Tuesday, October 9
Poster Session 2
10:30–12:30

Poster 146

DEVELOPING A NEW OCEAN COLOR ALGORITHM OF THE PAN-ARCTIC OCEAN: A SYNTHETIC APPROACH

As evidenced by a recent dramatic decrease of sea ice in both area and thickness of the Arctic Ocean (AO), primary production (PP) of the AO is likely increasing, as many remote sensing studies have suggested. It is well acknowledged that chlorophyll a concentration (chl a) is an essential variable for an estimate of PP. However, the performance of chl algorithms for the Arctic Ocean have not been thouroughly evaluated, especially in and around the several large river plumes dominated by CDOM that may significantly bias pan-Arctic primary production estimates. To overcome this issue, we first built a large in situ optical database of high-quality remote sensing reflectance at the Pan-Arctic scale. These data were subsequently used for tuning the original Garver-Seigel-Maritorena model (GSM01) for application to Arctic waters. Within the optical variability observed in natural waters, a bootstrap method was used to examine the performance of an algorithm that requires estimates for parameters including chl a specific absorption coefficients (aph-star), spectral decay constant for colored detrital matter absorption (s_cdm), and the power-law exponent for particle backscattering coefficient (s_bbp). A scoring system proposed by Brewin et al. (2015) was used to objectively determine the best combination of the parameters. Results show that the apparent percent difference of chl a estimates using the Arctic-tuned algorithm improved by 15% relative to the original one. The influence of the new chl a estimates on PP estimate relative to the original ones will be discussed.

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