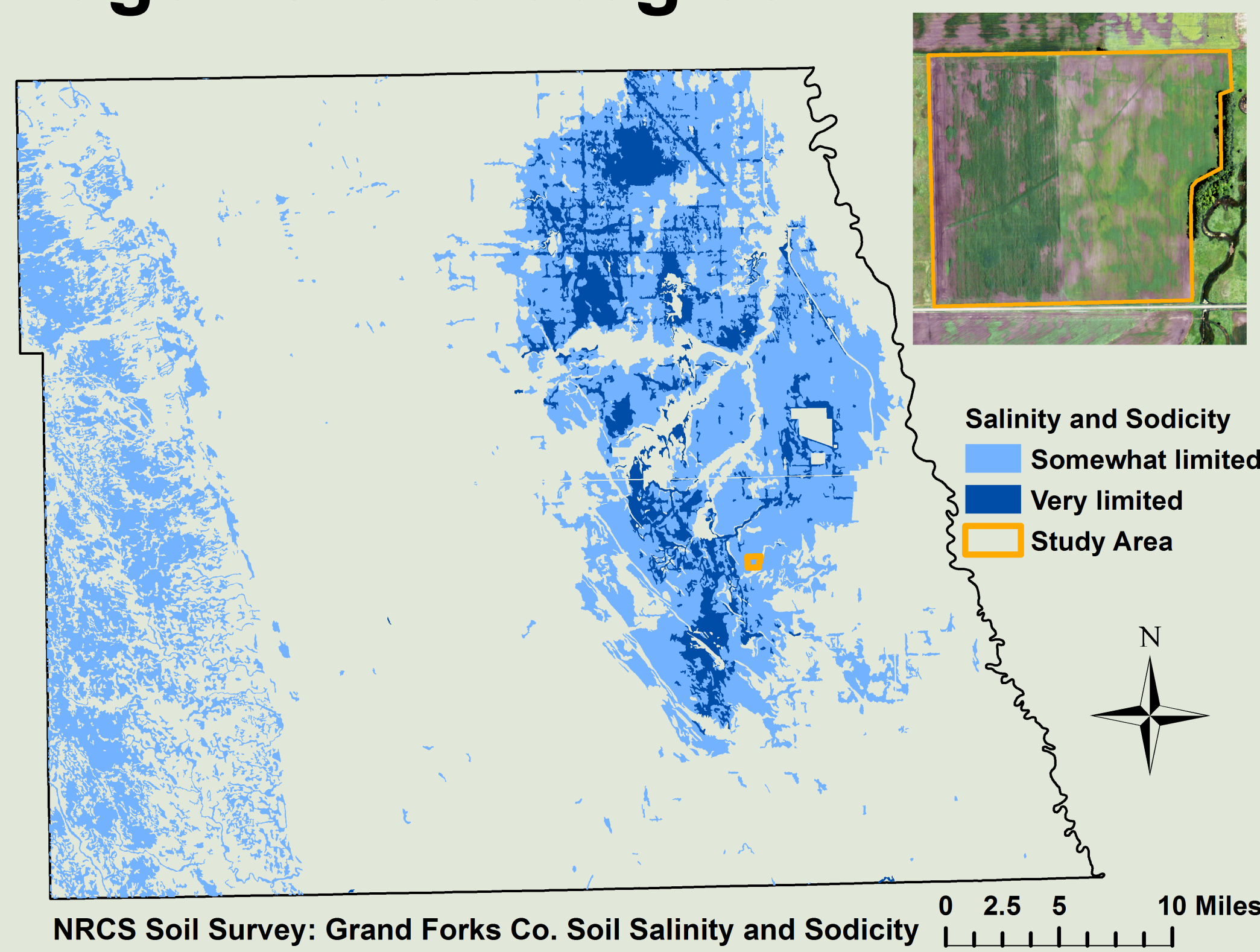


Salinity Management, Cover Crops and Tile Drainage: Research and Demonstration Site in Grand Forks County, ND

Introduction

North Dakota faces loss in productivity due to the presence of salts in geologic materials. Saline soils are increasing across the landscape, partly due to the climatic wet-cycle resulting in higher groundwater elevations but also due to agricultural management practices. Additionally, surface and subsurface flow is redistributing salts. Producers are asking for guidance on adapting management strategies.



NDSU Extension Response

NRCS Conservation Innovation Grant

Demonstrate and quantify impact of cover crops, rotations, tillage and/or soil amendments on soil chemical, physical, and/or biological properties and their relationship with nutrient cycling, soil water, and plant growth to provide remediation guidelines

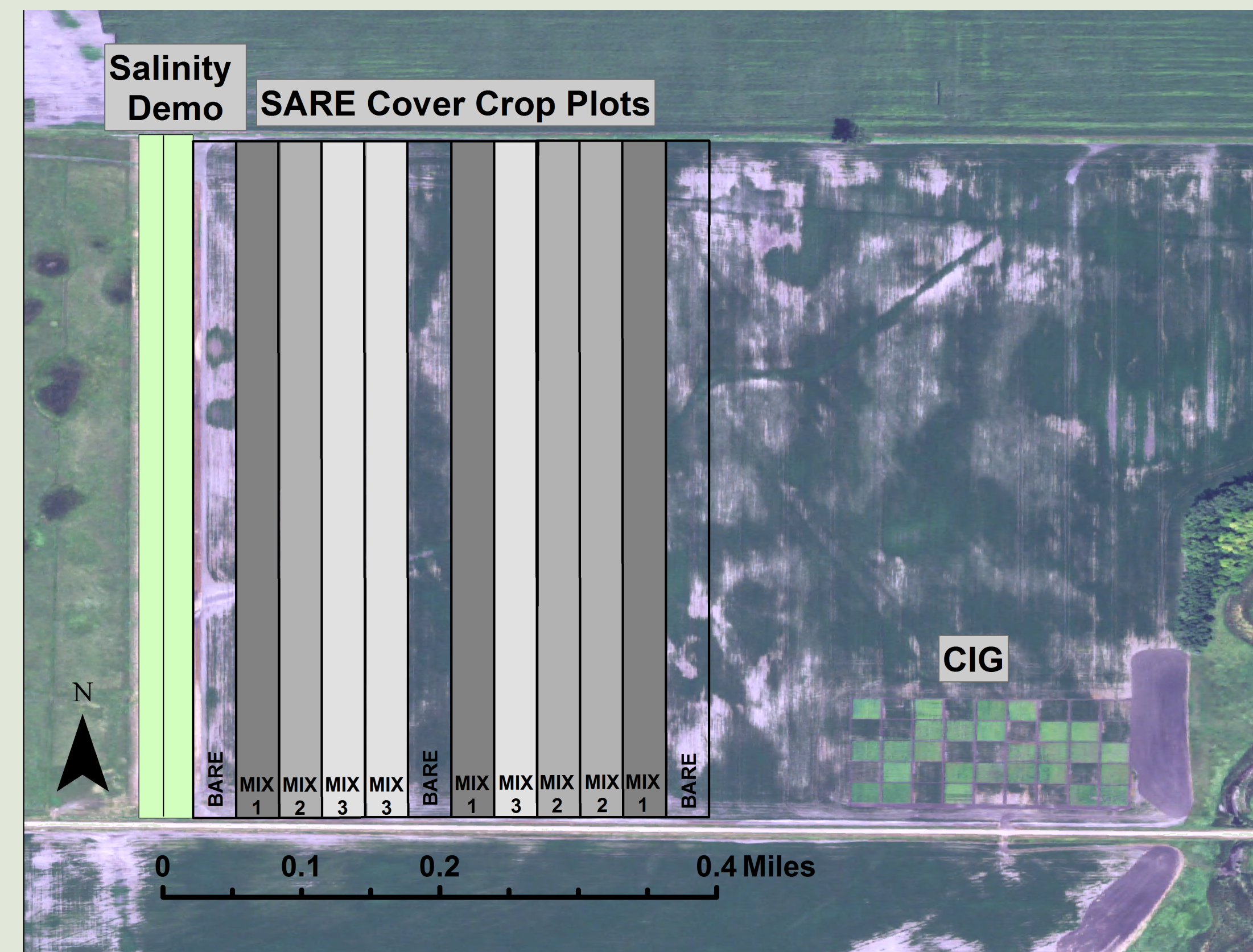
NC SARE & ND Dept. of Health

Practice science-based approaches to managing salinity and monitor how saline soils are influenced by water management and cover crops

Winter Soil Health Café Talks

Share information and ideas between producers & NDSU Extension Service

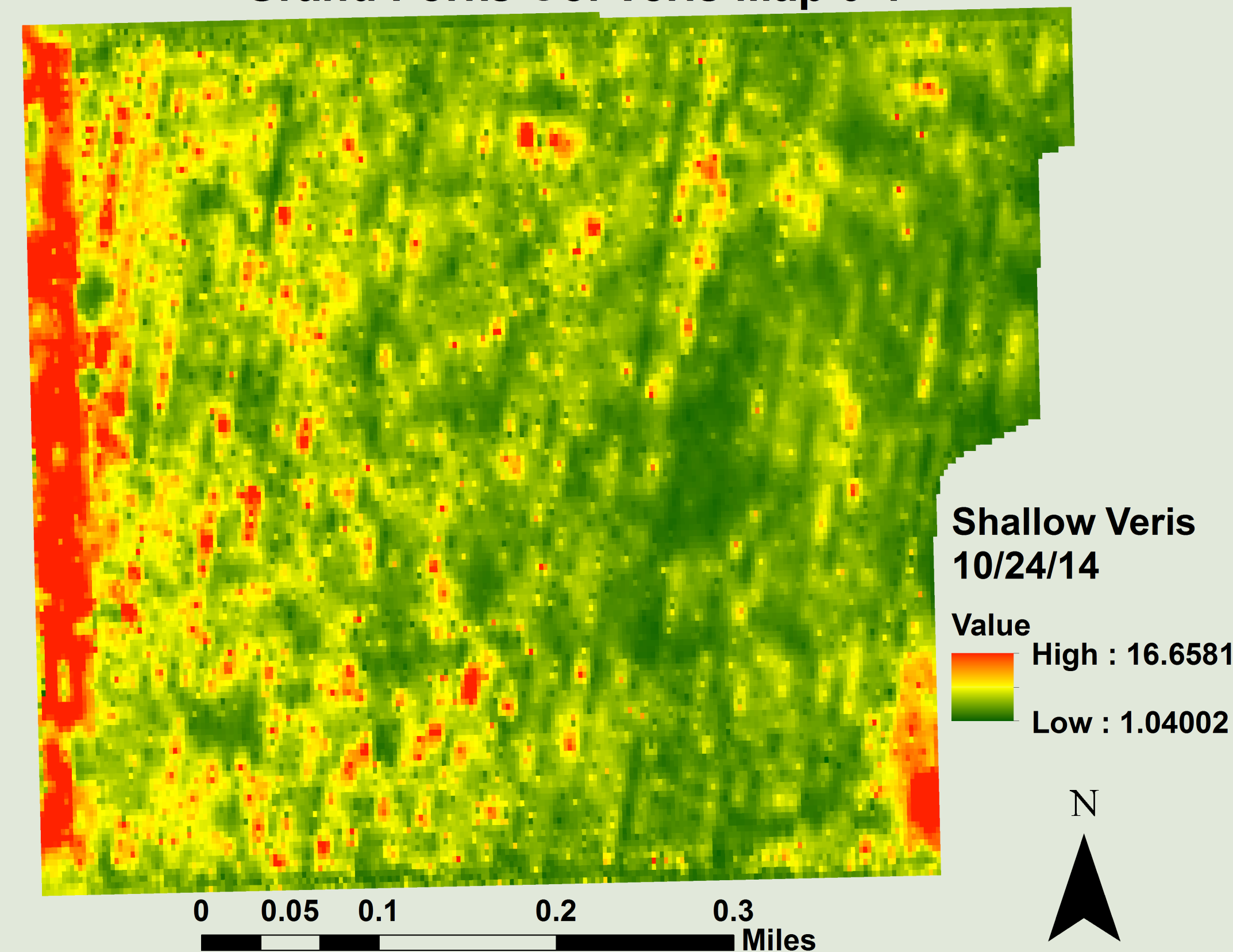
Plot Layout 2015



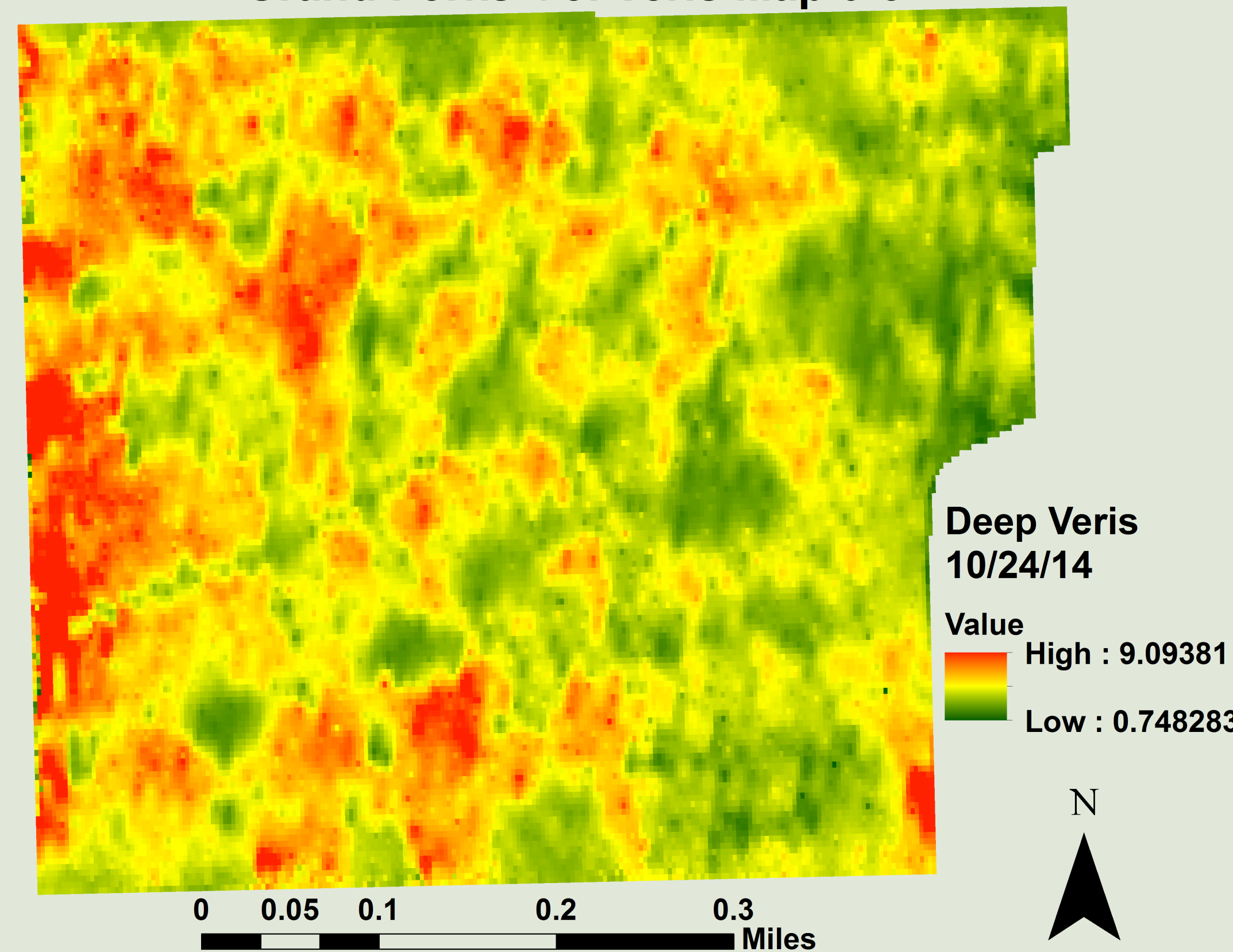
Monitoring and Data Collection

- ◆ On-Site Weather Station
- ◆ Water Quality Monitoring
- ◆ Cover Crop Biomass Sampling
- ◆ Measuring CO₂ for Microbial Activity
- ◆ Enzyme Analysis & Nutrient Cycling
- ◆ Weed Management in Cover Crops
- ◆ Veris Mapping

Grand Forks Co. Veris Map 0-1'



Grand Forks Co. Veris Map 0-3'



Producer Survey Results

Café Talks-25 Respondents

13% are likely to adjust current practices to manage salinity

14% are likely to use cover crops

Field Tours-12 Respondents

1 producer made operational changes based on what they learned

6 producers tested soils for salinity levels and are using cover crops

4 producers have completed salinity mapping of fields

Area of Knowledge	Increase in Knowledge
CO ₂ as a measure of microbial activity	+31%
How to measure CO ₂ in the field	+38%
Soil enzyme analysis and nutrient cycling	+24%
Cover crops and what roots do for soil health	+23%



Preliminary Results

2014 Yields

- Cover crop biomass yields were similar across treatments & drainage
- No significant differences were observed between soybean yields for check & gypsum plots for all drainage
- Not enough soil water to hold back so controlled drainage = free drainage