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Mesoscale Discussion 871

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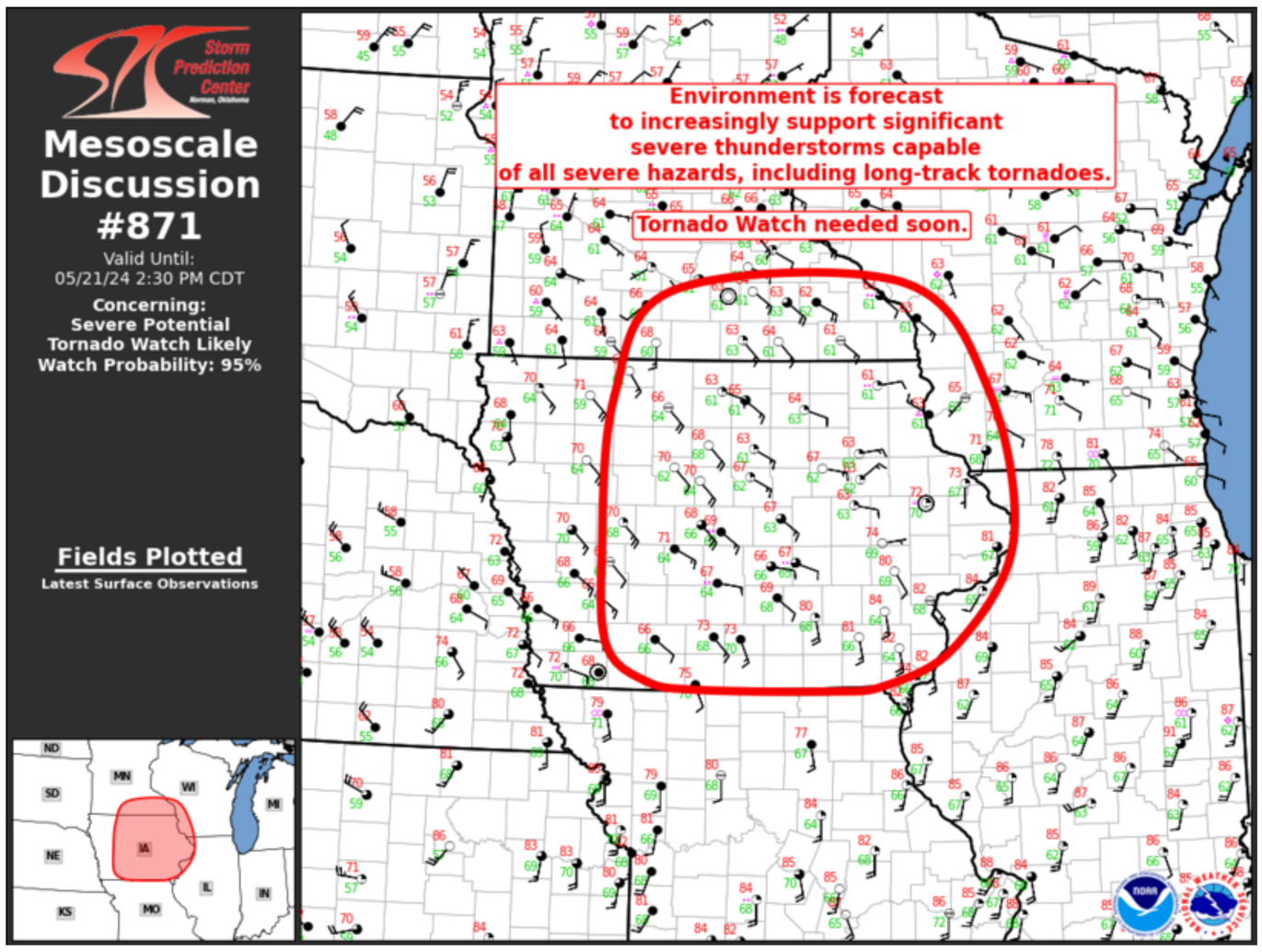

Mesoscale Discussion 0871
NWS Storm Prediction Center Norman OK
1232 PM CDT Tue May 21 2024

Areas affected...Central/Eastern IA...South-Central/Southeast MN...Far Southwest WI...Far Northwest IL

Concerning...Severe potential...Tornado Watch likely

Valid 211732Z - 211930Z

Probability of Watch Issuance...95 percent

SUMMARY...Environmental conditions are expected to becoming increasingly supportive of a significant severe thunderstorms capable of all severe hazards, including very large hail up to 3" inches, strong gusts to 75 mph, and long-track tornadoes. A Tornado Watch will likely be needed around 18-19Z, and a PDS designation is being considered.

DISCUSSION...Recent surface analysis places a low over southeast NE, with an outflow-modified warm front extending east-northeast across southern IA through the IA/IL/WI border vicinity. This warm front is expected to rapidly move northward in response to strong mass response ahead of the approaching shortwave trough, with upper 60s dewpoints likely in place across much of IA and mid 60s possibly reaching southern MN. As this occurs, steep mid-level lapse rates will also advect into the region, resulting strong buoyancy (i.e. MLCAPE 2500-3000 J/kg) by the early afternoon. Wind fields are expected to strengthen during this time frame as well, result in in very long hodographs and fast storm motion. Bunkers right motion for much of the region will be around 50 kt by the early afternoon. The result will be an environment very supportive of significant severe thunderstorms.

An initially discrete mode is anticipated, with the fast storm motions allowing storms to stay ahead of the cold front impinging on the region from the west. Any discrete storms will likely obtain supercellular characteristics quickly, with very large hail up to 3" inches, strong gusts to 75 mph, and tornadoes all possible. This includes the possibility of long-lived, long-track supercells capable of strong tornadoes and intense wind damage. Storm interactions with the warm front, as well as the presence of the deepening surface low, suggest the significant severe potential will likely extend into south-central/southeast MI and southwest MN, despite being displaced just north of the better mid-level flow and low-level moisture.

Some upscale growth is anticipated as storms continue eastward, with the resulting convective line capable of significant wind gusts around 75 mph. Given the continued strengthening of the low-level flow anticipated, some embedded QLCS circulations are likely as well.

All of these factors suggests a significant severe weather event is probable, and a Tornado Watch will likely be needed around 18-19Z. A PDS designation is being considered for this watch.

..Mosier/Guyer.. 05/21/2024

...Please see www.spc.noaa.gov for graphic product...

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