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The article by Kazezyılmaz-Alhan et. al titled, *a wetland hydrology and water quality model incorporating surface water/groundwater interactions,* used the WETSAND model to predict water quality and quantity effects from storm events on a restored wetland site. The article authors are students from the Department of Environmental and Civil Engineering at Auburn University and Duke University and the Wetland Center at Duke University. Wetlands are crucial to best management practices to improve water quality from storm and urban runoff. The study goals of Kazezyılmaz-Alhan et. al were to create and calibrate the WETSAND model to simulate storm events on restored wetland sites to determine if they decreased the peaks from surface flows and improved the water quality. The study area was at the Duke University restored wetland site, located in the Sandy Creek Watershed. The watershed receives runoff from part of the Duke University campus and part of the City of Durham, NC, and later flows into the Cape Fear River, a large drinking water source for portions of North Carolina.

WETSAND model is a one-dimensional model that considers the wetland site as a distributed area and predicts the water levels and pollutant distributions as functions of time and spatially throughout the wetland. The model has two main components that include the water quantity and water quality models. The wetland water quantity model uses outputs from the Storm Water Management Model (SWMM5) and many other factors, including the diffusion wave equation evaporation, rainfall intensity, and surface/groundwater interactions, to simulate runoff flowing into the wetland area. The water quality model calculates the concentrations of nitrogen and phosphorus species through advection, dispersion, decay, plant uptakes and sinks, and volatilization. The model found that during storm events the hydraulic peaks were significantly reduced, and the peaks of nutrient concentration levels also decreased significantly after residence time through the wetland area. Kazezyılmaz-Alhan et. al experienced some uncertainties within the model and needed better model calibration in future studies. The model could be expanded to a two- or three-dimension model to handle other wetland shapes or different hydrologic events.

I chose this article because during my undergraduate degree, my research included work on examining the nutrient uptake of a restored wetland that receives agricultural runoff. My research found that wetlands significantly reduce nutrient levels in runoff. Additionally, I conducted smaller side experiments on the nutrient uptake of filter feeders including fresh water mussels. Restored wetlands prove to reduce hydraulic peaks and nutrient concentrations and should be implemented as best management practices.