



WISEROADS

A PROJECT OF WESTERN DAKOTA ENERGY ASSOCIATION



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Western Energy Roundtable
April 16, 2024



Wise Roads Current Weather Stations

- 36 full sensor array
- 8 rain gauge & night camera
- 4 rain gauge only



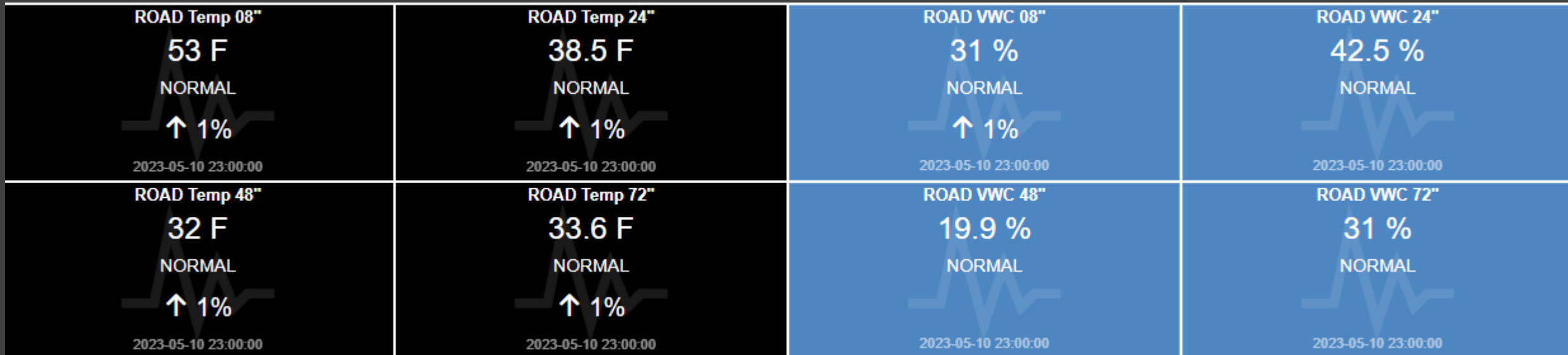
Road Temperature & Moisture Probes

- Installed at four 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

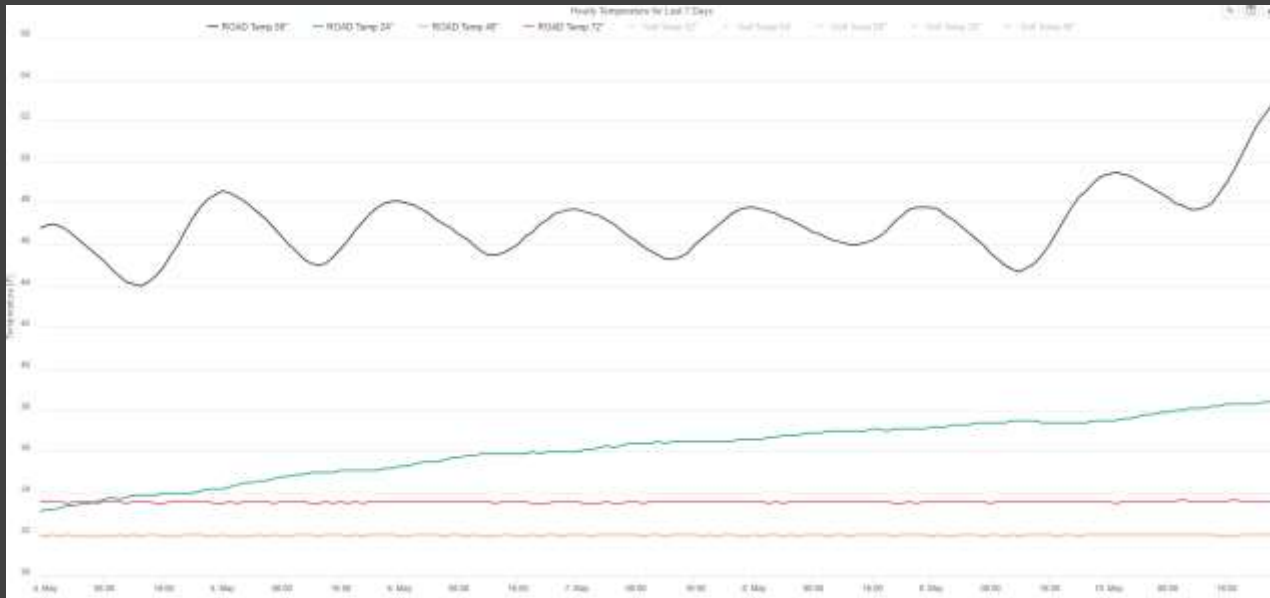
- Current Temperature and Moisture Data



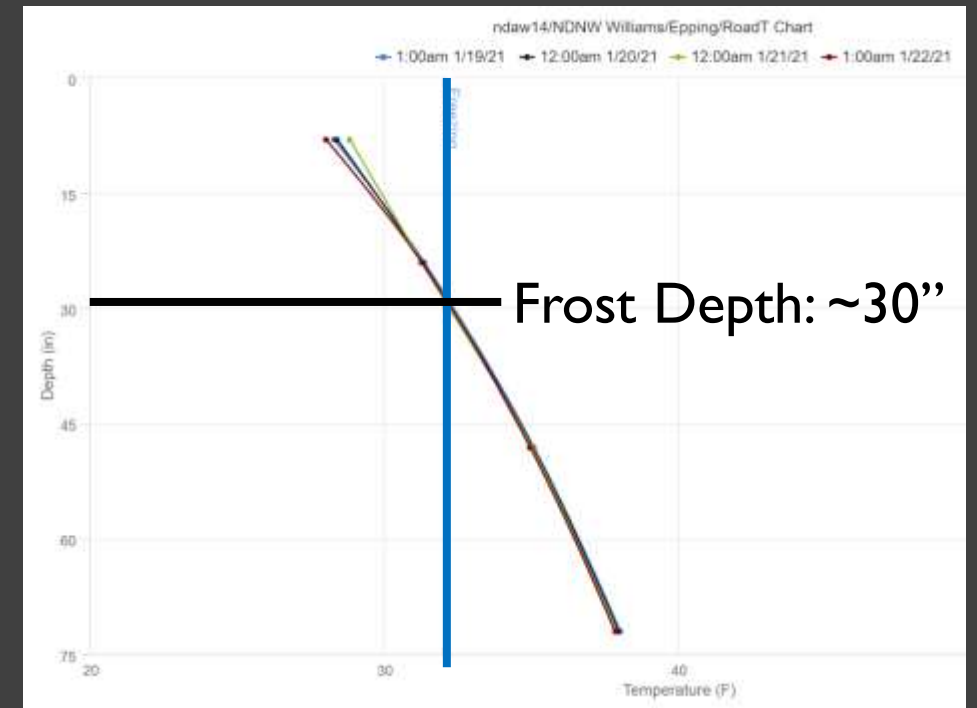
Road Temperature & Moisture Probes

- Temperature data charts

7 Day Temperature Chart



Temperature Profile



Banks – McKenzie County Road Probe Site



Banks Road Temp Data: Nov 1, 2021- May 31, 2022



Banks Road Temp Data: Nov 1, 2021- May 31, 2022

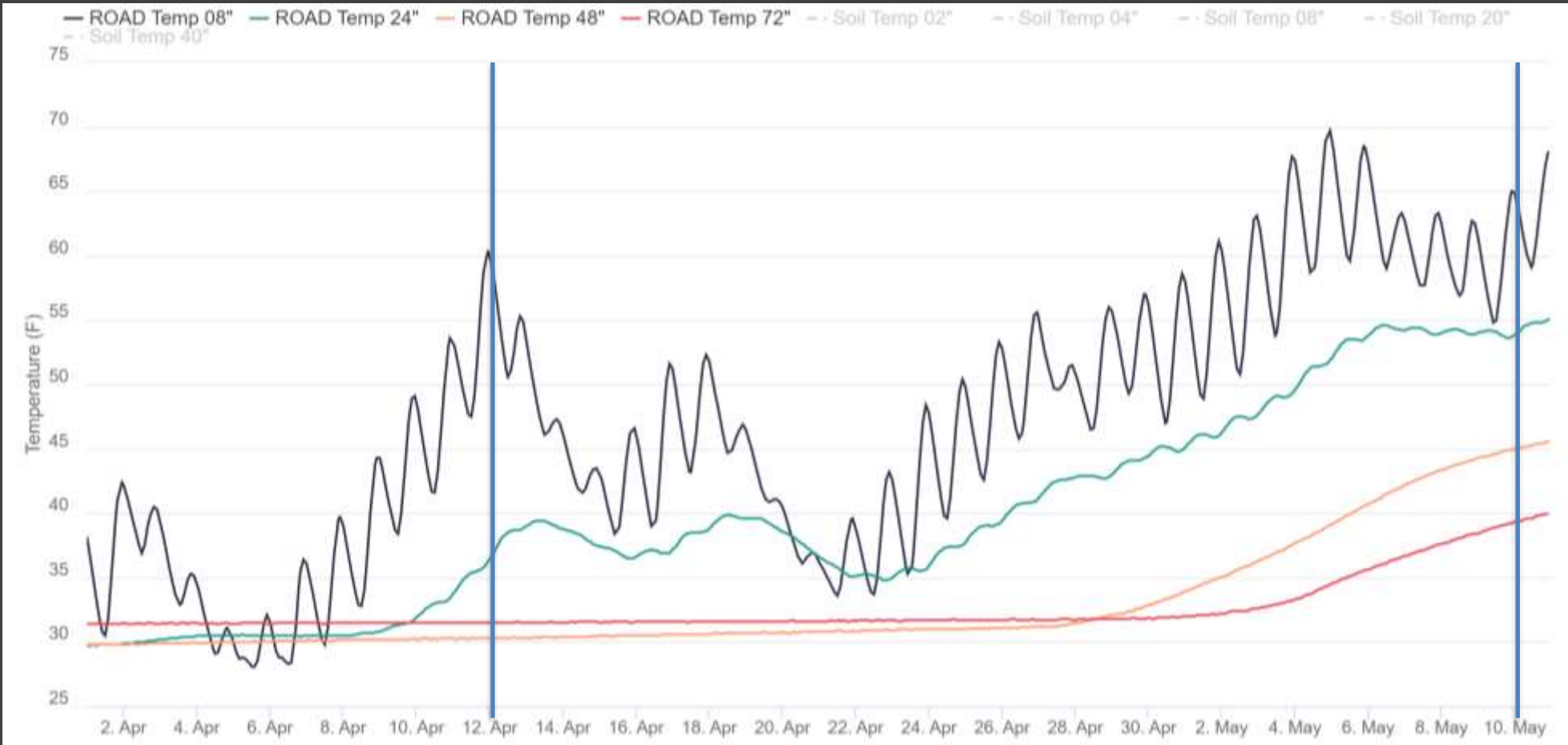


Banks Road Temp Data: Nov 1, 2022- May 10, 2023



McKenzie County Frost Law 2023

- April 12, 2023 – May 10, 2023



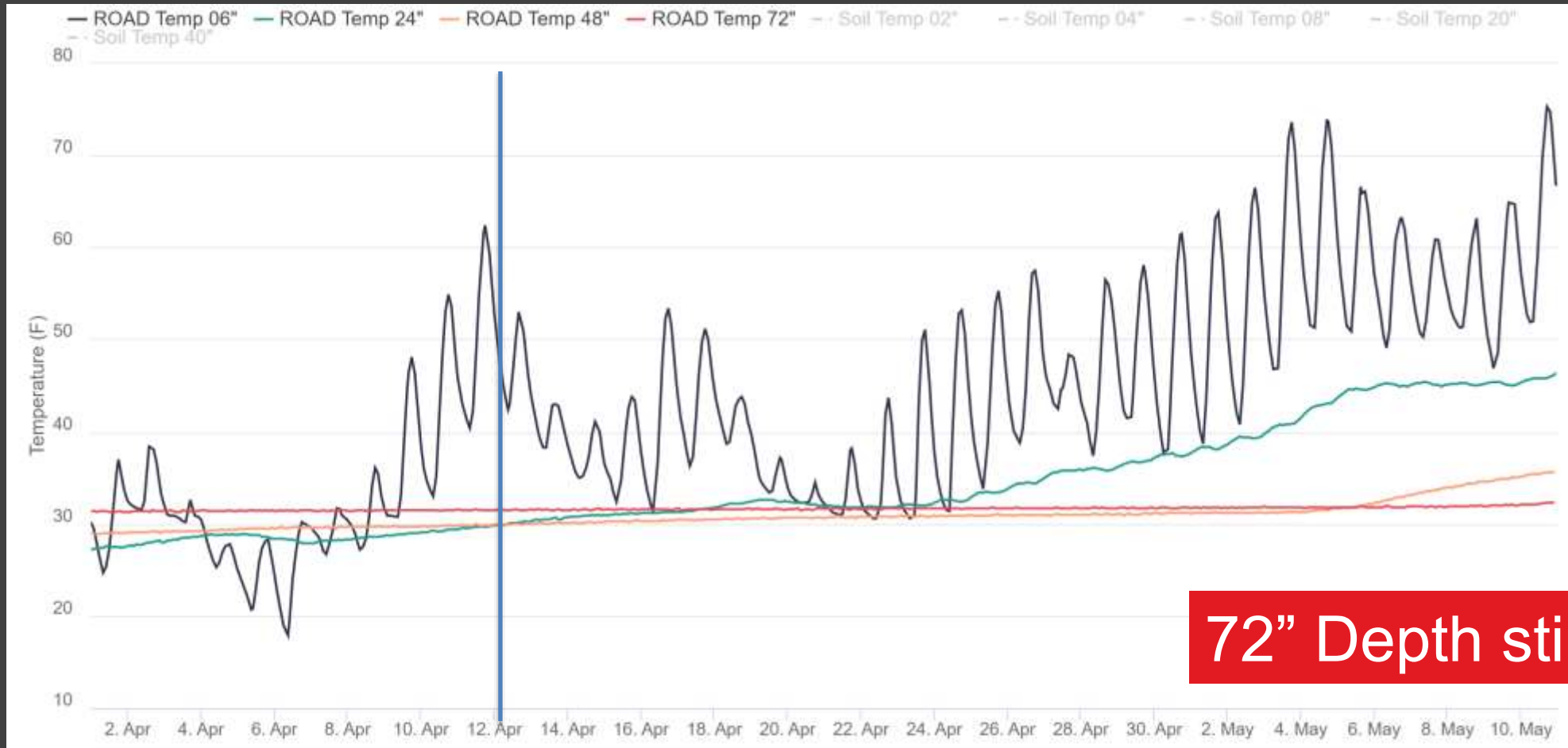
Dunn County Frost Law 2023

- April 10, 2023 – May 10, 2023



Mountrail County Frost Law 2023

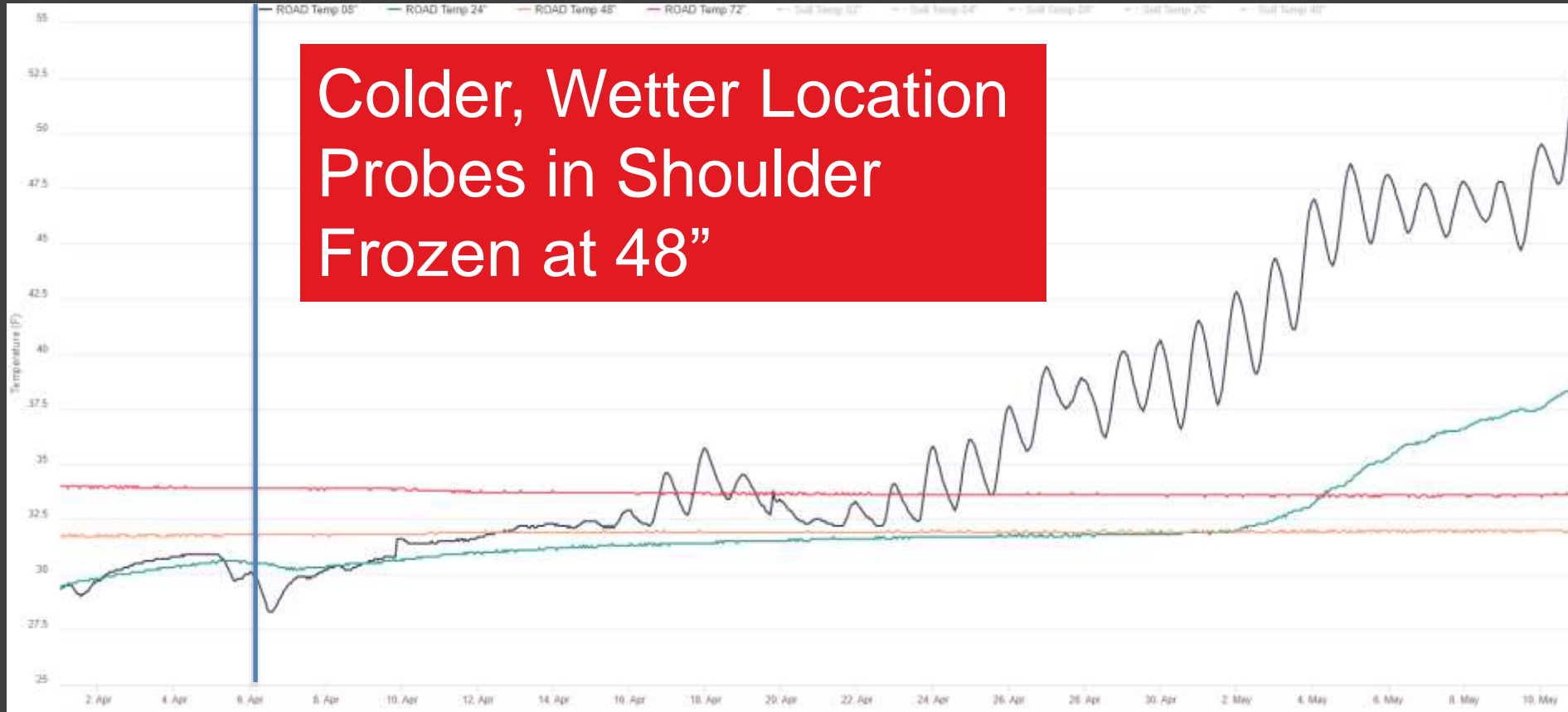
- April 12, 2023 -



72" Depth still 32°

Williams County Frost Law 2023

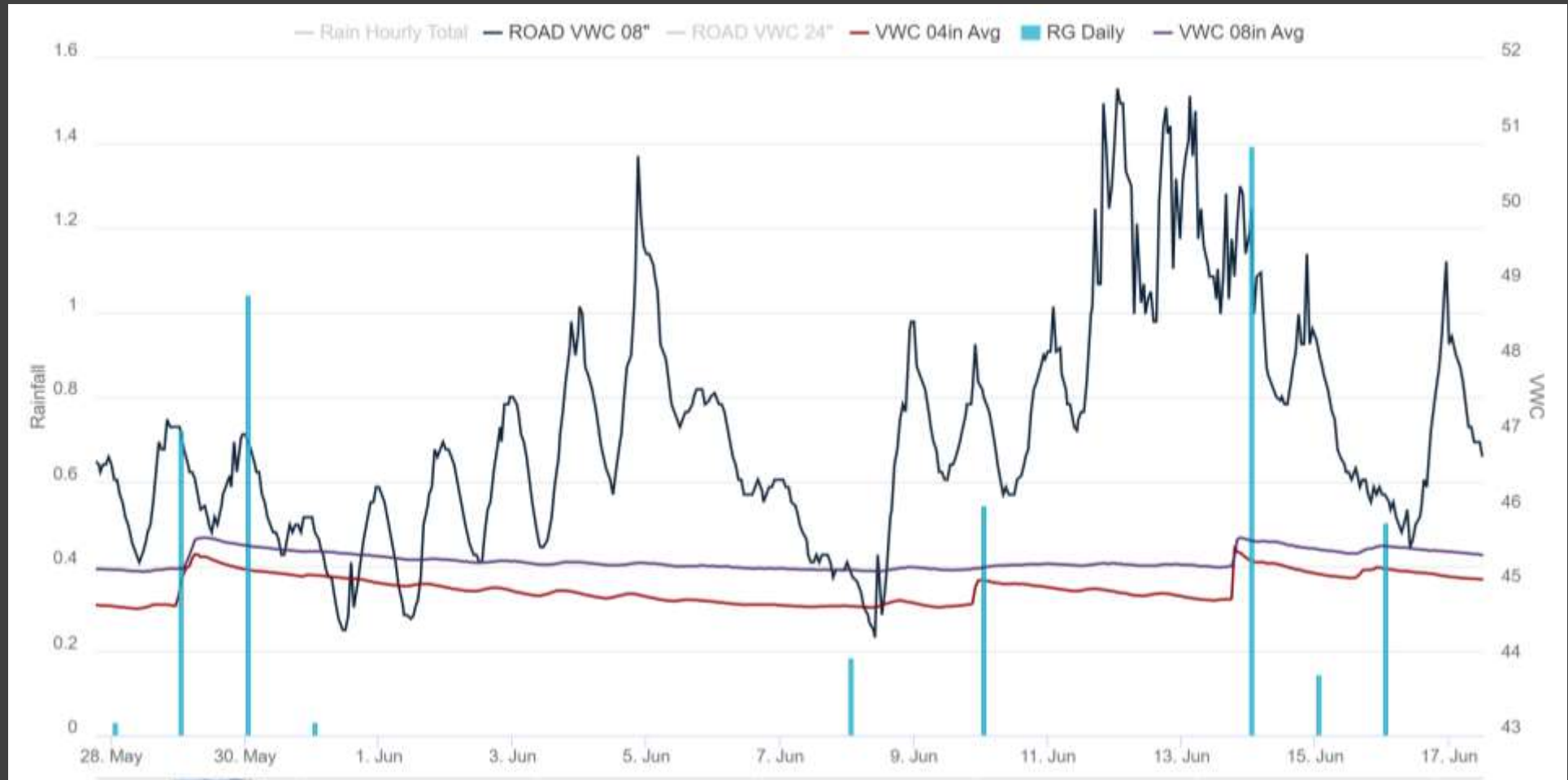
- April 6, 2023 -



Volumetric Water Content

- Measures within 3" of probe
- Does not work in frozen soil
- Salinity

Banks – Moisture Infiltration





THE WISE ROADS PROJECT

Wise Roads, as the name implies, is a project aimed at improving the efficiency of transportation associated with

WEATHER STATION MAP

• Fortuna	• Portal
Colgan	Rowhells

- Weather station map

WEATHER INFORMATION SYSTEM TO EFFECTIVELY REDUCE OILFIELD DELAYS AND DISRUPTION

DEVELOPED BY WDEA IN PARTNERSHIP WITH NDAWN AND NDLTAP

ROADS

WEATHER INFORMATION SYSTEM TO EFFECTIVELY REDUCE OILFIELD DELAYS AND DISRUPTIONS

...implies, is a project aimed at improving the efficiency of transportation associated with oil products and the service companies that support them depend on the use of county roads to move commodities and deliver supplies to and from well pads, tank batteries, and other industry facilities. However, when inclement weather strikes, local governments cannot effectively protect the movement of truck traffic and road conditions improve. Restrictions on the integrity of roads and the safety of the traveling public, but industry truckers (that at times restrictions were imposed more broadly than necessary.

...and provide additional, detailed, accurate weather information to county road managers. The Energy Association developed Wise Roads in partnership with the North Dakota Network (NDAWN) at NDSU. The project will ultimately deploy up to 50 weather grade throughout the oil-producing counties. Initial testing emphasis focused on the top four producers - Grant and Williams counties - but stations have also been installed in counties around the state. The goal of Wise Roads is to provide real-time weather information, especially allow county/ownership road managers to more precisely identify those roads that require it, and more importantly, exclude those that do not.

...gon, weather data was sparse across the Bakken. NDAWN had just eight weather stations in its closest to the core of the oil activity were near Hazen, Washburn City, Devils Lake, and Grand Forks. There was just one weather station in Cavalier, two in Mountrail County and four in Williams County. There are now 10 more County, and a total of 17 these stations in the other three counties. Other new stations have been installed in Bowman and Burke Counties.

...ts weather stations are equipped with high-resolution cameras, and are capable of measuring wind speed and direction, humidity, and air temperature and moisture. With the goal of installing Wise Roads weather stations in western North Dakota, the region is effectively covering temperature and wind speed and direction. However, there is still a benefit to a higher spatial density, and that is the focus of Phase IV of the regulatory work. But even when only a couple miles wide, and even in widespread rain events, often there are weather precipitation a few miles across. These rainfall events are easily missed with a 10 to 15

...er stations will also be in the gaps for rain data, but will be less expensive to install.

WEATHER STATION MAP



SUBSURFACE ROAD PROBES

Road Probes are installed in gravel roads adjacent to select Wise Roads Stations. These probes measure the temperature and moisture subsurface. Water Content at four depths: 6", 20", 40", and 72".

Data is available at the following stations:

DUNN COUNTY: MEDICINE HOLE

MCKENZIE COUNTY: BANKS

MOUNTRAIL COUNTY: RAT LAKE

WILLIAMS COUNTY: EFFING

WiseRoadsND.com

- Weather station map
- Road probe dashboard links

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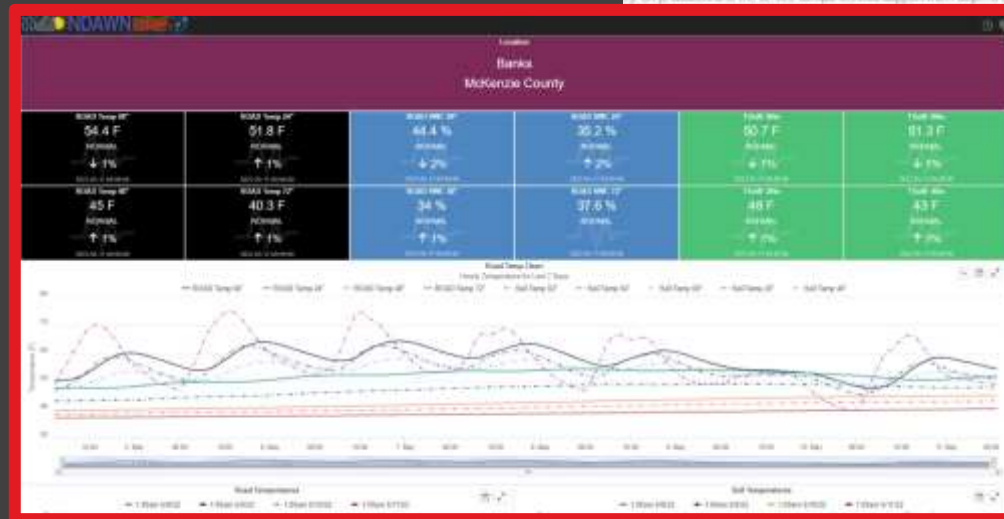
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er stations will also receive the gas for rain data, but will be less expensive to install

WEATHER STATION MAP



SUBSURFACE ROAD PROBES

Road Probes are installed in gravel roads adjacent to select Wise Roads Stations. These probes measure the temperature and moisture below the road surface at four depths: 5", 20", 40", and 72".

Data is available at the following stations:

DUNN COUNTY: MEDICINE HOLE

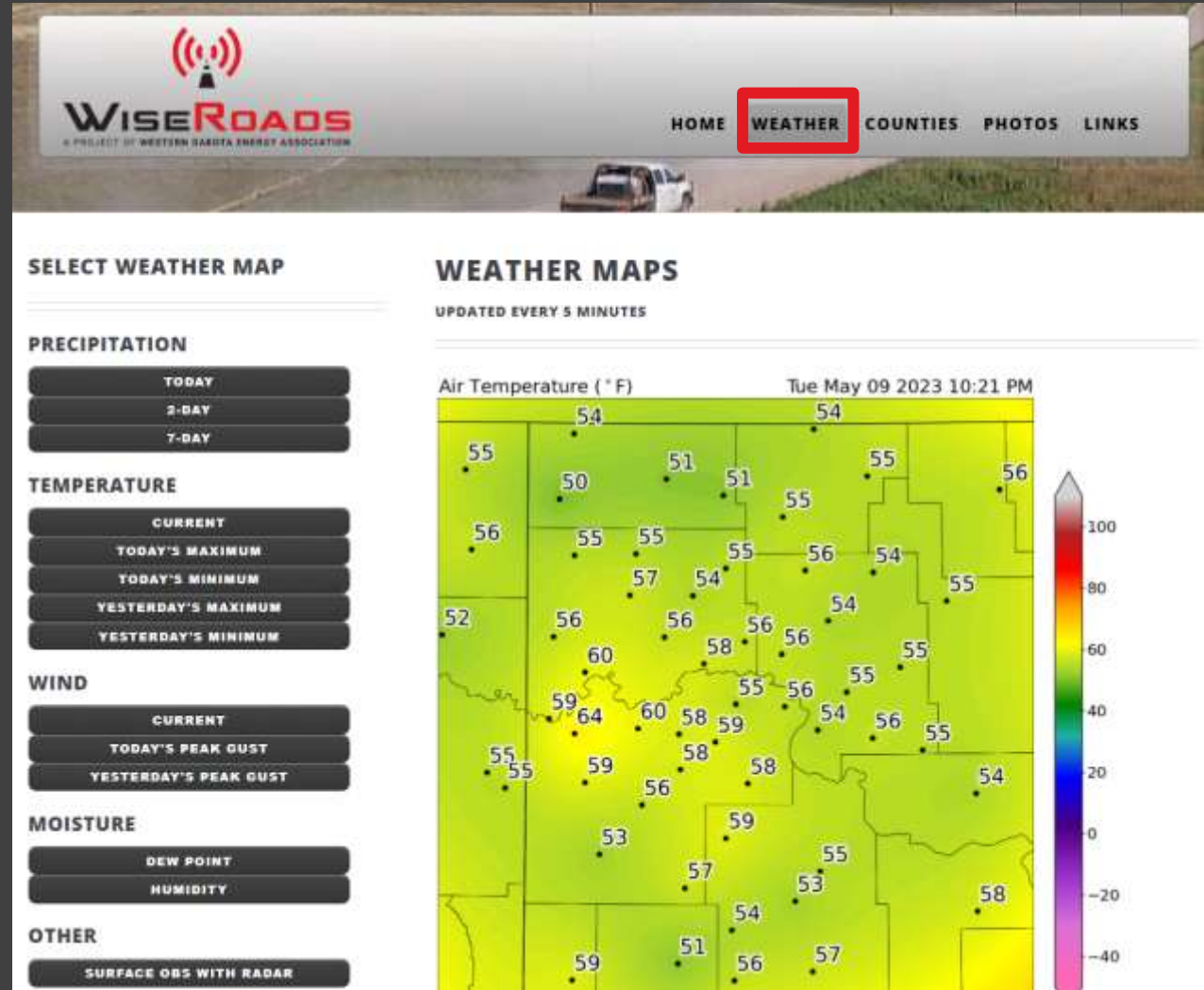
MCKENZIE COUNTY: BANKS

MOUNTRAIL COUNTY: RAT LAKE

WILLIAMS COUNTY: EPPING

WiseRoadsND.com – Current Weather

- 1-, 2-, & 7-Day rain totals
- Current & Yesterday's Weather



WiseRoadsND.com – Counties

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

The screenshot shows the WiseRoads website interface for Mountrail County. At the top, the navigation menu includes 'HOME', 'WEATHER', 'COUNTIES' (highlighted with a red box), 'PHOTOS', and 'LINKS'. Below the navigation, the page title is 'MOUNTRAIL COUNTY'. Underneath, there are links for 'MOUNTRAIL COUNTY RAIN DASHBOARD' and 'RAT LAKE ROAD PROBE DATA'. The main content area is divided into two columns: 'WEATHER DATA' and 'SOIL DATA'. Each column lists several station names with corresponding data fields. To the right of the data tables is a map of Mountrail County with various station locations marked with dots and labels: Powers Lake, Palermo, White Earth, Ross, Rat Lake, Shell Lake, Crane Creek, Big Bend, Liberty Plaza, and White Earth.

WiseRoadsND.com – Station Photos

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

The screenshot displays the WiseRoads website interface. At the top, there is a navigation bar with the following links: HOME, WEATHER, COUNTIES, PHOTOS (highlighted with a red box), and LINKS. The main heading reads "CURRENT PHOTOS - BILLINGS & GOLDEN VALLEY". Below this, there are four photo thumbnails arranged in a grid:

- FAIRFIELD**: A landscape photo of rolling hills under a cloudy sky. Metadata includes "NDWRN - Fairfield, ND" and "2023-08-08 08:30:27 PM".
- SULLY SPRINGS**: A landscape photo of rolling hills under a blue sky. Metadata includes "NDWRN - Sully Springs, ND" and "2023-08-08 08:40:01 PM".
- BEACH 95**: A landscape photo of rolling hills under a blue sky. Metadata includes "NDWRN - Beach 95, ND" and "2023-08-08 08:40:01 PM".
- SENTINEL BUTTE 10N**: A landscape photo of rolling hills under a cloudy sky. Metadata includes "NDWRN - Sentinel Butte 10N, ND" and "2023-08-08 08:30:08 PM".

Contact Us

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