

ESTIMATING THE EFFECT WETLANDS HAVE ON FLOOD HYDROGRAPHS
THROUGH COMPUTER SIMULATION

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ABSTRACT

Meyer, Aaron John, M.S., Department of Agricultural Economics, College of Agriculture, North Dakota State University, April 1998. Estimating the Effect Wetlands Have on Flood Hydrographs Through Computer Simulation. Major Professor: Dr. Jay A. Leitch.

The purpose of this study was to assess how effectively wetlands provide flood control. Synthetic watersheds, partially based on actual watersheds, were modeled to estimate the effect wetland location, initial water levels, storm intensities, and watershed shape have on flood hydrographs. Comparisons of the percentage changes in peak and total flows were made among simulated outlet hydrographs. Upland wetlands provided the greatest reductions in peak flows, while wetland location had no effect on total flows. Reductions in total flows were influenced by initial wetland water levels, but reductions in peak flows were not. Wetlands provided greater flood control for high frequency storms than for low frequency storms. Watershed shape primarily influenced lag times and had no effect on how wetlands influenced flood hydrographs. Understanding how wetlands affect flood hydrographs will help to formulate better flood prevention policies and management of wetlands.