations incorporate a set of model coefficients used to approximate the radiative transfer equation and a separate set of parameterisation coefficients that are to be retrieved in the inversion process. The accuracy of these equations largely depends on using appropriate fixed model coefficients and parameterisation. Generally, focus is given to the model parameterisation, such as IOP and bottom reflectance spectra, for improving retrieval accuracy in a specific region of interest. However, often, the model coefficients obtained from literature have been derived for specific solar-sensor geometry (such as nadir view), and by using an average particle phase function. We investigate the potential limitations of using these static model coefficients compared with approaches that use arbitrary solar-sensor viewing angles and particle phase