



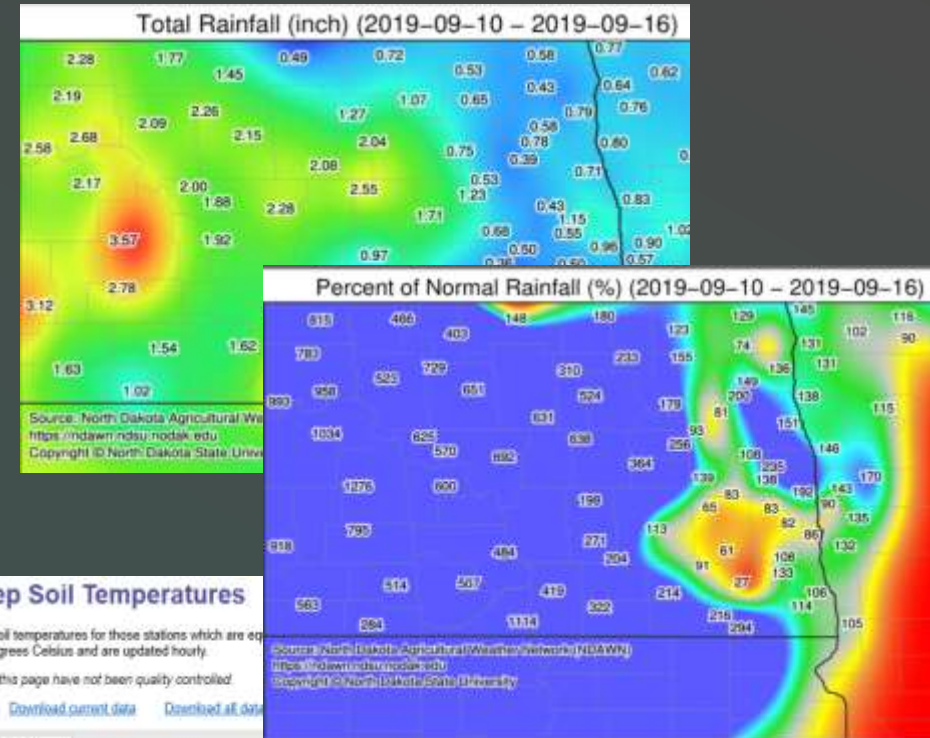
# Problem

- When inclement weather strikes, local governments impose weight restrictions on gravel roads that prohibit the movement of oilfield truck traffic until road conditions improve



# Solution

- Provide accurate weather information to assist road managers to precisely identify roads that require temporary weight restrictions and exclude those that do not.
- Provide weather forecasts to assist planning operations



## Current Deep Soil Temperatures

This page shows deep soil temperatures for those stations which are equipped with probes. Values are in degrees Celsius and are updated hourly.

Disclaimer: The data on this page have not been quality controlled.

[Switch to metric units](#) [Download current data](#) [Download all data](#)

Table		Graph														
Station	Last Updated	5 cm (2 in)	10 cm (4 in)	20 cm (8 in)	30 cm (12 in)	40 cm (16 in)	50 cm (20 in)	60 cm (24 in)	80 cm (31 in)	100 cm (39 in)	125 cm (49 in)	150 cm (59 in)	175 cm (69 in)	200 cm (79 in)	225 cm (89 in)	
Adams	17 Sep 21:00 CDT	66 °F	65 °F	63 °F	60 °F	58 °F	57 °F	56 °F	55 °F	54 °F	53 °F	52 °F	52 °F	51 °F	50 °F	
Amidon	17 Sep 21:00 CDT	67 °F	67 °F	65 °F	63 °F	62 °F	61 °F	61 °F	60 °F	59 °F	59 °F	58 °F	57 °F	56 °F	55 °F	
Botineau	17 Sep 21:00 CDT	63 °F	62 °F	60 °F	58 °F	57 °F	57 °F	56 °F	56 °F	55 °F	54 °F	54 °F	53 °F			
Bowman	17 Sep 21:00 CDT	65 °F	65 °F	65 °F	64 °F	62 °F	62 °F	61 °F	59 °F	59 °F	58 °F	57 °F	56 °F	55 °F	54 °F	
Canington	17 Sep 21:00 CDT	68 °F	67 °F	65 °F	63 °F	61 °F	60 °F	59 °F	58 °F	57 °F	57 °F	56 °F	56 °F			
Courtenay	17 Sep 21:00 CDT	75 °F	75 °F	73 °F	69 °F	66 °F	64 °F	62 °F	61 °F	60 °F	59 °F	59 °F	58 °F	57 °F	56 °F	
Crane Creek	17 Sep 21:00 CDT	64 °F	64 °F	65 °F	63 °F	61 °F	60 °F	59 °F	58 °F	57 °F	57 °F	56 °F	56 °F	55 °F	54 °F	
Croft	17 Sep 21:00 CDT	69 °F	67 °F	64 °F	62 °F	60 °F	59 °F	59 °F	58 °F	57 °F	56 °F	56 °F	55 °F	54 °F	53 °F	
Danhoff	17 Sep 21:00 CDT	68 °F	67 °F	65 °F	63 °F	61 °F	60 °F	59 °F	57 °F	57 °F	56 °F	55 °F	54 °F	53 °F	52 °F	
Dickinson	17 Sep 21:00 CDT	68 °F	67 °F	65 °F	64 °F	63 °F	62 °F	61 °F	60 °F	60 °F	59 °F	58 °F	58 °F			
Epping	17 Sep 21:00 CDT	65 °F	64 °F	62 °F	60 °F	59 °F	59 °F	58 °F	57 °F	57 °F	56 °F	56 °F	55 °F	54 °F	54 °F	



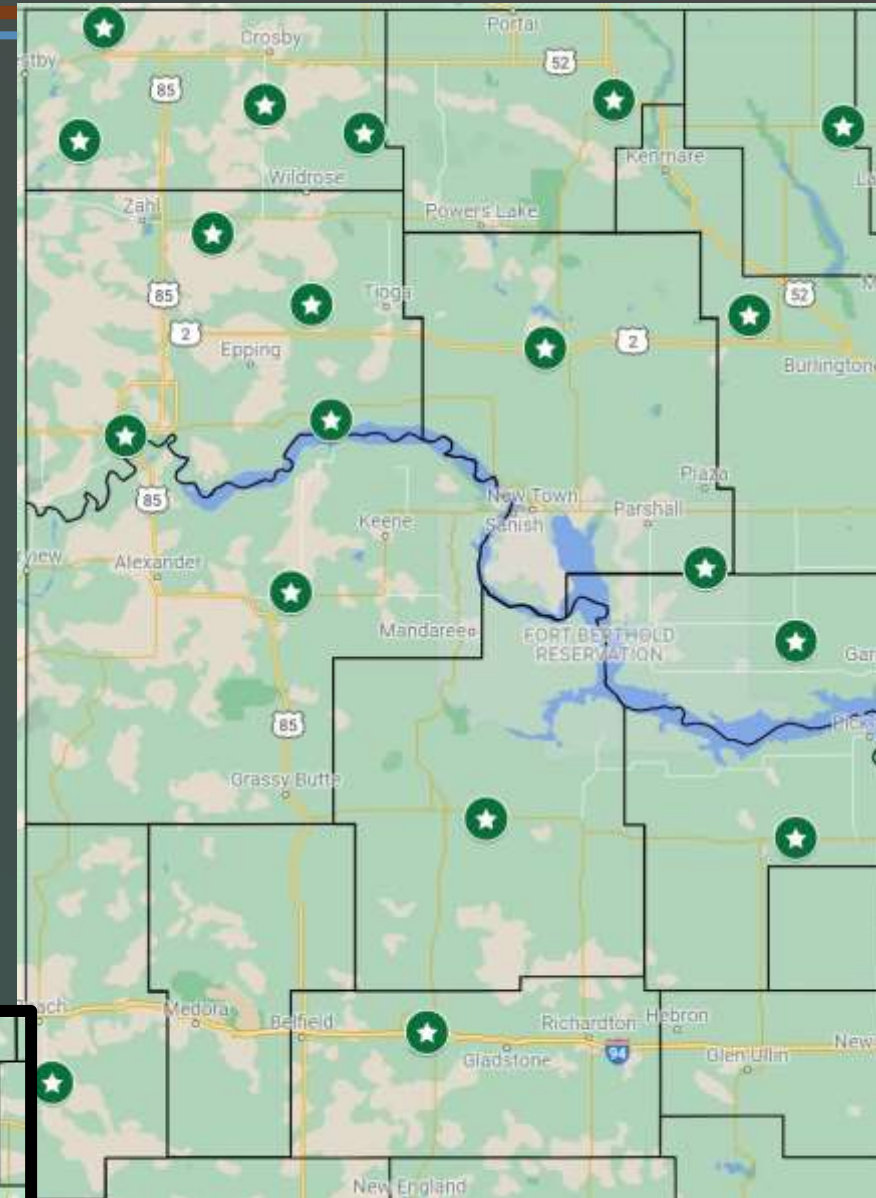
# Wise Roads Project

- Expand the existing NDAWN network in oil producing counties
- Use high-density weather data, particularly rainfall, to precisely place weight restrictions
- Maximize benefit by working with research partners, agriculture, and industry

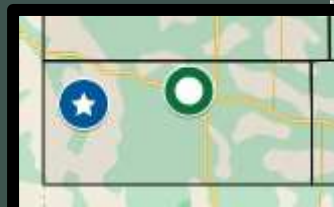


# Spring 2019 NDAWN Stations

- 8 total weather stations in “Big Four” Counties
- McKenzie and Dunn County each only had 1 station
- >40 miles between some stations



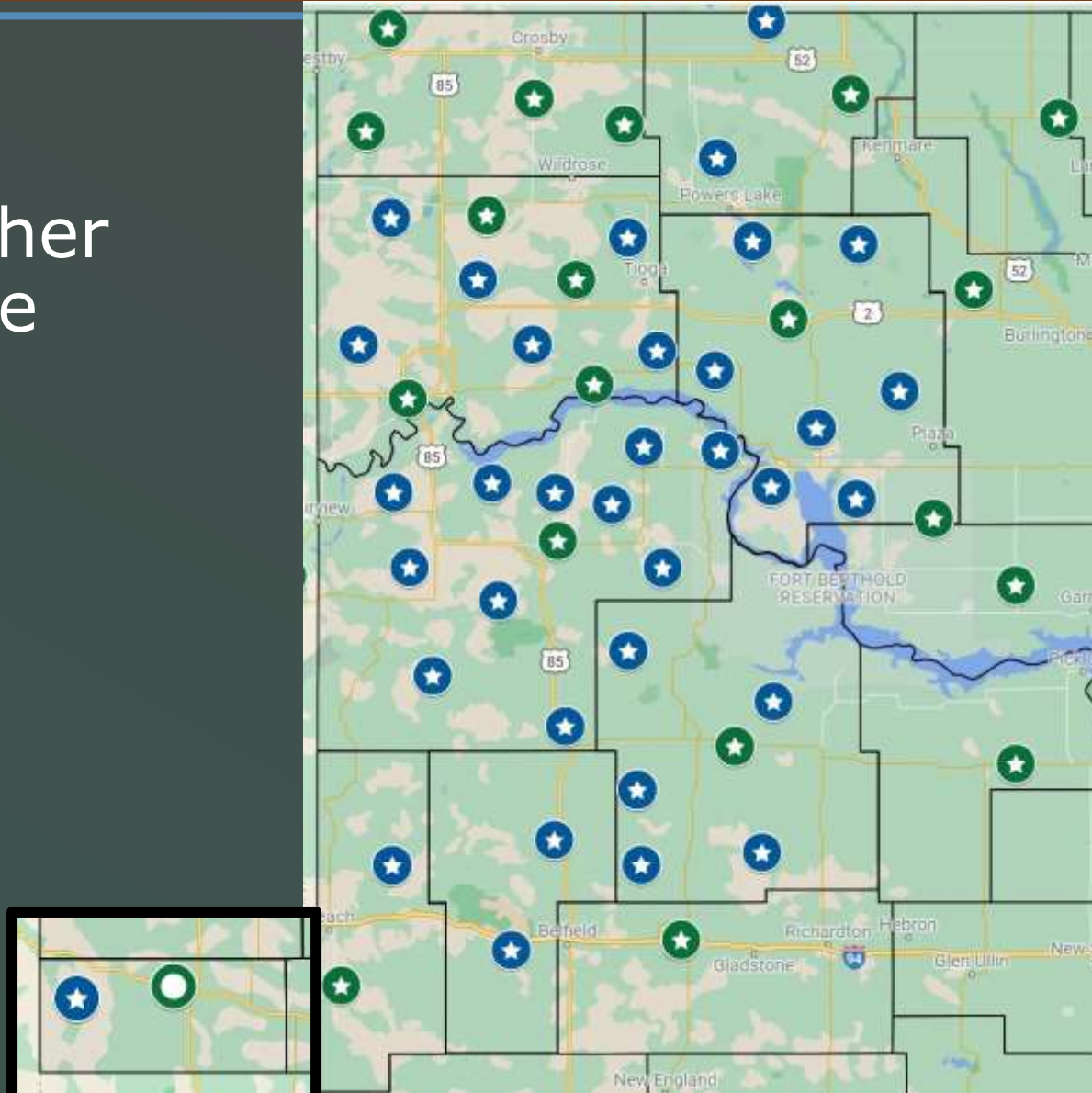
Bowman  
County



# Current NDAWN Stations

- 35 additional full-instrumentation weather stations installed since June 2019

Bowman  
County

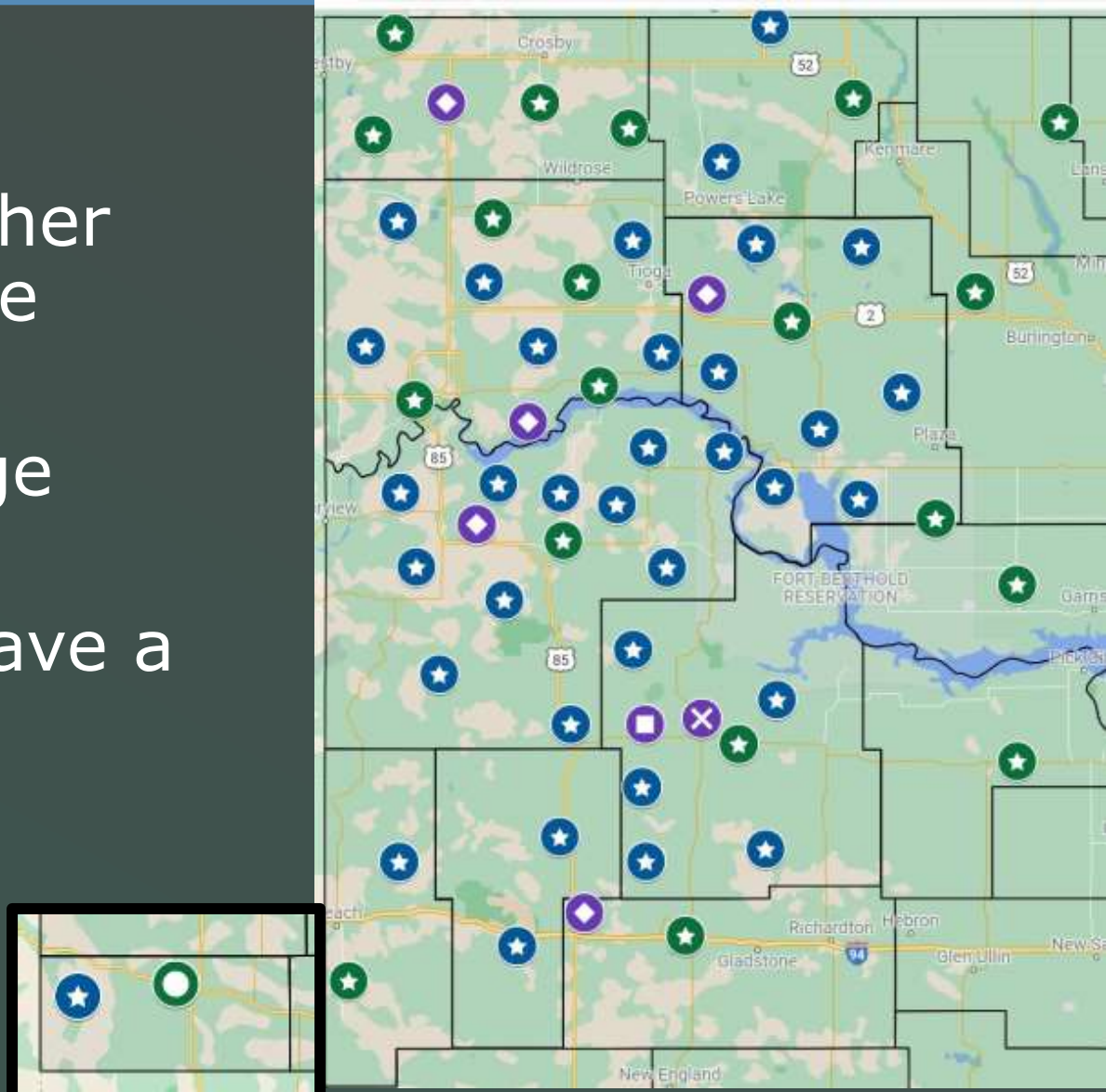




# Current NDAWN Stations

- 35 additional full-instrumentation weather stations installed since June 2019
- 7 additional rain gauge only sites
- “Big Four” counties have a total of 42 stations
- ~12 mile spacing

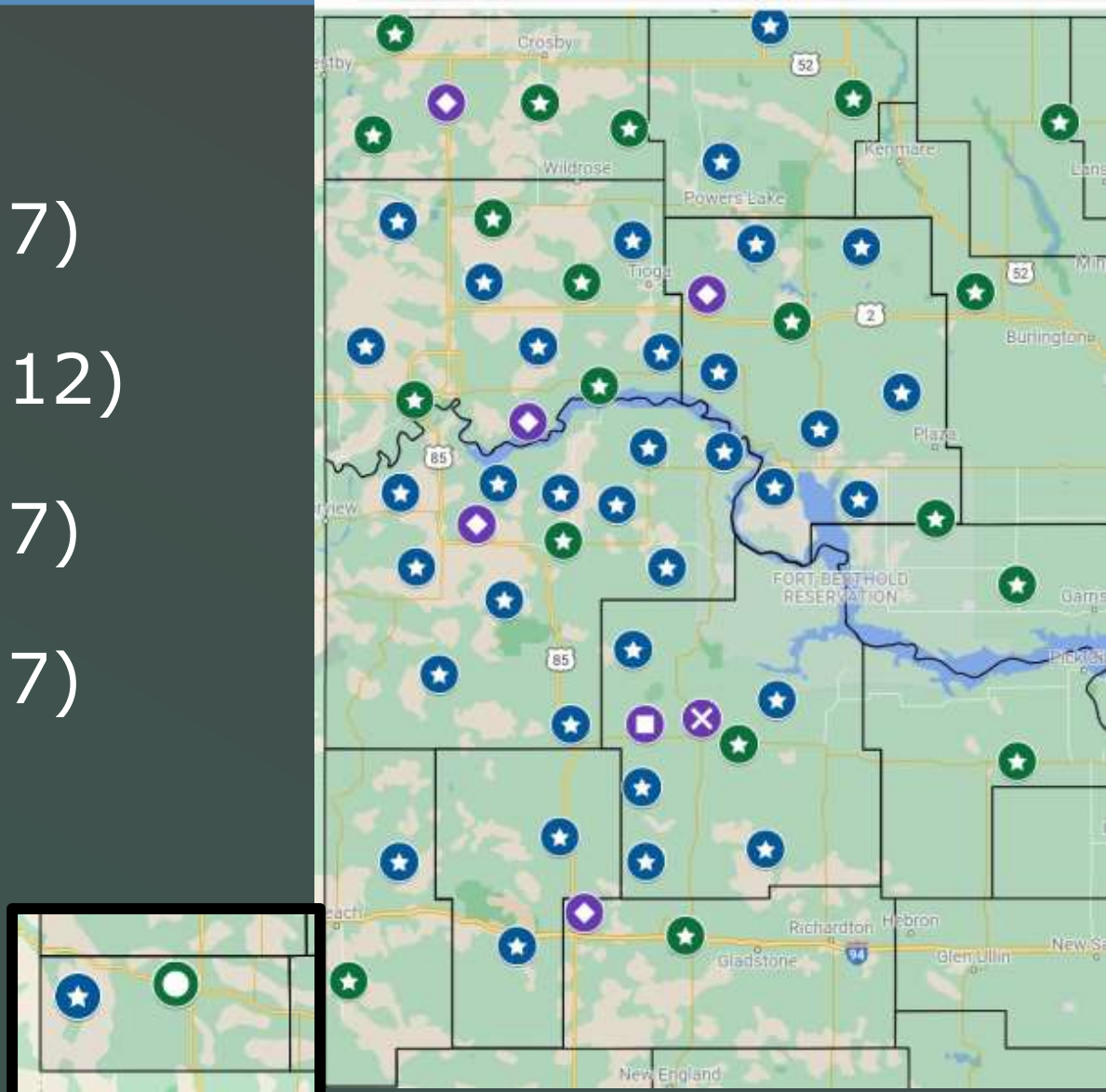
Bowman  
County



# Current NDAWN Stations

- Dunn: 8 (+7)
- McKenzie: 13 (+12)
- Mountrail: 10 (+7)
- Williams: 11 (+7)

Bowman  
County

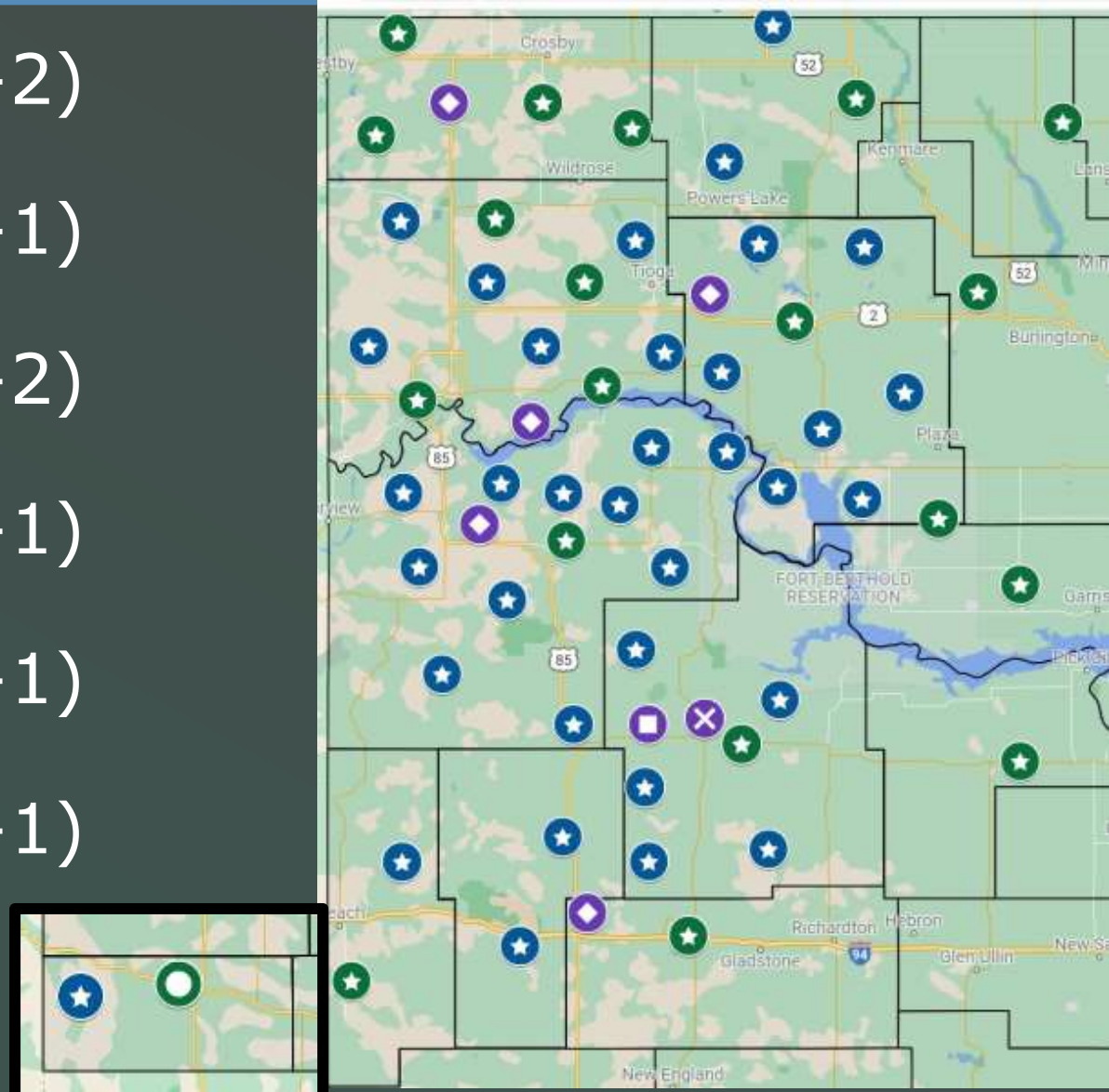




# Current NDAWN Stations

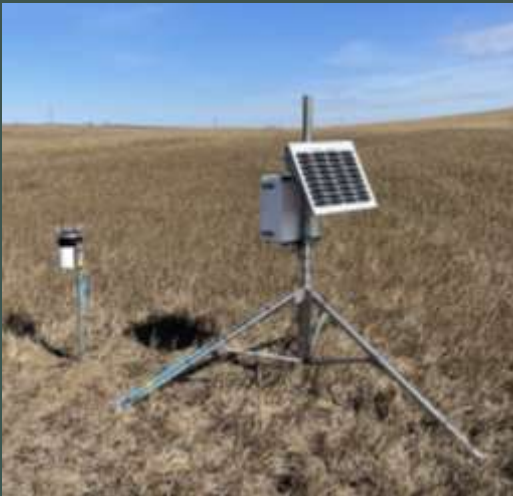
- Billings: 2 (+2)
- Bowman: 2 (+1)
- Burke: 3 (+2)
- Divide: 5 (+1)
- Golden Valley: 2 (+1)
- Stark: 2 (+1)

Bowman  
County

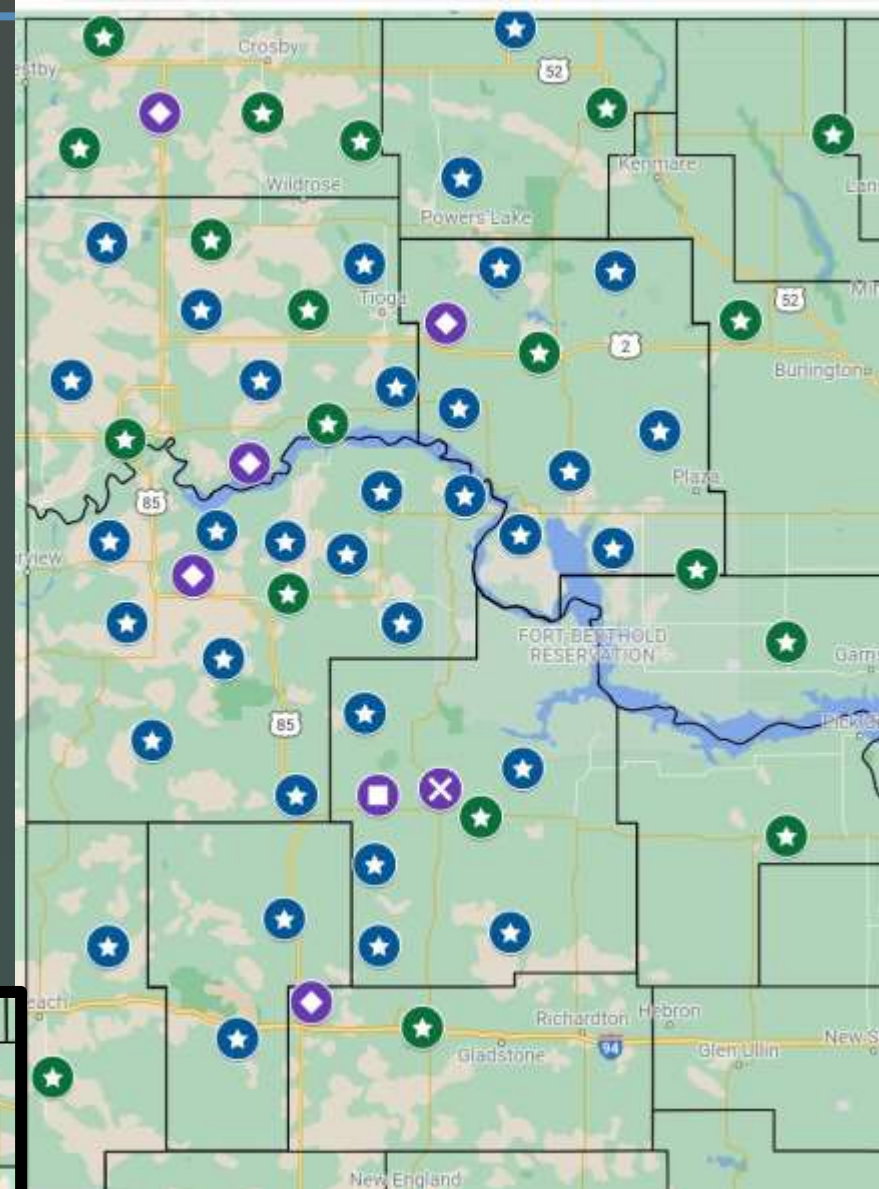
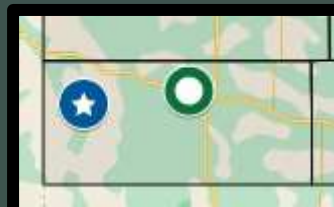


# Wise Roads: Phase 4

- Still working to add additional rain gauge only sites
- If connected to AC power can measure snow & sleet



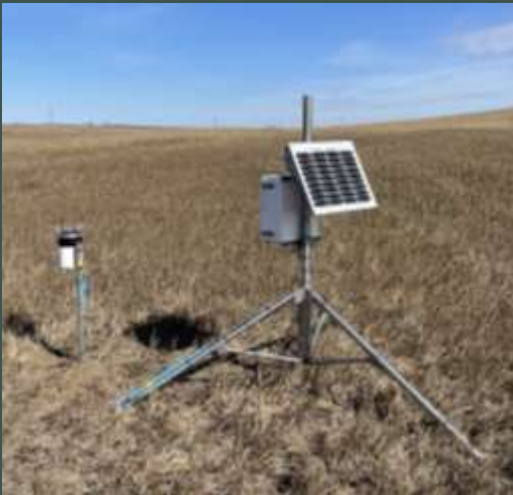
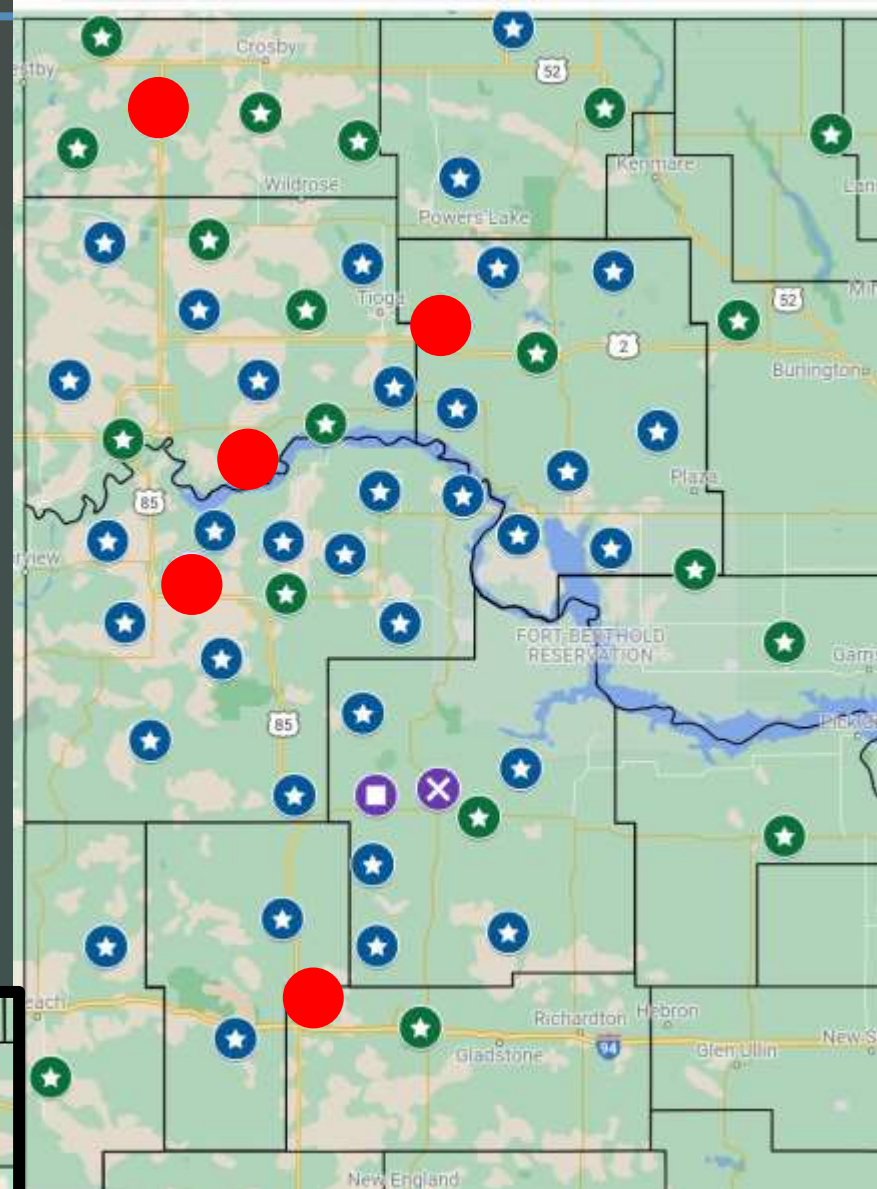
Bowman  
County





# Wise Roads: Phase 4

- 5 Wise Roads stations connected to AC Power
- 1 in each Mountrail, Divide, Williams, Stark, McKenzie



Bowman  
County



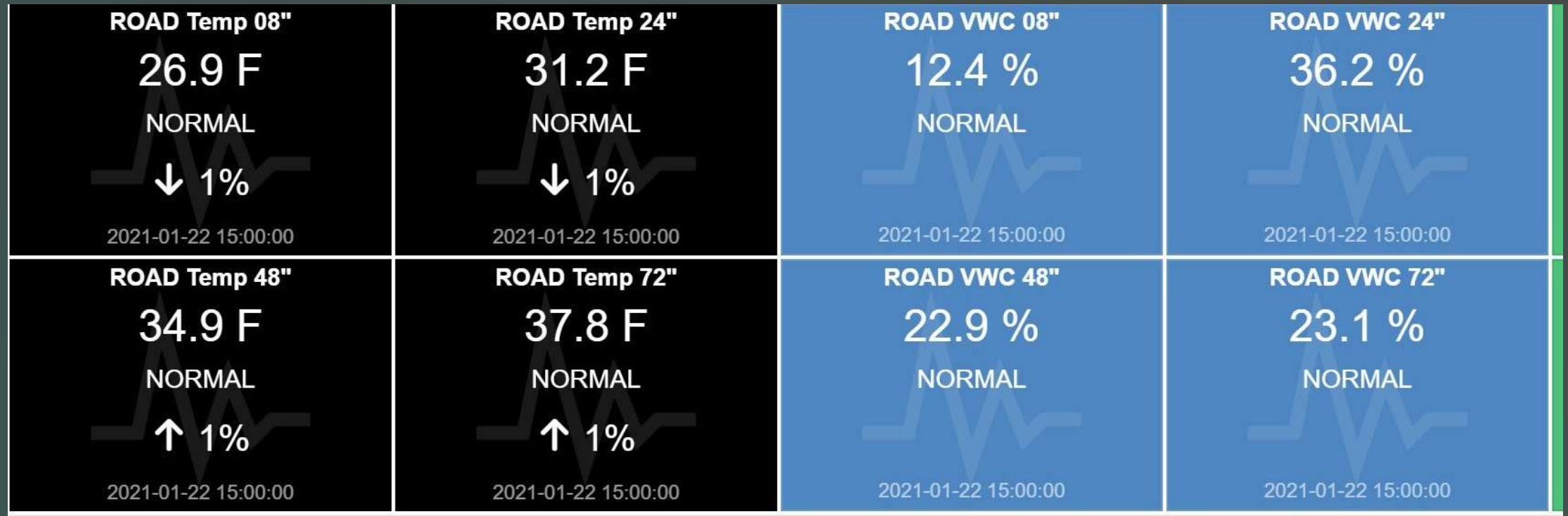
# Road Temperature & Moisture Probes

- Installed at three locations
- Probes installed at 4 depths: 6-8", 24", 48", 72" from surface
- Temperature and volumetric water content (VWC) measured at each depth
- Used for monitoring frost depth and moisture infiltration



# Road Temperature & Moisture Probes

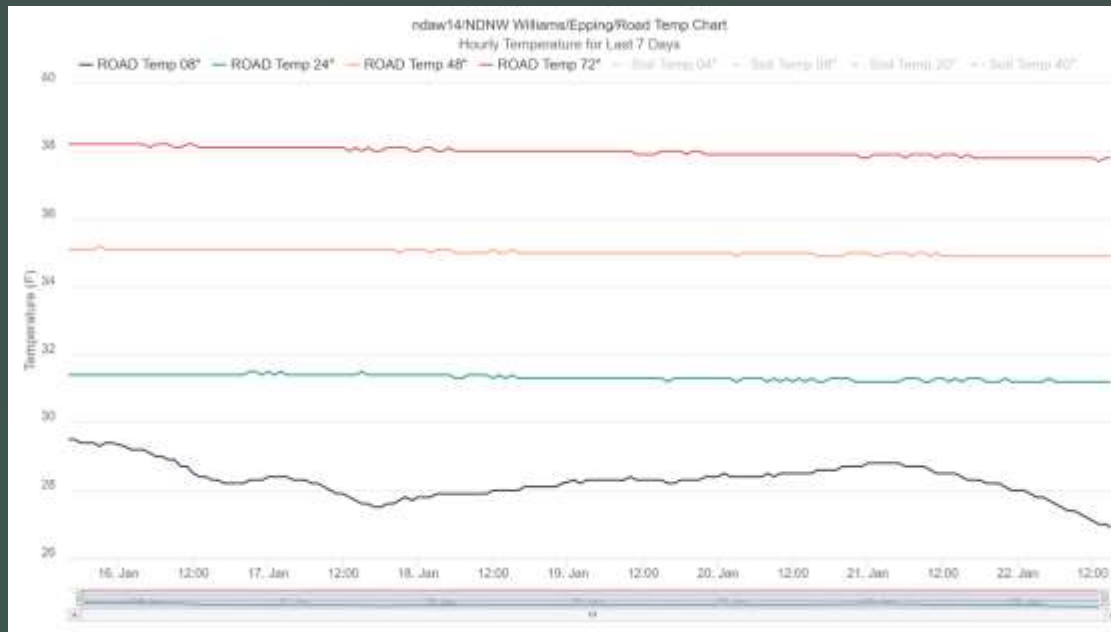
- Current Temperature and Moisture Data



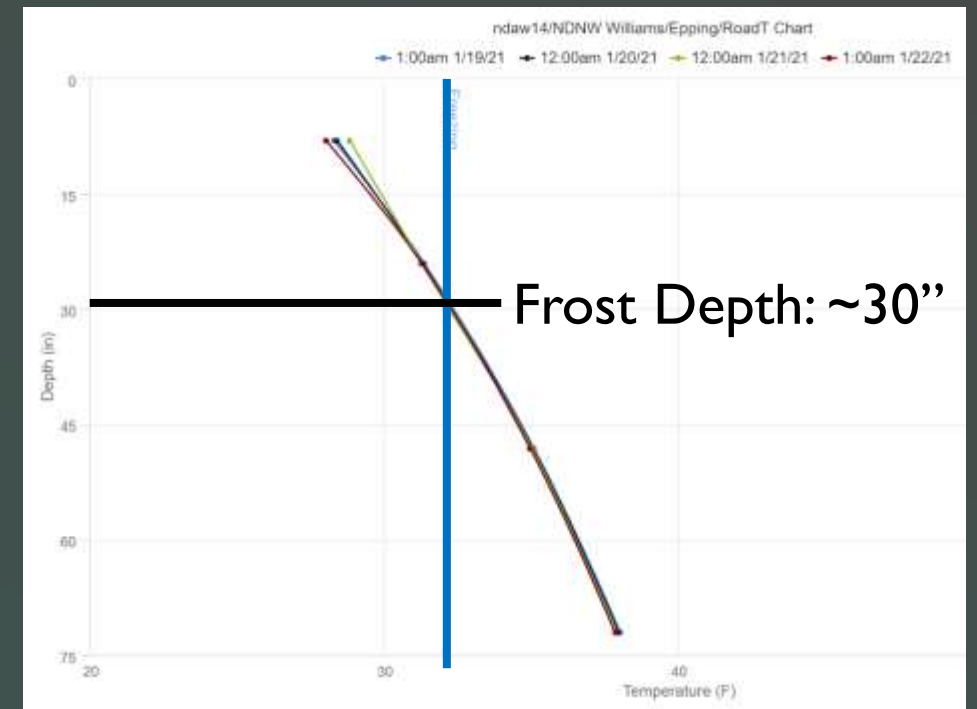
# Road Temperature & Moisture Probes

- Temperature data charts

## 7 Day Temperature Chart



## Temperature Profile





# Live Video Streaming

- Available on PC/Mac and mobile devices
- Live video with Pan/Tilt/Zoom capability



# Rainfall Notifications

- Road managers receive email/text notifications when daily rainfall thresholds are reached
- Each county can set unique thresholds



## NDSW Dunn/Hirschville/Campbell PakBus Logger/RG Active Daily Total

Hirschville: .75" Daily Rain

Current value is 0.76 in [0.75" Rain]

Login

or visit this link:

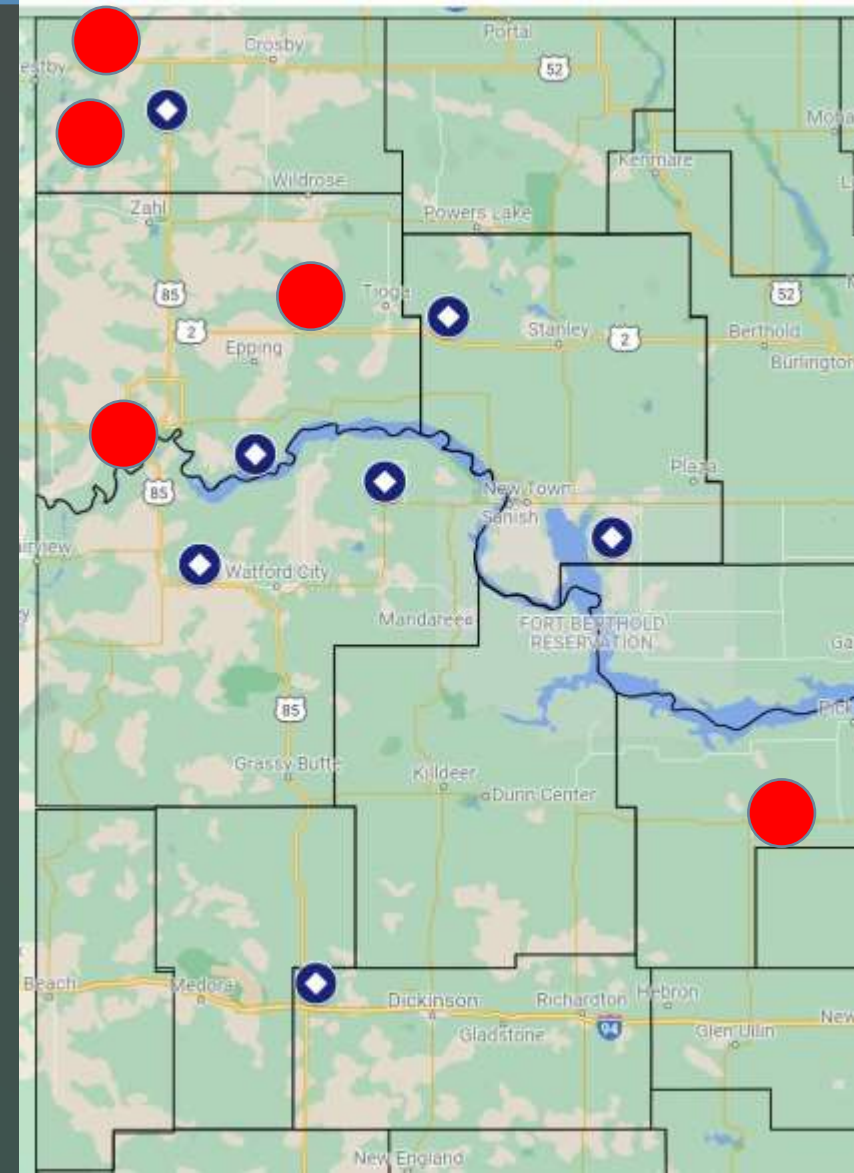
[https://ndawn.eagle.io/ui/ndaw14/NDSW\\_Dunn/Hirschville/Campbell\\_PakBus\\_Logger/RG\\_Active\\_Daily\\_Total](https://ndawn.eagle.io/ui/ndaw14/NDSW_Dunn/Hirschville/Campbell_PakBus_Logger/RG_Active_Daily_Total)

A map of North Dakota showing its 53 counties. The map is color-coded into three regions: a green region in the west, a light green region in the center, and a light gray region in the east. Major water bodies, including Lake Sakagawi, Lake Renville, and Lake Tostee, are shown in blue. The counties are labeled with their names: Divide, Burke, Renville, Bottineau, Rolette, Cavalier, Pembina, Williams, Mountrail, Ward, Mc Henry, Pierce, Towner, Benson, Ramsey, Walsh, Grand Forks, Nelson, Eddy, Griggs, Steele, Traill, Wells, Foster, Sheridan, Mercer, Dunn, Mc Kenzie, Billings, Stark, Oliver, Burleigh, Kidder, Stutsman, Barnes, Cass, Golden Valley, Morton, Burleigh, Kidder, Stutsman, Barnes, Cass, Slope, Hettinger, Grant, Emmons, Logan, La Moure, Bowman, Adams, Sioux, Mc Intosh, Dickey, Ransom, Sargent, and Richland.



# Missouri River Basin Project Update

- 4 additional all-season precipitation gauges were installed in the region
- Keene & Grassy Butte stations expected to be upgraded in 2022
- Snow depth sensors



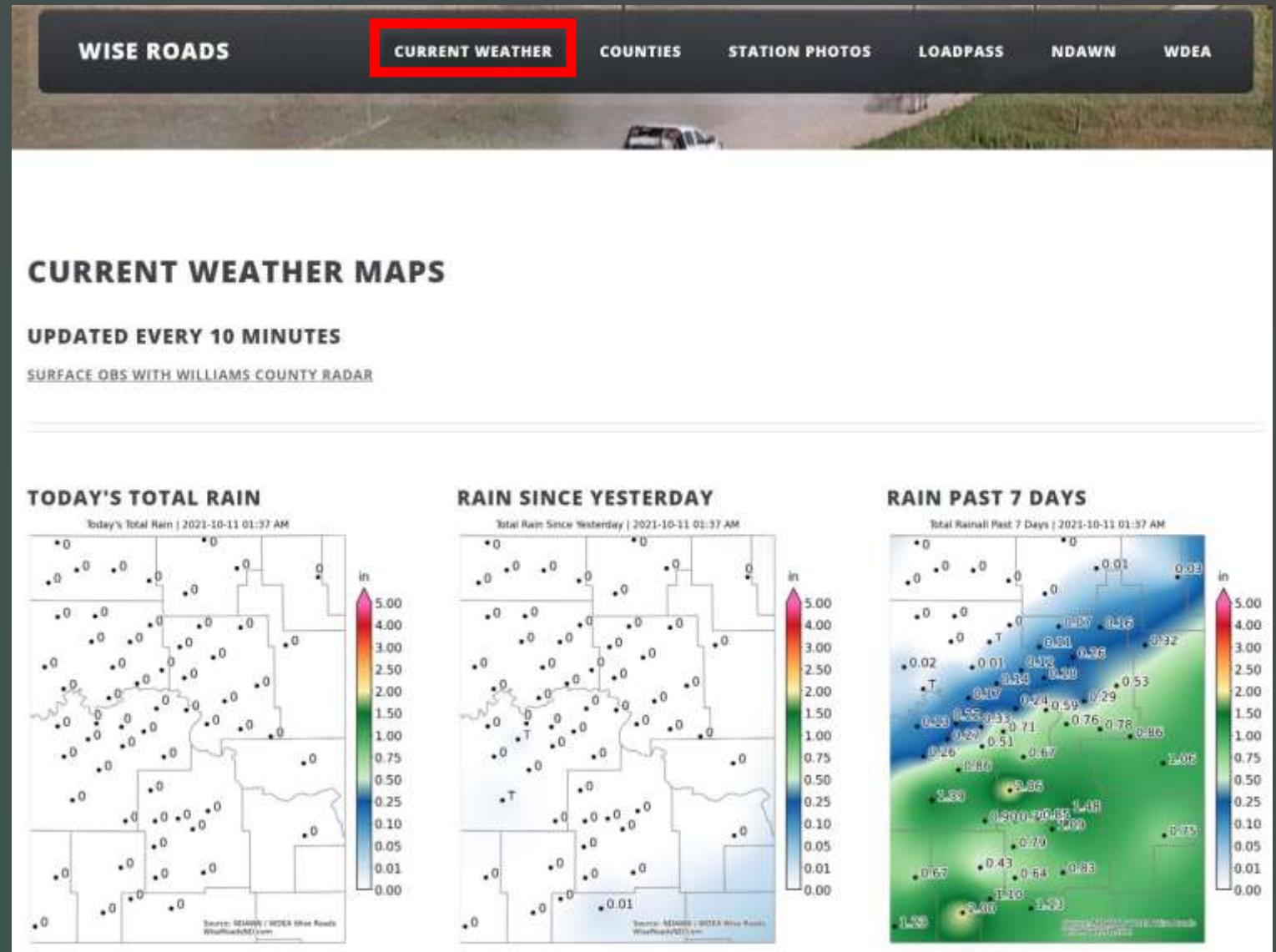
# Weather Data Resources

- WiseRoadsND.com
  - ❑ Current weather maps of western ND
  - ❑ Most recent camera images
  - ❑ Links to each station's individual data
- NDAWN Website (NDAWN.org)
  - ❑ Rain gauge only stations not available
- NDAWN Inversion App
- NDDOT Roads Map
  - ❑ Website & App



# WiseRoadsND.com – Current Weather

- 1-, 2-, & 7-Day rain totals
- Current temp & wind
- Today's max & min temp
- Today's Peak wind gust





# WiseRoadsND.com – Counties

- Maps showing all stations in the county
- Links to weather and soil data
- Latest camera images
- Road probe data

**WISE ROADS**    **CURRENT WEATHER**    **COUNTIES**    **STATION PHOTOS**    **LOADPASS**    **NDAWN**    **WDEA**

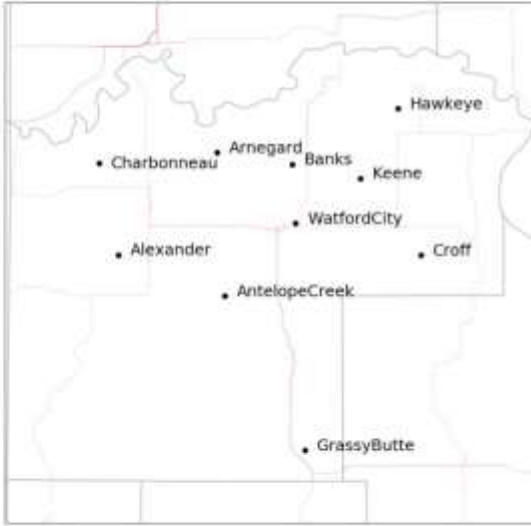
**MCKENZIE COUNTY**  
[MCKENZIE COUNTY RAIN DASHBOARD](#)

**WEATHER DATA**

<a href="#">Alexander</a>
<a href="#">Antelope Creek</a>
<a href="#">Arnegard</a>
<a href="#">Banks</a>
<a href="#">Charbonneau</a>
<a href="#">Croff</a>

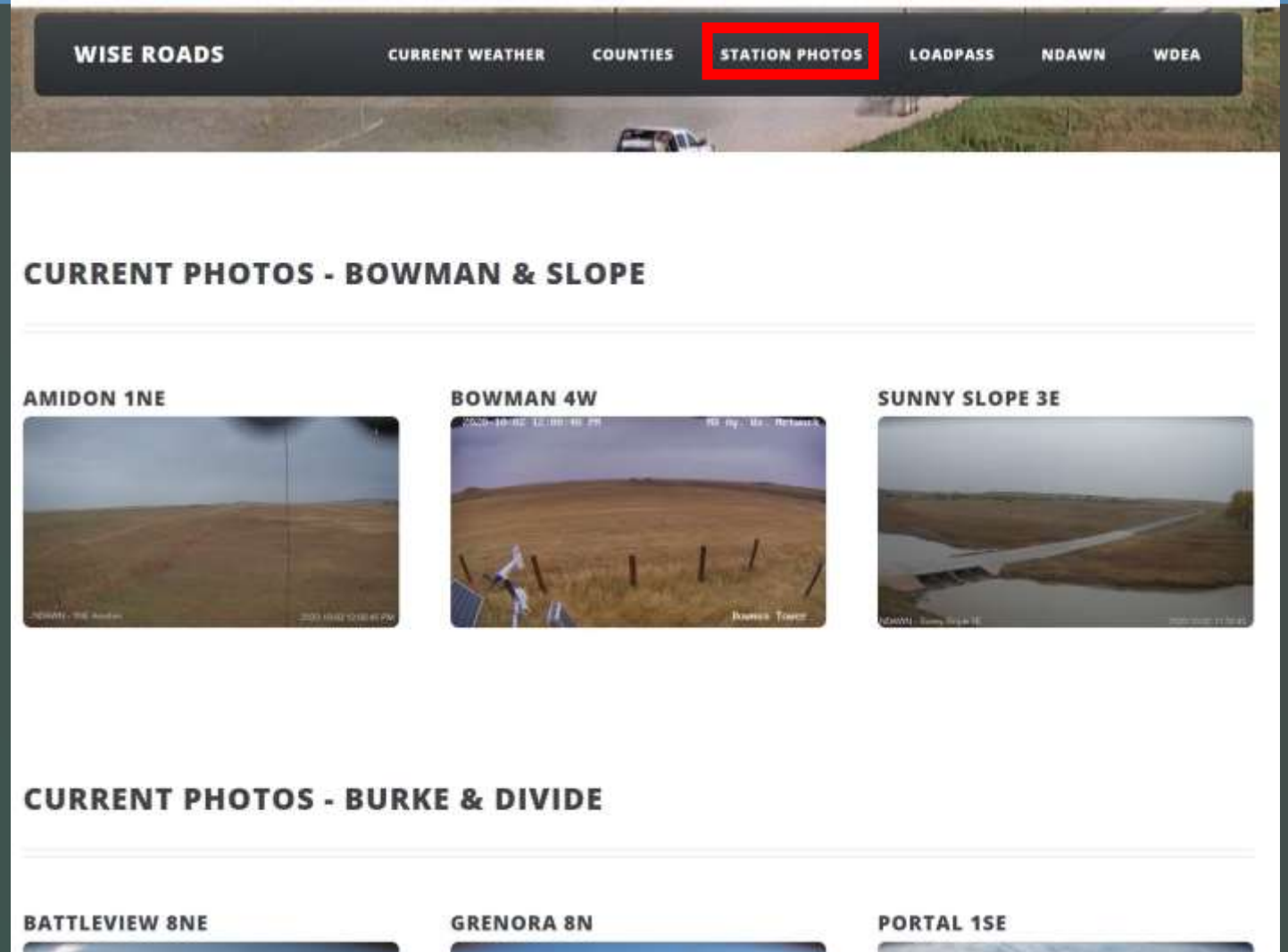
**SOIL DATA**

<a href="#">Antelope Creek</a>
<a href="#">Arnegard</a>
<a href="#">Charbonneau</a>
<a href="#">Croff</a>



# WiseRoadsND.com – Station Photos

- Latest camera images sorted by county
- All images are in HD and downloadable





# Contact Info:

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701-629-5181

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[Jonathan@ndenergy.org](mailto:Jonathan@ndenergy.org)



NDAWN -- Rat Lake 4NW

2020-02-18 04:47:55 PM





# WiseRoadsND.com

**WISE ROADS**

**CURRENT WEATHER**

**COUNTIES**

**STATION PHOTOS**

**LOADPASS**

**NDAWN**


**WDEA**

**WEATHER INFORMATION SYSTEM TO EFFECTIVELY  
REDUCE OILFIELD DELAYS AND DISRUPTION**

**DEVELOPED BY WDEA IN PARTNERSHIP WITH NDAWN AND NDLTAP**

**WEATHER STATION MAP**

# NDAWN.org – Current Weather



NDSU   NDSU Agriculture   NDSU School of Natural Resource Sciences

NDAWN » Current weather

NDAWN

HELP

WEATHER DATA

Current

Hourly

Daily

Weekly

Monthly

Yearly

NWS Daily Normals

NWS Monthly Normals

Monthly Report

Deep Soil Temperatures

Soil Moisture

APPLICATIONS

ACCOUNT

## Current Weather

Show Information

Table   Map

☒ Show data from additional heights

Current																		
Station	Ag District	Last Updated	Air Temp	Wind Chill	Wind Dir	Wind Speed	Peak Gust	Rel Hum	Dew Point Temp	Est. Wet-bulb Temp	Est. ΔT	Inversion 9/1.5 m	Inversion 3/1 m	Bare Soil Temp	Turf Soil Temp	Solar Rad	Sea-level Baro Press	
<a href="#">Ada 1N</a>	MN-NW	● 12 Dec 13:35 CST	5°	-3°	NW ↙	3 mph	4 mph	82 %	1°	4°	1°	---	-1.9°	33°	33°	253 W/m²	---	
<a href="#">Adams 5N</a>	ND-NE	● 12 Dec 13:35 CST	2°	-8°	ENE ↗	4 mph	5 mph	85 %	-2°	1°	1°	0.1°	-0.3°	25°	30°	288 W/m²	1029.1 mb	
<a href="#">Alamo 2S</a>	ND-NW	● 12 Dec 13:35 CST	12°	-1°	SSE ↘	9 mph	12 mph	85 %	9°	11°	1°	---	-0.2°	28°	28°	235 W/m²	---	
<a href="#">Amidon 1NE</a>	ND-SW	● 12 Dec 13:35 CST	26°	16°	SSE ↘	9 mph	11 mph	86 %	22°	25°	1°	-1.7°	-0.9°	32°	33°	189 W/m²	1016.6 mb	
<a href="#">Arnegard 9N</a>	ND-WC	● 12 Dec 13:30 CST	14°	4°	SE ↘	6 mph	8 mph	90 %	11°	13°	1°	---	-0.3°	25°	30°	118 W/m²	---	
<a href="#">Baker 1N</a>	ND-NC	● 12 Dec 13:35 CST	3°	-17°	ESE ↘	14 mph	17 mph	83 %	-2°	2°	1°	---	-0.4°	32°	33°	180 W/m²	1019.7 mb	
<a href="#">Beach 9S</a>	ND-SW	● 12 Dec 13:35 CST	22°	11°	SE ↘	8 mph	12 mph	94 %	20°	21°	1°	---	-0.2°	32°	32°	288 W/m²	1019.5 mb	
<a href="#">Becker 1W</a>	MN-C	● 12 Dec 13:35 CST	13°	3°	N ↑	5 mph	7 mph	79 %	8°	12°	1°	---	-0.6°	33°	33°	147 W/m²	---	
<a href="#">Berthold 5NW</a>	ND-NW	● 12 Dec 13:35 CST	8°	-5°	SE ↘	7 mph	10 mph	85 %	4°	7°	1°	---	-0.2°	27°	28°	246 W/m²	---	
<a href="#">Bottineau 14W</a>	ND-NC	● 12 Dec 13:35 CST	5°	-13°	SE ↘	13 mph	16 mph	80 %	0°	4°	1°	---	-0.3°	29°	29°	163 W/m²	1020.7 mb	
<a href="#">Boufella 1N</a>	ND-NW	● 12 Dec 13:35 CST	7°	0°	SE ↘	11 mph	14 mph	82 %	3°	8°	1°	---	-0.4°	32°	32°	150 W/m²	1019.3 mb	

# NDAWN.org – Current Weather

