

Residence Times of Cienfuegos Bay

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A high-resolution numerical model was applied to analyze the hydrodynamical exchange processes of the Cienfuegos Bay with the Caribbean Sea. Results show that freshwater inputs and wind are the main factors controlling the water exchange in the bay. Nine simulation case studies with three wind conditions and three freshwater inputs were carried out. The main conclusion is that the Cienfuegos Bay system has a slow exchange rate, with an average flushing time of 39 days during the rainy period and 50 days during the dry one, for the most probable wind direction. Two new temporary scales for Cienfuegos Bay are discussed: the local e-flushing time and the flushing lag. The results obtained for these new variables validate the slow exchange capacity of the bay.