



Precipitation Trends

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Lake Nokomis/Hiawatha Area Meeting
November 30, 2017

Minnesota Precipitation Trends

1. Minnesota is becoming wetter

- In all seasons of the year

2. Extreme rainfall increasing

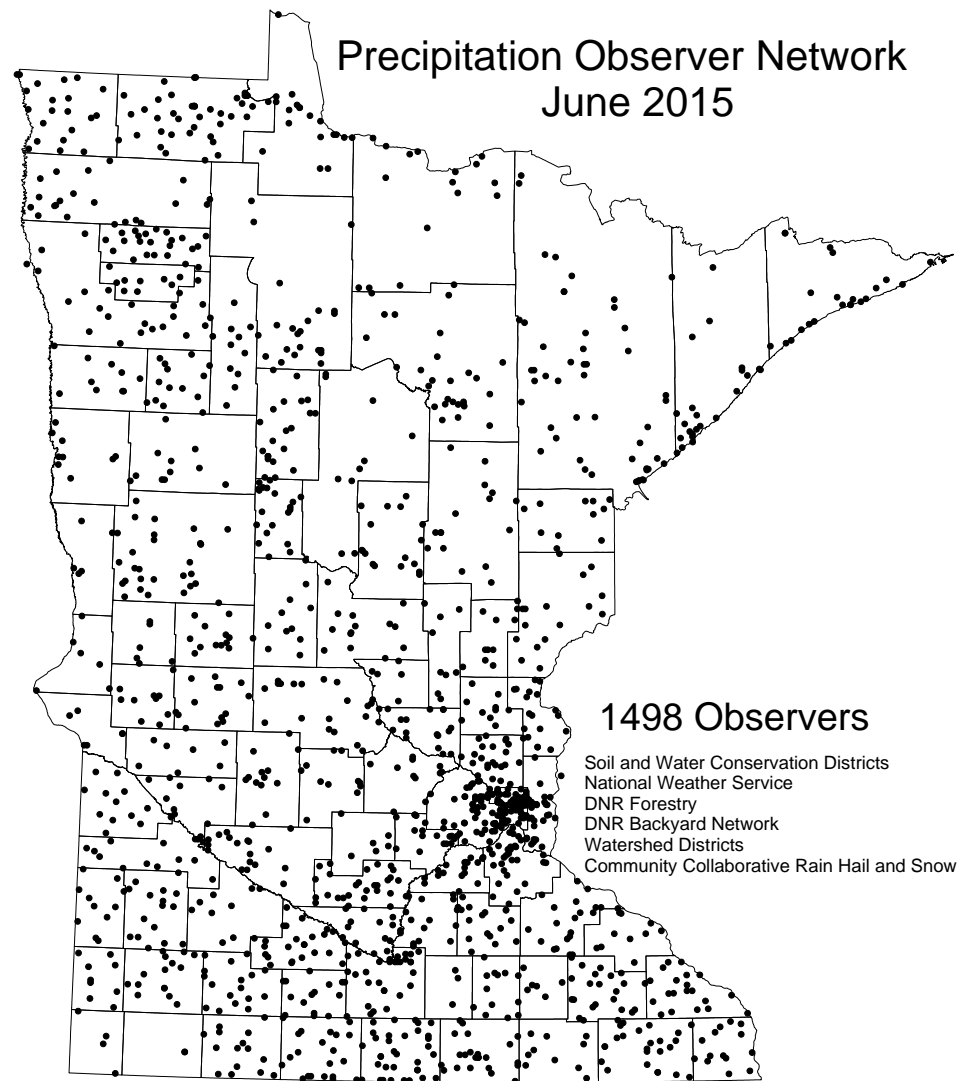
- More and larger “big” events



June 11, 2017 Hailstorm

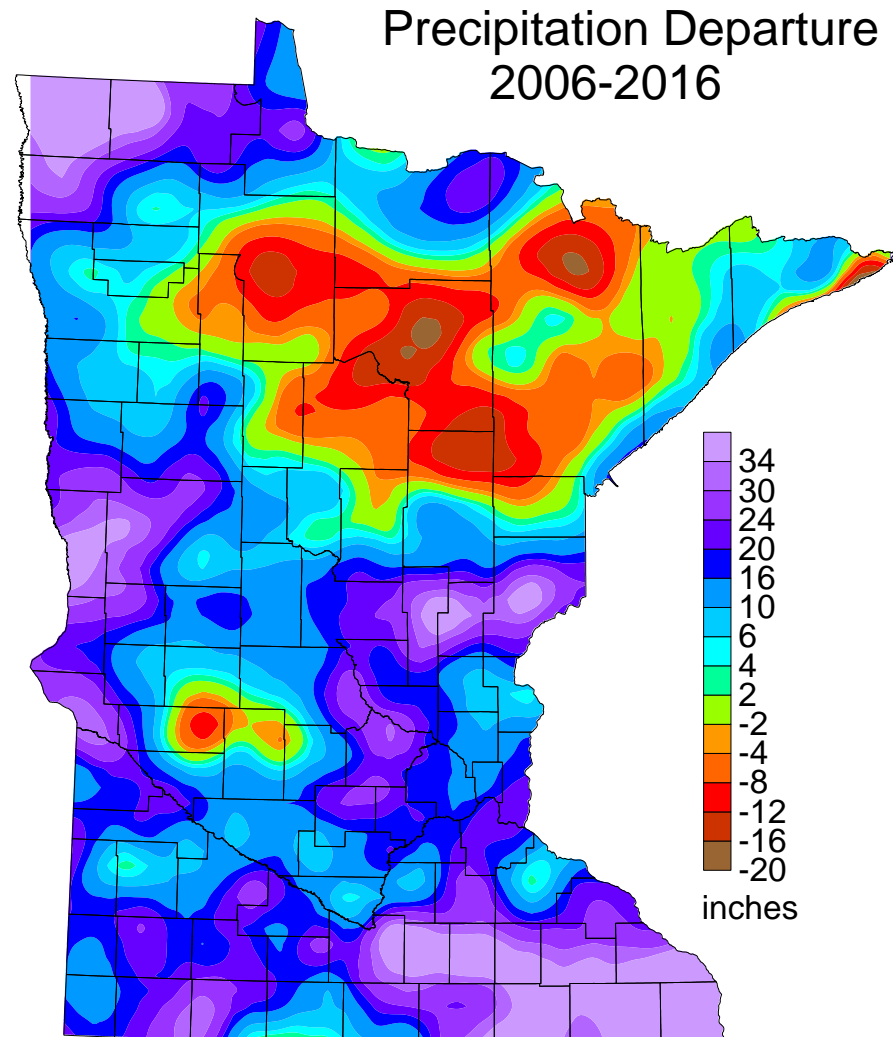
Courtesy: MNDNR State Climatology Office

MnGage Volunteer Rain Gage Network



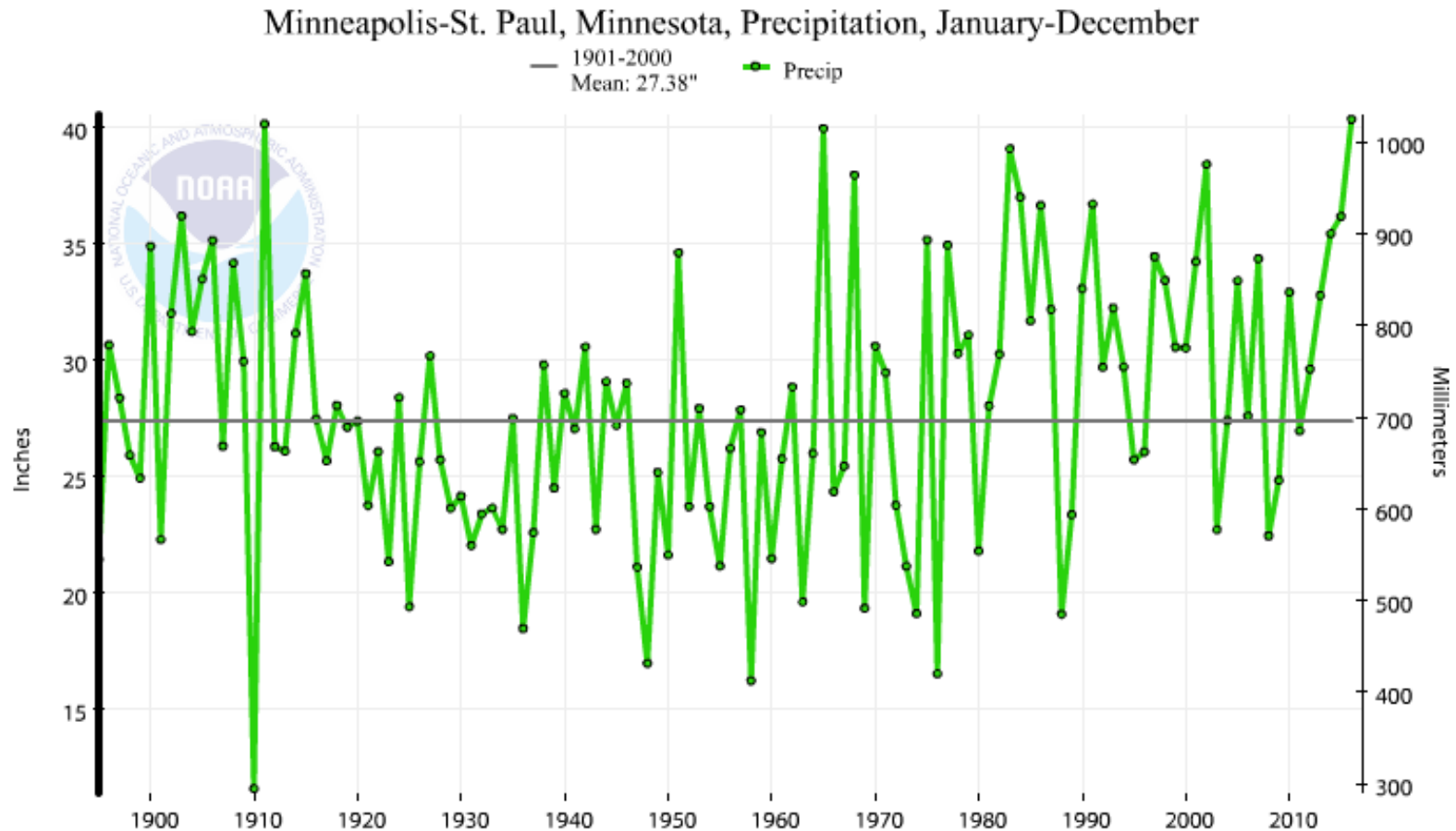
State Climatology Office
DNR Division of Ecological and Water Resources

MnGage Volunteer Rain Gage Network



MNDNR State Climatology Office - September 18, 2017

2016 was the Wettest on Record in the Twin Cities



Source: NOAA Climate at a Glance

2016 was the Wettest on Record in the Twin Cities

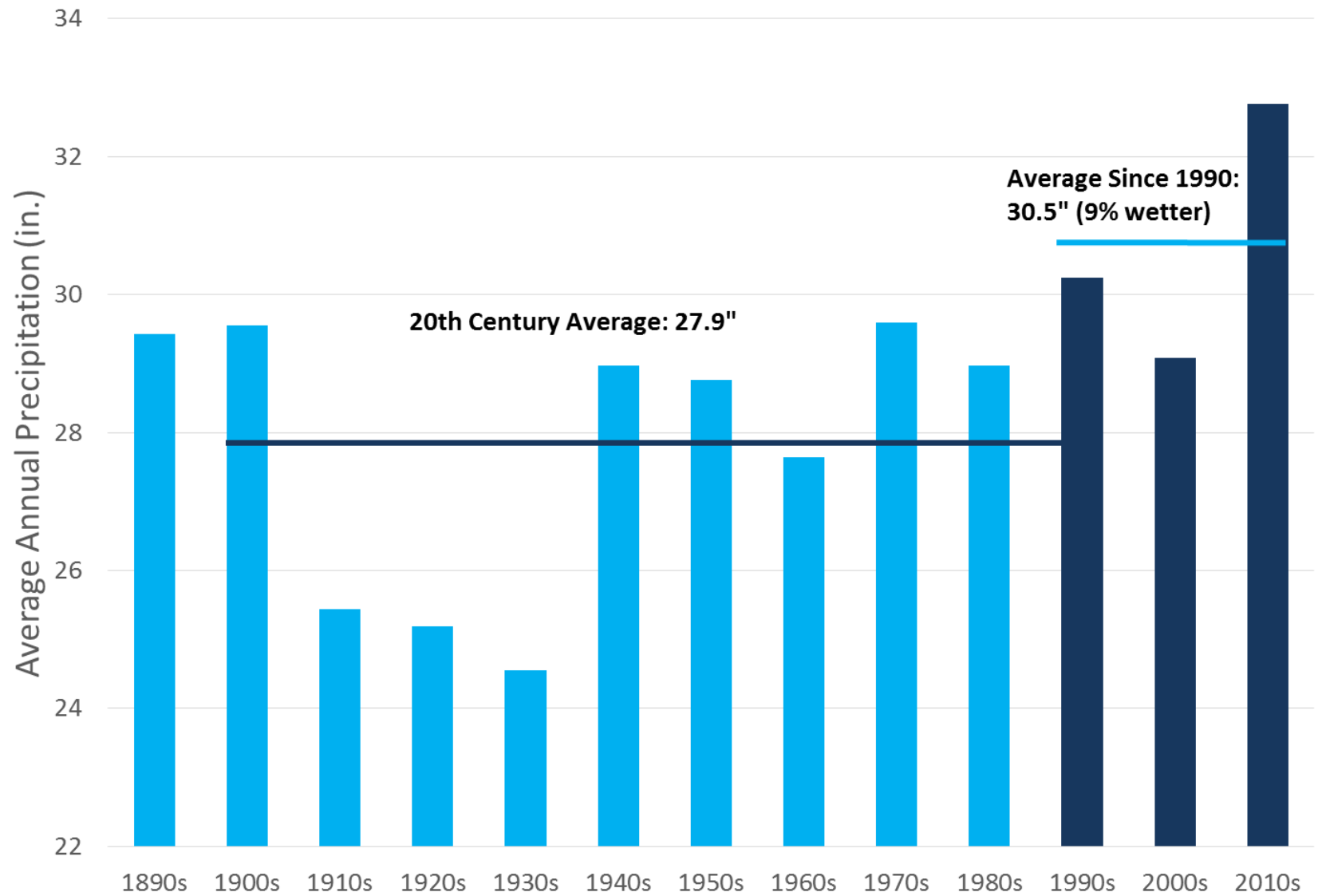
Station	2016 Record Precip. Amount	Previous Record (year)
Waseca	56.24"	50.46" (1991)
St. James	52.55"	42.72" (2010)
Harmony	51.71"	47.41" (1983)
Austin	48.35"	46.01" (1993)
Theilman	48.33"	47.20" (2010)
Minnesota City Dam	45.73"	44.29" (1968)
Winona Dam	43.57"	43.27" (1991)
Twin Cities	40.32"	40.15" (1911)

Source: MN DNR State Climatology Office

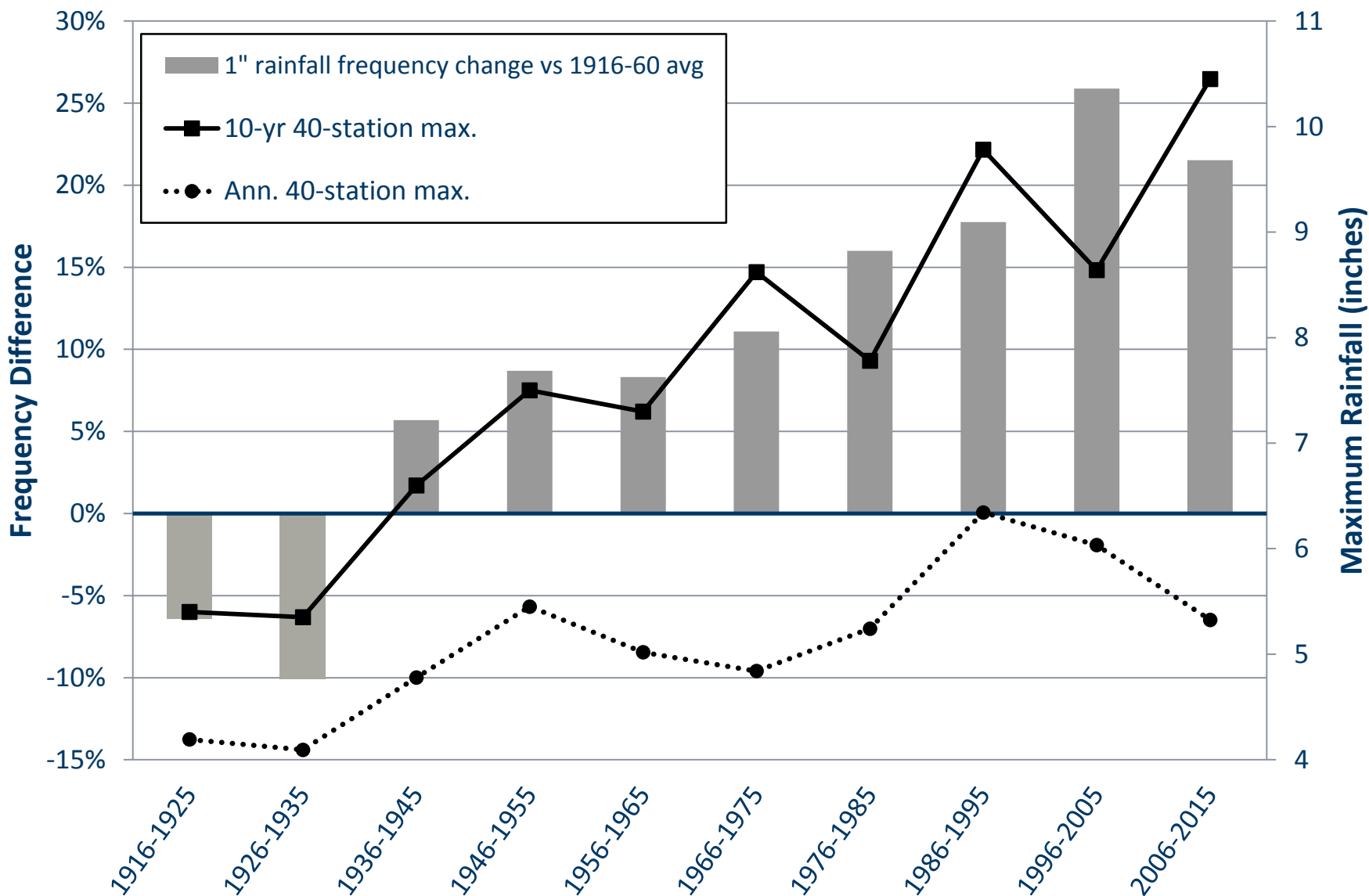
All Minnesota seasons getting wetter

Season	Total precipitation change, 1895-2016
Winter (Dec - Feb)	+ 6% (0.13")
Spring (Mar – May)	+15% (0.93")
Summer (Jun - Aug)	+11% (1.21")
Fall (Sep – Nov)	+11% (0.66")
Growing Season (May – Sep)	+ 9% (1.55")
Annual	+12% (2.98")

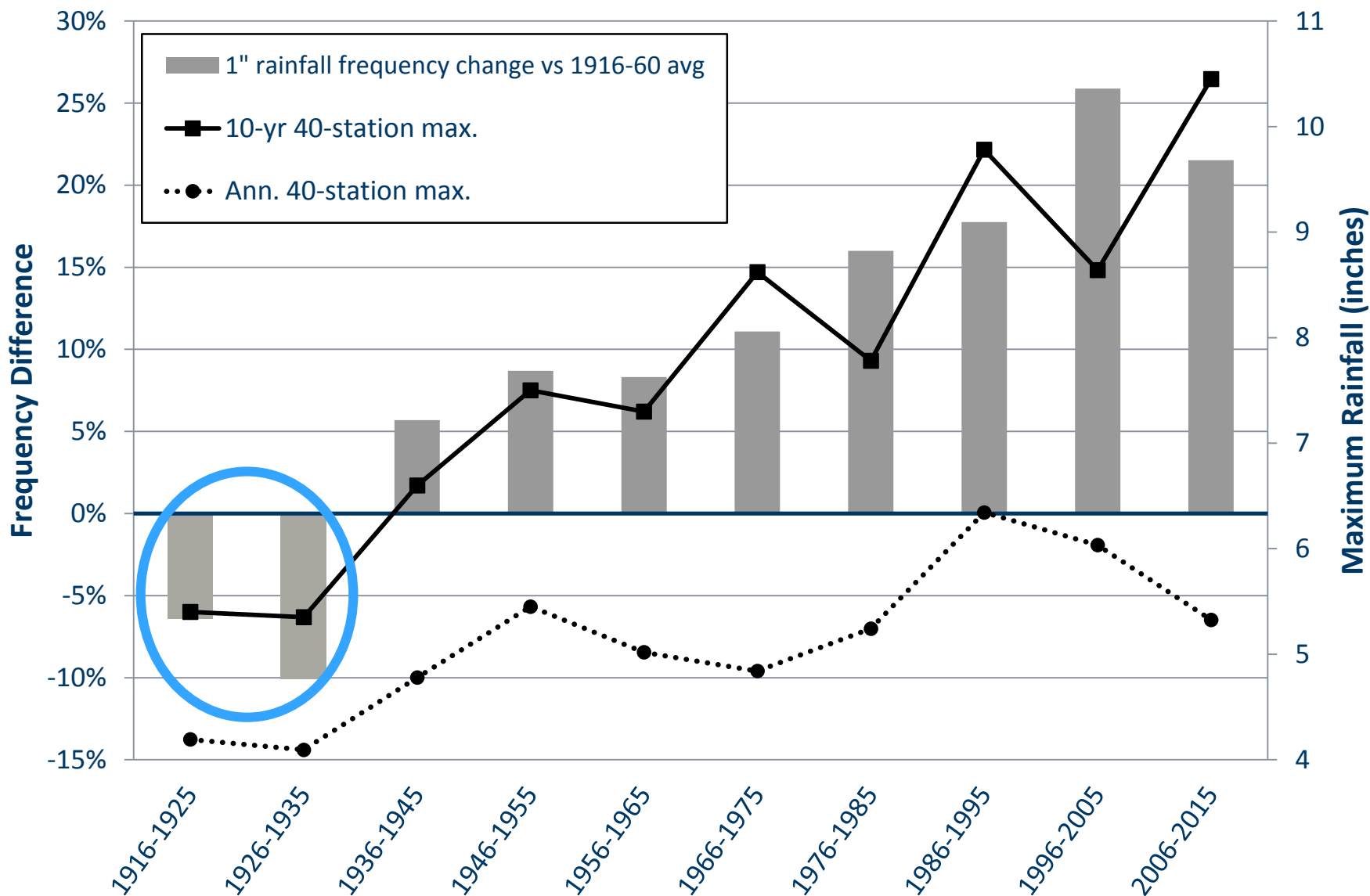
Eastern MN Average Annual Precipitation, by Decade



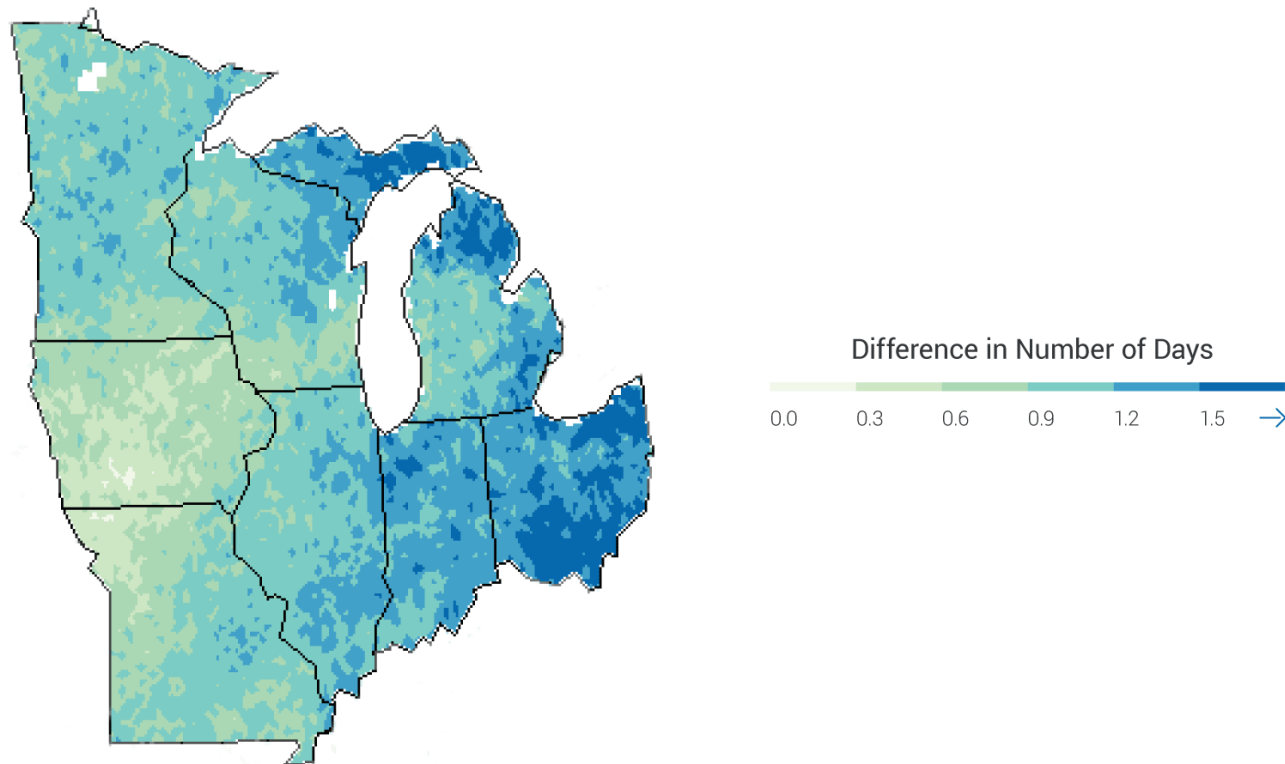
Changes in Heavy Precipitation Frequency and Intensity from 40 Long-Term Minnesota Stations, 1916-2015



Changes in Heavy Precipitation Frequency and Intensity from 40 Long-Term Minnesota Stations, 1916-2015



Continued increase in “upper 2 percentile” rainfall events projected by mid-century



Source: 2014 National Climate Assessment, [Midwest Chapter](#)

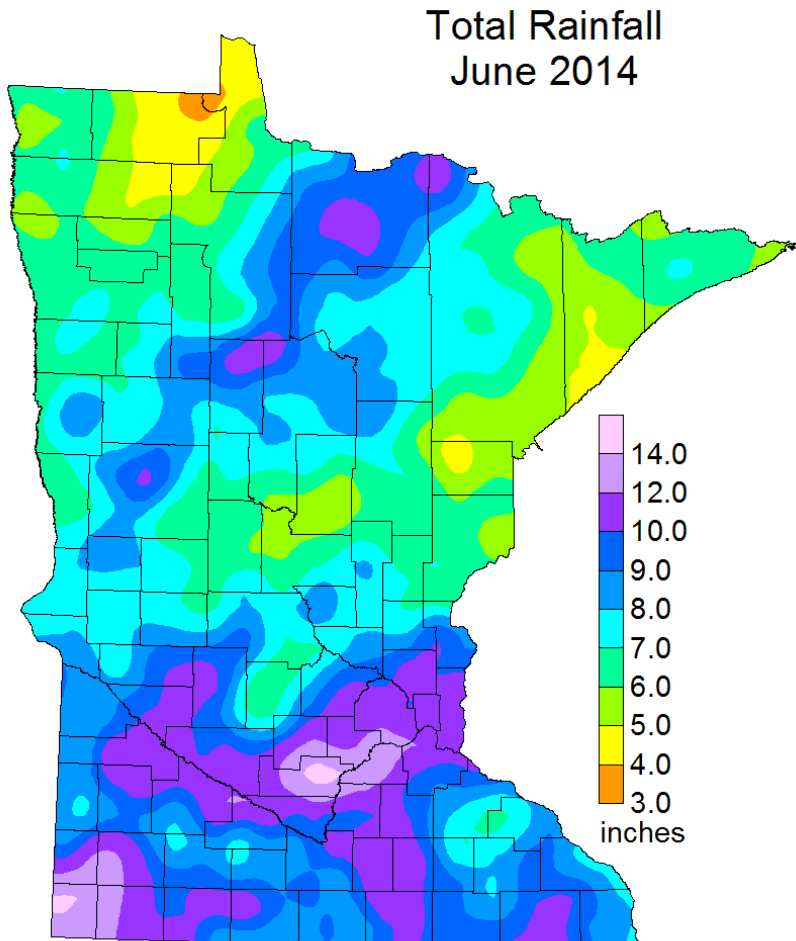
Extreme Rainfall Increasing

- Increases in frequency of heavy rainfall
- Increases in magnitude of heaviest rainfall
- Increased occurrence of large areal coverage extreme rainfall events

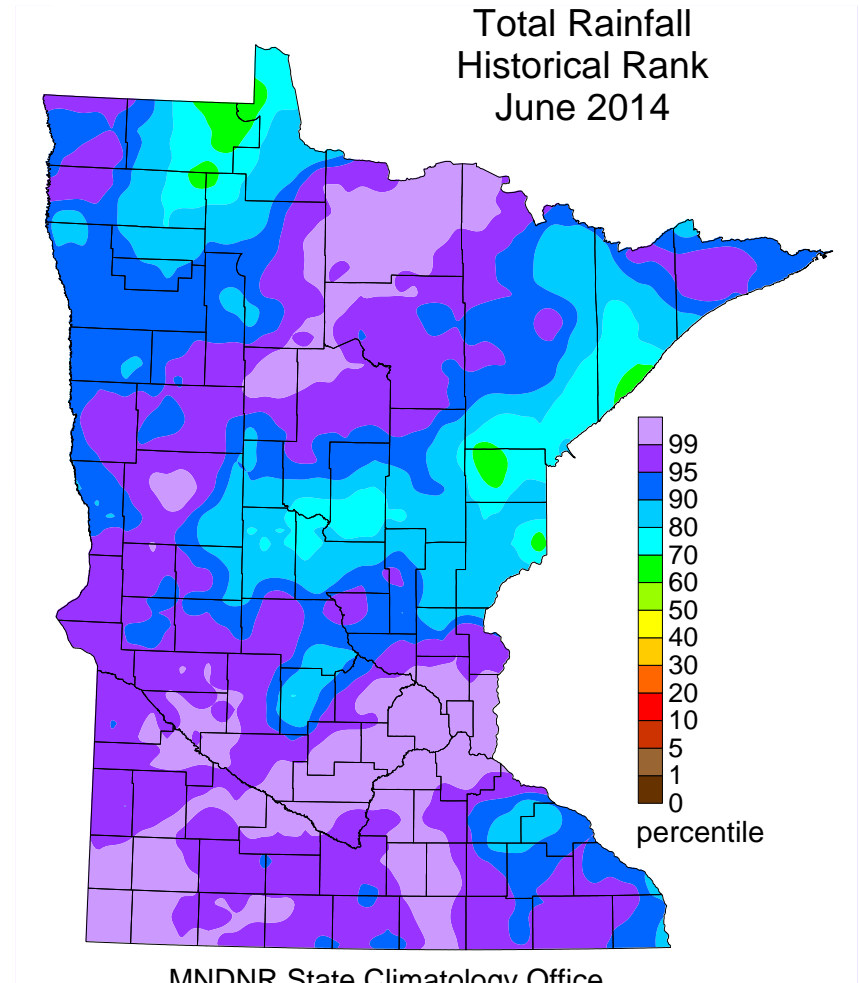
June 2014: Road Under Water
Courtesy: MNDNR State Climatology Office



Exceedingly Wet June 2014



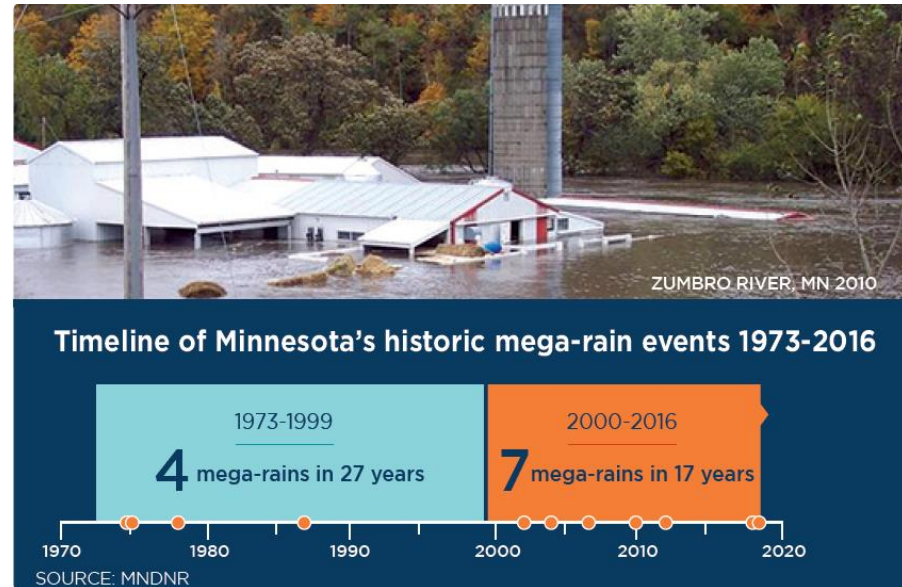
MNDNR State Climatology Office



MNDNR State Climatology Office

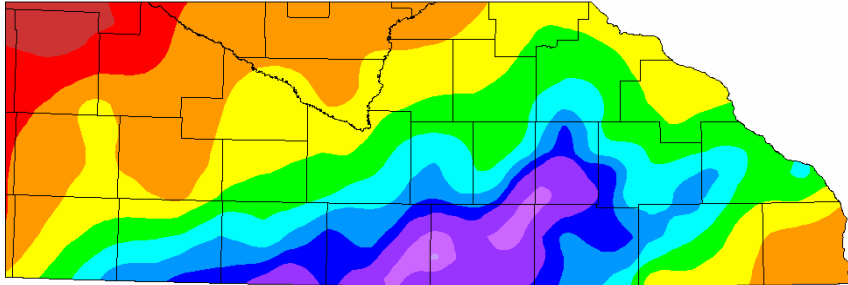
Extreme rainfall: “Mega” rain events (6” + over 1000 sq mi) are increasing

- June 28-29, 1975, Northwest MN
- June 30-July 2, 1978, Southeast MN
- July 23-24, 1987, Twin Cities Superstorm
- June 9-10, 2002, Northern MN
- September 14-15, 2004 Southern MN
- August 18-20, 2007, Southern MN
- September 22-23, 2010 Southern MN
- June 19-20, 2012, Northeast MN
- July 11-12, 2016, East-central MN
- August 10-11, 2016, Central and Southeast MN

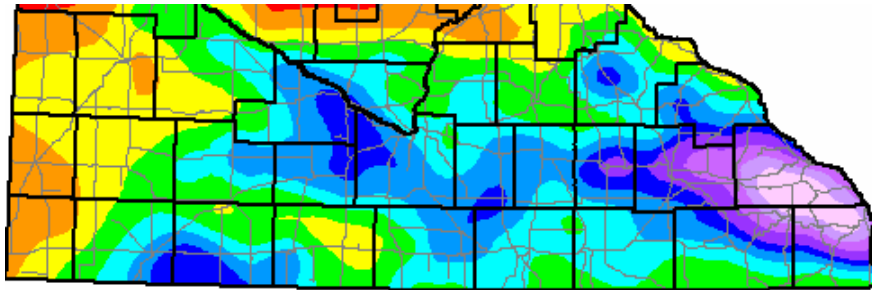


Source: 2017 MN EQB Environment and Energy Report Card (via DNR)

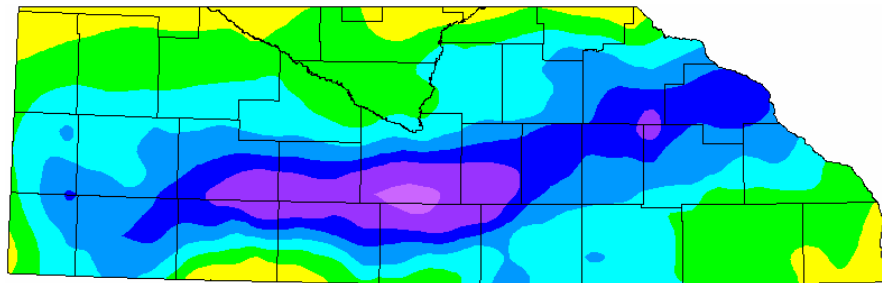
Extreme rainfall: “Mega” rain events (6” + over 1000 sq mi) are increasing



Sep 14-15,
2004



Aug 18-20,
2007



Sep 22-23,
2010

At this rate areas that add up to the size of southern Minnesota would be covered by 10” in 100 years.



Source: MN DNR State Climatology Office

In Summary

1. Minnesota is becoming wetter in all seasons
2. Extreme rainfall events increasing



Thunderstorm: Nov 28, 2016

Courtesy: MNDNR State Climatology Office

Thank You!

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Storms of
2017

Courtesy:
Minnesota State
Climatology Office

