

Ocean color algorithm development in the vicinity of Svalbard, Arctic Sea

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Environmental and climate changes are currently observed at a global scale and in particular in the Arctic. One of observing is remote sensing. However, the optical condition in high latitude is different from mid latitude like around Korea. Hence to develop the role of ocean color remote sensing in Arctic Sea, we have performed in-situ sampling to get bio-optical characteristics near Svalbard (Kongsfjorden) since 2006. Bio-optical characteristics, like spectrums of visible band (400-700nm) for upward and downward radiances, chlorophyll-a, colored dissolved organic matters (CDOM), suspended sediments (SS), and particle absorption etc, are used to develop accuracy of ocean color remote sensing on polar region. Both of in-situ chlorophyll-a and Moderate Resolution Imaging Spectroradiometer (MODIS)/AQUA chlorophyll-a were compared to improve the accuracy of MODIS chlorophyll-a around Svalbard. The relationship between the both showed different two types according in situ chlorophyll-a concentration, like below 1mg m⁻³ and above 1mg m⁻³. In case the below 1mg m⁻³ of in-situ chlorophyll-a, MODIS chlorophyll-a is overestimated than in-site chlorophyll-a. On the other hand, in the above 1mg m⁻³, MODIS chlorophyll-a is underestimated than the in-situ one. In-situ water leaving radiance (L_w) around Svalbard was overestimated of 35 % than MODIS L_w. Hence the algorithm of MODIS near Svalbard need to be developed to increase an accuracy of chlorophyll-a concentration. We made new experimental algorithm of chlorophyll-a using last 3 years in-situ measurements data.