

Retrieval of Ocean Color Products from Satellite Sensors in the Coastal Regions

M. Wang and W. Shi

NOAA/NESDIS/ORA, WWB/RM 102, 5200 Auth Rd., Camp Springs, MD 20746 (Email: Menghua.Wang@noaa.gov)

In the remote retrieval of the ocean near-surface properties, it is crucial to accurately remove the atmospheric and ocean surface effects from the sensor-measured signals. This process, which corrects more than 90% of sensor-measured signals, is often termed as atmospheric correction. Atmospheric correction for the ocean color products derived from the Moderate Resolution Imaging Spectroradiometer (MODIS) uses two near-infrared (NIR) bands centered at 748 and 869 nm. Ocean is assumed to be black at these two NIR bands for estimation of atmospheric effects. For the open oceans, the NIR ocean contributions are indeed negligible. For turbid waters in the coastal regions, however, ocean could have significant contributions in the NIR, leading to significant under-estimation of the MODIS-derived water-leaving radiances and significant errors in the derived ocean properties. In this presentation, we provide a new approach using the MODIS short wave infrared (SWIR) bands for atmospheric correction in deriving the ocean color products in the coastal regions. The ocean is still black in the turbid waters at the SWIR bands due to much stronger water absorption. We demonstrate advantages of the new approach by comparing ocean color results derived from the new atmospheric correction method and from the standard method. Results show that, in the turbid waters, the ocean color products using the new approach are significantly improved, while for the open oceans both methods produce very similar results. We also show results derived from MODIS high spatial resolution measurements using the SWIR bands method in the coastal regions. The MODIS high spatial resolution products provide tremendous potentials in research and application capabilities for understanding and monitoring the coastal region ocean variations and their influences to the regional geophysical and climatological changes.