# CLIMATE SIGNALS AFFECT FRESHWATER INFLOW, SALINITY AND TEMPERATURE IN GEORGIA ESTUARIES

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Variability in watershed precipitation, river discharge, salinity, and temperature for the Ogeechee, Satilla, and St. Marys estuaries was related to indices of four climate signals. Variability in watershed precipitation (not shown in detail here) was analyzed using empirical orthogonal functions (EOFs) and results were similar to those for the Altamaha River watershed (Sheldon and Burd 2014), showing alternating seasonal correlations with the Bermuda High Index (BHI) in summer-fall and the El Niño/Southern Oscillation Index (ENSO/SOI) in late fall-winter. The Atlantic Multidecadal Oscillation (AMO) imposes a long-term seasonality modulation that is weaker in the Ogeechee and St. Marys than in the Satilla and Altamaha watersheds, although these effects could be due to data limitations. Climate signal-precipitation patterns all propagated (with some signal attenuation) to lower watershed river discharge 0-1 month later and to estuarine salinity 0-2 months later, consistent with residence time estimates for each estuary. The BHI and SOI had only brief seasonal correlations with estuarine water temperatures. The North Atlantic Oscillation (NAO) was correlated with January-April temperatures but not with any of the flow variables. These patterns agree broadly with regional-scale analyses but are likely to be different from those outside the region. In the southeast US, fundamental estuarine characteristics such as freshwater inflow, salinity and temperature are influenced seasonally and interannually by a complex interplay among at least four climate signals.

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