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### **PATTERNS IN GROUNDWATER HYDROLOGY OF A SMALL CONSTRUCTED FLOODPLAIN WETLAND**

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**ABSTRACT** In constructed wetland design, the groundwater component of the hydrologic budget is often oversimplified or unaccounted for completely in practice. The objectives of this study were to 1) characterize the hydroperiod of a constructed floodplain wetland 2) identify trends in groundwater flow and extent of potential confining layers in the soil profile, and 3) estimate annual groundwater contributions to the hydrologic budget. Nested piezometers were installed throughout a small constructed floodplain wetland in the Ridge and Valley of Virginia. Water level data from the central nest in the wetland show a fully connected system with little evidence of confining layers and that the ACOE wetland hydrology criteria is met; the water table was within the top foot of the soil profile for a duration of the growing season for each of the two years of the study. Hydraulic gradients created elevation change from the hillslope to the stream channel drive the direction and magnitude of groundwater flow during most of the annual hydroperiod; however, flow direction changes when the floodplain water table is lowest in the months of July-Nov. Precipitation events cause the stream stage to rise and losing stream contributions to the floodplain reverse flow direction for a period of time. Spatially differentiated flow gradients will be used to quantify wetland through flow and the groundwater component of the hydrologic budget and evaluate seasonal groundwater flow response to precipitation events.

**Keywords:** Groundwater, constructed wetland, hydrology, piezometers