

National Weather Service Grand Forks



Miscellaneous Severe Weather Statistics



A new phase of modernization began across the National Weather Service in the early 1990s. For eastern North Dakota and the northwest quarter of Minnesota, it took a few years longer. The Fargo office of the National Weather Service was responsible for this portion of the Northern Plains until the upgraded office in Grand Forks took over in 1996. I was given the Storm Data focal point at the Fargo National Weather Service office in July 1995 (see the two Storm Data cover page clips below). The first big event I was responsible for documenting was the Hallock, Minnesota tornado of July 9, 1995. That tornado could have been a major disaster, as it hit a crowded fairground. The shift that worked that event at the National Weather Service in Fargo had some interesting stories to tell, as radar coverage, communications, and messaging was much different in the mid 1990s.

**JULY 1995
VOLUME 37
NUMBER 7**



At the Fargo National Weather Service office in the mid 1990s, the staffing level was about 10 people. Reports of severe weather were received, but they were not actively sought out (to verify warnings). To get our limited local information included in Storm Data, I had to call it in to the state offices in Bismarck (for ND) and Minneapolis (for MN), which had higher staffing levels. However, despite communicating information to Bismarck and Minneapolis for July through December 1995, most of it was never printed in Storm Data (it has been saved locally).

New national Storm Data software came out in October 1995, and I began to enter in reports through this program. I submitted a nil report (no reports) for October and November 1995, but we had several winter events for December 1995. However, for some reason, these reports did not make it into the December 1995 Storm Data publication. The first reports for eastern North Dakota and the northwest quarter of Minnesota in Storm Data began in January 1996. I was also re-assigned from Fargo to Grand Forks in October 1995, and our staff was larger (although not full yet, lead forecasters were hired later). This allowed us to actively seek out information to verify our warnings. Therefore, there should be a marked improvement in how our severe weather statistics appear from October 1995 onward. This publication looks at some of our severe weather statistics over the years, and includes a few years prior to 1996 for comparison.

Vincent Godon, NWS Grand Forks

Table of Contents

Tornado Statistics	Page 2
Hail Statistics	Page 12

1. Tornado Statistics

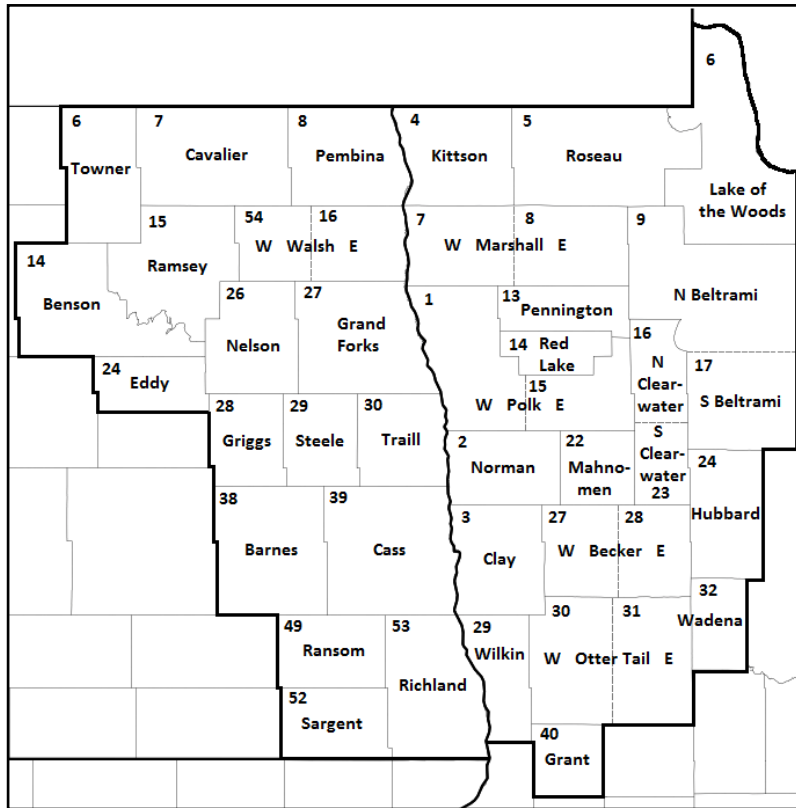


Figure 1 NWS Grand Forks Area of Responsibility

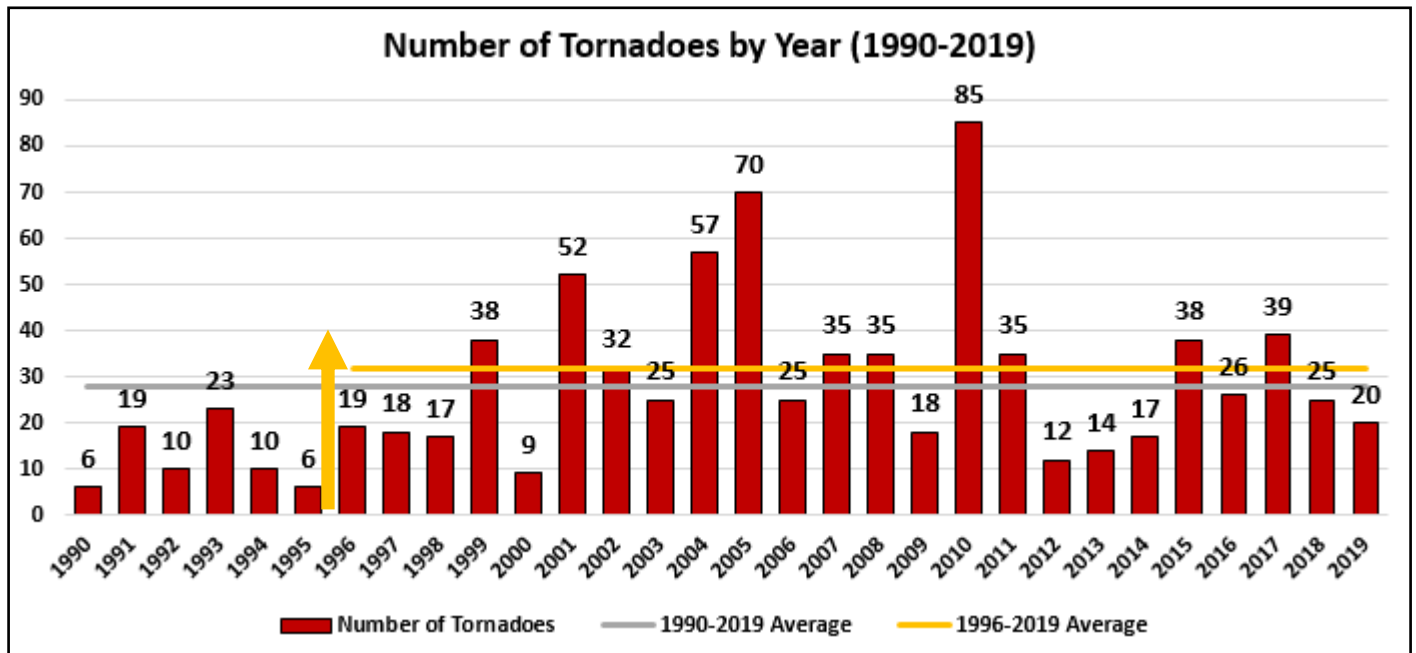


Figure 2 Number of Tornadoes by Year (1990-2019)

For reference, Figure 1 shows the area of responsibility of NWS Grand Forks, which includes eastern North Dakota and the north-west quarter of Minnesota. Figure 2 shows the number of tornadoes that have been observed each year from 1990 to 2019. The orange arrow in Figure 2 shows when modernization occurred. The number of tornadoes varies from a low of 6 (1990, 1995) to a high of 85 (2010). The gray line in Figure 2 shows the average number of tornadoes (28) for these 30 years (1990-2019), while the orange line shows the average number of tornadoes (32) for the modernized years (1996-2019).

Looking at strictly the modernized tornado data (1996-2019), there are some other interesting facts. Figure 3 plots the monthly tornado average. There have not been any tornadoes in March or November, only 4 tornadoes were observed in April (3 EF0's and 1 EF1), and only 3 tornadoes were observed in November (1 EF0 and 2 EF2's). So essentially, the tornado season runs from May through about mid September, but most actually occur in June and July. Slightly more tornadoes have been reported in June (12.9) versus July (10.5).

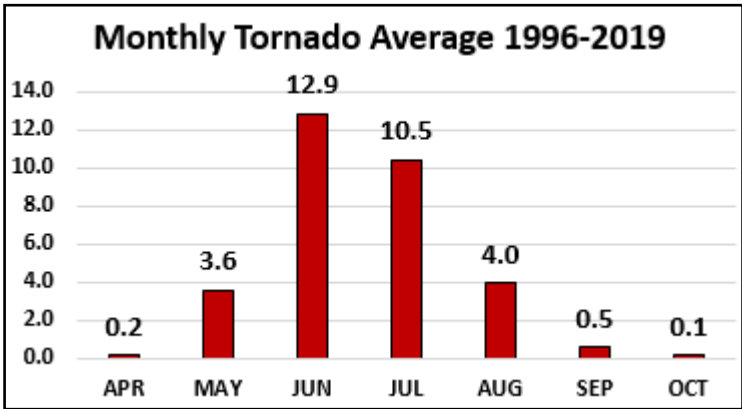


Figure 3 Monthly Tornado Average (1996-2019)

The previous tornado charts have lumped all tornadoes together, regardless of their strength. The Enhanced Fujita Scale, which rates the intensity of tornadoes, is shown below:

EF0	65-85 mph	light damage
EF1	86-110 mph	moderate damage
EF2	111-135 mph	considerable damage
EF3	136-165 mph	severe damage
EF4	166-200 mph	devastating damage
EF5	>200 mph	incredible damage

Figure 4 plots the monthly tornado average by EF scale for April through October. There have been no EF5 tornadoes since modernization took place. Most of the tornadoes over eastern North Dakota and the northwest quarter of Minnesota have been ranked as F0/EF0 (black column in Figure 4), F1/EF1 (orange column in Figure 4), or F2/EF2 tornadoes (blue column in Figure 4). There have been F3/EF3 and F4/EF4 tornadoes, but on average, most years do not have one. June is again the peak month, although July is not too far behind.

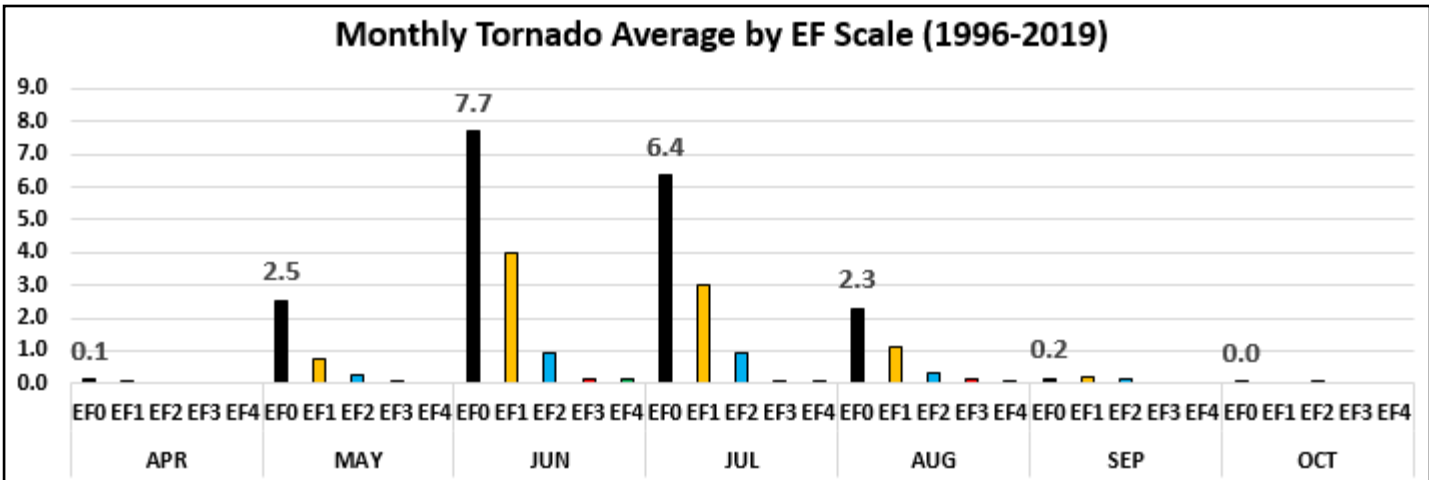


Figure 4 Monthly Tornado Average by EF Scale (1996-2019)

Looking closer at the F3/EF3, F4/EF4, and F5/EF5 tornadoes from 1996 through 2019, there have been 9 F3/EF3 tornadoes. Figure 5 roughly shows the 9 tornado locations (yellow lines, or yellow dot for minimal path length). Storm Data descriptions of the 9 tornadoes are shown after Figure 5.

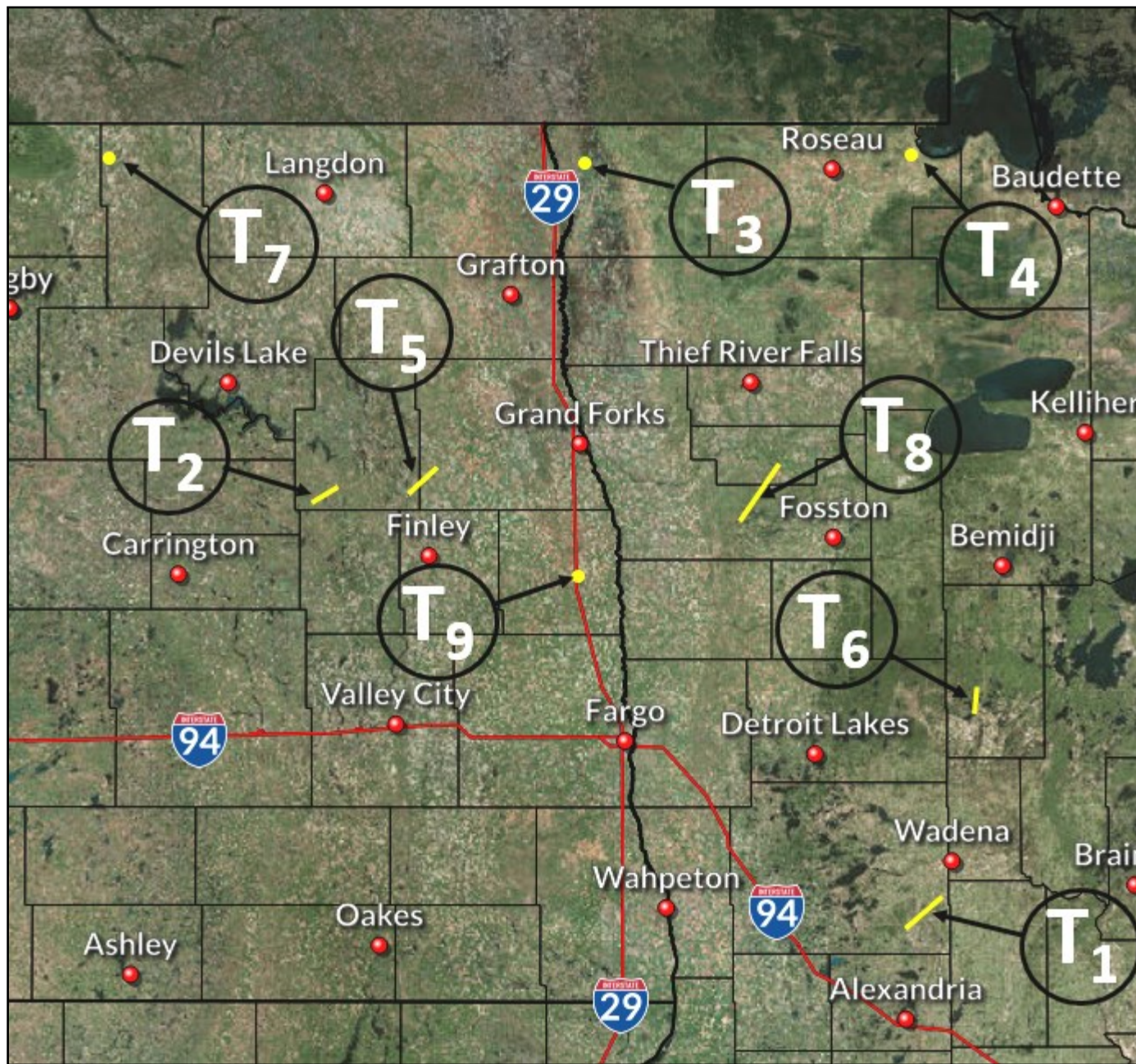


Figure 5 F3/EF3 Tornadoes (1996-2019)

T1 June 13, 2001

Otter Tail County
1 W Parkers Prairie to
11 NE Parkers Prairie

13 1753CST
 1815CST

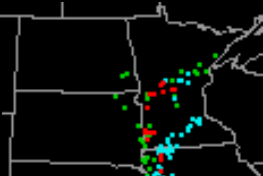
0 3 5M Tornado (F3)

The tornado caused quite a bit of damage along its path across southeast Otter Tail county before it crossed into Todd county. At one farmstead, 9 people huddled inside a house with no basement as its roof was torn off. Nobody was injured, but another trailer home nearby was completely destroyed. Many irrigation systems were overturned, trees, power poles, and lines snapped, and grain bins destroyed by the strong wind. An estimated 100 poles were broken off leaving nearly 1,100 people without power. At another farm, a 40x80 foot pole barn was wrecked. About 6 miles northeast of Parkers Prairie, a man and his two kids rode out the storm in their minivan inside a quonset. Trees all around them and the quonset were crumpled by the wind, yet they survived. Another farmstead lost a house, trailer home, and two silos. A turkey barn containing 12,000 turkeys was also hit, with an estimated 60 percent of the turkeys perishing.

TORNADO REPORTS...

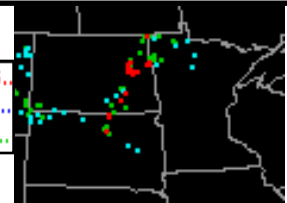
WIND REPORTS/HI.....

HAIL REPORTS/LG.....



T2 July 18, 2001

TORNADO REPORTS...
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



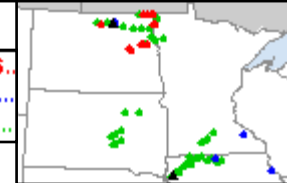
Nelson County
9 SW Pekin to
5 S Pekin

18 1705CST 5 150 0 0 200K Tornado (F3)

A tornado hit the home of the Nelson county sheriff, who was out of town at the time. The tornado tore the roof off the house and destroyed the barn. A piece of farm machinery was thrown through the bedroom wall and a tractor was hurled 75 yards. The sheriff's squad car was crushed.

T3 May 19, 2004

TORNADO REPORTS...
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



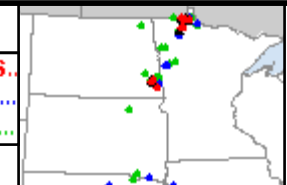
Kittson County
1 S Humboldt to
2 SE Humboldt

19 1805CST 1.5 150 0 0 200K Tornado (F3)

The tornado demolished 4 structures. One of the structures, a 30x40 foot machine shed, was swept from its foundation and thrown into the adjacent fields. Tools from the shed were driven into the banks of a nearby highway. Other debris was spread over a mile away. Many trees were torn up.

T4 August 5, 2006

TORNADO REPORTS...
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



Roseau County
1 WNW Warroad to
1 E Warroad

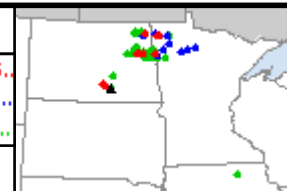
05 1802CST 4 500 0 0 20M Tornado (F3)

Tornado number two of a series tracked east-southeast for about 4 miles across the northern part of Warroad. The main tornado appeared to have touched down about a mile west of the Marvin Windows plant complex at the northwest corner of Warroad. The tornado grew to around 500 yards wide as it moved across the Lakeview Park and campground area. The tornado apparently lifted as it passed into Muskeg Bay of the Lake of the Woods. Peak wind speeds were estimated from 160 to 180 mph.

Damage was extensive along the tornado path in Warroad. At the Marvin Windows plant, the roof was damaged and 16 semi trailers were overturned. Several of the trailers were full with new windows, which were a complete loss. The nearby Pepsi plant had its sign blown down. At the Warroad City Park and Campground, 30 to 40 campers were destroyed and roughly 10 boats were damaged or sunk. The city pool, which had been recently renovated, was also damaged. The Trading Post Gift Shop was completely destroyed. Many large trees were also snapped off or broken into pieces. Eight to 10 homes also sustained damage.

T5 August 26, 2007

TORNADO REPORTS...
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



NELSON COUNTY --- 6.0 NNE ANETA [47.76, -97.93], 11.0 NNE ANETA [47.83, -97.89]

08/26/07 19:04 CST 0 Tornado (EF3, L: 5.00 mi , W: 580 yd)
08/26/07 19:14 CST 0 Source: NWS Storm Survey

This tornado continued into western Grand Forks County, where it dissipated 3 miles west-northwest of Logan Center at 716 pm CST. The total tornado track was about 6 miles long, with about 5 miles of this total occurring in Nelson County. The tornado destroyed a garage and farm outbuildings at 3 farmsteads. It killed 5 buffalo and completely dismantled a swathing combine. Trees were also snapped off or uprooted along the damage path and several empty metal grain bins were torn from their anchors and demolished. Gravel roads were deeply scarred by debris. Peak winds were estimated at 150 mph.

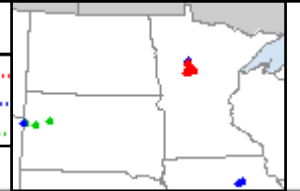
GRAND FORKS COUNTY --- 3.0 WNW LOGAN CENTER [47.82, -97.88], 3.0 NNW LOGAN CENTER [47.84, -97.84]

08/26/07 19:14 CST 0 Tornado (EF3, L: 1.00 mi , W: 580 yd)
08/26/07 19:16 CST 0 Source: NWS Storm Survey

This tornado began about 6 miles north-northeast of Aneta in eastern Nelson County at 704 pm CST. The total tornado track was about 6 miles, with about 1 mile of it occurring in Grand Forks County. The tornado lofted and destroyed a second combine in Grand Forks County before it lifted. Peak winds were estimated at 150 mph.

T6 June 6, 2008

TORNADO REPORTS..
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



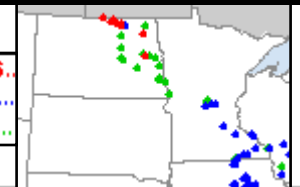
HUBBARD COUNTY --- 3.9 WNW DORSET [46.98, -95.02], 12.0 NNE PARK RAPIDS [47.08, -94.97]

06/06/08 08:37 CST	0	Tornado (EF3, L: 7.29 mi , W: 400 yd)
06/06/08 08:47 CST	0	Source: Law Enforcement

This tornado tracked for about 7 miles from the southwest edge of Big Sand Lake, across Pickerel Lake, to 1 mile northwest of Emmaville by 947 am CDT. Maximum width was around 400 yards with peak winds to 160 mph. The tornado completely destroyed two homes and damaged several others on Pickerel Lake. It flattened dozens of acres of forest.

T7 July 7, 2008

TORNADO REPORTS..
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



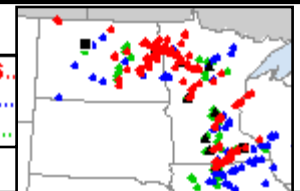
TOWNER COUNTY --- 7.3 W ARMOURDALE [48.86, -99.53], 11.0 WNW ROCKLAKE [48.84, -99.45]

07/07/08 14:45 CST	5K	Tornado (EF3, L: 3.00 mi , W: 75 yd)
07/07/08 14:50 CST	5K	Source: Law Enforcement

This tornado originated in Rolette County, where it produced EF3 damage near Rolla. It continued into Towner County for about 3 more miles and lifted about 11 miles west-northwest of Rock Lake. It produced mainly EF1 damage to scattered trees and fields in Towner County. Peak winds in Towner County were estimated at 90 mph.

T8 June 17, 2010

TORNADO REPORTS..
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



POLK COUNTY --- 2.4 ENE MAPLE BAY [47.64, -96.18], 5.6 NNE MENTOR [47.77, -96.09]

06/17/10 17:15 CST	1	0	Tornado (EF3, L: 9.00 mi , W: 150 yd)
06/17/10 17:27 CST	2	0	Source: Emergency Manager

This tornado began in Polk County and tracked northeastward for nine miles to the Red Lake County line about 5 miles north-northeast of Mentor. After crossing into Red Lake County, it continued for an additional 6 miles. The tornado tracked across Maple Lake and the community of Mentor. Trees were sheared off or uprooted, power poles were snapped, and roofs and garages were destroyed. A convenience store and gas station along U. S. Highway 2 were flattened. Cabins, campers, boats, and docks were damaged along the northeast side of Maple Lake. Peak winds were estimated at 145 mph.

Direct Fatalities: M58BU

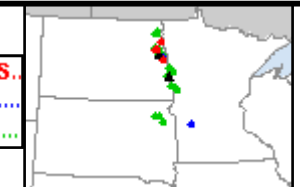
RED LAKE COUNTY --- 5.0 SE TERREBONNE [47.77, -96.09], 4.0 ENE TERREBONNE [47.85, -96.07]

06/17/10 17:27 CST	0	Tornado (EF3, L: 6.00 mi , W: 150 yd)
06/17/10 17:36 CST	0	Source: Emergency Manager

This tornado began in Polk County, about 4 miles south-southwest of Mentor at 615 PM CDT. The tornado tracked into Red Lake County and continued an additional 6 miles to roughly 4 miles east-northeast of Terrebonne. The tornado sheared trees and blew down farm buildings near the Polk County line and lofted debris from Mentor well past the community of Plummer. The total track length was about 15 miles and peak winds were estimated at 145 mph.

T9 August 27, 2016

TORNADO REPORTS..
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



TRAILL COUNTY --- 3.1 NNW TAFT [47.49, -97.10], 2.5 NNE HILLSBORO [47.43, -97.05]

08/27/16 17:02 CST	0	Tornado (EF3, L: 3.00 mi , W: 300 yd)
08/27/16 17:10 CST	0	Source: NWS Storm Survey

The tornado destroyed a two car garage and snapped or uprooted numerous trees northwest of the Taft elevator. It crossed Interstate 29 near Taft and tore down filled grain bins, elevator legs, and tore the roofing off the office. It then tore the roof off and caved in the walls of a well built home east of the elevator complex. Peak winds were estimated at 140 mph.

From 1996 through 2019, there have been 7 F4/EF4 tornadoes. Figure 6 roughly shows the 7 tornado locations (yellow lines). Storm Data descriptions of the 7 tornadoes are shown after Figure 6.

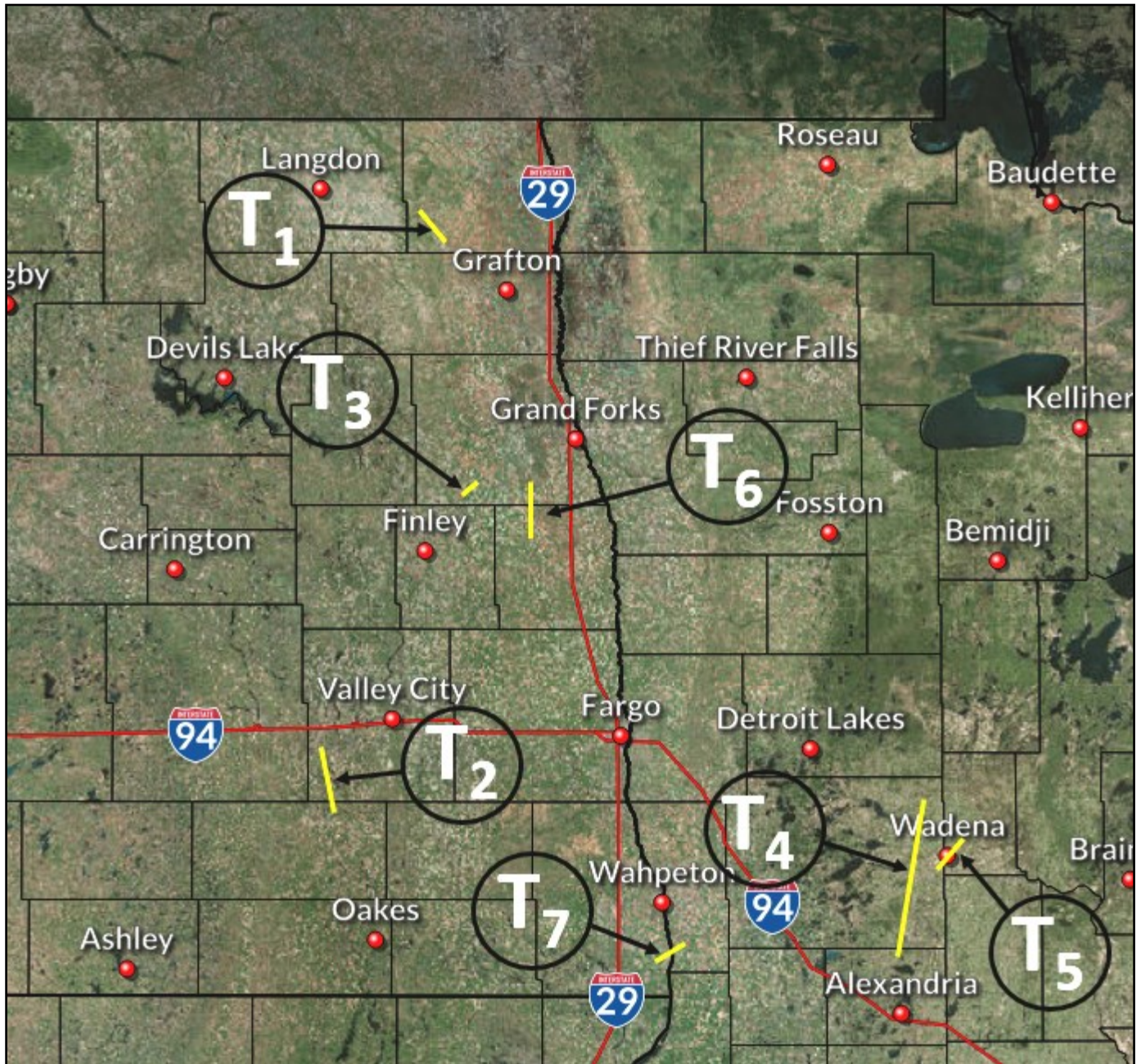


Figure 6 F4/EF4 Tornadoes (1996-2019)

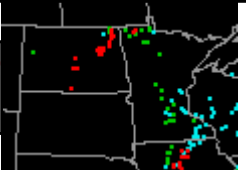
T1 June 6, 1999

Pembina County
5 W Crystal to Mountain

06	1420CST 1430CST	8	500	0	0	1M	Tornado (F4)
----	--------------------	---	-----	---	---	----	--------------

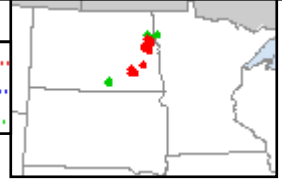
A tornado touched down southeast of Mountain, where it damaged several farmsteads. One farm home was completely lifted up and tossed 100 yards. A combine was also picked up and thrown several hundred feet. A swather was picked up and wrapped around several trees. In the town of Mountain, numerous trees were knocked flat. 2 mobile homes were destroyed, the roof was torn off a house, and a garage was destroyed.

TORNADO REPORTS..
WIND REPORTS/MI.....
HAIL REPORTS/LG.....



T2 July 18, 2004

TORNADO REPORTS...
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



Barnes County

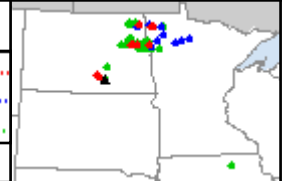
13 NW Litchville to
10 WSW Litchville

18 1925CST 10 200 0 0 1.7M 100K Tornado (F4)

The tornado tracked south for about 4 miles along 97th avenue southeast, then turned to the southeast and tracked about 6 more miles before it crossed into LaMoure county about 2 miles north-northwest of Marion. One abandoned farmstead 10 miles west-northwest of Litchville was nearly swept clean of its buildings. Eight to nine buildings and 5 to 6 metal grain bins were swept away. At an occupied farmstead about 9 miles west of Litchville, the most damage was reported. The family was out baling hay at the time and were not hurt. The equipment they used to bale hay (three tractors and a baler) were the only things left unscathed by the tornado. Two houses, 5 outbuildings, a cattle barn, and miscellaneous farm equipment were all leveled. Machinery and debris were scattered across the yard and in the nearby pond and fields. A new pickup truck was demolished and sheet metal and metal support beams were wrapped around trees and vehicles. About 35 cows were killed, 20 grain bins were demolished, and a semi truck was overturned. The last F4 tornado in eastern North Dakota occurred on June 6, 1999, near Mountain, ND.

T3 August 26, 2007

TORNADO REPORTS...
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



GRAND FORKS COUNTY --- 2.0 WSW NORTHWOOD [47.72, -97.61], 2.0 ENE NORTHWOOD [47.74, -97.53]

08/26/07 19:42 CST 1 50M Tornado (EF4, L: 5.00 mi , W: 1400 yd)
08/26/07 19:54 CST 18 2M Source: NWS Storm Survey

The tornado touched down about 2 miles west-southwest of Northwood. The tornado crossed the Goose River about a mile west-southwest of the Northwood airport and left a 200 yard wide stretch of downed trees in its wake. By the time it hit the airport, the ground track was one-third of a mile wide and growing wider. At this point the tornado was still visible outside the increasingly heavy rain.

The tornado reached an incredible width of eight-tenths of a mile as it pushed through Northwood to the east-northeast. At this point it had multiple vortices embedded in the overall "wedge" shaped tornado. The strongest of these vortices appears to have scoured the ground and left broad circulation patterns of debris in the overall damage and debris field. Around this time the tornado likely became wrapped in heavy rain and would have been difficult to observe from a distance. The most extreme damage appeared to be in the northeast corner of the community.

Northwood, in southwest Grand Forks County, had a population of about 1000 people. 90 percent of the roughly 460 homes were damaged. One death occurred in a mobile home, with 18 other injuries reported. The death occurred in a trailer park on the north edge of town, where 19 total units were demolished.

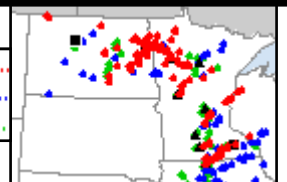
Just to the east of the trailer park, in the area that sustained the extreme damage, three businesses were hit particularly hard. An agricultural company, the towns largest employer, had its buildings heavily damaged. A nearby construction company lost two large steel buildings and other equipment. Steel beams from the two steel buildings were twisted and tossed nearby. Finally, a car dealership lost 15 to 20 vehicles from its parking lot along highway 15. Many of these vehicles were damaged beyond recognition and tossed into nearby fields. One corn field to the north of highway 15 (across from the 3 businesses on the northeast side of town) had it stalks snapped off several inches from the root bases, with pieces of husked corn laying around.

Hangers and airplanes were also damaged at the airport. The local health center, school, supermarket, and grain elevator were damaged. Near the elevator, several rail cars were knocked off the tracks. Hundreds of trees were snapped, uprooted, or damaged. Power was also knocked out to many customers, but eventually was turned off (for safety reasons) to the entire town. A total of about 2600 truckloads of debris were hauled to the town landfill. In the days following the tornado, a Presidential Disaster Declaration was granted.

Direct Fatalities: M57MH

T4 June 17, 2010

TORNADO REPORTS...
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



OTTER TAIL COUNTY --- 4.8 ESE URBANK [46.11, -95.42], 4.5 S HILLVIEW [46.61, -95.25]

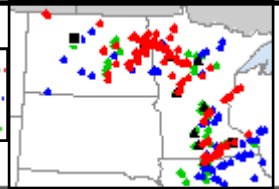
06/17/10 14:45 CST 1 0 Tornado (EF4, L: 38.00 mi , W: 2288 yd)
06/17/10 15:45 CST 5 0 Source: NWS Storm Survey

This tornado began in Douglas County, Minnesota. It moved northward into Otter Tail County and produced an additional 38 miles of continuous damage path. The tornado destroyed numerous homes and farmsteads along its path, completely sweeping 7 homes from their foundations. At times, this multi-vortex tornado complex consisted of multiple tornadic tubes pivoting around a common center. Peak winds were estimated at 175 mph.

Direct Fatalities: F78OU

T5 June 17, 2010

TORNADO REPORTS...
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



OTTER TAIL COUNTY --- 4.8 SSE BLUFFTON [46.41, -95.18], 4.7 SE BLUFFTON [46.43, -95.15]

06/17/10 15:59 CST 0 Tomado (EF4, L: 2.00 mi , W: 1936 yd)
06/17/10 16:02 CST 0 Source: Trained Spotter

This tornado touched down in Otter Tail County and tracked northeastward for about 2 miles before crossing into Wadena County just southwest of the Wadena city limits. The tornado developed rapidly into a multi-vortex wedge type tornado as it approached Wadena. The tornado continued in Wadena County another 8 miles and ended about 516 PM CDT. Otter Tail County received mainly extreme tree damage with peak winds estimated at 170 mph.

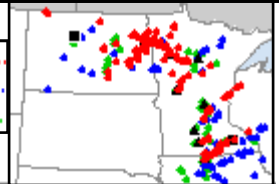
WADENA COUNTY --- 1.7 SW WADENA [46.43, -95.15], 7.0 NE WADENA [46.52, -95.03]

06/17/10 16:02 CST 0 Tomado (EF4, L: 8.00 mi , W: 1936 yd)
06/17/10 16:16 CST 20 0 Source: Storm Chaser

This multi-vortex wedge tornado began in Otter Tail County about 3 miles southwest of the city of Wadena at 459 PM CDT. It tracked for about 2 miles in Otter Tail County, then it continued for another 8 miles in Wadena County. The tornado ravaged the western half of the community of Wadena. Numerous homes were flattened to the ground and at least one was completely swept from its foundation and destroyed. Public and industrial buildings were wrecked, the fairgrounds were damaged, and headstones in the cemetery were overturned. School buses and vehicles were propelled through the air for hundreds of yards. The tornado hit on the day of the Wadena all-school reunion, so many additional people were in the area. Roughly 100 people were displaced from their homes. Peak winds were estimated at 170 mph.

T6 June 17, 2010

TORNADO REPORTS...
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



TRAILL COUNTY --- 2.5 SE PORTLAND JCT [47.54, -97.30], 2.0 SE HATTON ARPT [47.68, -97.32]

06/17/10 14:49 CST 0 Tomado (EF4, L: 9.00 mi , W: 150 yd)
06/17/10 15:05 CST 1 0 Source: NWS Storm Survey

The tornado tracked northward for nearly 9 miles to about 12 miles north of Mayville by 405 PM CDT and crossed into Grand Forks County. It then continued for another 8 miles to around 10 miles west of Thompson by 418 PM CDT, for a total track length of nearly 17 miles. Trees in shelterbelts and farmsteads were snapped, uprooted, or sheared off. One well constructed house near Holmes was completely swept from its foundation and destroyed. Peak winds were estimated at 185 mph. A farm shop about five and one-half miles north of Mayville was hit by the tornado, destroying the shop. A man inside survived with cuts on his hand.

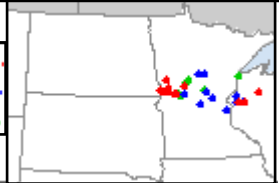
GRAND FORKS COUNTY --- 2.9 SSW HOLMES [47.68, -97.32], 10.0 W THOMPSON [47.78, -97.32]

06/17/10 15:05 CST 0 Tomado (EF4, L: 8.00 mi , W: 150 yd)
06/17/10 15:18 CST 0 Source: NWS Storm Survey

This tornado began in Traill County about 3 miles north-northeast of Mayville at 349 PM CDT. The tornado crossed into Grand Forks County and tracked for an additional 8 miles to about 10 miles west of Thompson. The total track length was roughly 17 miles. One well constructed house near Holmes was completely swept from its foundation and destroyed along with several other farm buildings. Peak winds were estimated at 185 mph.

T7 August 7, 2010

TORNADO REPORTS...
WIND REPORTS/HI.....
HAIL REPORTS/LG.....



RICHLAND COUNTY --- 3.1 SSW TYLER [46.11, -96.63], 3.3 SSE TYLER [46.11, -96.56]

08/07/10 17:25 CST 0 Tomado (EF4, L: 2.50 mi , W: 600 yd)
08/07/10 17:37 CST 0 Source: Trained Spotter

This tornado touched down south of Tyler and tracked to the east for roughly 2.5 miles before crossing the Bois de Sioux River into Wilkin County, Minnesota. In Wilkin County, the tornado continued for another 2.5 miles and lifted about 650 pm CDT. The total track length was about 5 miles and peak winds were estimated at 175 mph.

WILKIN COUNTY --- 5.3 SW DORAN [46.13, -96.56], 2.5 SW DORAN [46.15, -96.52]

08/07/10 17:37 CST 0 Tomado (EF4, L: 2.50 mi , W: 600 yd)
08/07/10 17:50 CST 0 Source: NWS Storm Survey

This tornado began in Richland County, North Dakota, at 625 pm CDT, where it had a path length of 2.5 miles. It continued in Wilkin County, Minnesota, where it finally lifted about 2.5 miles southwest of Doran. The total path length was roughly five miles and peak winds were estimated at 175 mph.

As mentioned before, there have been no F5/EF5 tornadoes since modernization has occurred. However, there were two F5 tornadoes prior to modernization, and they are shown in Figure 7 below. Descriptions of the 2 tornadoes are shown after Figure 7.

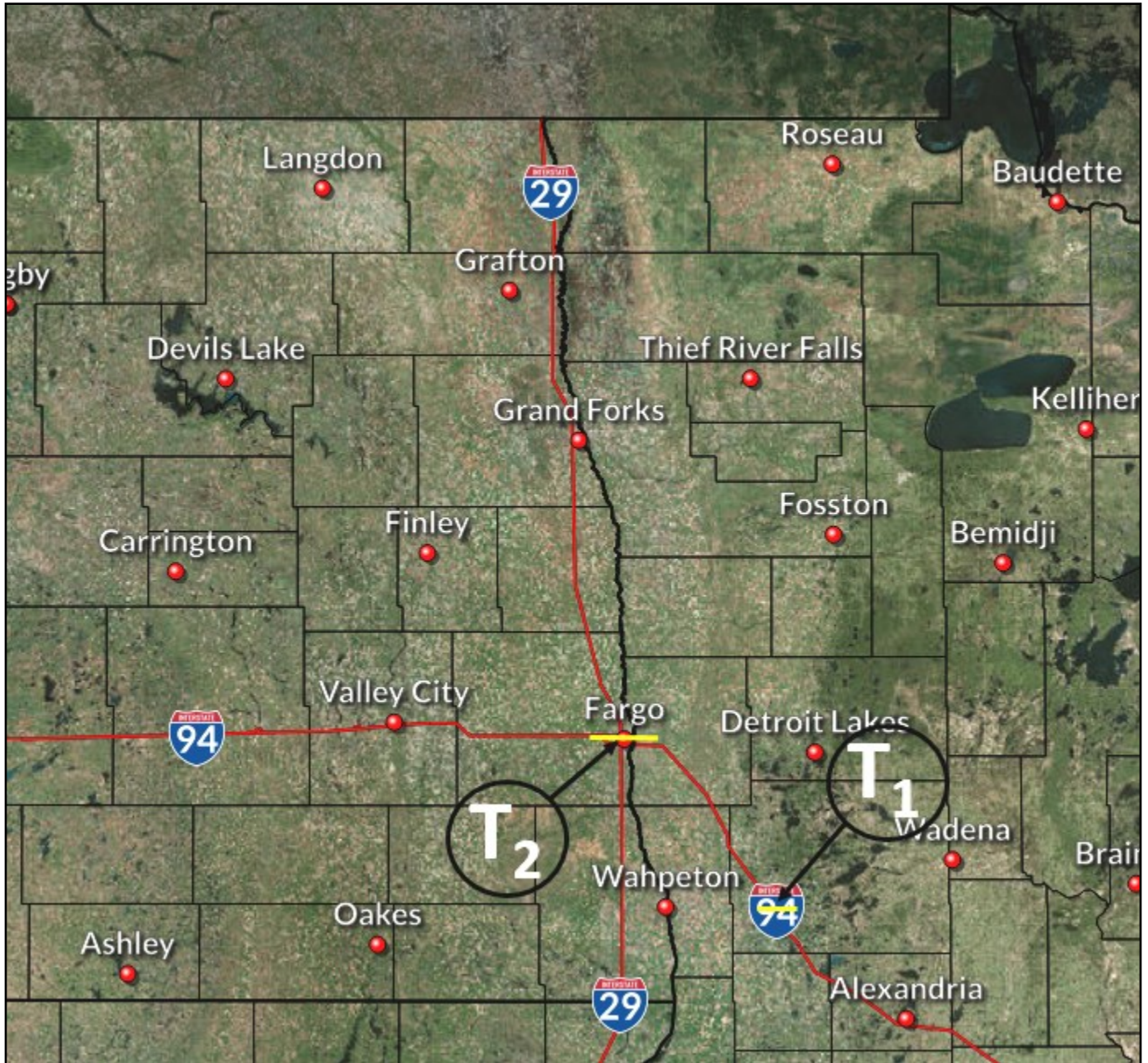


Figure 7 F5/EF5 Tornadoes

T1 June 22, 1919

The Fergus Falls Tornado: more information can be found at: https://www.weather.gov/fgf/1919_06_22_FergusFallsTornado

T2 June 20, 1957

The Fargo-Moorhead Tornado: more information can be found at: <https://www.weather.gov/fgf/fargo57tornado>

Deaths/Injuries from Tornadoes since 1996

(List may not be complete)

F1/EF1 Tornadoes

June 17, 2010	Red Lake County, MN		1 Injury
---------------	---------------------	--	----------

F2/EF2 Tornadoes

October 26, 1996	Otter Tail County, MN		1 Injury
June 6, 2008	Wadena County, MN		1 Injury
June 6, 2008	Hubbard County, MN		1 Injury

F3/EF3 Tornadoes

T8 June 17, 2010	Polk County, MN	1 Death	2 Injuries
------------------	-----------------	---------	------------

F4/EF4 Tornadoes

T3 August 26, 2007	Grand Forks County, ND	1 Death	18 Injuries
T4 June 17, 2010	Otter Tail County, MN	1 Death	5 Injuries
T5 June 17, 2010	Wadena County, MN		20 Injuries
T6 June 17, 2010	Trill County, ND		1 Injury

Earliest and Latest Tornadoes since 1996

Earliest Tornado

April 21, 2012	1135 CST	Wilkin County, MN (EF0) (5SE Kent—2.9ENE Brushvale)
----------------	----------	--

Latest Tornado

October 26, 1996	1714 CST	Hubbard County, MN (F0/EF0) (4N Dorset)
------------------	----------	--

2. Hail Statistics

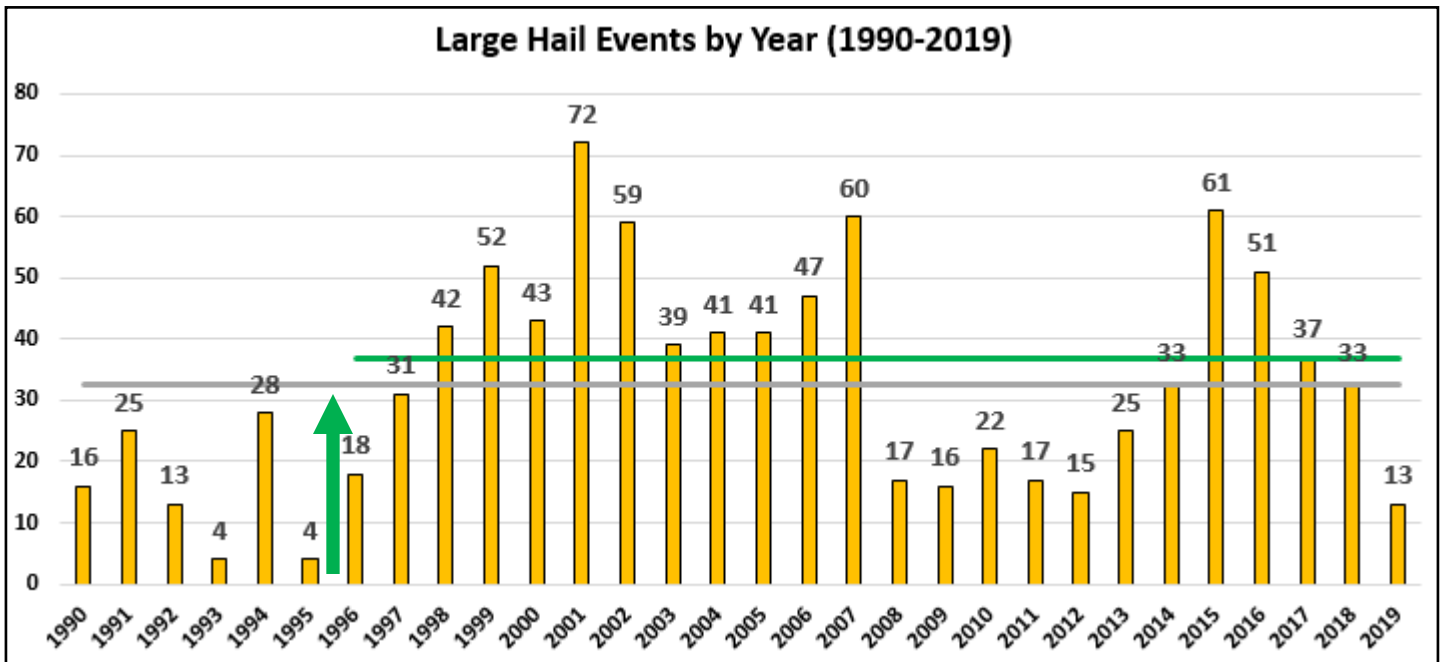


Figure 8 Large Hail Events by Year (1990-2019)

Hail events were analyzed from 1990 to 2019. However, this does not include all hail events. To look at every hail event throughout this time period would take a long time to compile. So Figure 8 strictly looks at hail reports of 1.75 inches and larger, from 1990 to 2019. The green arrow in Figure 8 shows when modernization occurred. The number of large hail reports varies from a low of 4 in 1993 and 1995 to a high of 72 in 2001. The gray line in Figure 8 shows the average number of large hail reports (33) for these 30 years (1990-2019), while the green line shows the average number of large hail reports (37) for the modernized years (1996-2019).

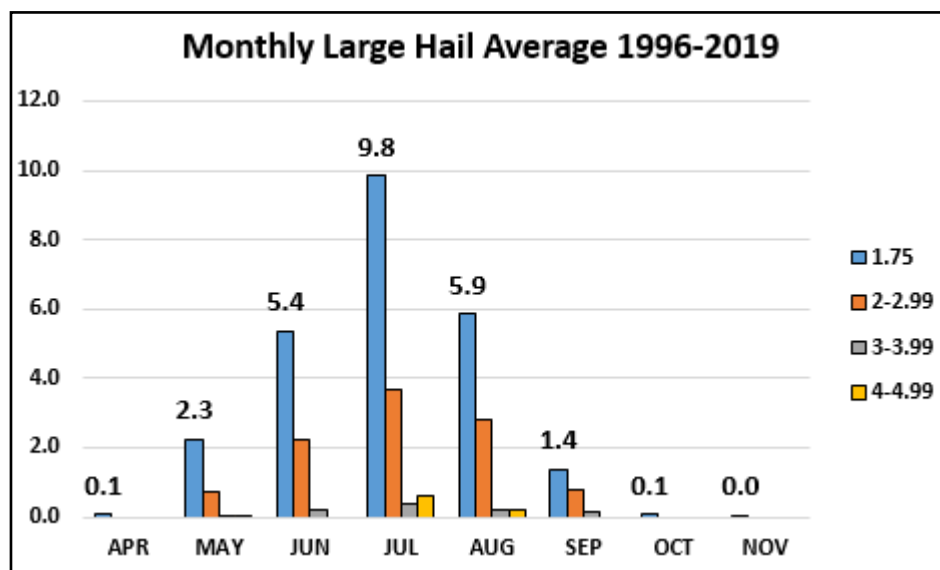


Figure 9 Monthly Large Hail Average (1996-2019)

Switching to just the modernized era (1996-2019), the hail reports of 1.75 inches and larger can be broken down into four different groups, 1.75 inches, 2-2.99 inches, 3-3.99 inches, and 4-4.99 inches. Figure 9 shows the results of this breakdown. The most hail reports were the 1.75 inch size group (blue columns in Figure 9), with the most occurring in July. The 2-2.99 inch size group came in second (orange columns in Figure 9), with the most also occurring in July. Hail sizes larger than 3 inches occur rarely.

Very large hail events (4.50 inches and greater) occurred 9 times (Figure 10), and the Storm Data entries are shown after Figure 10. If you look closely at the Storm Data entries that follow, you will notice that no very large hail events have occurred since 2004.

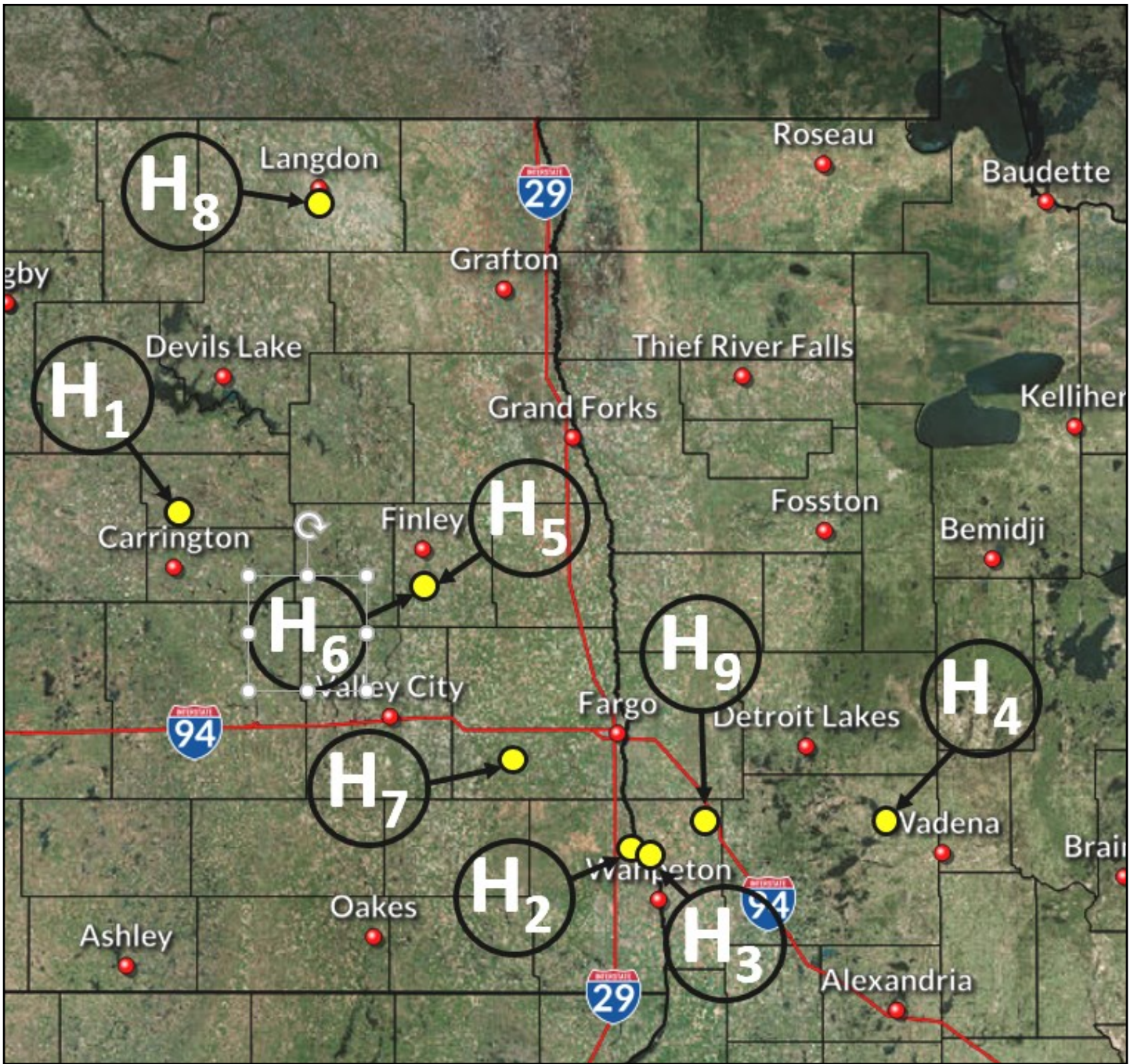
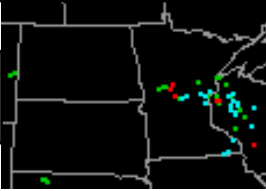
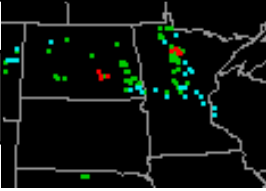
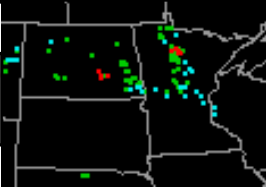
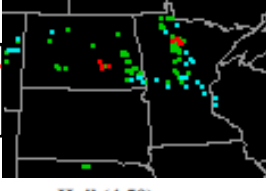
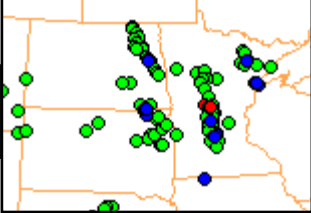
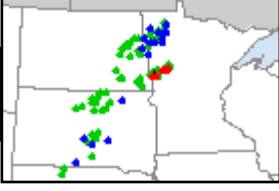


Figure 10 Locations of 4.50 Inch Hail (1996-2019)

H1 July 28, 1996				SPC Map N/A			
Eddy County							
2 S New Rockford	28	1804CST	0	0	100K	Hail (4.50)	

H2 July 14, 1998			SPC Map N/A		
Richland County Abercrombie	14	1745CST	0	0	Hail (4.50)
H3 July 14, 1998			SPC Map N/A		
Wilkin County Kent	14	1740CST	0	0	Hail (4.50)
The large hail damaged a few vehicles and smashed some house windows.					
H4 July 8, 2000			<div style="border: 1px solid black; padding: 2px; display: inline-block;"> TORNADO REPORTS.. WIND REPORTS/HI..... HAIL REPORTS/LG..... </div> 		
Otter Tail County 5 W New York Mills	08	1946CST	0	0	Hail (4.50)
H5 July 17, 2001			<div style="border: 1px solid black; padding: 2px; display: inline-block;"> TORNADO REPORTS.. WIND REPORTS/HI..... HAIL REPORTS/LG..... </div> 		
Steele County 10 S Finley	17	1600CST	0	0	Hail (4.50)
H6 July 17, 2001			<div style="border: 1px solid black; padding: 2px; display: inline-block;"> TORNADO REPORTS.. WIND REPORTS/HI..... HAIL REPORTS/LG..... </div> 		
Steele County 10 S Finley	17	1645CST	0	0	Hail (4.50)
H7 July 17, 2001			<div style="border: 1px solid black; padding: 2px; display: inline-block;"> TORNADO REPORTS.. WIND REPORTS/HI..... HAIL REPORTS/LG..... </div> 		
Cass County 3 N Chaffee	17	1715CST	0	0	50K Hail (4.50)
The ground was white with hail. The hail killed birds and damaged several vehicles and buildings.					
H8 July 19, 2003			<div style="border: 1px solid black; padding: 2px; display: inline-block;"> TORNADO REPORTS.. WIND REPORTS/HI..... HAIL REPORTS/LG..... </div> 		
Cavalier County 4 S Langdon	19	1745CST	0	0	4M Hail (4.50)
H9 May 11, 2004			<div style="border: 1px solid black; padding: 2px; display: inline-block;"> TORNADO REPORTS.. WIND REPORTS/HI..... HAIL REPORTS/LG..... </div> 		
Wilkin County 6 W Lawndale	11	1800CST	0	0	Hail (4.50)

Very large hail events (4.75 inches and greater) occurred once, and the Storm Data entry is also included below. This is the largest hail report over eastern North Dakota and the northwest quarter of Minnesota since modernization (1996).

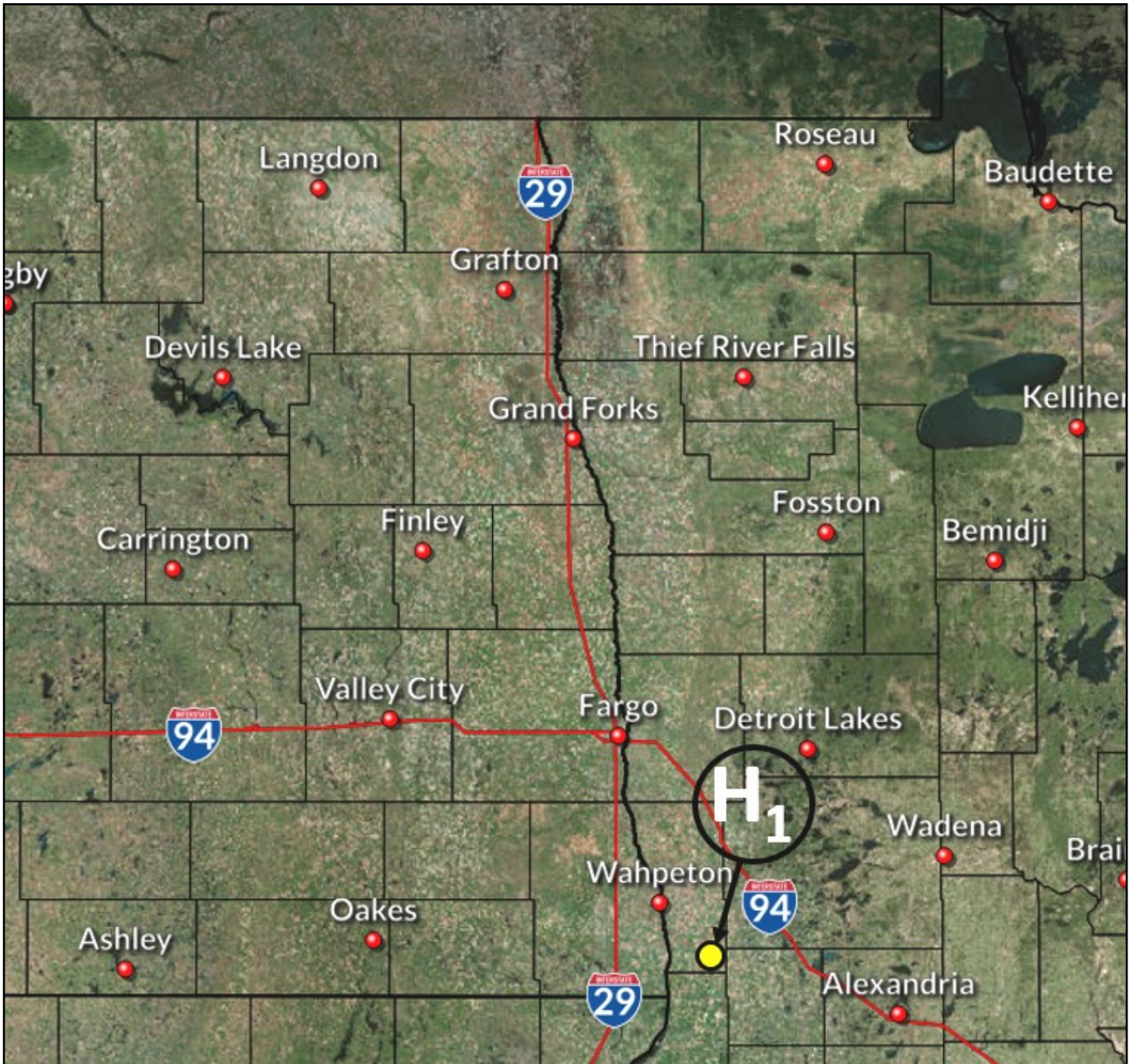
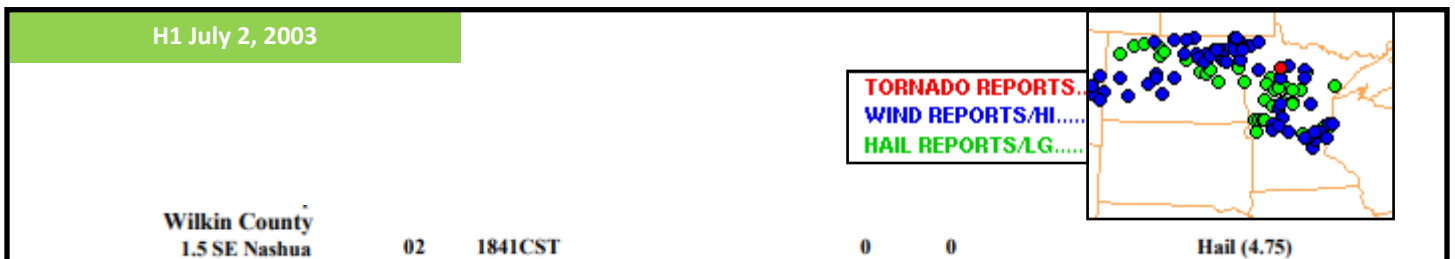


Figure 11 Location of 4.75 Inch Hail (1996-2019)



Earliest and Latest Large Hail Report Since 1996

Earliest 1.75 Inch Hail Report

April 15, 2003	1912 CST	Otter Tail County, MN (3W Parkers Prairie)
----------------	----------	---

Latest 1.75 Inch Hail Report

November 1, 2000	1900 CST	Polk County, MN (1NW Winger)
------------------	----------	---------------------------------