



Laura Suppes

Assistant Professor
Department of Public Health
& Environmental Studies

ADVANCEMENT OF THE SCIENCE

Occurrence of Nitrate and Indicators of Agricultural and Septic System Contamination in a West Central Wisconsin Sand Aquifer

Abstract Fertilizers, manure, and septic effluent are potential sources of nitrate in groundwater. Nitrate can be harmful if ingested above the U.S. Environmental Protection Agency maximum contaminant level of 10 mg/L. In Eau Claire County, located in West Central Wisconsin, approximately one quarter of households rely on private wells. Sources of nitrate in private wells in Eau Claire County have not been researched previously.

A total of 110 private wells in Eau Claire County were tested for seven agricultural and three septic indicators to identify sources of nitrate contamination. Nitrate contamination risk factor data (e.g., well depth, casing depth) were also collected. Average nitrate concentrations were significantly higher in wells with agricultural indicators, suggesting agriculture is a source of nitrate. Wastewater indicators were identified, but septic systems were not a significant source of nitrate. Well casing depth was the only risk factor associated with elevated nitrate. Funds should be allocated to the Eau Claire City-County Health Department to promote and subsidize point-of-use drinking water treatment in homes with nitrate levels

Laura Suppes, MPH, PhD, REHS
University of Wisconsin-Eau Claire

Ted Johnson
Eau Claire City-County Health
Department (Retired)

Shane Sanderson, MS, JD, REHS
Linn County Department
of Health Services

Sarah Vitale, PhD
University of Wisconsin-Eau Claire

Audrey Boerner, MS
Eau Claire City-County
Health Department

lawn fertilizer or other sources (Shaw, 1994). In addition to the health risks from nitrate, there could be additional risks to private well owners where co-contaminants associated with agriculture and septic systems exceed representative action limits. Elevated nitrate

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