

GEORGIA STREAMFLOWS ASSOCIATED WITH THE EL NIÑO-SOUTHERN OSCILLATION

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Abstract. The El Niño/Southern Oscillation (ENSO) is a primary mode of global climate variation on an inter-annual time scale. The influence of the El Niño/Southern Oscillation on precipitation and streamflow can be found in many regions of the World. With water resources becoming more heavily utilized in the Southeast United States, gaining a better perspective of the climatic influences on streamflow would be of significant value. The National Weather Service Southeast River Forecast Center is tasked with providing water resource information, including long term streamflow forecasts, to external partners across the Southeast including Georgia. This study will provide a better perspective on the links between the El Niño/Southern Oscillation and Georgia streamflow and thus provide better information to support water resource initiatives in Georgia.

This analysis used monthly runoff data calculated from streamflow produced by the United States Geological Survey (USGS) for the period from 1951 through 2009. The areas examined were the Hydrologic Unit Code (HUC) at the 04 level for the Apalachicola (Unit 0313), Altamaha- St. Marys (Unit 0307) and the Ogeechee-Savannah (Unit 0306) watersheds. The monthly runoff values for each of these watersheds were then compared to the Oceanic Niño Index (ONI). The ONI ENSO cycle is comprised of three possible phases, the El Niño phase, the La Niña phase or the neutral phase.

Results showed that the El Niño/Southern Oscillation had the most significant impacts on streamflow during the primary recharge months of January through March. El Niño phases were associated with above normal streamflows during the late winter and spring while the La Niña phase was associated with below normal streamflow for the same period. This was true for all three watersheds studied. Neutral conditions were associated with near normal streamflow.