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**Title: Controls on the Availability and Opportunity for Sediment Deposition Within a Macrotidal Salt Marsh Creek**

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**Category: Environment**

The distribution of sedimentary material is the primary determinant of biological processes in estuarine environments, where sediment transport is difficult to predict due to time-variant effects, such as flocculation processes. Work presented here considers the influence of flocculation and suspended sediment concentration on deposition in a Bay of Fundy tidal creek, over a range of tidal amplitudes. Results of disaggregated inorganic grain size (DIGS) analysis, performed with a Coulter Multisizer III, show variations in floc parameters that are linked to fluctuating suspended sediment concentration and maximum depth. Entropy analysis of DIGS data indicates that the number of nominal groups in this dataset is four. Preliminary results demonstrate that increases in floc fraction are linked to increasingly dynamic flow conditions associated with over-marsh tides, though the accompanying increase in suspended concentration and an extended inundation period. Resulting deposition on creek banks is a function of the availability of material (e.g. concentration) and the opportunity for deposition (e.g. hydrodynamics). The anticipated decrease in tidal amplitude with extraction of energy from the Bay of Fundy system will reduce the total inundation time of area marshes, which may have repercussions for channel and marsh surface equilibrium during an era of rising sea level.