Thursday, October 11
Poster Session 4
10:30–12:00

Poster 116

BIO-OPTICAL PROPERTIES AND EMPIRICAL ALGORITHMS ON VICINITY WATERS OF SVALBARD, ARCTIC

Chlorophyll (Chl) concentration is one of the key indicators identifying changes in the Arctic marine ecosystem. However, current Chl algorithms are not accurate in the Arctic Ocean due to different biooptical properties from those in the lower latitude oceans. In this study, we evaluated the current Chl algorithms and analyzed the cause of the error in the western coastal waters of Svalbard, which are known to be sensitive to climate change. The NASA standard algorithms showed to overestimate the Chl concentration in the region. This was due to the high non-algal particles (NAP) absorption and colored dissolved organic matter (CDOM) variability at the blue wavelength. In addition, at lower Chl concentrations (0.1–0.3 mg m^3), chlorophyll-specific absorption coefficients were 2.3 times higher than those of other Arctic oceans. This was another reason for the overestimation of Chl concentration. OC4 algorithmbased regionally tuned-Svalbard Chl (SC4) algorithm for retrieving more accurate Chl estimates reduced the mean absolute percentage difference (APD) error from 215% to 49%, the mean relative percentage difference (RPD) error from 212% to 16%, and the normalized root mean square (RMS) error from 211% to 68%. This region has abundant suspended matter due to the melting of tidal glaciers. We evaluated the performance of total suspended matter (TSM) algorithms. Previous published TSM algorithms generally overestimated the TSM concentration in this region. The Svalbard TSM-single band algorithm for low TSM range (ST-SB-L) decreased the APD and RPD errors by 52% and 14%, respectively, but the RMS error still remained high (105%).

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