Geophysical Research Abstracts, Vol. 9, 04335, 2007
SRef-ID:

Satellite-derived distributions of DOC and CDOM in the U.S. Middle Atlantic Bight

A. Mannino (1), M.E. Russ (1,2) and S.B. Hooker (1)

(1) NASA Goddard Space Flight Center, Maryland, USA, (2) University of Maryland Baltimore County/Goddard Earth Science & Technology Center, Maryland, USA (antonio.mannino@nasa.gov / Fax: 301-286-5337 / Phone: 301-286-0182)

In coastal ocean waters, distributions of DOC vary seasonally and interannually due to multiple source inputs including *in situ* primary production, contributions from adjacent ocean waters, and terrigenous, anthropogenic and estuarine-derived organic matter entering the coastal ocean from rivers and bays, and removal processes such as advection, microbial remineralization and photooxidation. Chesapeake Bay, as one of the largest and most productive estuaries in the world, can influence the carbon cycle of the adjacent continental margin through contributions of carbon and nutrients. We conducted several cruises in 2005 and 2006 between the mouth of Chesapeake Bay and continental slope waters within the U.S. Middle Atlantic Bight (MAB) to examine the impact of Chesapeake Bay and adjoining watersheds on distributions of DOC and chromophoric dissolved organic matter (CDOM) and to estimate the net ecosystem production of DOC and photooxidative loss of CDOM. One of our objectives is to apply our *in situ* data to develop algorithms to retrieve CDOM and DOC from Aqua-MODIS and SeaWiFS satellite observations. In order to develop empirical algorithms for CDOM and DOC, we correlated the CDOM absorption coefficient (a_{CDOM}) with *in situ* radiometry (reflectance band ratios) and then correlated DOC to reflectance band ratios through the CDOM to DOC relationships. Our validation analyses demonstrate that DOC and a_{CDOM} can be retrieved to within 10% and $\sim$20% uncertainties on average, respectively, from coastal ocean waters using the Aqua-MODIS and SeaWiFS satellite sensors. The satellite-derived DOC and a_{CDOM} products are being applied to quantify the seasonal net ecosystem production of DOC and photooxidation of CDOM as well as estimating the reservoirs of DOC and CDOM in the MAB. With accurate satellite retrievals of CDOM and DOC, we will be able to apply satellite

observations to investigate interannual and decadal-scale variability in surface CDOM and DOC within continental margins and monitor the impacts of climate change and anthropogenic activities on coastal ecosystems.