Influence of Storm Surge Barrier on Salinity during Storm Surge Period

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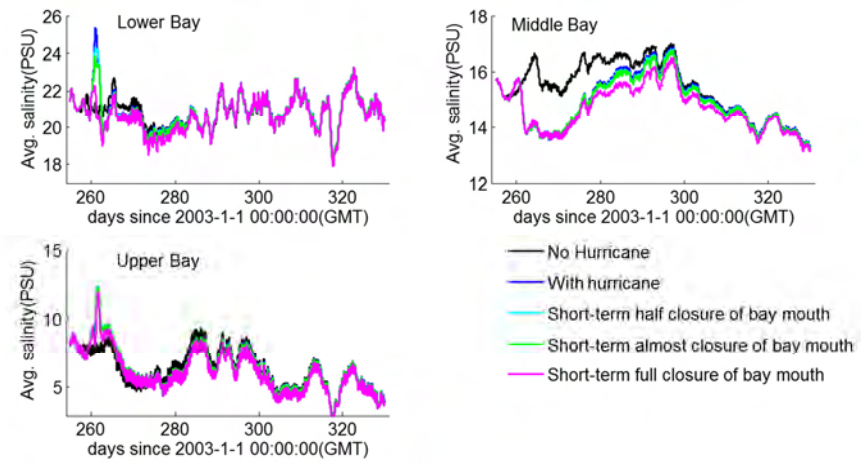
The change in salinity due to the use of different types of temporary storm surge barriers during representative storms was investigated using a numerical model.

- Temporary closure of the Bay mouth during storms will result in a moderate change of salinity.
- Vertical mixing during the storm surge period is dominated by the strength of the local wind forcing; therefore, no significant difference in vertical mixing occurred for different scenarios.
- Noticeable changes in salinity occur near the mouth and middle Bay.

Change in vertical mean salinity in different regions of the Bay during Hurricane Isabel was investigated. Three scenarios, temporary partial-closure of the Bay mouth, temporary near complete closure of the Bay mouth (except for 2 open deep-water channels), and temporary full closure of the Bay mouth for a 2-day period, were examined. The results were compared to current conditions with and without hurricane. The 'without hurricane' case was simulated by turning off the wind and replacing open boundary conditions with harmonic forcings. The influence period is about 40 days. A marked difference occurs in the middle Bay region. The salinity difference between the different cases are about 1-2 psu.



Vertical mixing occurred during the hurricane. Local wind is the dominant forcing to cause vertical mixing. A marked change occurs near the mouth among the different scenarios.