

WORKING *Together*
to address nitrate in groundwater

Nitrate in Groundwater Minnesota's Central Sands Region



Margaret Wagner
Minnesota Department of Agriculture

Subcommittee on Water Policy May 13, 2024



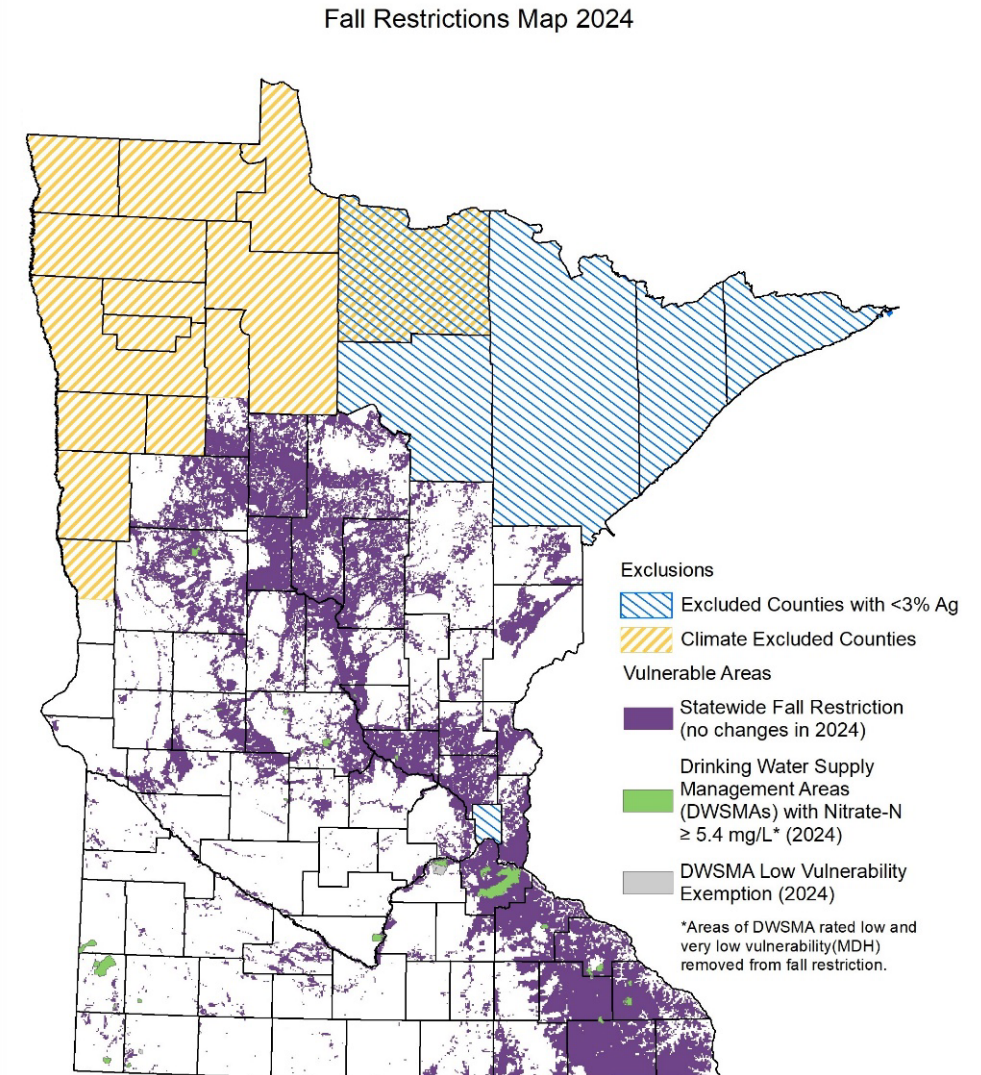
Groundwater Vulnerability

Nitrate in groundwater is a challenge that starts with geology and soil texture

Central and southeastern Minnesota are most vulnerable to nitrate contamination.

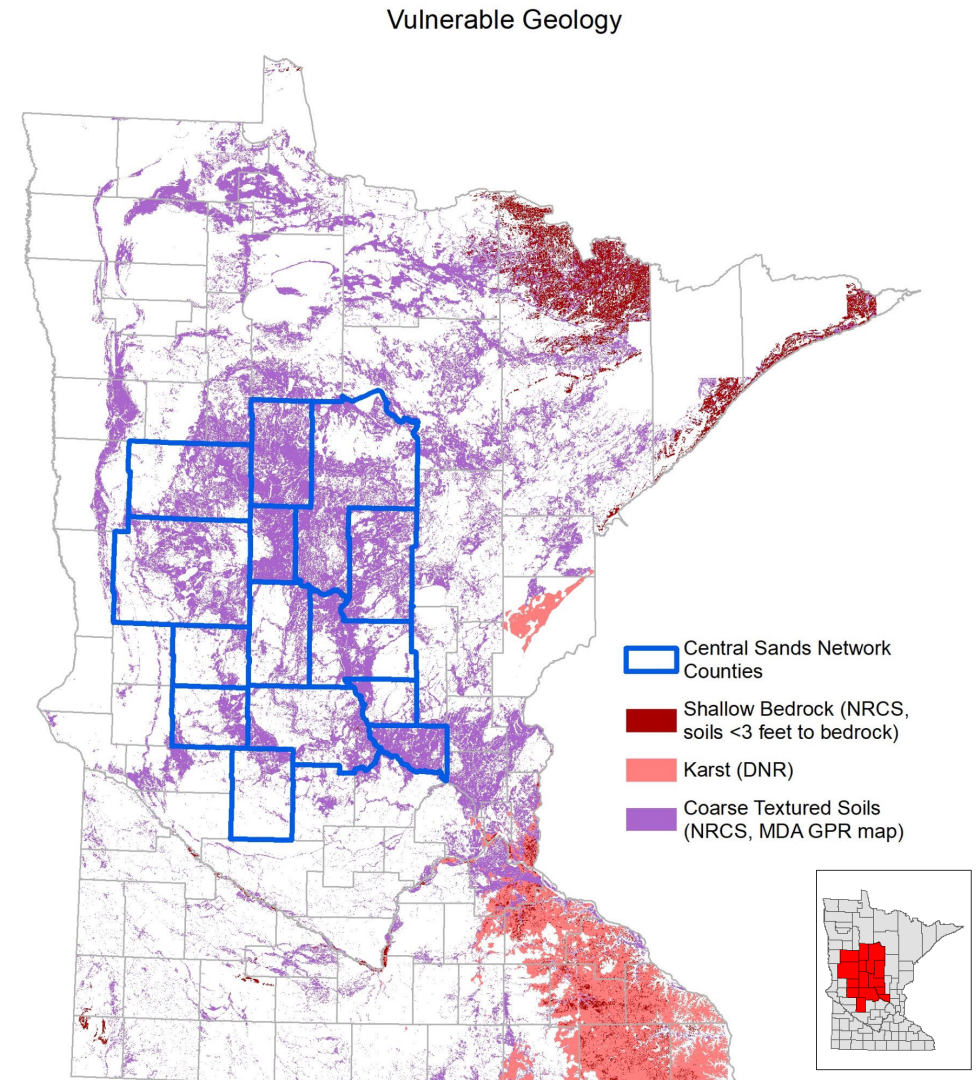
Central Minnesota counties are vulnerable because of widespread sandy soil.

Regions of southeast are vulnerable because of shallow bedrock, sinkholes and underground caves (referred to as karst geology).



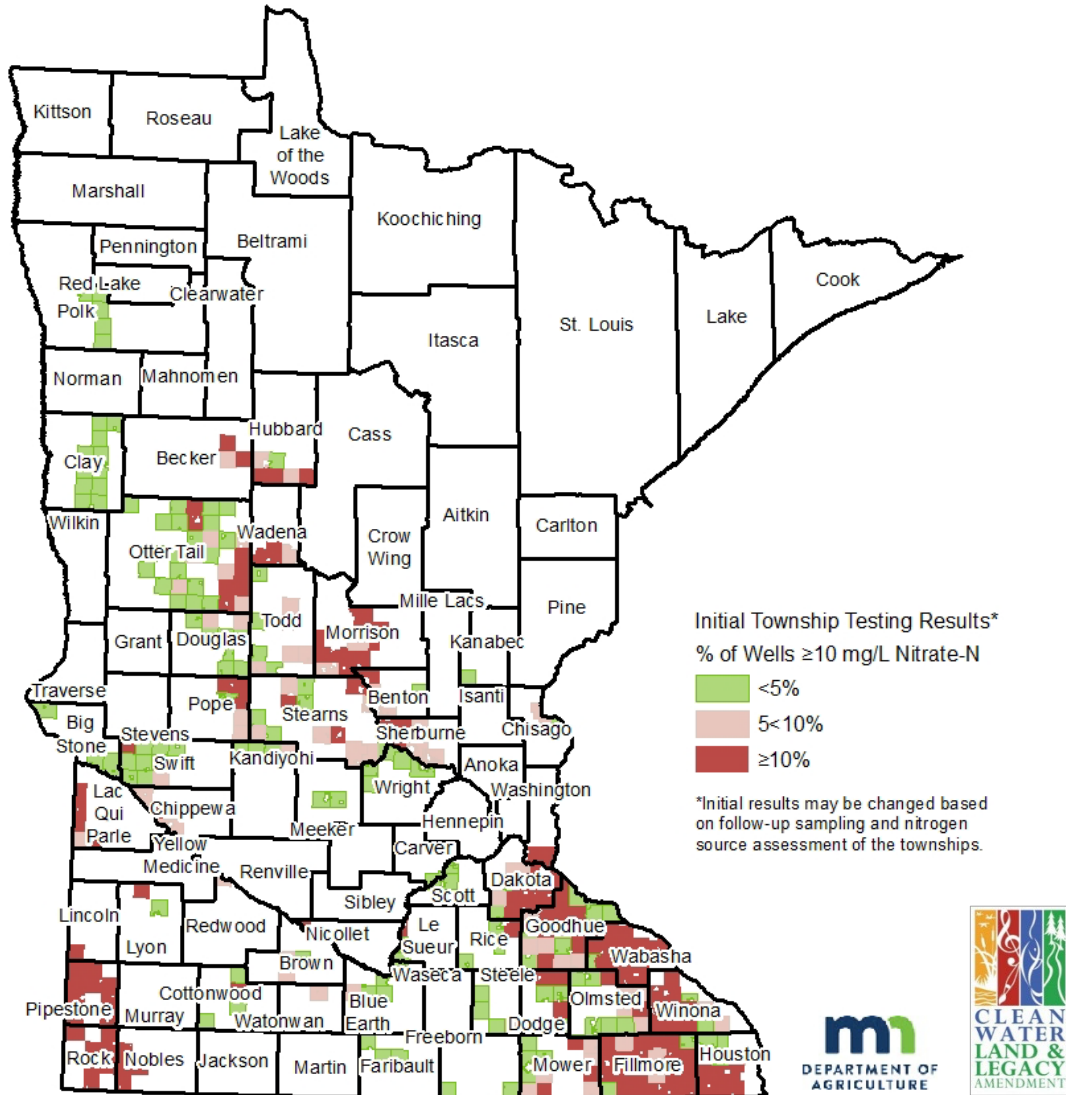
Central Sands Region

- 14 county region
- Glacial outwash and sandy soils
- Shallow groundwater
- Limited geologic protection from activities on the land surface
- High value crops such as edible beans, corn and potatoes
- Intensely irrigated



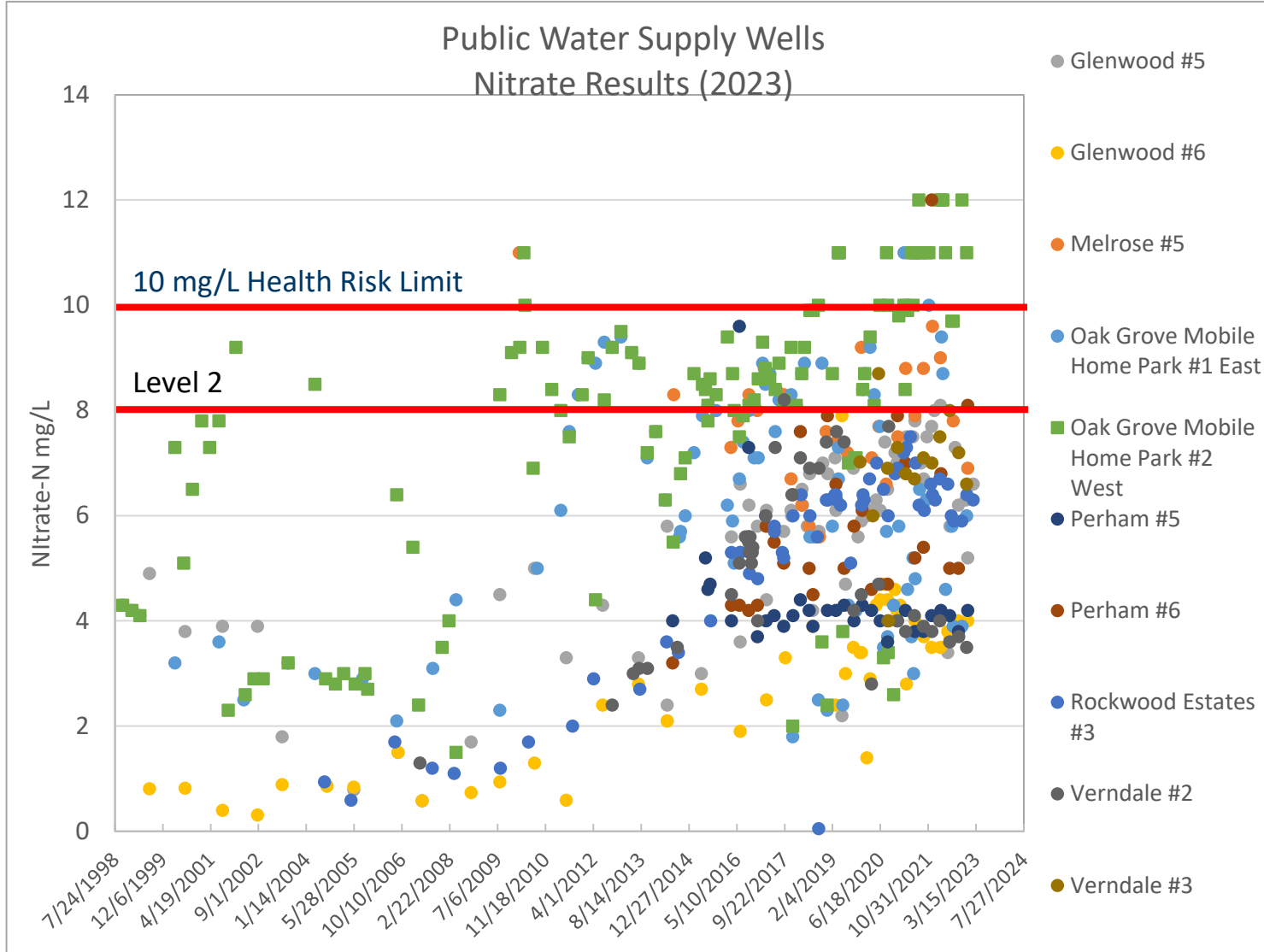
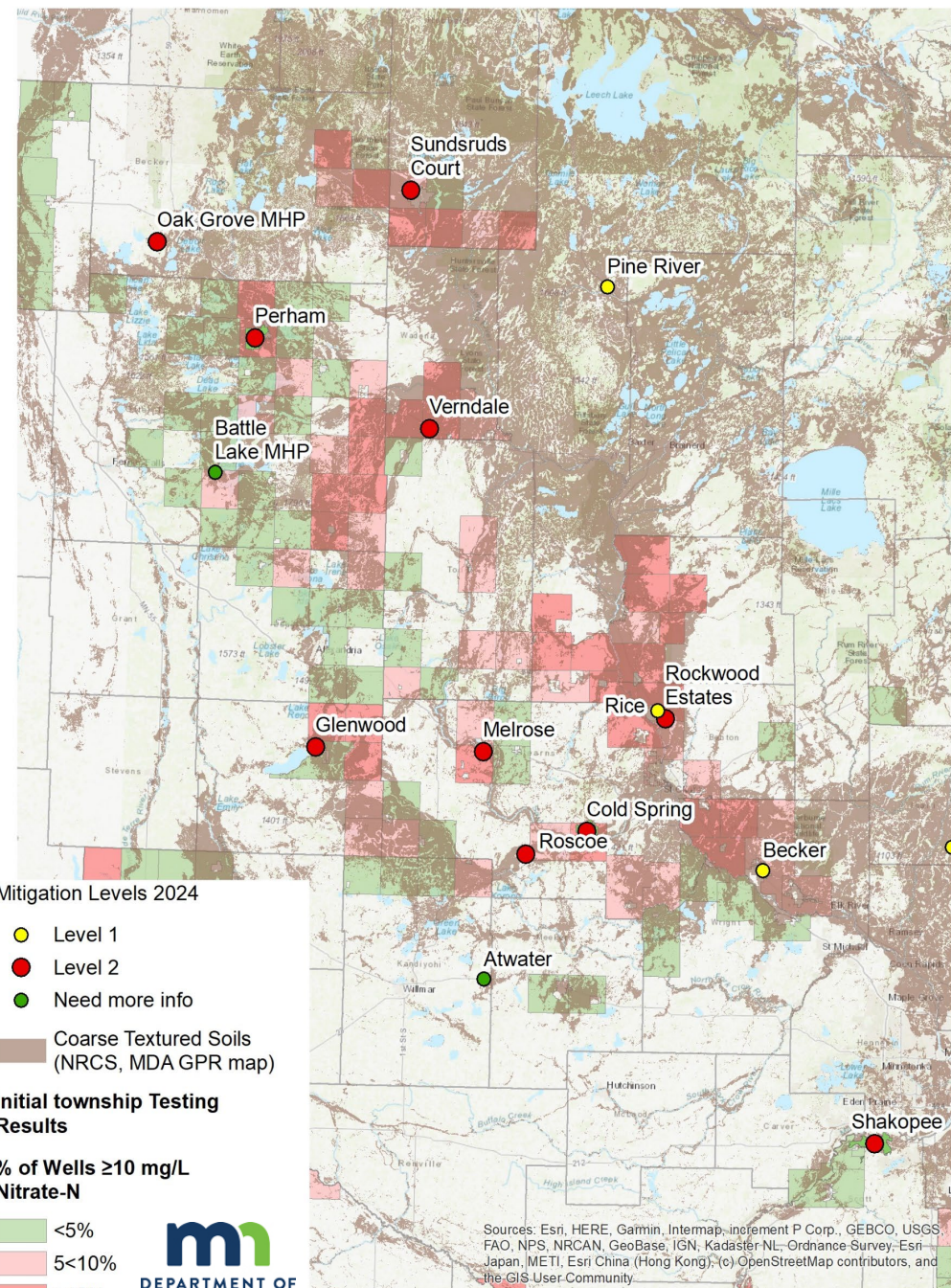
Township Testing Initial Results

Statewide, more than 90,000 private well owners were offered nitrate testing in 344 townships from 2013 to 2019.



Township Testing Region	Total Initial Wells	Number of Wells ≥ 10 mg/L	Percentage of Wells ≥ 10 mg/L
Central	15,275	1,037	6.8%
Southeast (8 Counties)	8,714	1,058	12.1%
Statewide	32,217	2,925	9.1

Central Sands Public Water Supply Nitrate Concentrations



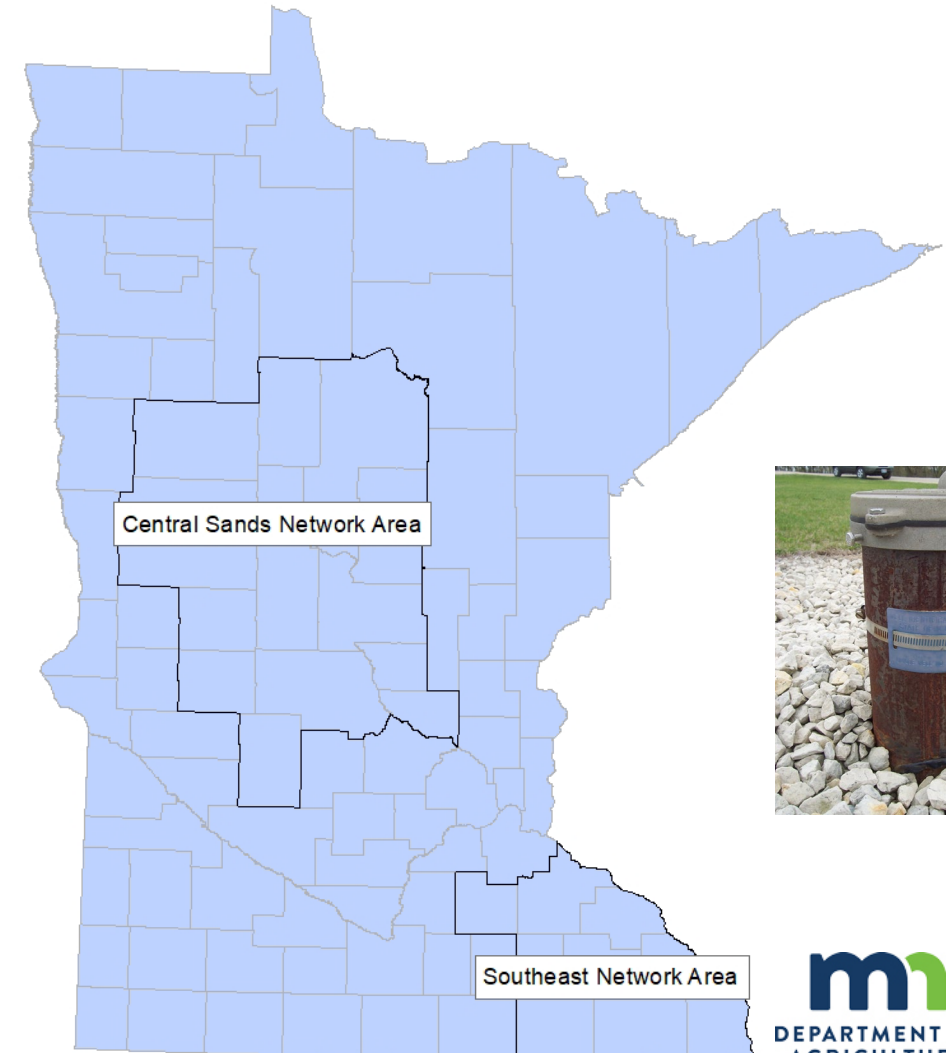
Regional Long-Term Nitrate Monitoring Networks

1. Southeast Volunteer Network

- 2008 Pilot Project
- Originally coordinated between multiple agencies and counties, now continued through MDA
- Nine (9) counties participate

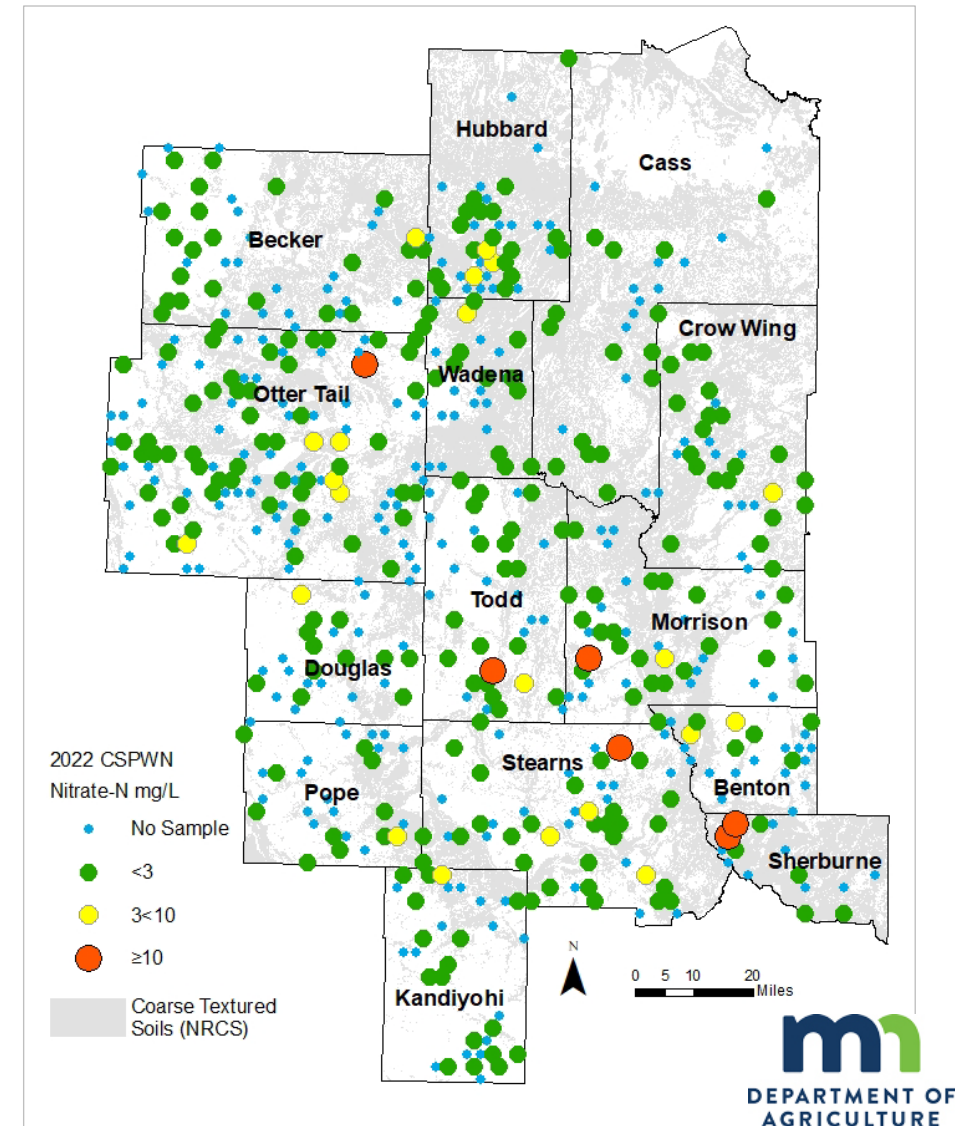
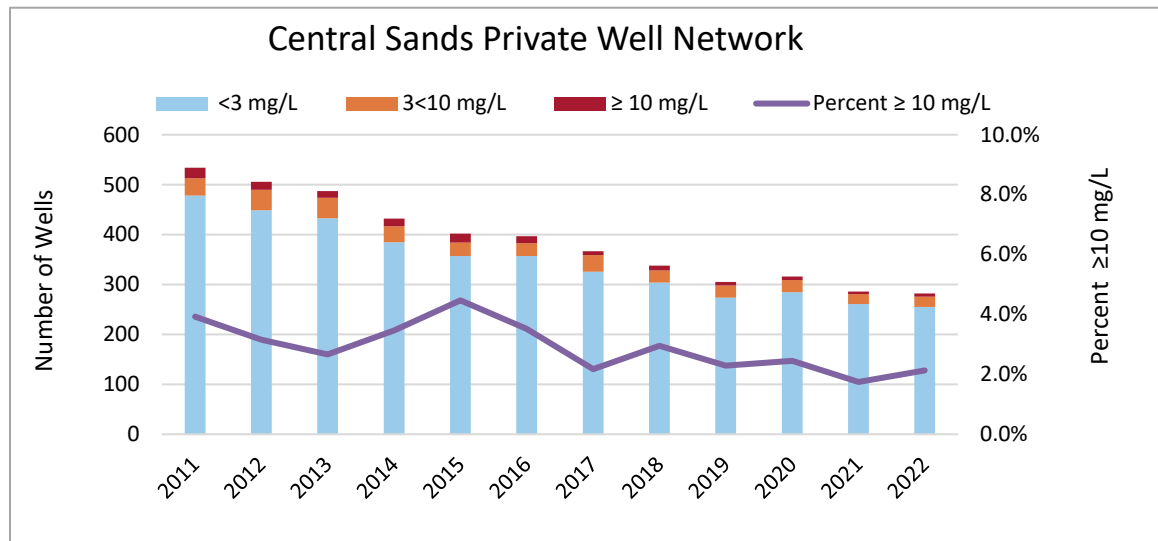
2. Central Sands Private Well Network

- 2010 designed using the lessons learned from the Southeast
- Coordination between MDA and 14 Counties
- Both networks were statistically designed with a random grid.



Nitrate Trends in Groundwater Central Sands

- Volunteers ranged from approximately 550-290 since 2011.
- With respect to well depth and age there was no significant difference over the years from 2008 through 2018. (MDA, 2019)
- Nitrate kits are sent annually each spring.



Rosholt Farm

- MDA is working with partners at the Rosholt Research Farm near Westport, Minnesota to develop guidance and outreach on irrigation and nitrogen best management practices and the associated water quality impacts on irrigated, sandy soils.
- Rosholt Farm's sandy soil and need for supplemental irrigation typifies the challenges that many producers face on the outwash sands of west-central and central Minnesota.
 - ✓ Nitrogen, Cover Crop and Water Quality Research
 - ✓ Variable Irrigation and Nitrogen Study
 - ✓ Evaluation of Irrigation Scheduling Methods
 - ✓ Reduced Irrigation Study



Additional Information

Township Testing Program

- Visit www.mda.state.mn.us/township-testing-program

Nitrogen Fertilizer Management Plan

- Visit www.mda.state.mn.us/nfmp

Groundwater Protection Rule

- Visit www.mda.state.mn.us/nfr

Rosholt Farm

- Visit www.mda.state.mn.us/protecting/cleanwaterfund/gwdwprotection/rosholtfarm

Private Well Pesticide Sampling Project

- Visit www.mda.state.mn.us/pesticide-fertilizer/private-well-pesticide-sampling-project

Pesticide Monitoring Well Network

- Visit www.mda.state.mn.us/pesticide-fertilizer/monitoring-assessment-agricultural-chemicals-environment