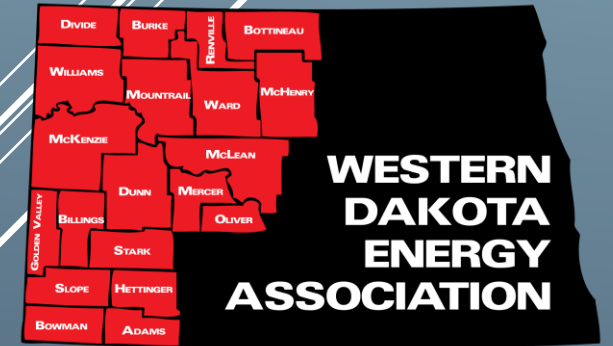


Wise Roads

Weather Information System to Effectively
Reduce Oilfield Delays and Disruption



PROBLEM:

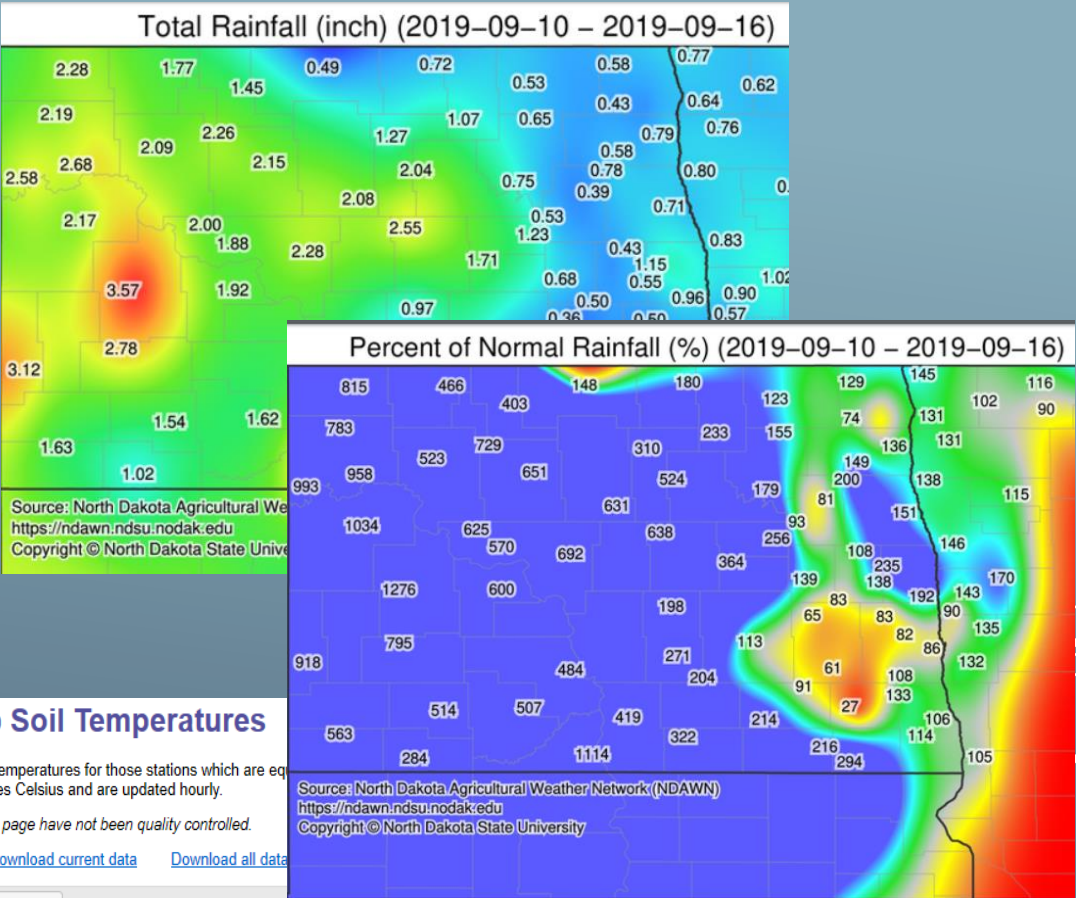
WHEN INCLEMENT WEATHER STRIKES, LOCAL GOVERNMENTS IMPOSE WEIGHT RESTRICTIONS ON GRAVEL ROADS THAT PROHIBIT THE MOVEMENT OF OILFIELD TRUCK TRAFFIC UNTIL ROAD CONDITIONS IMPROVE.



SOLUTION:

PROVIDE ACCURATE WEATHER INFORMATION, SPECIFICALLY PRECIPITATION DATA, TO ASSIST ROAD MANAGERS IN MORE PRECISELY IDENTIFYING ROADS THAT REQUIRE TEMPORARY WEIGHT RESTRICTIONS AND EXCLUDE THOSE THAT DO NOT.

PROVIDE MORE DETAILED WEATHER FORECASTING DATA FOR INDUSTRY TO ASSIST IN PLANNING OPERATIONS



Current Deep Soil Temperatures

This page shows deep soil temperatures for those stations which are equipped with soil temperature 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
Bottineau	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
Carrington	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
Croff	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
Denhoff	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

- ▶ Work with research partners to maximize benefit
- ▶ Install research-grade weather stations in areas with heavy oilfield traffic
- ▶ Make data publicly available through NDAWN, LoadPass and other sites
- ▶ Provide training to road managers through LTAP



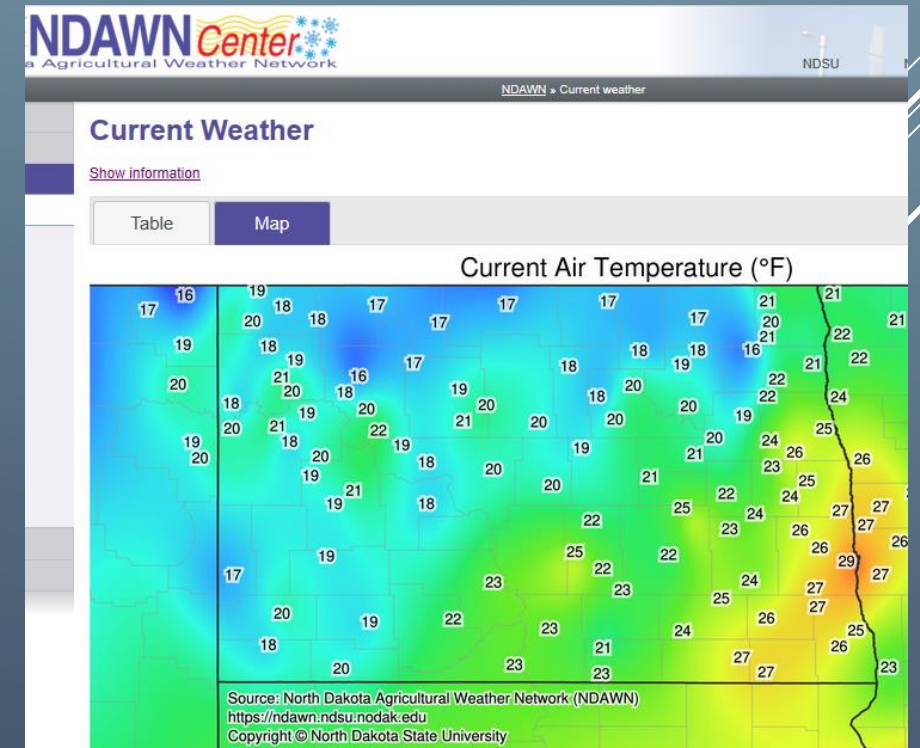
SCOPE OF WISE ROADS PROJECT

- Install up to 50 weather stations in the oil-producing counties
- Prioritize areas with significant drilling and production activity
- Locate stations to fill gaps in existing RWIN (DOT) and NDAWN networks
- Stations will be owned by NDAWN, operational costs covered by WDEA



EXPECTATIONS OF THE PROJECT

- ▶ County Road Departments utilize the weather data to determine the area of impact for closures
- ▶ County Road Departments use weather station locations to create/modify road “zones” for issuing restrictions
- ▶ Forecast and weather accessible from:
 - ▶ Ndenenergy.org and LoadPassPermits.com
 - ▶ NDAWN (ndawn.ndsu.nodak.edu)
 - ▶ County Websites



EXPECTED BENEFITS OF THE PROJECT

- ▶ More narrowly defined local road restrictions and more geographic zones established
- ▶ Significant savings to oil industry thru improved productivity and reduced revenue loss due to shut-in wells
- ▶ Use of weather data for research to evaluate the performance of road building materials
- ▶ Benefits to agriculture producers, i.e., soil temperature, precipitation, wind speed, etc.

From: LoadPass Notification System
<cms@loadpasspermits.com>
Sent: Tuesday, July 09, 2019 10:05 AM
To: Geoff Simon <geoff@ndenergy.org>
Subject: Notice from Dunn : Restriction Added:
Zone 1 County Gravel roads

LoadPass Notification

The following restriction has been added:

County: Dunn
Active Date: 7/9/2019
Road: Zone 1 County Gravel roads
URL: <https://permits.loadpasspermits.com/n/1613>
Due to the wet conditions, we will be restricting Zone 1 to 12,000GVW at 10:00am mst until further notice. At this time all other zones will remain open. Please refer to the Zone map for location.
[Load Pass Zone Map](#)

2019-07-17 05:20:41 PM



NDAWN - 5NW Charbonneau

2019-07-17 05:19:40 PM



NDAWN - 9N Arnegard

2019-07-17 05:19:41 PM



NDAWN - 3E Croff

2019-07-17 05:19:41 PM

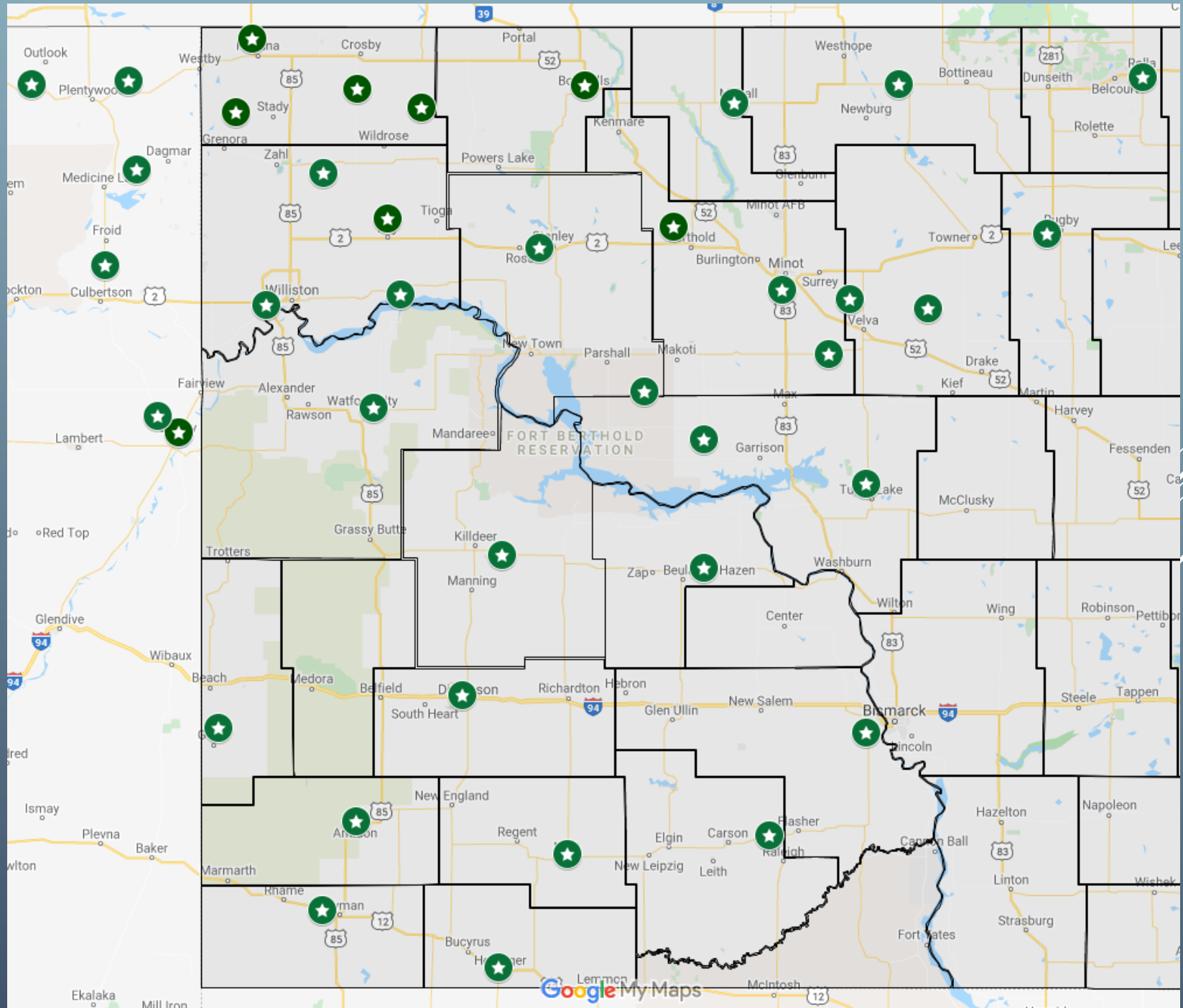


NDAWN - 3NW Hawkeye

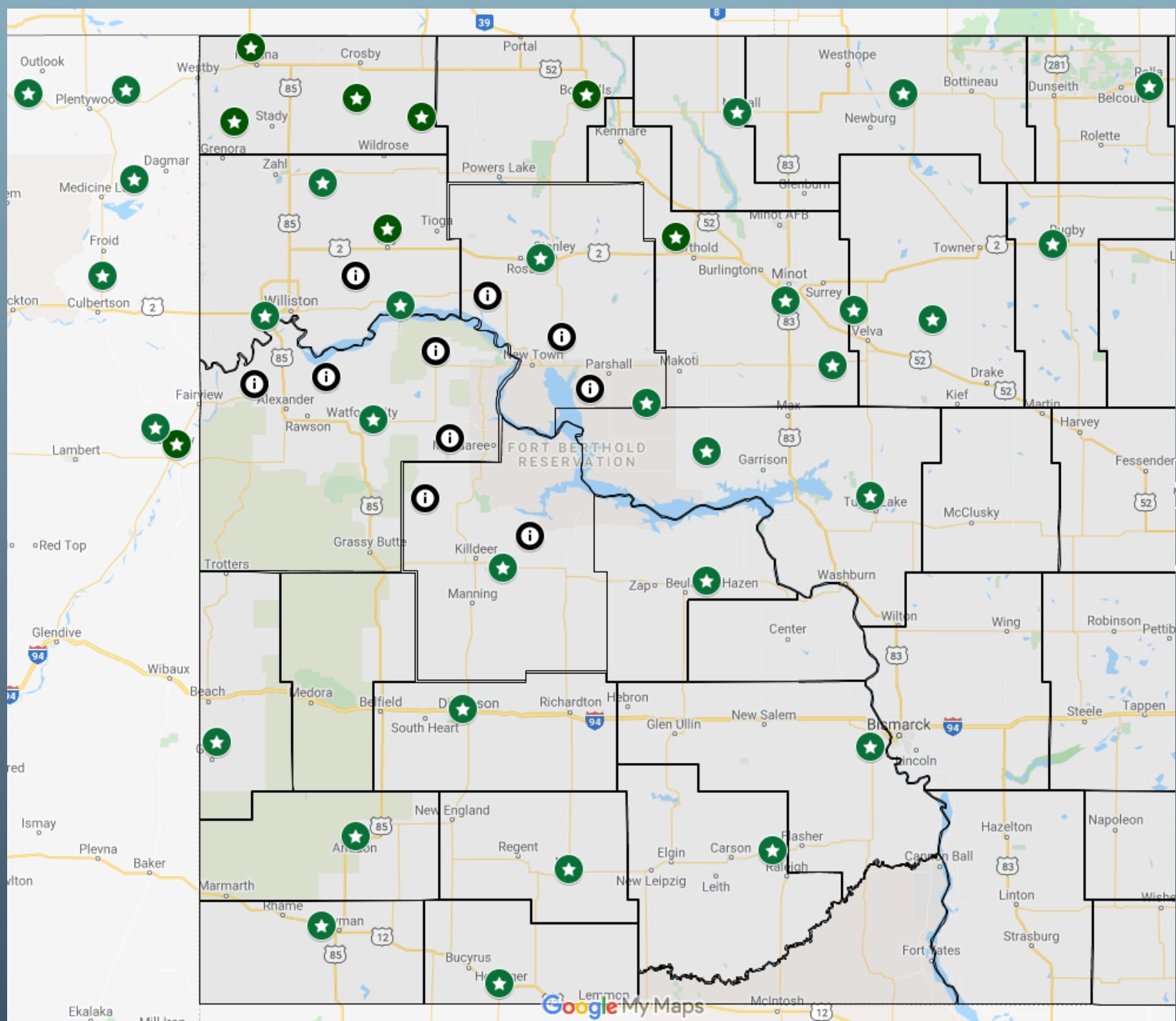
WEATHER DATA UTILIZATION

- ▶ WDEA in partnership with OGRC contracted meteorologist services
 - ▶ Jonathan Rosencrans
 - ▶ Services and tasks
 - ▶ Installation, maintenance, and support of weather stations
 - ▶ Data utilization
 - ▶ Forecasting
 - ▶ Training and Support
- 
- A series of three parallel white lines of varying lengths, slanted diagonally upwards from left to right, located in the bottom right corner of the slide.

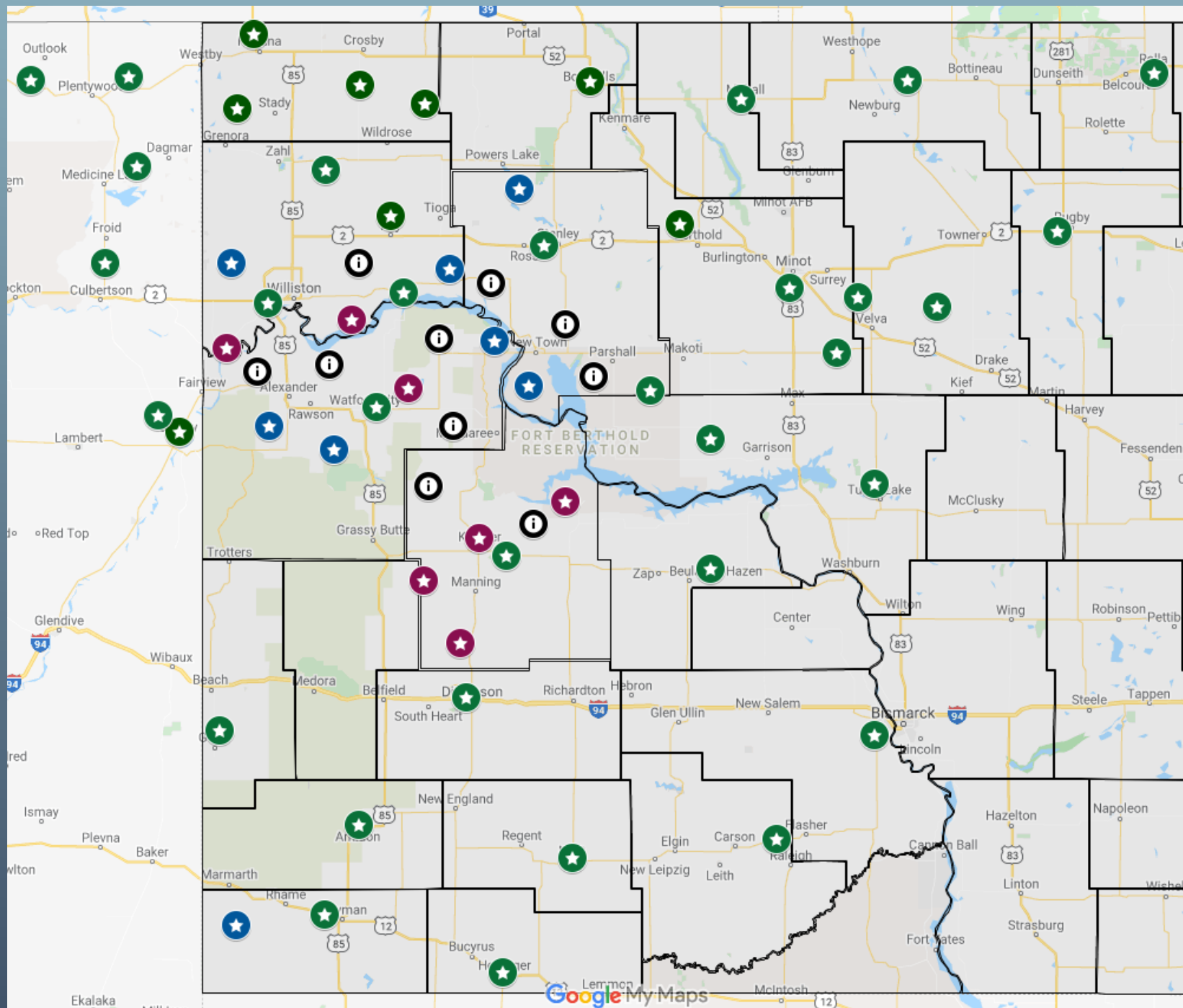
EXISTING ND DAWN STATIONS



PHASE 1 LOCATIONS



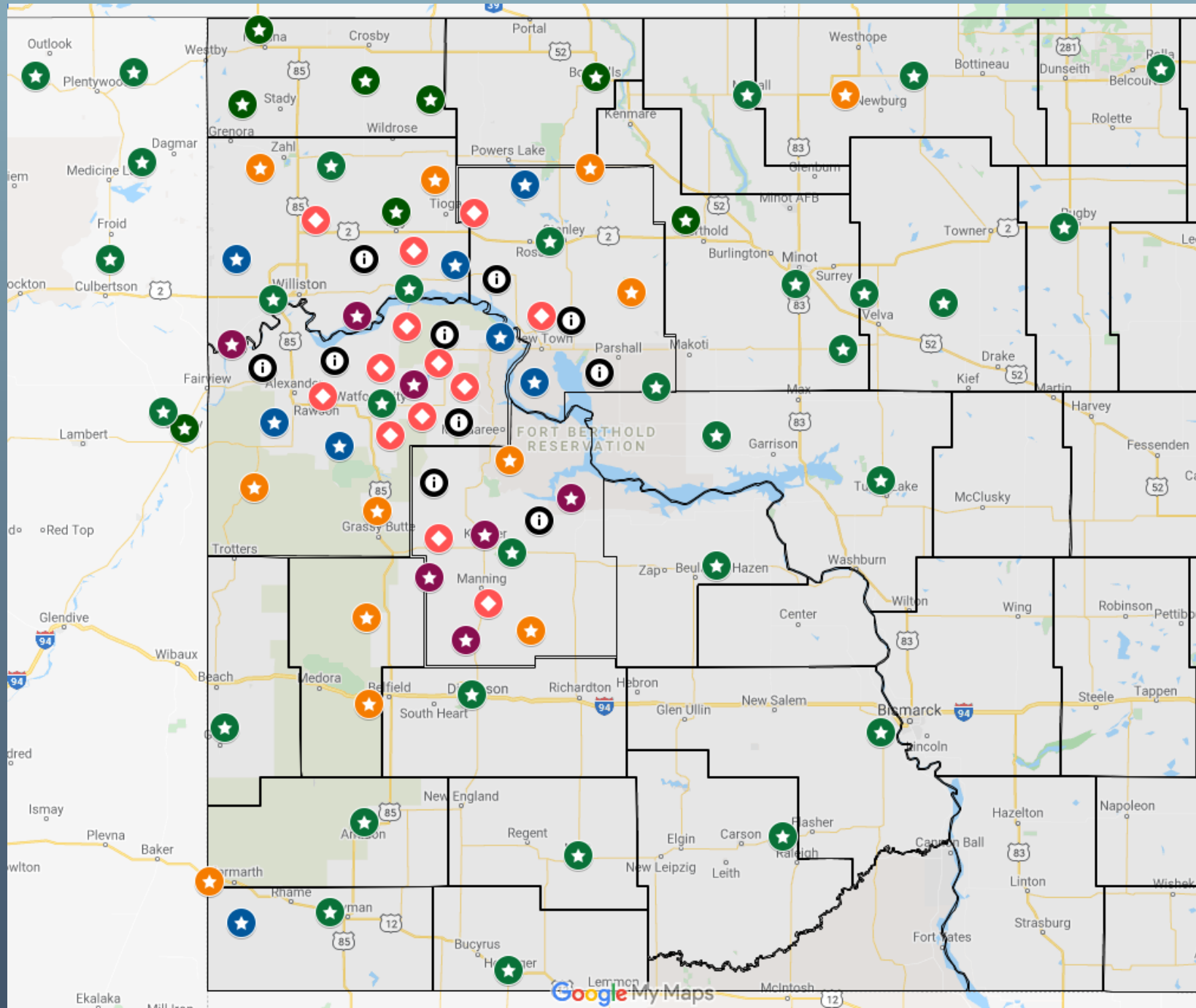
PHASE 2 LOCATIONS



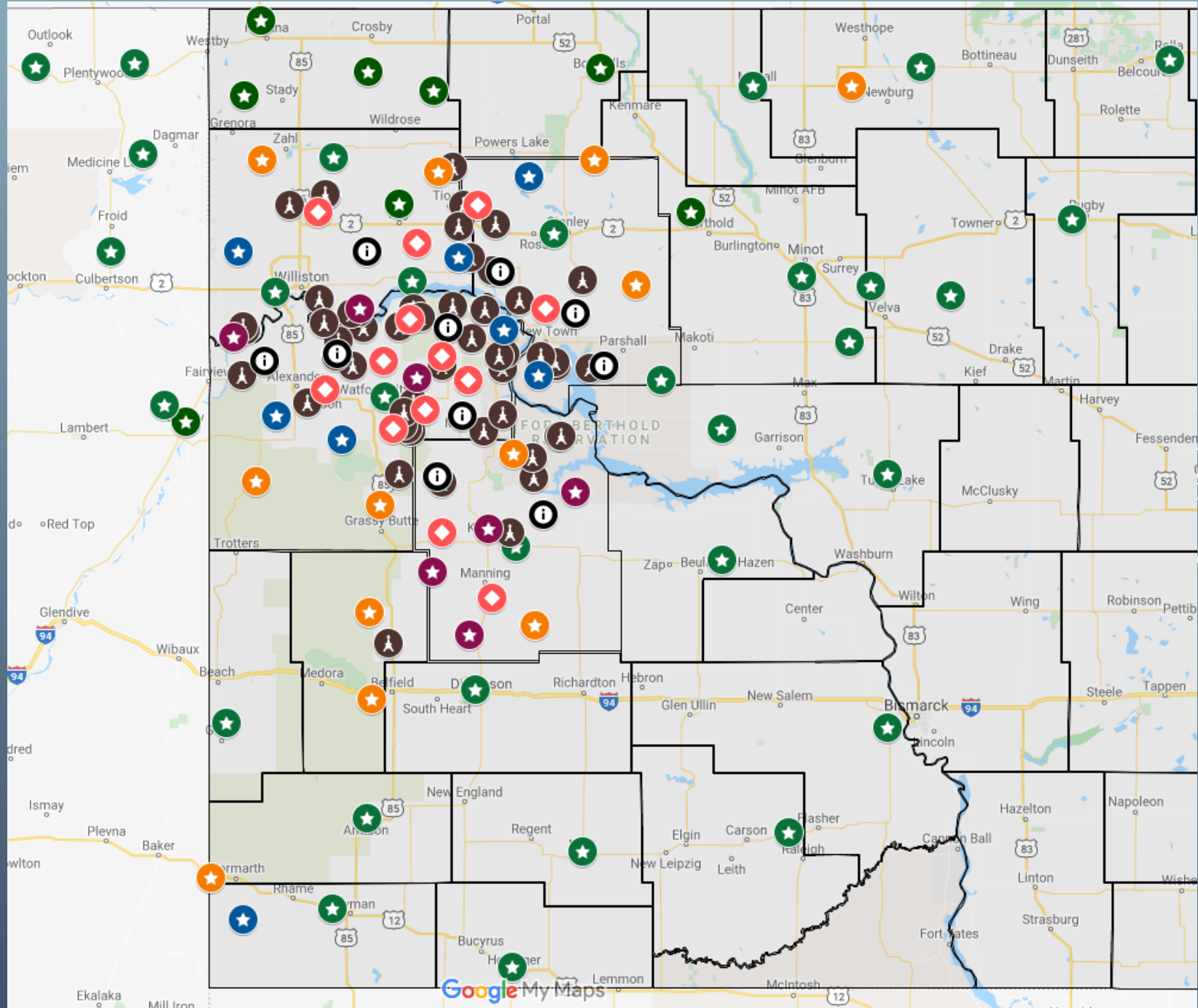
PHASE 3

LOCATIONS

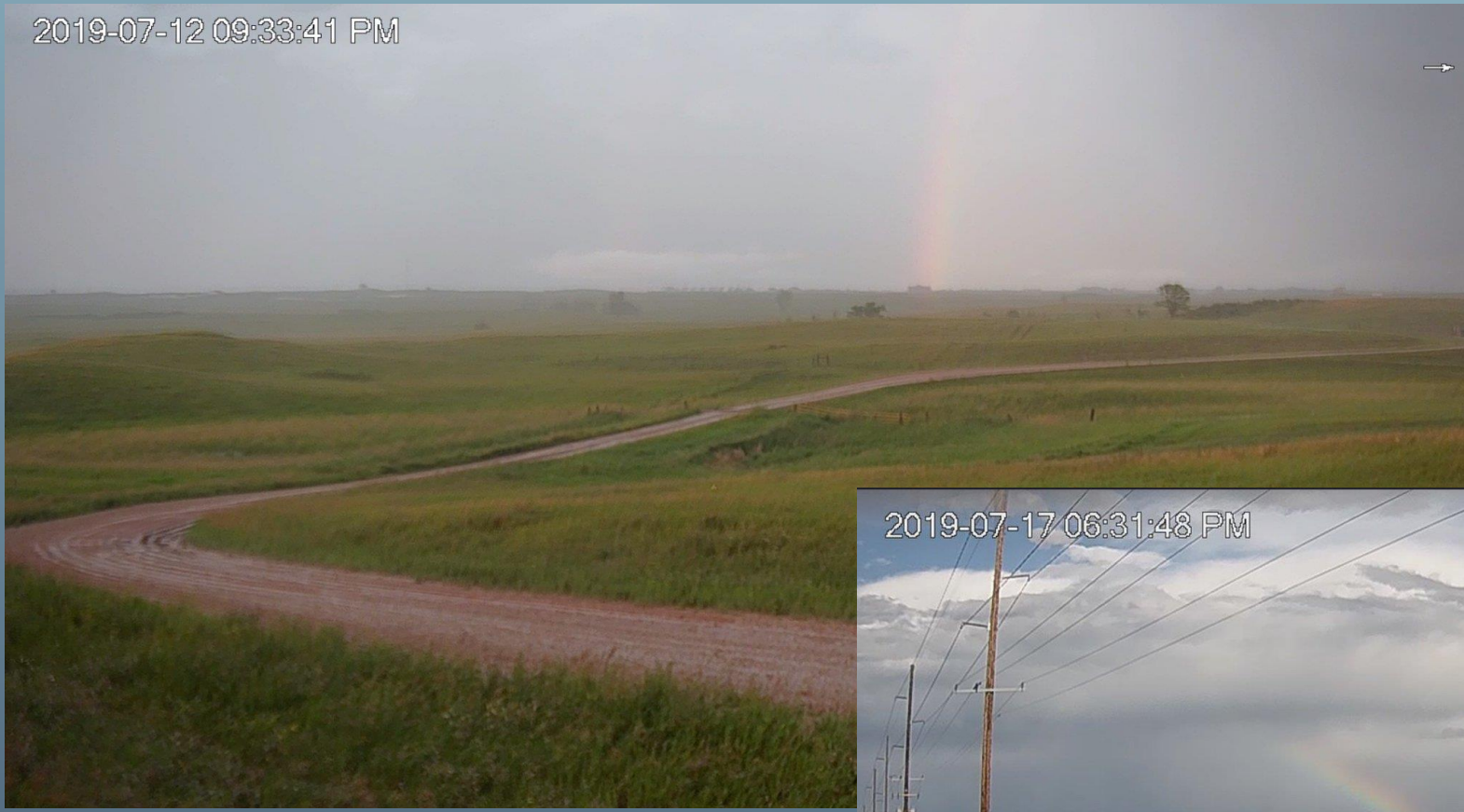
(SITING IN PROCESS)



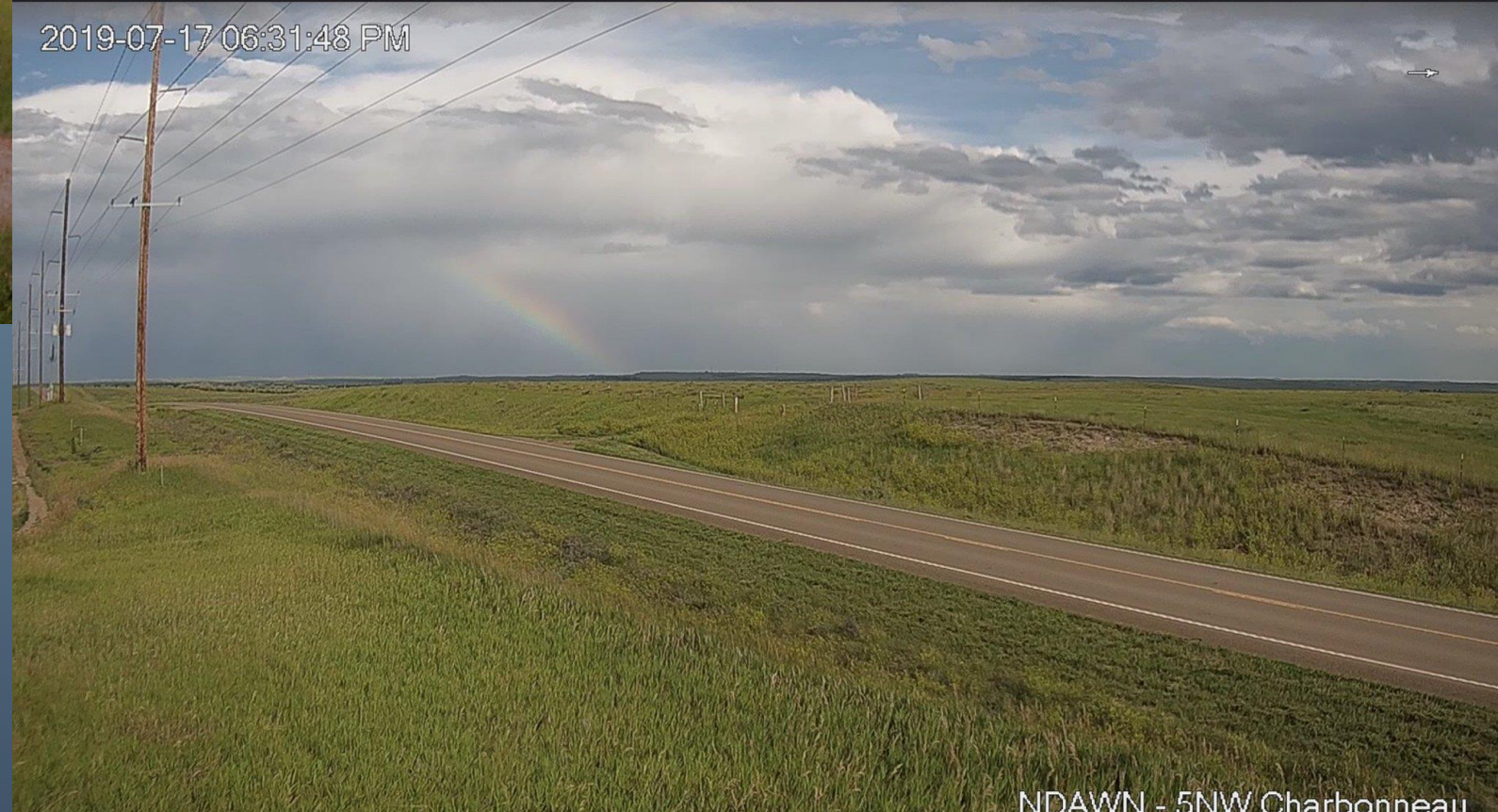
STATION DENSITY TO ACTIVITY



2019-07-12 09:33:41 PM



2019-07-17 06:31:48 PM



NDAWN - 5NW Charbonneau