

INTERANNUAL VARIABILITY IN THE EXTENT OF WETLAND-STREAM CONNECTIVITY WITHIN THE PRAIRIE POTHOLE REGION

Melanie Vanderhoof, Laurie Alexander¹

The degree of hydrological connectivity between wetland systems and downstream receiving waters can be expected to influence the volume and variability of stream discharge. The Prairie Pothole Region contains a high density of depressional wetland features, a consequence of glacial retreat. Spatial variability in wetland density, drainage evolution, and precipitation patterns as well as interannual and interdecadal variability in climate can be expected to result in variable degrees of wetland-stream connectivity within the region. Although numerous studies have examined how interannual variation in wetland water level influence available waterfowl habitat within this region, very few studies have explicitly examined how this variability in water level might influence the degree of surface water connectivity between wetlands or between wetlands and streams within this region. This study utilized a time series analysis of Landsat images (1990-2011) to map interannual variability in patterns of inundations and wetland-stream connectivity by fusing static data sources (e.g. NWI, NHD) with dynamic data sources (e.g. Landsat). Changes in the degree of wetland-stream connectivity were related to temporal variability in wetness conditions using drought indices and stream gauge data, as well as spatial variability in geology, as characterized by the U.S. EPA ecoregions, which influence wetland and stream density. We found that both the area of inundation and the degree of wetland-stream connectivity was correlated with climate conditions, and that the degree of wetland-stream connectivity varied between ecoregions. An improved understanding of wetland-stream connectivity within landscapes that contain a high density of depressional wetlands is critical to improve our predictions of stream flow and our understanding of how water moves through watersheds. Disclaimer: authors views expressed here do not necessarily reflect views or policies of USEPA.

¹Melanie Vanderhoof, ORISE Post-Doctoral Fellow, US Environmental Protection Agency, Washington, DC 20460
Laurie Alexander, Research Ecologist, US Environmental Protection Agency, Washington, DC 20460

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.