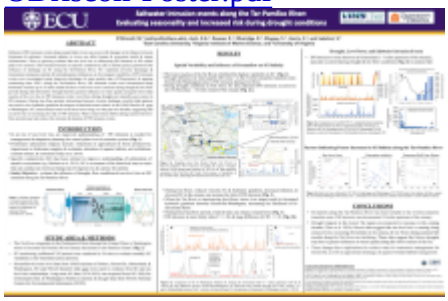
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Poster
Saltwater intrusion events along coastal plain rivers can occur with changes in the balance between freshwater and saltwater. Increased salinity in rivers can affect human and ecosystem health and impair infrastructure. There is growing evidence that sea level rise is influencing saltwater intrusion in southeastern coastal plain river systems. This research focuses on specific conductivity (SC-a salinity proxy) patterns and the influence of discharge on salinity in the riverine-estuarine transition zone along the Tar-Pamlico River (NC). Upstream (riverine discharge) and downstream (estuarine salinity and hydrodynamics) influences on the temporal variability of saltwater intrusion events were investigated using long-term discharge and water quality data (1970s-present) and ongoing monitoring since 2022. Along the Tar-Pamlico River, saltwater intrusion events were documented along freshwater reaches at least 10 miles inland and these events were more common during drought and low-flow periods during July-December. Drought had the greatest influence on water quality along the lower tidal reaches of the Tar River due to saltwater intrusion events. Low-flows during droughts are typically a pre-cursor to saltwater intrusion. During low-flow periods, the interactions between riverine discharge, wind and tidal patterns can result in low hydraulic gradients and transport of brackish water inland. At the USGS Pamlico River gage at Washington, NC, average annual water levels have been rising over the past two decades, suggesting that sea level rise is increasing the risk of saltwater intrusion. Water conservation efforts during summer to fall low-flow periods may help to reduce the intensity and duration of saltwater intrusion events.
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