

North Dakota Water Resources Research Institute (NDWRRI) Seminar Series

“When Giving Riverbanks a Rest Pays Off”

Presenter: Dr. Sushant Mehan, South Dakota State University

Date: Monday, October 26

Time: 3:30–4:30 PM (CDT)

NDSU AGHILL ROOM 110

Zoom link: <https://ndsu.zoom.us/j/98591740209>



Abstract

Streams flowing through agricultural landscapes connect farms, livestock, communities, and ecosystems. When cattle continuously graze streamside areas, vegetation can decline, soils may become vulnerable to erosion, and sediment, nutrients, and bacteria can reach the water. Yet permanently removing these lands from agricultural production may be neither practical nor economically attractive to producers. This seminar examines Seasonal Riparian Area Management, a voluntary conservation approach implemented in the Skunk Creek watershed of eastern South Dakota. The program gives vegetation within the floodplain an opportunity to recover by deferring livestock grazing during the growing season while allowing landowners to continue using the area at other times. The study combined satellite observations, land-use records, long-term water-quality monitoring, statistical change-detection methods, and economic analysis to evaluate whether the program produced measurable benefits. Vegetation health increased significantly in portions of the enrolled area, while downstream monitoring indicated reductions in *E. coli*, nitrate plus nitrite, and suspended sediment following program implementation. Land-use patterns also supported evidence of continued pasture management, and benefit–cost ratios greater than one indicated favorable returns for both landowners and public stakeholders. Beyond presenting the scientific results, the seminar will explore a broader question: How can conservation programs be designed so that ecological restoration, agricultural use, landowner participation, and public investment reinforce rather than compete with one another? The findings demonstrate how long-term monitoring and multiple forms of evidence can help communities evaluate nature-based water-management strategies and make more defensible watershed decisions.

Speaker biography

Dr. Sushant Mehan is an Assistant Professor and SDSU Extension Water Resource Engineer Specialist at South Dakota State University. He works at the intersection of water resources engineering, agricultural water management, and hydroinformatics. His research examines how climate, land management, and agricultural practices influence water quantity and quality, with particular emphasis on nutrient transport, hydrologic modeling, remote sensing, and data-driven decision support. Through research and Extension, Dr. Mehan collaborates with producers, communities, agencies, and other stakeholders to develop practical and scientifically defensible approaches for improving water sustainability. He earned his Ph.D. in Agricultural and Biological Engineering from Purdue University.