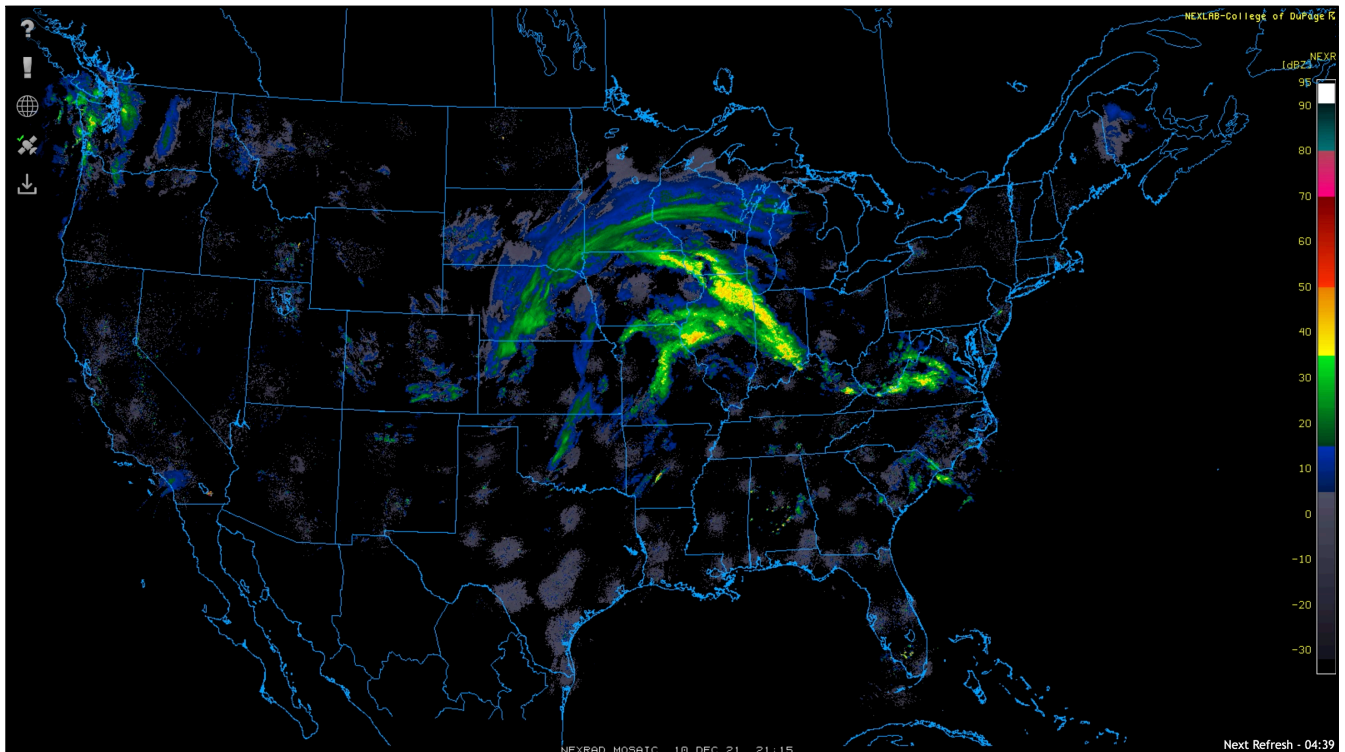




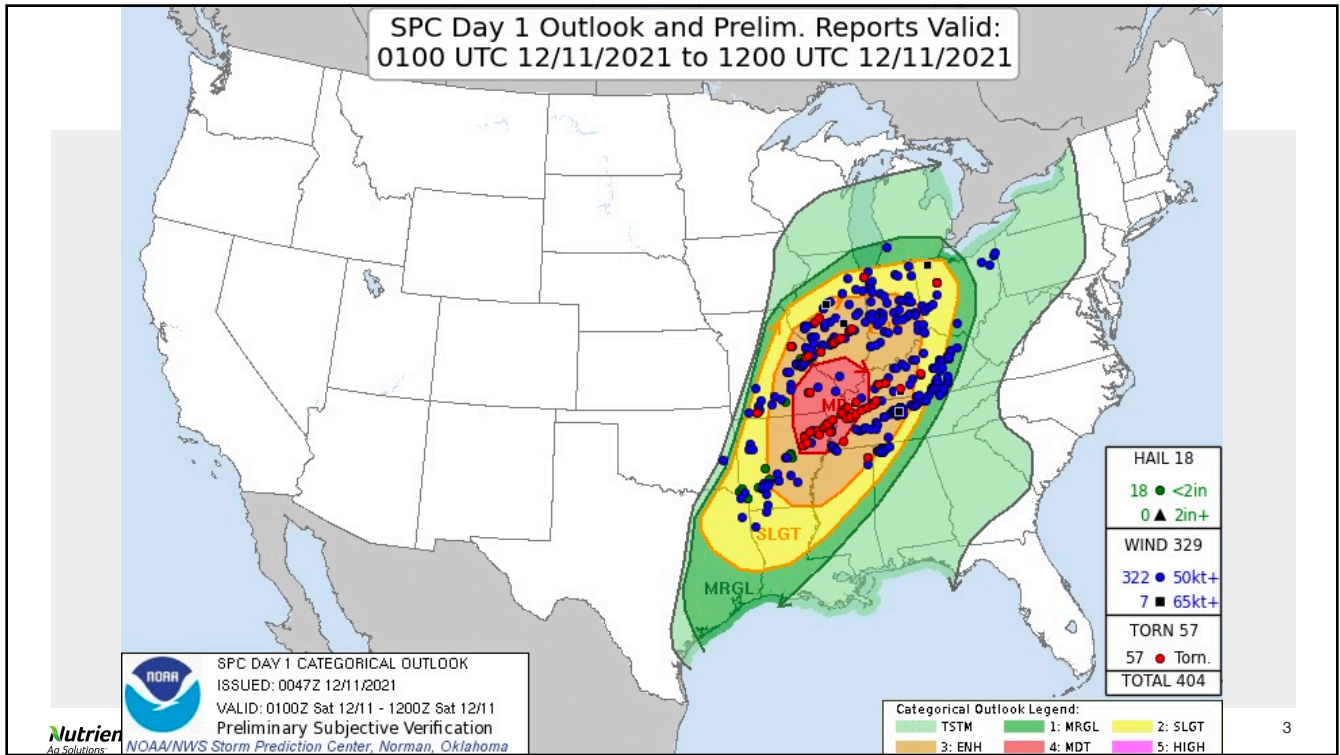
Ditching the Crystal Ball

Dec 14, 2021
Eric Snodgrass
eric.snodgrass@nutrien.com
@ag_weather
Nutrien Science Fellow
Principal Atmospheric Scientist
Nutrien Ag Solutions

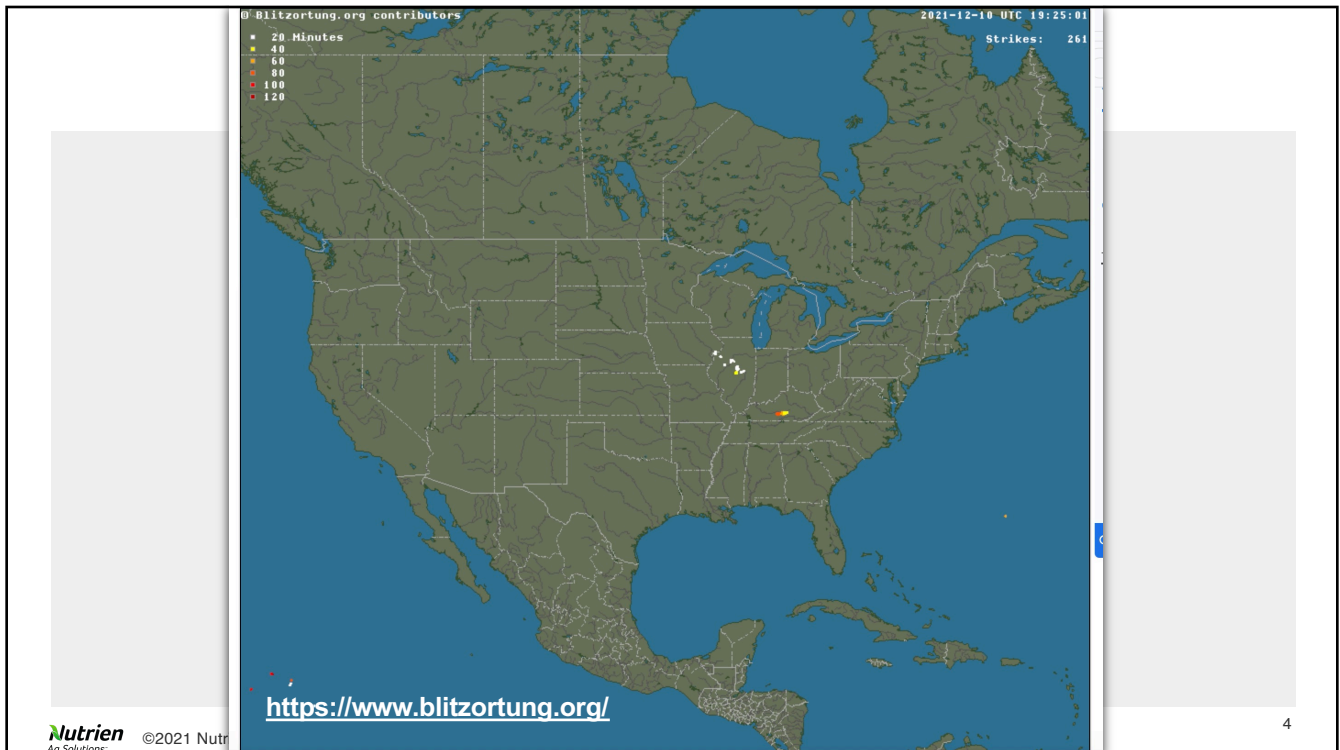
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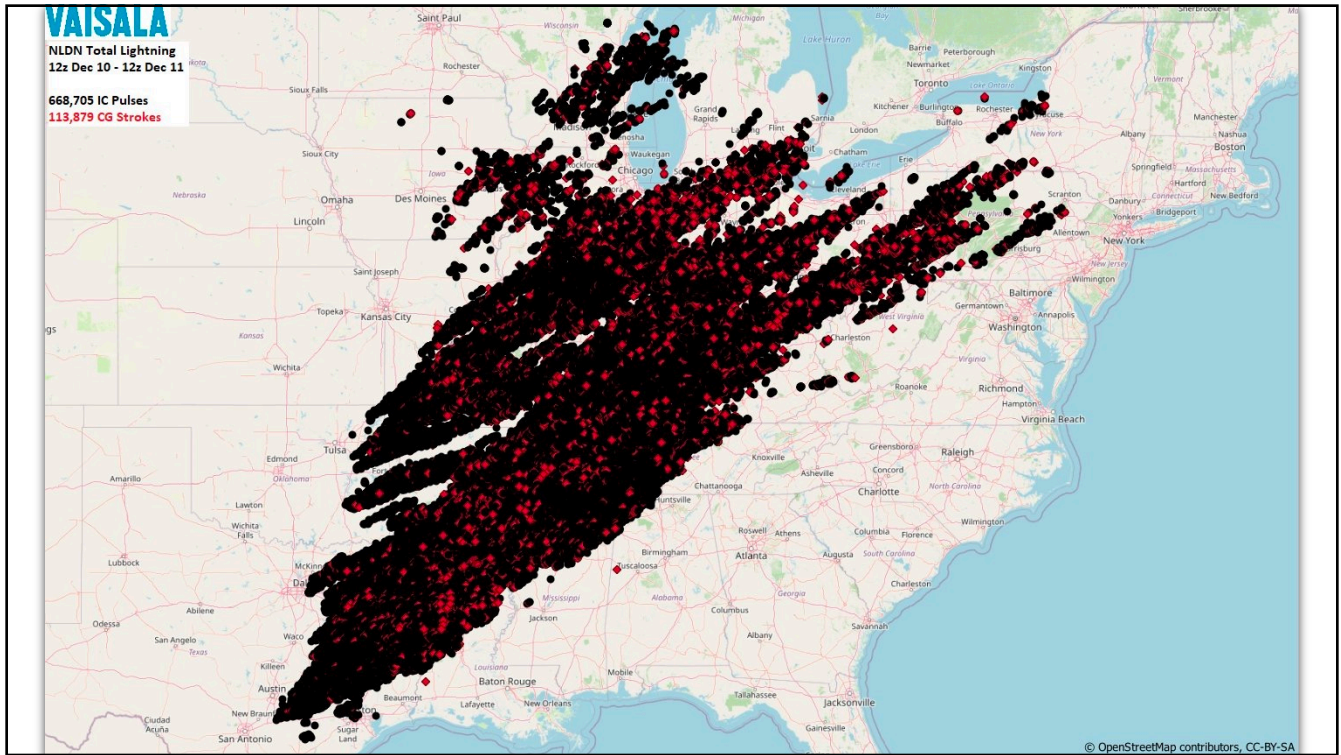
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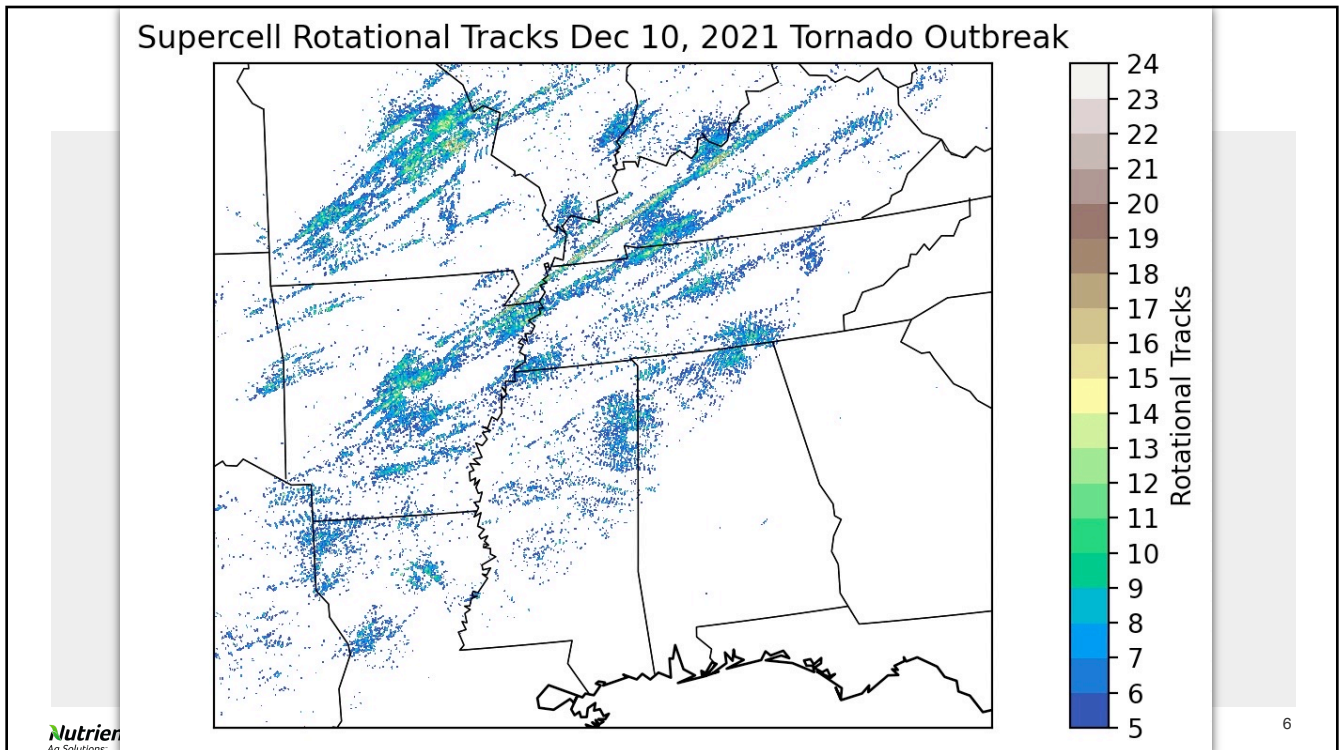
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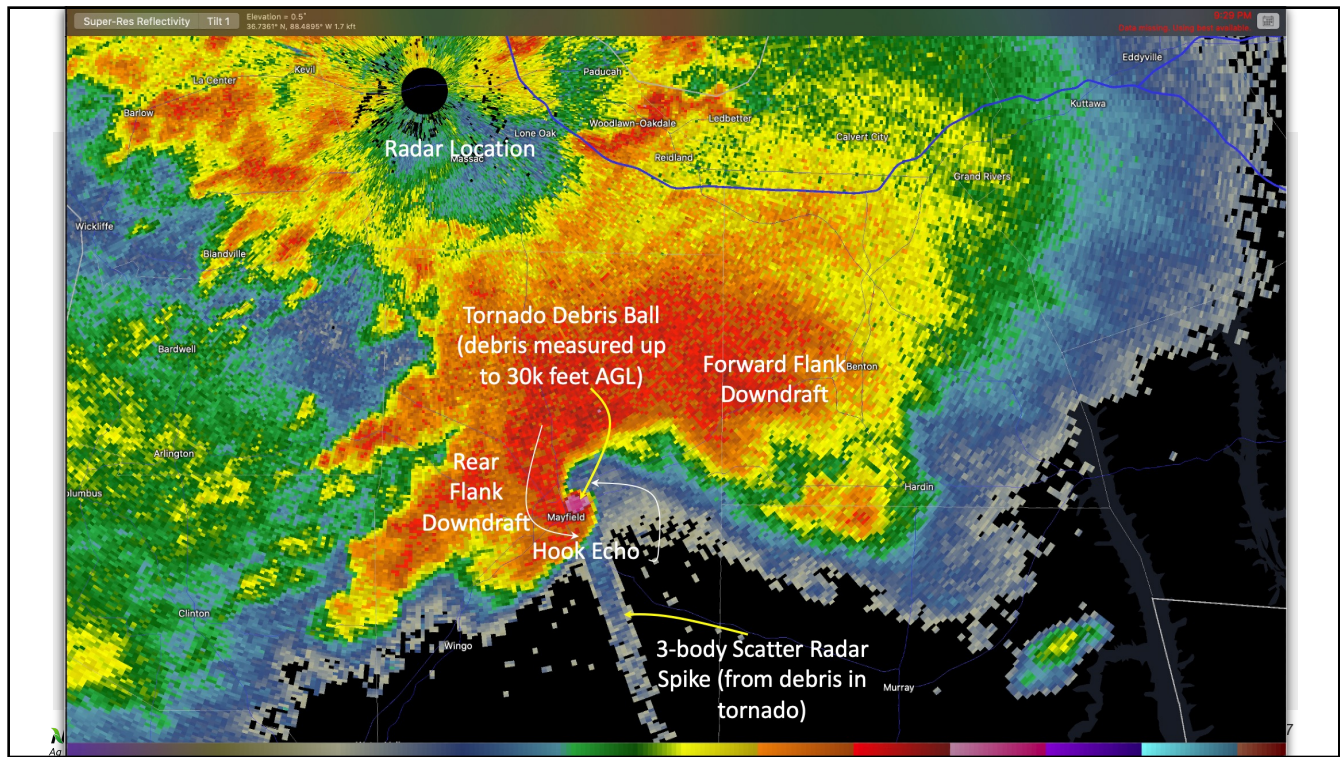
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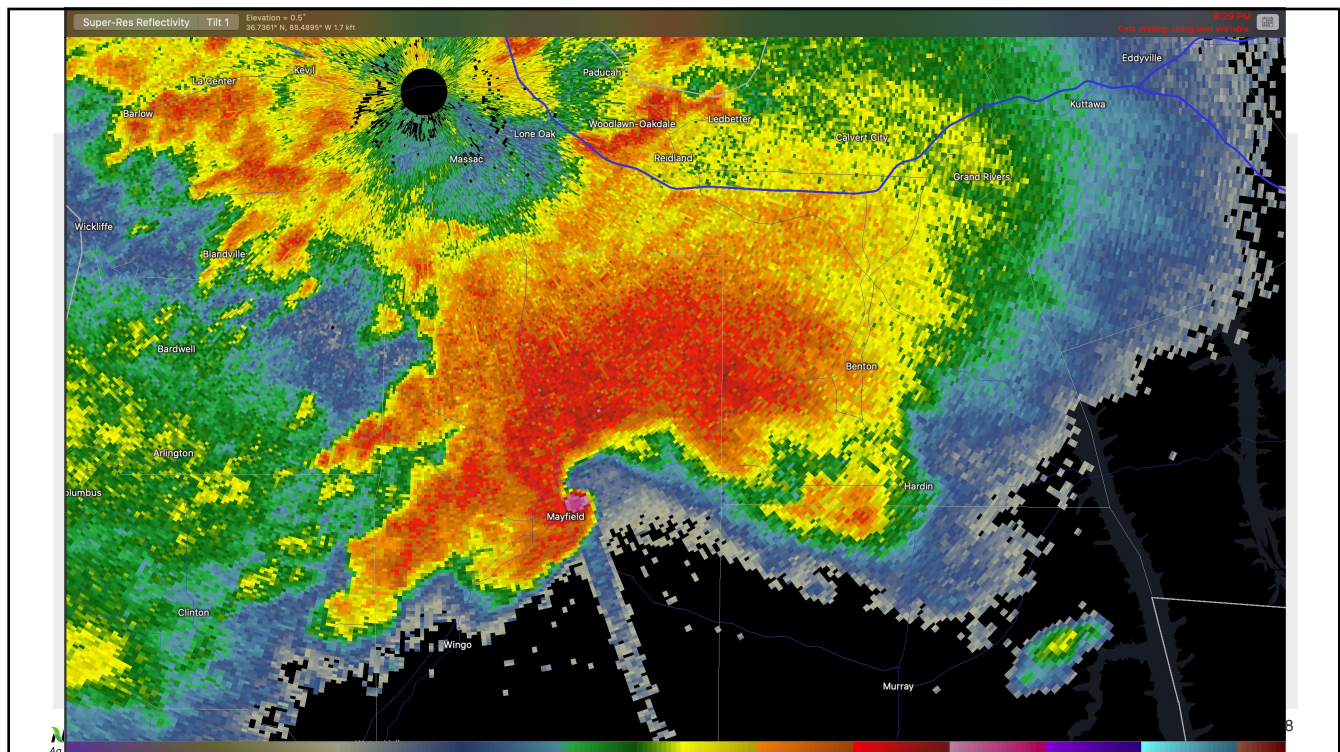
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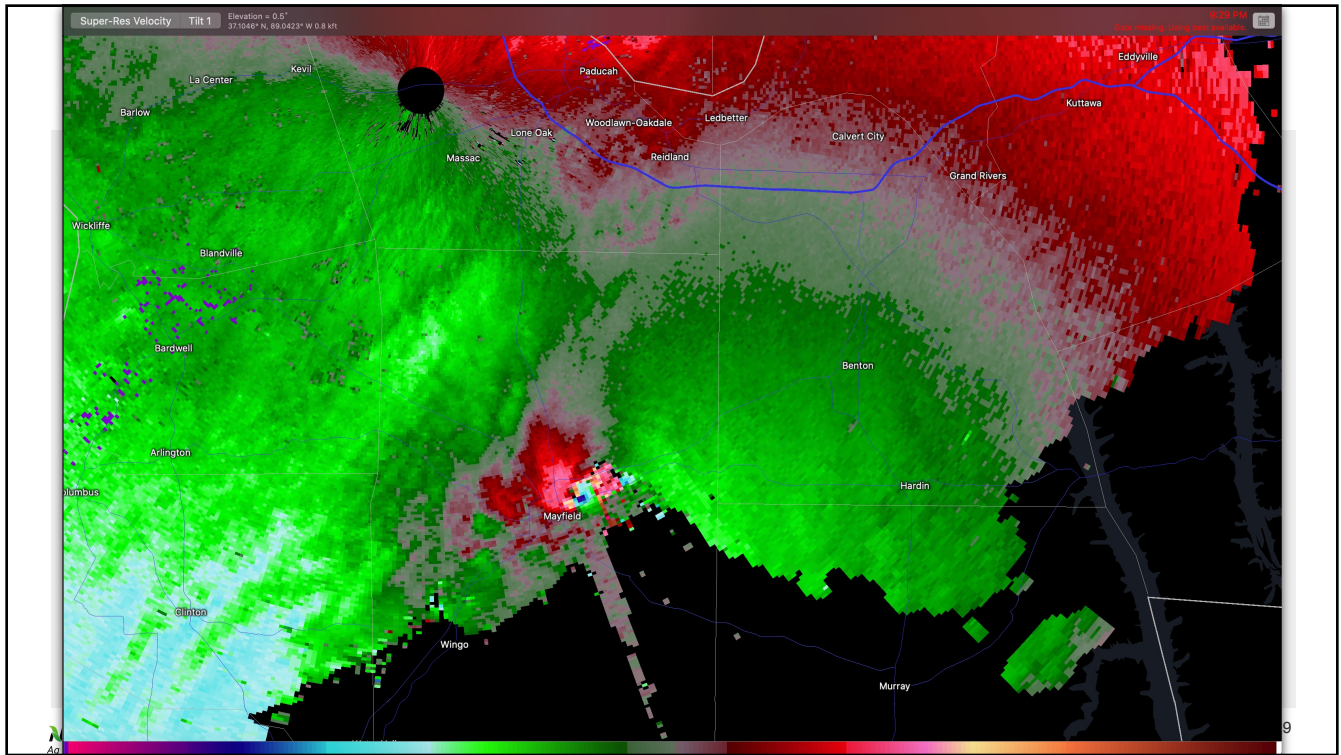
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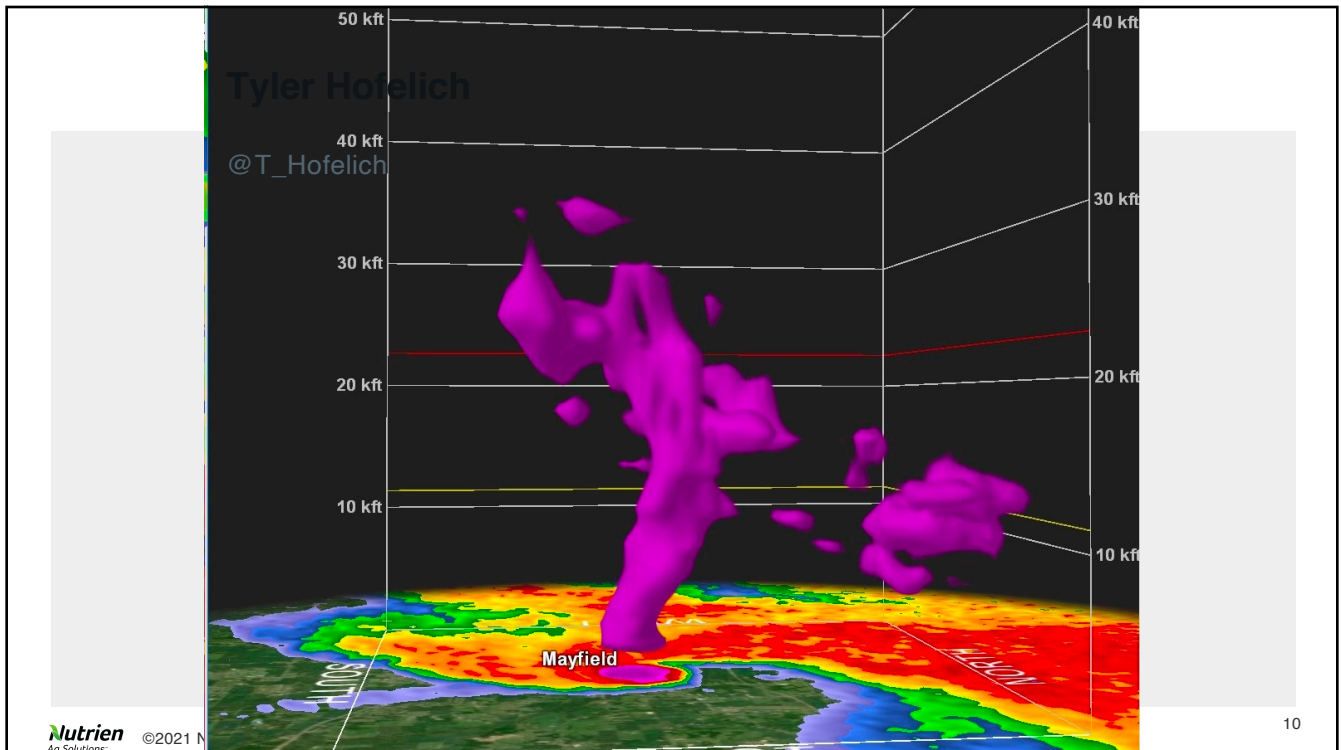
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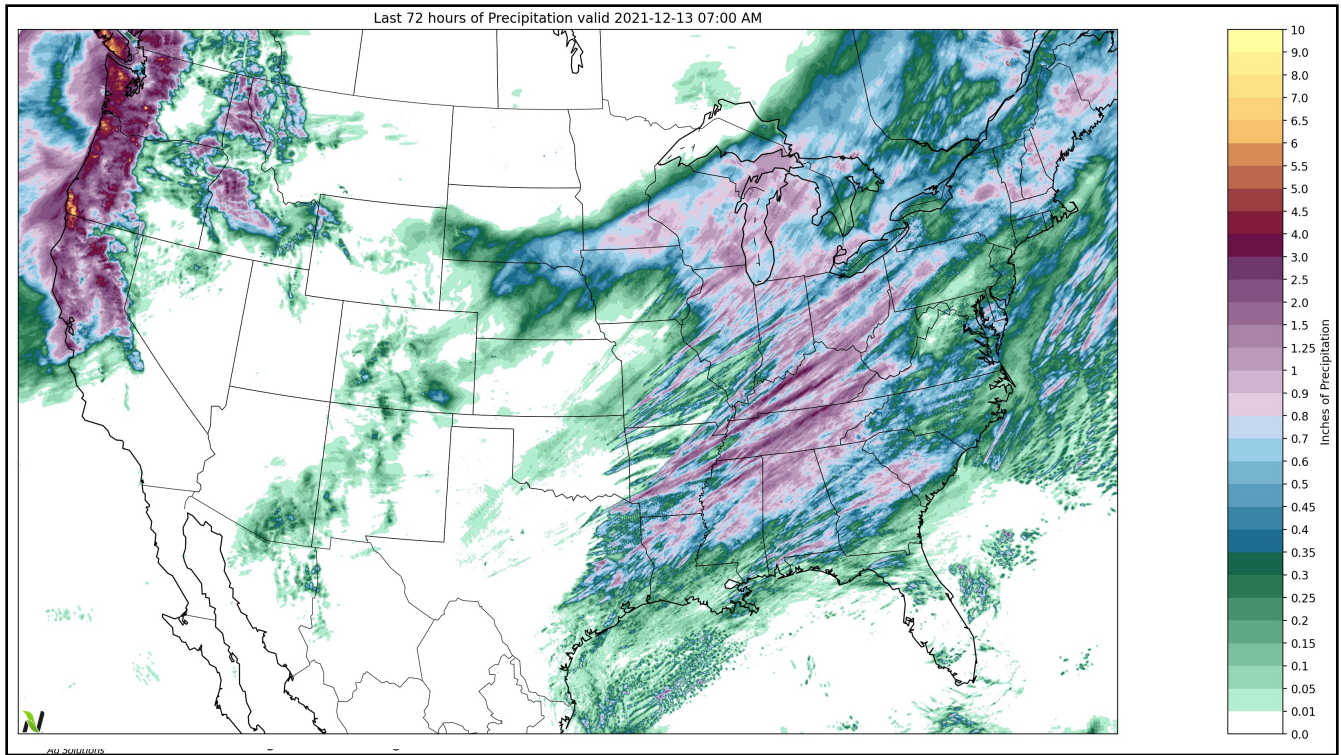
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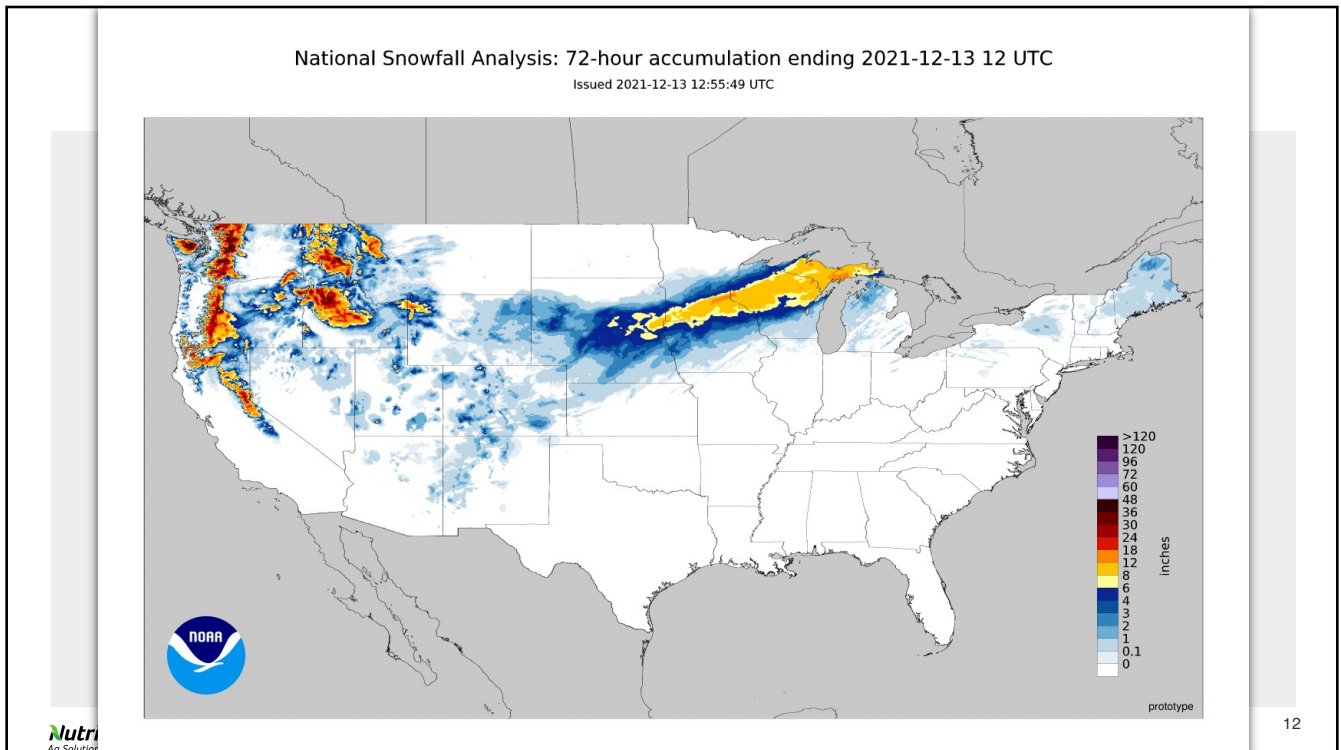
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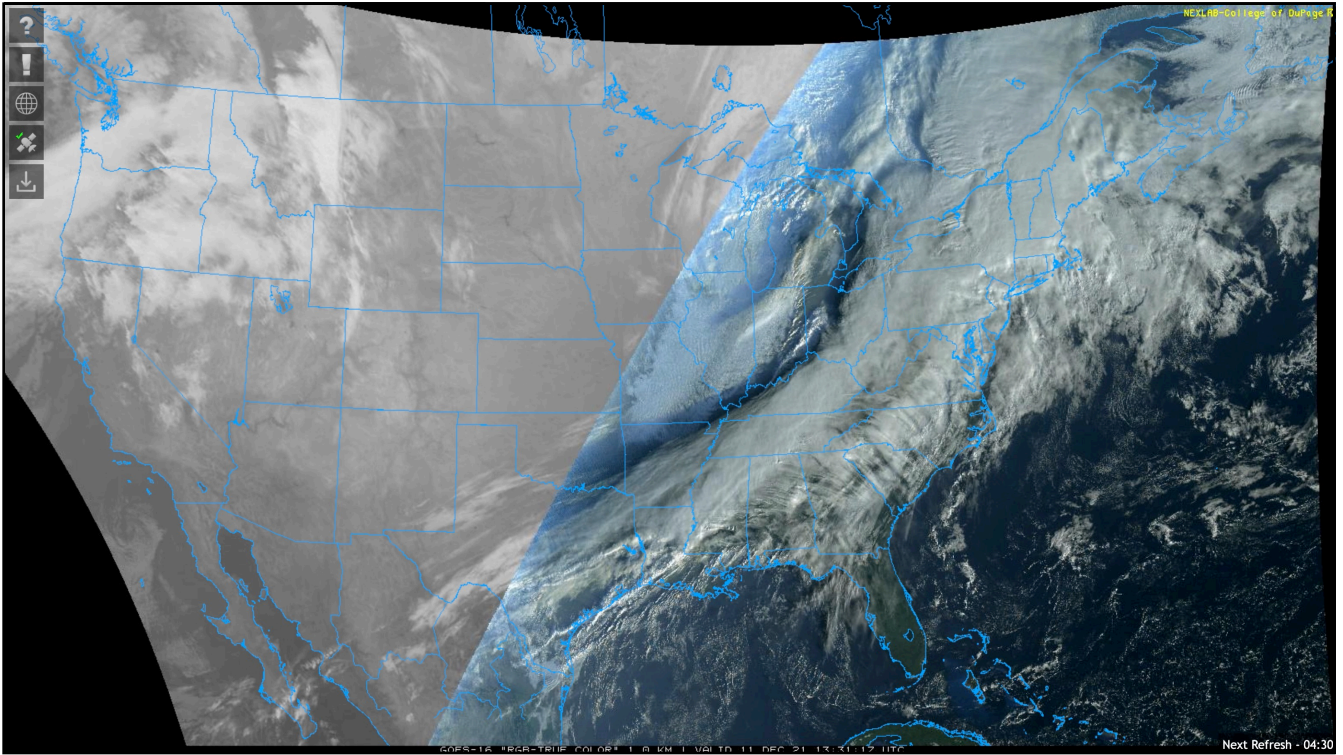
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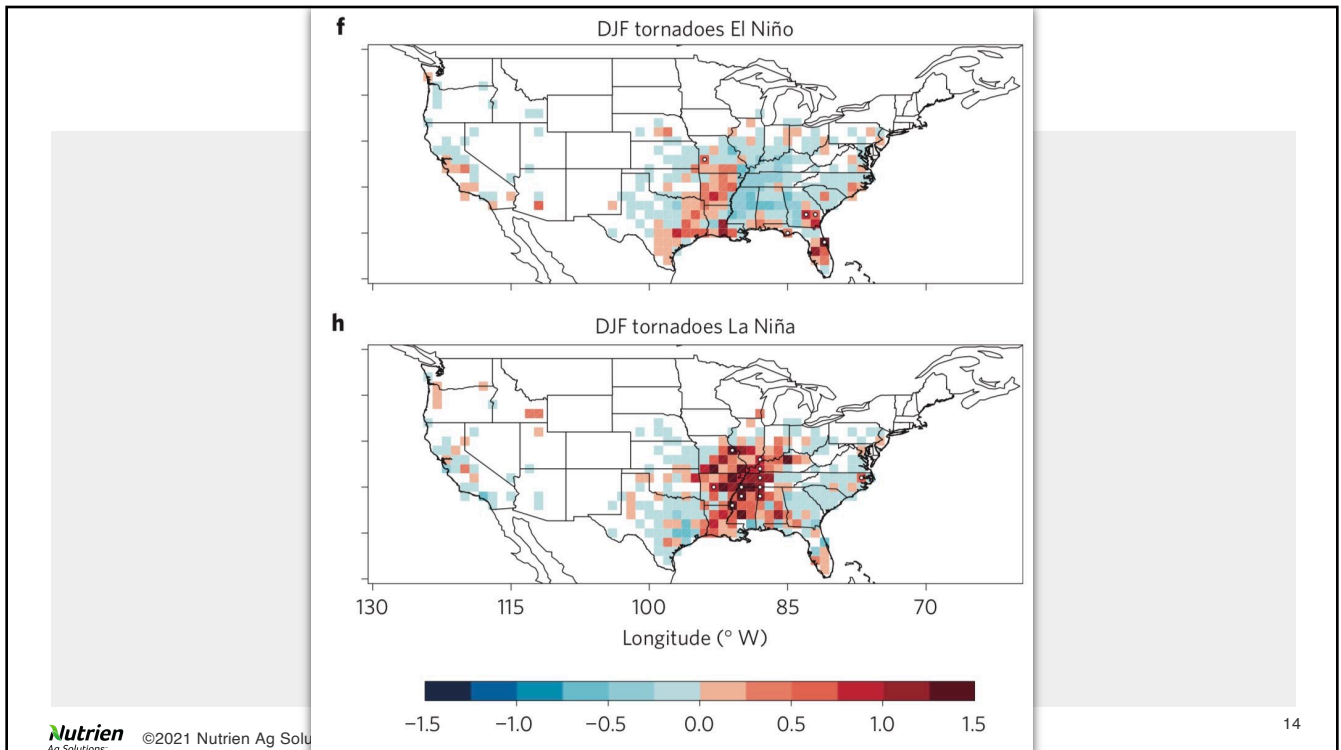
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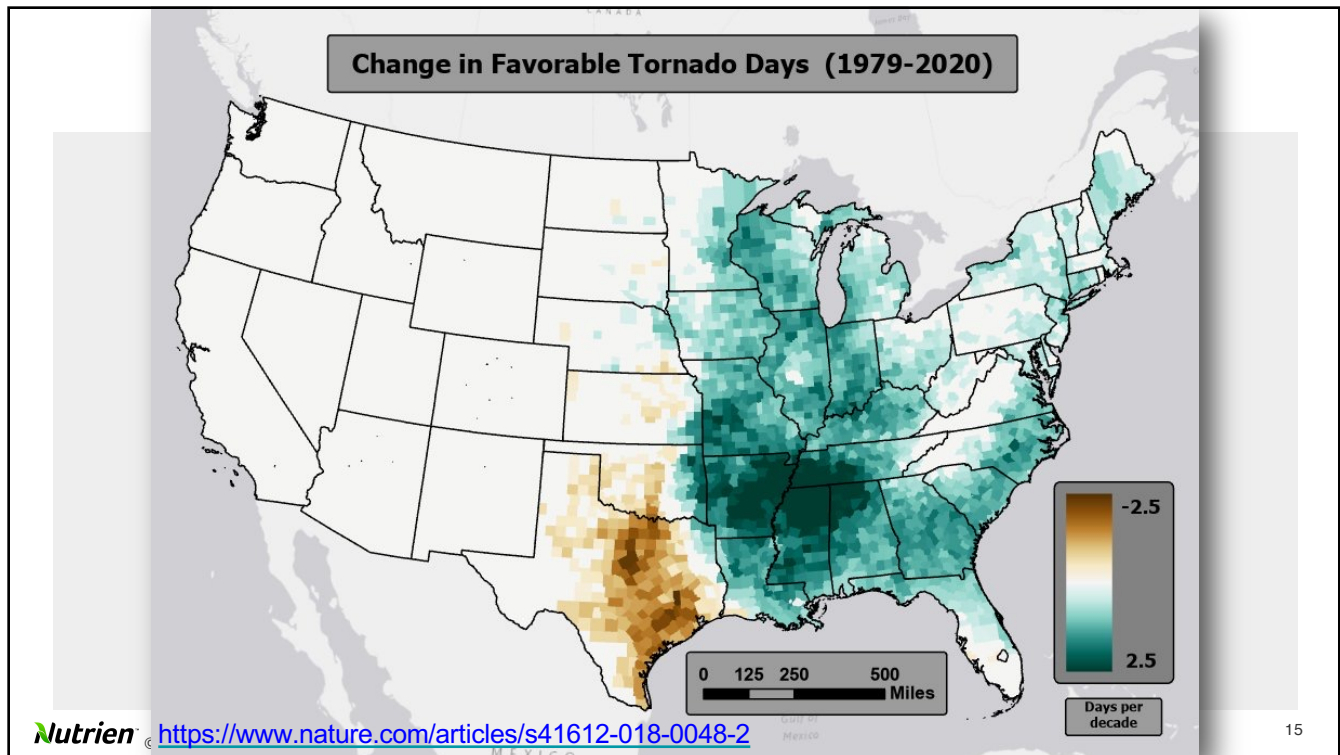
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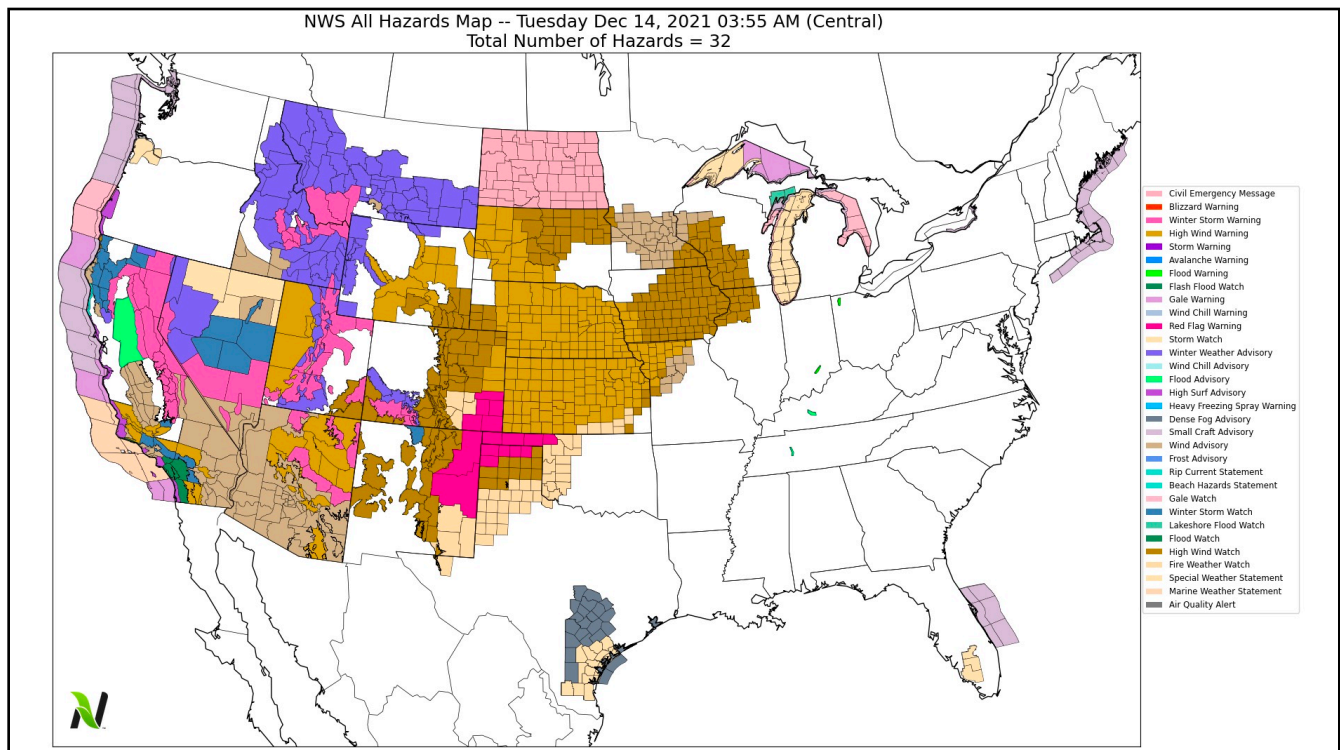
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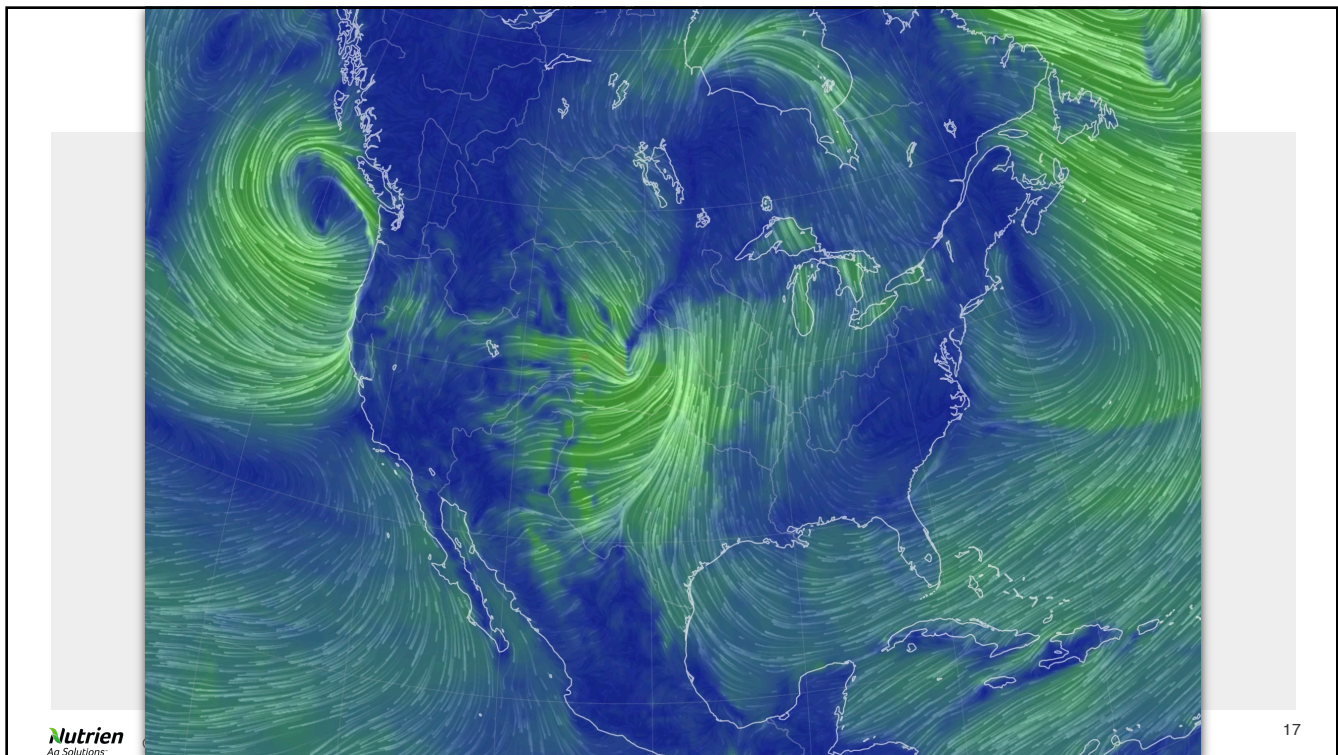
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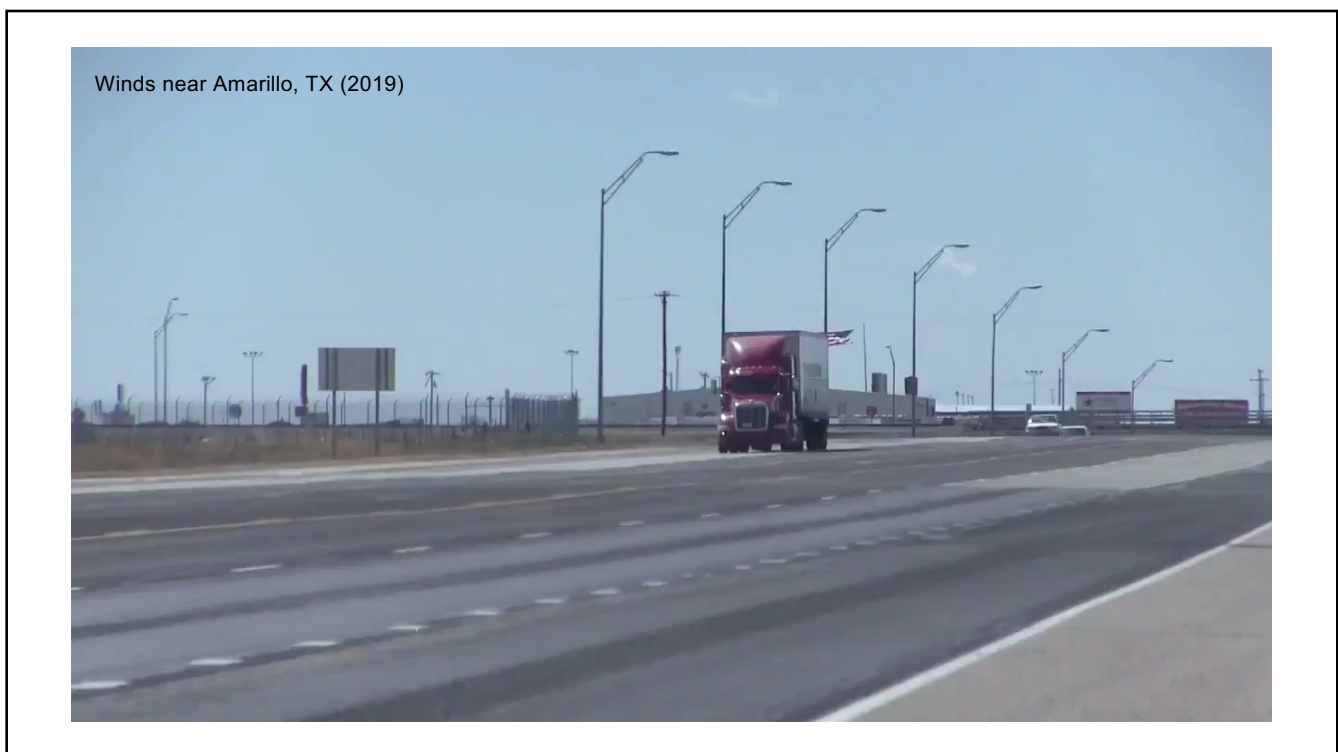
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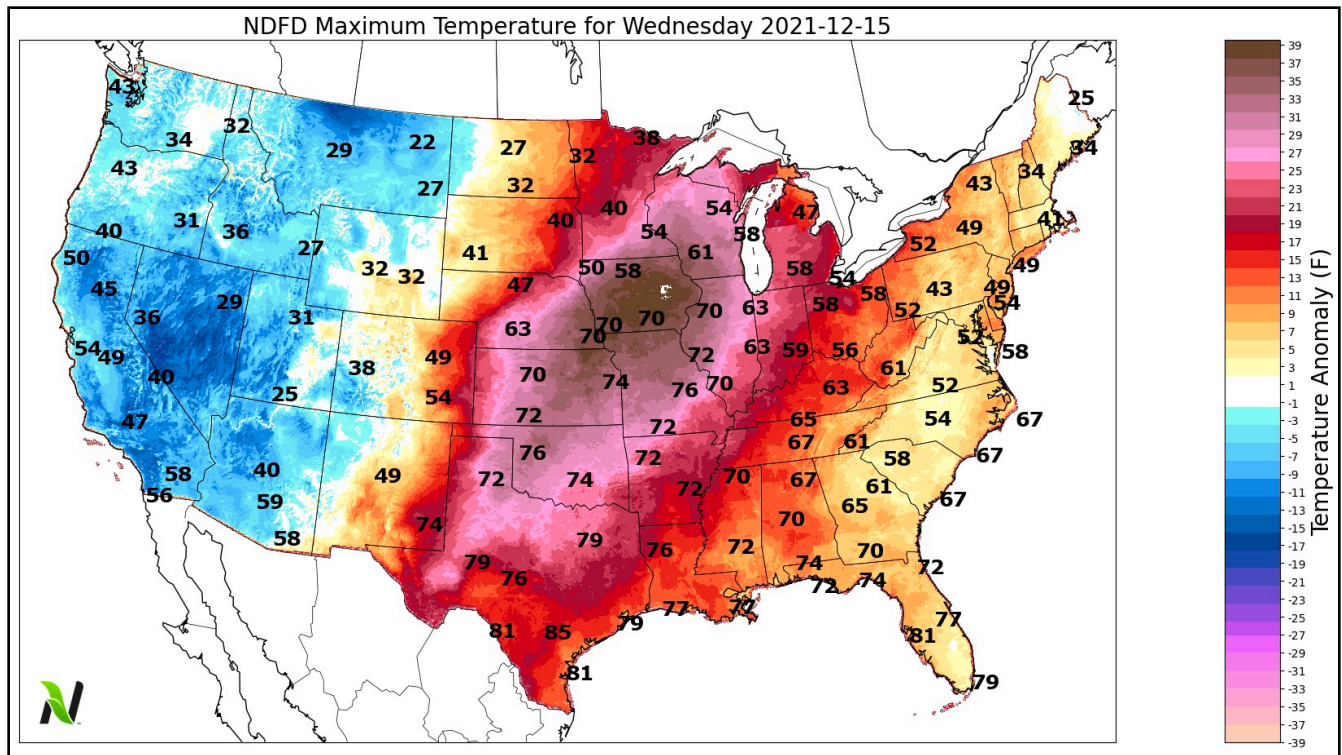
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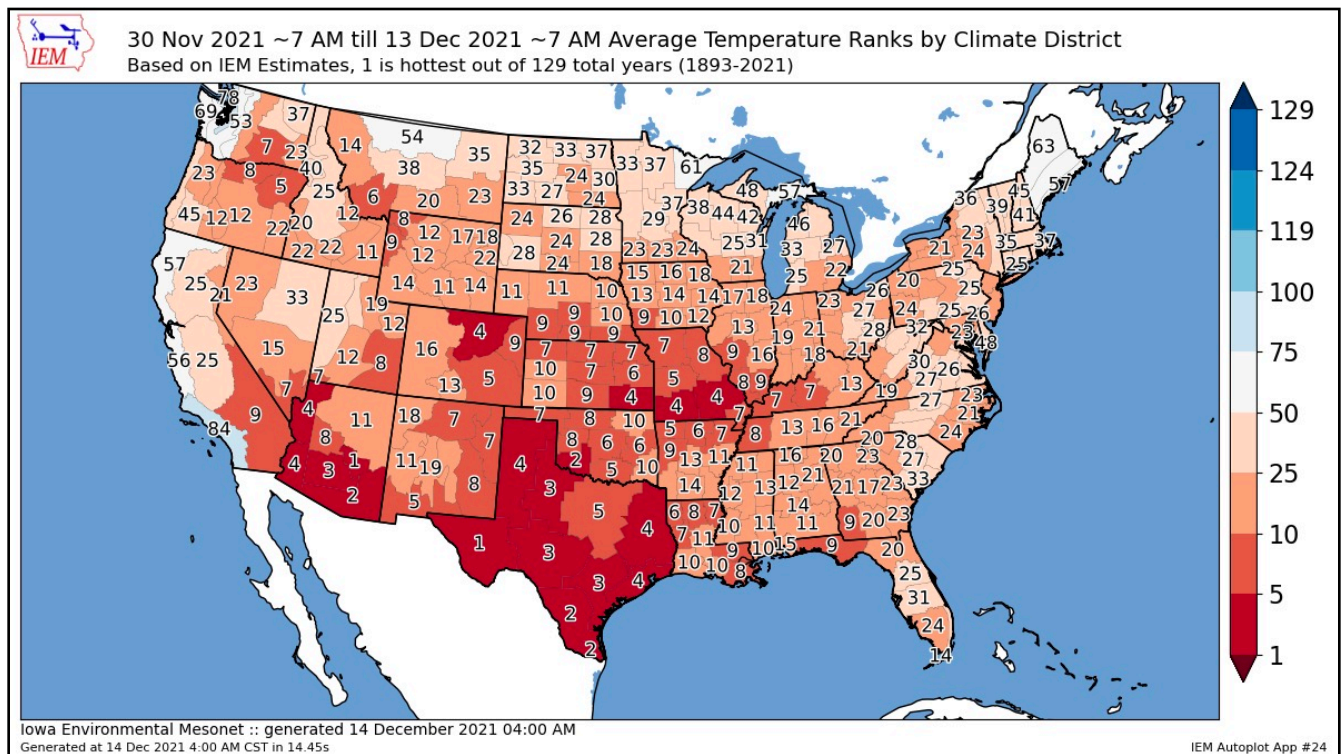
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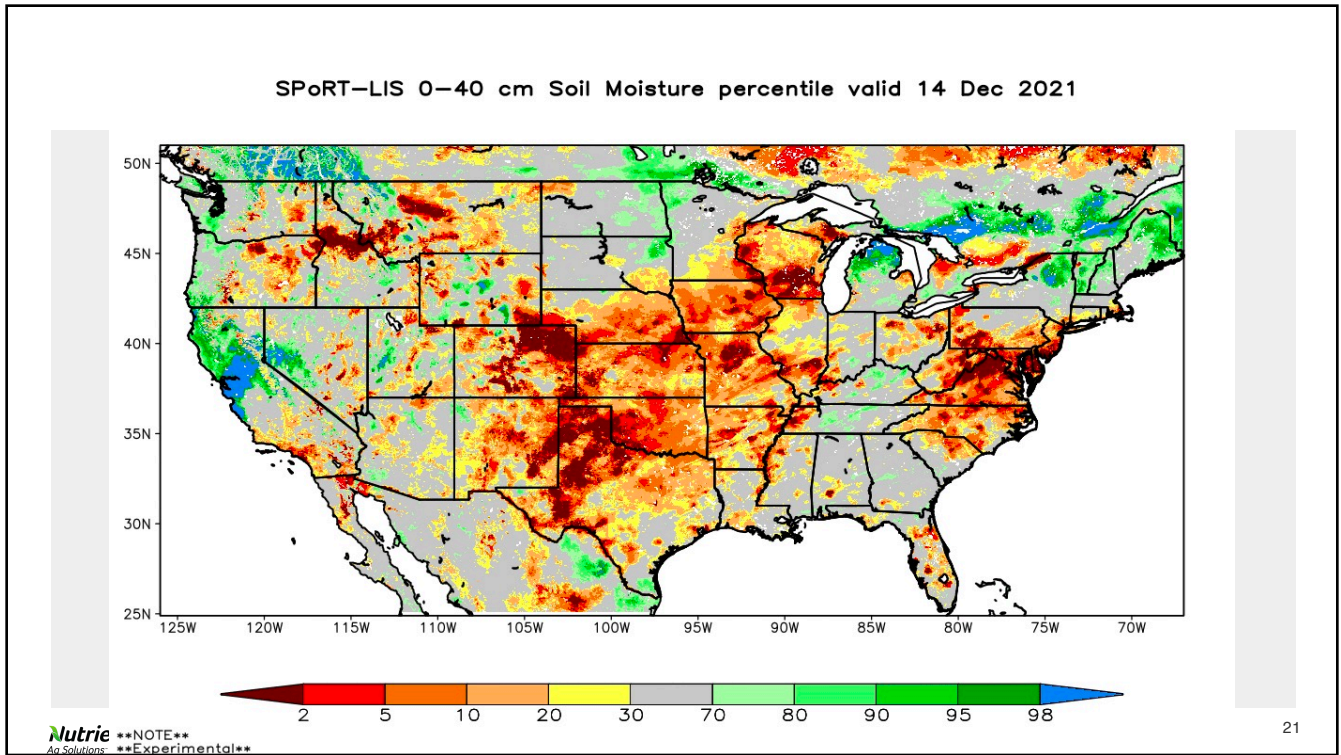
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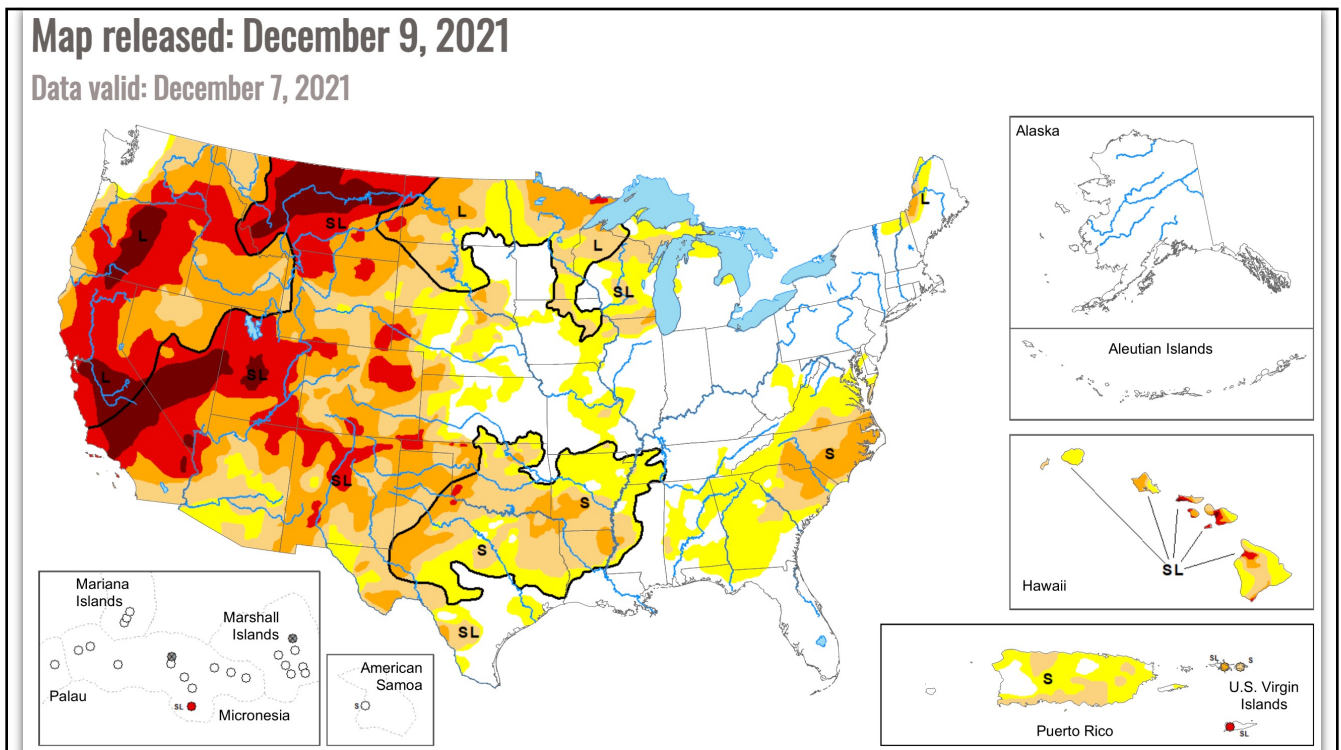
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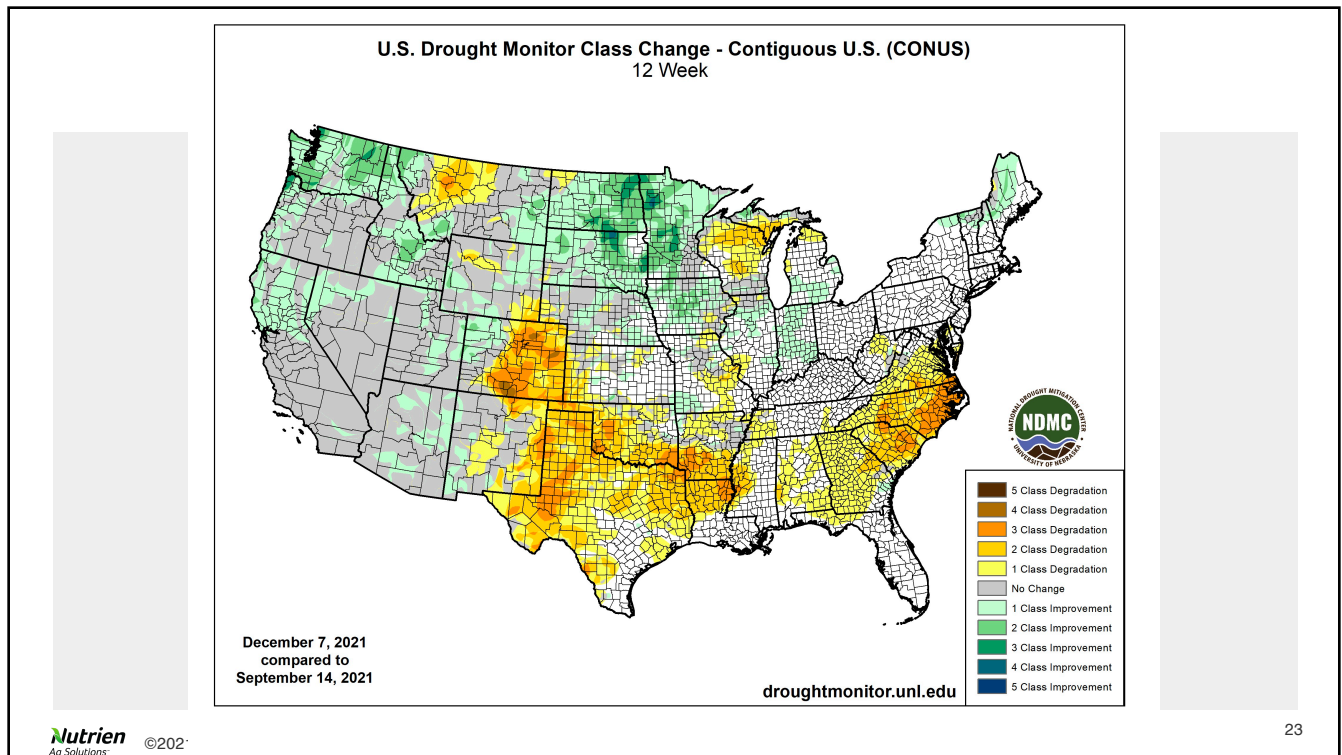
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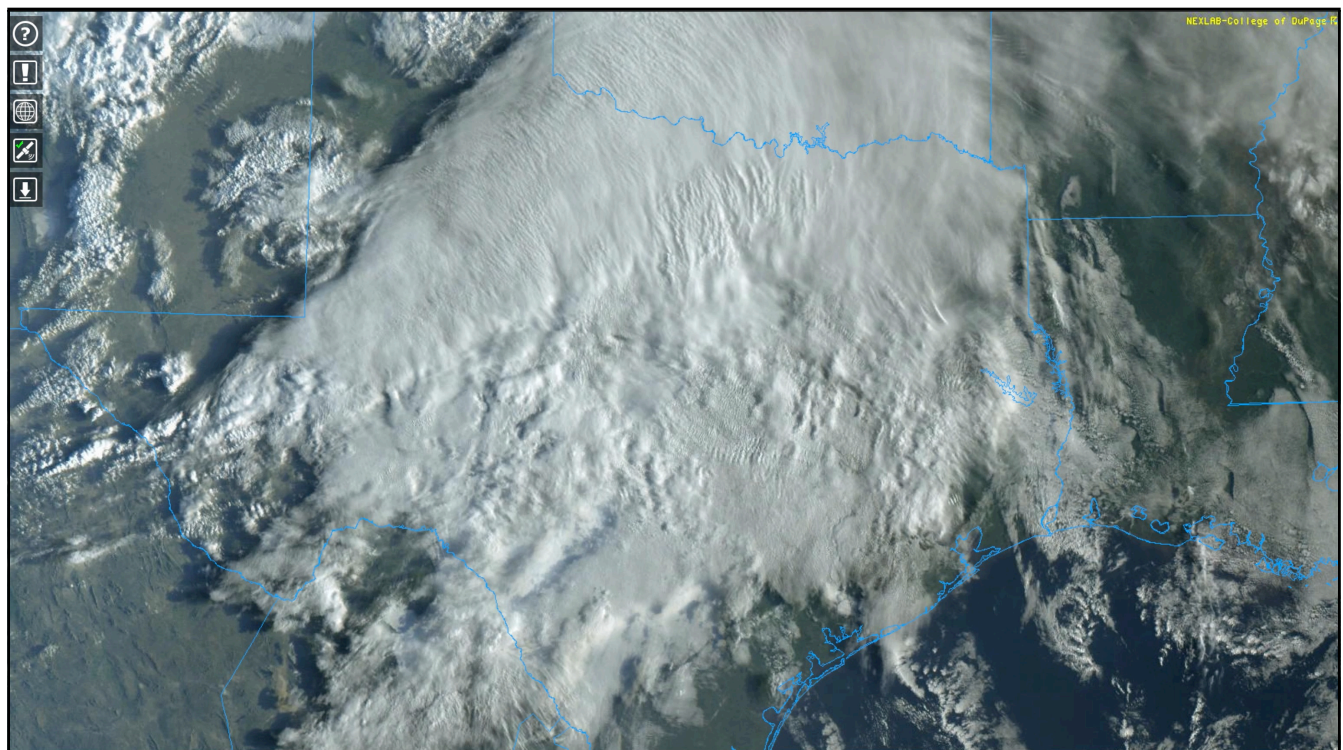
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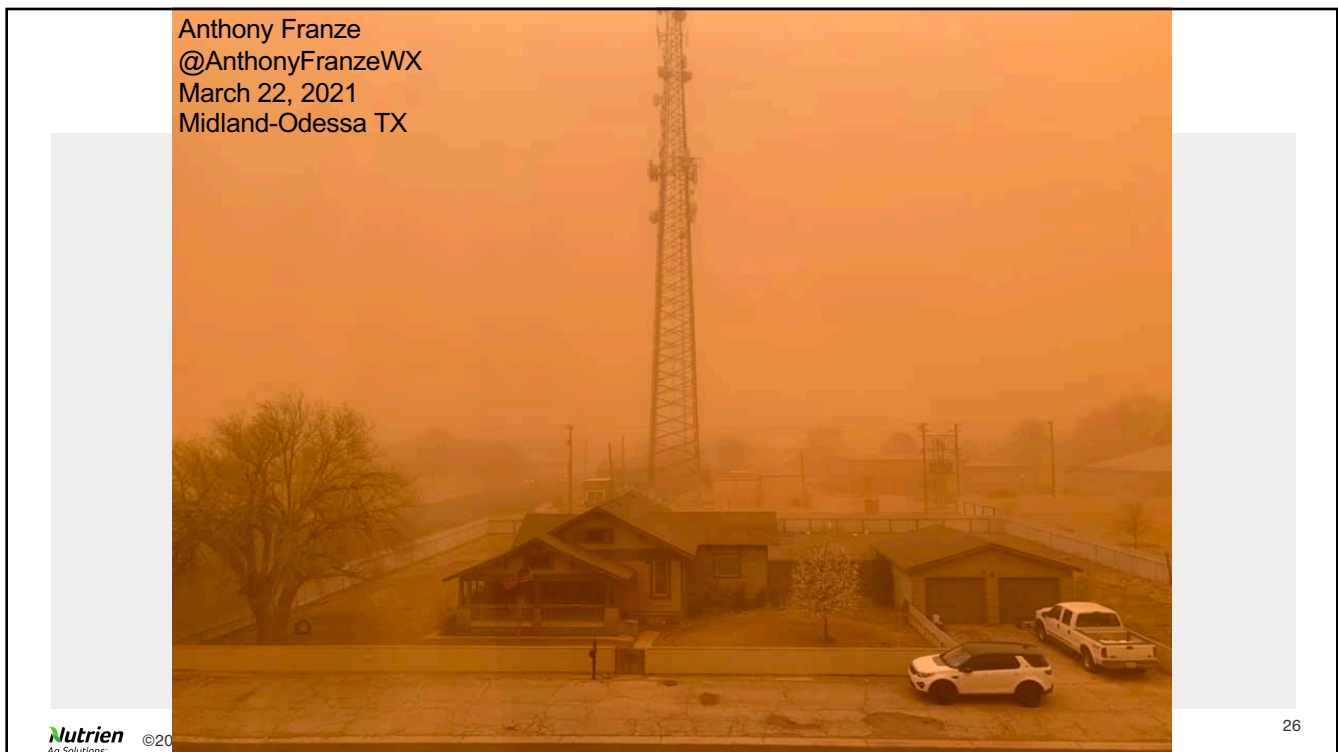
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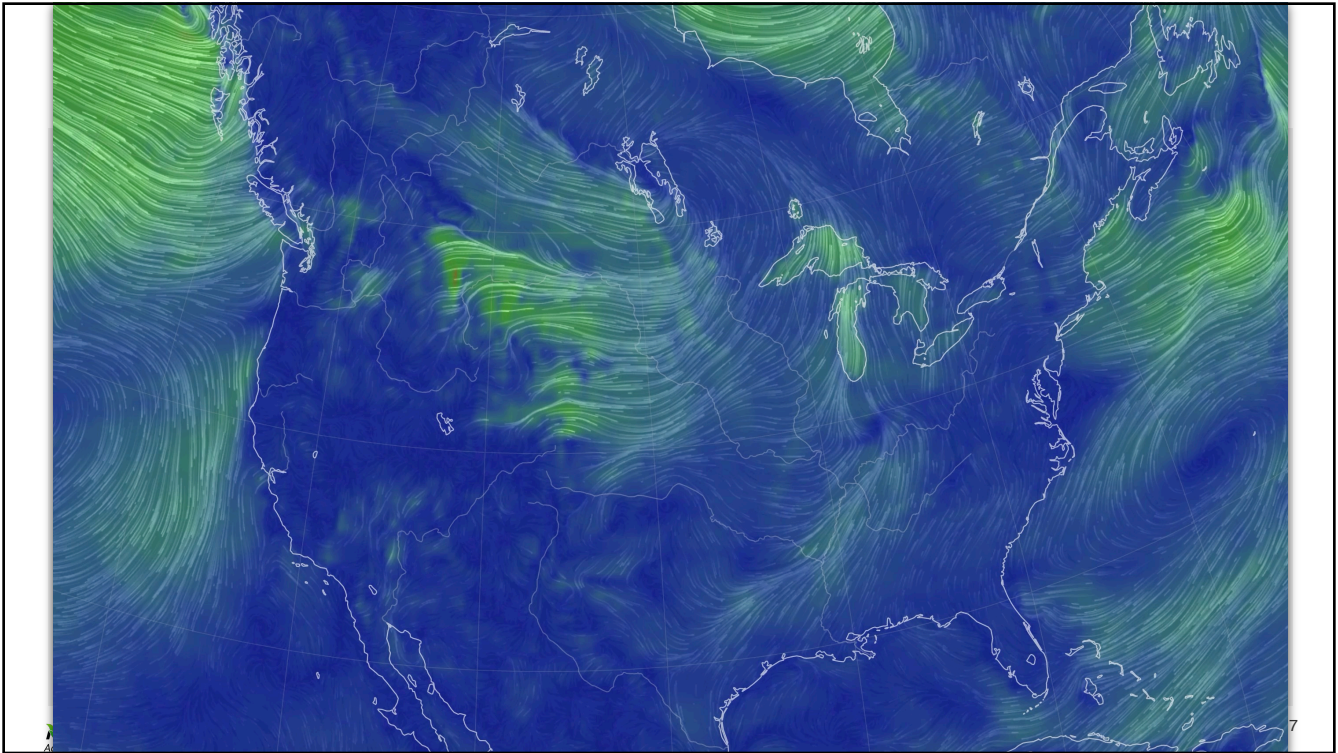
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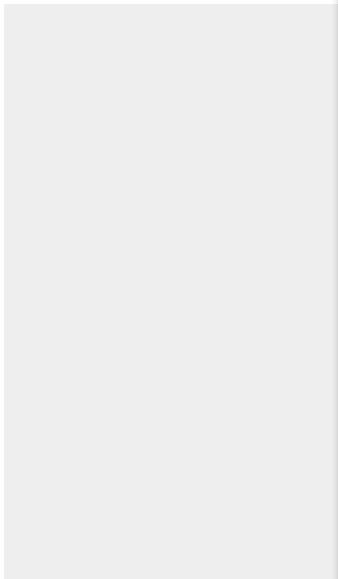


26



27

Denton, MT (Dec 1)



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28

28

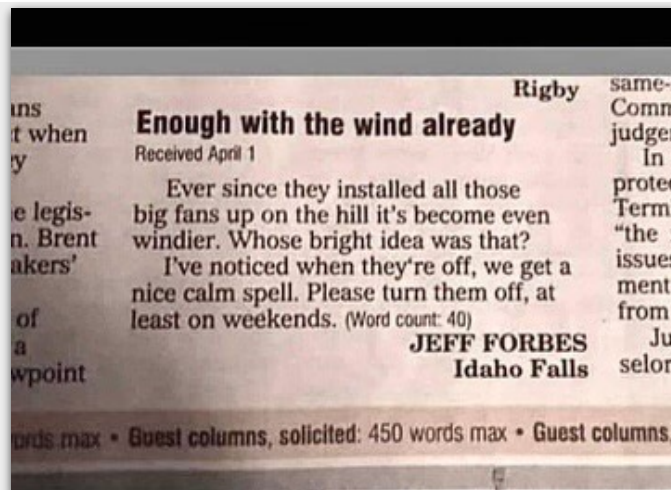


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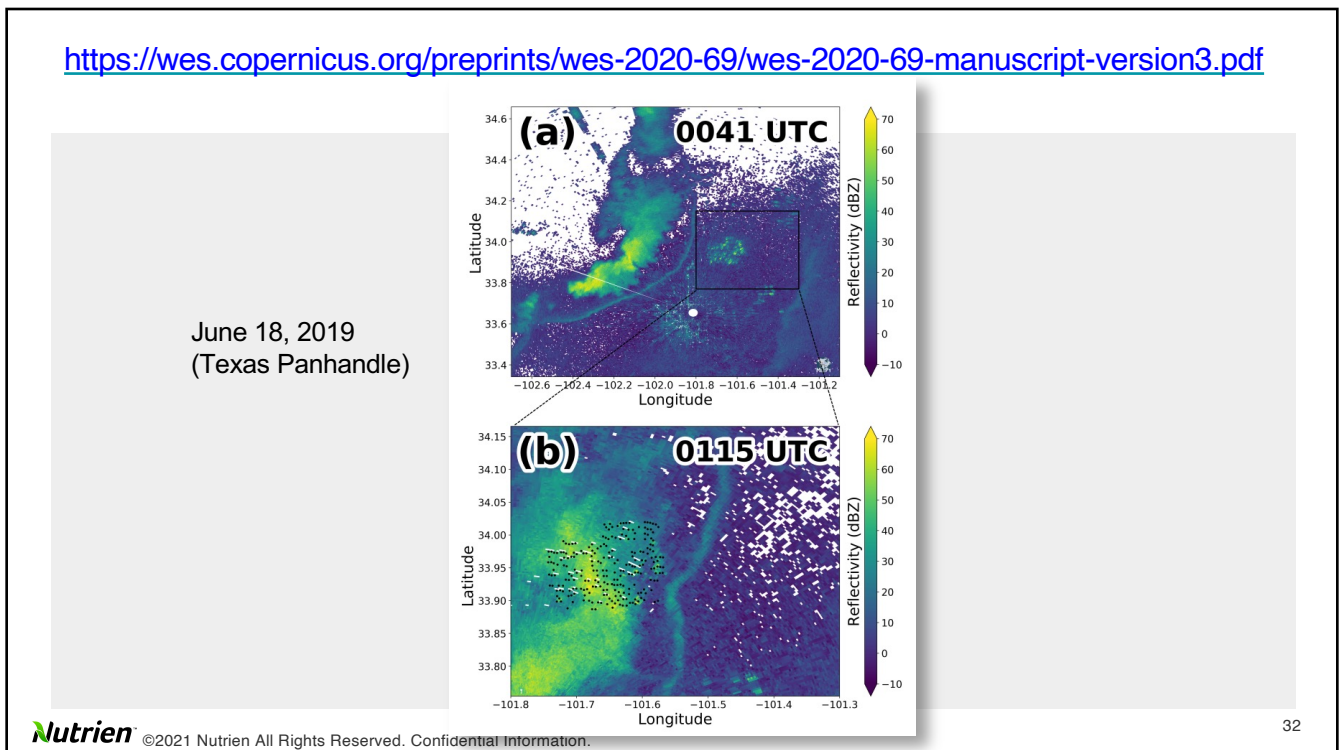
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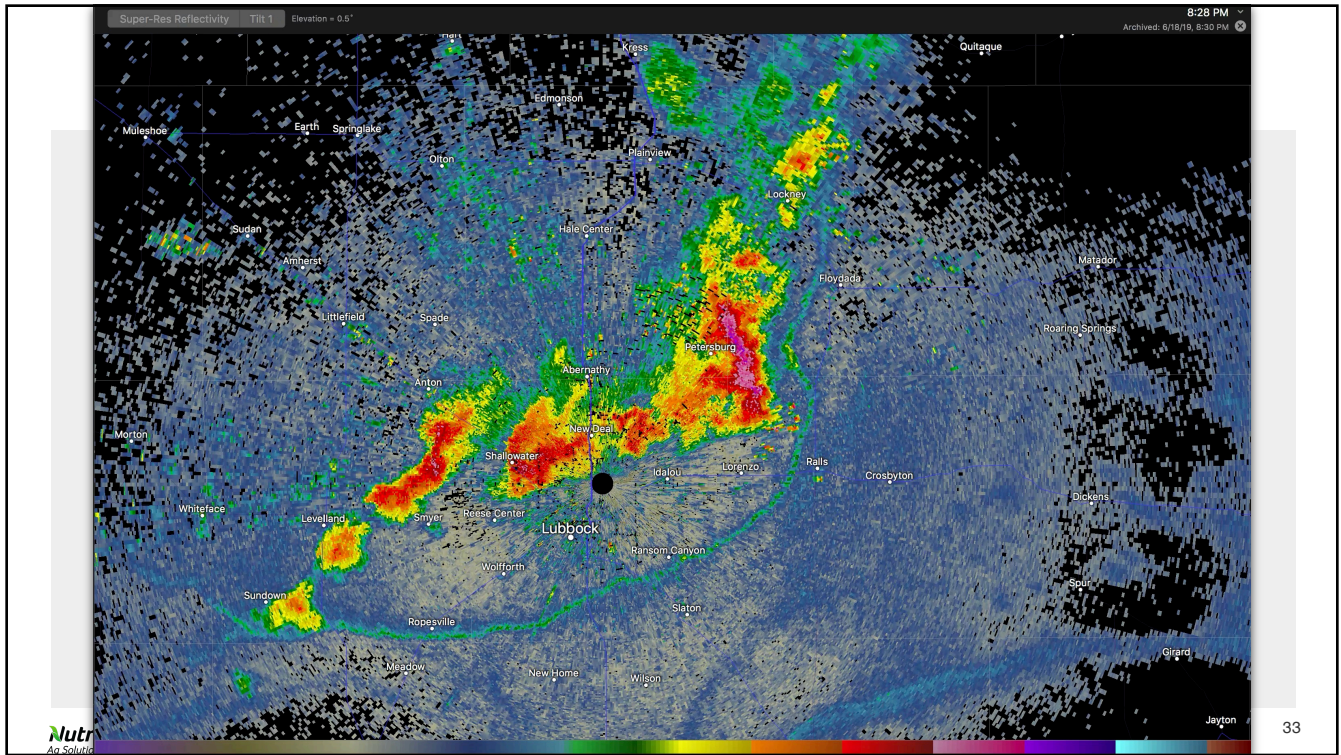
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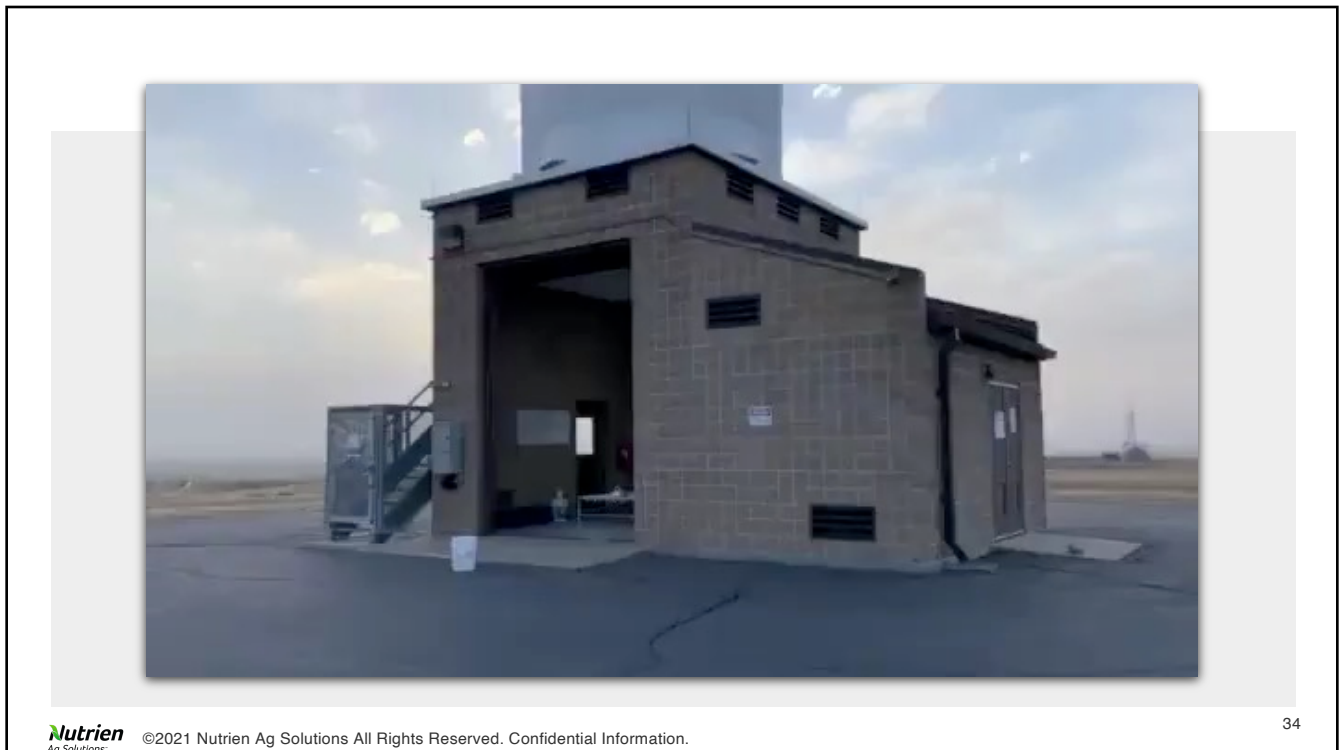
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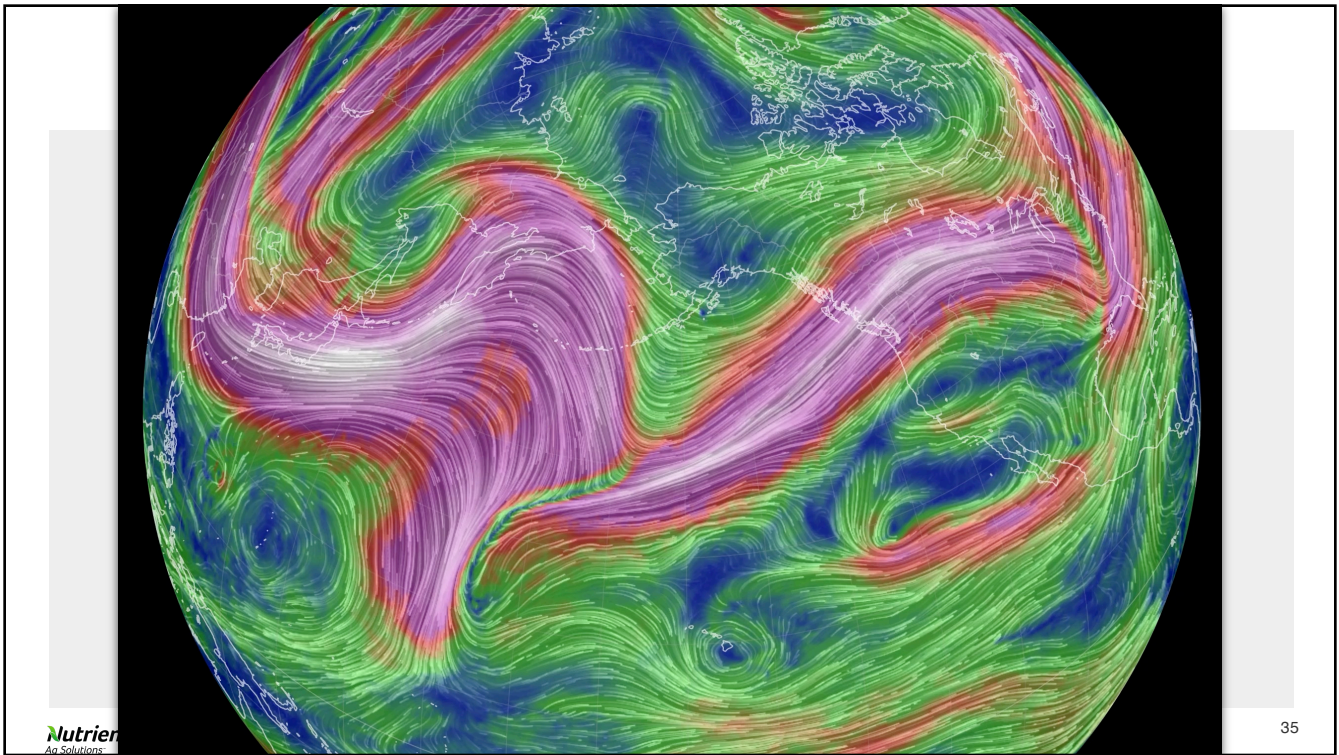
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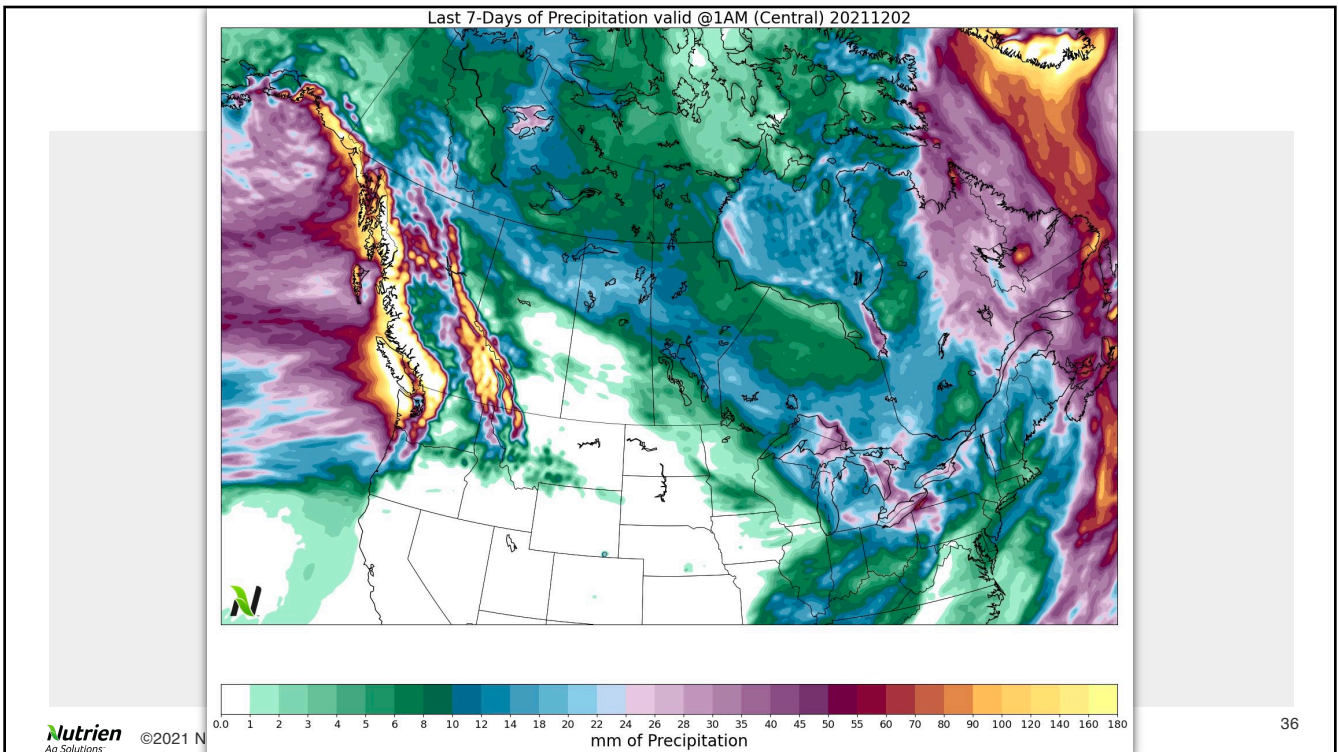
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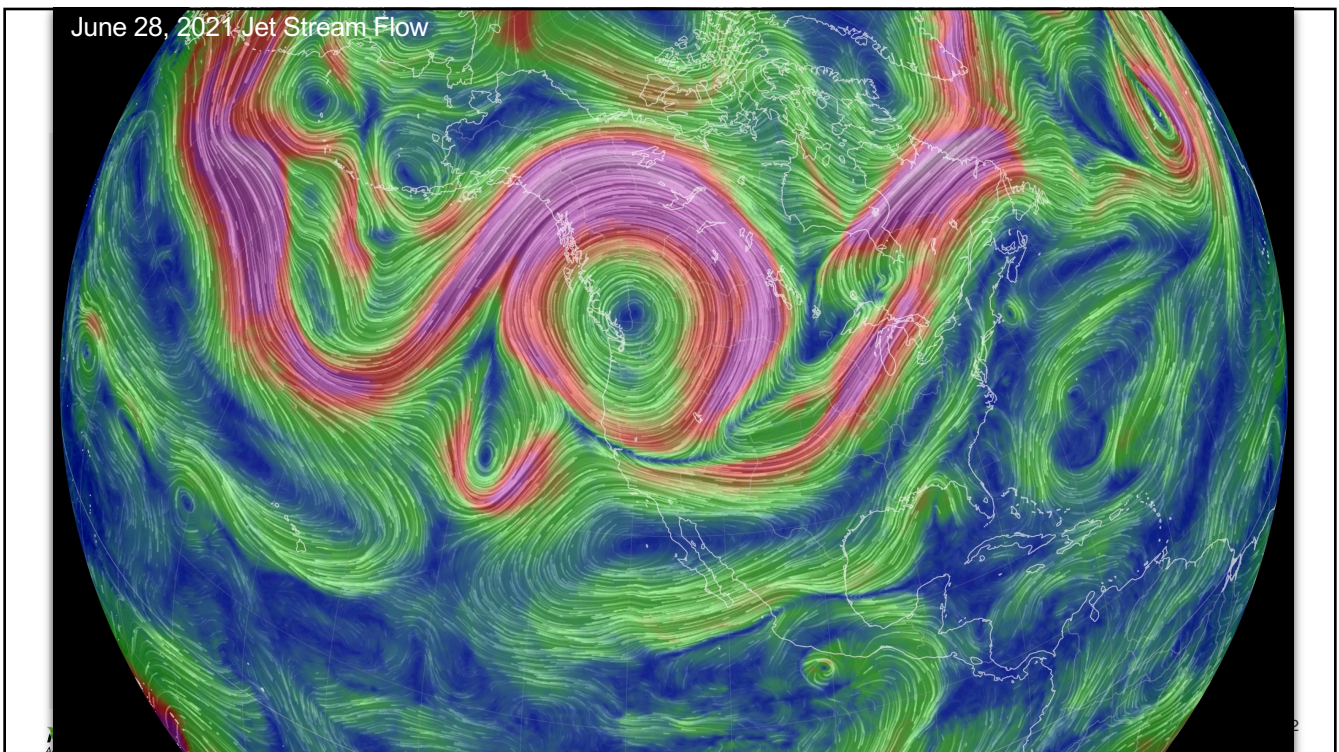
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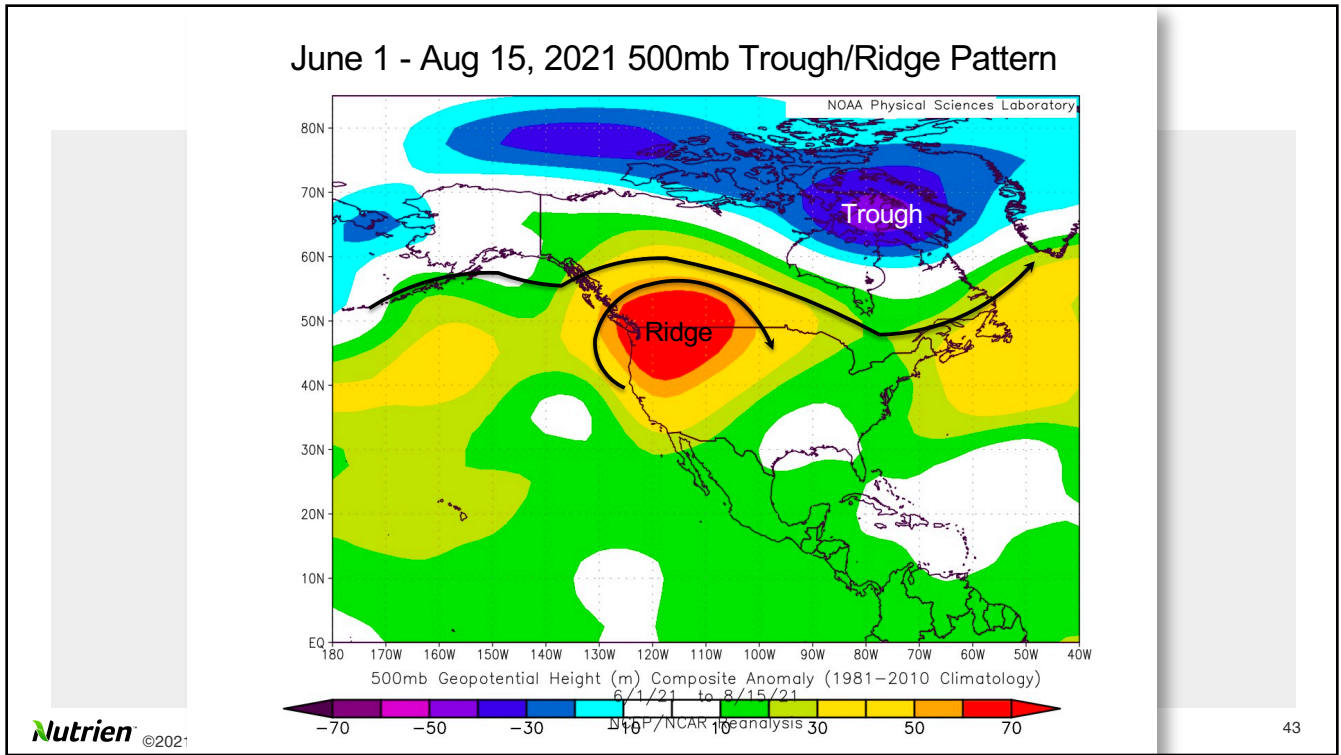
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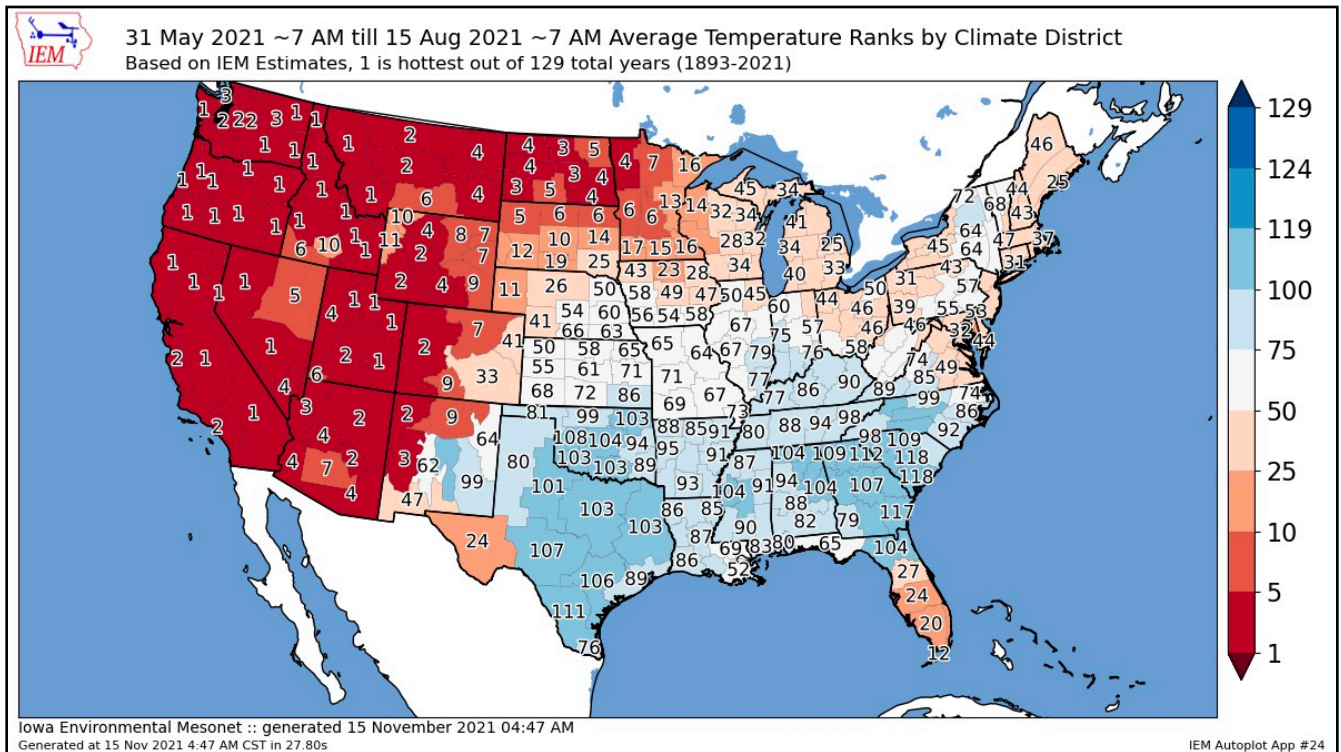
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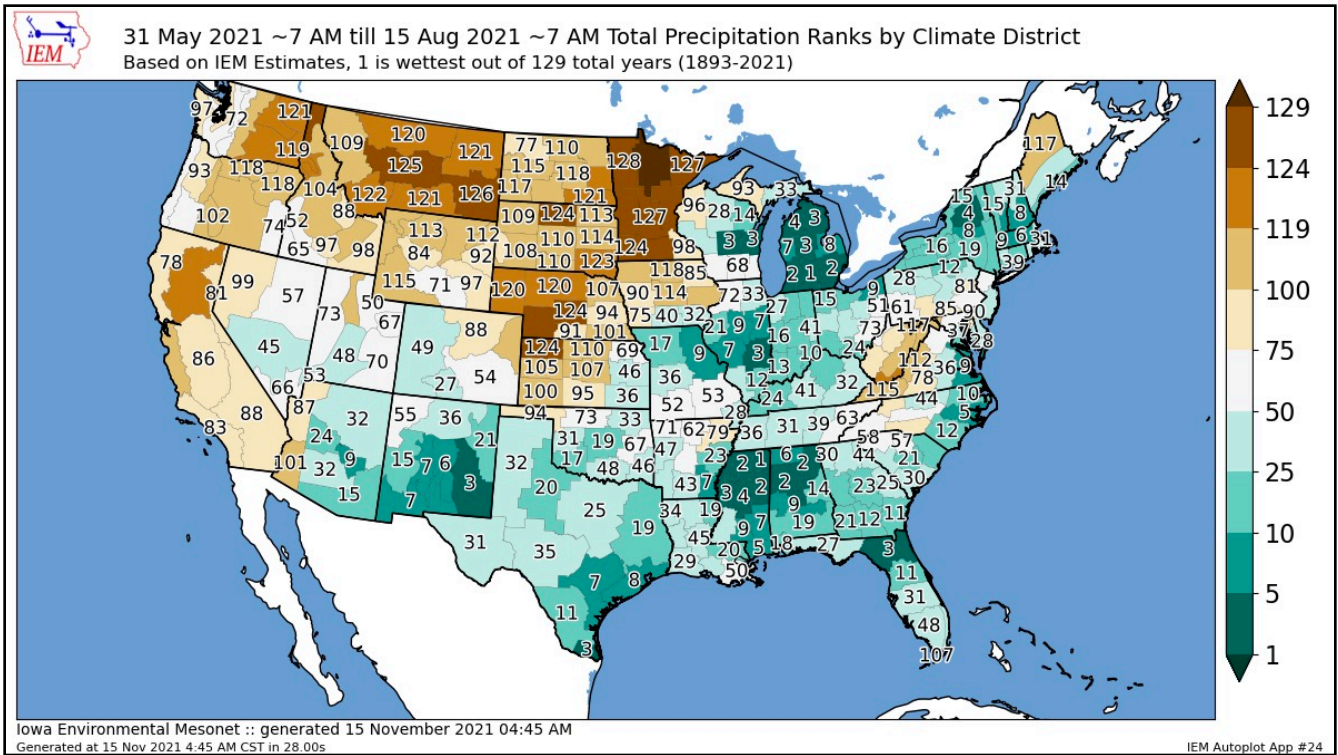
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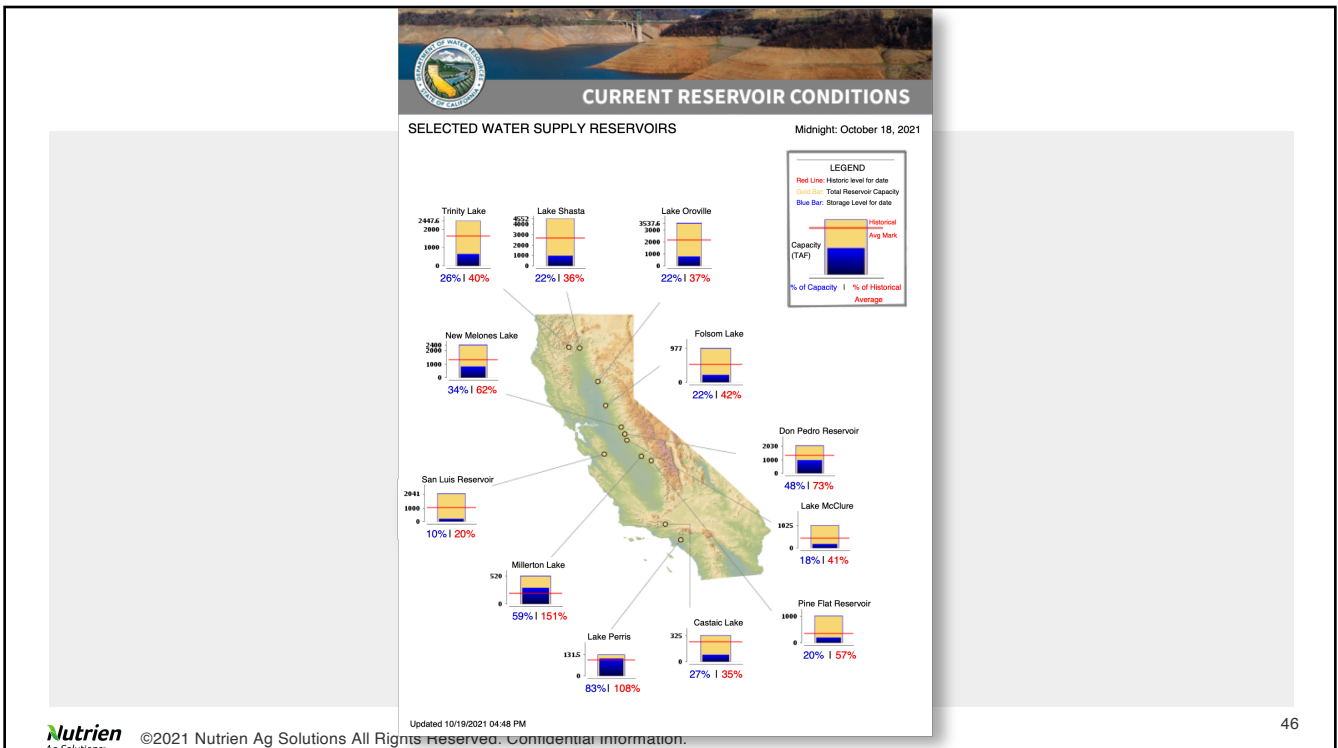
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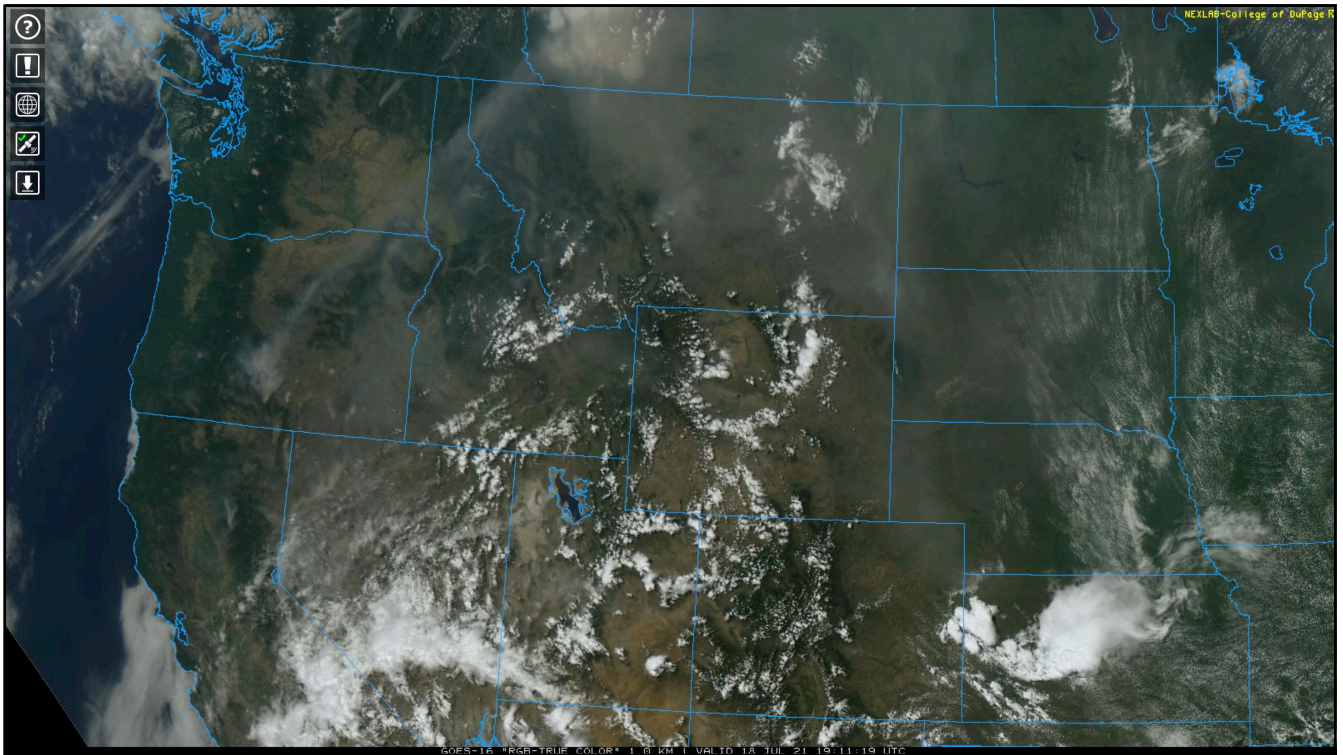
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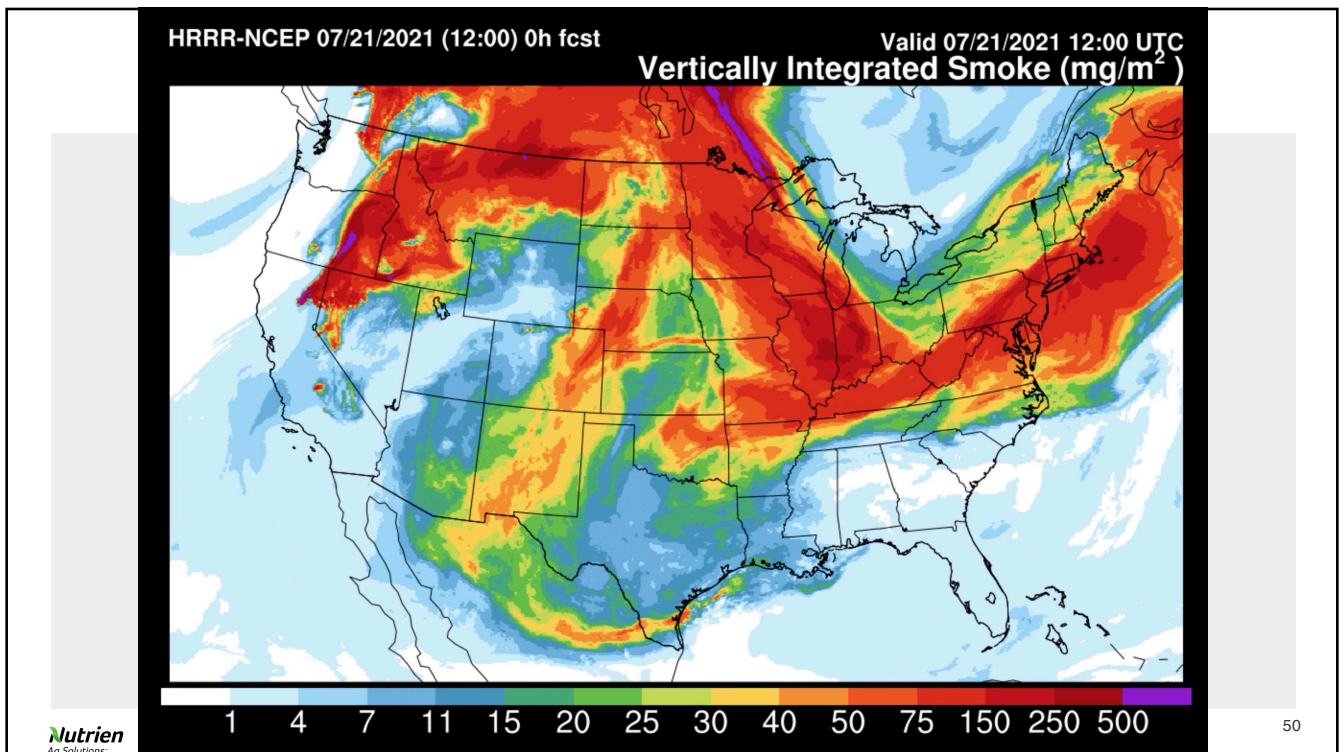
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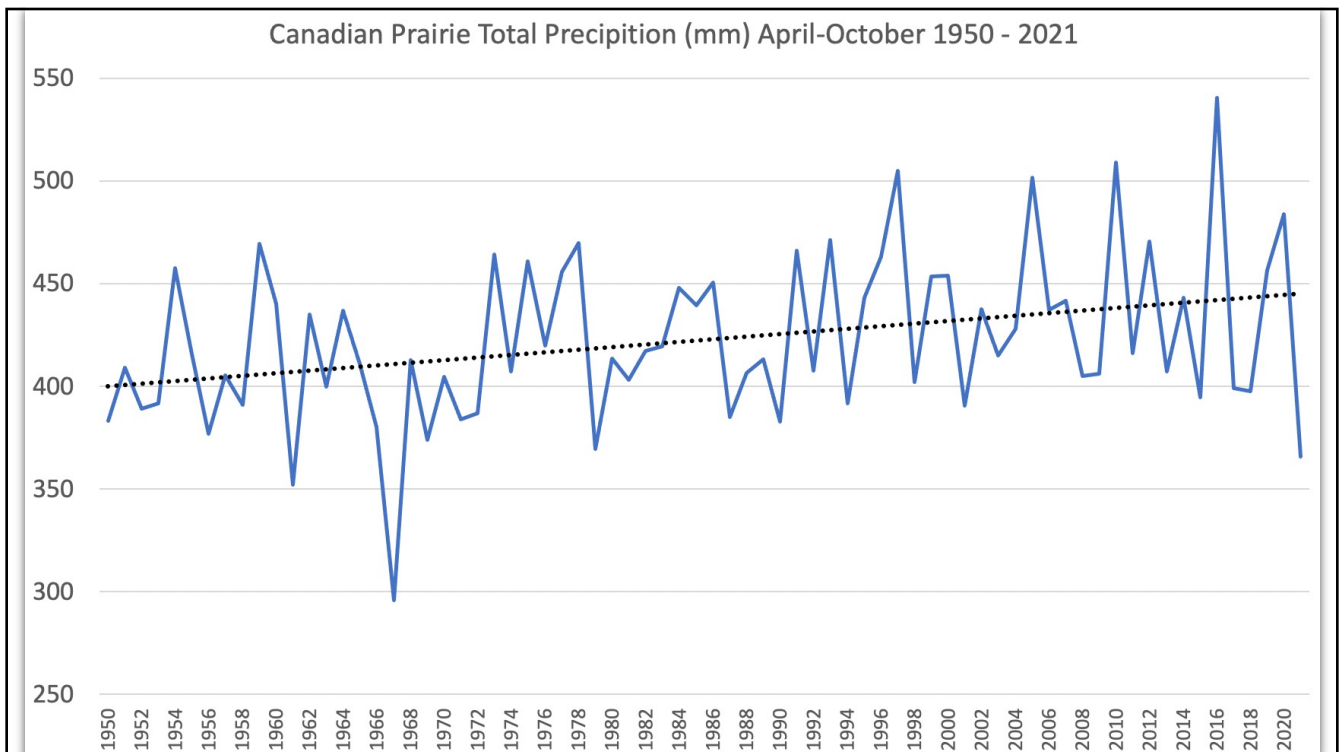
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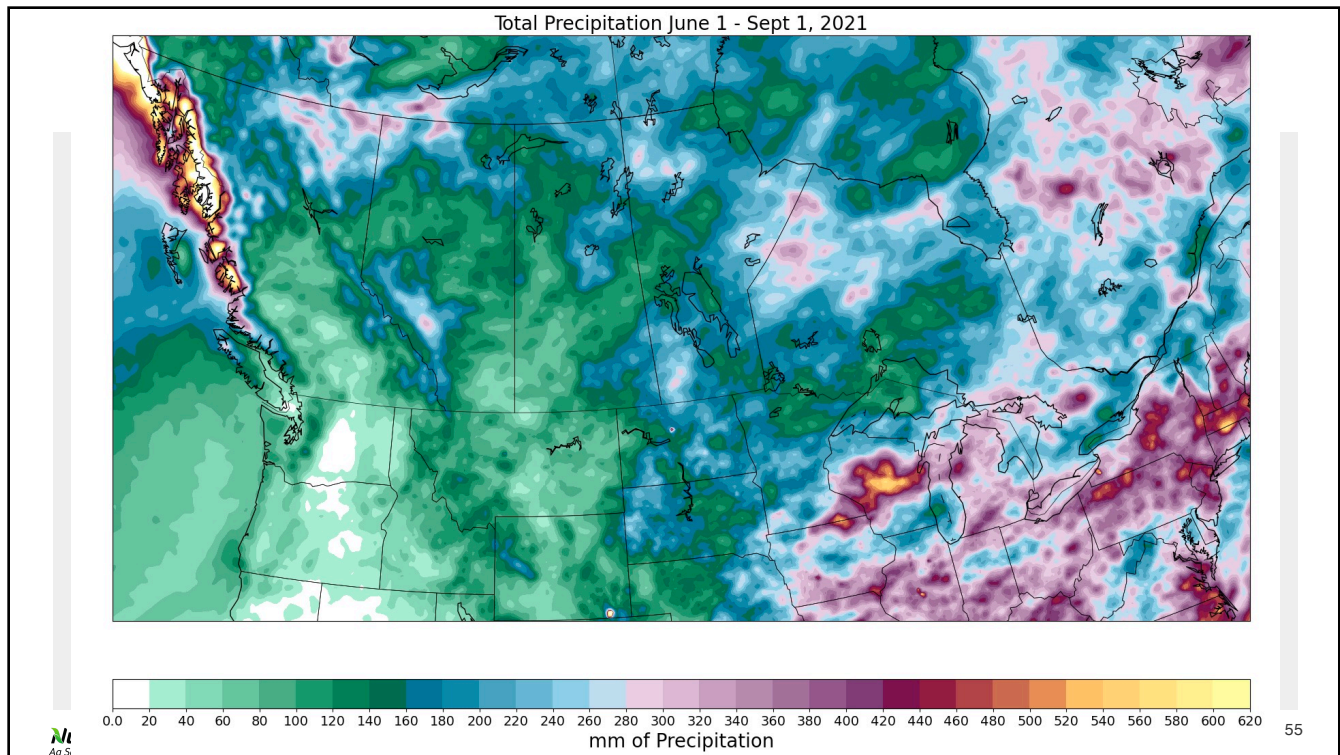
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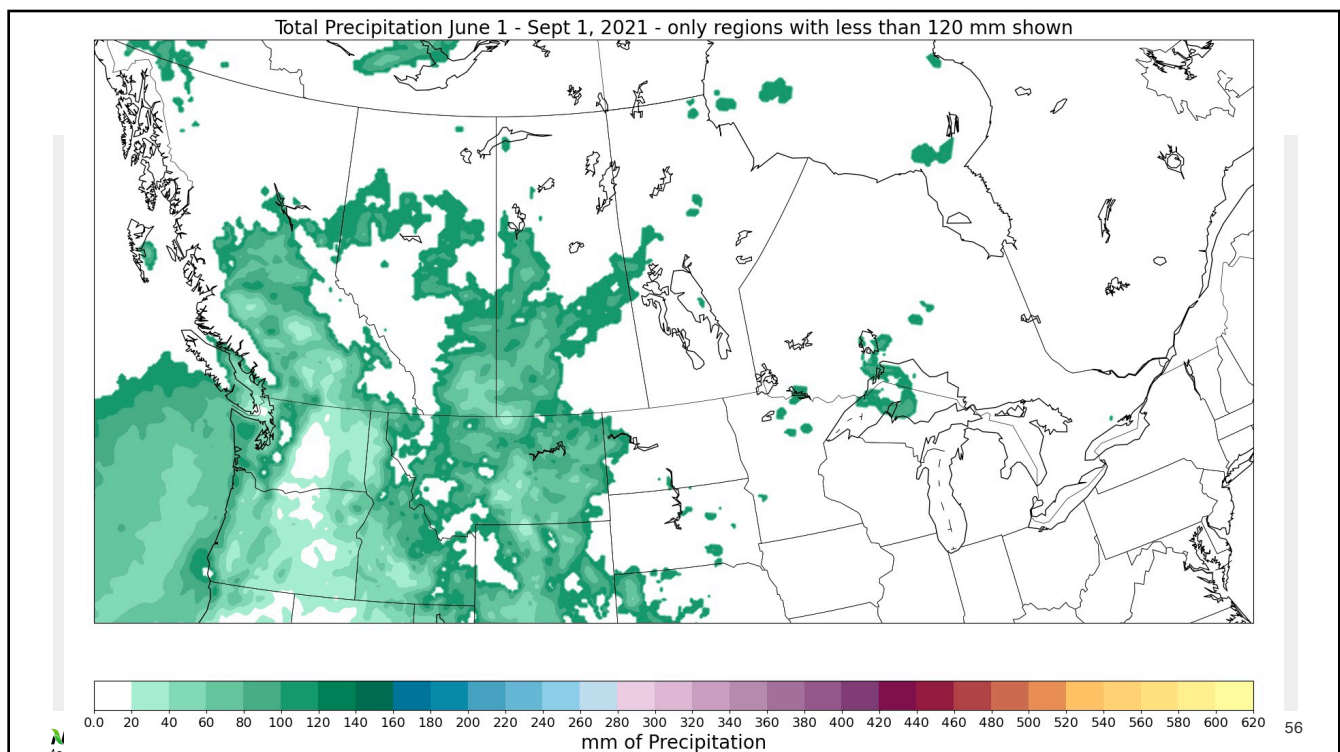
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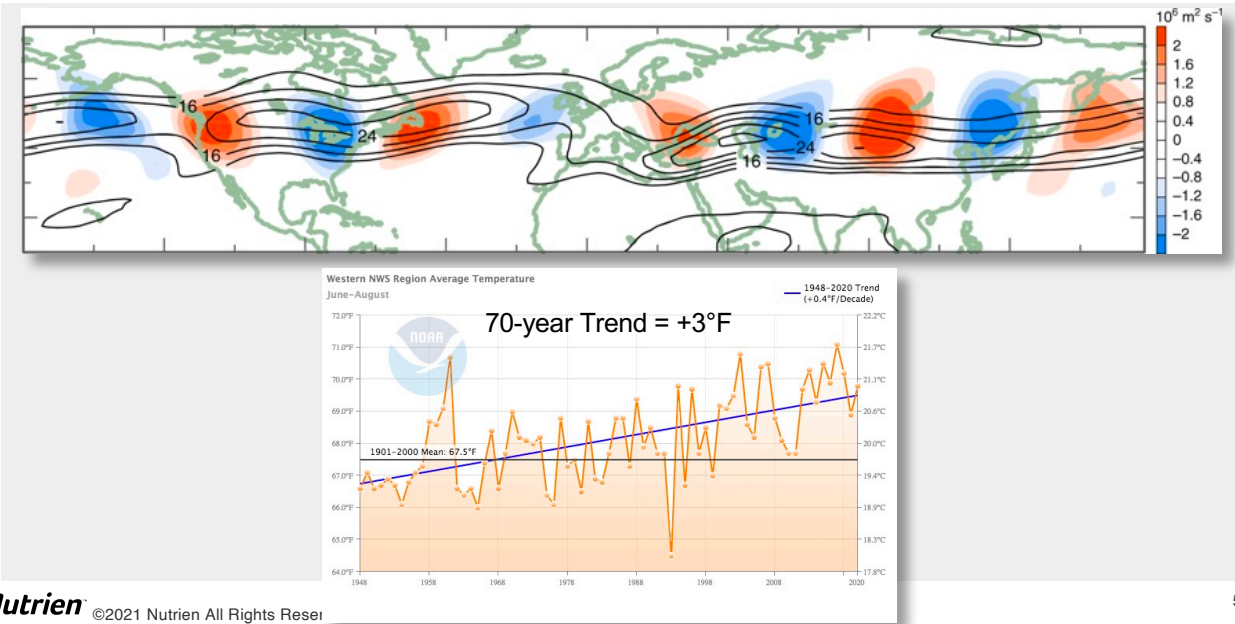
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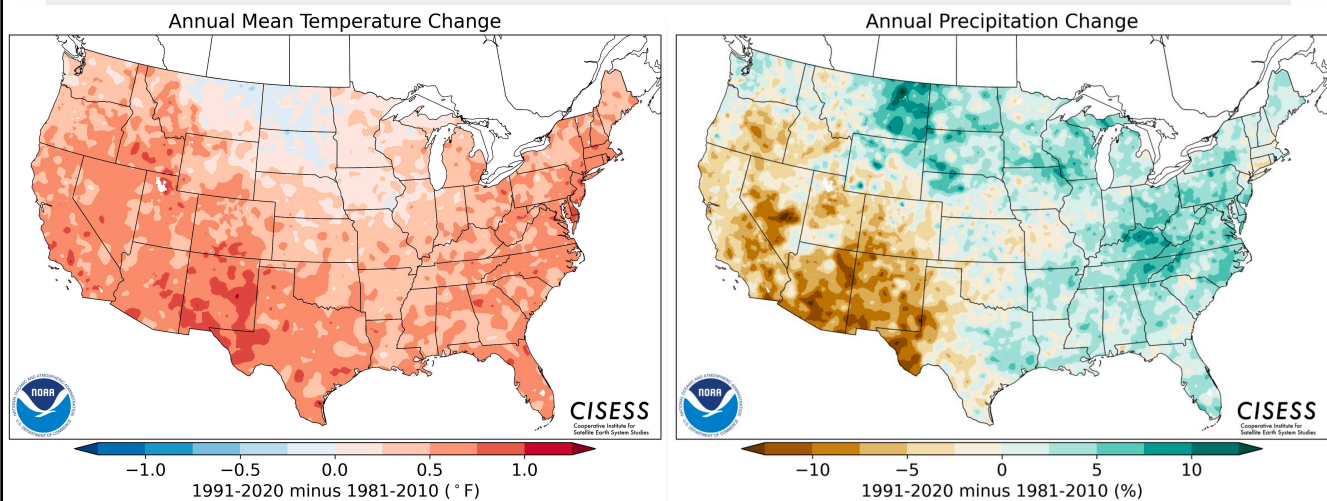
Long term trends in summer jet stream pattern

<https://www.nature.com/articles/s41467-018-05256-8>



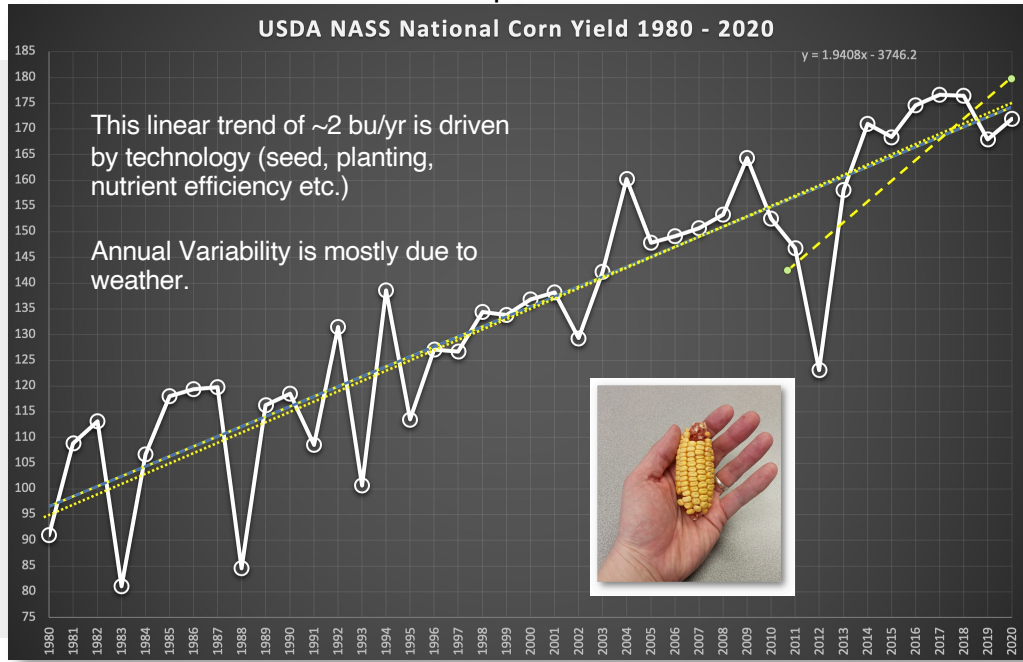
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New Climate "Normals" 1991-2020



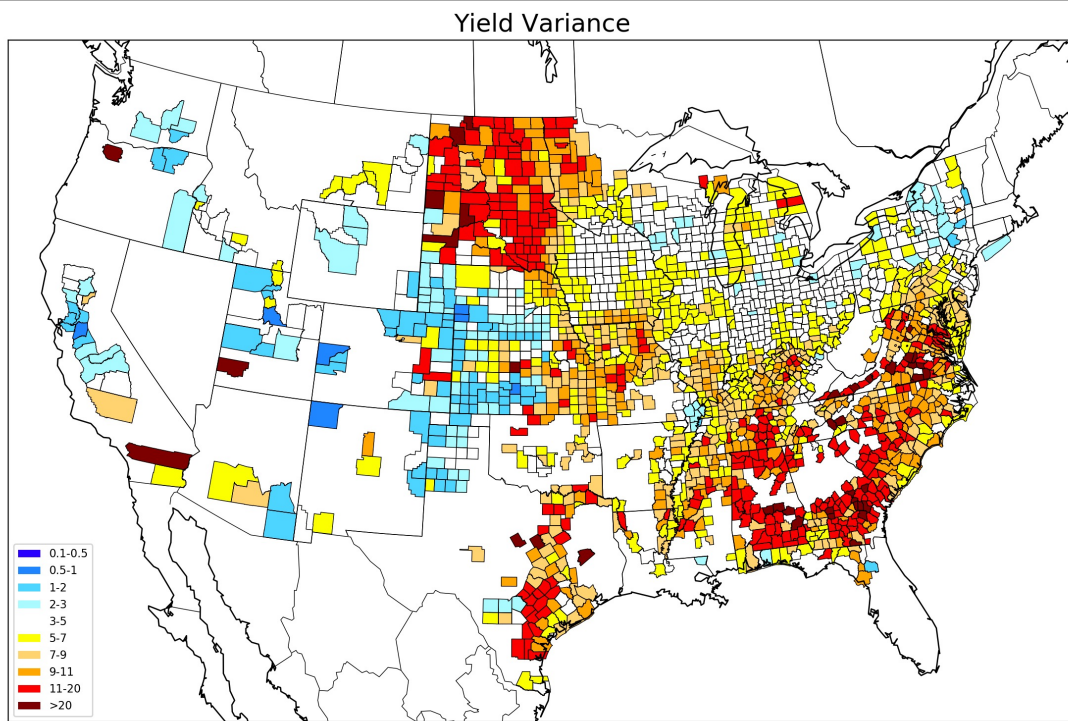
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Will These Shifts in Climate Records Impact This Trend?



59

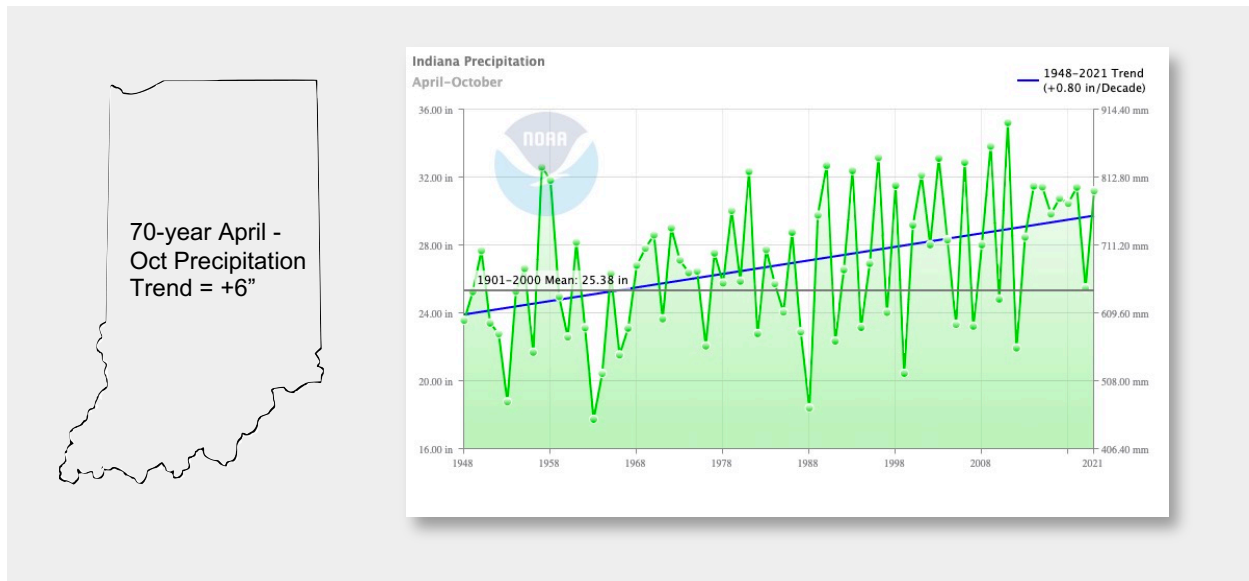
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60

Indiana: Growing Season Precipitation

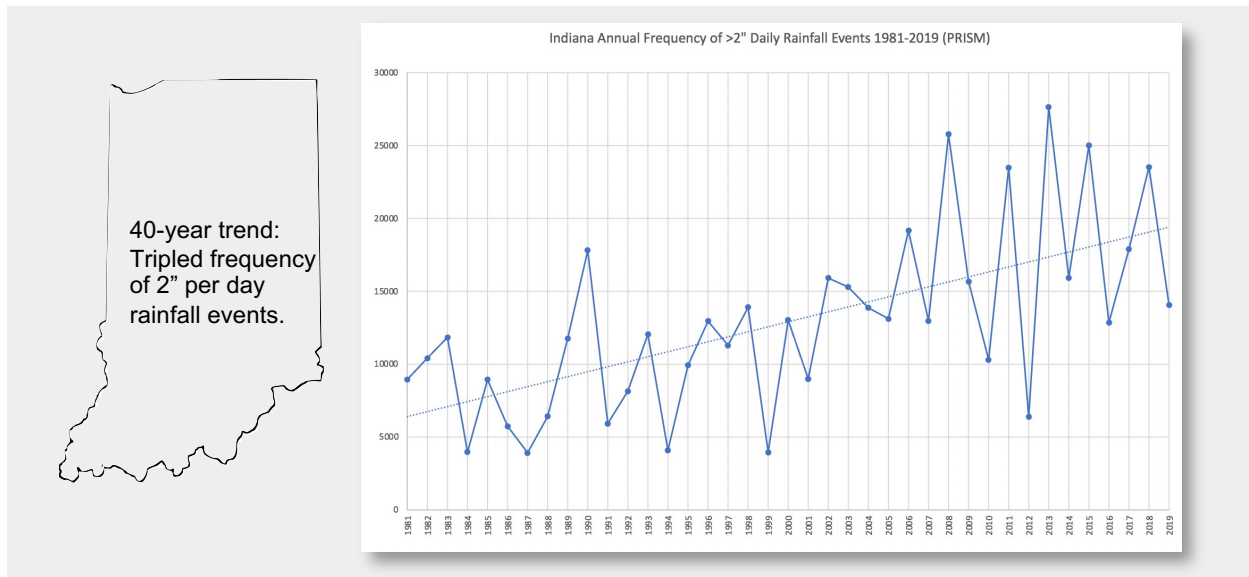


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Indiana: Annual Precipitation Variability

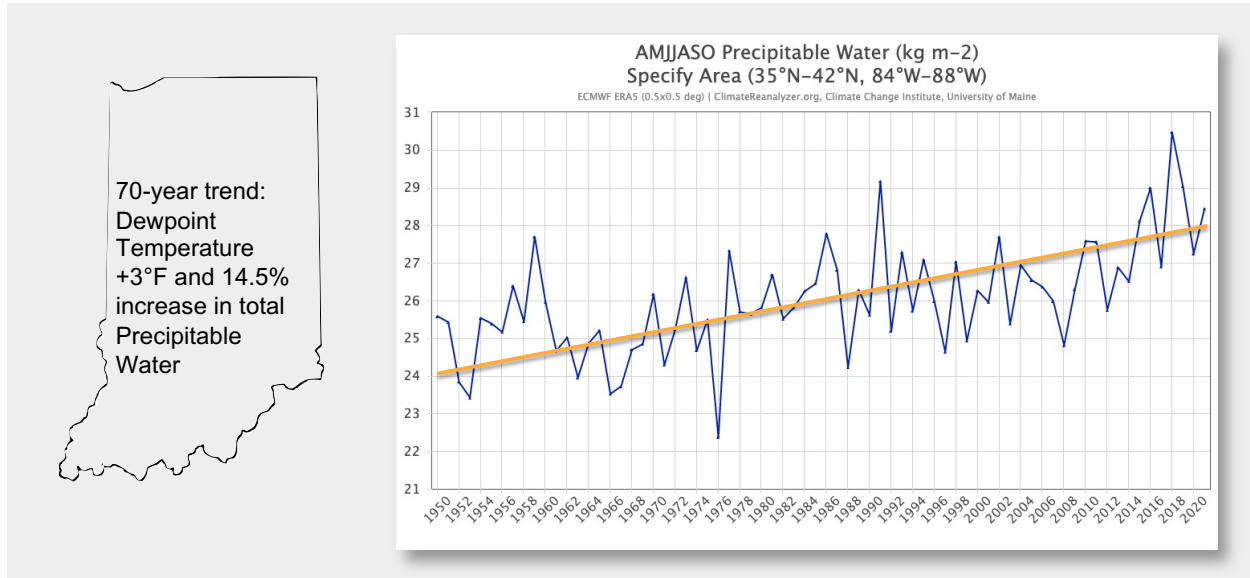


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Indiana: Growing Season Humidity



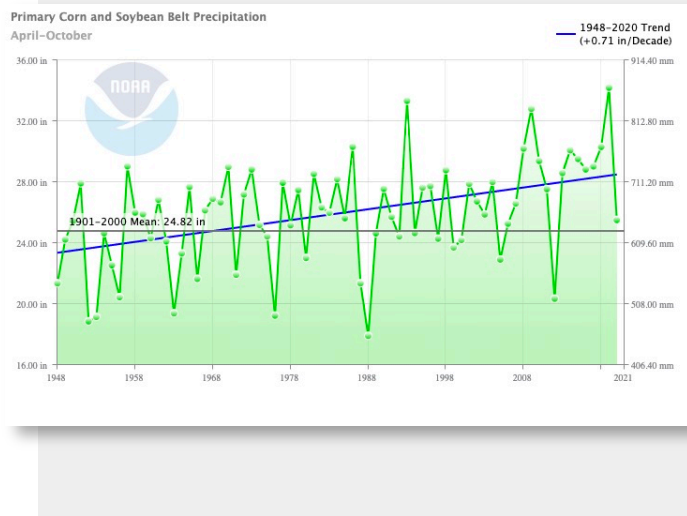
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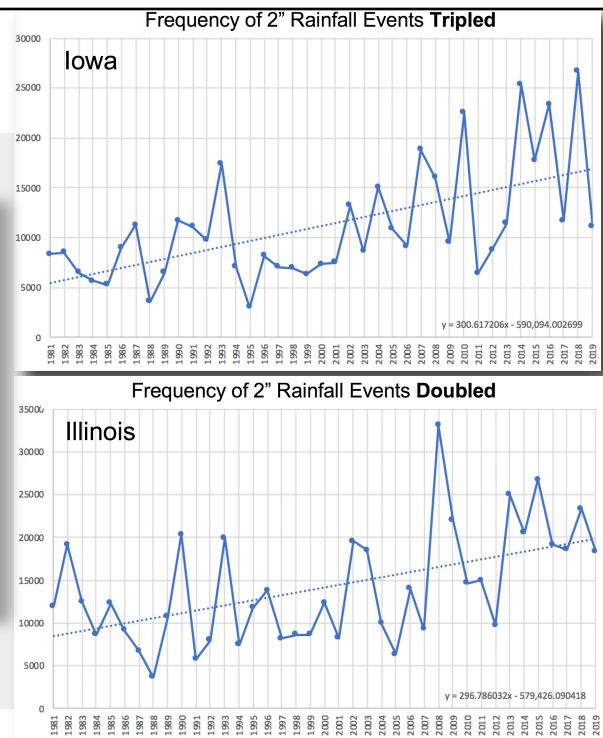
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Increased Precipitation Variability

April-October +5.5" of Total Rainfall



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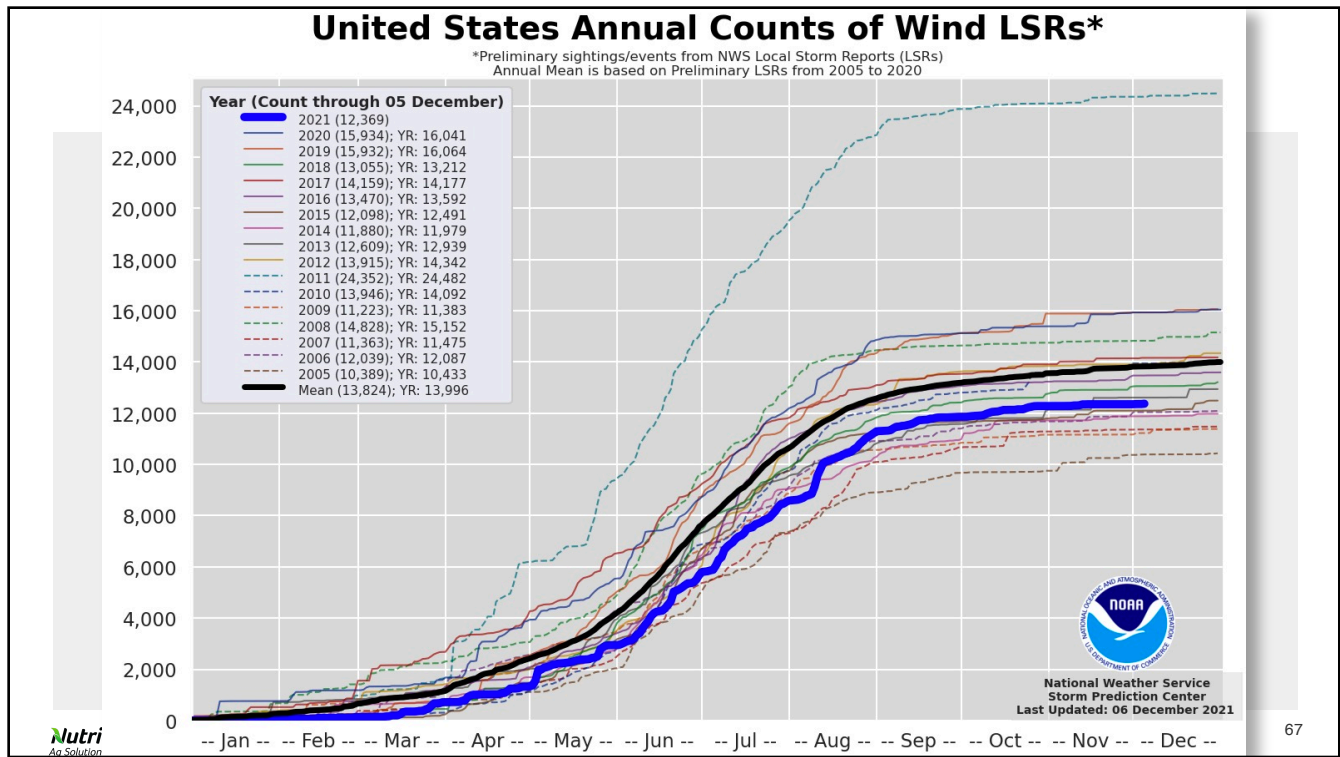
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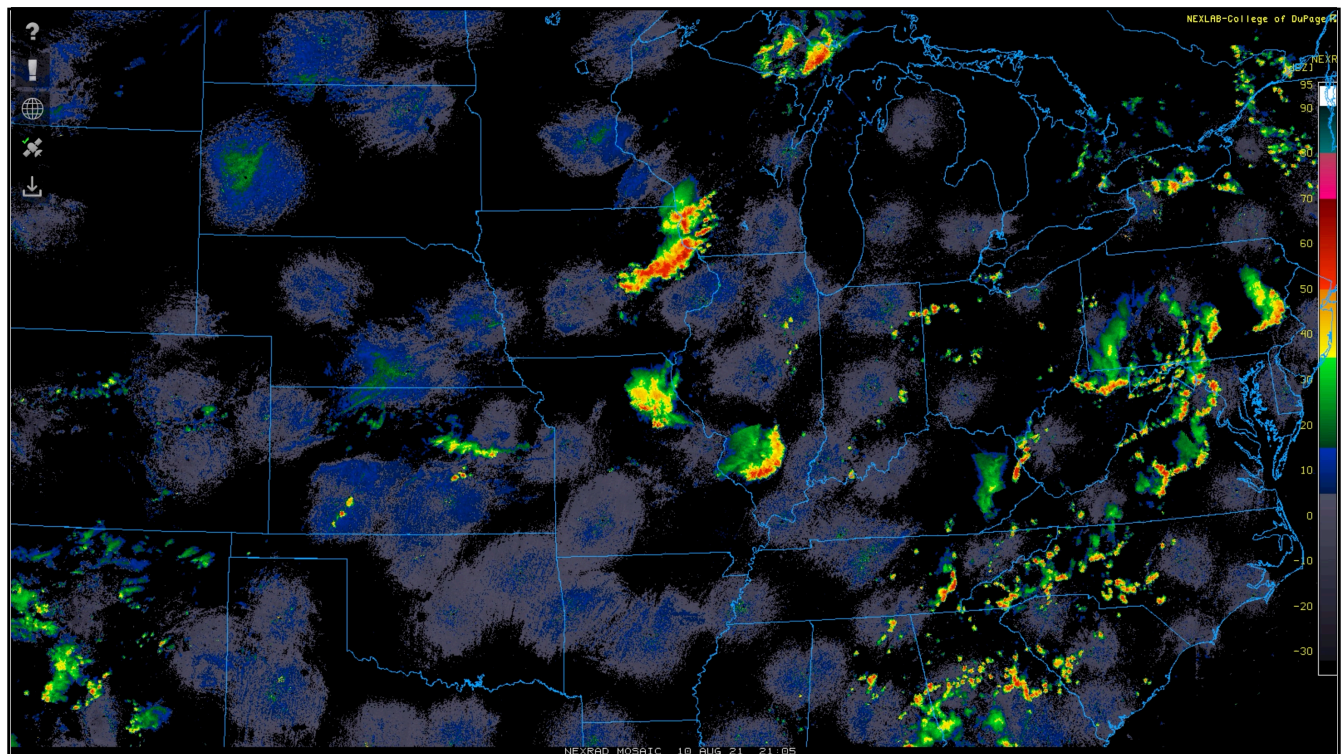
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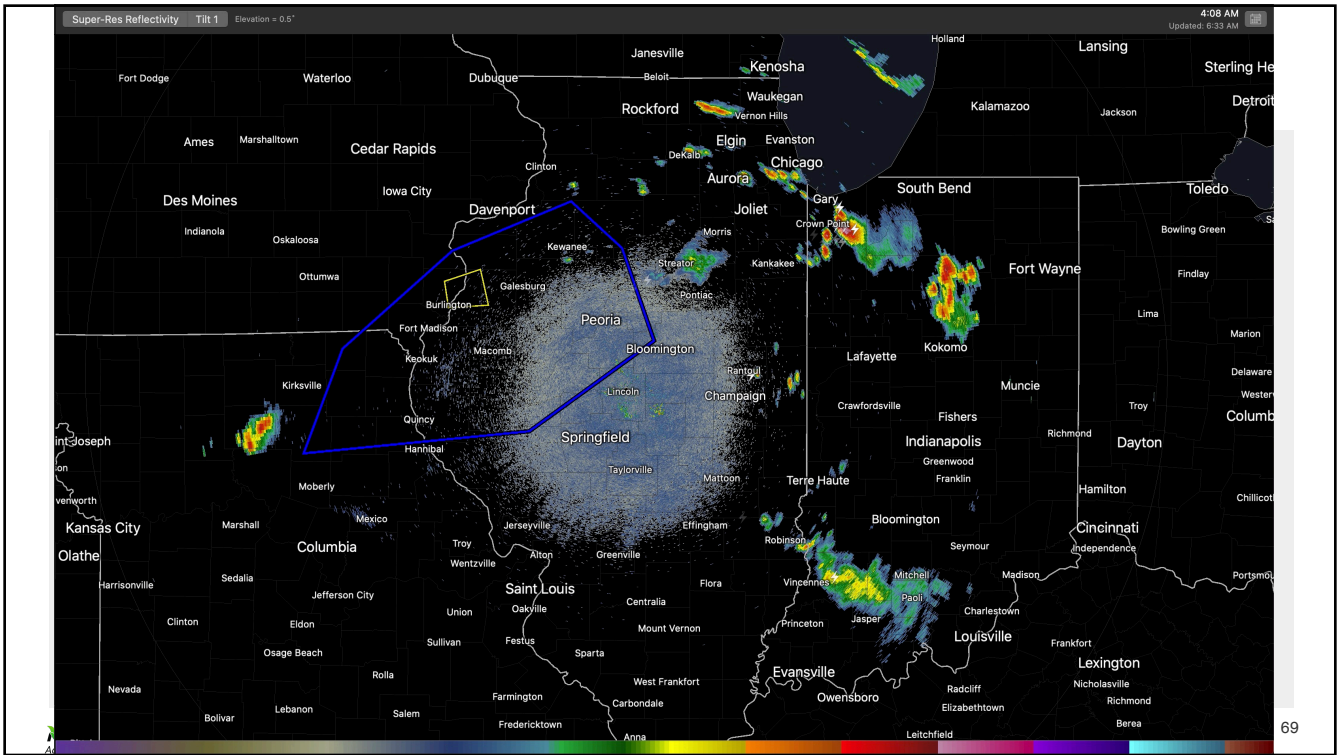
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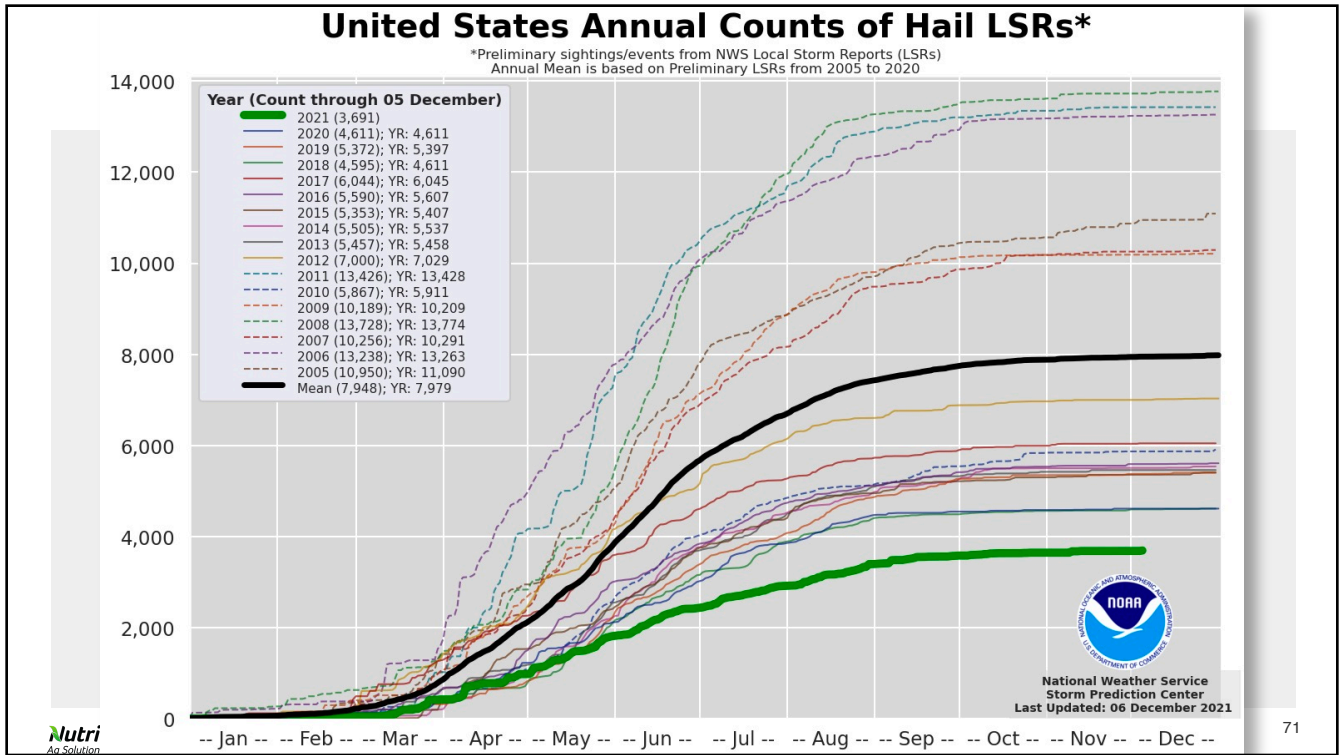
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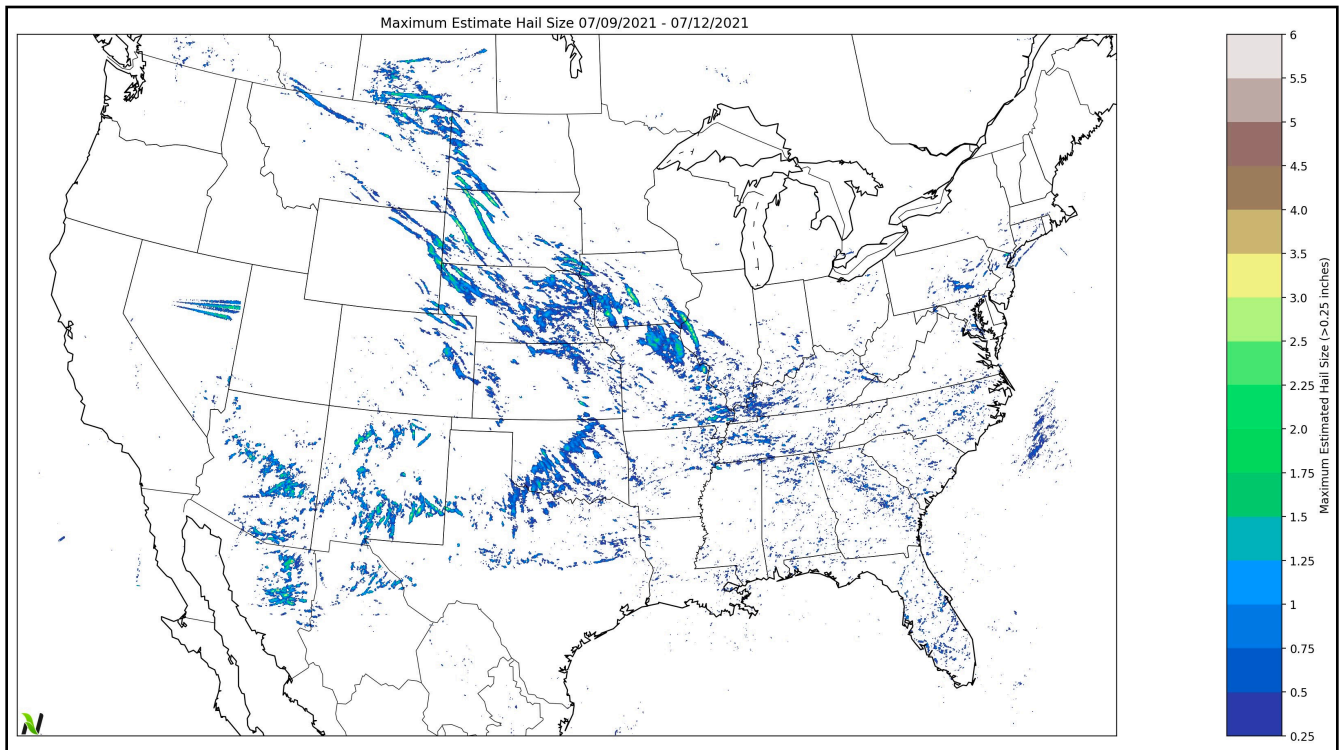
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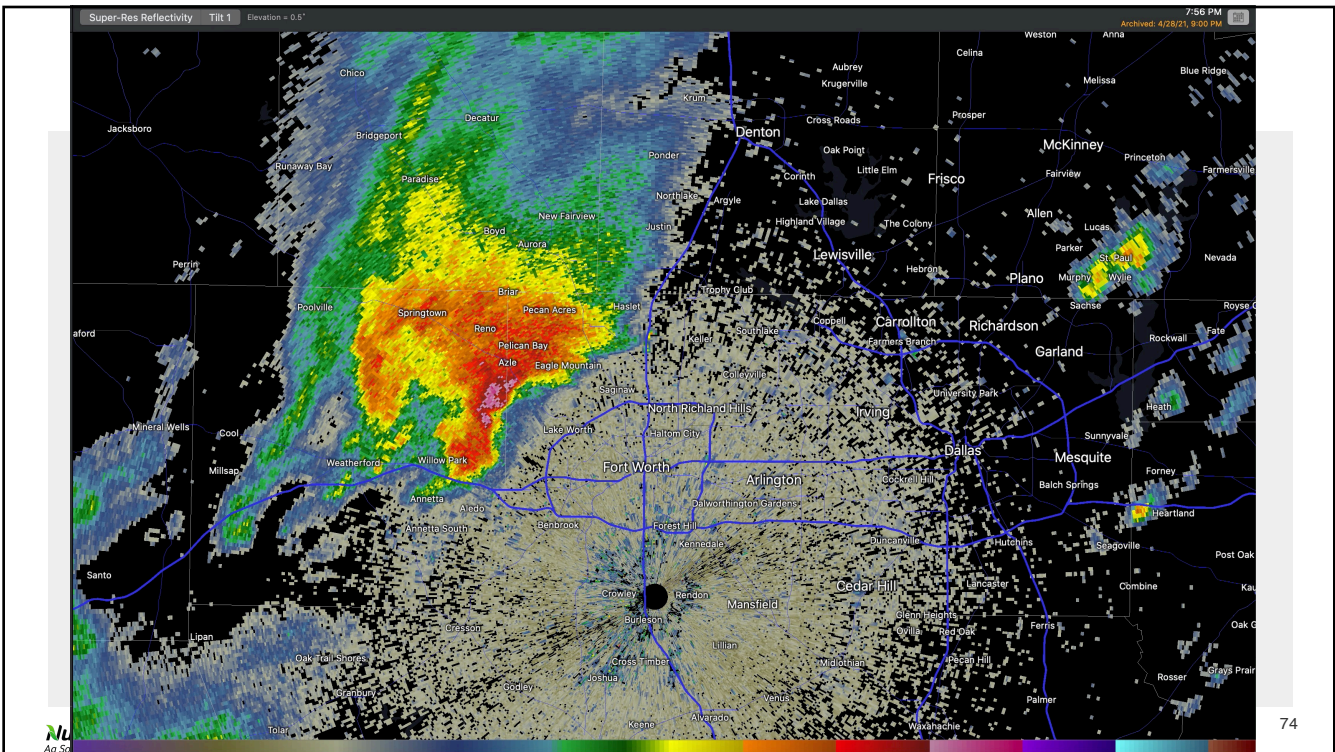
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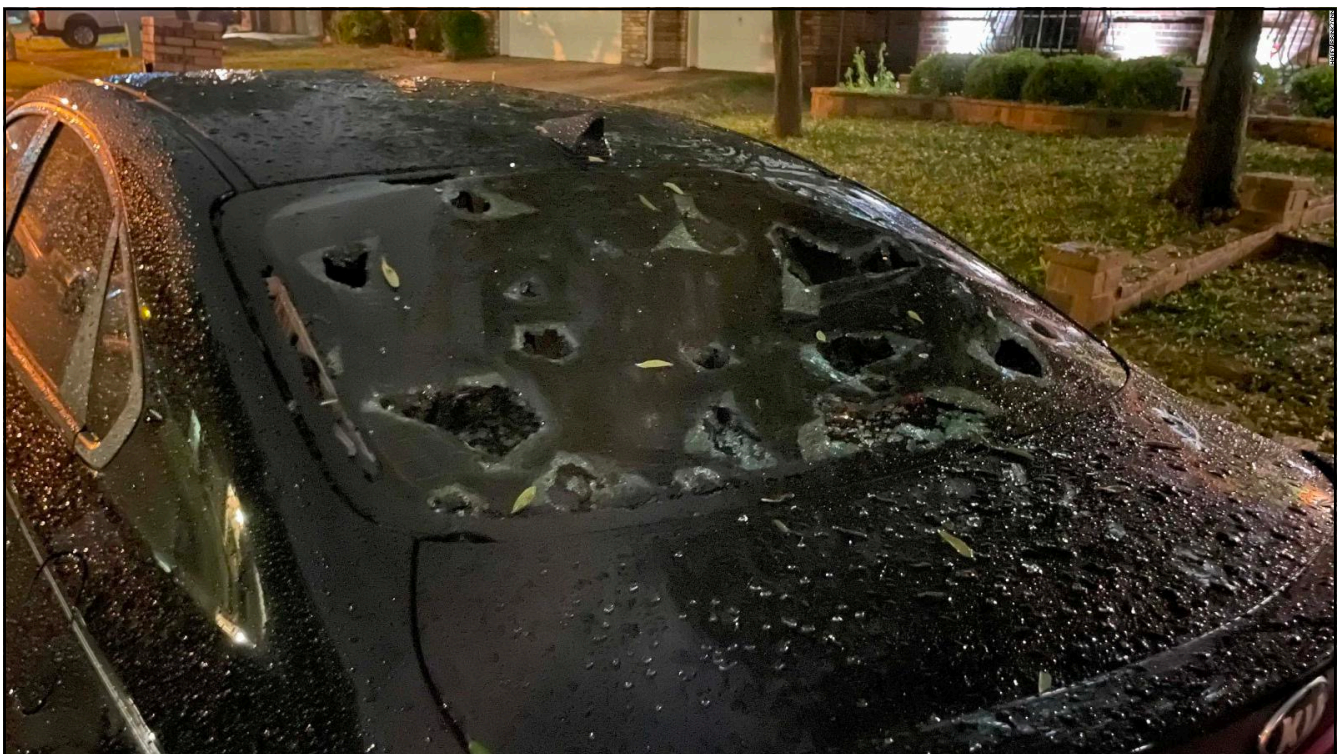
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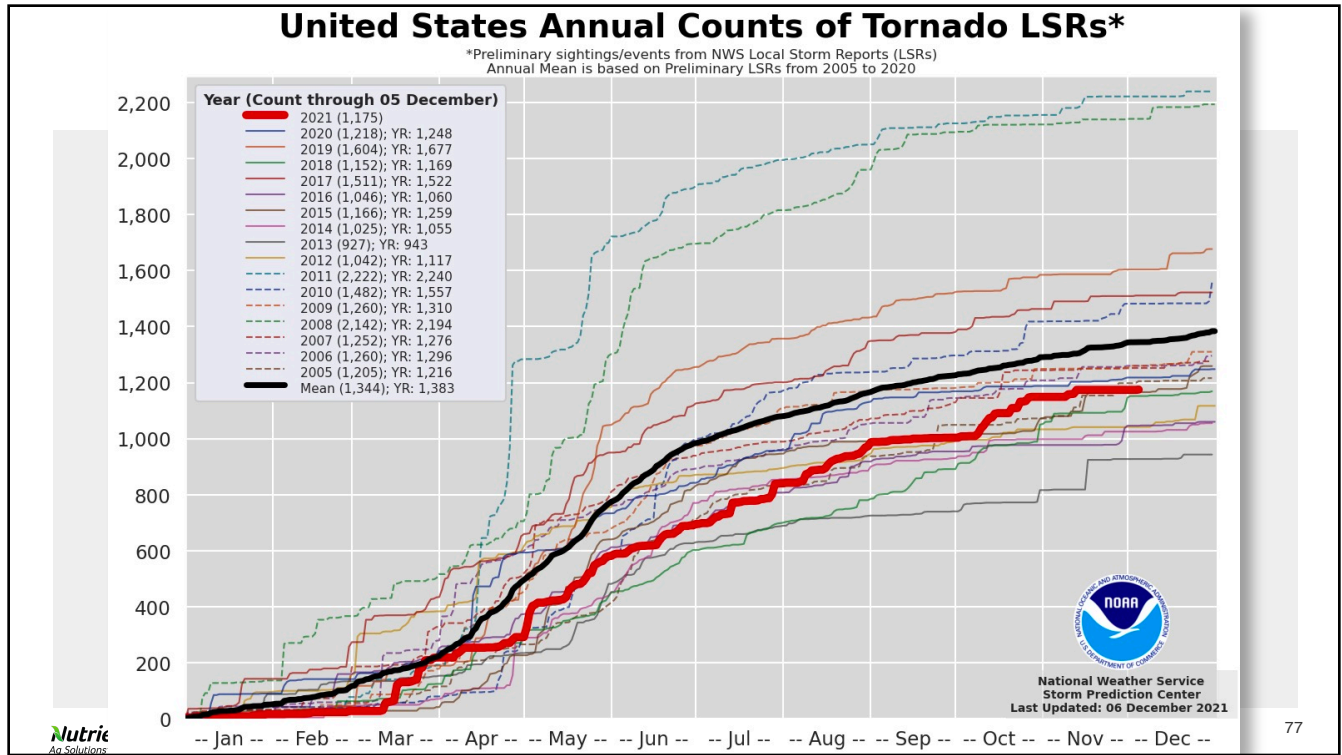
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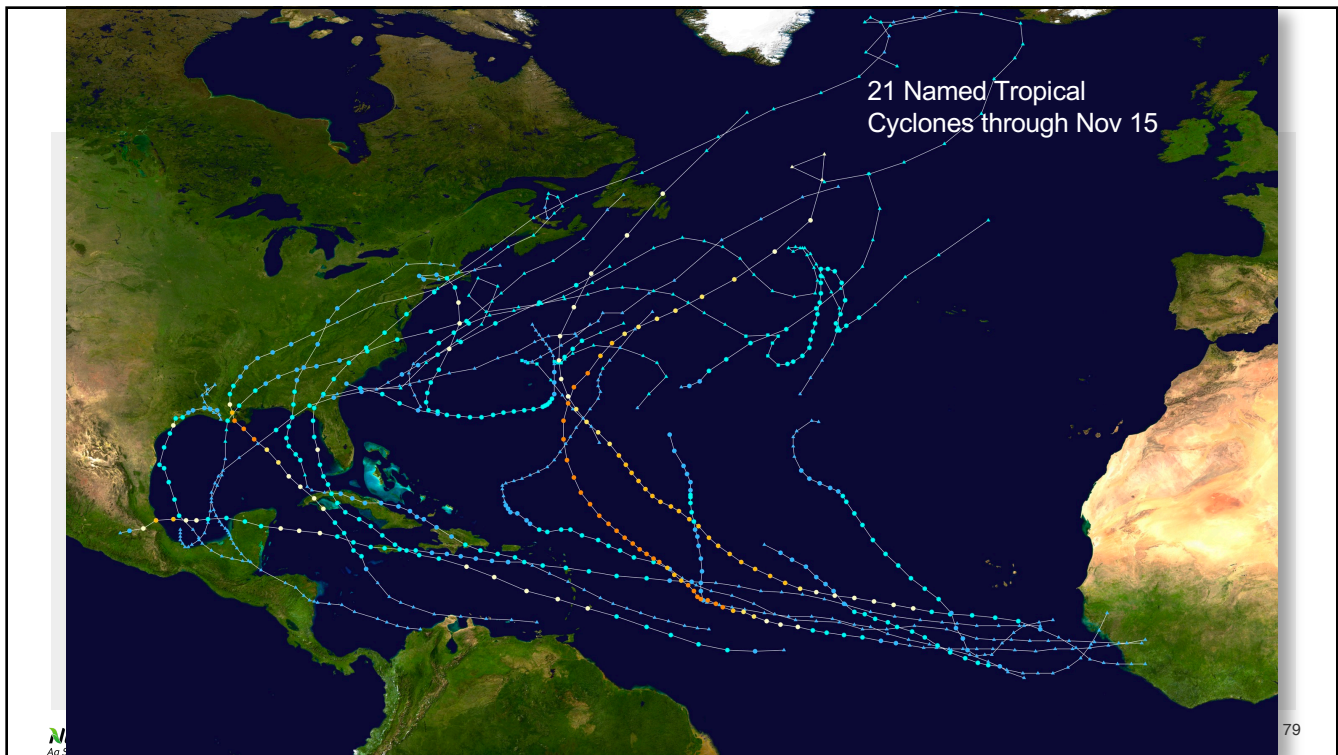
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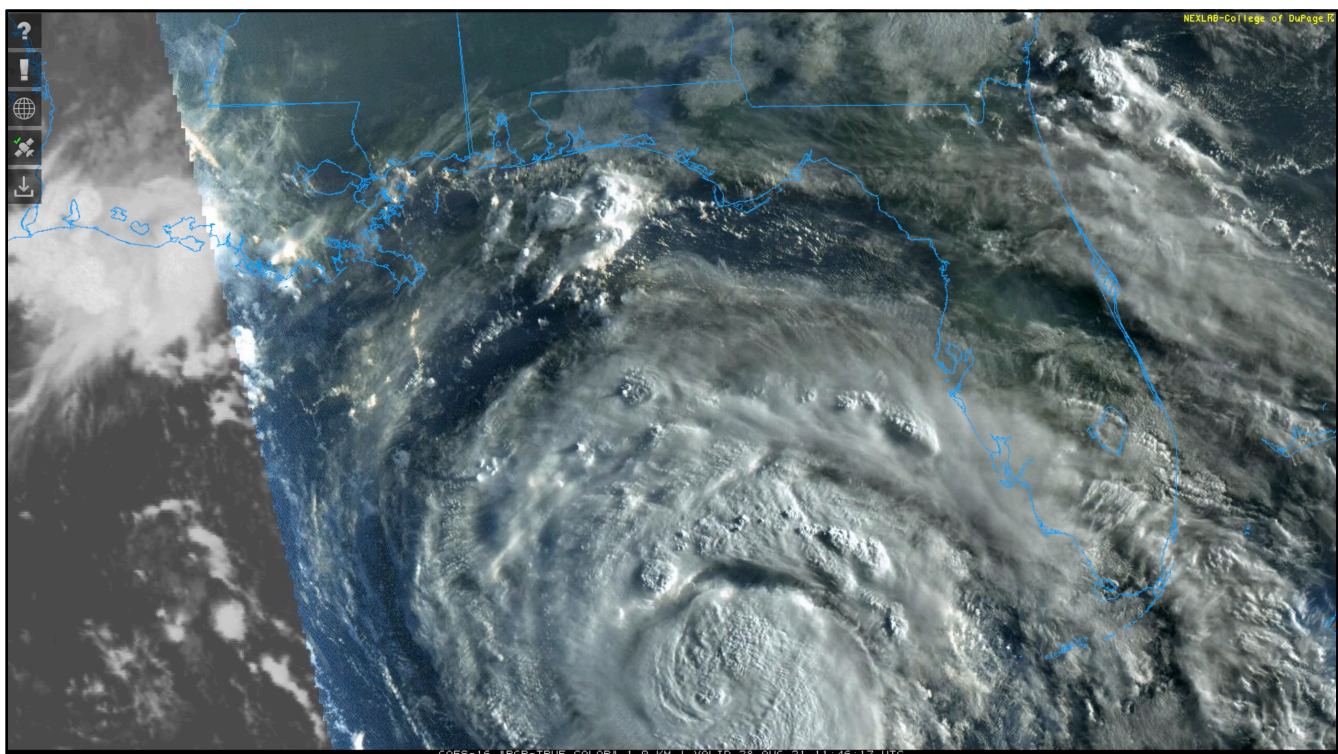
77



78



79



80

New Orleans, LA
Brett Adair
@AlaStormTracker
@NWSNewOrleans
Aug 29, 2021
West of I-10 near LaPlace



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81

81

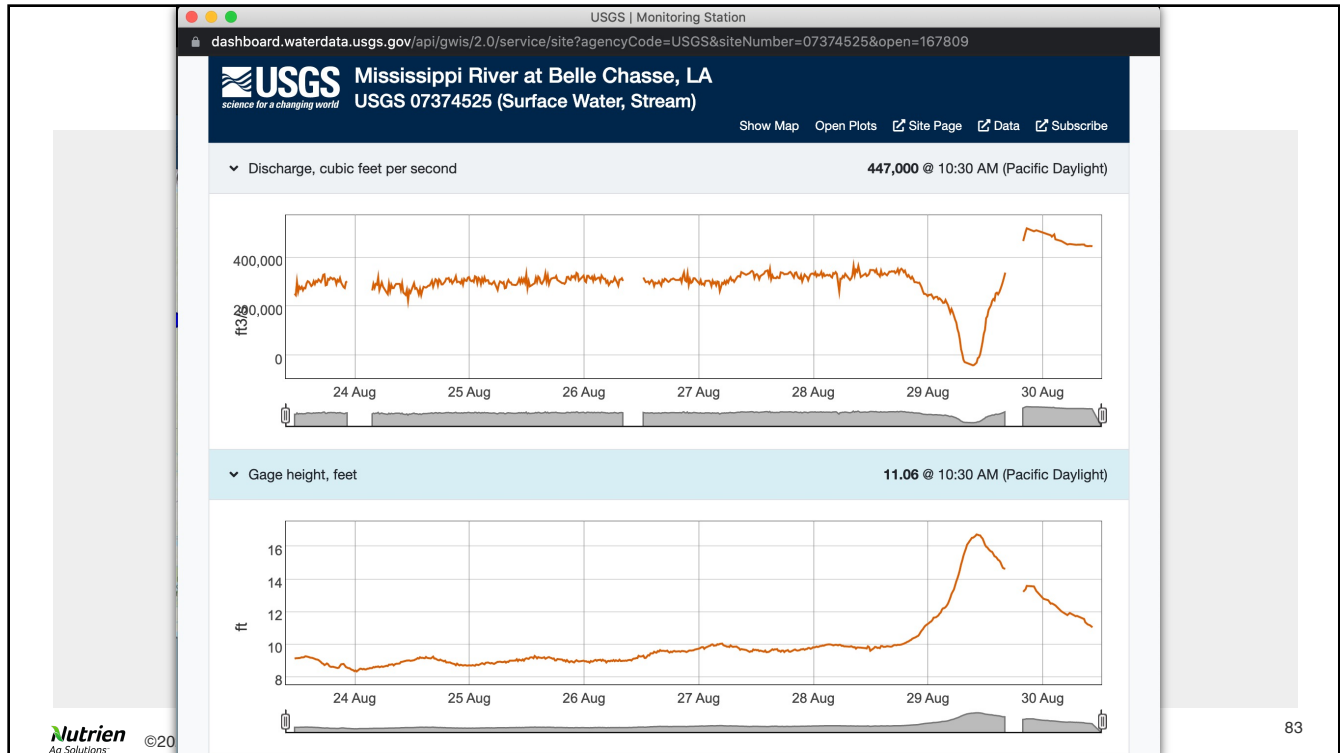
Jeff Nowak
@Jeff_Nowak
Posted for Scott
Alexander in New
Orleans, LA CBD
Aug 29, 2021



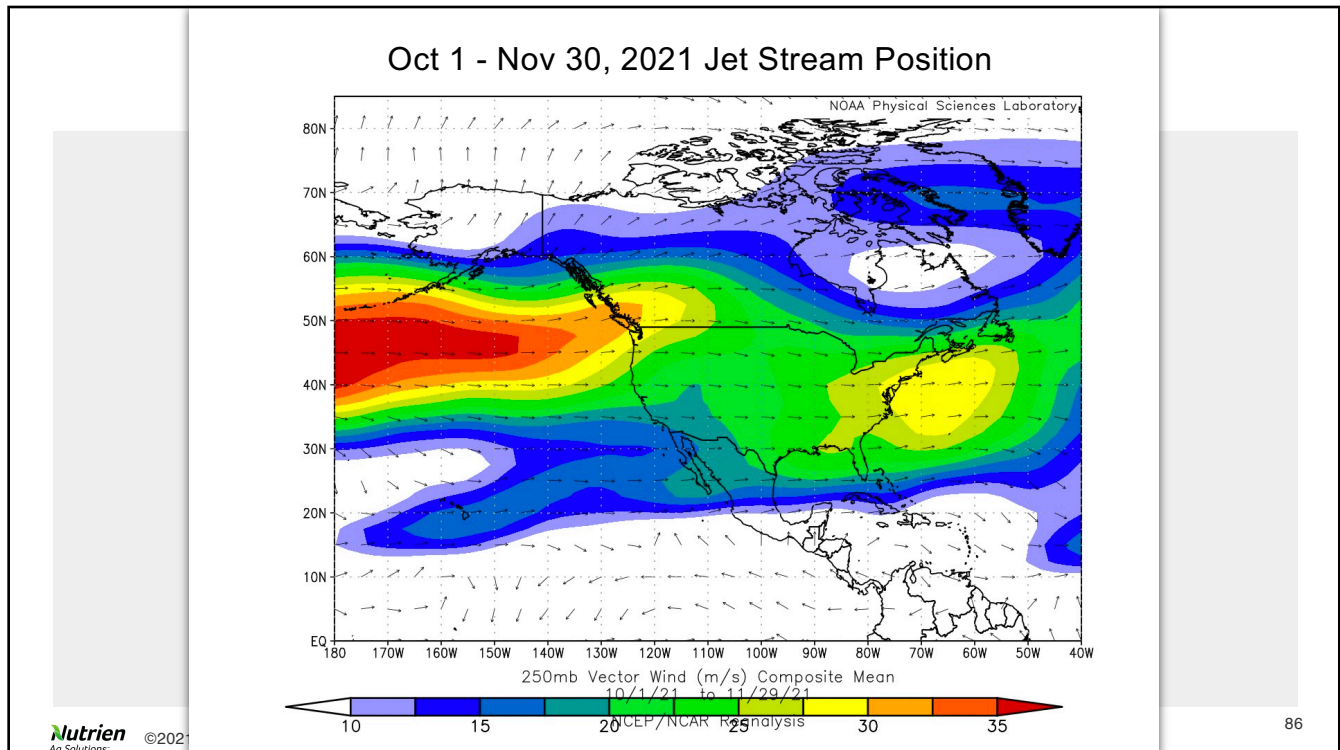
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82

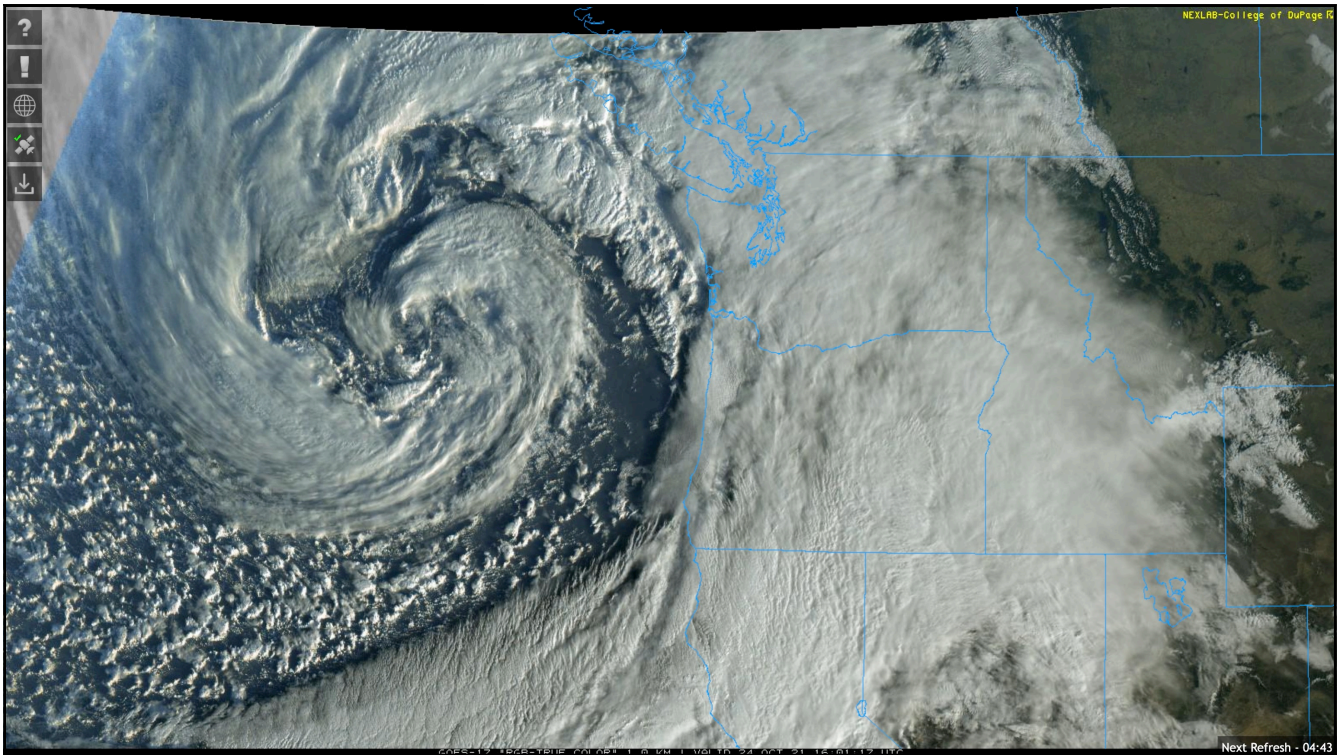
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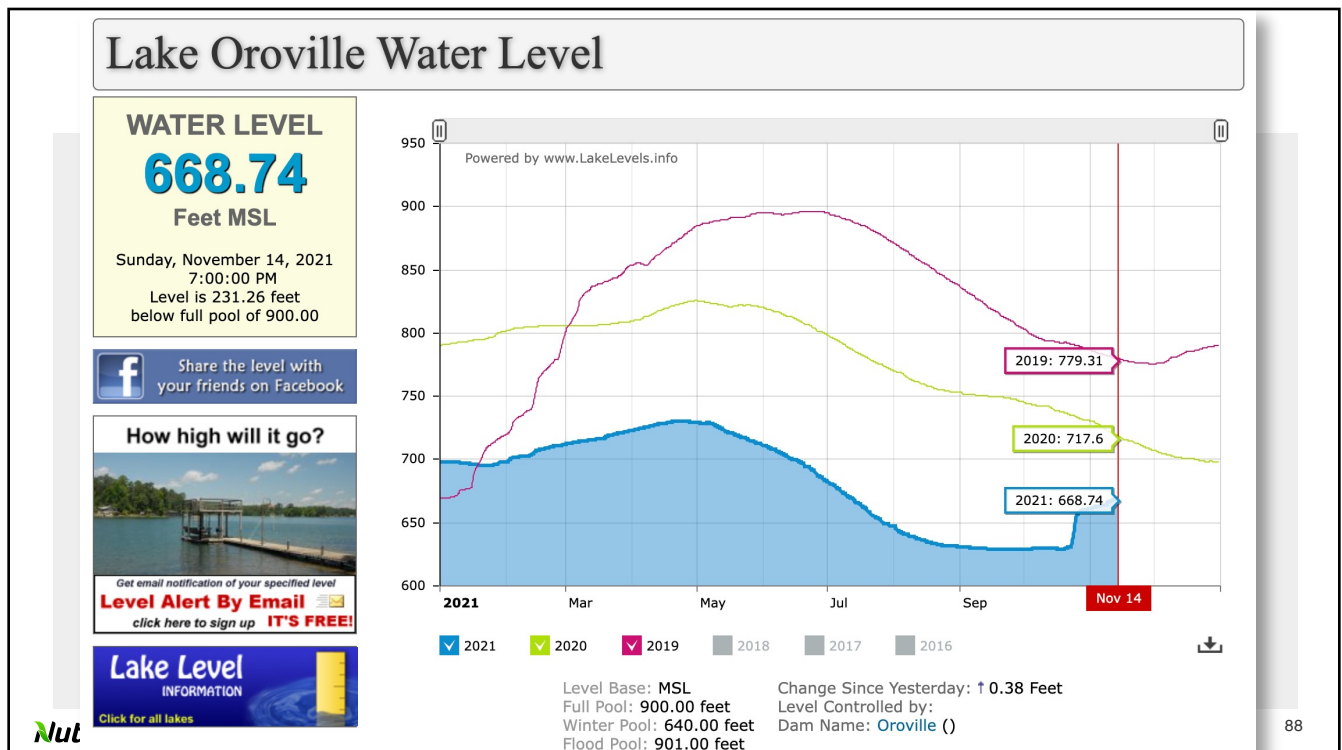
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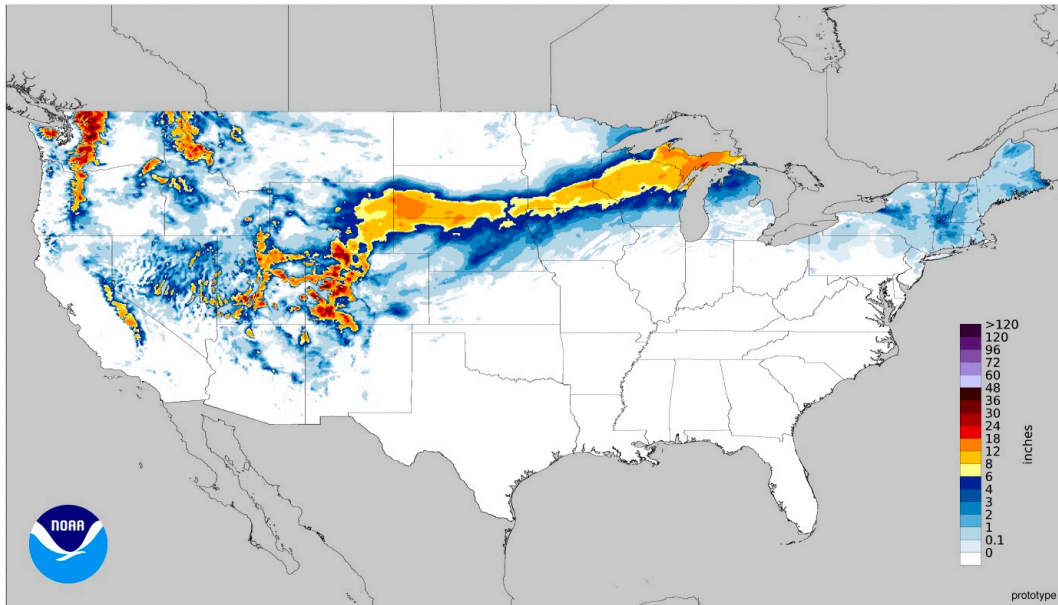
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National Snowfall Analysis: 72-hour accumulation ending 2021-12-12 00 UTC

Issued 2021-12-13 12:34:04 UTC



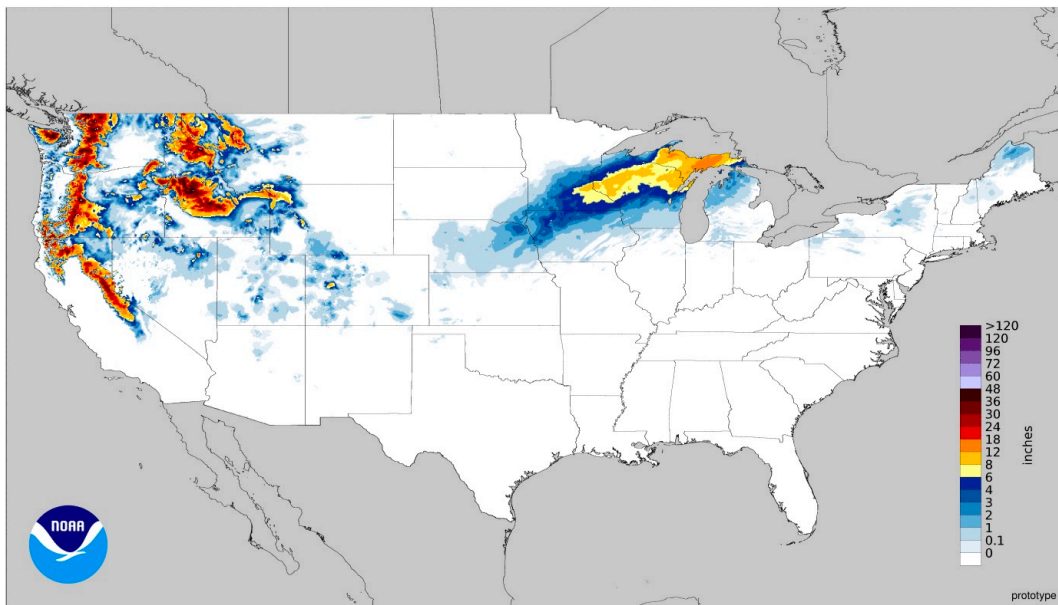
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National Snowfall Analysis: 72-hour accumulation ending 2021-12-14 00 UTC

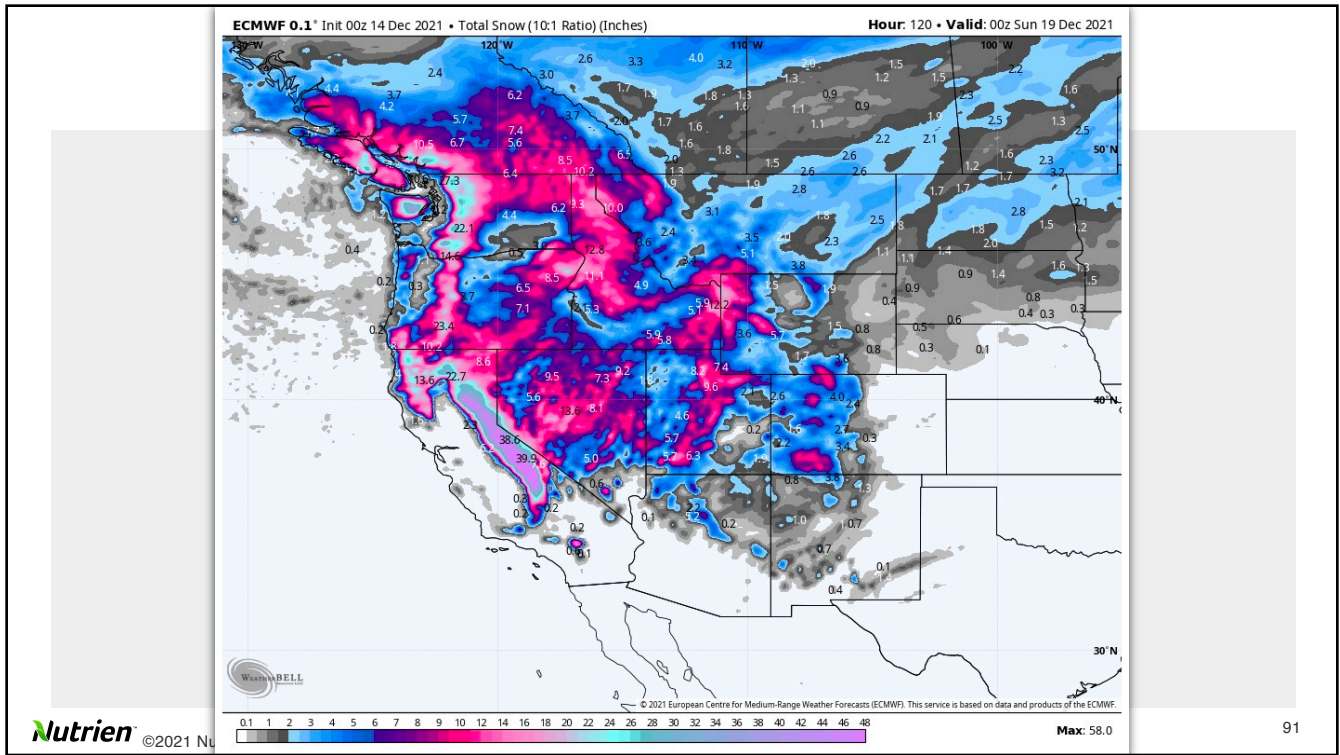
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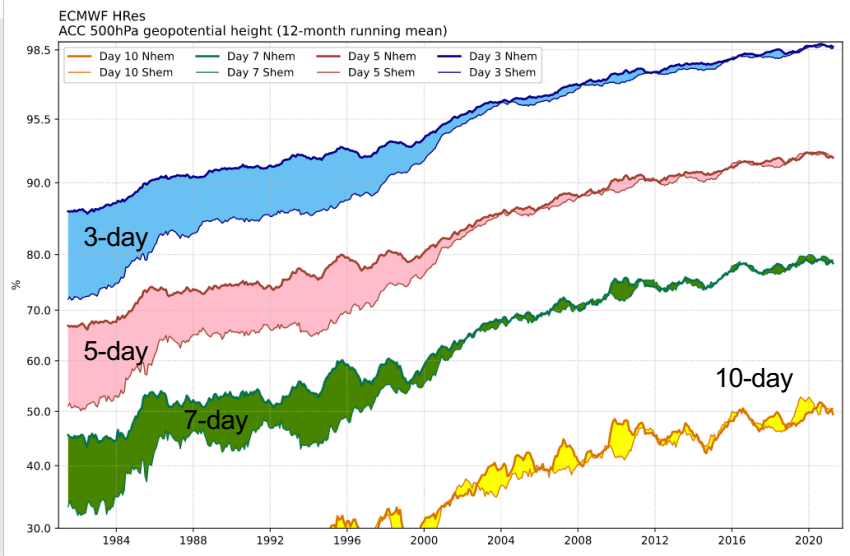
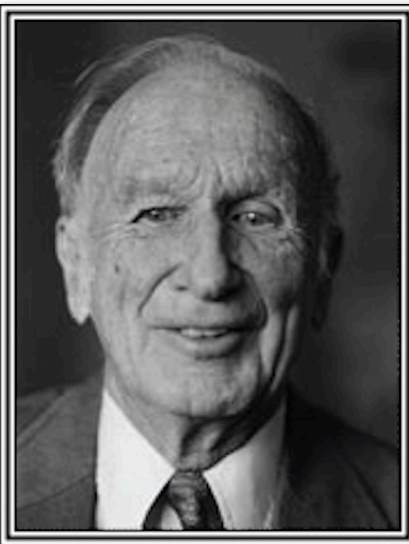
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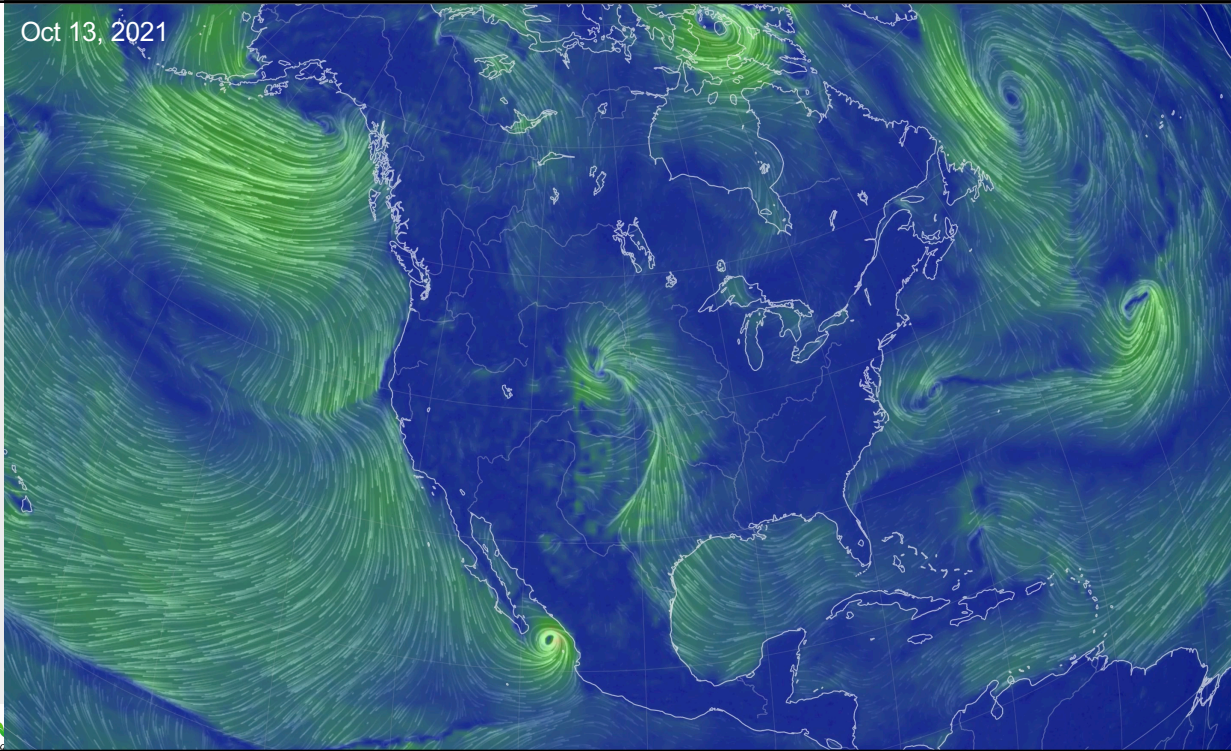
Limits of Prediction



92

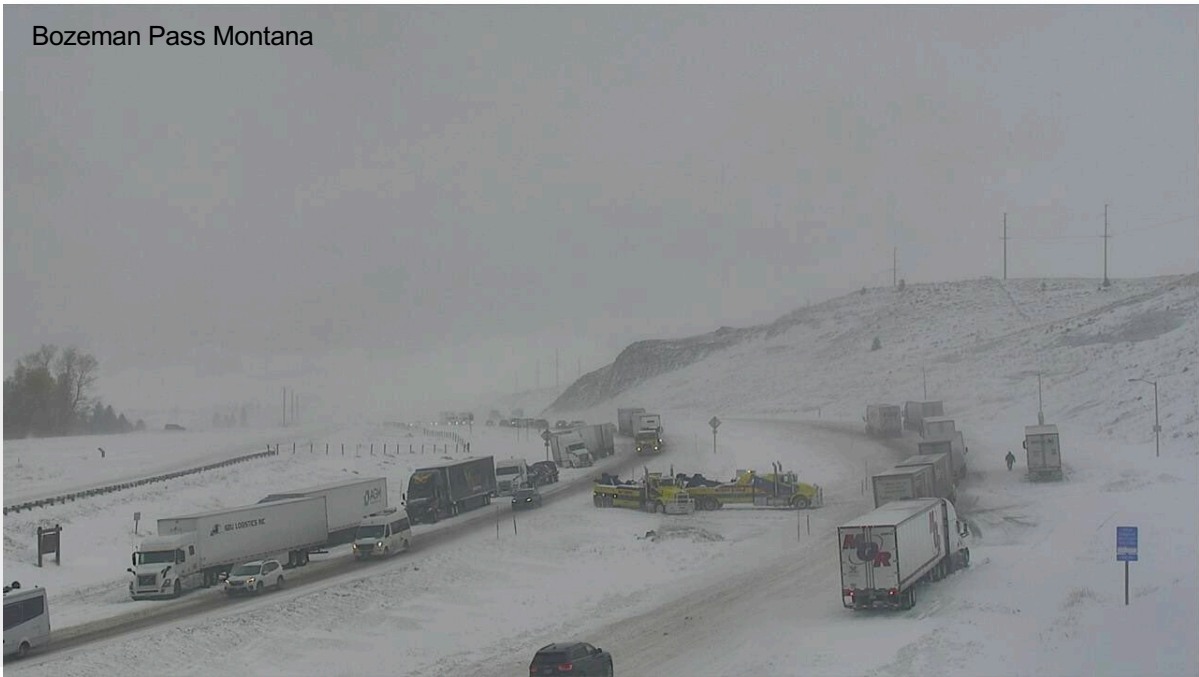
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Oct 13, 2021



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Bozeman Pass Montana

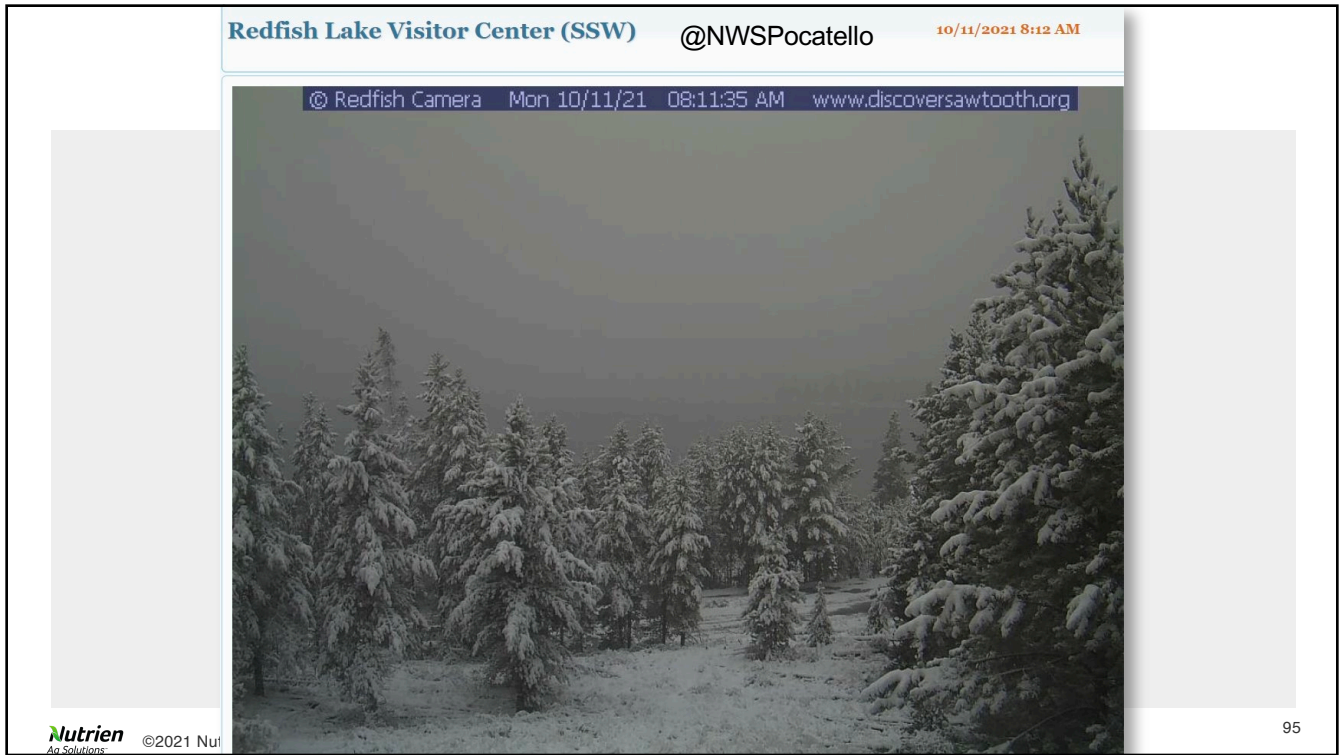


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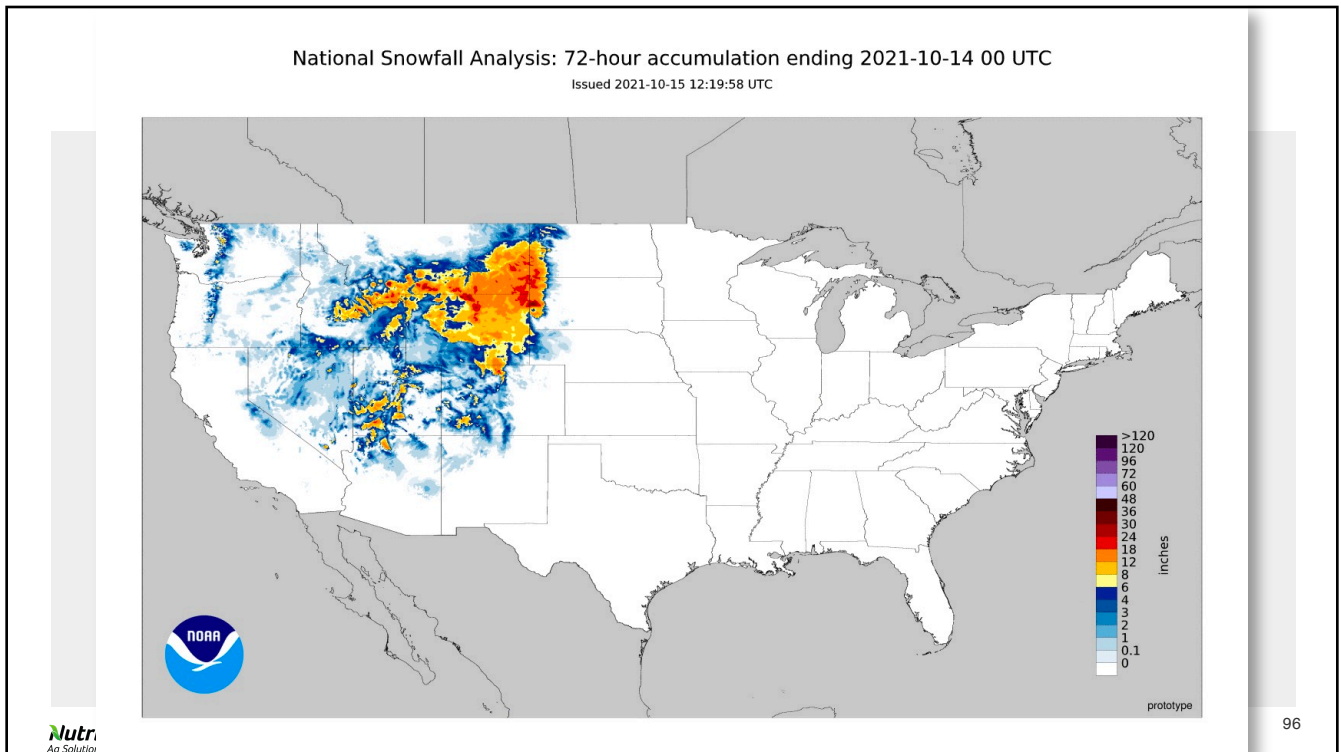
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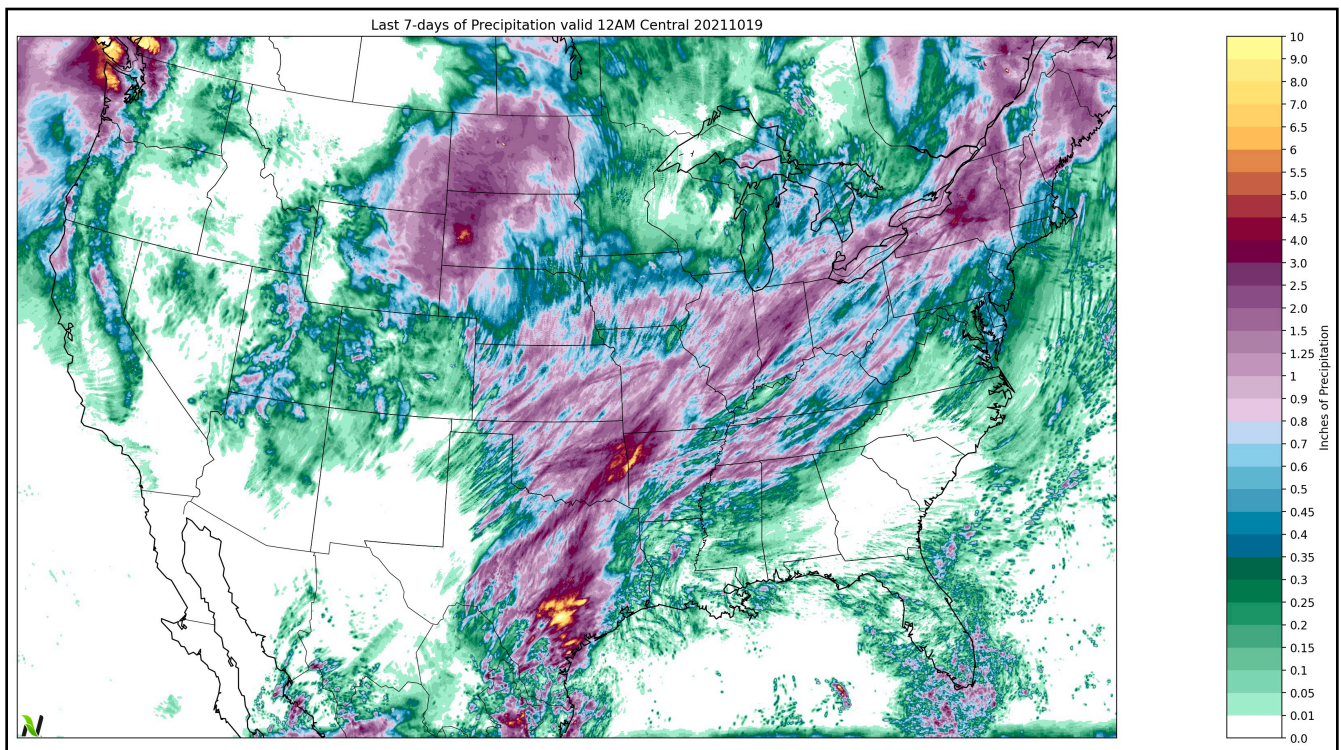
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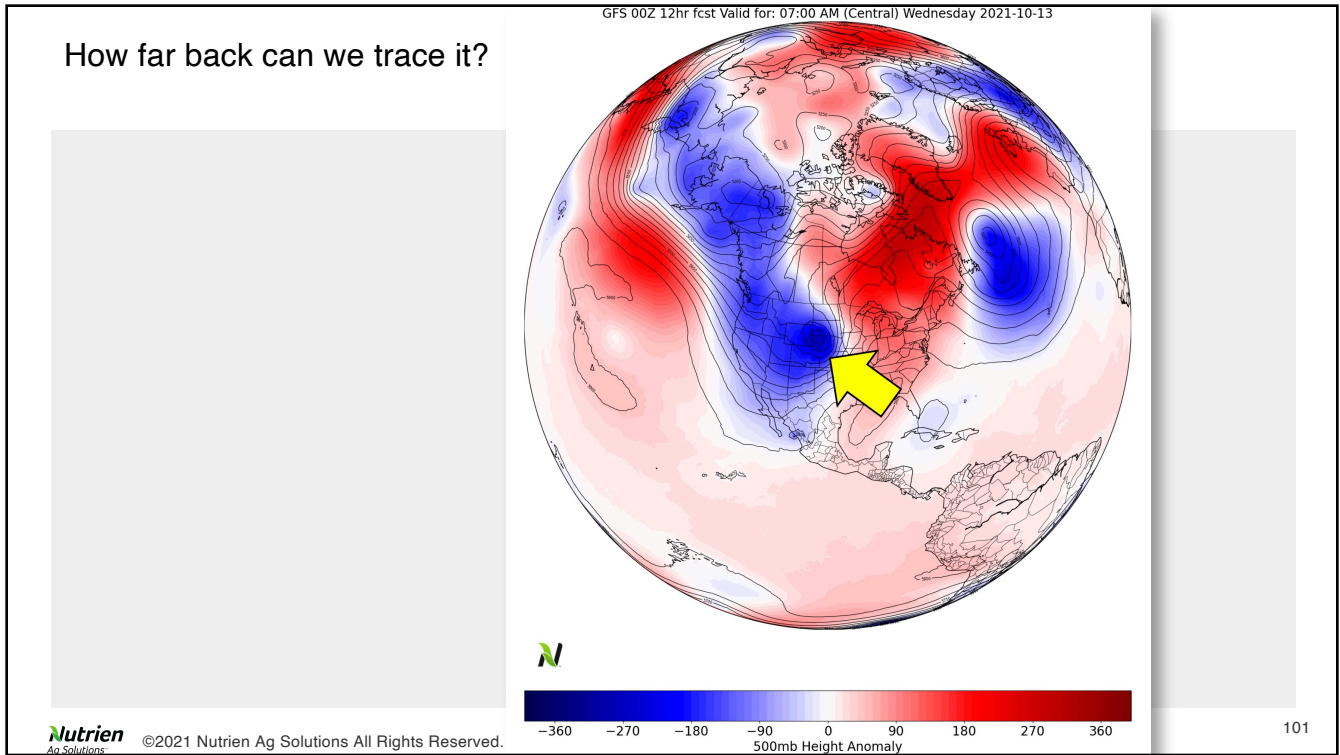
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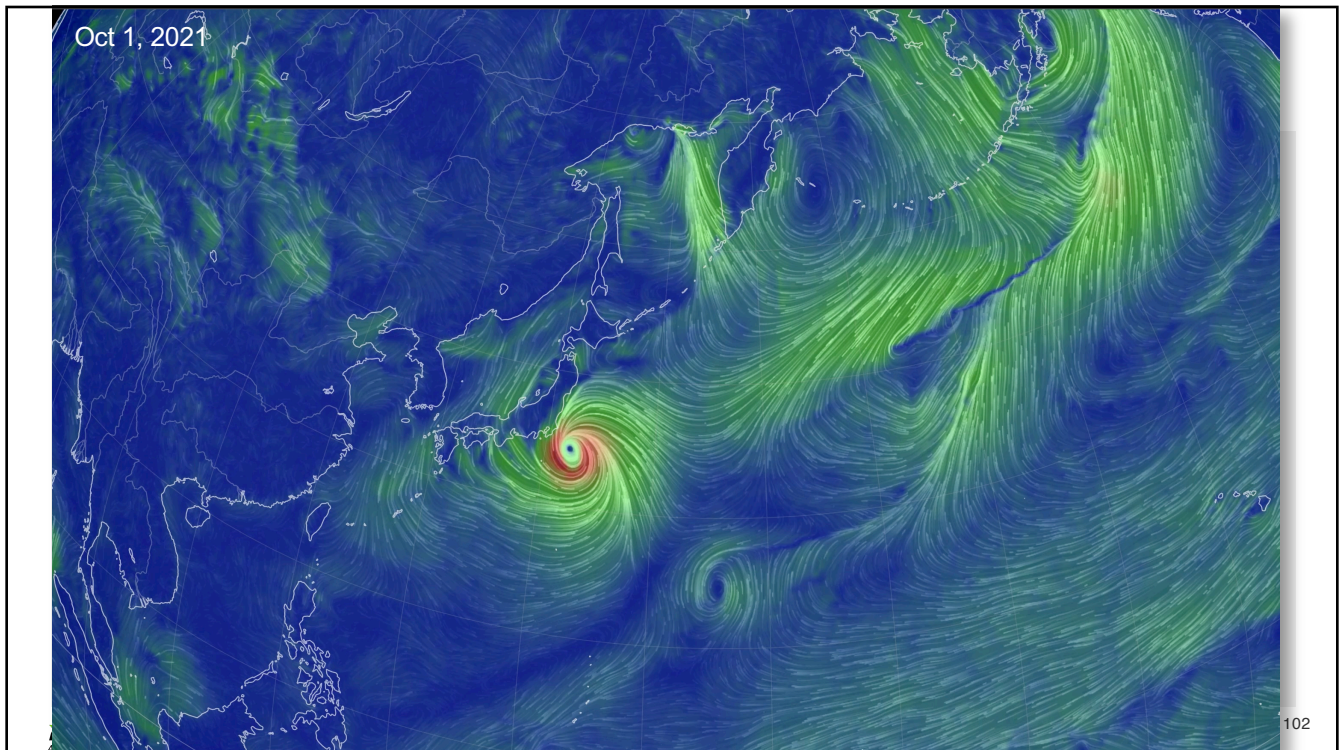
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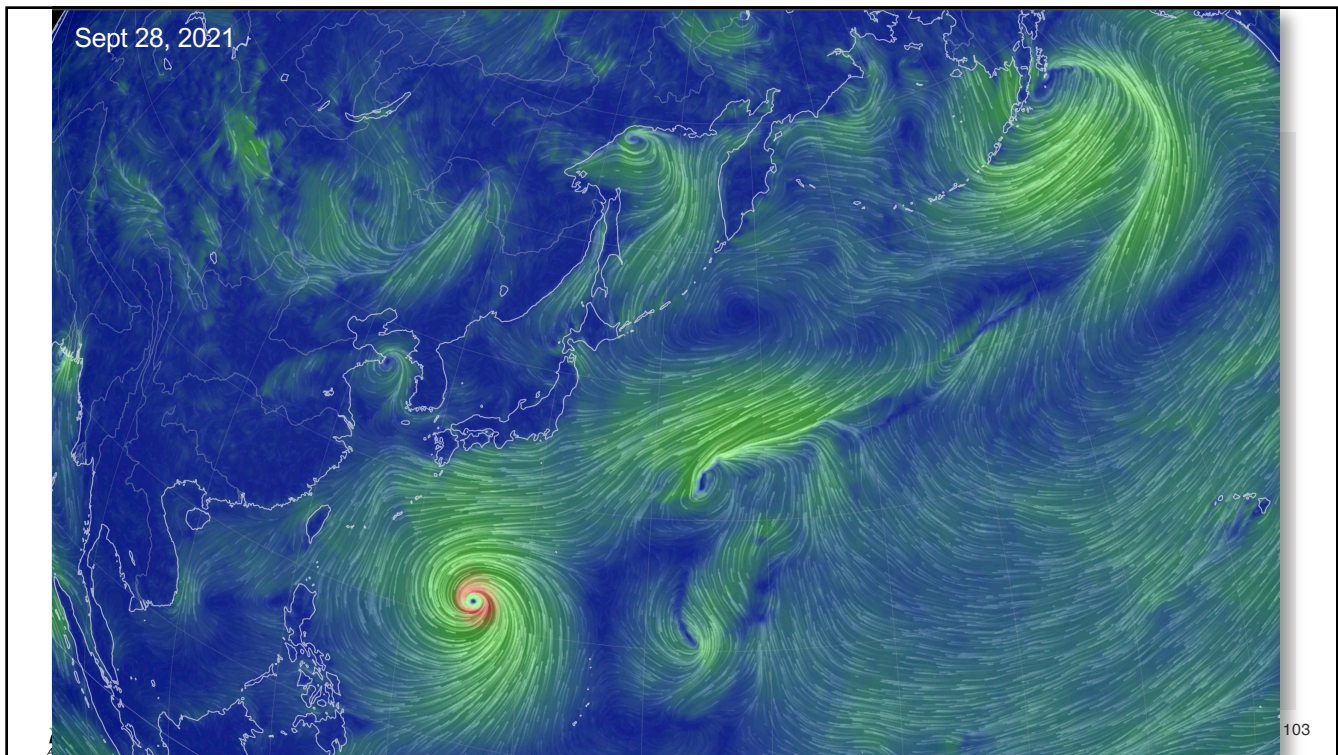
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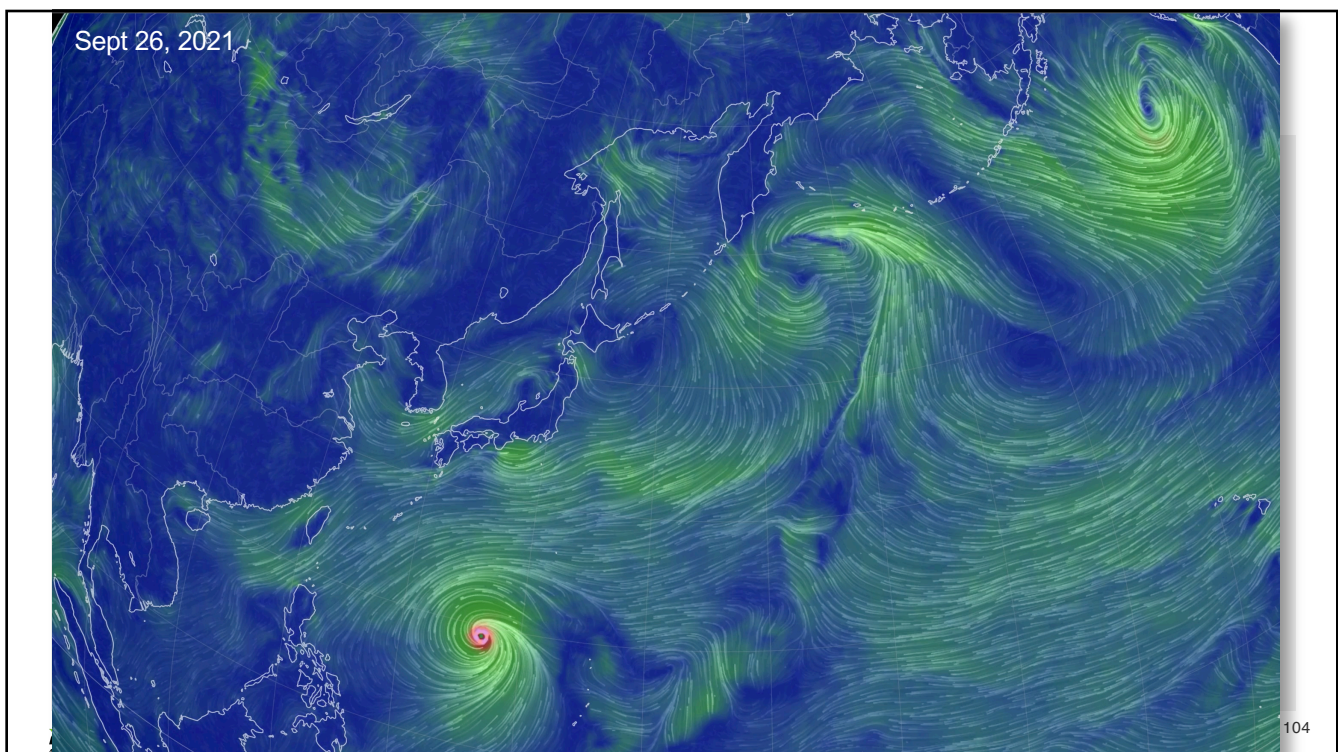
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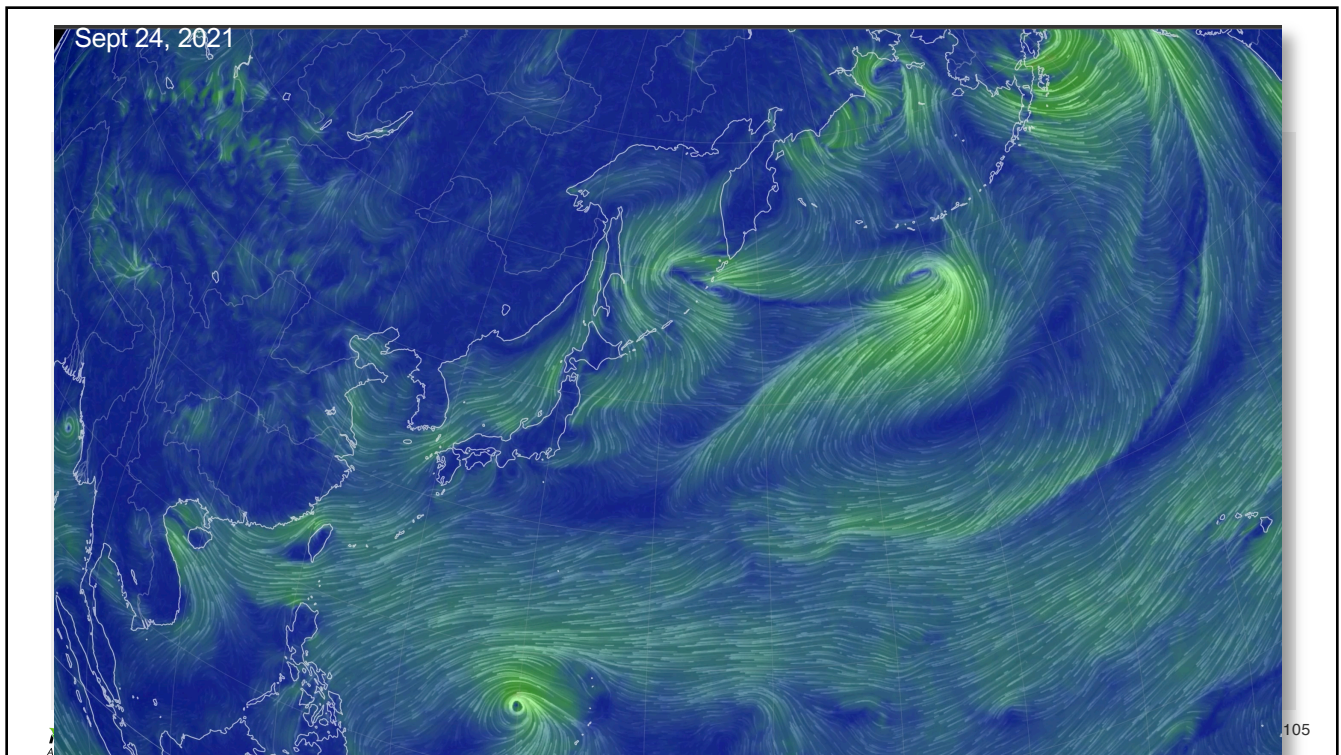
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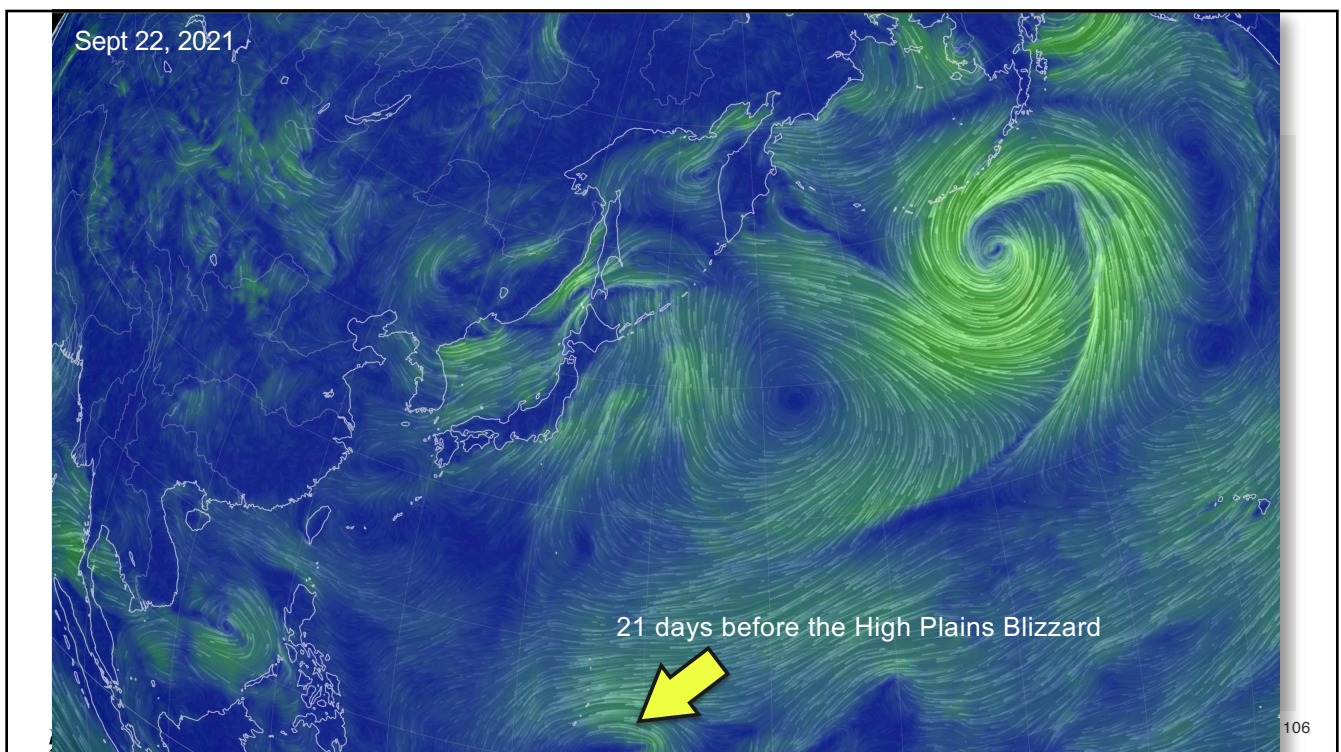
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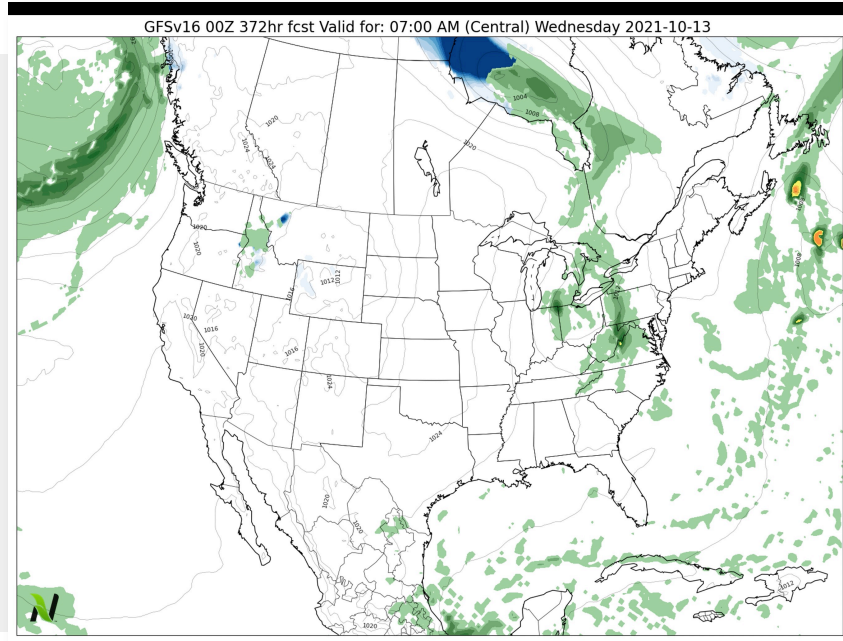


105



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But when did the models start to find it?



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107

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So it's a rare day that I feel like this when predicting the weather...



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And I want you to know that prediction is hard...



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109

109

No predictive skill...



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110

110

No predictive skill...



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111

111

No predictive skill...



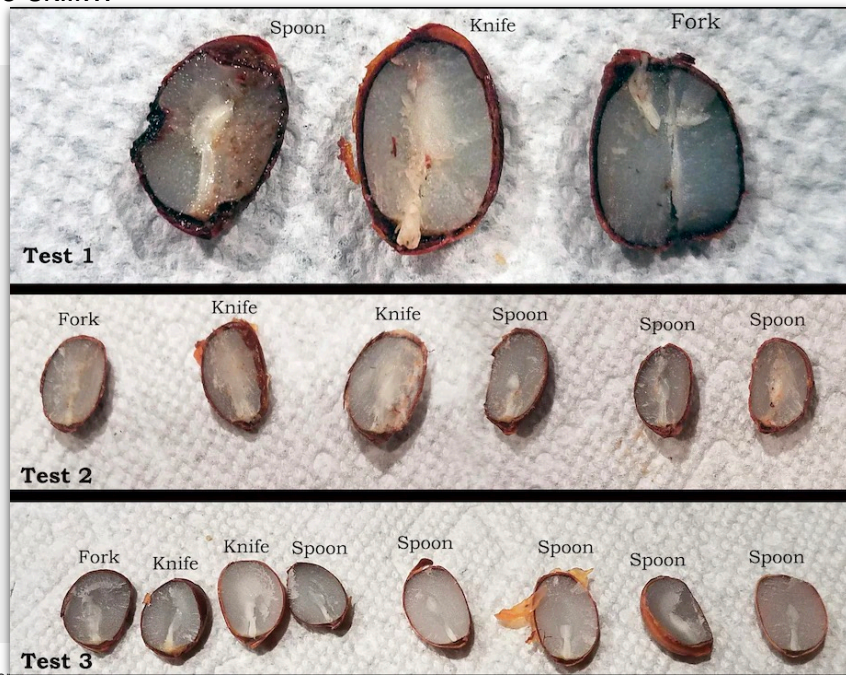
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No predictive skill...



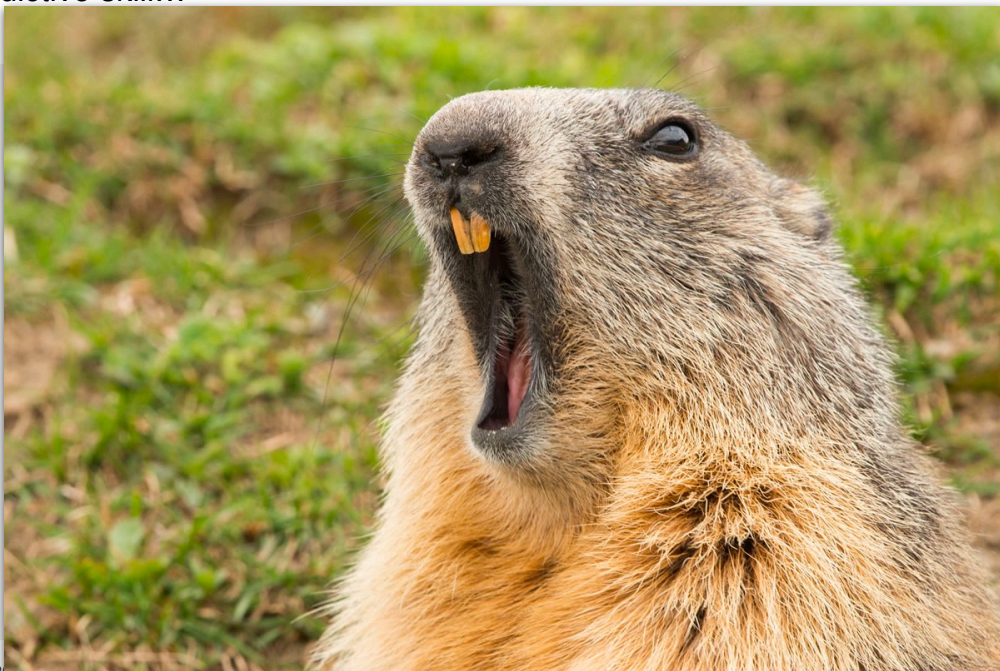
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No predictive skill...



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But it's Winter 2021-22 we need to investigate.



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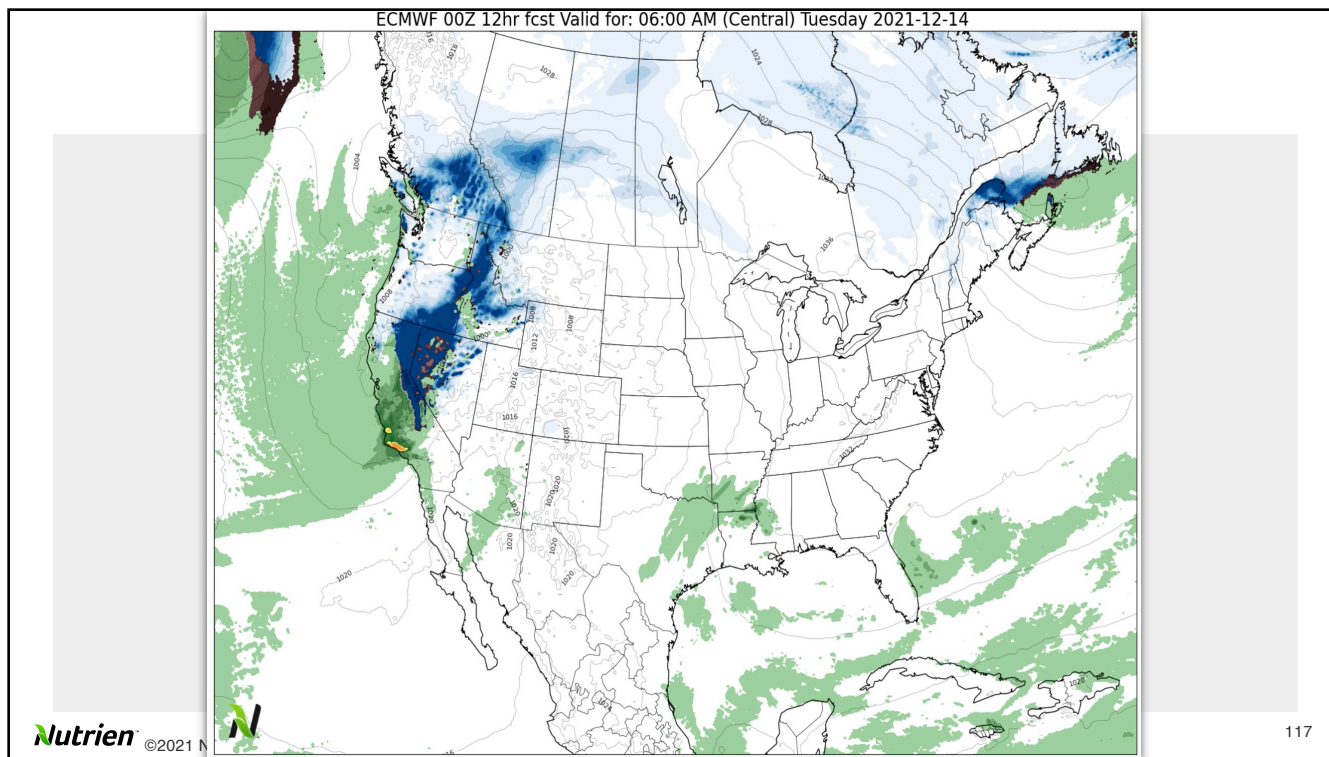


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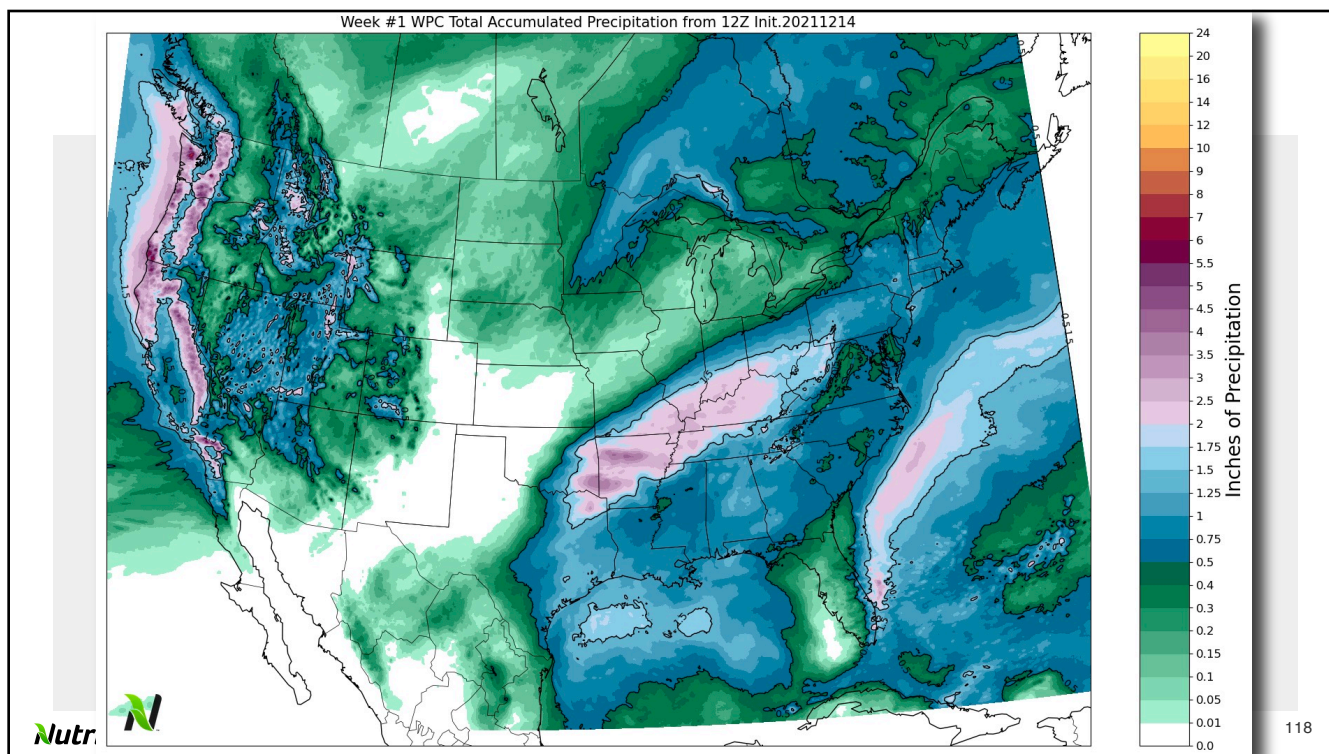
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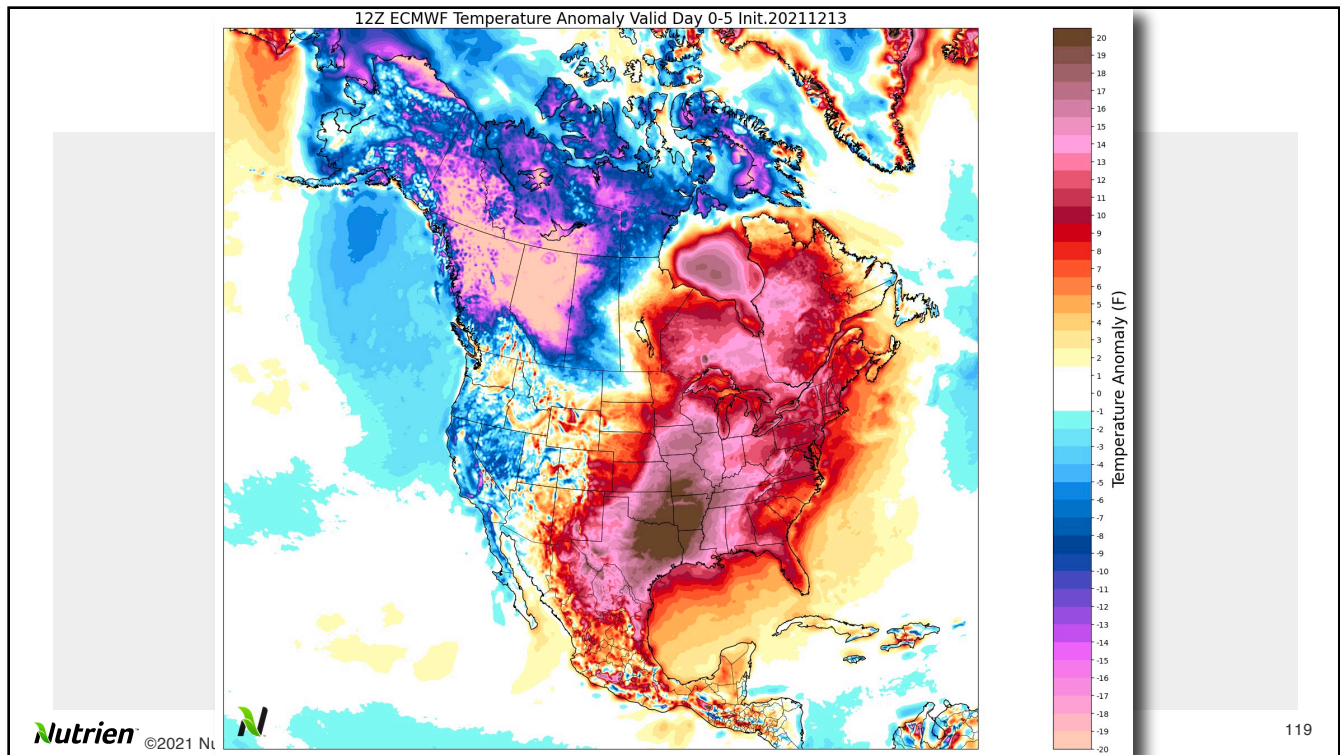
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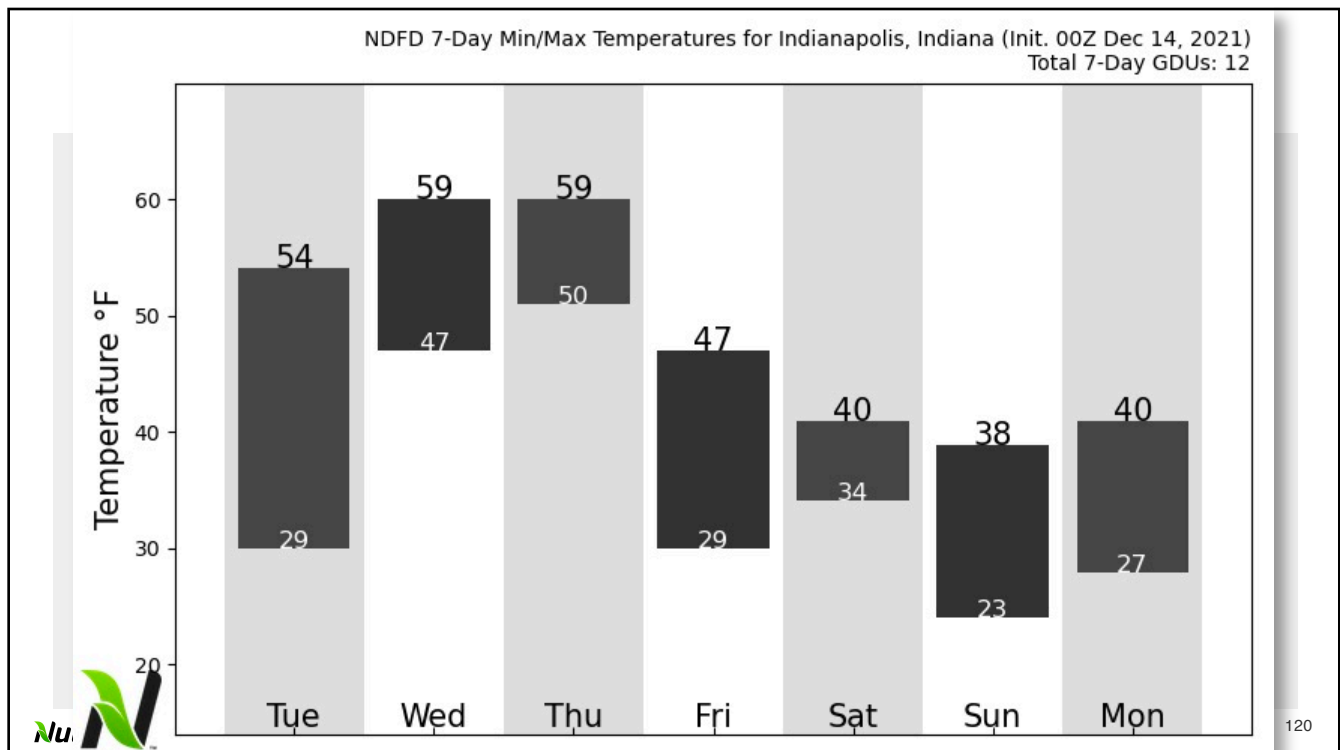
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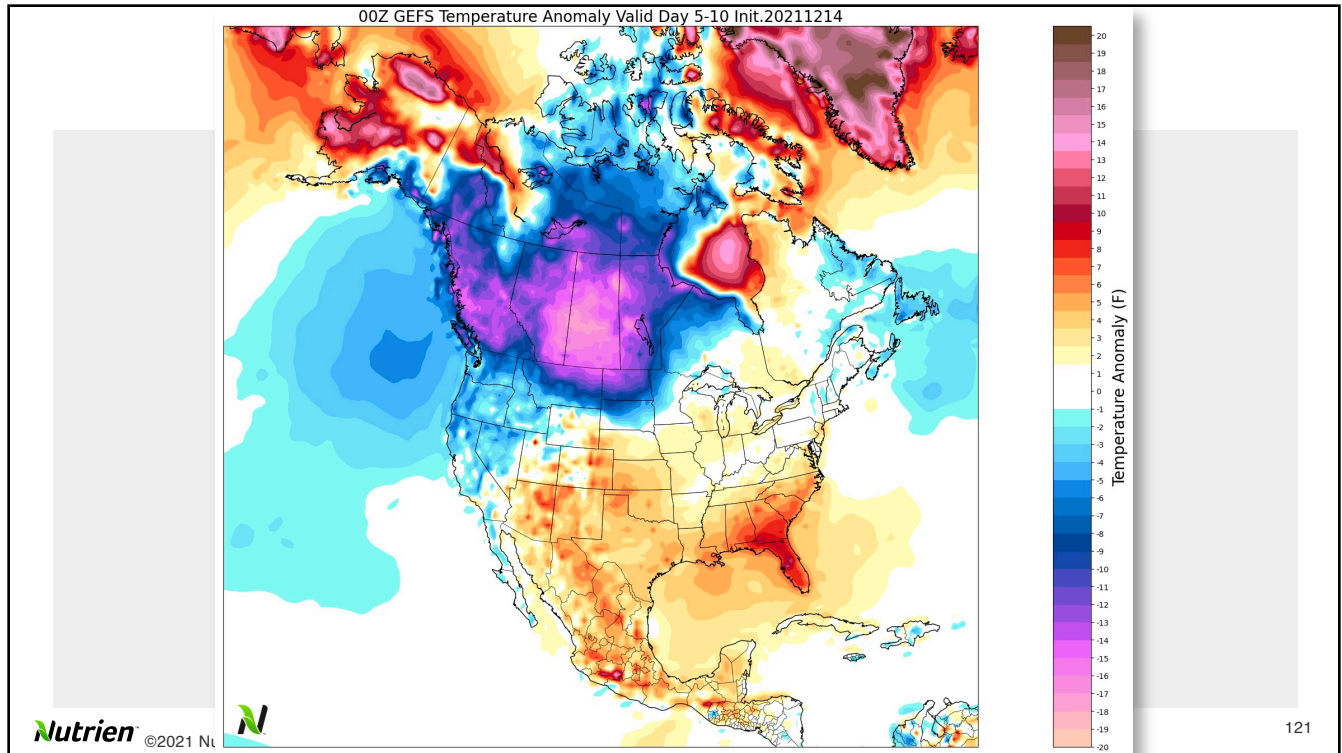
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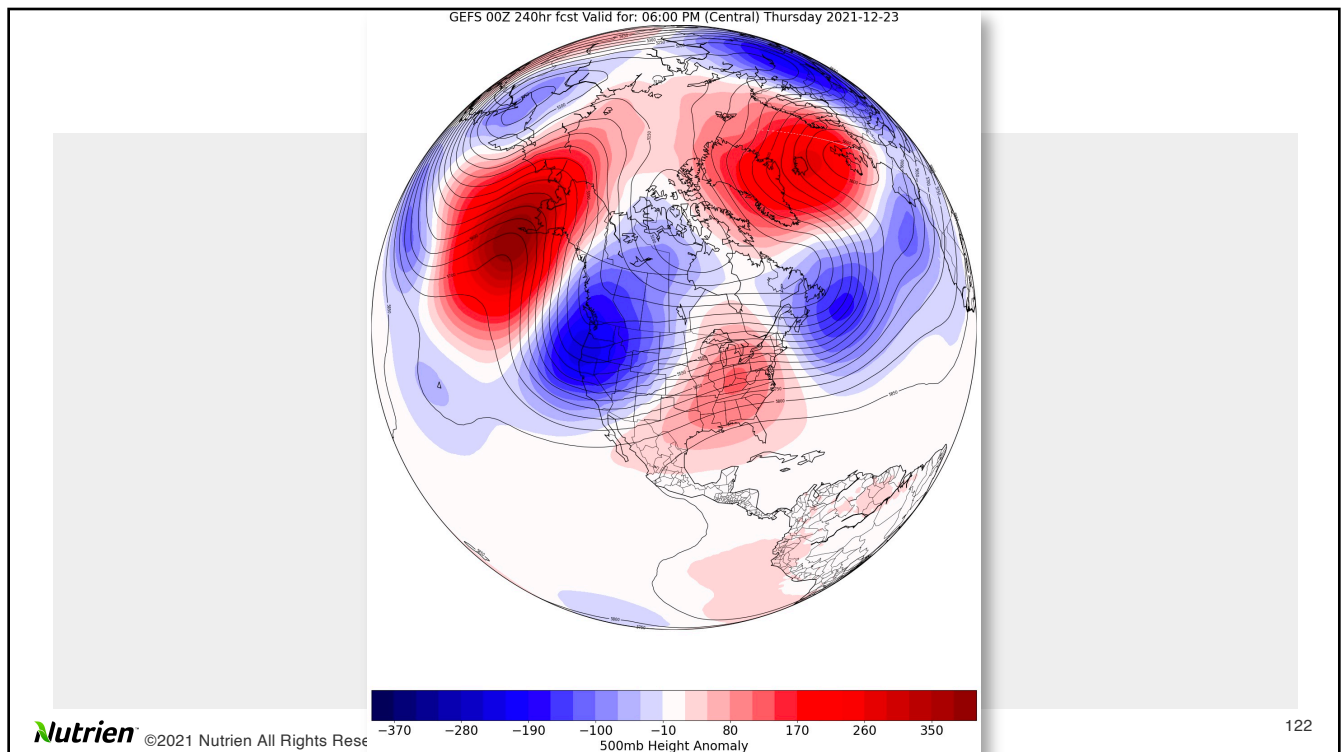
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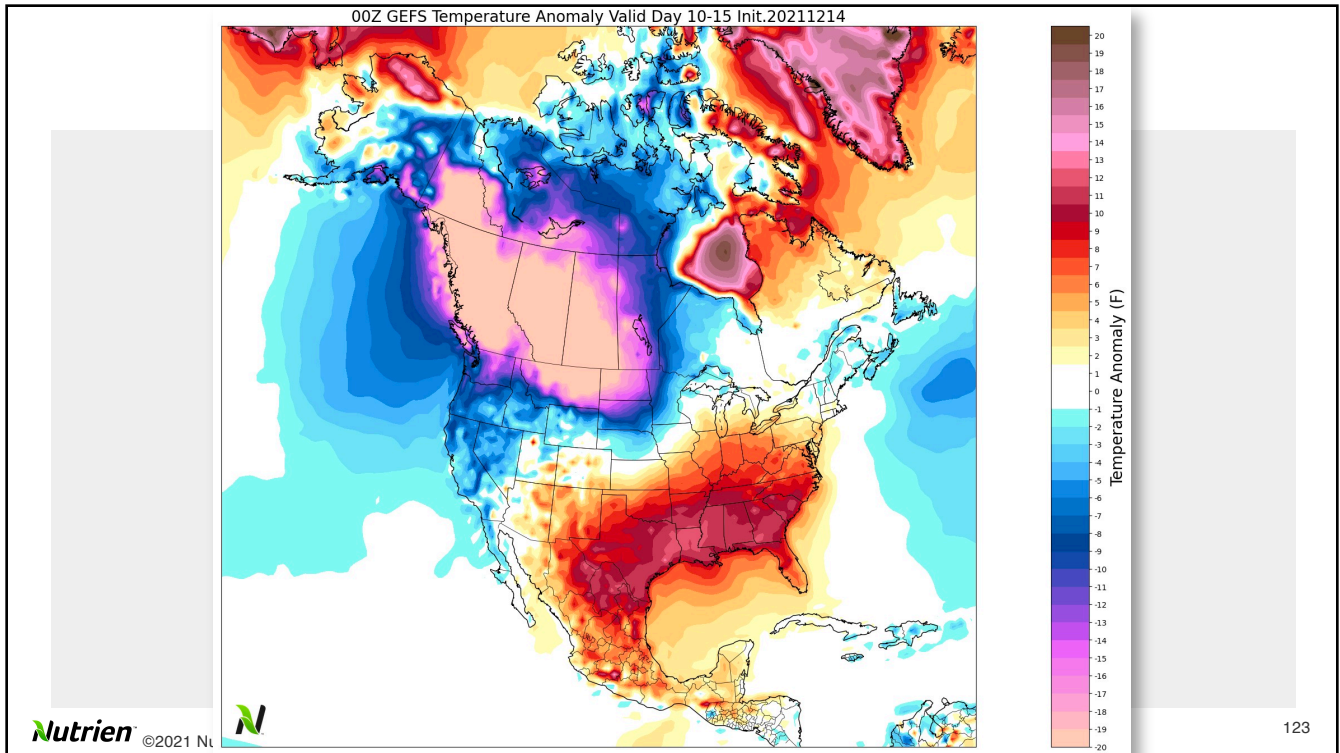
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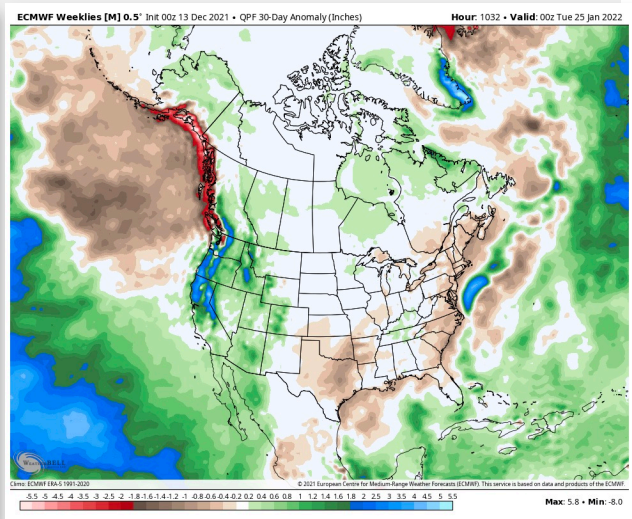
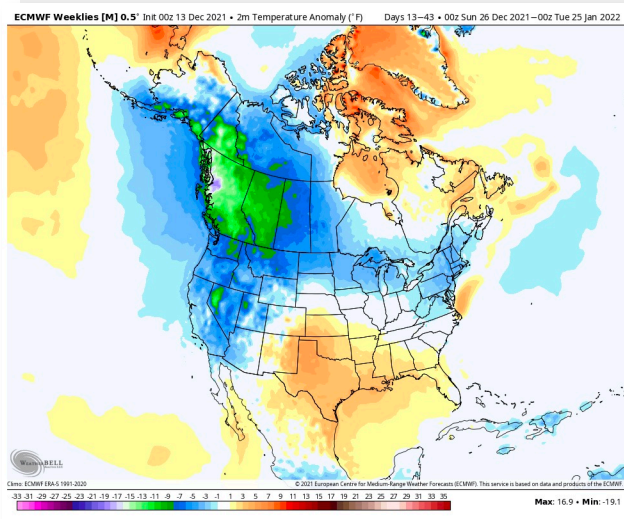


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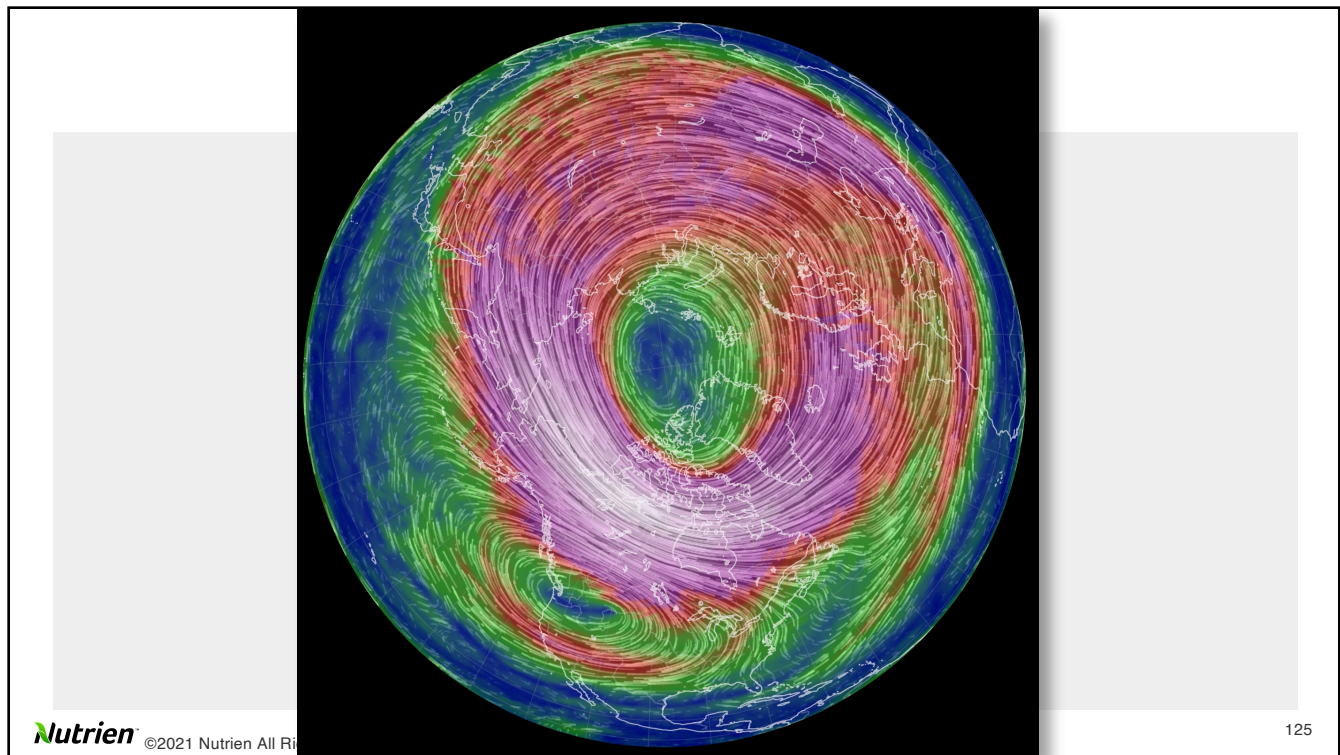
Dec 25, 2021 - Jan 25, 2022 ECMWF “Weeklies”



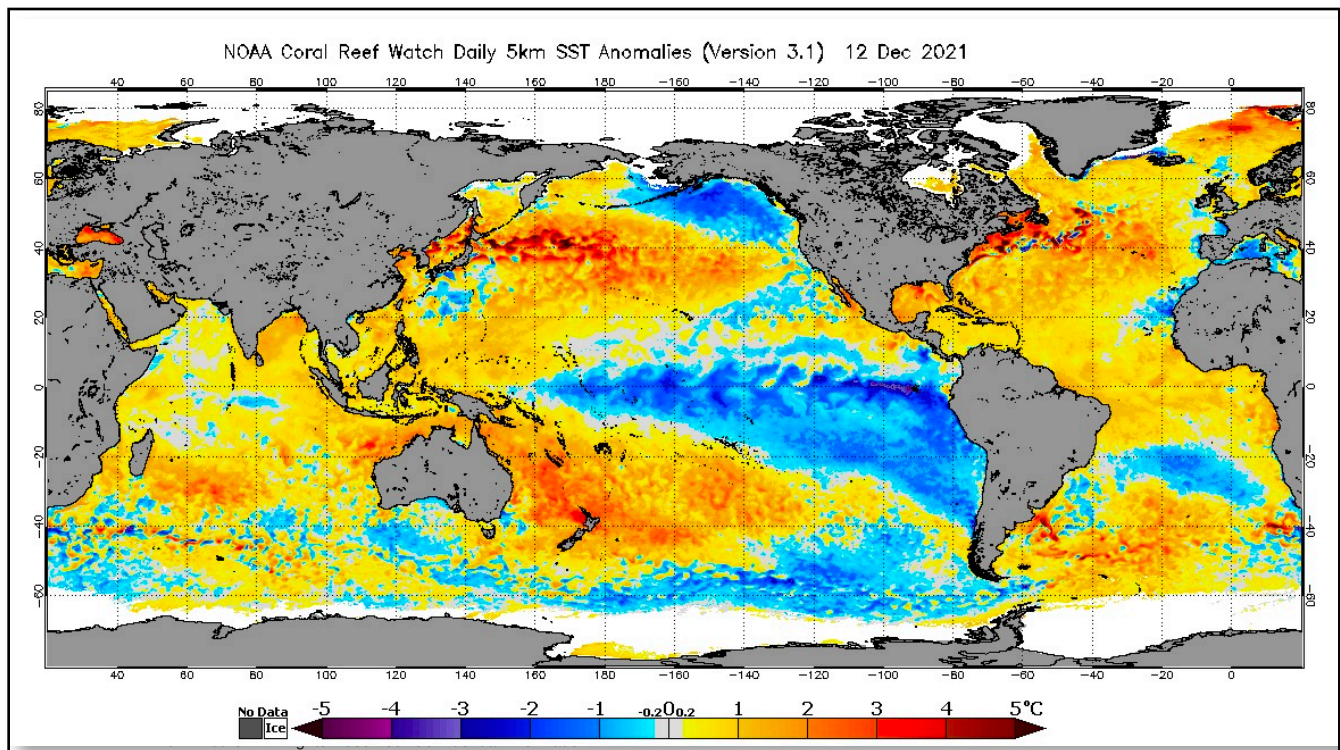
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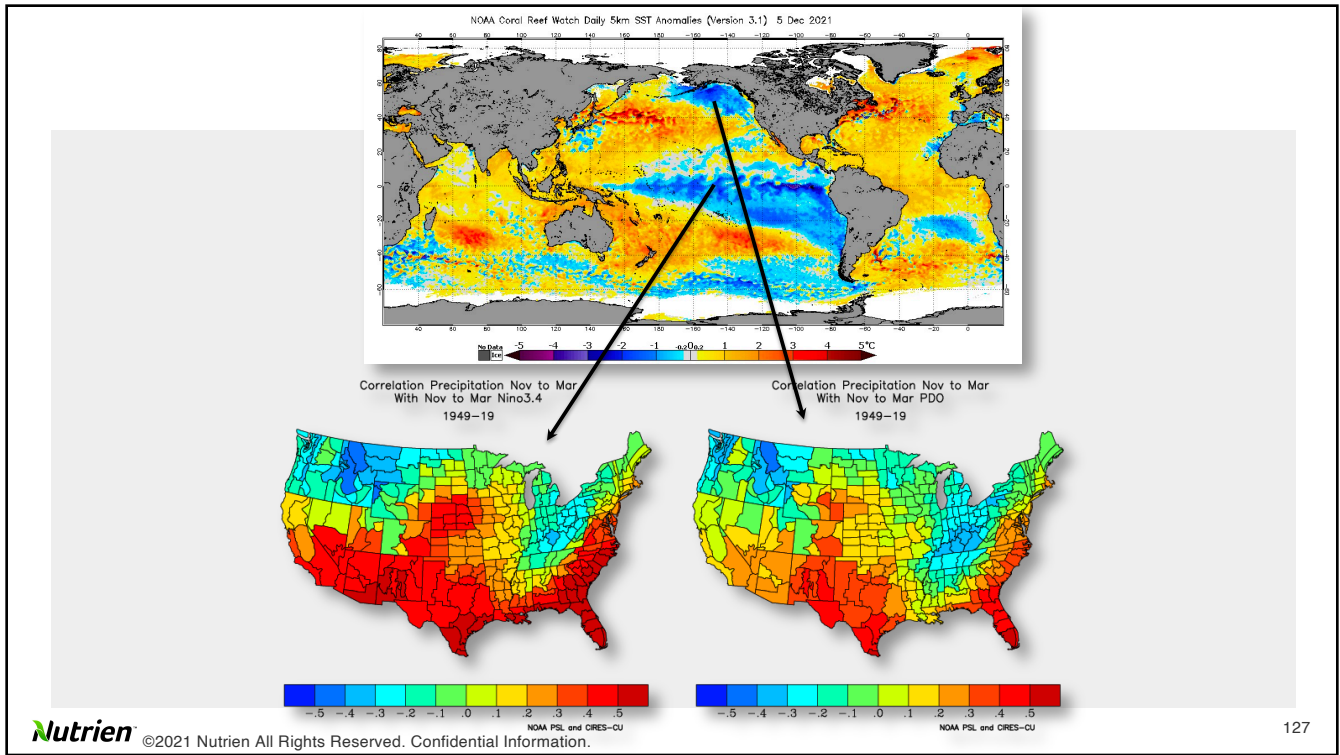
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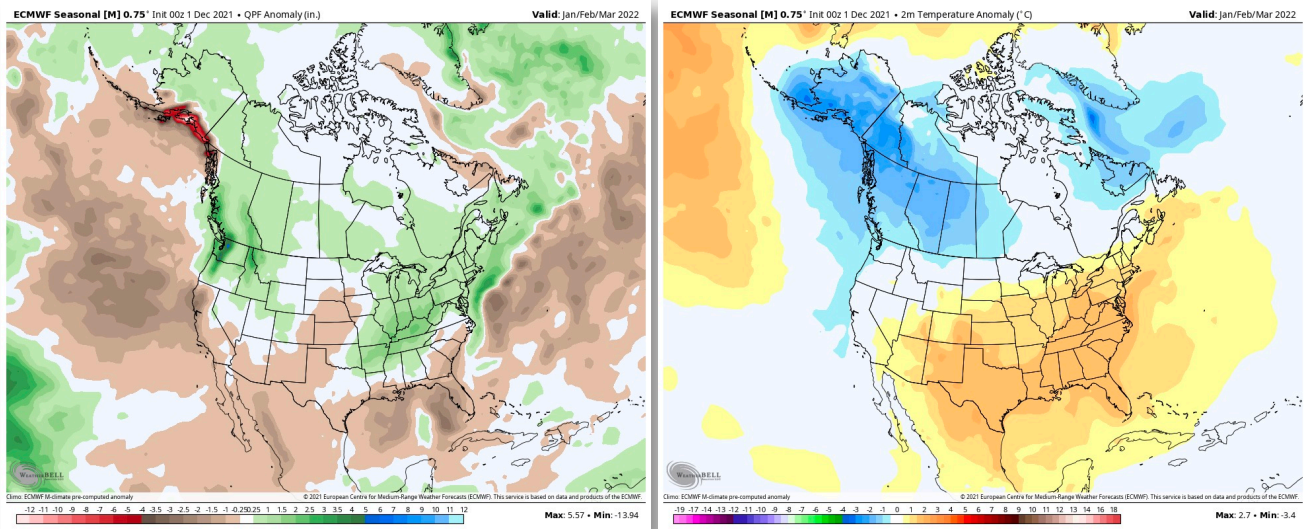


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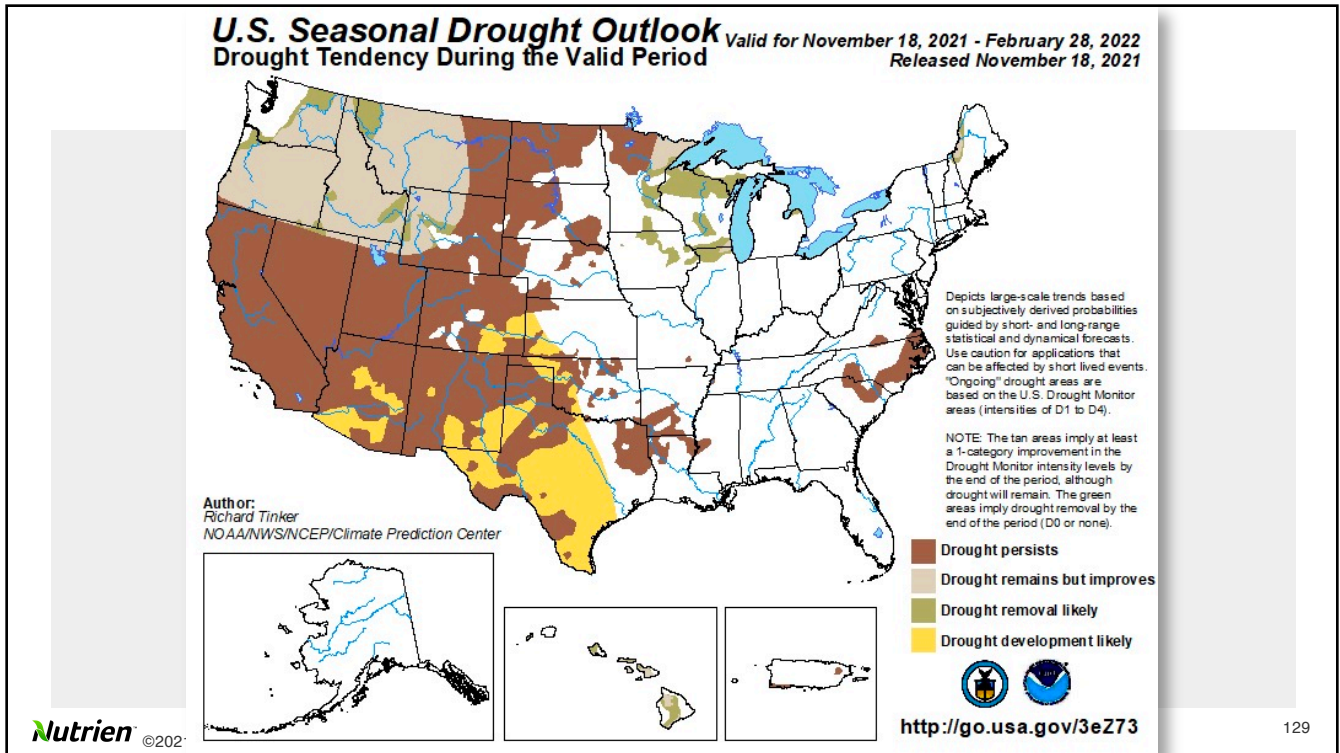


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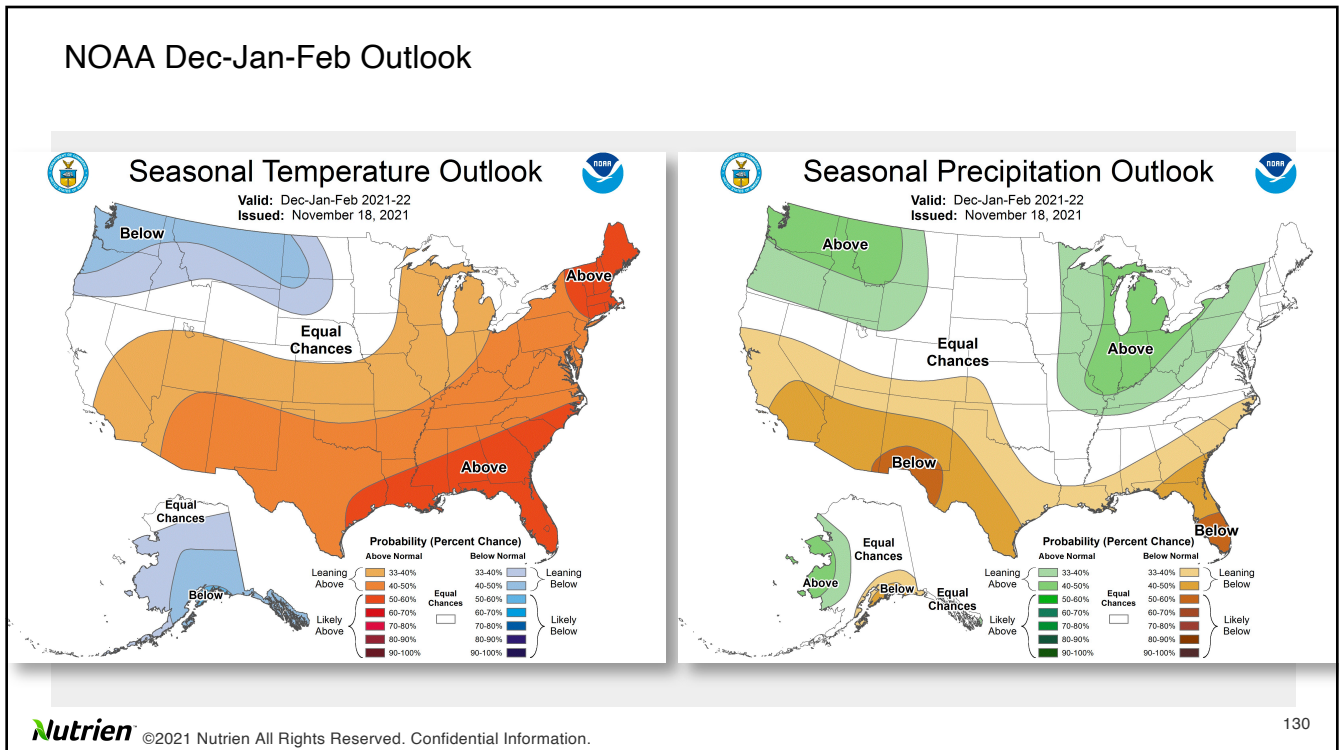
ECMWF and NMME: Jan-Feb-Mar Precipitation Outlook



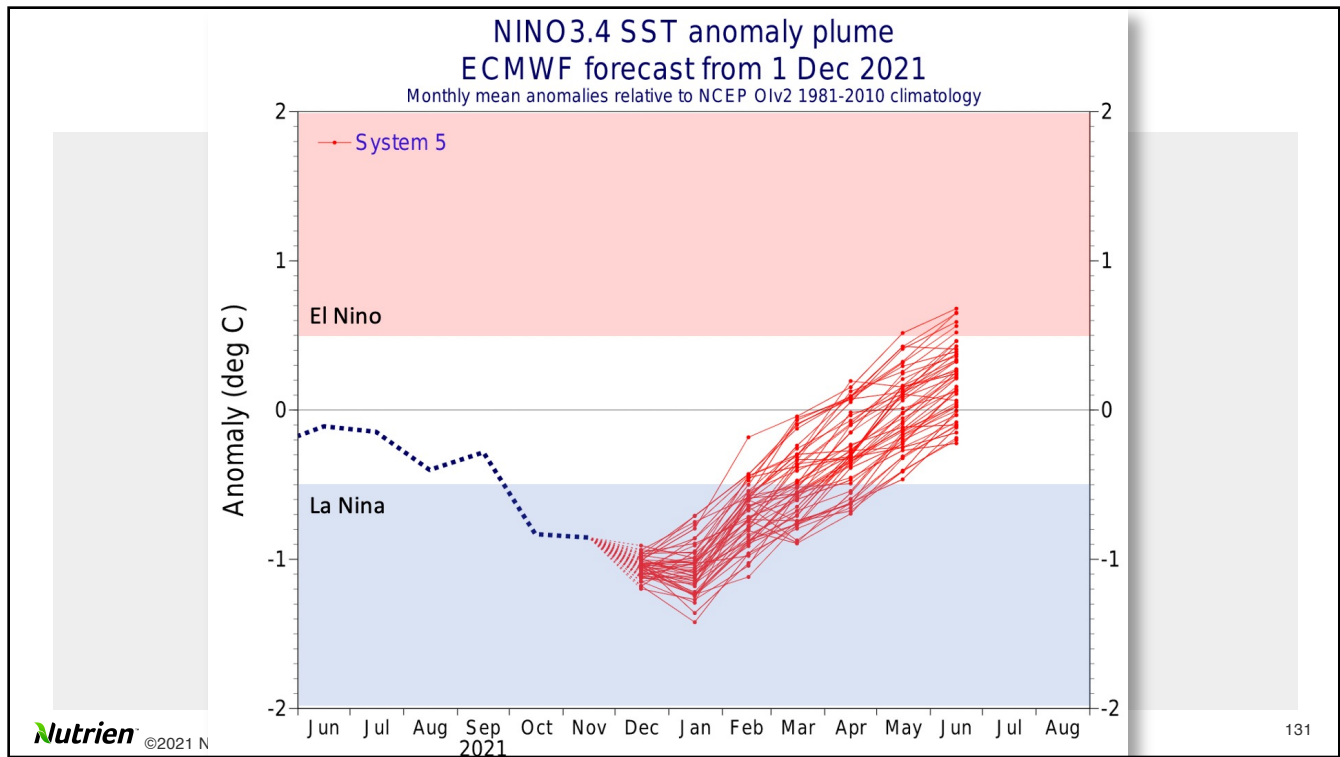
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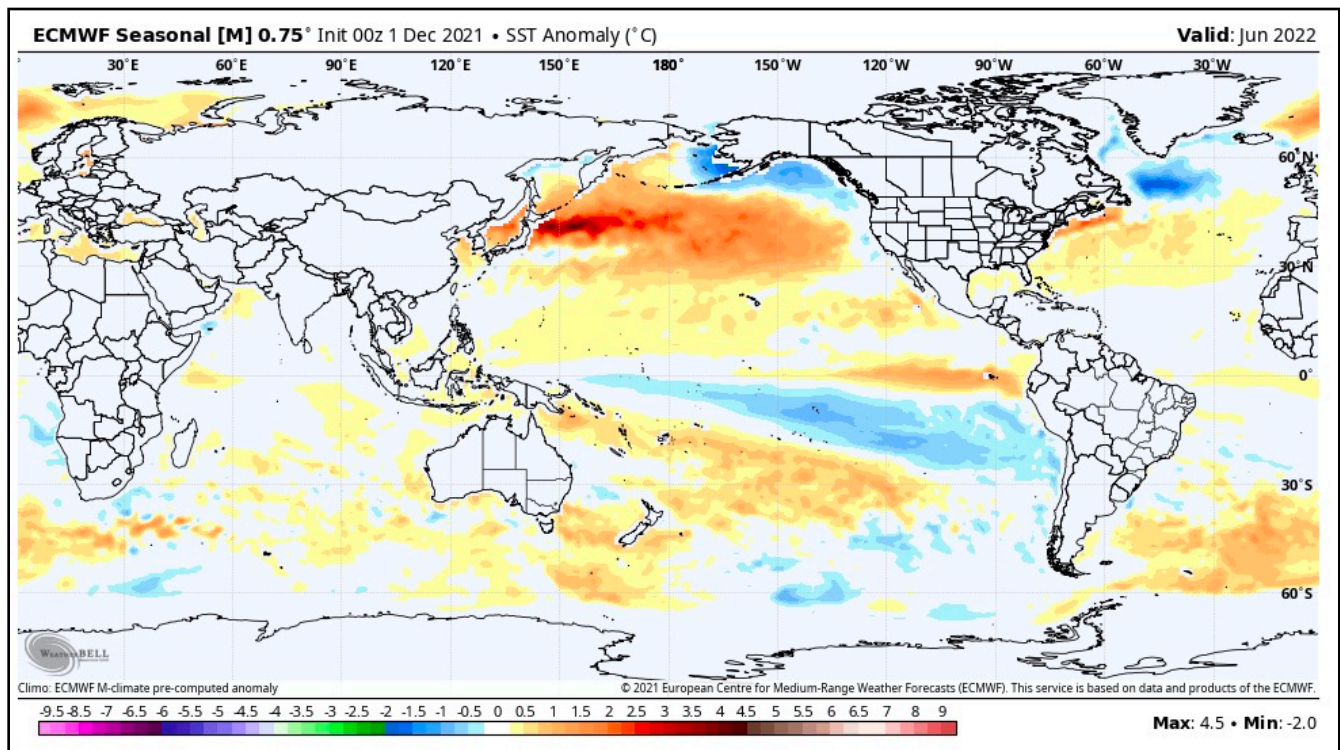
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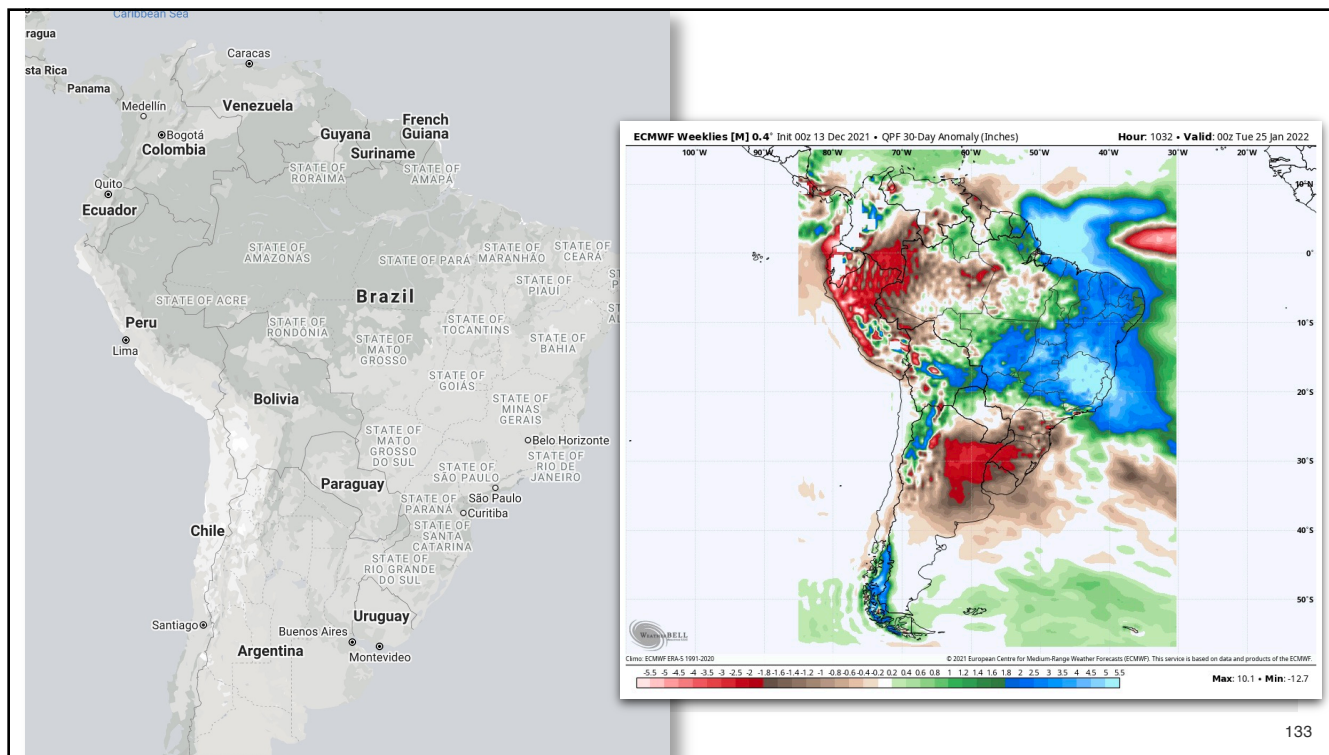
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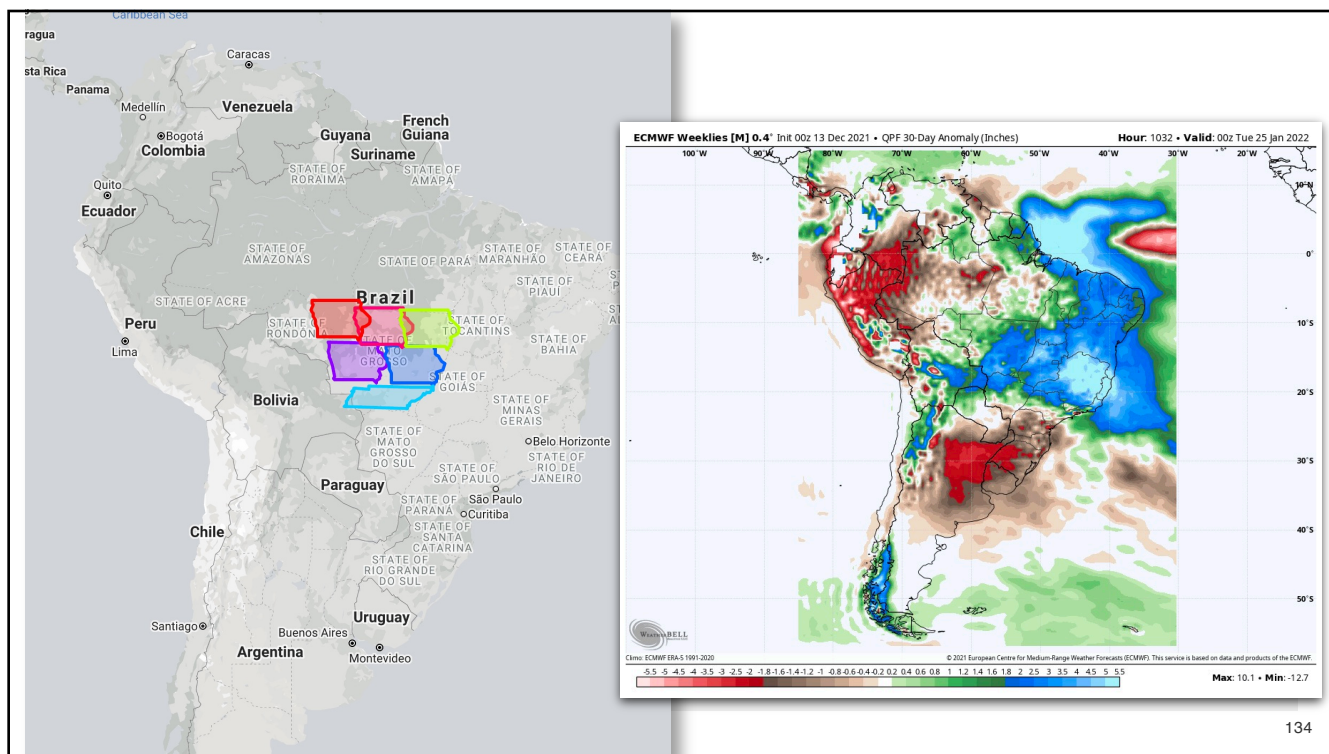
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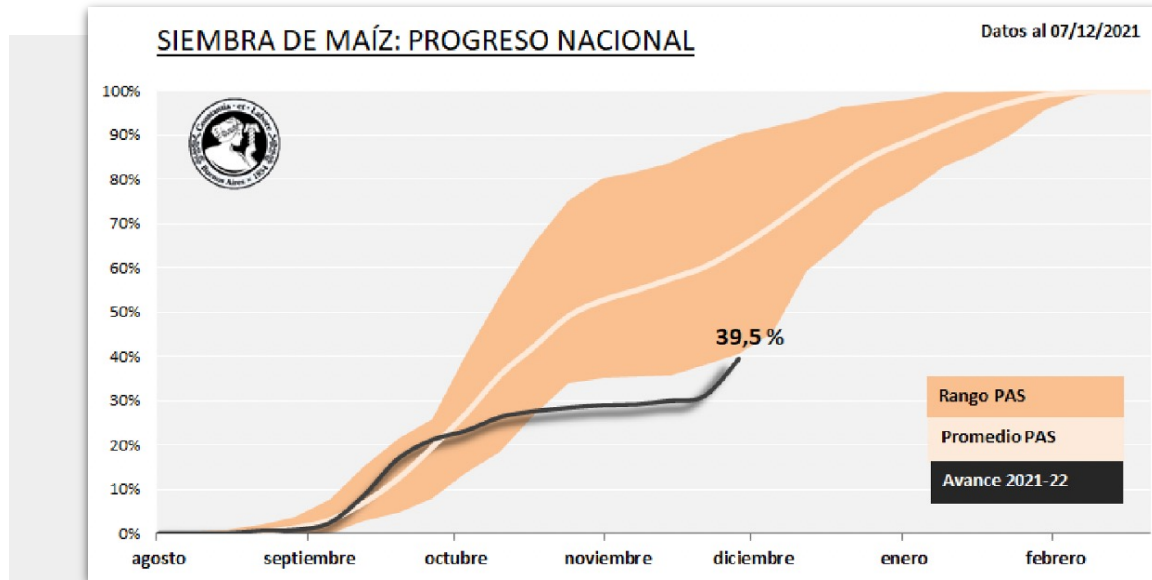


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Buenos Aries Grain Exchange Corn Planting Progress 2021



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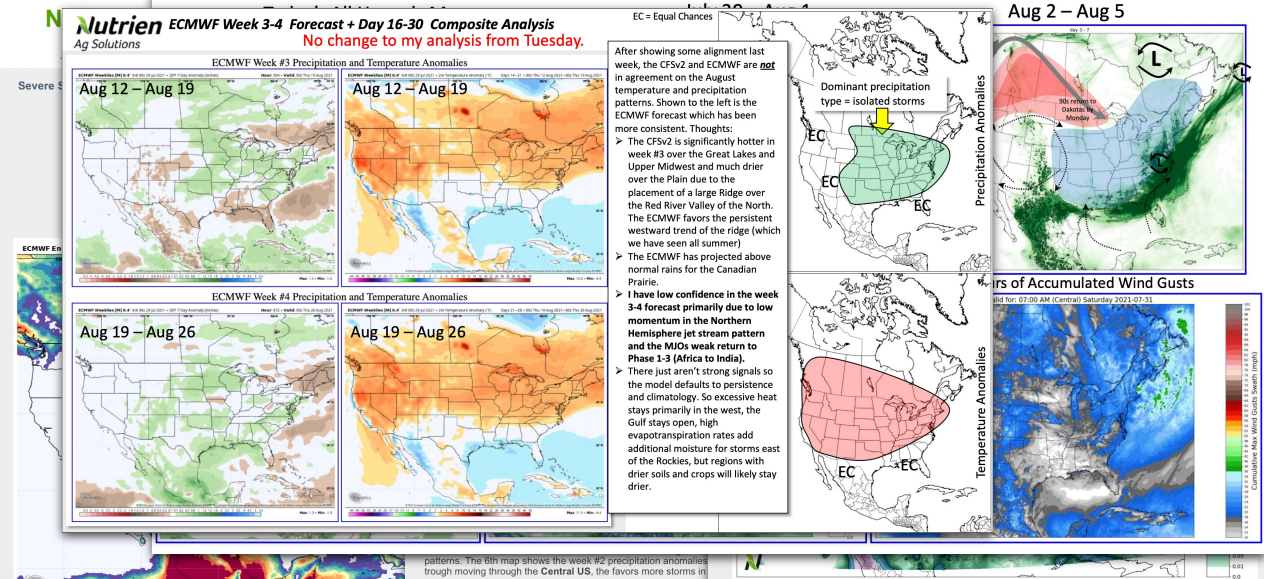
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