

HYDRO-CLIMATIC TRENDS IN THE SOUTHEASTERN US

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Abstract. Indications of a climatic change on a global scale are increasingly calling into question what we know about and what to expect from our own local climates. A changing climate means the traditional method of using historical hydro-climatic conditions as expected conditions in water planning and management may be unwise. New methods for determining and characterizing expected local hydro-climatic conditions should consider an evaluation of how historical local hydro-climatic conditions have changed over time. In this sense, an evaluation of hydro-climatic trends in the Southeastern US has been developed using historical records from weather gages. Trends for monthly precipitation, maximum and minimum temperatures, evaporation, and stream flow have been developed for various historic time intervals during 1909 to 2009.

The historic hydro-climatic trends have been plotted and mapped in a manner to easily show seasonal and regional shifts that have occurred in the past 50 and 100 years. These trends vary by season and location, and there are few trends that appear to be region-wide and no trends that appear year-round. In the past 100 years the annual temperature records region-wide indicate a cooling trend strongest during winter and fall and weakest during summer months. However 50-year trends indicate a warming trend in almost all months region-wide. The 100-year trends of precipitation indicate an increase in annual precipitation in most areas, however, a decrease during the driest summer months. The 50-year trends indicate a decrease in annual precipitation and increased evaporation in almost all regions. Identification and illustration of these trends is an important step in debunking the traditional notion that “what was, will be” and moving towards a non-stationary hydro-climatic approach to water planning and management.