

OCEAN OPTICS XXIV

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Friday, October 12

Oral Session 12

14:00–15:20

15:00–15:20

EVALUATION OF CHLOROPHYLL-A AND POC MODIS AQUA PRODUCTS IN THE SOUTHERN OCEAN

The Southern Ocean plays a critical role in the evolution of global climate. A better understanding of the system is necessary to predict the climate trajectory of the 21st century, and an accurate estimate of phytoplankton biomass is key to being able to do so. In this study, MODIS Aqua Level 2 (nominal 1 km × 1 km resolution) chlorophyll-a (CSat) and Particulate Organic Carbon (POC) products are evaluated by comparison with in-situ data from 11 research cruises (2008-2017) across multiple seasons, including measurements of POC and chlorophyll-a from both High Performance Liquid Chromatography (CHPLC) and fluorometry (CFluo). Contrary to a number of previous studies, results show that the global chlorophyll-a algorithm performed well when comparing satellite estimates to HPLC measurements. Using a strict comparison criteria (time window of ±12 h and mean satellite chlorophyll from a 5×5 pixel box centered on the in-situ location), the median CSat:Cin-situ ratios were 0.89 (N = 46) and 0.49 (N = 73) for CHPLC and CFluo respectively. The mean relative difference (MRD) and mean relative absolute difference were lower for the CHPLC comparison (-5.8% and 36.2% respectively), than for the CFluo comparison (-35% and 54%). Differences between CHPLC and CFluo were associated with the presence of Diatoms containing chlorophyll-c pigments, which induced an overestimation of chlorophyll-a when measured fluorometrically due to a potential overlap of the chlorophyll-a and chlorophyll-c emission spectra. The global POC algorithm also performed well with a median POCsat:POCin-situ ratio of 0.92 (N = 43) and a MRD of 11.8%.

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