Question – Has EFDC been used on a deepening study? Was there post construction monitoring to evaluate model performance? How did the model perform?

The EFDC hydrodynamic model has previously been applied to two other federal navigation projects, the Savannah Harbor Expansion Project (SHEP) and the Charleston Harbor port expansion. EFDC is also being used for two ongoing deepening studies, the Charleston Harbor Post 45 Feasibility Study and the Seattle Harbor Deepening Project. The SHEP has not been constructed, but will be monitored during and after construction. The only post construction monitoring study for a deepening project is the 10 year monitoring study of the water-level and salinity effects in the Cape Fear River estuary due to deepening of Wilmington Harbor. The Wilmington Harbor Feasibility Study included a modeling study of the proposed deepening and widening of the Cape Fear River deep-draft channel using the USACE RMA10-WES model. The monitoring study found that the project impact to tidal range throughout the estuary was comparable to the results from the RMA10-WES modeling, that being 0.2 ft or less. The variability in the tide range was found to be due to flow and tidal epochs that were for the most part offsetting trends. This study showed the utility and accuracy of using a surface water model to simulate the effects of, among others, deepening projects.

While there are no examples of post construction monitoring of a deepening project that applied EFDC to estimate the project impacts, the question regarding the performance of EFDC for deepening projects relates to the capability of EFDC to simulate the influence of depth and geometry on hydrodynamics and transport in an estuary. The EFDC Literature Review shows numerous examples of calibrated and validated EFDC applications, including the St Johns River Water Management District's Lower St. Johns River EFDC application, that demonstrate the model's ability to accurately represent the effect of depth and geometry on hydrodynamics and transport in an estuary.

For navigation projects it is important to consider the sensitivity of the model to depth and width changes of navigation channels and other features. The primary technique to address this is to increase the resolution of the model grid to represent these changes. During development of the EFDC model for the Jacksonville Harbor Navigation Study, a sensitivity analysis was performed to determine an optimum grid resolution. Based on this analysis, grid cells were added to the navigation channel to increase resolution and improve the model's representation of the navigation channel's existing and proposed features.