

ABSTRACT SUBMISSION

Doyle

Dendroecological investigation of saltwater intrusion on a tidal freshwater swamp in coastal South Carolina, USA

Thomas W. Doyle¹, William H. Conner², L. Wayne Inabinette², Ken W. Krauss¹

¹ U.S. Geological Survey, National Wetlands Research Center, Lafayette, LA (USA)

² Baruch Institute of Coastal Ecology and Forest Science, Georgetown, SC (USA)

Coastal forests along the Gulf of Mexico and south Atlantic are currently undergoing forest dieback and decline from increasing tidal inundation, saltwater intrusion, and altered freshwater flow attributed in part to global climate change. Policy makers and land managers need to know whether the altered health and loss of coastal forest is attributed to current management practices or natural climate extremes and variability. Tree-ring records are valued commodities for reconstructing climate history and for determining the sensitivity and response of biological systems to climate change. A dendroecological investigation of a salt-stressed cypress swamp at Hobcaw Barony, Georgetown, South Carolina was conducted to determine the period and process of forest decline. Tree core collections were taken from dominant baldcypress, *Taxodium distichum*, trees in a tidal swamp affected by saltwater intrusion and a nearby non-tidal depressional wetland. Tree ring chronologies from both sites show similar sensitivity to regional droughts and episodic hurricanes, most notable, Hurricane Hugo in 1989. Post-Hugo growth response demonstrated suppressed ring growth and missing rings in years following storm impact and an extended suppression effect of saltwater impact of the salt-stressed tidal site in contrast to a growth release among trees at the non-tidal site. Overall stemwood production was significantly greater, more than double the basal area increment on an annual basis, for the non-tidal wetland relative to the tidal swamp for most of the last century. Further investigation is required to discover whether the onset of suppression at the tidal site is related to land-use practices or of climatic origin.