A Three-Dimensional Hydrodynamic Model for Delaware Bay Estuary TEVFIK KUTAY CELEBIOGLU, MICHAEL PIASECKI, Drexel University, Philadelphia, PA — A numerical 3D model for the tidal portion of the Delaware Bay has been developed using the UnTRIM hydrodynamic kernel. The model extends from Trenton, NJ south past the inlet at Cape May, NJ and incorporates a large portion of the continental shelf (up to the 50 meter isobath) to capture the processes of the continental shelf and their relation and impact on the bay dynamics. Circulation patterns are successfully simulated by using a variable, harmonically decomposed, water level boundary condition of three diurnal (K_1, Q_1, O_1) and four semi-diurnal (K_2, S_2, N_2, M_2) components in both space and time. Various turbulence closure models are compared for use with the hydrodynamic model. Four of these models ($k - \varepsilon$, $k - \omega$, $k - kl$ and $k - ge$) have been implemented in the hydrodynamic code using Generic Length Scale (GLS) approach that mimics the models through its parameter combinations. Low order models show significant deviations from the measured salinity data. Among the two equation models, ($k - \varepsilon$) approach appears to work the best even though it is difficult to discern general rules for the selection of an appropriate or the best model for other modeling domains.

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Date submitted: 03 Aug 2006   Electronic form version 1.4