319 & GROUNDWATER

AGENDA

Introduction to 319 (Katie Hickle)

Groundwater Success Stories:

- Bazile Vadose Zone (Jessica Russell)
- Waverly Wellhead Protection Area (Noah Hovorka)

Questions (All)

INTRODUCTION TO 319

ALPHABET SOUP - WHO IS WHO IN WATER MANAGEMENT

UNL Extension

UNL Water Center

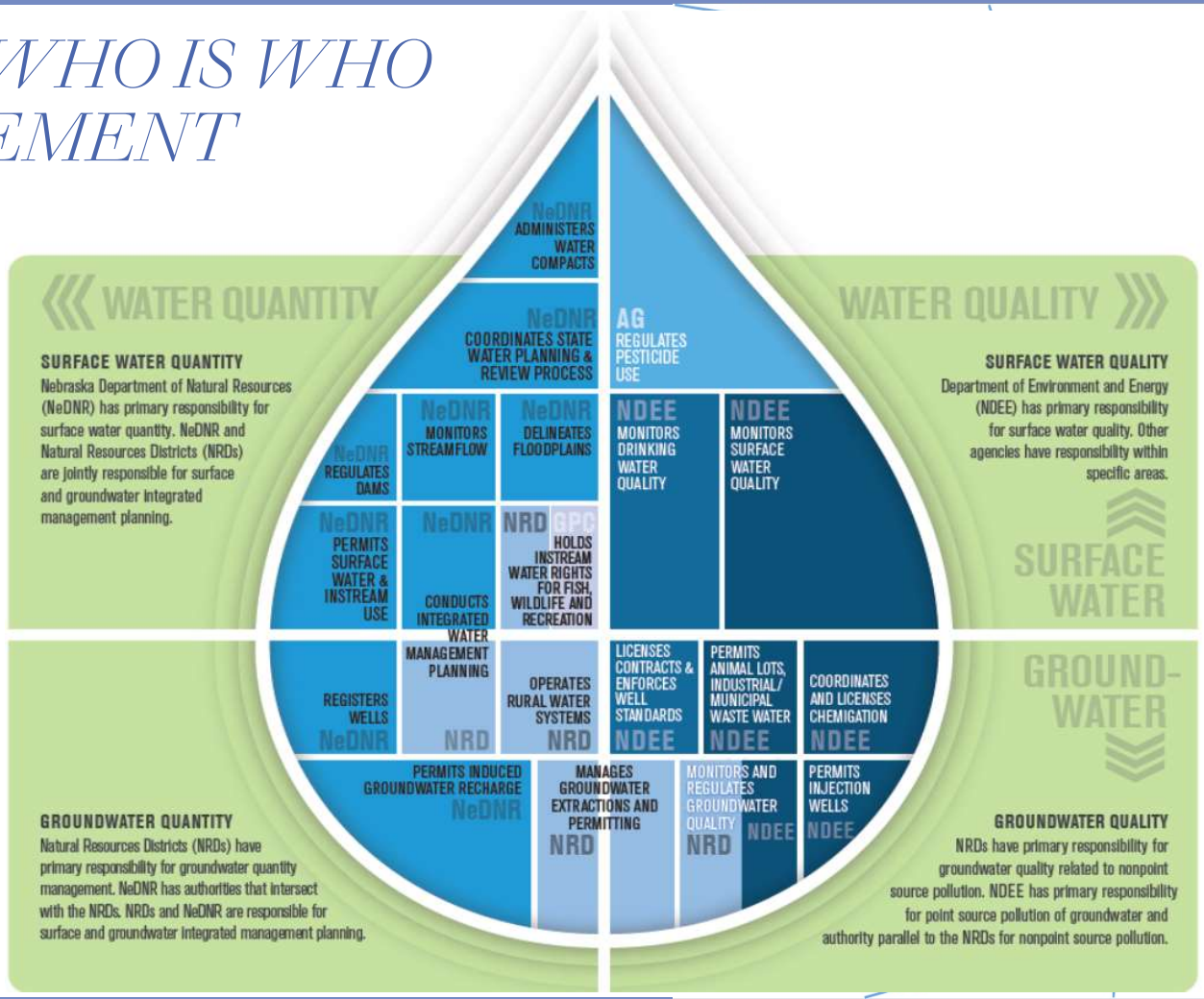
Nebraska Rural Water Association

Public Water Operators

USGS

USDA- NRCS

And More…..



ADDRESSING NONPOINT SOURCE IMPAIRMENTS THROUGH VOLUNTARY ACTION

Who: Any governmental sub-agency including non-profits

What: Monetary, educational, technical, and partnership assistance

When: Addressing existing impaired waters & preventing impairments to pristine waters

Why: To enable communities and partnerships in the bettering of water resources.

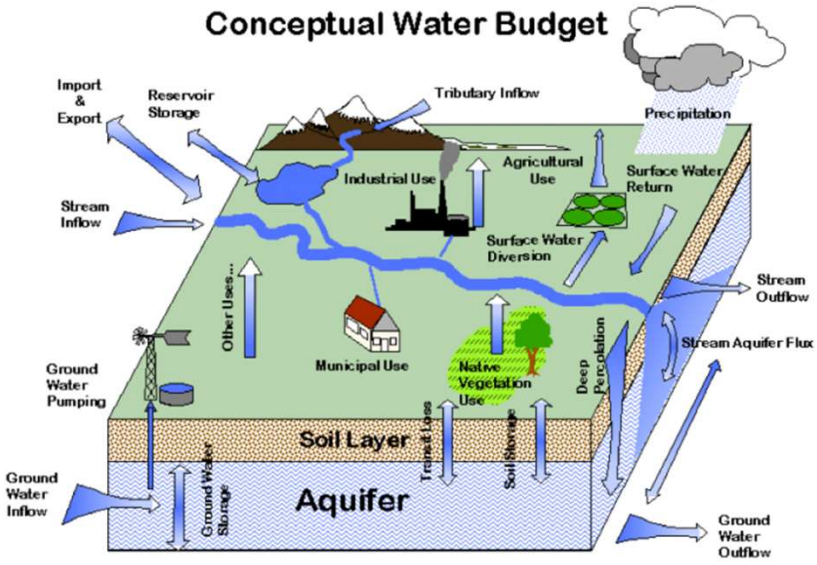
SURFACE AND GROUNDWATER MANAGEMENT HAVE BEEN INTERTWINED FOR YEARS

1975 — LB 577 Assigned legal authority to regulate the use of groundwater to NRDs

1985 — LB 1106 NRD created groundwater management plans to protect water quality and regulate usage

1996 — LB108 Nebraska recognized hydrological connection between groundwater and surface water

2002 — LB 1003 creation of the Water Policy Task Force by the Governor focus on integrative management of surface water and groundwater



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BAZILE VADOSE ZONE

2021 - 2023

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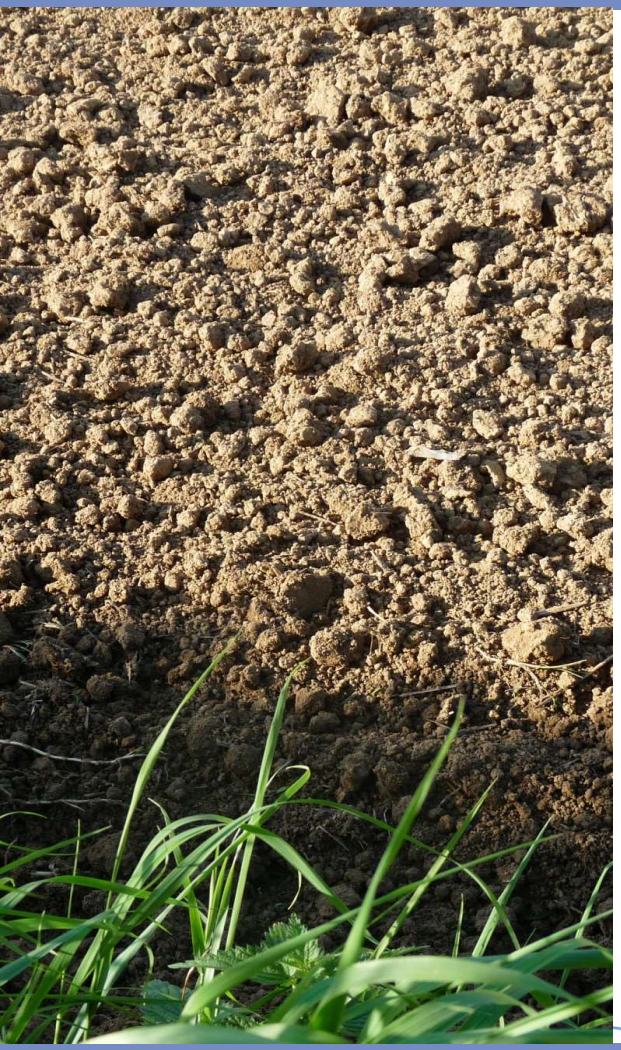
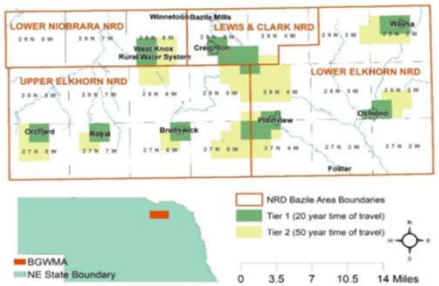


BACKGROUND

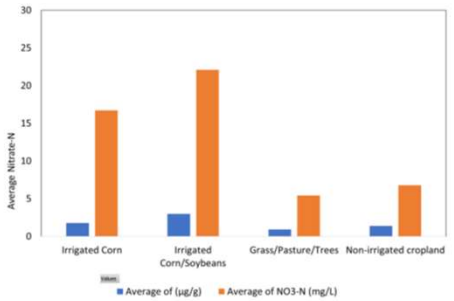


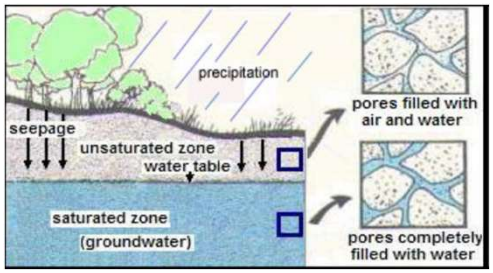
- Project within the BGMA
  - Sandy soil
  - GW dependency for irrigation and drinking water
- Justified through 319 because the streams of concern are gaining streams (streams that gain water from groundwater discharge) and are therefore affected by nitrate levels
- Vadose Zone = the unsaturated zone between the surface and the groundwater below
- Completed by the Nebraska Water Center and UNL Conservation and Survey Division

GOALS & METHODS

- Determine the distribution and source of nitrogen in the vadose zone
- Quantify nitrate in the vadose zone and estimate vertical transport rates to the groundwater table
- Provide a data base to compare project successes to every 10 years

← Accomplished through the collection of soil cores at 34 different locations (11 cores per location)

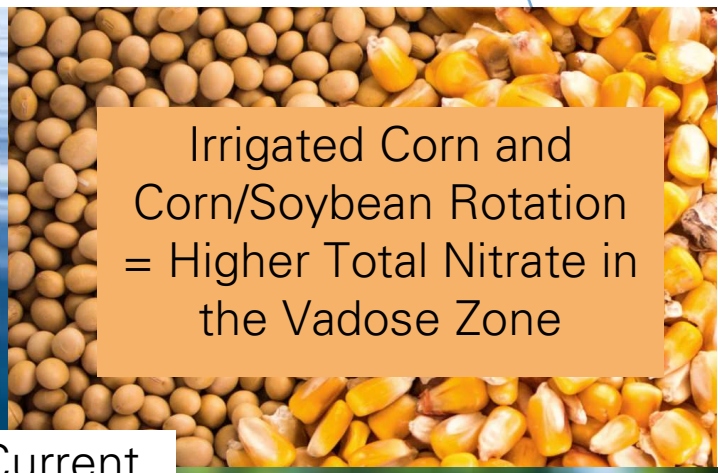




CONCLUSIONS

Sandy Soils + Shallow Water Table = Increased Nitrate Leaching

Water and nitrate transport rates are around 7 feet/year (in some wellhead protection areas)



Irrigated Corn and Corn/Soybean Rotation = Higher Total Nitrate in the Vadose Zone

Overall Reduction of N from 2016 to Current

Improvement in Fertilizer and Irrigation Water Management Practices = Reduction in Groundwater Nitrate

Presence of Organic (manure) Nitrogen Sources leads to Elevated Nitrate

Collection of fertilizer and irrigation water application rates should be done in the future so that specific management practices can be targeted to highly vulnerable soils and sediments

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WAVERLY WELLHEAD PROTECTION AREA (WHPA)

2022 - CURRENT

BACKGROUND

- Wellhead Protection Areas (WHPA) are a voluntary program that focuses on community water systems to protect groundwater from Nitrate and other contaminants

- In 2019 the Waverly WHPA was updated to include a 50-year-time-of-travel and a demo farm showcasing recommended BMPs was created on city property in a partnership with UNL, LPSNRD, the City of Waverly, and other partners

GOALS

Protect local drinking water aquifers from Nitrate contamination in the Waverly WHPA and the greater LPSNRD

Increase BMP adoption rates through public outreach and education as well as stakeholder engagement

Hire a Drinking Water Protection Specialist (DWPS) to lead and focus outreach with producers in the area

Create a soil sample package with local environmental labs to boost yields and reduce inputs

Establish a working group comprised of sponsors (DEE, UNL, NRCS, etc.) to aid in nitrogen load reduction

Producer assistance in identifying and applying for cost share and/or research programs through local, state, and private sources

WHERE WE ARE TODAY & WHAT'S AHEAD

- Tyler Benal was hired as the DWPS in late July
- Outreach began this fall with Tyler meeting producers in the WHPA one-on-one
- An open house was hosted on 4/15/24 in Waverly to highlight the work in the WHPA and an educational event with UNL on lawn care is planned for May

Tyler Benal – LPS NRD Drinking Water Protection Specialist

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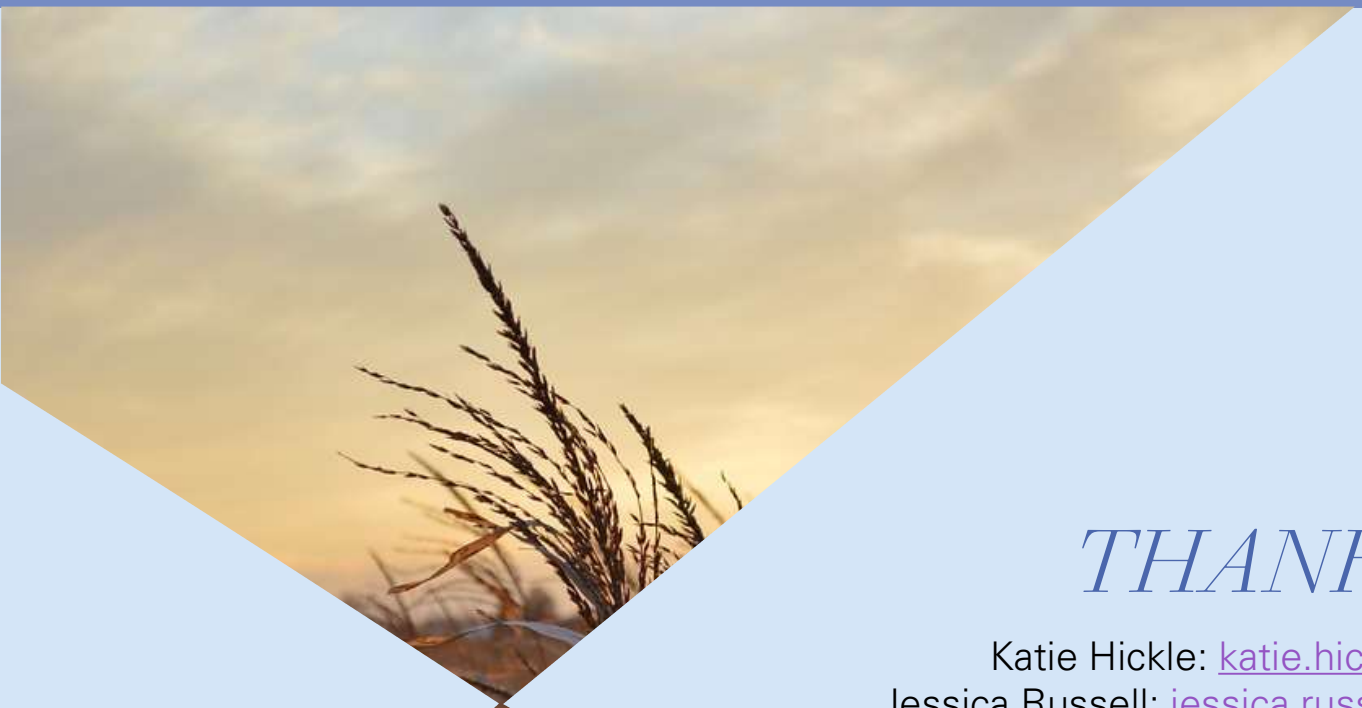
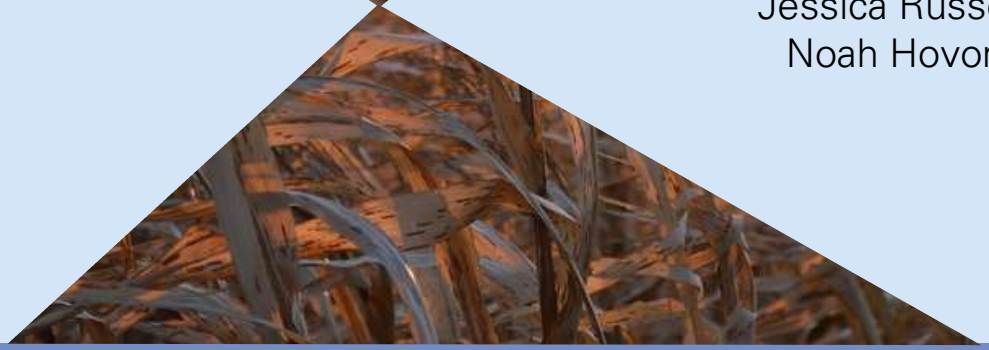
Phone: (402)-476-2729

QUESTIONS?





THANK YOU!

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