

**ON THE USE OF OCEAN COLOR REMOTE SENSING TO MEASURE
THE TRANSPORT OF DISSOLVED ORGANIC CARBON
BY THE MISSISSIPPI RIVER PLUME**

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Abstract

We investigated the use of ocean color remote sensing to measure the transport of dissolved organic carbon (DOC) by the Mississippi River to the Gulf of Mexico. From 2000 to 2005 we recorded surface measurements of DOC, colored dissolved organic matter (CDOM), salinity, and water-leaving radiances during five cruises to the Mississippi River Plume. These measurements were used to develop empirical relationships to derive DOC, CDOM, and salinity from monthly composites of SeaWiFS imagery collected from 1998 through 2005. We used river flow data and a two-end-member mixing model to derive DOC concentrations in the river end-member, river flow, and DOC transport from remote sensing data. We compared our remote sensing estimates of river flow and DOC transport with data collected by the United States Geological Survey (USGS) from 1998 through 2005. Our remote sensing estimates of river flow and DOC transport correlated well (~ 0.70) with the USGS data. Our remote sensing estimates and USGS field data showed low variability in DOC concentrations in the river end-member (7-11%), and high seasonal variability in river flow ($\sim 50\%$). Therefore, changes in river flow control the variability in DOC transport, indicating that the remote sensing estimate of river flow is the most critical element of our DOC transport measurement. We concluded that it is possible to use this method to estimate DOC transport by other large rivers if there are data on the relationship between CDOM, DOC, and salinity in the river plume.

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