

# **FLOOD DYNAMICS OF THE LOWER ROANOKE AND CASHIE RIVERS AND THEIR INTERACTION WITH THE ALBEMARLE-CHOWAN ESTUARINE SYSTEM**

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Bertie Peninsula is water-bound by a complex drainage system encircling three sides and dissecting through its interior. Roanoke River forms the western and southern boundaries, and estuarine waters of Albemarle Sound and Chowan River forms the southeastern and eastern boundaries. The Peninsula's interior is dominated by a network of black-water tributaries, like the Cashie River. Complex interactions within this world-class, integrated water system produce various catastrophic storm impacts on this region.

The lower Roanoke River has three segments that function differently. Water flow in the upper segment (Roanoke Rapids dam to Hamilton) is dependent on dam discharge determined by upstream weather conditions and dam management policies. The middle segment (Hamilton to Jamesville) is a fluctuating transition zone. The lower segment (Jamesville to Albemarle Sound) is at sea level and dominated by Albemarle Sound and Chowan Estuary dynamics including small astronomical and wind tides, and storm surges that overwhelm the diffused flow from dam discharge.

The Cashie River tributary also has three river segments. The upper Cashie is riverine and dependent on rainfall. Windsor occupies the transition zone between riverine and estuarine conditions. The lower Cashie River estuary is dominated by Albemarle Sound dynamics with little to no influence from Roanoke River dynamics. Thus, catastrophic floods at Windsor are dependent on interactions of large upstream rain inputs simultaneously with major backflow from wind set-up and/or storm surge from Albemarle-Chowan estuary. Ground-water level and seasonal evapotranspiration in the lower Cashie floodplain also impact severity of flooding in Windsor.