



The seasonal variability of the sea surface height in the Colombian Basin: Altimeter data and modeling

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This work compares the seasonal variability patterns in the Colombian Basin derived from a global, eddy-permitting, numerical model and the altimeter observations. The seasonal variability in the Colombian Basin is driven by the inflow through the Aruba passage and by the local wind forcing over the basin. According to our results the influence of the passages on the seasonality are restricted to the southeastern and the northwestern basin meanwhile toward the western and southwestern portion of basin is controlled mainly by the local curl of the wind stress. Modeled transport through the main passages at the Colombian Basin agree very well with observed and prior modeled transports. Over the western and the southwestern basin the seasonal explained variance of the wind stress curl reaches up to 70% of total variance. Although the mean circulation is cyclonic, seasonal variations of circulation could be explained as a cyclonic (anticyclonic) gyre from July-October (January to May) which starts as a gyre in the central basin and moves and contracts against the coast toward the south basin. Against the coast this gyre appears to be connected with the Darien Counter Current. This current flows as an eastward surface current but flows as an eastward subsurface current (named Caribbean Coastal Undercurrent) from 78W.