

# POSSIBLE EFFECTS OF NITRATE CONTAMINANTS IN NEBRASKA WATERWAYS ON HUMAN HEALTH

## *DWFI-Supported Student Research*

Each year DWFI leverages Robert B. Daugherty Foundation funds and additional donor funds to support graduate and undergraduate student research and creative activity. Funds are matched one-to-one by their DWFI Faculty Fellow advisors. This year we had to cancel our annual research forum, scheduled for April 2, and missed seeing the students present their work in person.

To celebrate the incredible research being done, students have shared a brief summary of their work and its impact. We're excited to share their work with you here. View more research from DWFI's supported students » <http://dwfi.us/Gx3150ze6F5>

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## **WHAT?**

Nebraska is an agricultural state with the widespread use of nitrogen-containing fertilizers. Runoff after precipitation or inappropriate irrigation can drive the nitrogen compound into drinking water. The ingestion of high concentrations of nitrate above the maximum contaminant limit can cause adverse health outcomes, including methemoglobinemia in infants, birth defects, thyroid disease, and cancers (colorectal, gastric, bladder and non-Hodgkin lymphomas). We are investigating the relationship between the high incidence of pediatric cancer observed in Nebraska and the nitrate concentration in surface and groundwater.

## **SO WHAT?**

We calculated the age-adjusted incidence for the three major types of pediatric cancers (central nervous system tumors, leukemia, and lymphoma), and we represented them on a Nebraska map at the watershed level. We also computed the average nitrate concentration collected during our study period, and we overlaid the nitrate data on the same map to determine a spatial relationship between the two. We found that some watersheds with pediatric cancer incidence above the national average also have high nitrate concentration.

## **NOW WHAT?**

These results suggest that different agricultural activities across the state might pose different risks for the major types of pediatric cancer in Nebraska. This observation may help elucidate cancer hot spots across the state. The possible correlation between agrichemical occurrence in water and elevated incidence of pediatric cancer warrants further investigation.