Lake County SMC

Gaging the Weather

Bob Gardiner, PE, CFM
Permit Engineer

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What's up with the weather lately?

- Record heat
- Record cold
- Record snow
- Record rain
- Record floods

And these records were breaking other records set in the last 10 years!

Why is the weather changing?

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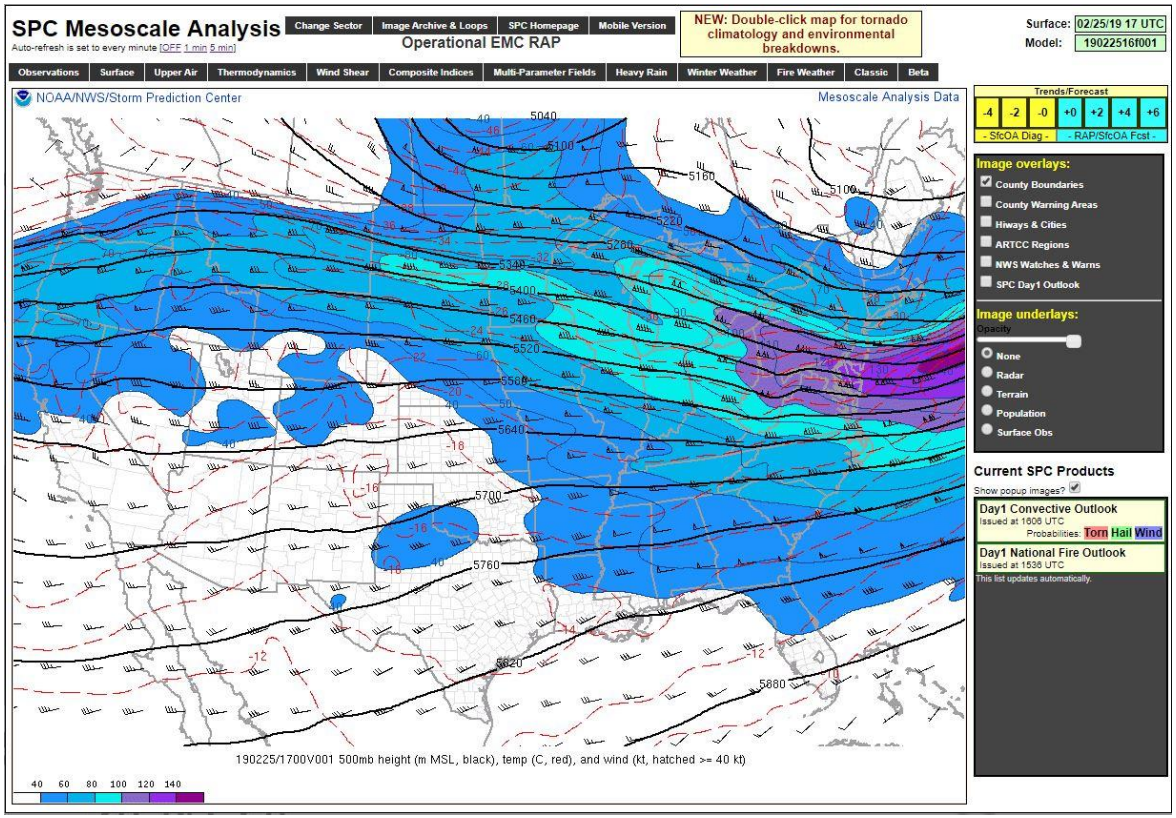
Un-Warmed

- Zonal Flow – Jet Stream flows smoothly west to east



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Un-Warmed Conditions

- Cold Lava Lamp – normal jet stream

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Global Warming

- Equator heats up adding energy to the atmosphere

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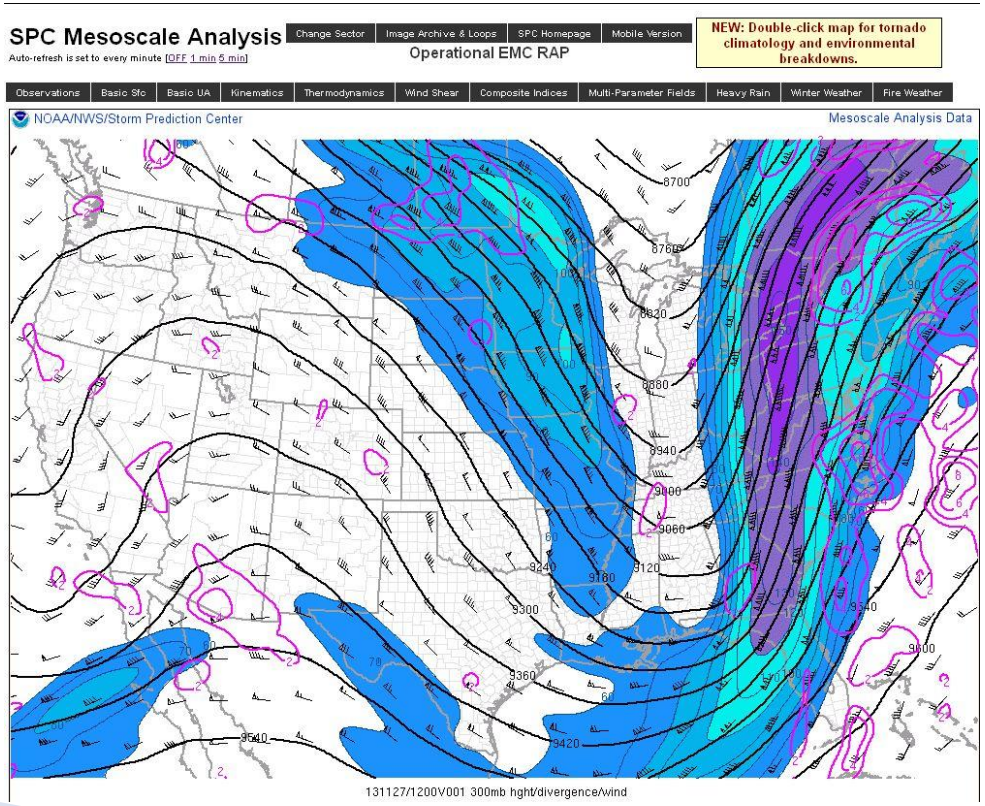
Climate Change

Weather is the result of the temperature differential between the poles and the equator.



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Climate Change

- Hot air holds more water vapor than cold
- Perturbations in the jet stream bring warm and cold air together more “energetically”
- Revised Bulletin 70 (Illinois rainfall)
  - Rainfall amounts in NE Illinois increasing by about 20% – 45%
- Doesn’t matter what you call it, things are changing.

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Weather Present

So where is the precipitation and when is it going to get here?

Here are the tools I use

(URLs will be posted on the SMC website)

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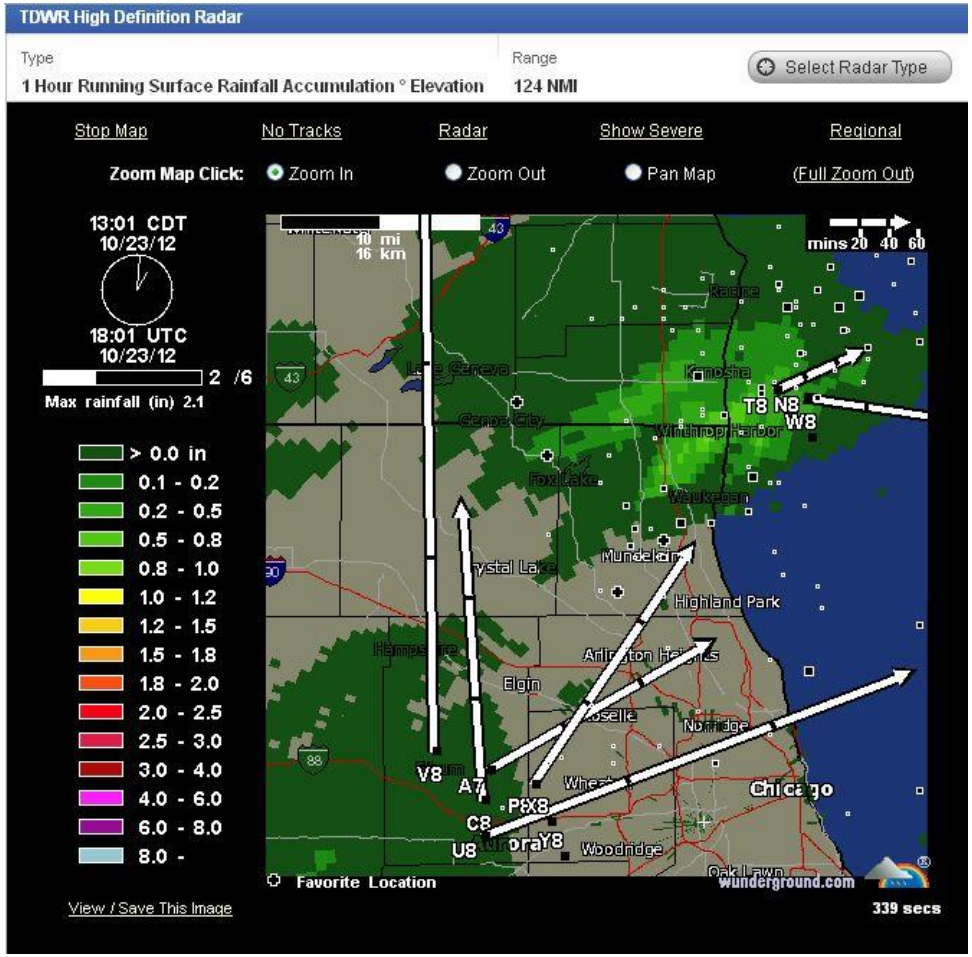
Weather Underground Precip. Radar



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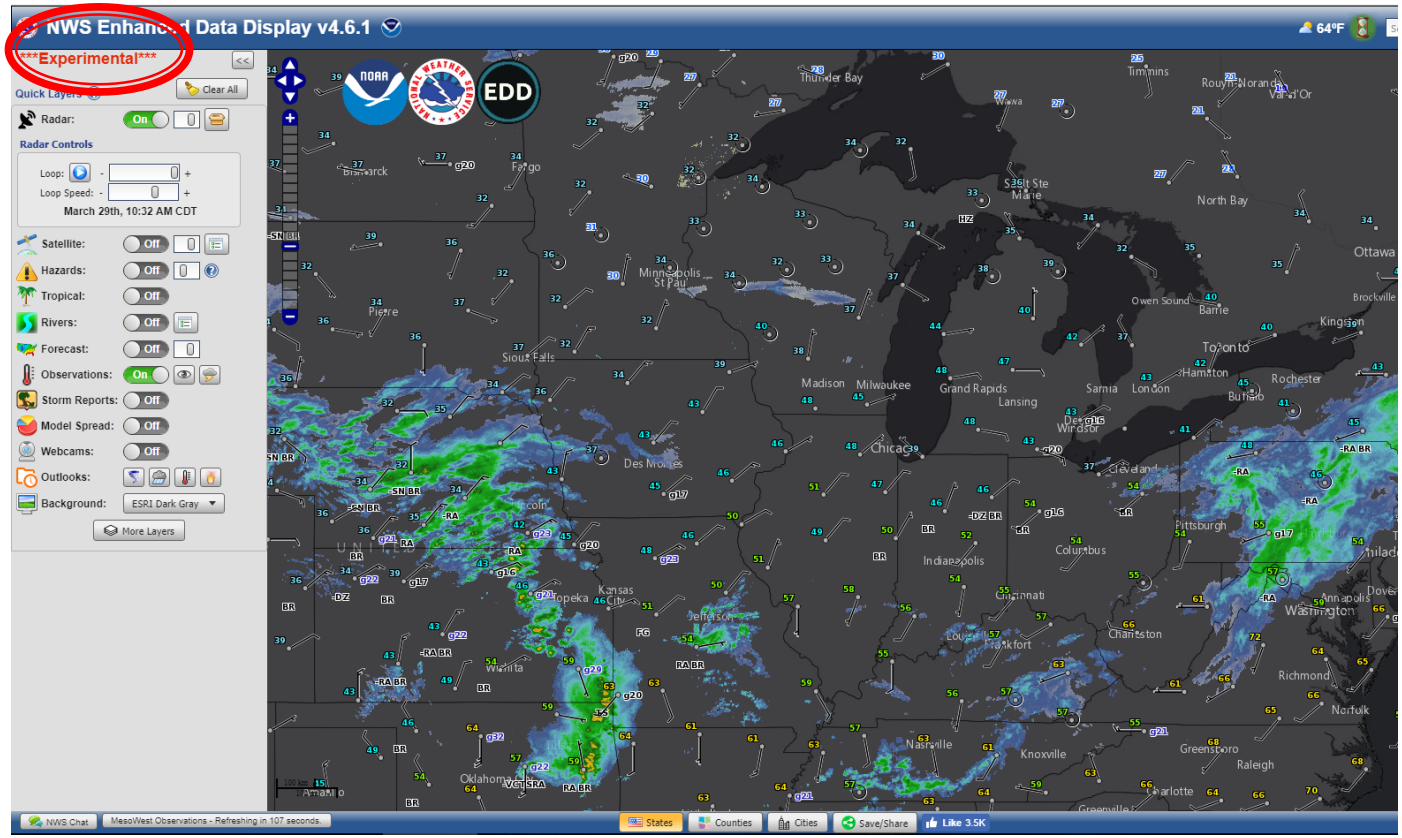
NWS Enhanced Data Display



Very Powerful but not user friendly and doesn't always work

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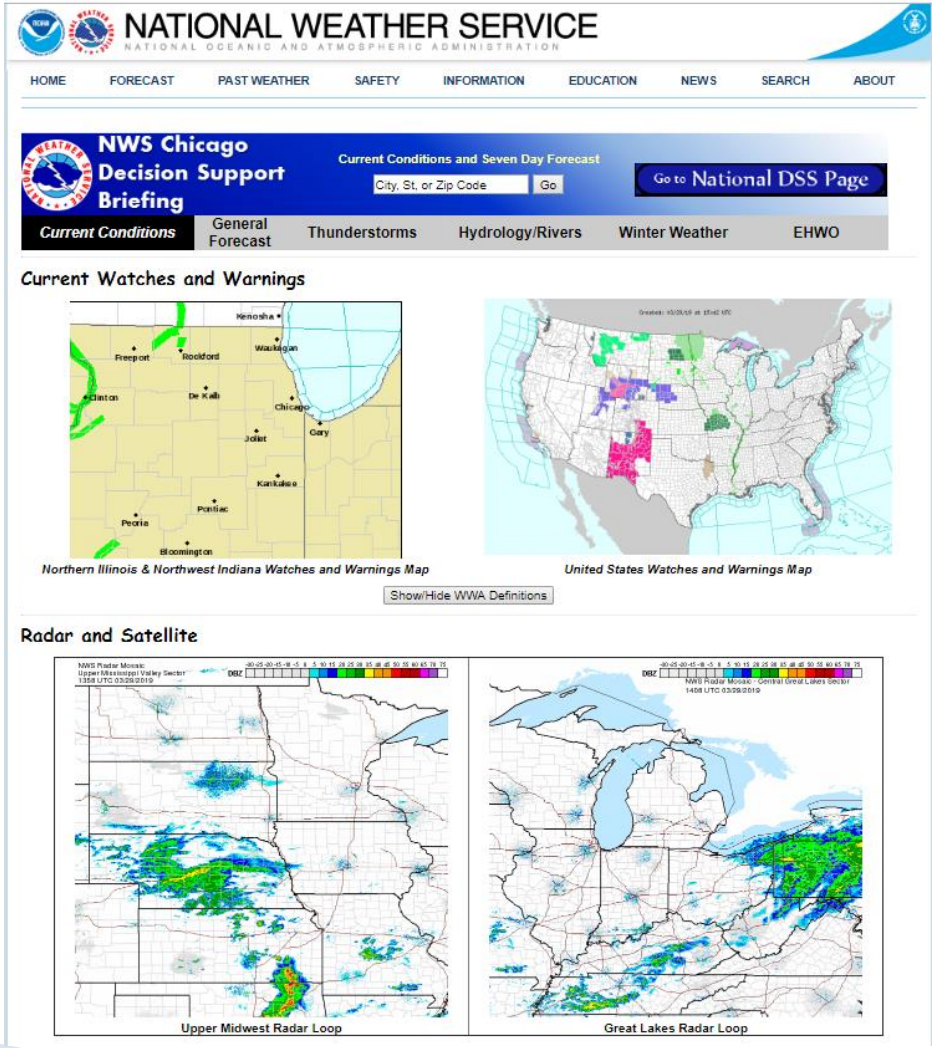
NWS Chicago Decision Support Briefing



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Bob’s Storm Summaries

- I’m not a meteorologist!
- Email distribution
- Summary of precipitation (rain/snow)
- Map showing precipitation distribution
- Combines data from SMC rain gages, NWS, USGS, CoCoRaHS
- Heads up on strong/severe weather

Rainfall from 6/27/19 to 6/28/19

Reply | Reply All | Forward | ...

GR

Gardiner, Robert D.
To
Bcc 'abruder@eea-ltd.com'; 'Aho, Scott A.'; 'dsintern@barrington-il.gov'; 'PGustafson@eroundlake.com'; Westman, Glenn H.; **+289 others**

Fri 6/28/2019 11:04 AM

Rainfall from 06 27 2019 to 06 28 2019.pdf
225 KB

6/27/19 – 6/28/19 Lake County received between about 0" and 0.9" with an overall average of 0.4" and a standard deviation of 0.3". In other words, it rained hard under the thunderstorms and sprinkled everywhere else.

The storms that were a long way off early this morning hit us a lot faster than I thought possible. The NWS was talking about the possibility of them getting here this afternoon so I think everyone was surprised by how quickly they got here. Be that as it may, there are thunderstorms coming through now and they started with a really impressive shelf cloud and wind. Looking at the radar I think we are in a brief lull now and will see rain pick up again shortly. Then maybe another break and then I'm thinking that the storm currently in Iowa may make it here later today. Of course, with all the storms now the atmosphere could cool and stabilize enough so we won't get afternoon thunderstorms…on the other hand, if we see some sunshine the atmosphere may destabilize enough that when the Iowa disturbance hits us it will fire up more storms.

I wrote this sentence early this morning so it may no longer be true*: Looks like no lake breeze this afternoon so we all cook in upper 80s to mid-90s with high dew points today. Remember when it was -50°?*

Saturday looks to be sunny but with hot and humid air present there is a chance of some pop up storms along a lake breeze.

Sunday looks like it may be the day with the lowest probability of any storms with a high of around 90.

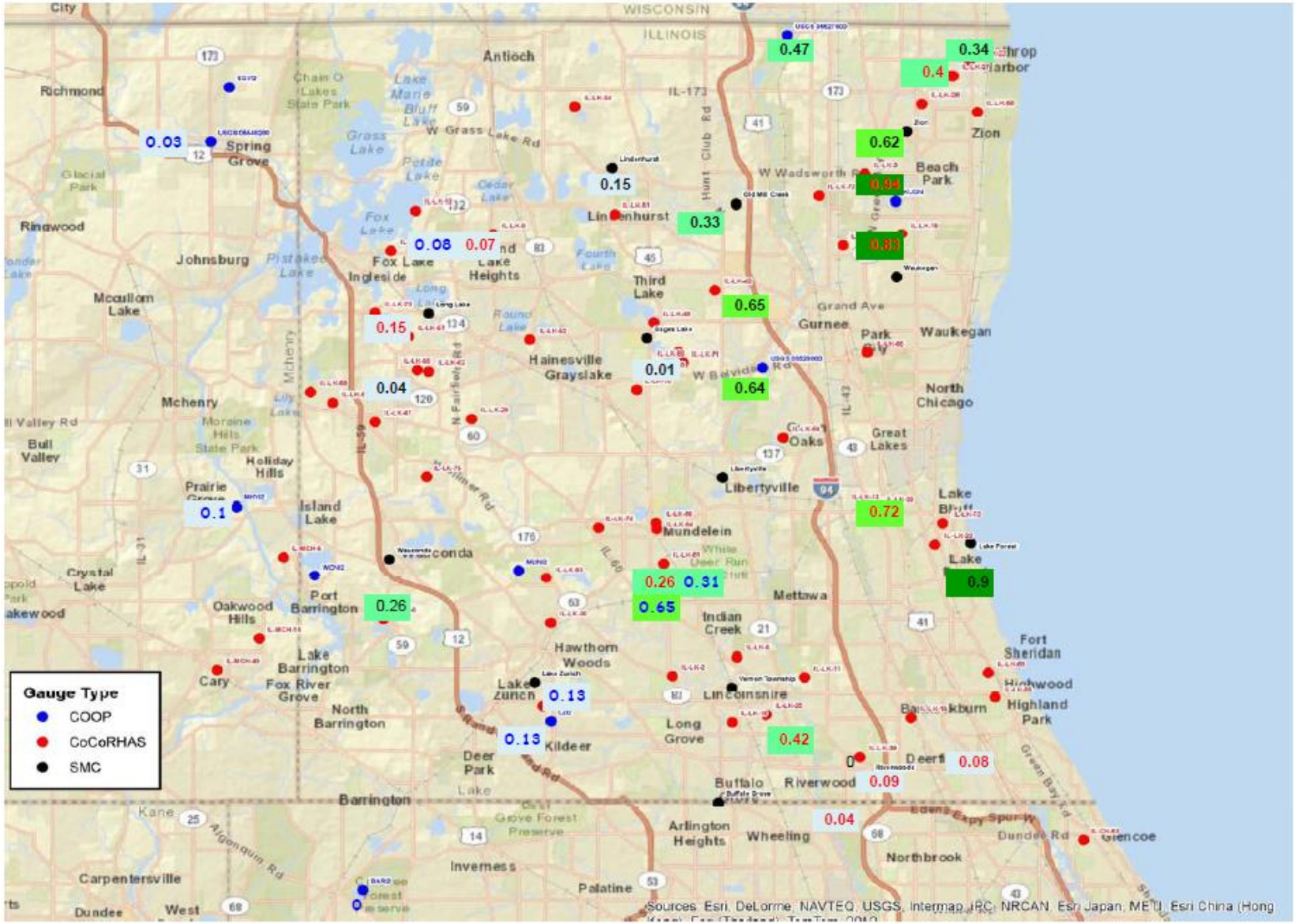
TOTAL STORM PRECIPITATION EQUIVALENT SUMMARY

Starting Thursday	6/27/2019	at	0700
Ending Friday	6/28/2019	at	0700

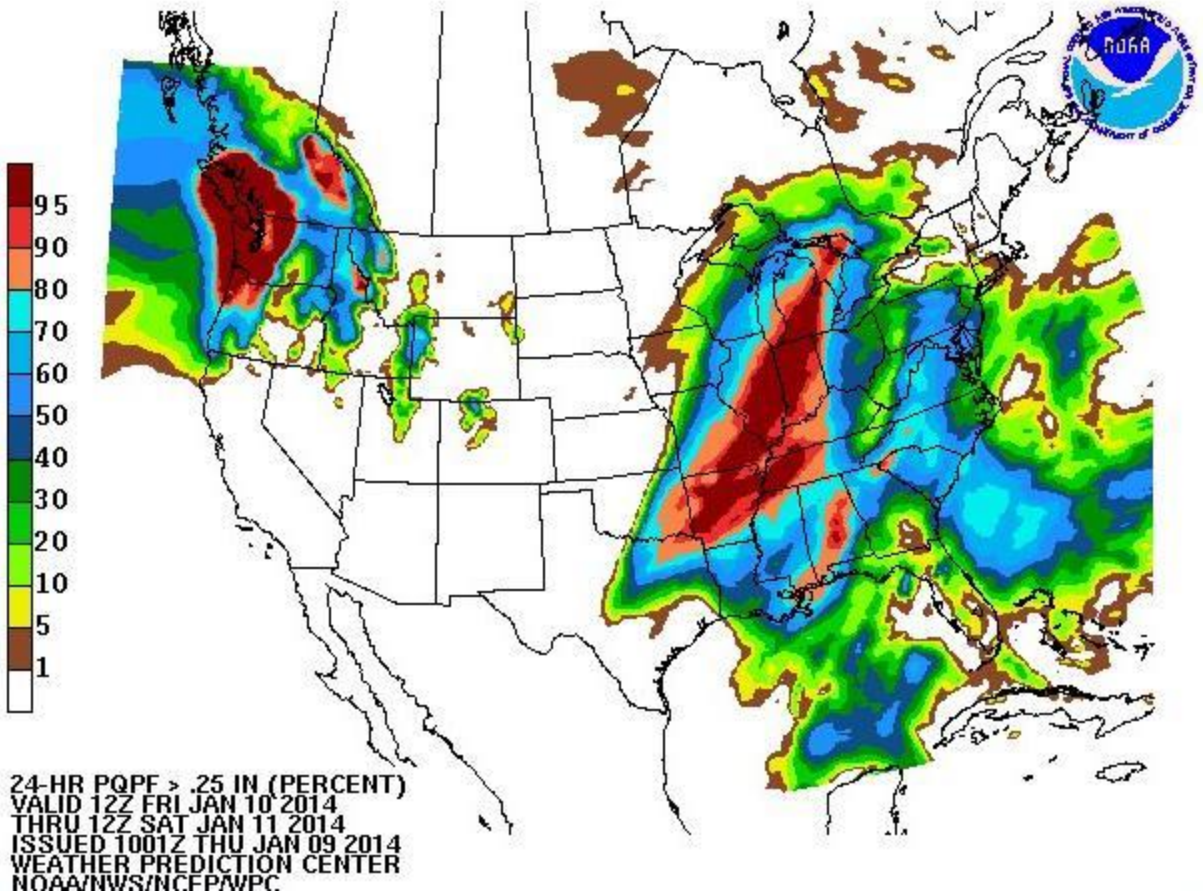
a 24 hour interval

Lake County only

Maximum	0.94
minimum	0.00
Average	0.36
STD	0.29



We didn't get as much as you said we would!



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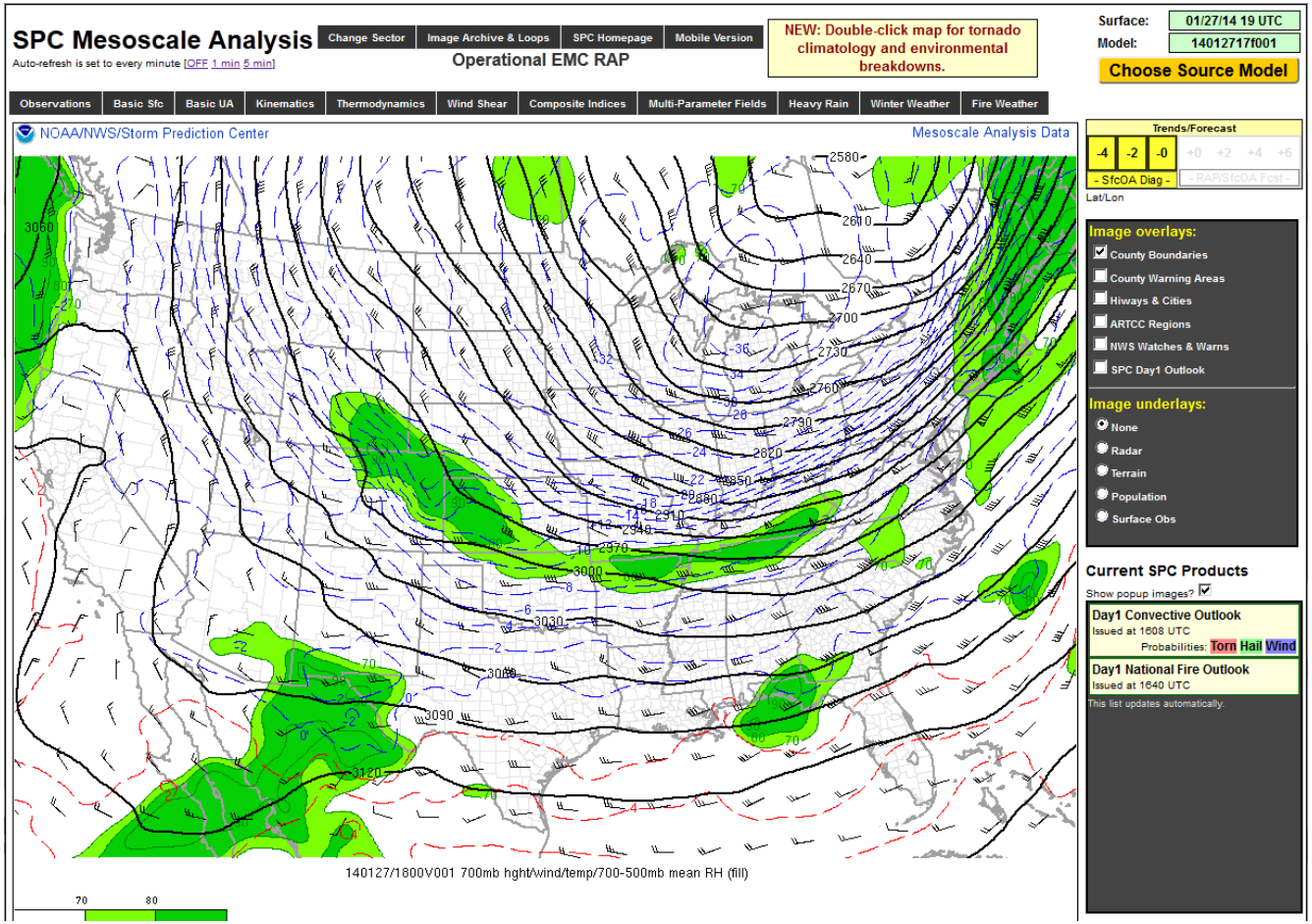
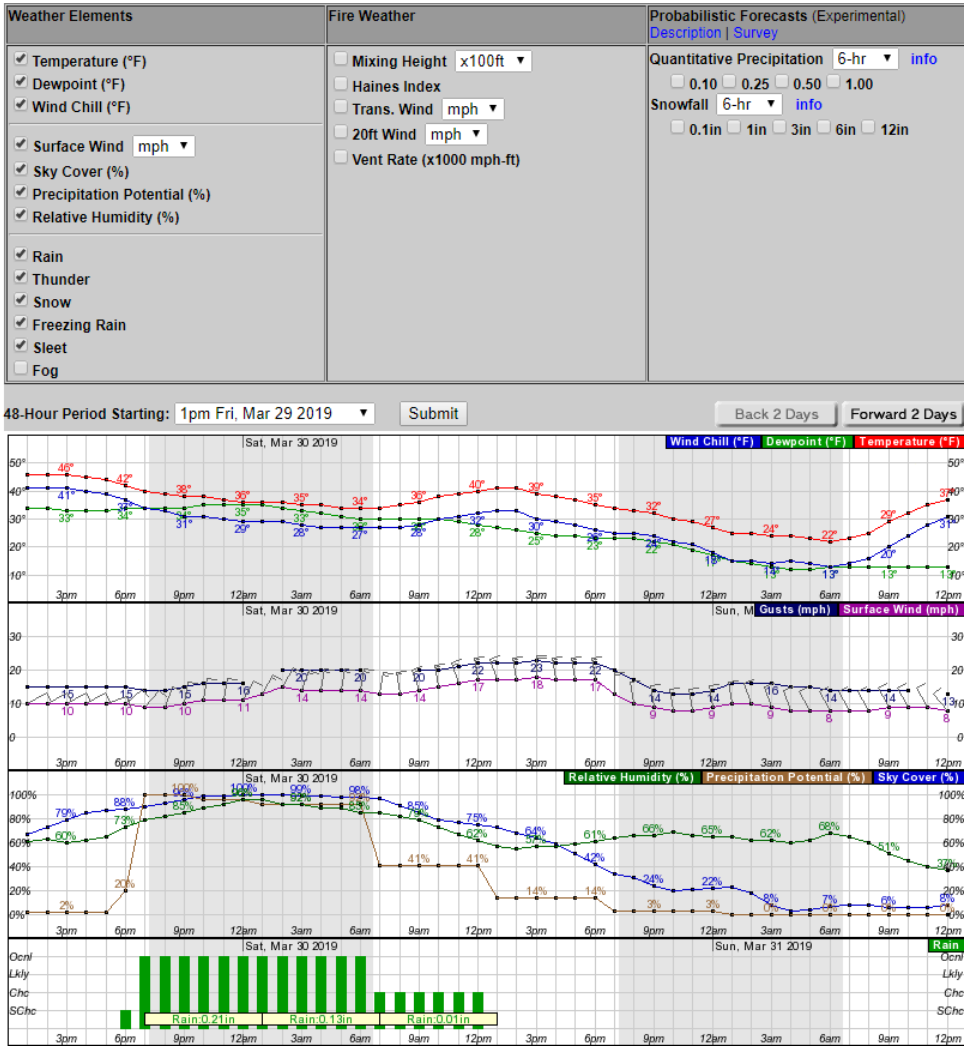
Weather Future

Tools I use every day

SPC gives a view across the country



NWS Hourly Weather Forecast



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NWS Forecast Discussion

Area Forecast Discussion

Issued by NWS Chicago, IL

Current Version | Previous Version | Text Only | Print | Product List | Glossary Off
Versions: **1** 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

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Area Forecast Discussion
National Weather Service Chicago/Romeoville, IL
627 AM CDT Fri Mar 29 2019

.SHORT TERM...
317 AM CDT

Through Saturday...

Main forecast concerns/challenges are with light rain trends
early this morning, and then with returning showers area wide this
evening through Saturday morning. Some embedded thunder possible
south of I- 80 tonight, with a rain snow mix possible north of
I-88 late tonight into early Saturday morning.

In the near term, scattered light rain continues to move across
parts of northeast IL and northwest IN as surface trough and front
move through the area. Expect this light rain to further diminish
over the next several hours, while these surface features sag to
the south of the area. A period of dry weather is then likely for
most areas later this morning through mid afternoon, however, some
isolated light showers may continue just north of this
trough/front along and south of the Kankakee river valley. Do
anticipate some clearing across northern IL this morning, with
partly cloudy to partly sunny skies likely through midday. The
exception will be areas south of I-80 where skies will likely stay
cloudier. Another day with temps in the 50s is likely, though
locations near the lake will likely stay in the 40s with onshore
winds in place.

Increasing clouds is expected later this afternoon ahead of
approaching short wave energy. Rain chances quickly increase out
ahead of this energy early this evening, with area wide showers
likely. Mid levels will remain fairly active tonight as a deeper
trough digs across the upper midwest, and while another lower
amplitude trough moves through the central CONUS. While this large
scale ascent is in place, expect surface trough/front to move
east northeast through the region. This will support continued
rain development for much of tonight into early Saturday morning.
Most guidance in agreement with this trough and front staying
right along the CWA or just to the south. In this setup, expect
higher rainfall amounts to be along I-88 and southward, and the
highest south of I- 80. Rainfall amounts of 0.25" to 0.50"
expected north of I-88, I-88 to I-80 expect around 0.50" to 1.00",
and then south of I-80 1.00" to 1.50". Elevated instability is
likely to be in place just north of this boundary tonight, with
some thunder possible south of I-80. Given the convective nature
of this precip, some locally higher rainfall amounts are possible
in this location. Precip will begin to shift to the east early
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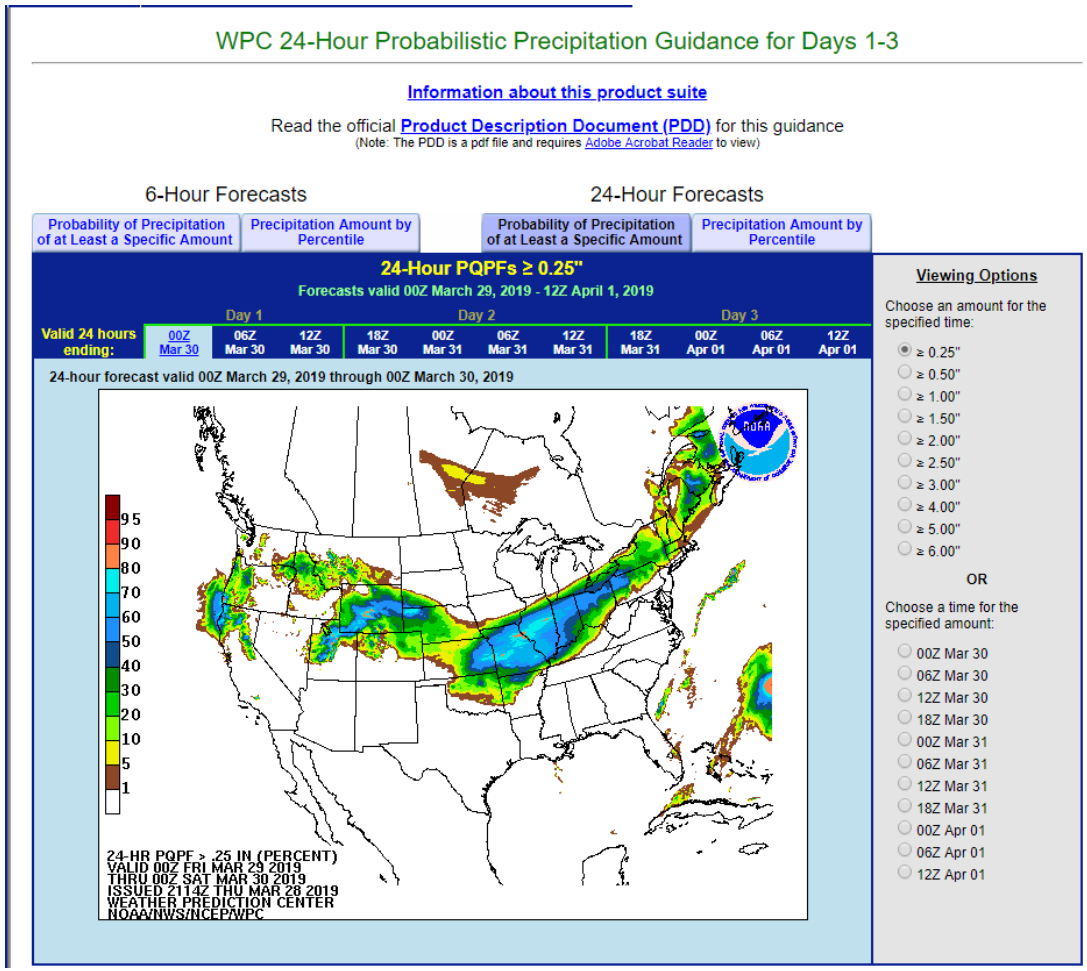
Probabilistic Precipitation (rain)



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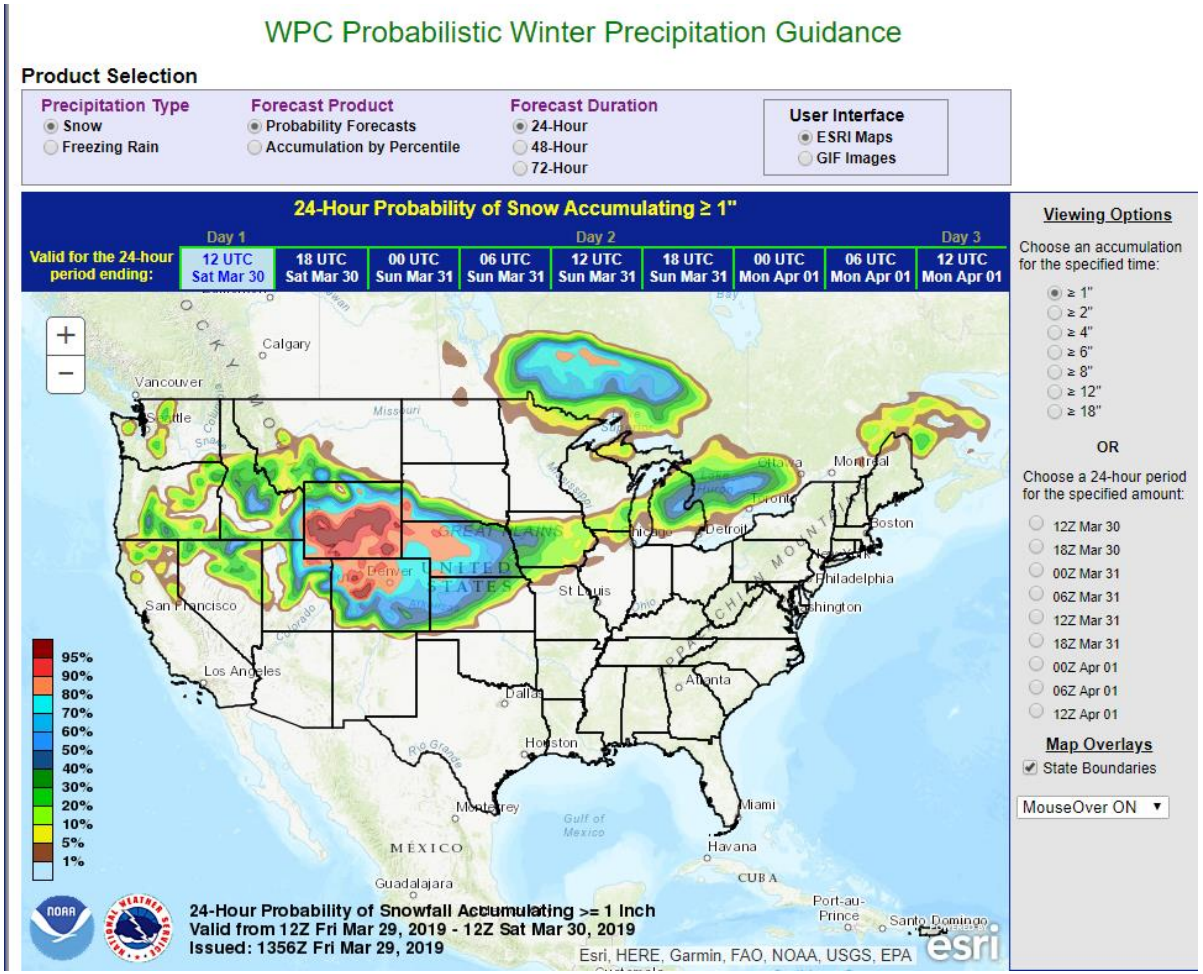
Probabilistic Winter (snow)



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Questions?

First question on everyone's mind is… "gage?"

The USGS and NWS use "Gage" instead of "Gauge" so I do, too.

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