

Monitoring and modeling wetland chloride concentrations in relationship to oil and gas development.

Max Post van der Burg and Brian Tangen

U.S. Geological Survey, Northern Prairie Wildlife Research Center, 8711 37th Street SE, Jamestown, ND 58401.

Produced waters, or “brines”, associated with oil and gas development have the potential to alter wetland water chemistry and biota. The purpose of our study was to conduct a pilot regional assessment of possible produced water contamination within the Williston Basin. We randomly collected surface water samples from wetlands in North Dakota and Montana for chemical analyses. Using a number of modeling techniques, we found that high chloride index values tended to be associated with greater concentrations of elements that are often associated with brines. We also found that chloride index values were positively correlated with the number of wells within 2 km of a wetland. We made spatially explicit predictions of chloride index values on the landscape to describe the possible distribution of high chloride sites. We discuss our results in terms future monitoring and analysis of oil and gas impacts on wetland water chemistry.