

TEN YEARS OF REAL-TIME STREAMFLOW GAGING OF TURKEY CREEK – WHERE WE HAVE BEEN AND WHERE WE ARE GOING

Paul Conrads, Devendra Amatya¹

The Turkey Creek watershed is a third-order coastal plain stream system draining an area of approximately 5,240 hectares of the Francis Marion National Forest and located about 37 miles northwest of Charleston near Huger, South Carolina. The U.S. Department of Agriculture (USDA) Forest Service maintained a streamflow gaging station on Turkey Creek from 1964 to 1981. After the substantial impact to the National Forest from Hurricane Hugo in 1989, researchers recognized the importance of re-establishing a streamflow monitoring station on Turkey Creek. The U.S. Geological Survey, in cooperation with the USDA Forest Service and the College of Charleston, established a stream gaging station in Turkey Creek in February 2005 (http://waterdata.usgs.gov/sc/nwis/uv?site_no=02172035). The gage is located on the downstream side of the U.S. Highway 41N Bridge approximately one-half mile upstream from the discontinued Forest Service gaging station. Since the gage was re-established in 2005, 84 streamflow measurements have been made to establish and confirm the stage-streamflow relation (rating) for the station. Over the ten-year streamflow record, average annual streamflow has varied from a minimum of 1.32 cubic feet per second (ft³/s) to a maximum of 28.9 ft³/s. The peak streamflow of 1,470 ft³/s occurred on October 25, 2008. The long-term streamflow data for Turkey Creek provides a basis for understanding natural variability, reducing uncertainty in model inputs and parameter estimation, and developing new hypotheses about hydrological and ecological functions of coastal plain forested landscapes. Recent research interests in tidal freshwater forested wetlands (TFFW) have included the downstream reaches of the Turkey Creek that transition to TFFW. The extent of tidal effects is temporally variable and results from changing upland streamflow conditions, coastal water levels, and tide cycles. For the TFFW, the riparian water table levels result from precipitation, upland flow, and downstream tidal exchange. The streamflow data from the Turkey Creek gaging station will provide critical data to understanding the dynamic downstream tidal response and its implications to eco-hydrologic functions and processes. The presentation will evaluate the 10 years of streamflow and precipitation data, describe methods of estimating high flood streamflows, compare Turkey Creek to other coastal plain watersheds, and describe the complexity of downstream flows in the riparian areas of TFFW.

¹Paul Conrads, Surface Water Specialist, US Geological Survey, Columbia, SC 29036

Devendra Amatya, Research Hydrologist, USDA Forest Service, Center for Forested Wetlands Research, Cordesville, SC 29434

Citation for proceedings: Stringer, Christina E.; Krauss, Ken W.; Latimer, James S., eds. 2016. Headwaters to estuaries: advances in watershed science and management—Proceedings of the Fifth Interagency Conference on Research in the Watersheds. March 2-5, 2015, North Charleston, South Carolina. e-Gen. Tech. Rep. SRS-211. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 302 p.