CAPTURING PORE WATER SEEPAGE IN SALT MARSHES: FIELD MEASUREMENTS AND MODELING RESULTS

Maggie Esch[1], Jaye Cable[2], and Christof Meile[1]

AUTHORS: [1]UGA - Marine Sciences, 220 Sanford Dr Marine Sciences Bldg , Athens, Georgia 30602; [2]UNC - Marine Sciences, Chapel Hill, North Carolina
REFERENCE: *Proceedings of the 2013 Georgia Water Resources Conference*, held April 10–11, 2013, at the University of Georgia

Abstract. Marshes play an important role in the exchange of nutrients between terrestrial and marine environments, and it has long been hypothesized that these dynamic ecosystems export excess organic material to the coastal ocean (Odum, E.P. 1980. In Estuarine perspectives, p. 437-525). However, the magnitude of that export has yet to be adequately constrained. Thus, a more complete understanding of the coastal ocean carbon cycle would greatly benefit from the quantification of this potentially significant flux. Water passing through the marsh subsurface gets enriched in inorganic and organic carbon, such that even a small flux of pore water to tidal creeks can be a significant constituent of the carbon and nutrient budget (Jordan, T.E. and Correll, D.L. 1985. Estuar. Coast. Shelf Sci. 21: 45-55).

Accurate estimation of the overall carbon export from marshes requires, in part, the determination of creek bank seepage fluxes. Here, we present our efforts to quantify these fluxes of pore water from tidal creek banks, using a combination of field experiments and modeling. Field work involved deploying experimental devices designed to capture pore water seeping from creek banks. Preliminary results show seepage dynamically changing over rising and falling tides. Additionally, reactive transport modeling was used to assess the experimental design and the variation in seepage with vertical position in the creek bank as a means to scale up the observations.