



“Fishing for Innovation in the Natural Sciences”

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Bridging Spatial Gaps: Modelling the Relative Influence of Tidal Currents and Waves on Suspended Sediment Dynamics and Seasonal Sedimentation in Intertidal Ecosystems
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Over the last few years our ability to model basin scale hydrodynamics and sediment transport and explore the implications of tidal energy extraction has increased significantly. However, few if any models have been able to effectively integrate and translate Basin scale processes to the local spatial scale complexities of the marsh/mudflat environment. This presentation will investigate the effects of tidal currents and surface waves on sediment re-suspension and transport in the Minas Basin and depositional processes within tidal creek and marsh system at Kingsport. Observations of concurrent tidal currents from bottom-mounted acoustic sensors at three locations across a depth gradient (deep Basin, tidal flat and salt marsh) are used to validate the predictions of a coupled hydrodynamic-wave-sediment model for study periods in January and June 2013, and to assess changes to suspended sediment concentrations on tidal flats induced by wave-orbital and tidal current induced bed shear stress. In addition, validated model results are used to help explain seasonal variability in sediment deposition within tidal creek and marsh surface and differences in grain size characteristics of deposited sediments.