



A favorable test of isolation on the West Florida Shelf with implication for red tides

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Analysis of year-long drifter trajectories and simulated surface Lagrangian coherent structures (LCSs) suggested the presence of a cross-shelf transport barrier (CSTB) on the West Florida Shelf (WFS). The CSTB was conjectured to provide a large degree of isolation, which is consequential for the fueling of red tides on the southern WFS by nutrients possibly released by rivers and canals directly on the region. Here this conjecture is thoroughly tested by computing LCSs as well as performing tracer advection calculations based on seven-year-long records of simulated surface and subsurface currents. The LCS computations reveal that the CSTB extends downward in the water column. The tracer calculations suggest that, while the majority of the nutrients possibly released by rivers and canals directly on the southern WFS are retained within the region for long times, only a small fraction of the nutrients possibly released by rivers outside the WFS reach the southern WFS.