Outline of Procedure used for Sediment Transport Model Review

1. Ran AnchorQEA's (AQ's) sediment transport model for the 30-year simulation using the model executables, input files, and run script provided by AQ.
2. Determined the predicted change in bed elevation at every active grid cell over the 30-year model run. A plot of these bed elevation changes were provided to the Portland Harbor RPM. The large simulated changes in bed elevation in the reach centered around RM 10.5 are thought to be due to the use of a decoupled hydrodynamic and sediment transport model. It was also noticed that the AQ model did not simulate the flow around the backside (eastside) of Ross Island.
3. The Portland Harbor RPM instructed E Hayter to use the SNL-EFDC model that is used by ERDC (that has a dynamically coupled hydrodynamic, sediment transport, and contaminant transport model) to simulate sediment transport using the same model domain and boundary forcings used by AQ.
4. The steps followed in performing this modeling are outlined below. An ERDC Letter Report that describes the modeling performed is currently in preparation.
    a. AQ's EFDC grid files and boundary condition files were used to drive 2D SNL-EFDC hydrodynamic model. The setup was modified so that the flow on the east side of Ross Island was simulated.
    b. The SNL-EFDC hydrodynamic model was used to simulate the 30-year time period and the results were compared to the results from AQ's hydrodynamic model to insure the simulated hydrodynamics were the same. The two models yielded essentially the same predicted water surface elevation and velocity fields for the 30-year simulation.
    c. The SEDZLJ bed model included in the SNL-EFDC model was modified to use the same sediment size classes, the same sediment bed input files (e.g., bed_dry_den; fnam_fraccoh*; fnam_fracnon*; bed_non_d90; etc.), the same values of TAUCOR, ERATE_A, and ERATE_N, and a similar core mapping as used in AQ's model. Because of the lack of sediment data in the sand dominated short reach of the Columbia River and the Columbia-Willamette confluence area included in the model domain, changes in bed elevations in this area of the model domain was not modeled using the SEDZLJ model included in SNL-ERDC. The same strategy was used by AQ (and by ERDC) for the upstream-most reach of the Lower Willamette River.
    d. The dynamically linked SNL-EFDC hydrodynamic and sediment transport model was run on a Linux server for the 30-year period to simulate sediment transport. In addition to erosion, deposition, and suspended load transport, bedload transport and changes in bed morphology were simulated using the SNL-EFDC model. The change in bed elevation in the active grid cells over the 30-year simulation were sent to the Portland Harbor RPM.