# Rainfall Characteristics of Central Florida: Implications to Short- and Long-Term management Decisions

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**Abstract**.  Tampa Bay Water (www.tampabaywater.org), the largest wholesale water provider in Florida, along with its member governments (Hillsborough, Pasco, Pinellas Counties, and the cities of St. Petersburg, New Port Richey and Tampa) provide water for more than 2 million customers. Tampa Bay Water supplies over 180 mgd millions of gallons per day (mgd) annually to the region using a diverse mix sources including groundwater, direct surface water withdrawals, off-site reservoir storage, and a desalination plant. This shift away from relying on groundwater production to surface water produce increases our uncertainties and requires that supply reliability analyses be performed. The reliability and uncertainty of these sources stem from uncertainties in the prevailing weather pattern in general and that of rainfall in particular. Understanding rainfall characteristics and its connections to atmospheric circulation patterns of the region bear a direct influence on both demand and supply sides of the agency's activity. This research explores the short- and long-term signals embedded in rainfall observations by looking at inter-annual and longer time scale variability, how these modes manifest in different seasons of the year, and presents implications to short- and long-term management decisions.

The challenge is to gain a sufficient understanding of rainfall variability within the Tampa Bay area and evaluate how short- term and long-term decision making benefits from the additional knowledge of climate variability. Issues to be addressed are embedded signal frequencies, their mode of variability at short- or longer time scale, and the implications to the activities of Tampa Bay Water.

Key words: Rainfall Variability, Filtering, Wavelet and Spectral Analysis, Signal Decomposition, Water Management Decisions