



Storm Prediction Center Outlook Guidance: Risk to Watch or Warning Likelihood

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Student Volunteer 2024

Goals



- Compare Storm Prediction Center (SPC) Outlook risk level with warnings and watches issued
- Give context and guidance for different risks
 - Our staff and our customers
 - E.g. What should we expect to see on a day in an enhanced risk?

Methodology



- Data collected from Iowa Environmental Mesonet (IEM)
 - 1/1/2015 - 6/25/2024
 - Outlooks valid starting at 12z or 13z
 - Central county coordinates entered for outlooks
- Outlook data compared with warning/watch data

Search by Point
Either enter coordinates manually:
Latitude (deg N): 43.8174
Longitude (deg E): -91.1933
Outlook Search Options:
 List Most Recent Event(s)
Select Outlook: Day 1 Day 2 Day 3
Select Category:
 Categorical Hail Tornado Wind
Update

Or drag marker to select coordinate:

Results of Point Search
Convective Outlooks Mesoscale Convective Discussions
This archive dates back until 1987.

Convective Outlooks for Lon: -91.1933 Lat: 43.8174

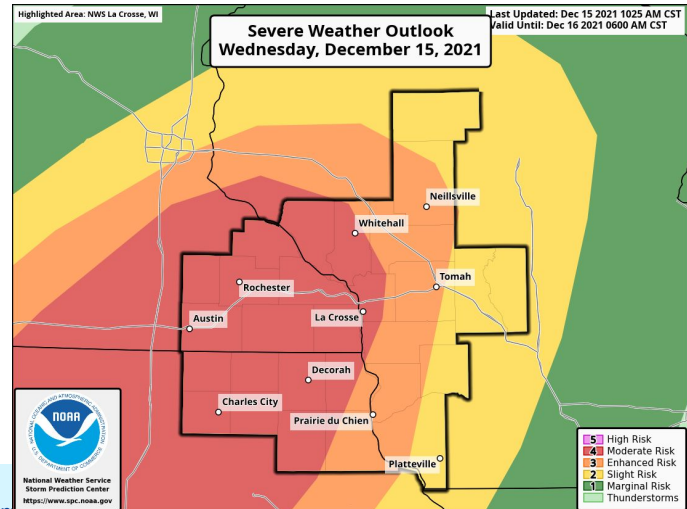
Day	Threshold	Outlook Issued At (UTC)
1	SLGT	2024-08-05T05:32:00Z
1	MRGL	2024-08-04T06:04:00Z
1	MRGL	2024-08-03T16:21:00Z
1	MRGL	2024-08-01T06:00:00Z
1	SLGT	2024-08-01T01:00:00Z
1	MRGL	2024-07-30T06:08:00Z
1	MRGL	2024-07-29T05:59:00Z
1	SLGT	2024-07-15T05:50:00Z
1	MRGL	2024-07-14T05:34:00Z
1	SLGT	2024-07-13T05:41:00Z
1	SLGT	2024-07-04T05:53:00Z
1	MRGL	2024-07-02T05:49:00Z

A special thank you to Daryl Herzmann at Iowa State Mesonet for the archived data resources.

Limitations



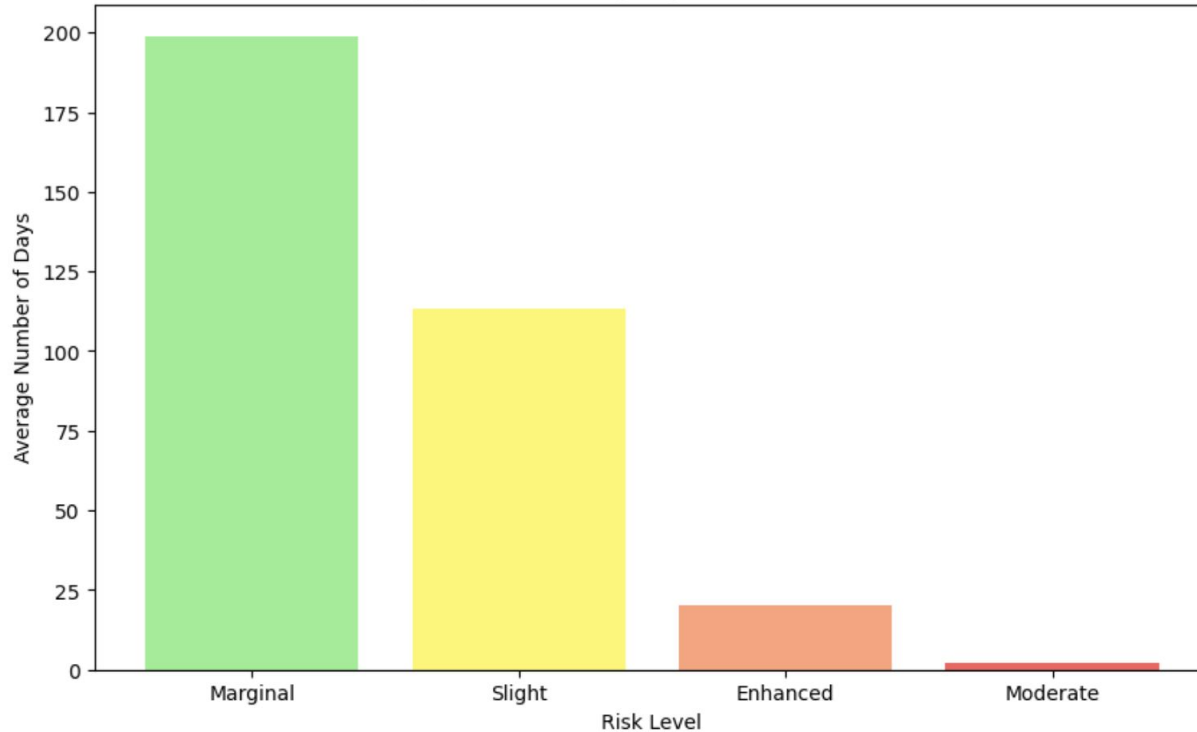
- County size is not accounted for
- Outlook level is only representative of the county center
- No information on high risk outlook days and little on moderate
- 9.5 years of data



Average Days for Each Risk Level Across CWA in 9.5 Years



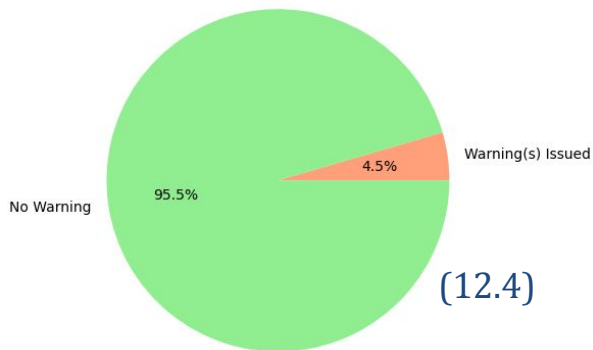
Average Number of Days by Risk Level Across CWA



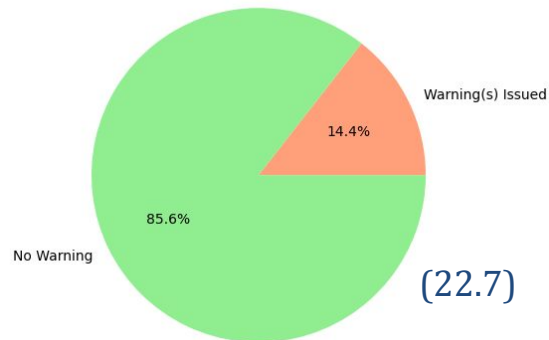
Average Probability of Warning for CWA



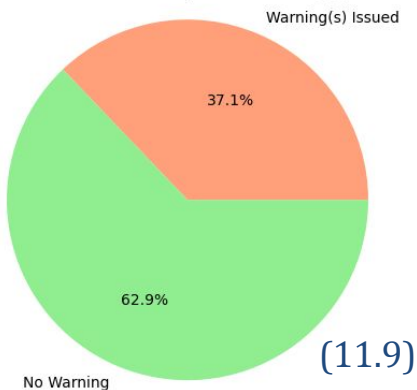
Marginal Risk Days with Warning(s)



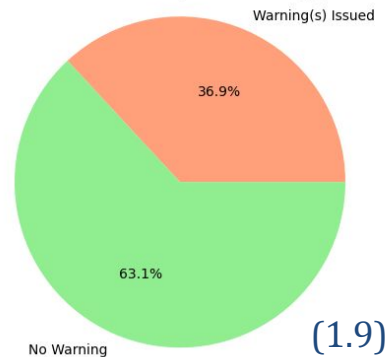
Slight Risk Days with Warning(s)



Enhanced Risk Days with Warning(s)



Moderate Risk Days with Warning(s)

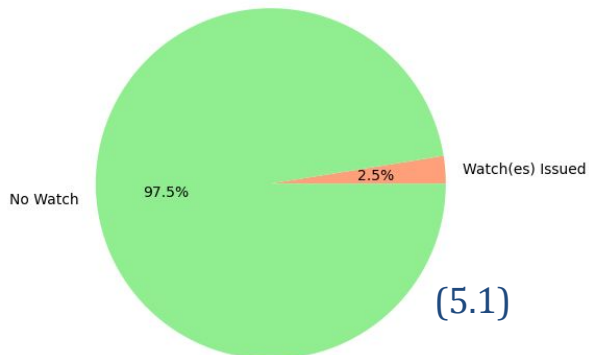


(Average number of warnings issued in each outlook across CWA since 2015)

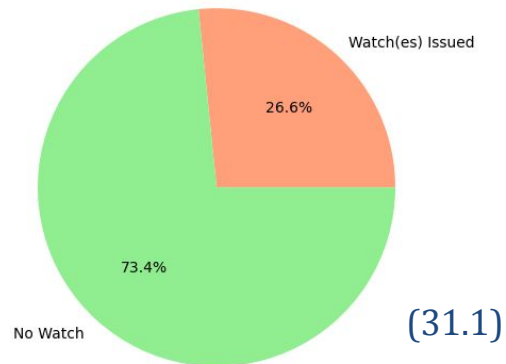
Average Probability of Watch for CWA



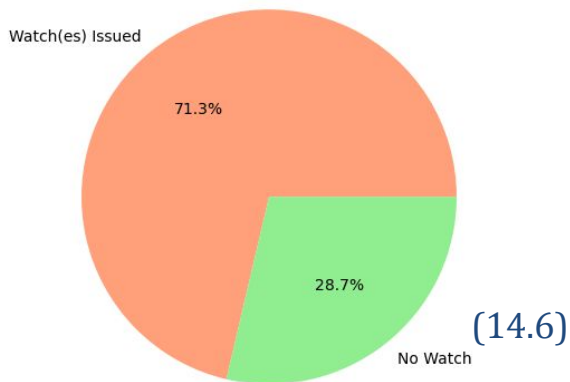
Marginal Risk Days with Watch(es)



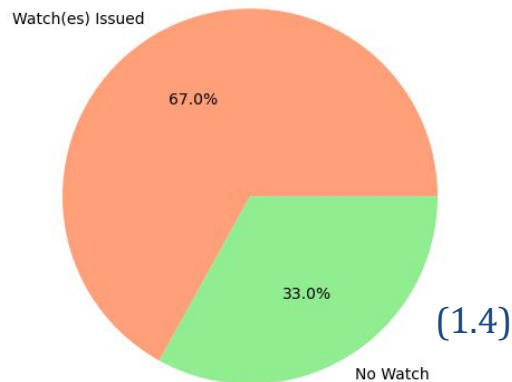
Slight Risk Days with Watch(es)



Enhanced Risk Days with Watch(es)



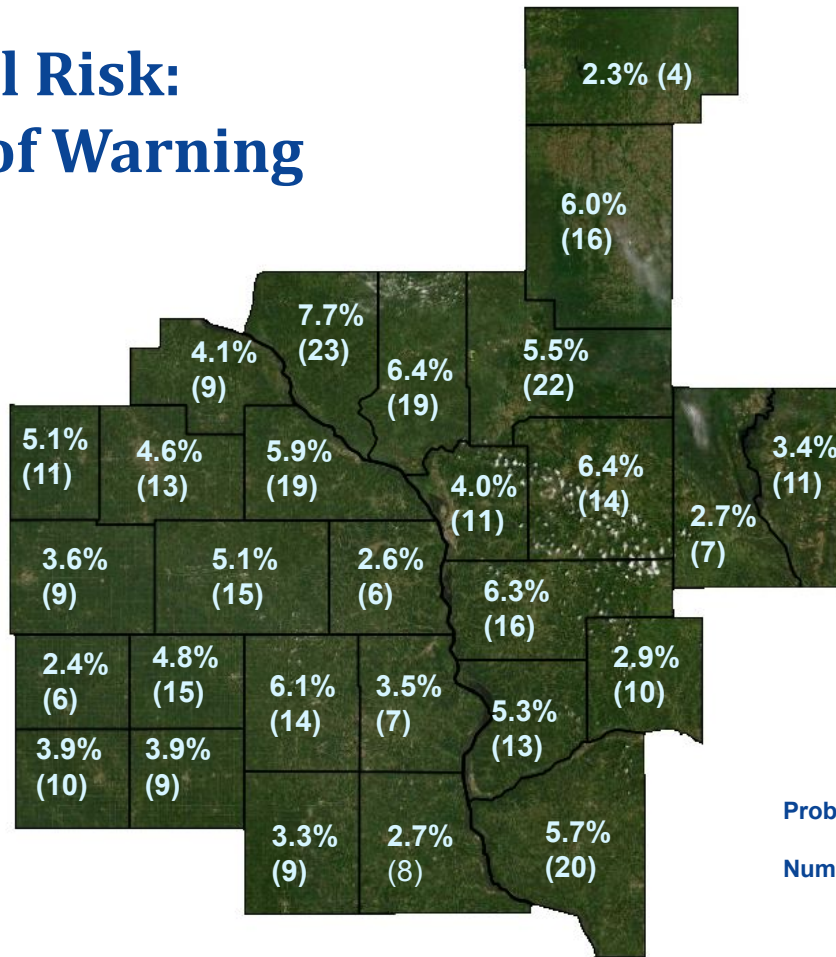
Moderate Risk Days with Watch(es)



(Average number of watches issued in each outlook across CWA since 2015)



SPC Marginal Risk: Probability of Warning

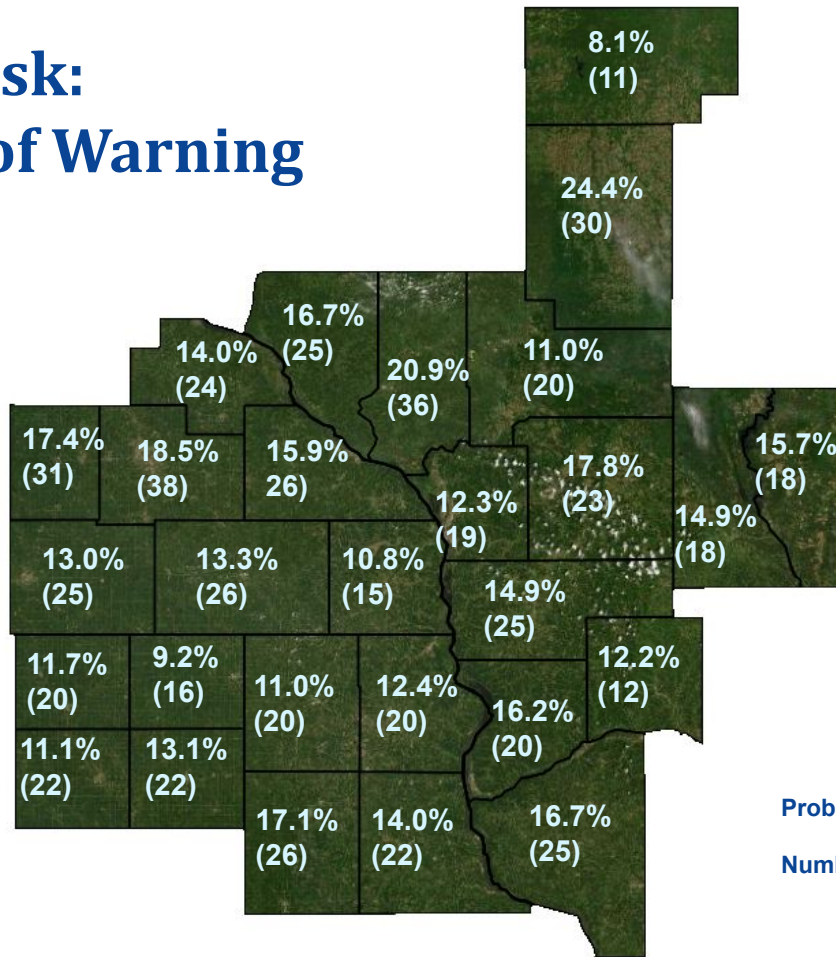


Probability of Issuing at Least One Warning

Number of Warnings



SPC Slight Risk: Probability of Warning

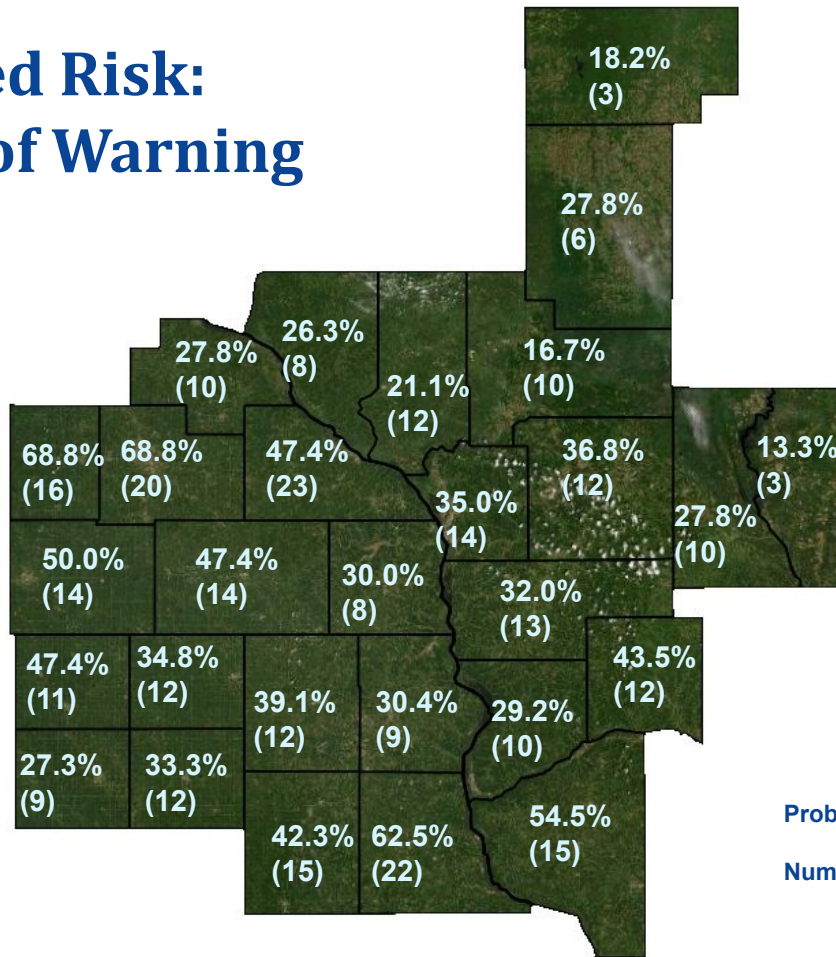


Probability of Issuing at Least One Warning

Number of Warnings



SPC Enhanced Risk: Probability of Warning

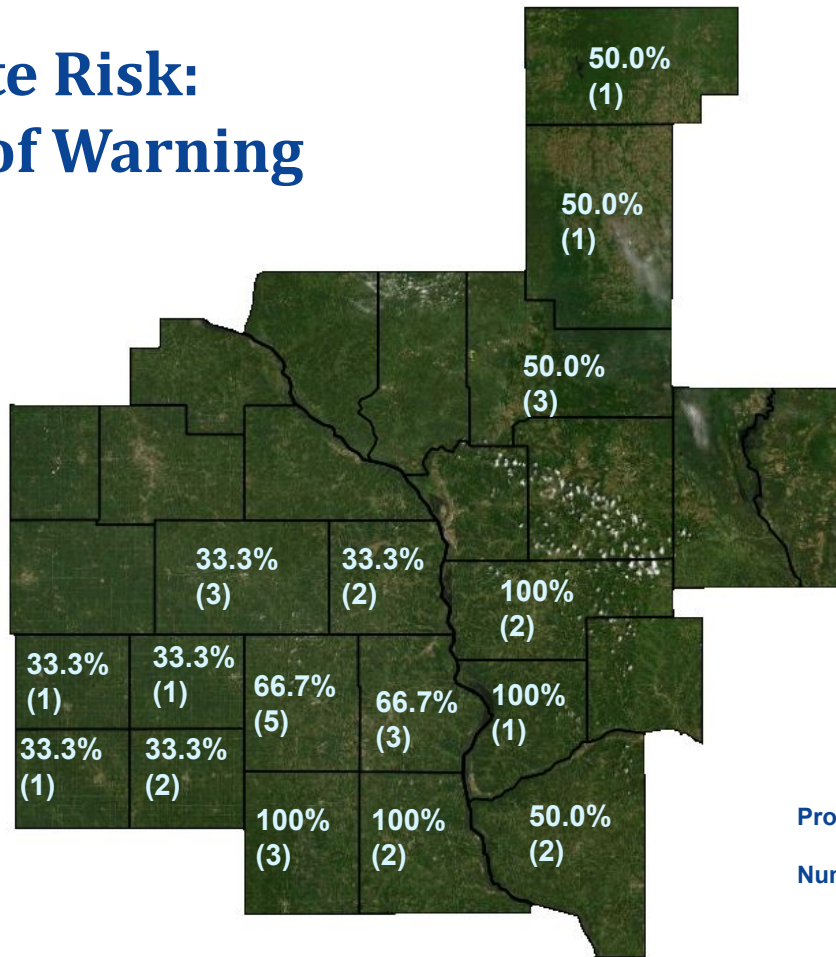


Probability of Issuing at Least One Warning

Number of Warnings



SPC Moderate Risk: Probability of Warning

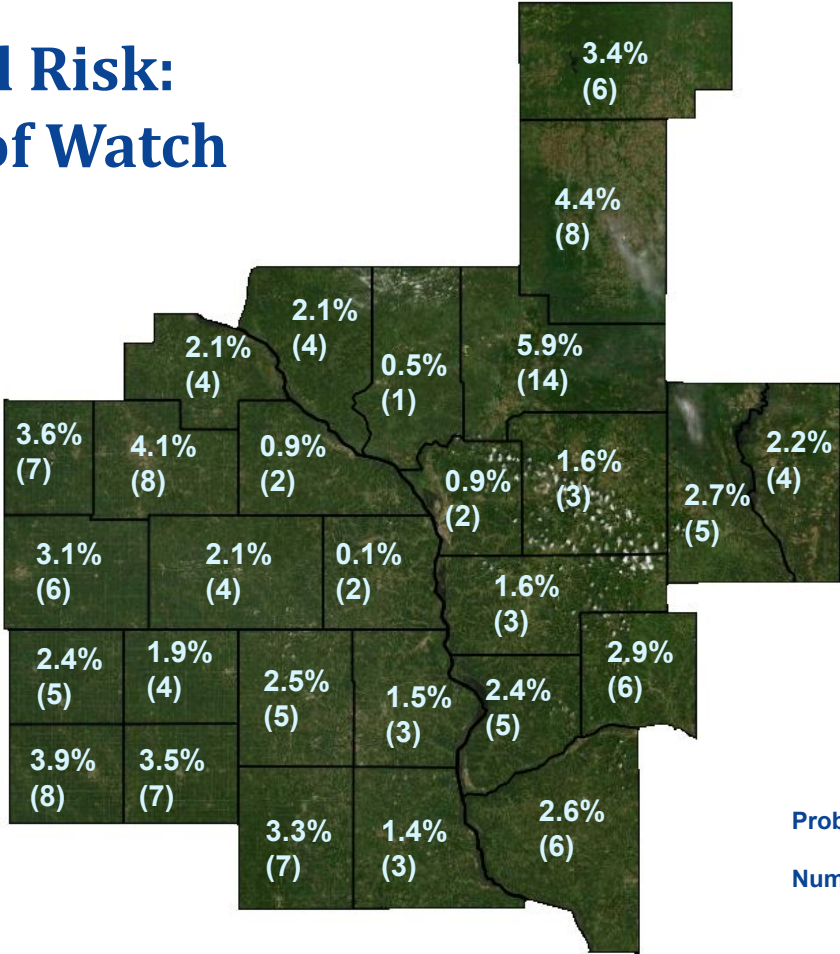


Probability of Issuing at Least One Warning

Number of Warnings



SPC Marginal Risk: Probability of Watch

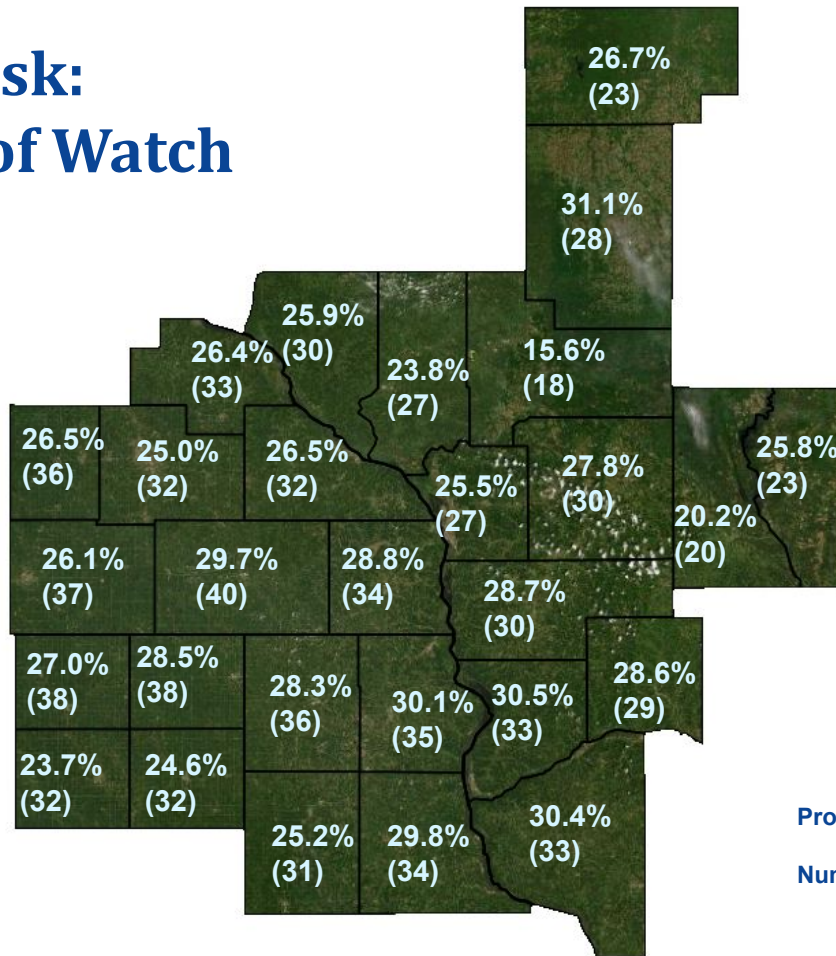


Probability of Issuing at Least One Watch

Number of Watch



SPC Slight Risk: Probability of Watch

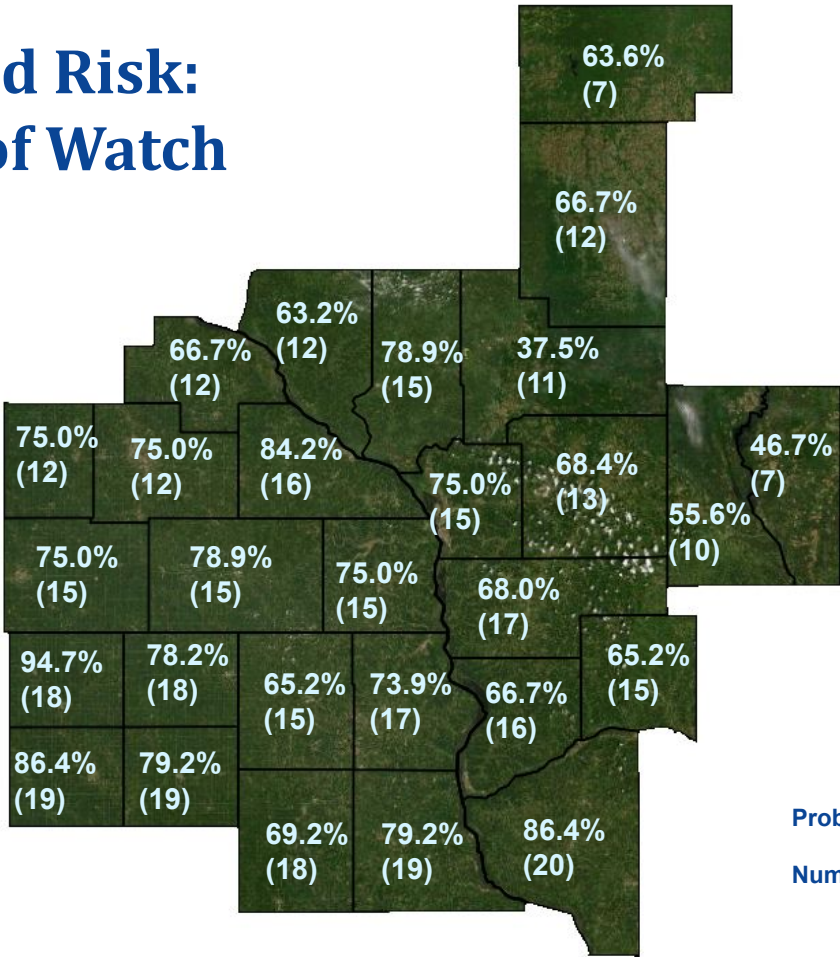


Probability of Issuing at Least One Watch

Number of Watch



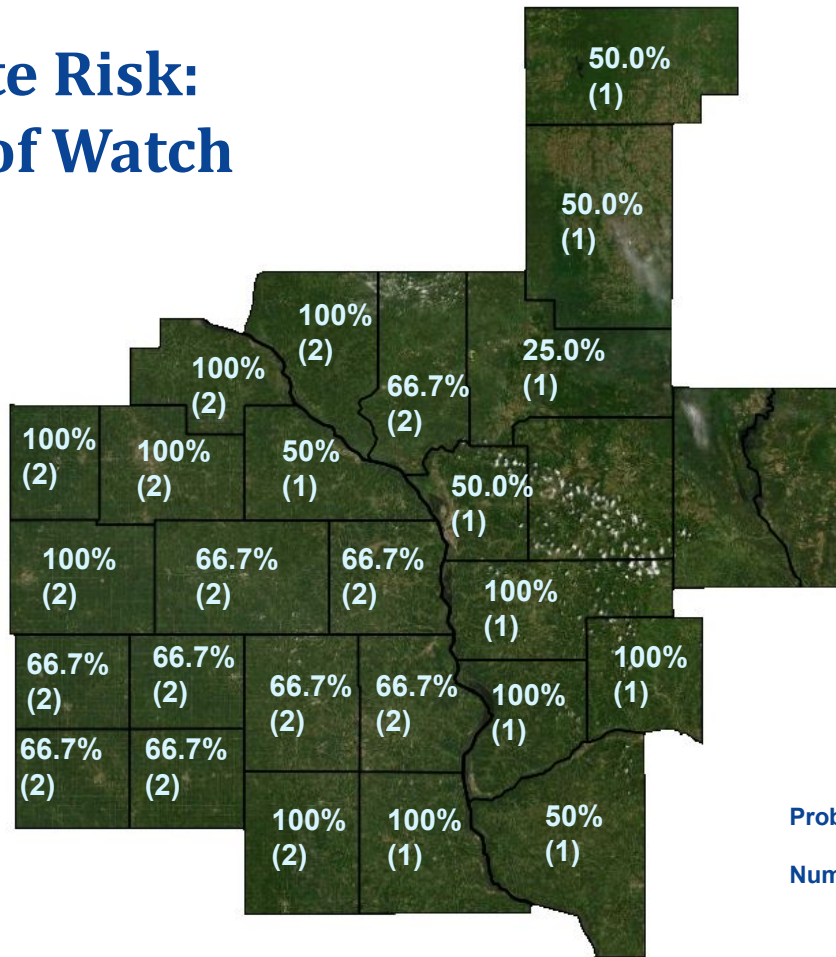
SPC Enhanced Risk: Probability of Watch



Probability of Issuing at Least One Watch
Number of Watch



SPC Moderate Risk: Probability of Watch



Probability of Issuing at Least One Watch

Number of Watch

Summary



Average Probability of a Warning or Watch Across CWA

	Marginal	Slight	Enhanced	Moderate
Warning	4.5%	14.4%	37.1%	36.9%
Watch	2.5%	26.6%	71.3%	66.9%