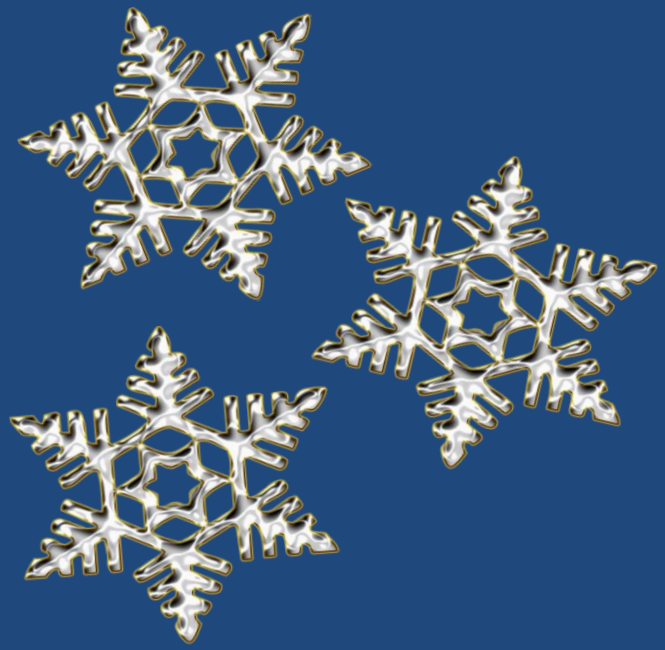


BAZILE GROUNDWATER MANAGEMENT AREA PROJECT UPDATE

Winter Meeting
January 22nd, 2016

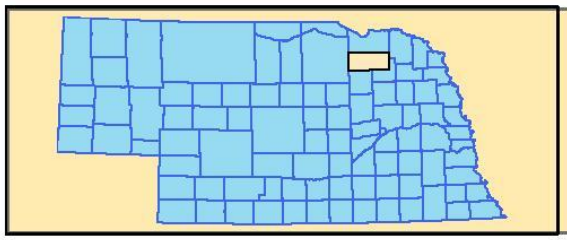
Stephanie Butler, Project Coordinator

House Keeping Items

- Attendance today is valid for nitrogen certification requirements in the Lower Niobrara, Lewis and Clark, Upper Elkhorn and Lower Elkhorn NRDs
- Be sure to fill-out information on the certification sheet
- Irrigation water samples every 4 years

Outline

- Project History
- Project Details
- Project Activities
- Project Future



Bazile Groundwater Management Area

W09 W08 W07 W06 W05 W04 W03 W02 W01

N30
N29
N28
N27
N26

Lower Niobrara
Lewis & Clark
Upper Elkhorn
Lower Elkhorn

29N 08W | 29N 07W | 29N 06W | 29N 05W | 29N 04W | 29N 03W | 29N 02W
28N 08W | 28N 07W | 28N 06W | 28N 05W | 28N 04W | 28N 03W | 28N 02W
27N 08W | 27N 07W | 27N 06W | 27N 05W | 27N 04W | 27N 03W | 27N 02W

Winnetoon
Bazile Mills
Creighton
Wausa
Osmond
Orchard
Royal
Brunswick
Plainview
Foster

Legend

Bazile Groundwater Management Area
NRD Boundary

Provided by Brent Lakin
October 15, 2013

N W E S

0 2.5 5 10 Miles

Project History

- Elevated nitrate levels since the 1980s
- 1990s project "Bazile Triangle"
- Levels have continued to rise
- 2014 project "Bazile Groundwater Management Area" (GWMA)
  - Funding from the NRDs, Nebraska Dept. Environmental Quality (NDEQ), Nebraska Environmental Trust

Lower Elkhorn Natural Resources District

Upper Elkhorn Natural Resources District

Lower Niobrara Natural Resources District

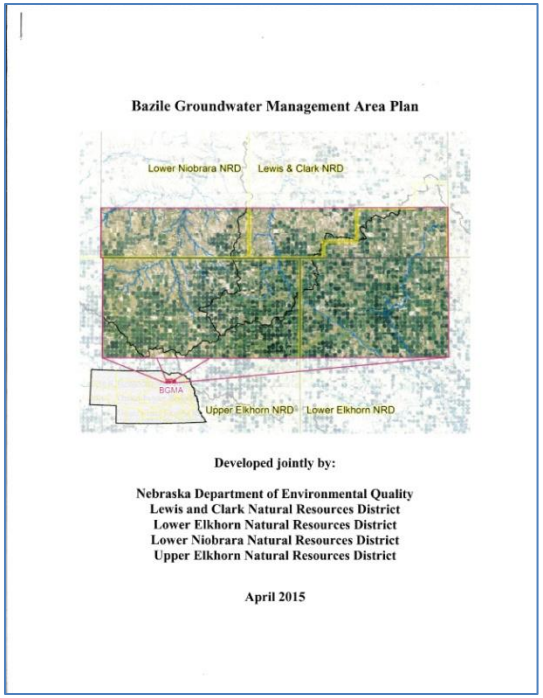
Lewis & Clark NRD Natural Resources District

Nebraska DEQ

Nebraska Environmental Trust

Project History

- The NRDs and NDEQ have worked together to develop a plan for the Bazile GWMA
- Can be found online at www.uenrd.org or by contacting the Upper Elkhorn NRD office



Project History

Project Importance

- NRDs tasked with managing for groundwater contaminants
- Federal health standard for nitrate, 10 ppm
- Over 7,000 residents in the Bazile GWMA rely on groundwater
- Creighton, Osmond, Orchard and Brunswick all under Administrative Order

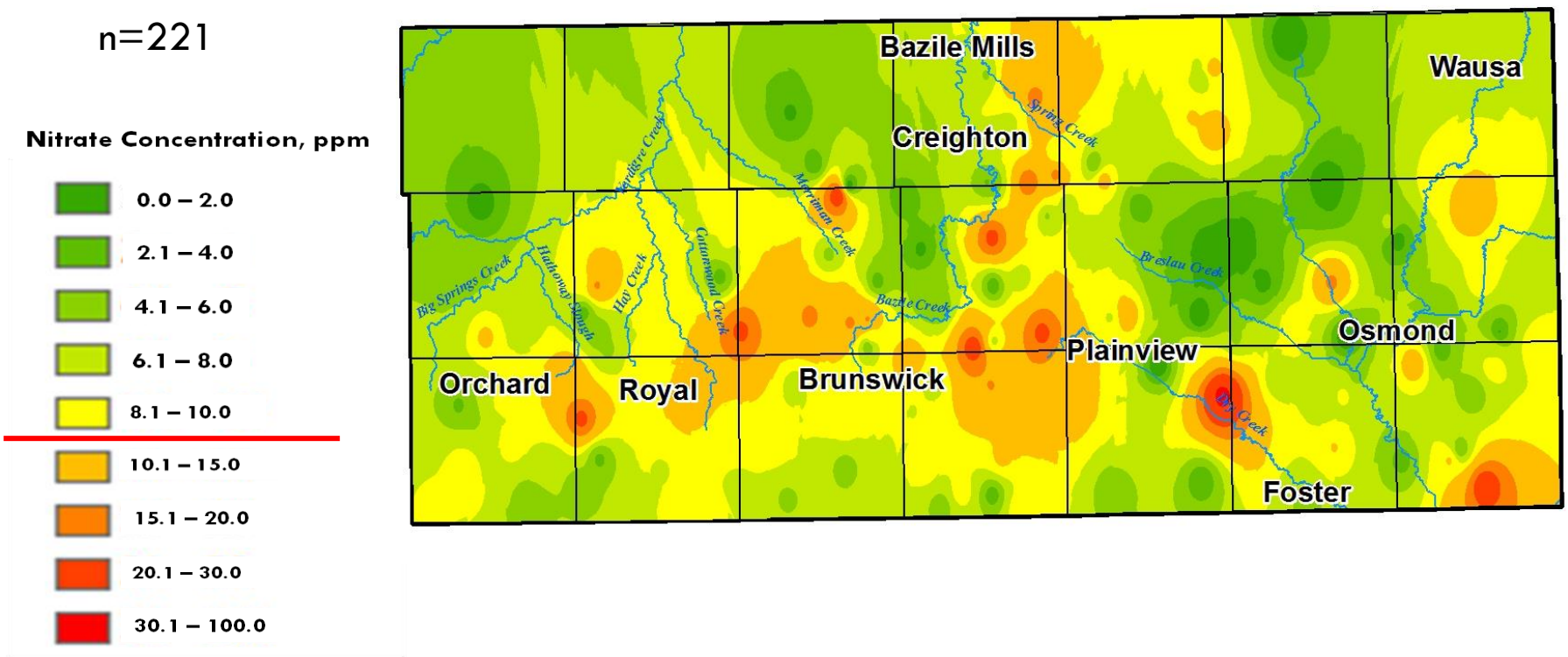
Project Goals

- Lower nitrate levels below 10 ppm
- Information/education activities
- Voluntary adoption of best management practices
- Protect surface water

Project History

Nitrate levels
1980-1989

n=221

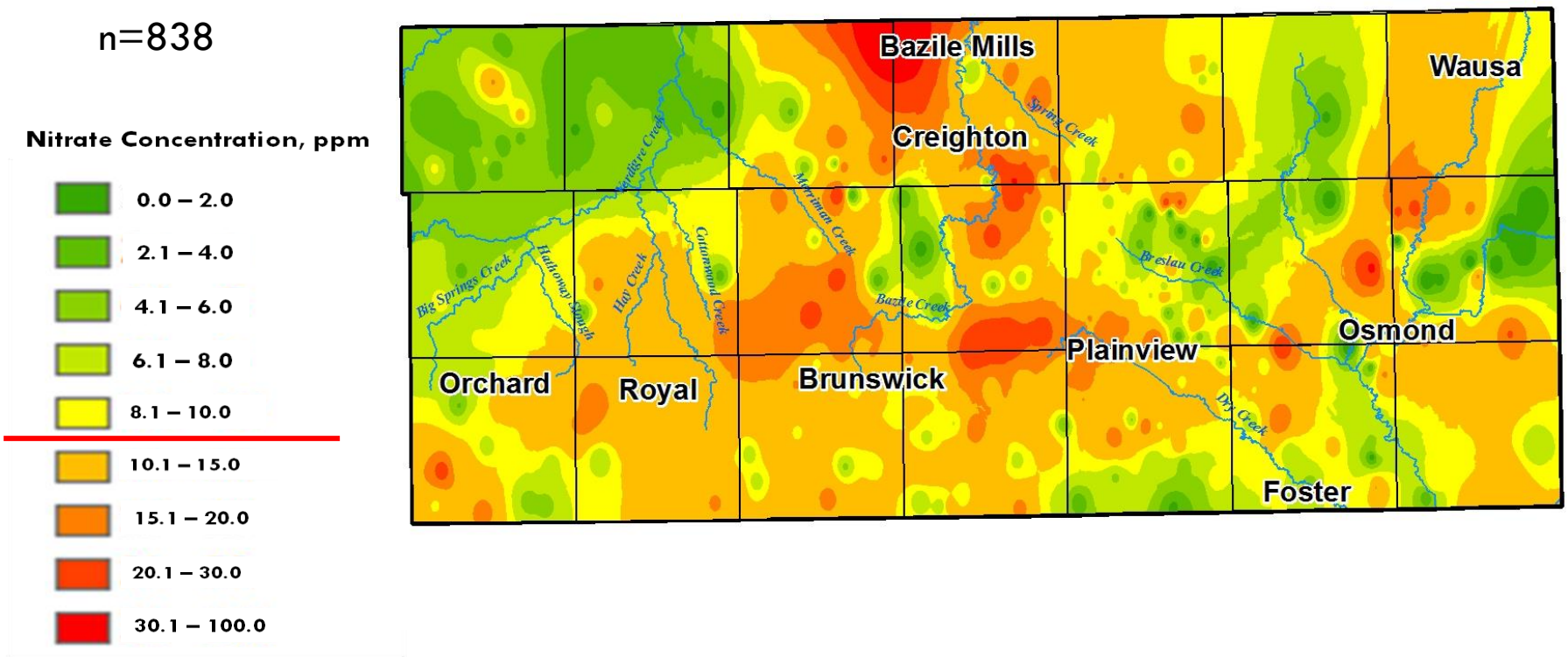


Data from the Nebraska Department of Natural Resource's Clearinghouse database

Project History

Nitrate levels
1990-1999

n=838

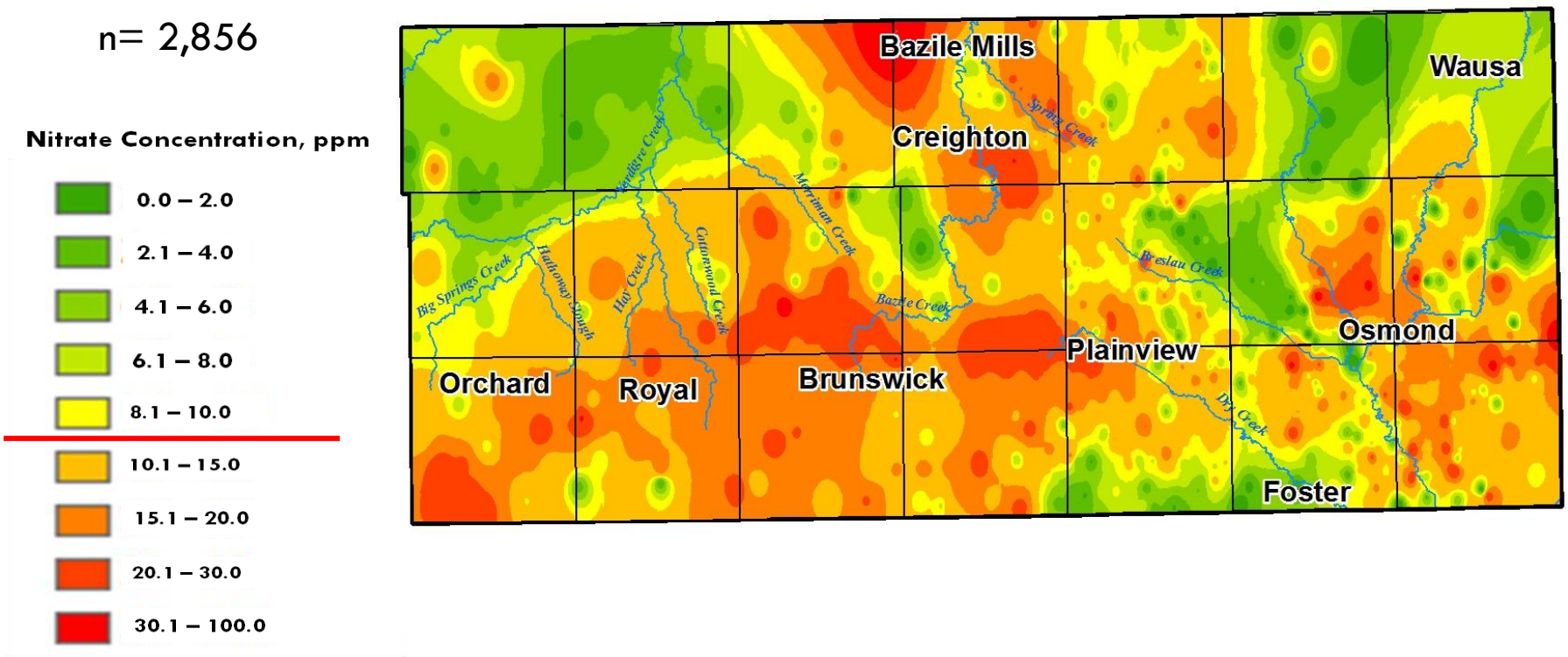


Data from the Nebraska Department of Natural Resource's Clearinghouse database

Project History

Nitrate levels
2000-2009

n= 2,856

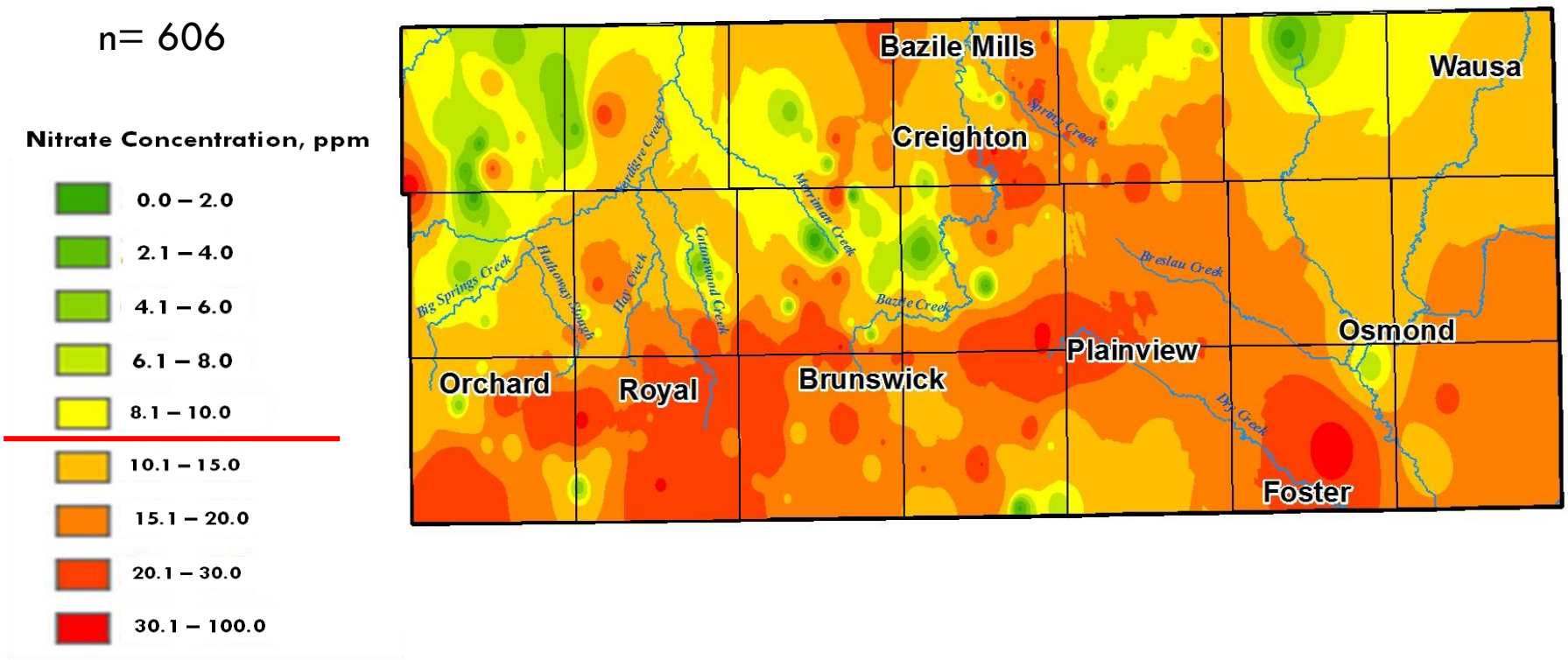


Data from the Nebraska Department of Natural Resource's Clearinghouse database

Project History

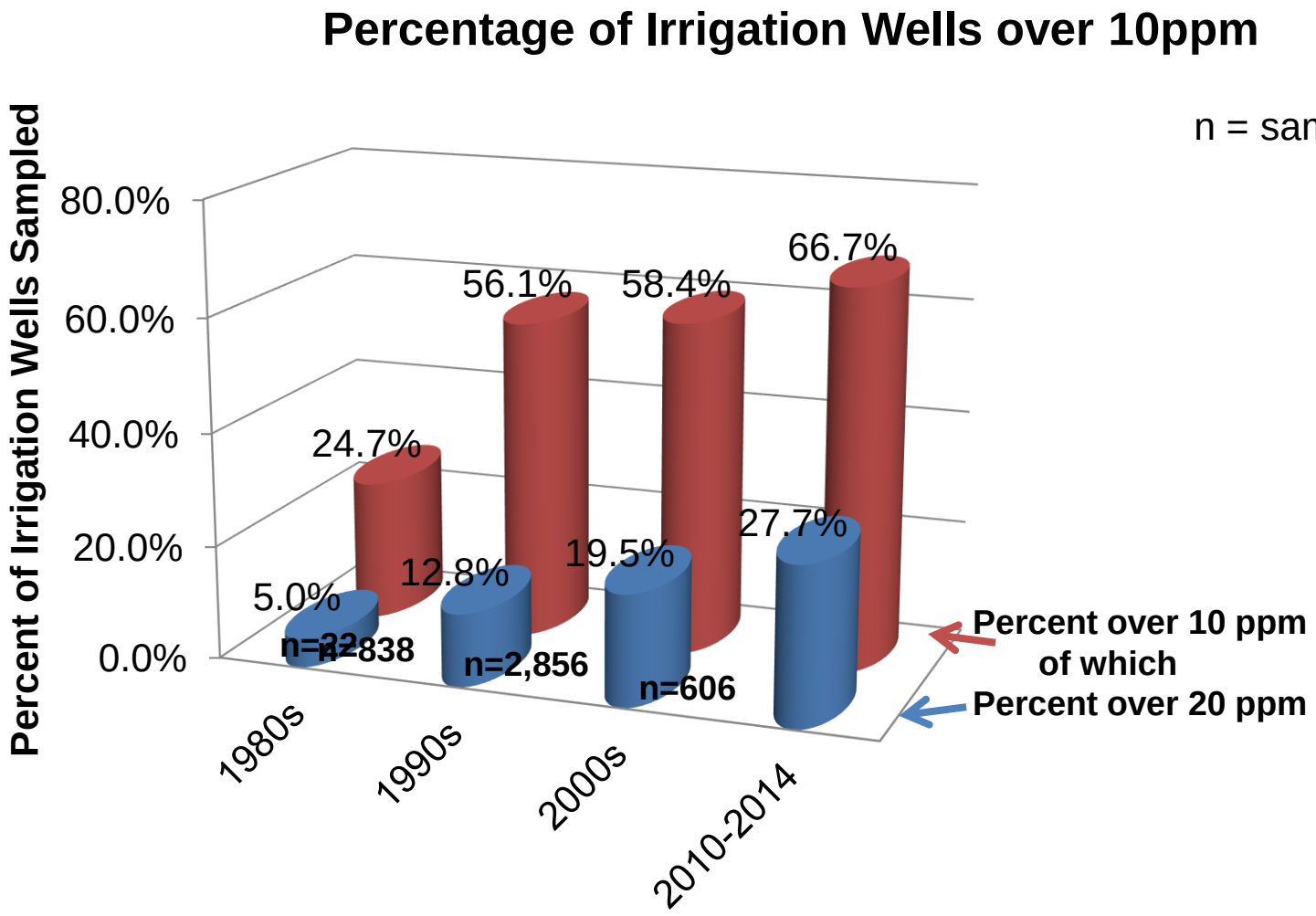
Nitrate levels
2010-2014

n= 606



Data from the Nebraska Department of Natural Resource's Clearinghouse database

Percentage of Irrigation Wells over 10ppm



Project Details

- #1 Goal : Reduce the groundwater concentration of nitrate though the voluntary adoption of best management practices (BMPs)
- Methods to reach this goal:
  - Exercise NRD groundwater management plans already in place
    - Need compliance on crop reporting forms, nitrogen certification, irrigation water samples
  - Provide informational/educational activities for producers
  - Establish demonstration sites and conduct additional research studies
  - Provide cost-share on select BMPs

Project Details

- Informational/Educational Events
  - Informational meetings
  - Established demonstration sites
    - Farm Tour in 2015 & 2016
    - Urban Lawn Day in 2016

Project Details – Additional Research

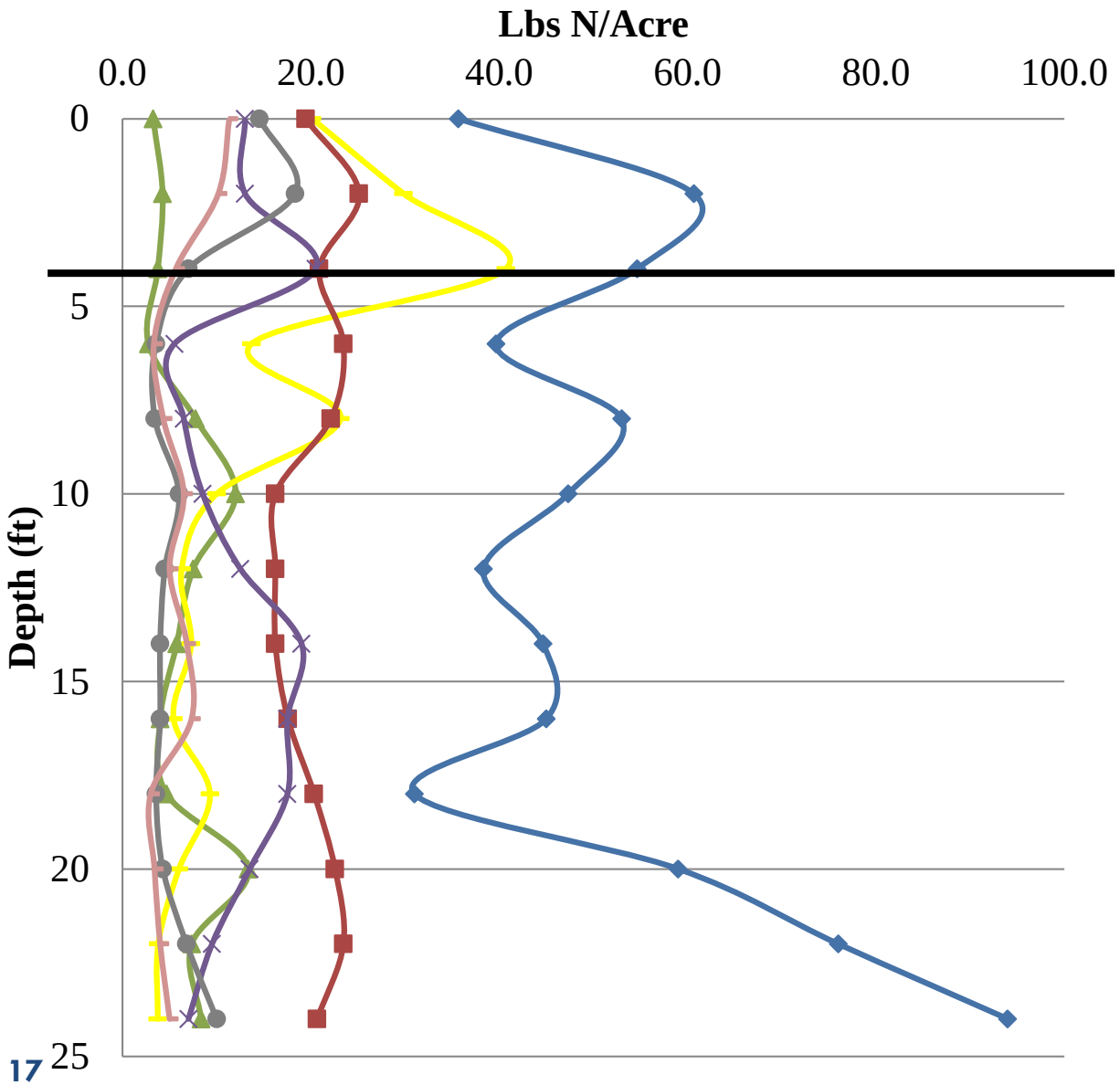
- Deep Vadose Sampling
- Sampled down to 24 feet
  - 49 locations in 2014
  - Currently sampling
- Examined nitrate concentrations
  - Affect of land use
  - Affect of BMPs
  - Insight into recharge rates
  - Long term project

Project Details – Additional Research

- Vadose sampling data
  - Importance of recharge rates
  - Weather
  - Varying soil types
  - Varying management programs

Average All Types

2014 Data
n= sample size



- Average Alfalfa, n=4, 15.8 lbs N/ac
- Average Dryland, n=7, 175.9 lbs N/ac
- Average Irrigated Crop (During Season), n=3, 516.0 lbs N/ac
- Average Irrigated Crop (After Harvest), n=9, 264.2 lbs N/ac
- Average No-Till, n=2, 163.5 lbs N/ac
- Average Pasture, n=9, 79.1 lbs N/ac
- Average Urban Lawn, n=6, 60.5 lbs N/ac

Project Details – Additional Research

- Key Findings from Vadose Sampling
  - Nitrogen loss is closely linked to the amount and timing of nitrogen application and irrigation events
  - When residual nitrate-N is high at post-harvest, the potential for off-season leaching is high
  - The amount of nitrogen applied to a crop should be based on expected yield and account for all nitrogen credits already available
  - Excess irrigation will result in nitrogen leaching, even if fertilizer amounts are timed according to crop needs

Project Details – Additional Research

- Isotope Sampling
- Looking for tracers to give insight into sources of nitrogen
- Samples analyzed by UNL's Water Lab
  - Analysis pending…

Project Details – Cost-share Programs

- Nebraska Environmental Trust Funds
  - 50% cost-share on flowmeters (61 installed)
  - 100% cost-share on tissue analysis (89 fields)
  - 100% cost-share on UNL agricultural phone apps
- Various NRD cost-share programs available
  - Manure analysis
  - Soil sampling
  - Irrigated crop to irrigated pasture conversion

Project Future

Long-term Project Team Effort

2014-2018

Implement I&E activities, voluntary adoption of BMPs

2018

Re-evaluate management plan, results and goals

Continue with I&E and BMPs

2022

Re-evaluate management plan, results and goals

Continue with I&E and BMPs

2032

Re-evaluate management plan, results and goals

Continue with I&E and BMPs

Project Future

- What we need to Succeed:
  - Voluntary adoption of BMPs above and beyond what is required by the NRDs
    - Follow UNL recommended fertilizer rates
    - Utilizing nitrogen credits
  - Farm for profit
  - Team Work
    - Talk to us

Questions?

- More project information can be found at:
  - www.uenrd.org
  - 402-336-3867
  - sbutler@uenrd.org
- Keep informed:
  - Bazile Groundwater Management Area Project's facebook page

Thanks for your attendance today!