

Climate Change & Recent Forecasts

Sara Strassman
Presented to Floodplain Advisory Committee
March 5, 2020

Data provided by: Wisconsin Initiative on Climate Change Impacts
National Weather Service
Climate Central

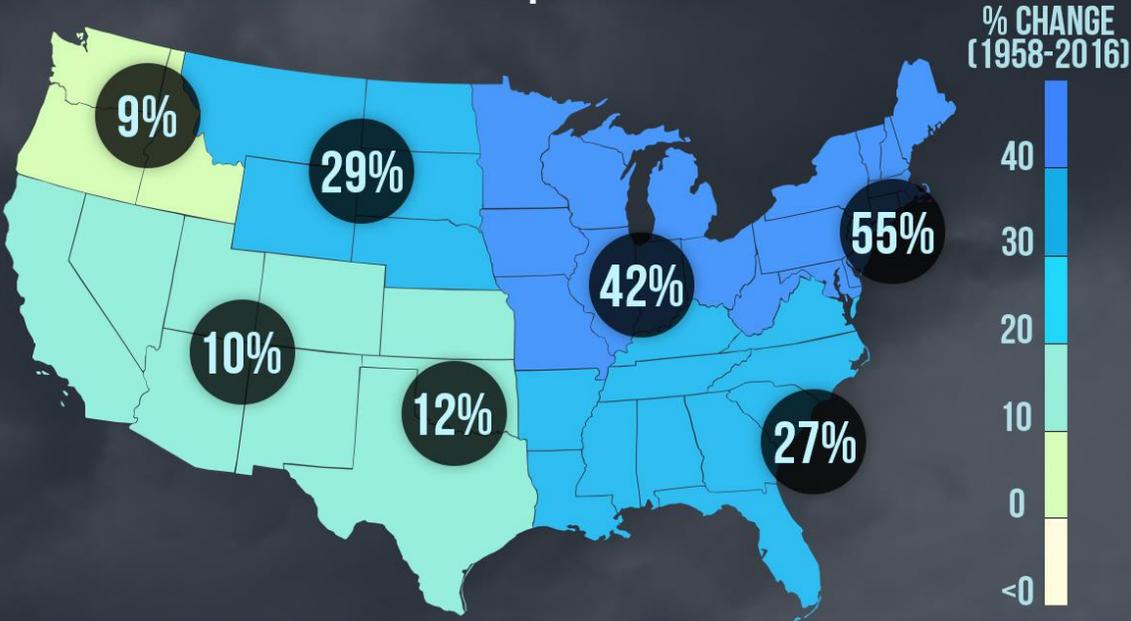
Summary of Expected WI Climate Changes

- Warmer temperatures in all seasons (by 5-6° F)
- More extremely hot days and muggy nights (nights above 70° F)
- More frequent snow melt with more mild winter days
- Less extreme cold (fewer temps below 0° F)
- Longer growing season
- More summer droughts
- Winter precipitation increasingly rain and freezing rain, less snowfall
- Wetter climate, especially during winter and spring
- More intense and frequent heavy rainfalls

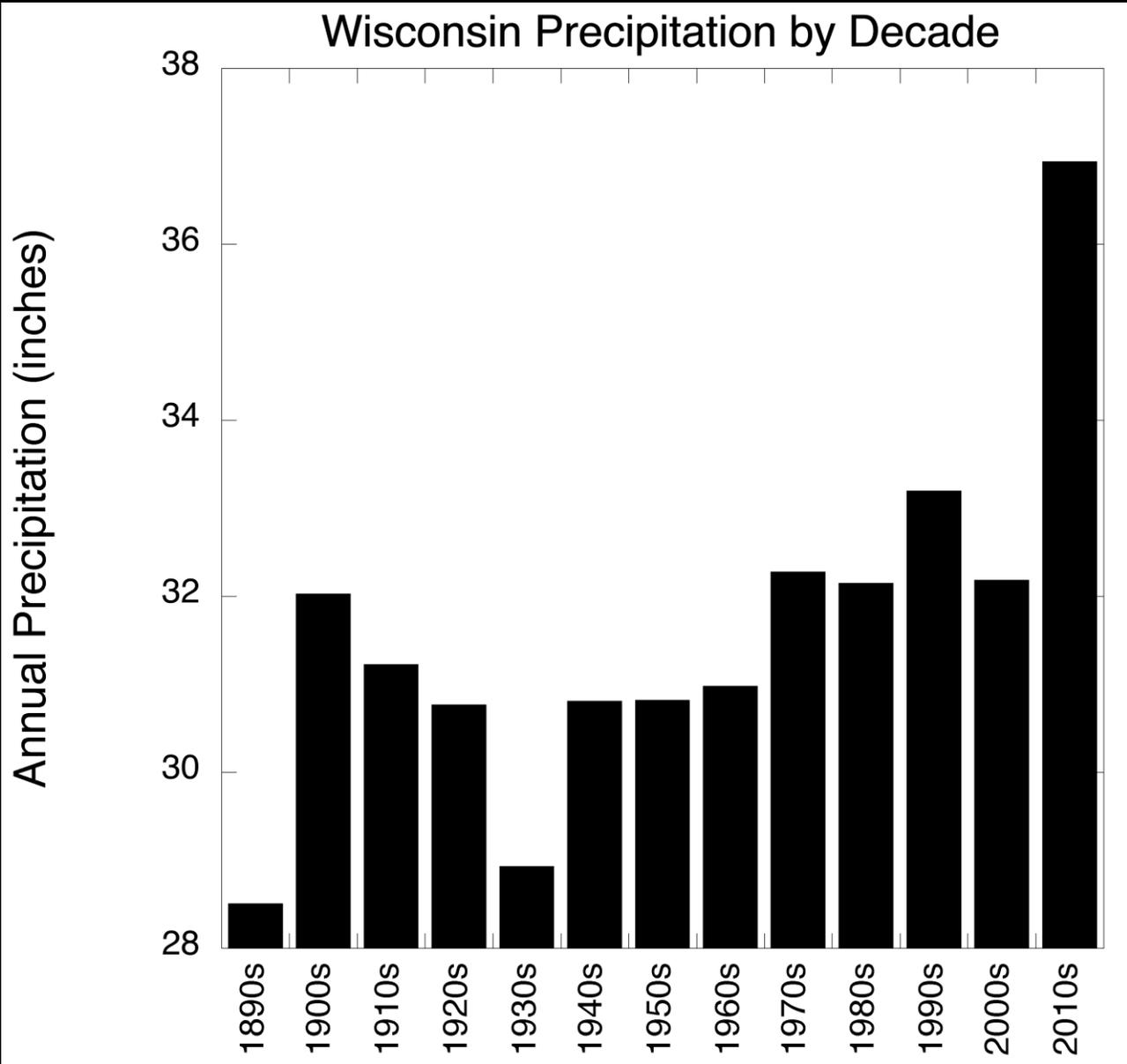
Trend in Heaviest Precipitation in Recent Decades

MORE DOWNPOURS

Increase in Heaviest Precipitation Events



Heaviest events defined as top 1% of events
Source: USGCRP Climate Science Special Report 2017



Past decade the wettest on record—by far!

2019 the wettest year

Becoming wetter in all seasons

La Crosse Gauge

- **Recent Crests**

- (1) 13.33 ft on 06/01/2019
- (2) 14.33 ft on 04/24/2019
- (3) 14.58 ft on 04/03/2019
- (4) 12.17 ft on 06/25/2018
- (5) 12.26 ft on 05/04/2018
- (6) 12.42 ft on 05/25/2017
- (7) 12.04 ft on 09/26/2016
- (8) 13.73 ft on 07/02/2014
- (9) 14.35 ft on 04/14/2011
- (10) 13.84 ft on 09/27/2010

- **Historic Crests**

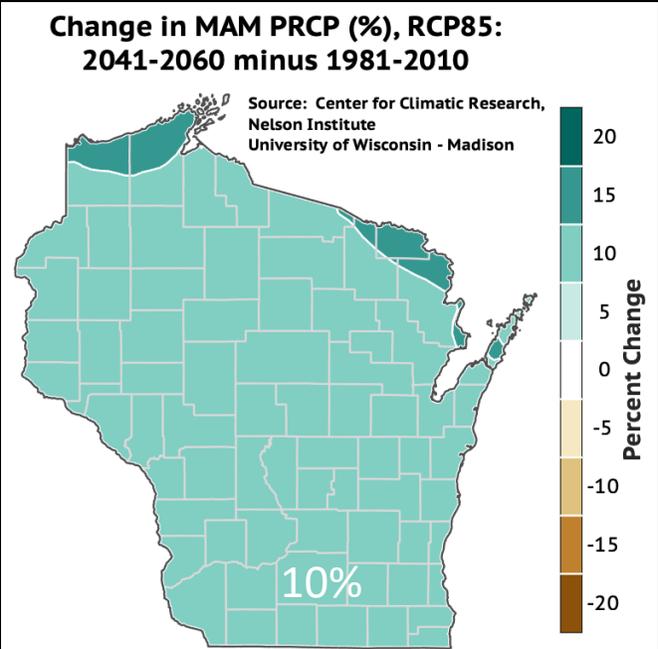
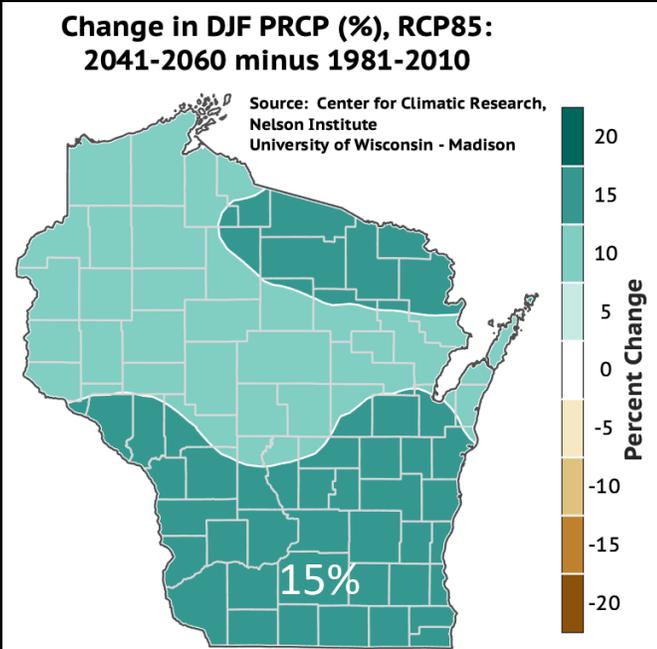
- (1) 17.89 ft on 04/22/1965
- (2) 16.41 ft on 04/18/2001
- (3) 15.70 ft on 04/20/1969
- (4) 15.30 ft on 04/20/1952
- (5) 15.01 ft on 04/12/1997
- (6) 14.90 ft on 04/19/1951
- (7) 14.60 ft on 04/07/1967
- (8) 14.58 ft on 04/03/2019
- (9) 14.50 ft on 05/08/1888
- (10) 14.50 ft on 05/02/1975
- (11) 14.40 ft on 10/17/1881 (P)
- (12) 14.35 ft on 04/14/2011
- (13) 14.33 ft on 04/24/2019
- (14) 14.32 ft on 05/07/1954
- (15) 14.20 ft on 04/02/1920 (P)
- (16) 14.10 ft on 06/26/1993
- (17) 14.00 ft on 04/08/1986
- (18) 13.84 ft on 09/27/2010
- (19) 13.73 ft on 07/02/2014
- (20) 13.70 ft on 09/28/1986



Projected Change in Seasonal Precipitation in Wisconsin

Statistical
Downscaling

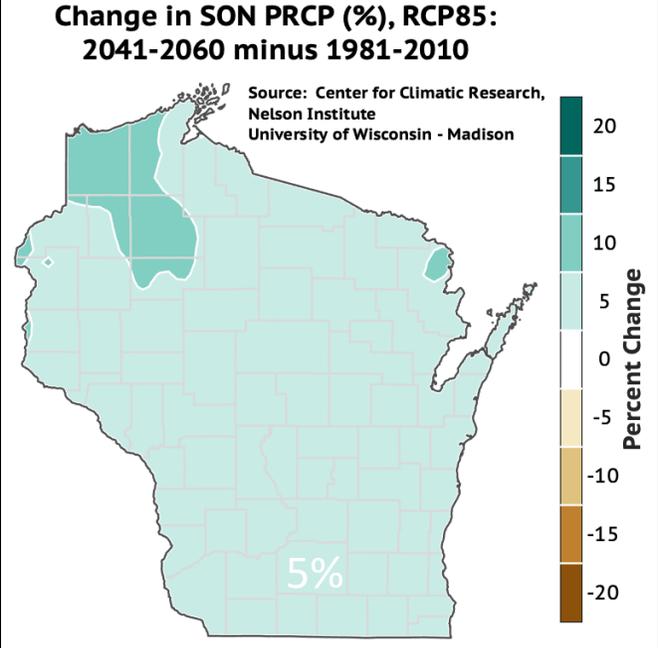
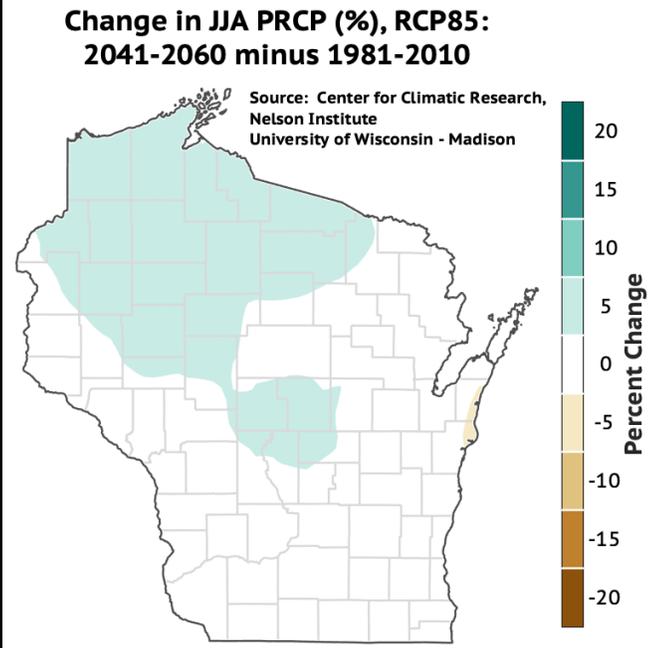
Winter



Spring

Summer

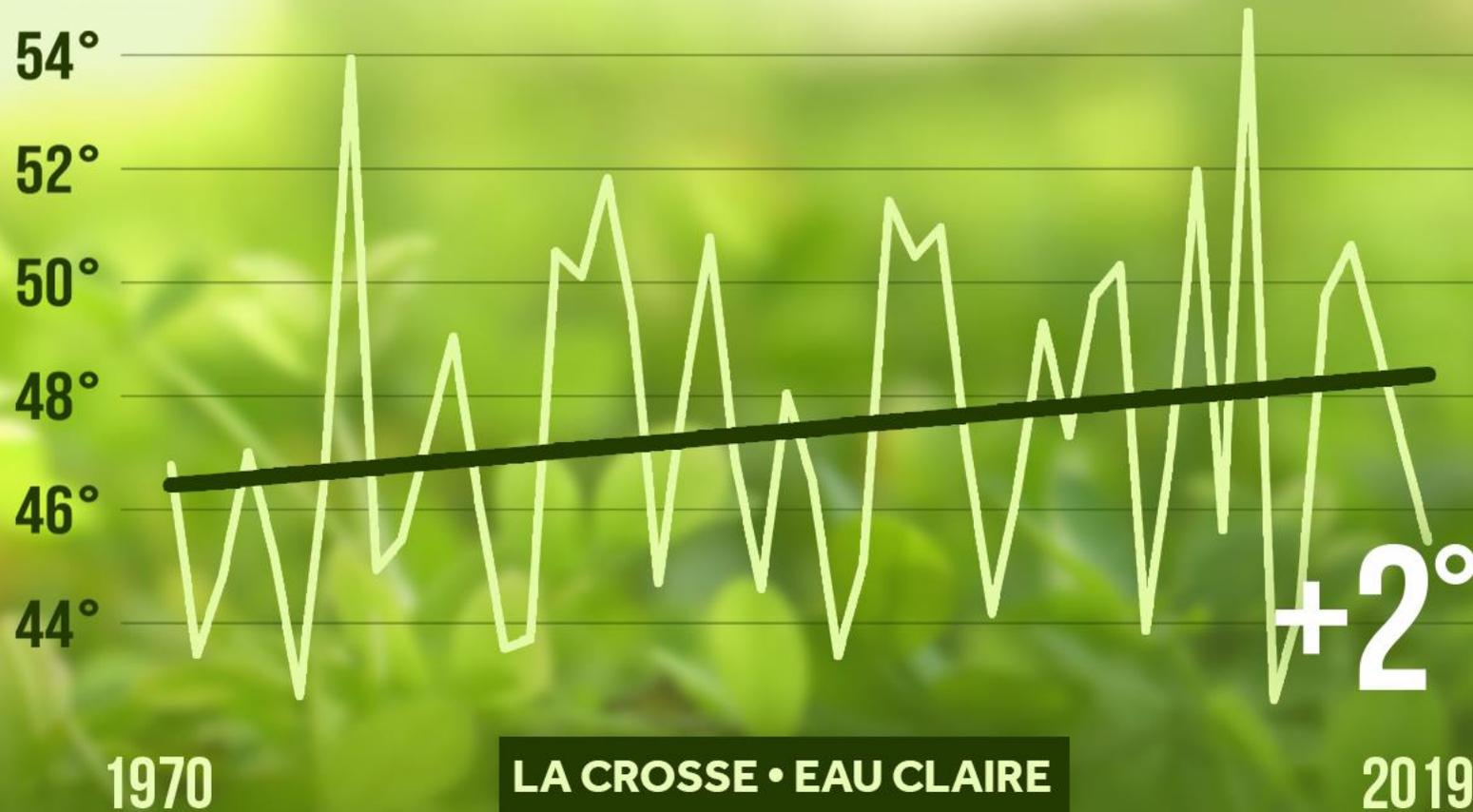
Models
disagree



Autumn

SPRING WARMING

AVERAGE SPRING TEMPERATURE

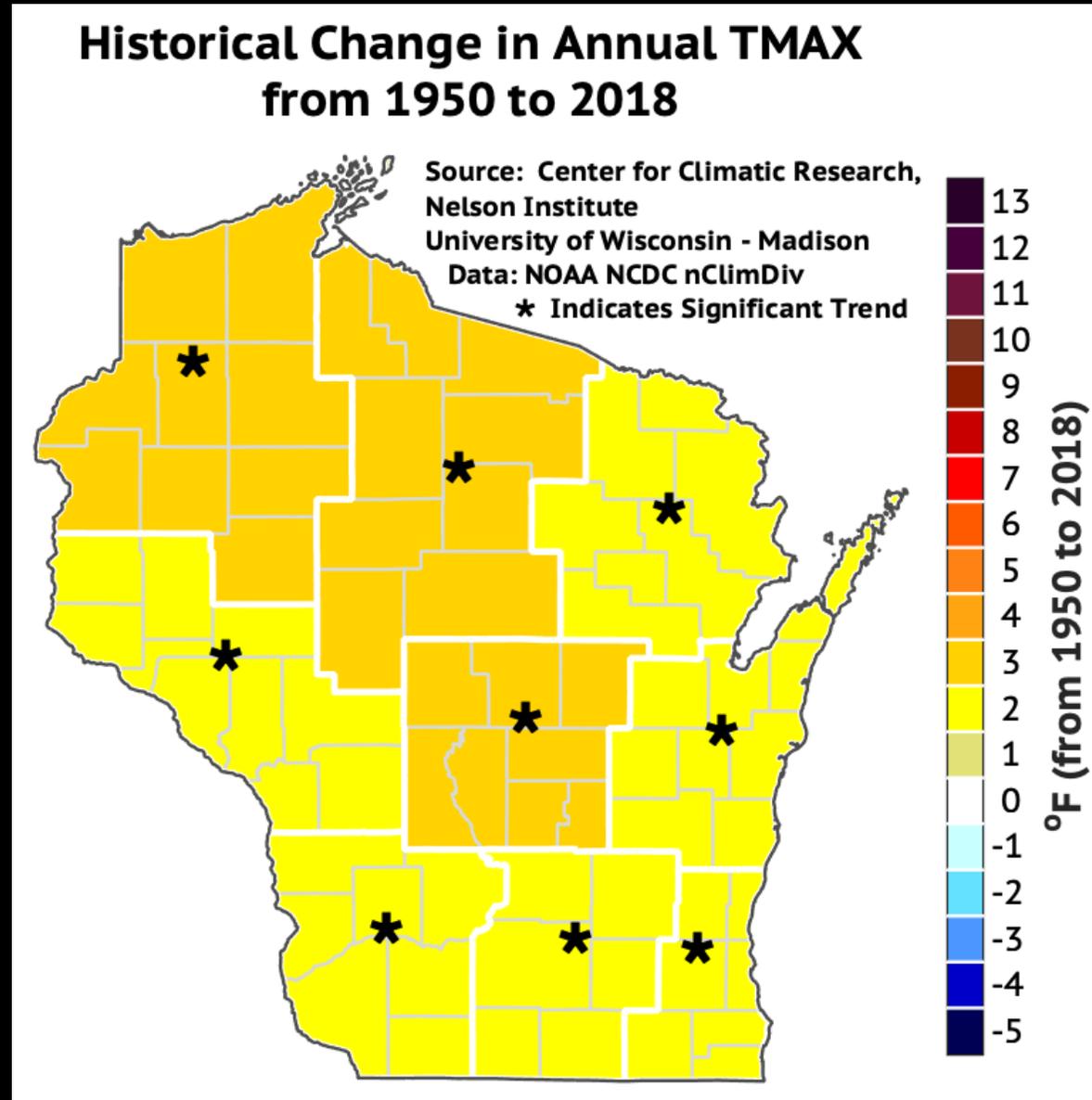


Average spring temperature (Mar-May).
Source: RCC-ACIS.org. Produced 2/26/2020

CLIMATE  CENTRAL

Temperature Trend Since 1950

Wisconsin has warmed by about 2°– 3°F since the mid 20th Century

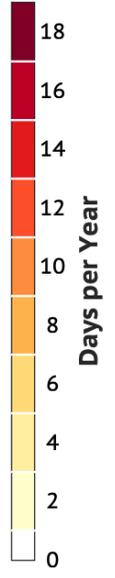
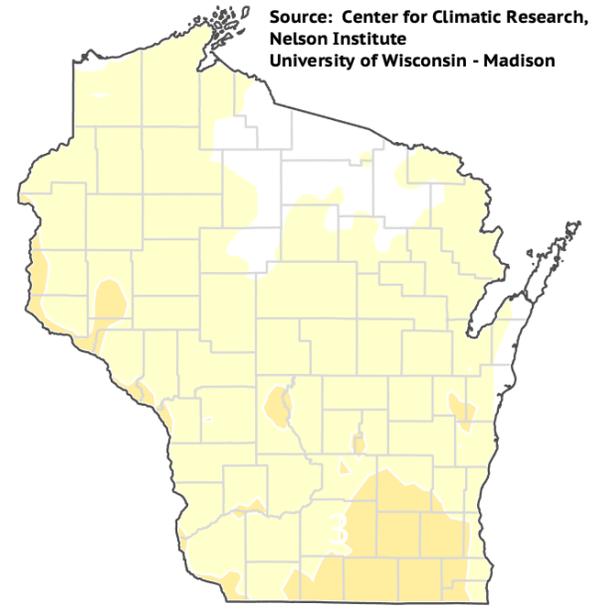


**Extremely
Hot Days**

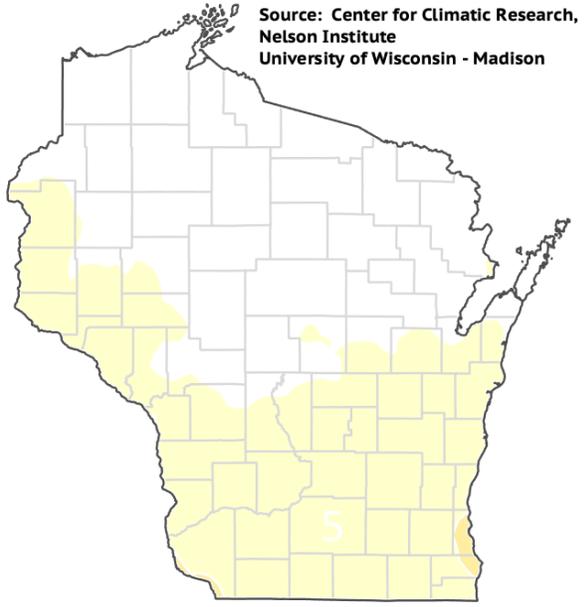
**Days per Year with TMAX > 100°F
1981-2010 Conditions (HISTORICAL)**



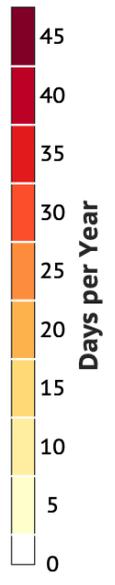
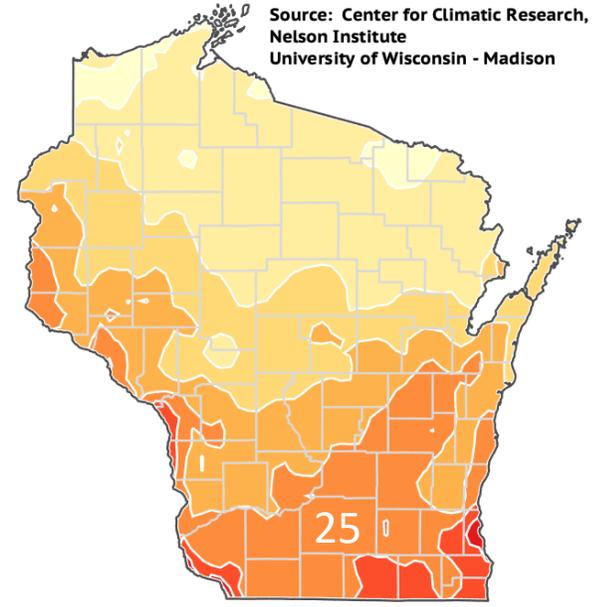
**Days per Year with TMAX > 100°F
2041-2060 Conditions (RCP85)**



**Days per Year with TMIN > 70°F
1981-2010 Conditions (HISTORICAL)**



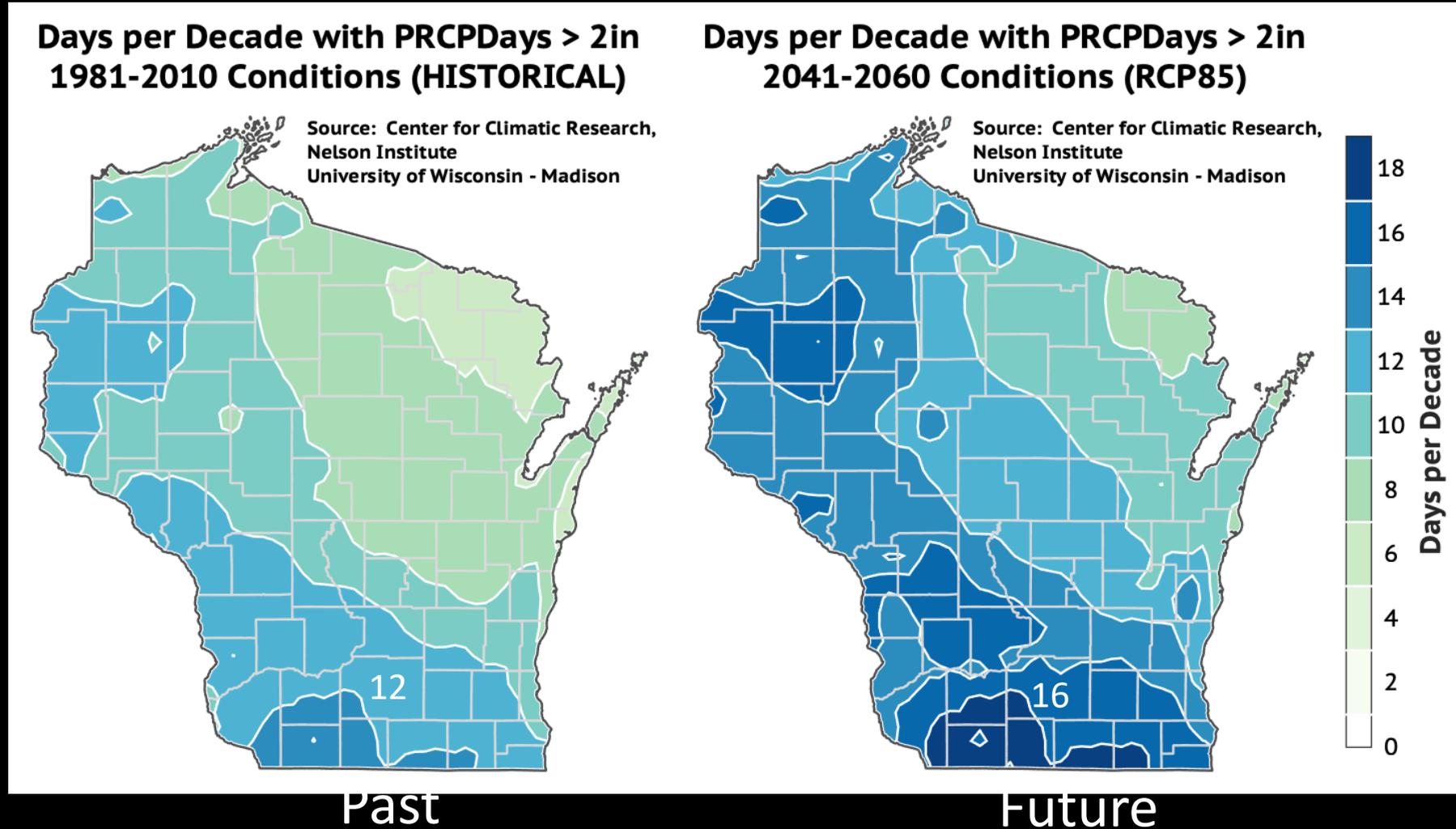
**Days per Year with TMIN > 70°F
2041-2060 Conditions (RCP85)**



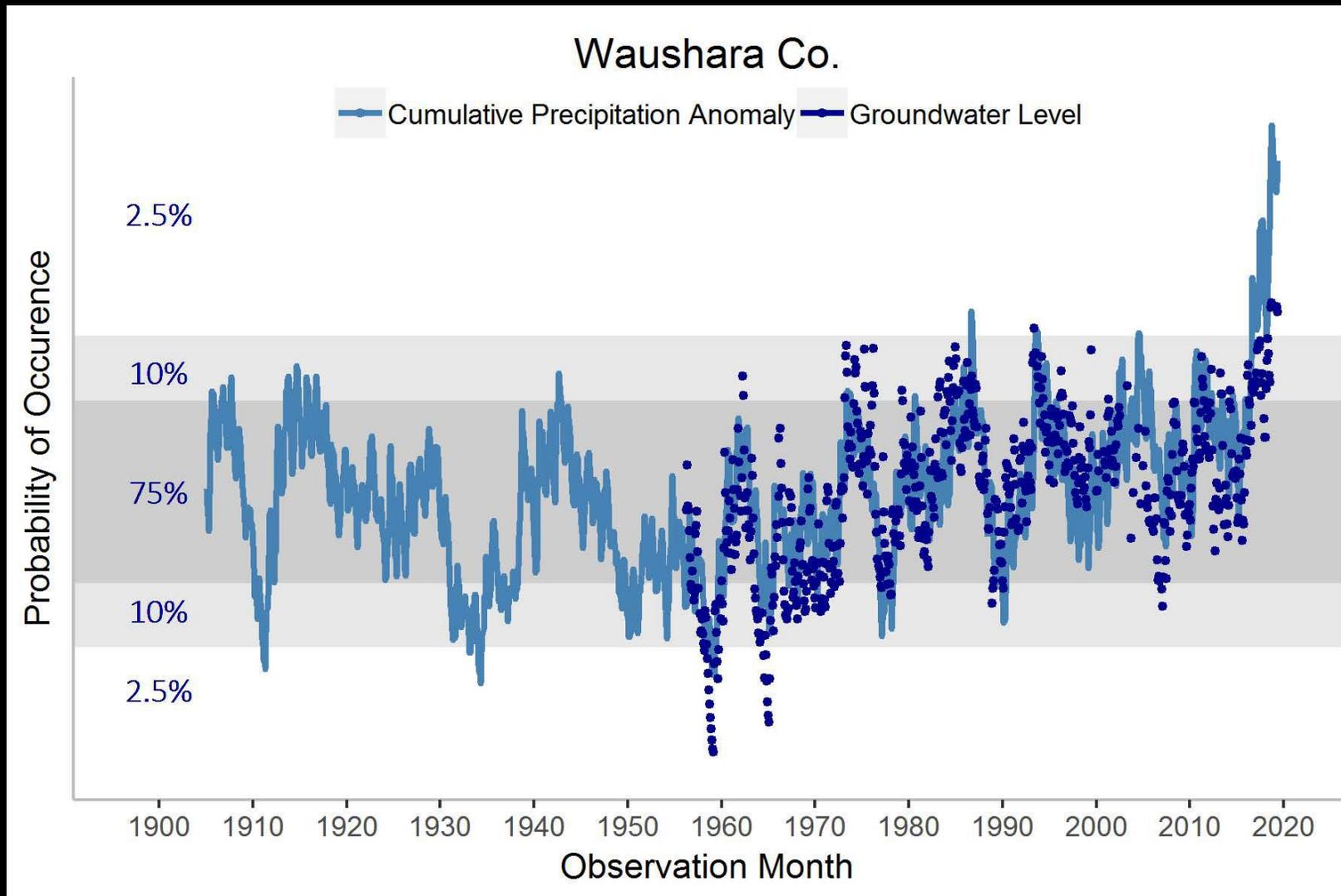
**Extremely
Muggy
Nights**

Projected Change in **Extreme Precipitation** in Wisconsin

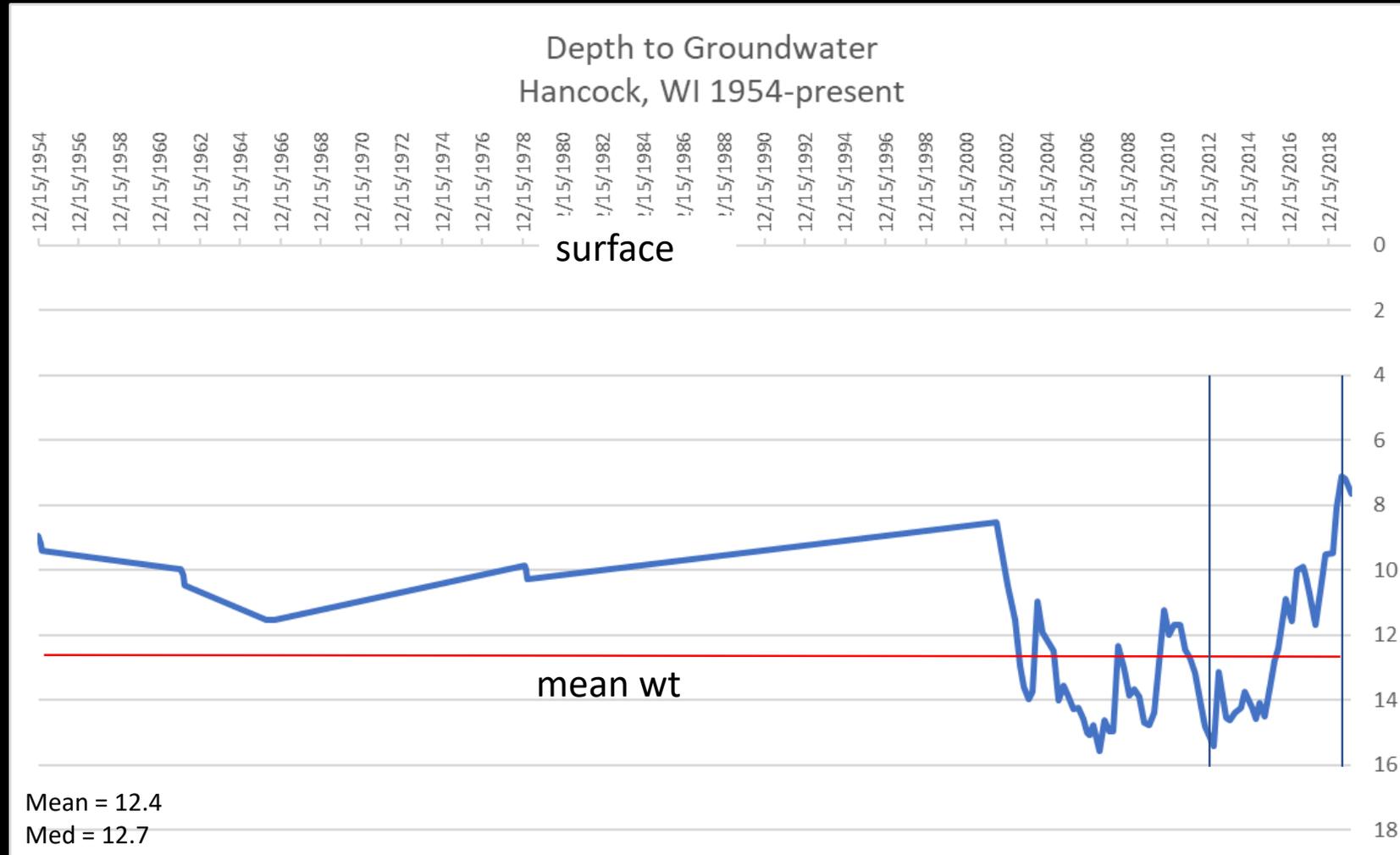
Statistical downscaling, RCP8.5



Groundwater Flooding: Just add rain....



Groundwater levels in the CWSP



$\Delta h/t \sim 7\text{ft}/7\text{yr}$



Surface Soil Moisture

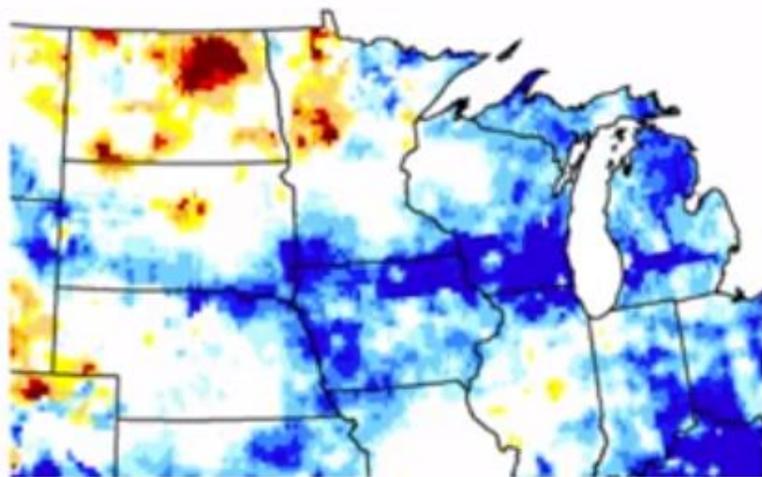


Watch later

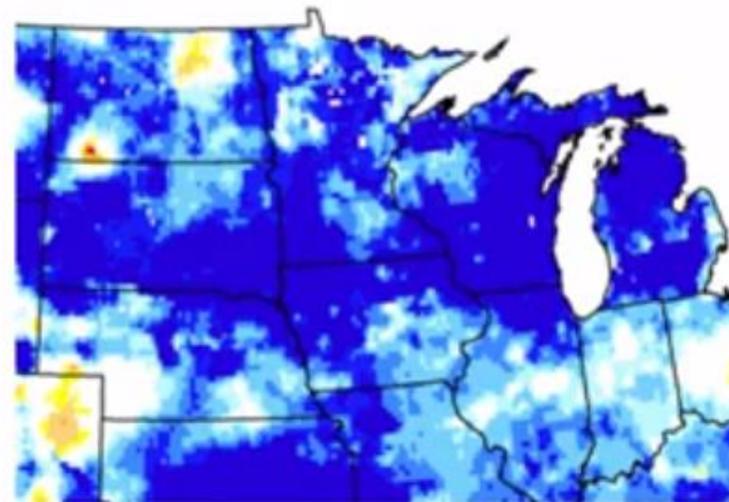


Share

February 25, 2019



February 24, 2020



Wetness Percentiles Relative to period 1948-2009



MORE VIDEOS



3:58 / 14:15

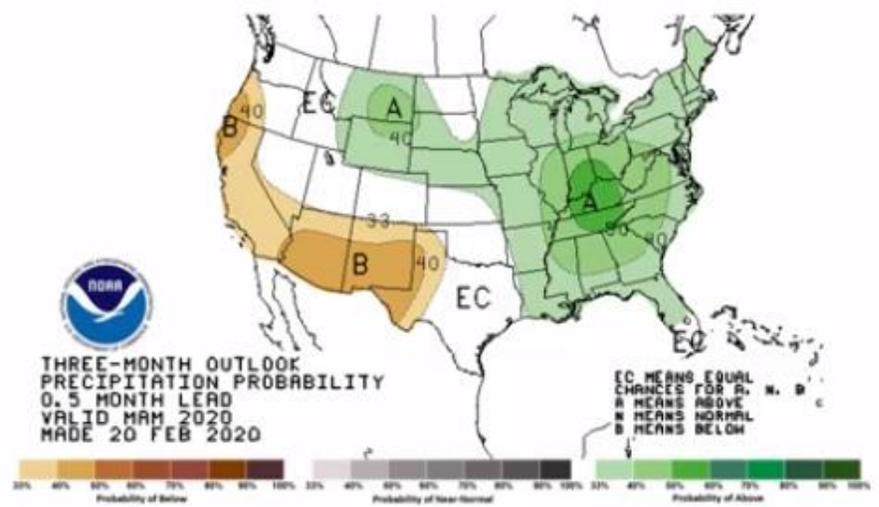
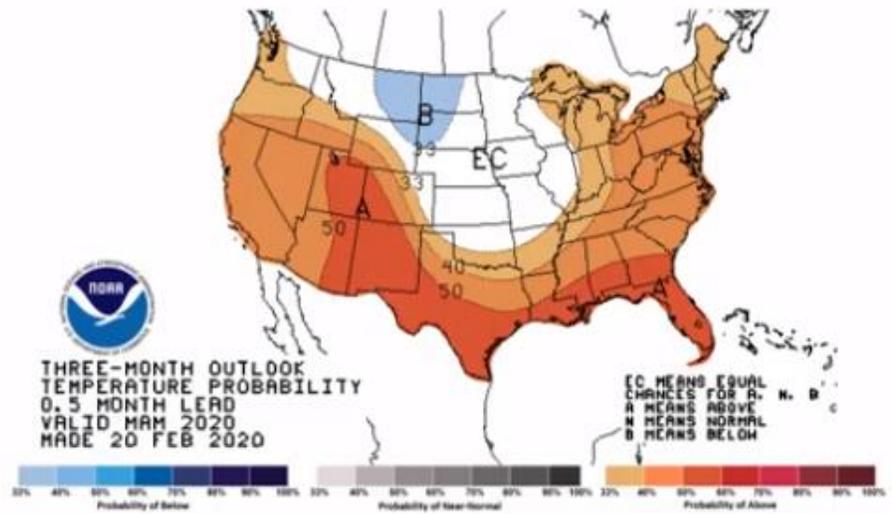




March-April-May Outlook

Temperatures

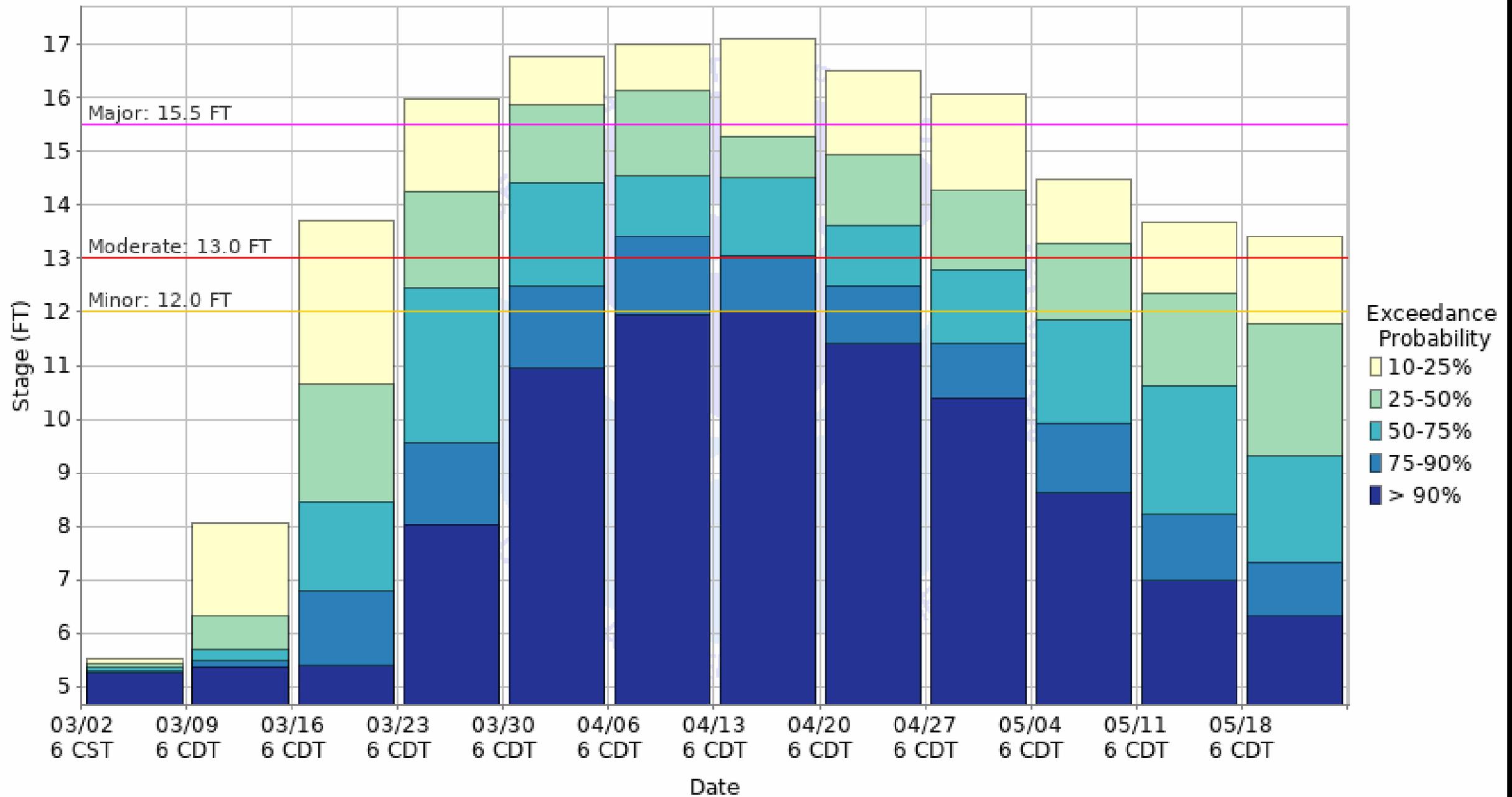
Precipitation



MORE VIDEOS



Forecast for the period 03/02/2020 - 05/31/2020
 This is a conditional simulation based on the conditions as of 02/24/2020



Resources:

Wisconsin Initiative on Climate Change Impacts:

<http://www.wicci.wisc.edu>

Center for Climatic Research Data Pages:

<http://nelson.wisc.edu/ccr/resources/visualization-and-tools.php>

National Climate Assessment (2014):

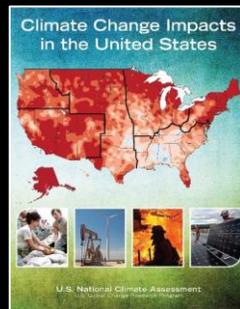
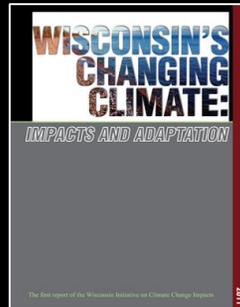
<http://nca2014.globalchange.gov/>

National Academies Climate Change:

<http://nas-sites.org/americasclimatechoices/>

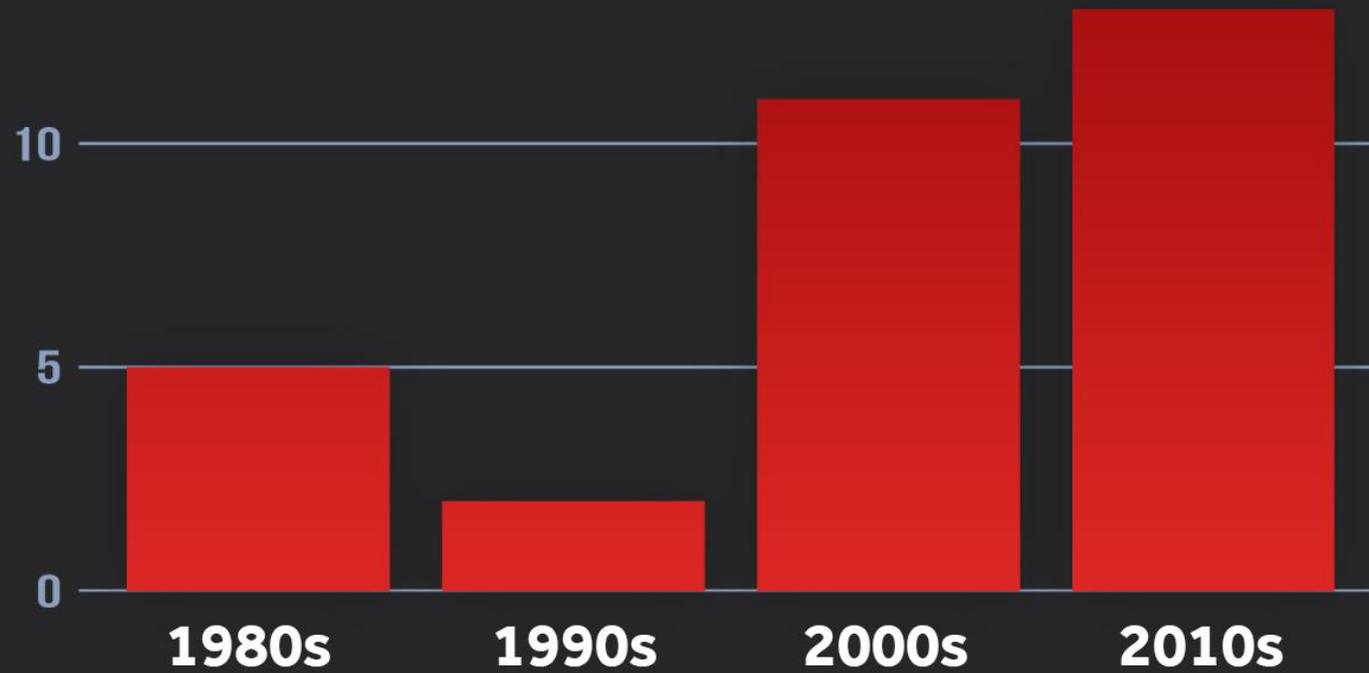
National Institute for Applied Climate Science

<https://www.nrs.fs.fed.us/niacs/>



WISCONSIN BILLION-DOLLAR DISASTERS

WEATHER & CLIMATE EVENTS



1980-2019 billion-dollar weather and climate disasters (CPI-adjusted).
Source: NOAA/NCEI. Produced 2/12/2020

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