PHYSICAL AND BIOGEOCHEMICAL PATTERNS IN A SALTMARSH/RIVER SYSTEM (DUPLIN RIVER, GA)

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Abstract. Salt marshes are among the most productive habitats on Earth, and constitute a critical interface between the land and the sea. These intertidal ecosystems are home to a unique assemblage of fauna and flora, and play in important role in the transformation of biogeochemically active elements and the export of nutrients to the coastal ocean (Levin et al. 2001, Ecosystems 4(5): 430-451). It is therefore essential to quantify the transport processes and biogeochemical reactions that alter the composition of both surface and subsurface fluids within marsh-coastal river ecotones.

Here, we present a synthesis of multidisciplinary data from a tidally driven saltmarsh/river system located in coastal Georgia, USA. We describe spatial and temporal patterns in river chemistry and identify the relative influence of water exchange processes (riverine and groundwater flow, precipitation, and tides) and transformation processes taking place in the saltmarsh/river system on these patterns.

We argue that understanding the tidal dynamics and mixing processes within this river/marsh/upland system is critical to understanding surface water geochemical patterns, and that this understanding is facilitated by multidisciplinary research.