EXECUTIVE SUMMARY FOR INTERIM REPORT

Hydrodynamic Model Study Results, Craney Island Eastward Expansion

1. The first two phases of the CIEE Hydrodynamic Model Study have been completed in which a) the model was calibrated and verified for the Elizabeth River and b) four expansion options were tested using single variable runs (runs in which only the tidal range is allowed to vary). The four expansion designs were evaluated in terms of both global and local changes through simulation comparisons with the Base Case condition.

2. Global evaluation was conducted for Hampton Roads and the Elizabeth River by enumerating percentages of total area associated with class intervals of change in a particular property such as RMS difference in water surface elevation. Other properties evaluated by area percentile analysis included current magnitude, surface and bottom salinity, and bottom sedimentation potential.

3. Local evaluation was conducted in specific areas containing features considered important to estuarine circulation (e.g., tidal fronts, eddies, tidal and non-tidal transport in tributaries) including areas of change pinpointed by global analysis.

4. Of the four expansion designs tested, global analysis revealed that the Northward Expansion (Option 6) and the Northeast Expansion (Option 9) produced noticeably greater percentile changes in water surface elevation, current magnitude, salinity, and bottom sedimentation potential. Westward Expansion (Option 5) produced a lesser degree of change. Eastward Expansion (Option 7) produced only minor changes in the immediate vicinity of Craney Island.

5. Strong westerly surface and bottom currents were indicated in the berthing channel for the Northward Expansion (Option 6) and are believed responsible for a significant increase in bottom salinity noted west of Craney Island and extending into the Nansemond River entrance.

6. Local analysis revealed no appreciable change in flushing ability in either the Elizabeth River basin or its tributaries for any of the options tested. Northward Expansion (Option 6), however, produced noticeable changes in simulated residual currents within the Elizabeth River and within the area between Newport News Point and Craney Island.

7. A tidal front near Newport News Point and a large tidal eddy over Hampton Flats appear to be affected by Northward Expansion (Option 6) and North/East Expansion (Option 9).

8. The modeling program will now proceed with historical runs in the next phase of testing (historical runs will utilize four months of real time observations for input). Two of the four expansion options are to be selected for detailed evaluation through a range of conditions including extratropical storms combined with high and low river discharge events.