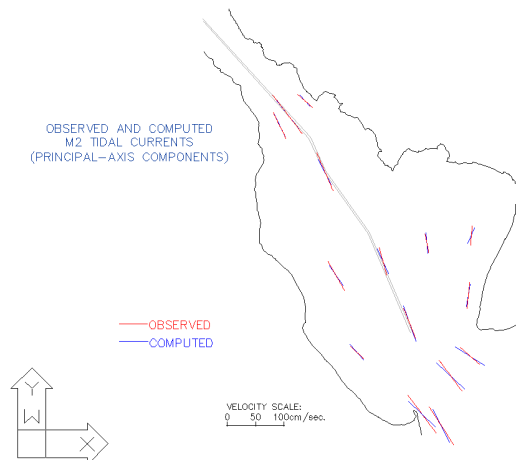
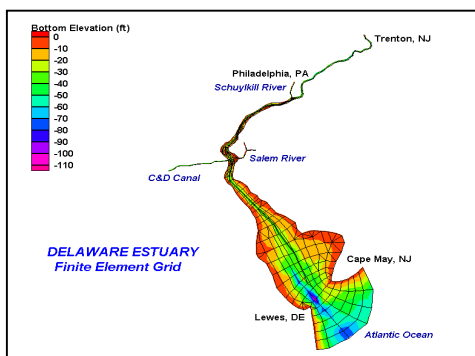


## PROJECT TITLE: EFFECTS OF HISTORICAL DREDGING ACTIVITIES AND WATER DIVERSIONS ON THE TIDE AND SALINITY REGIME OF THE DELAWARE ESTUARY (HYDRODYNAMIC MODELING)

Contractor: [Najarian Associates](#)  
 Client: DRBC and EPA

Amount: \$40,000  
 Completion Date: March, 1993

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This U.S. EPA Delaware Estuary Program study analyzed historical trends in Delaware Estuary tides and salinity patterns in relation to historic dredging activities and water diversions. To this end, a state-of-the-art, three-dimensional, hydrodynamic and salt transport model was adapted to the Delaware Estuary. The model was calibrated with available tide, current and salinity data, and used to examine effects of long-term dredging activities on the tide and salinity regime of the Delaware Estuary.

Since 1910, the main navigation channel of the Delaware Estuary has been dredged repeatedly, increasing the former 18-foot controlling depths to about 40 feet. These activities significantly increased the cross-sectional area of the upper Estuary. Tidal ranges also increased in the upper Estuary during this period. For example, the mean tidal range *doubled* (from about 4 ft to 8 ft) at Trenton during the previous century. These historical tidal increases may be related to historical increases in upper-Estuary conveyance areas. To explore this hypothesis, model simulations were conducted for both the pre-dredged and post-dredged bathymetries. Model simulation results supported the hypothesis of bathymetric controls.

Also, the model was used to predict potential effects of a proposed 5-foot deepening of the main navigation. Results indicated that a proposed 5-foot deepening of this channel would minimally impact the Estuary's tide and salinity regime.