# Study the effect of reservoirs on the Continental Scale River Flow Modeling using High Resolution NHDPlus Dataset

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Dams are important subsets of water management which have altered the magnitude and timing of the discharge within the river network. Recent developments in hydrologic modeling provide capability to study the effect of water management activities on river basins at the regional to continental scales. This study represents the continental-scale streamflow modeling of the Mississippi River Basin (MRB) with consideration of U. S. Army Corps of Engineers (USACE) reservoirs' effect on river discharge and floods in the basin. For this purpose, the Routing Application for Parallel computatIon of Discharge (RAPID) was implemented to the MRB with more than 1.2 million river reaches for a 10-year analysis (2005-2014). The high resolution river network was built based on the NHDPlus dataset and runoff data were obtained from the Variable Infiltration Capacity (VIC) Land Surface Model. The reservoir release information for 175 reservoirs was received from 12 USACE districts within MRB and Tennessee Valley Authority (TVA). Results showed that model performance considerably improved when reservoirs were considered in the modeling system. Improvement in the streamflow simulation varied from 138% to 2%. The gages in the western region of the basin showed higher improvement compared to the eastern region. Although, the Kling-Gupta Efficiency (KGE) values did not show large differences when the reservoirs were added to the model in the eastern region of the basin, the model was able to better capture observed peak flows compared to the exclusion of reservoirs in the model.