

APPLIED COASTAL

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Project: Two-Dimensional
Hydrodynamic Modeling Port
of Wilmington, Delaware

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Due to channel shoaling problems within the Port of Wilmington, a hydrodynamic model was developed to evaluate the influence of tidal currents on sediment transport processes. To accurately simulate the existing current patterns in the vicinity of Wilmington, the entire Delaware Bay estuary was modeled. Since the effects of freshwater inflow tidal forcing through the C&D Canal, and frictional damping as well as tidal amplification along the length of Delaware Bay have a significant impact on the flow patterns within the upper estuary, incorporation of these influences in the model was critical. By developing a calibrated/verified model of Delaware Bay, hydrodynamics in the near-field region surrounding the Port of Wilmington could be determined with confidence. The boundary conditions incorporated into the model of existing conditions could then be utilized to drive modeling scenarios of various alternatives including:

- South jetty extension
- North jetty extension
- Narrowing of the turning basin

The modeling of alternatives focused on the near-field alterations to current patterns associated with each potential solution. Although sediment transport was not directly evaluated, alterations of the modeled current patterns potentially would cause changes to the existing transport patterns. Utilizing structural and/or dredging options, it may be possible to reduce shoaling rates within the Port's navigation channel, thereby reducing maintenance dredging costs.

