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Abstract:

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Seasonal influences on sediment deposition and characteristics in a hypertidal salt marsh and tidal creek system

The purpose of this research was to determine the seasonal variability in sediment dynamics in a Bay of Fundy tidal creek and salt marsh system. With anthropogenic changes being imposed on intertidal communities, such as a decrease in energy caused by the installation of tidal in-stream energy conversion devices, it is necessary to understand the fundamental sediment processes occurring. Sediment deposition, suspended sediment concentrations, velocities and surface samples were collected at four stations (creek, marsh bank, marsh edge, and marsh surface) at Kingsport marsh approximately every six weeks from May 2012 to June 2013. Five high resolution topographic surveys of the channel were conducted for surface elevation change. Deposition was highest in the creek and lowest at both the marsh edge and surface. Grain size and concentration both decreased with increasing distance from creek. Periods with rainfall were followed by high suspended sediment concentrations as rain mobilized sediment during low water. Meteorological effects were effective at modifying the size distribution of the particles available. Incoming suspended sediment concentrations were generally higher in the winter. This increase in sediment supply in the winter was enough to influence deposition in the creek and on the marsh bank but not enough to influence the deposition on the marsh edge and marsh surface. Therefore, the high marsh was not as seasonally variable as the bank and the creek. Understanding the mechanism of sediment transport and behaviour in these intertidal ecosystems is crucial to anticipating changes in sedimentation patterns from anthropogenic influences.