

A 500-YEAR RECONSTRUCTION OF MEAN GROUNDWATER ELEVATIONS IN NORTH CENTRAL FLORIDA

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Tree ring-based hydrologic reconstructions can extend perspectives of water resource variability beyond instrumental records to span centuries, thereby enabling analyses of the climatic drivers of long-term changes in hydrologic conditions and informing planning. Early tree-ring-based climate reconstructions focused primarily on relatively xeric environments where water was clearly limited for parts of any given year. As the science of dendroclimatology matured, efforts extended to more mesic environments where recent droughts have amplified concern for water scarcity in areas with growing human populations. Here, we report the results of a multi-year effort that resulted in 1) development of a new longleaf pine (*Pinus palustris*) tree-ring record from trees and stumps in Goethe State Forest, north-central Florida and 2) development and analysis of a new reconstruction of groundwater elevation within the Suwannee River Water Management District. The tree-ring chronology spans the years 1472–2017 and tells a fascinating story of climate variability and landuse change over that period, including clear suppressions in growth that likely result from logging and turpentine in the 1800s and early 1900s. Combining the longleaf pine chronology with previously developed tree-ring records from bald cypress (*Taxodium distichum*) produced a robust reconstruction that captures 55% of the variance in mean groundwater elevation for north central Florida and extends from 1500–2017. This reconstruction indicates that recent lows in groundwater are exceptional relative to the last five centuries. Periodicity and low-frequency changes indicate important roles for ocean-atmospheric phenomena in the variability of groundwater elevations. This data set represents an important new proxy-based reconstruction for a region where such efforts have been historically limited.

PRESENTER BIO: Tom Mirti is Deputy Executive Director at SRWMD. His experience spans 30 years in north Florida in the public and private sectors. Tom spent five years during the 1980's in West Africa working with non-governmental organizations. He and his wife have operated a 25-acre organic farm since 1993.