



Seasonal and interannual variability of cross-shelf transports of chlorophyll in the Gulf of Mexico

J. Zavala-Hidalgo and B. Martínez-López

Centro de Ciencias de la Atmósfera, Universidad Nacional Autónoma de México, Mexico City, Mexico (jzavala@atmosfera.unam.mx / Fax: +52 55-56160789 / Phone: +52 55-56224096)

The seasonal and interannual variability of offshore, cross-shelf transports of chlorophyll-rich waters in the Gulf of Mexico is studied using level-3, monthly SeaWiFS data for the period September 1997-December 2004 and monthly NCEP/NCAR-Reanalysis winds. Cross-shelf transports of chlorophyll-rich waters have a seasonal cycle that is largely modulated by the wind field. These transports are mainly located at three regions: southwest of the Louisiana-Texas shelf, the southern Bay of Campeche, and southeast of the Mississippi River mouth. In the first two sites, the confluence of along-coast currents, produced by the convergence of the along-coast wind stress component, is the cause of the offshore transport of chlorophyll-rich waters, with maximum values occurring during May in the southwestern Louisiana-Texas shelf and during October in the southern Bay of Campeche. Southeast of the Mississippi River mouth, the maximum is observed in July due to the prevailing southwesterly winds during this month.

A large fraction of the interannual variability of the offshore transports of chlorophyll-rich waters on the southwestern Louisiana-Texas shelf and the southern Bay of Campeche is also explained by anomalies of the convergence of the along-coast wind stress component. On the southern Bay of Campeche, maxima in chlorophyll-a concentration and wind convergence are observed during 1999 and minimum values in 2002 and 2004. On the southwestern Louisiana-Texas shelf, maximum values of chlorophyll-a concentration and along-coast wind component for a month May are observed in 2001 and minimum values in 2000 and 2003, with a large correlation between anomalies of these two variables.