



Coastal circulation off southern Tamaulipas and northern Veracruz, western Gulf of Mexico, during winter 2012-2013

David Rivas

Mexico (drivas@cicese.mx)

Four months of observations from a near-coastal mooring deployed off southern Tamaulipas-northern Veracruz coast (western Gulf of Mexico) during winter 2012-2013 provides velocity, temperature, and salinity series in a region where apparently no in-situ measurements have been formally reported. The measurements show numerous events of intense alongshore velocities with magnitudes typically exceeding 80 cm/s, associated with intensified winds associated with the cold fronts invading the western Gulf during fall-winter, via coastal-trapped motions coming from northern locations. These motions must induce a coastal jet that modulates the regional along-shelf transports. This notion is corroborated by an analytical coastal-trapped wave (CTW) model which explains most of the variability of the sea level and the alongshore barotropic velocity observed in the mooring. Several near-inertial signals exceeding 50 cm/s are also observed at the surface levels. These high-frequency (HF) signals occur several hours before the intensified currents induced by the winds. Comparison between HF series of water velocity and wind suggests a direct influence of the winds affecting the NW Gulf (northern Tamaulipas/southern Texas) about 6-9 hours before the occurrence of the HF currents at the mooring. These near-inertial events induce a vigorous mixing of the local riverine discharge.