New York State Mesonet

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New York State Mesonet, UAlbany, NY

Some Intro Slides By Jerry Brotzge & June Wang

Why a Mesonet in New York?

NYS Mesonet
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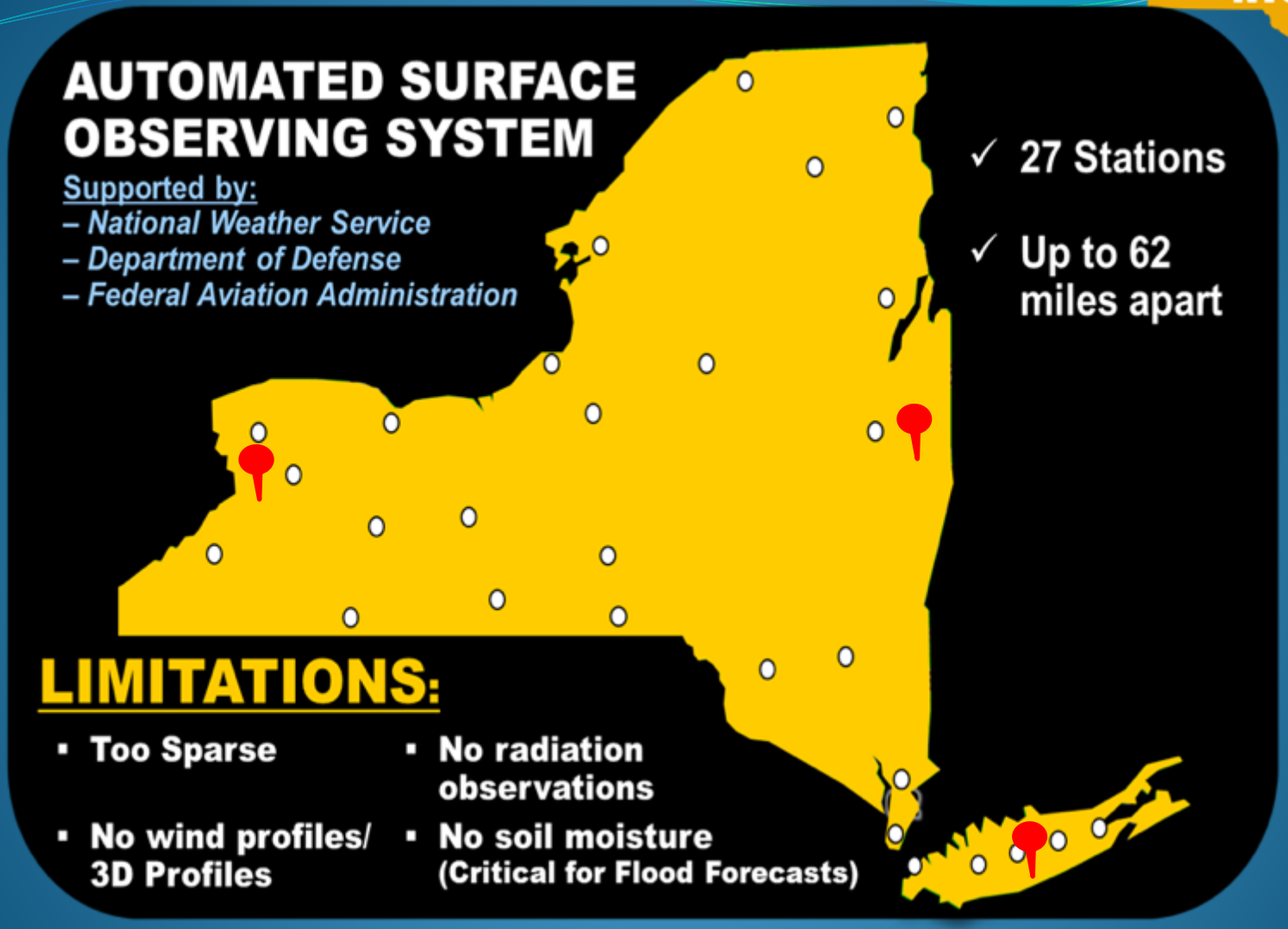

Existing main data source is from 27 ASOS & 3 radiosonde stations in NYS

Why a Mesonet in New York?

NYS Mesonet
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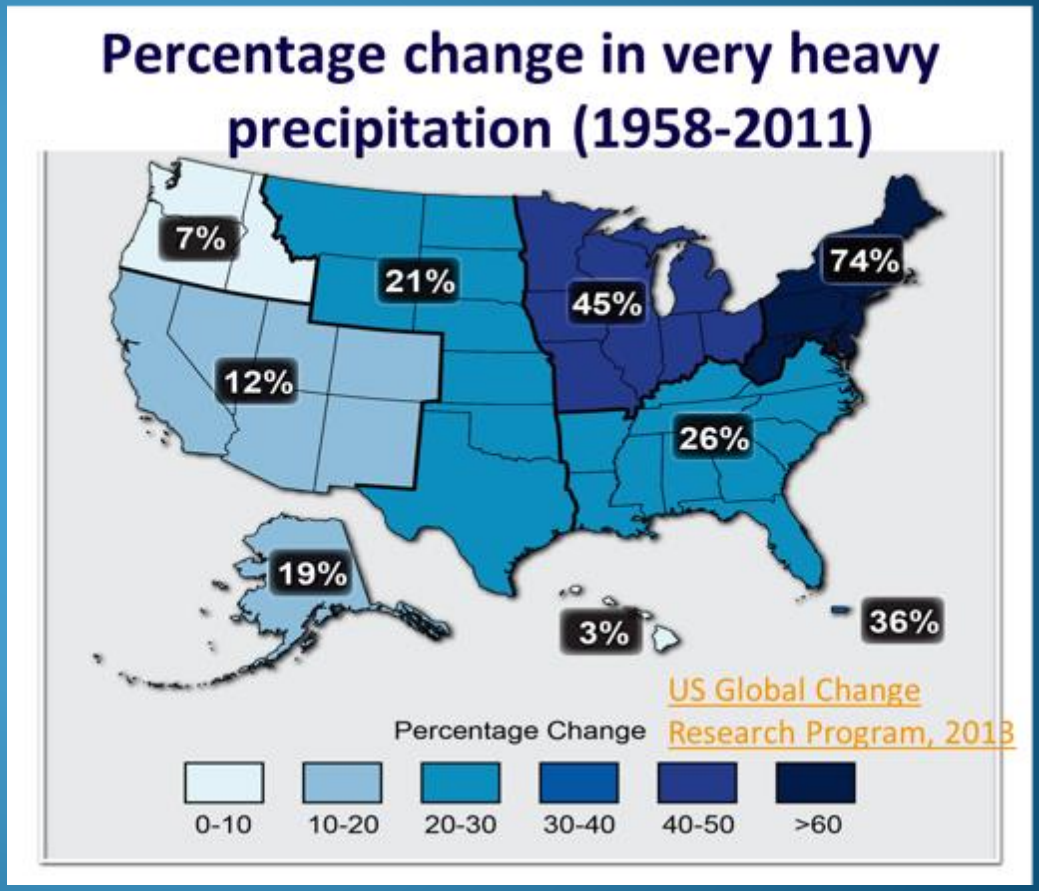
24 Disasters and Emergencies declared for NY State by FEMA from 2006-2017. 15 with rainfall and flooding; 8 with winter weather.

2012 – Hurricane Sandy, $66B
2011 – Tropical Storm Lee, $3B
2011 – Hurricane Irene, $14B
2010 – Northeast Flooding, $2B
2008 – Ice Storm, $2B
2007 – Heat/Drought, $3B
2006 – Flooding, $2B



NY has experienced and will continue to see more extreme weather events

Brief Overview

- Support made possible by FEMA from Superstorm Sandy funds
- NYS Mesonet award began 1 April 2014 & will become operational on April 1, 2018
- Network totals 180 stations, including:
  - 126 standard sites
  - 20 snow sites
  - 17 profiler sites
  - *18* surface energy budget sites
  - (plus a 12 site micronet along the Thruway)
- Data collected, quality-controlled, and disseminated every 5 min
- At least one station in every county and borough across NY

An “End to End” System

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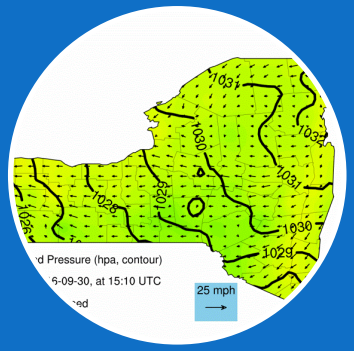
Observations

- Networks
- Sensors
- Systems

Data QA &QC

- Calibration
- Monitoring
- Correction



Analysis & products

- Visualization
- Merging

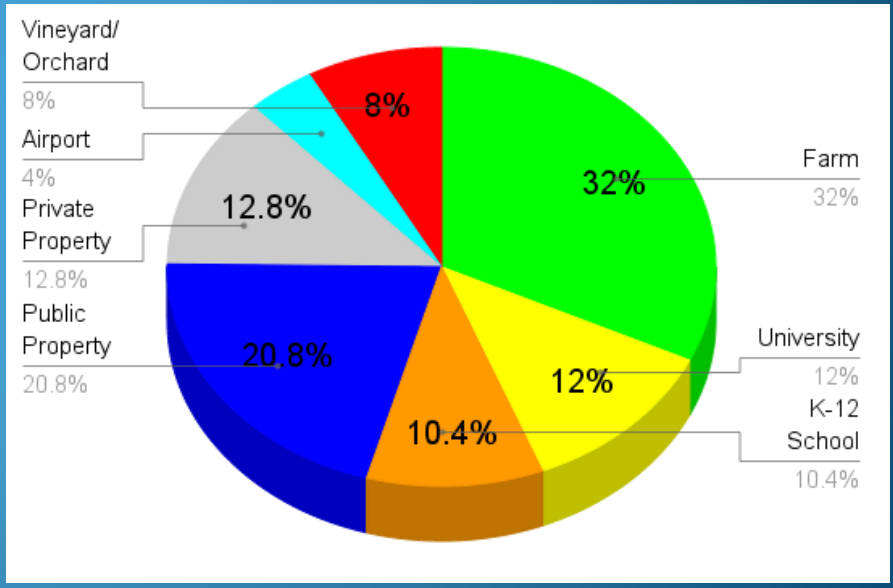
Applications

- NWS
- Emergency M.
- Transportation
- Agriculture
- …

A Mesonet is more than “just” instruments!

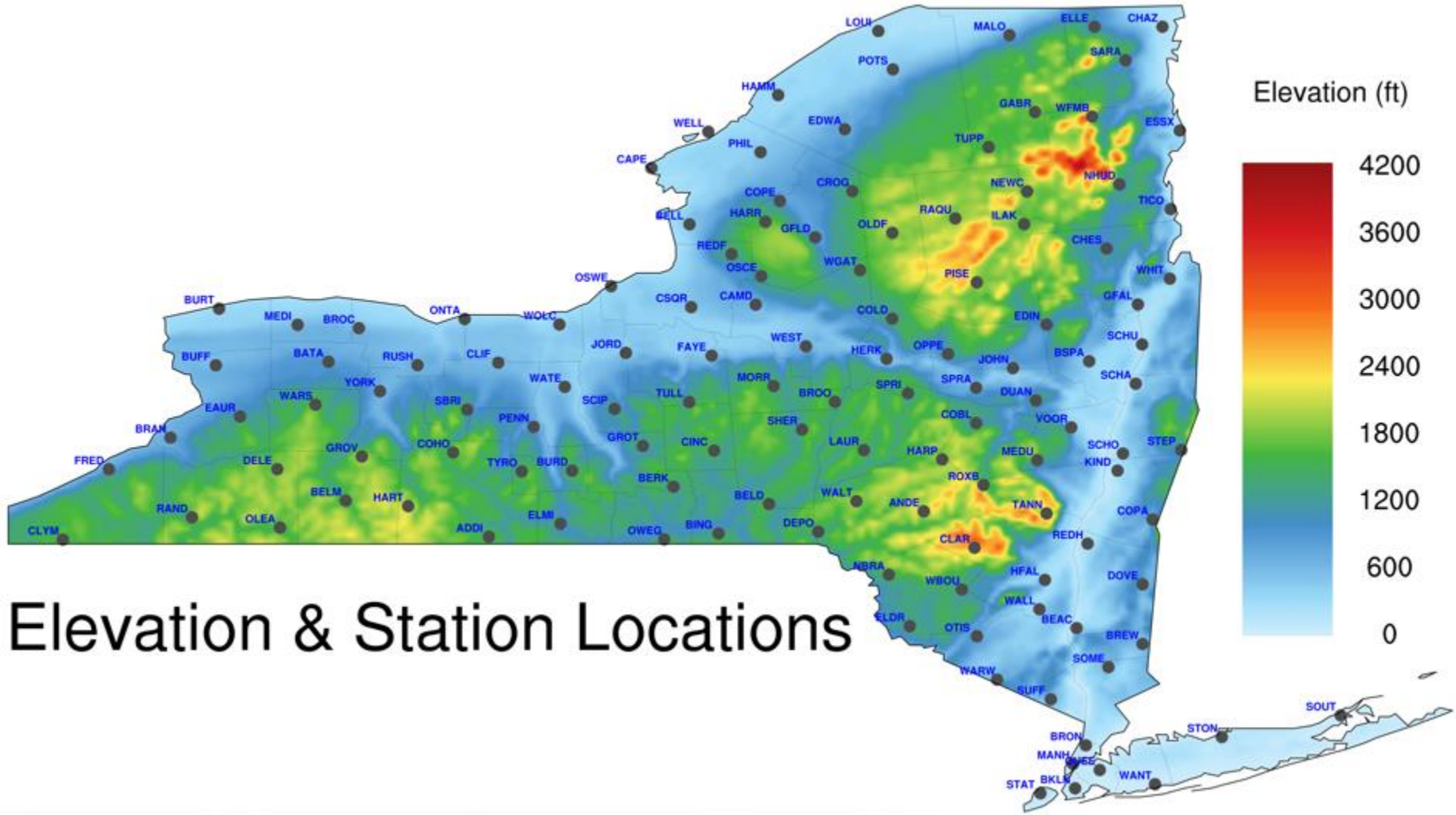
Siting Criteria

- General network configuration with 19 mile spacing
- Area representativeness – valley, high terrain, crops, forests
- NWS input – areas prone to flooding; gaps in observations
- WMO standards:
  - Generally flat terrain
  - No obstructions within 300 ft
- FEMA guidelines:
  - No flood zones, no wetlands
  - No historical property
  - No archaeologically sensitive areas



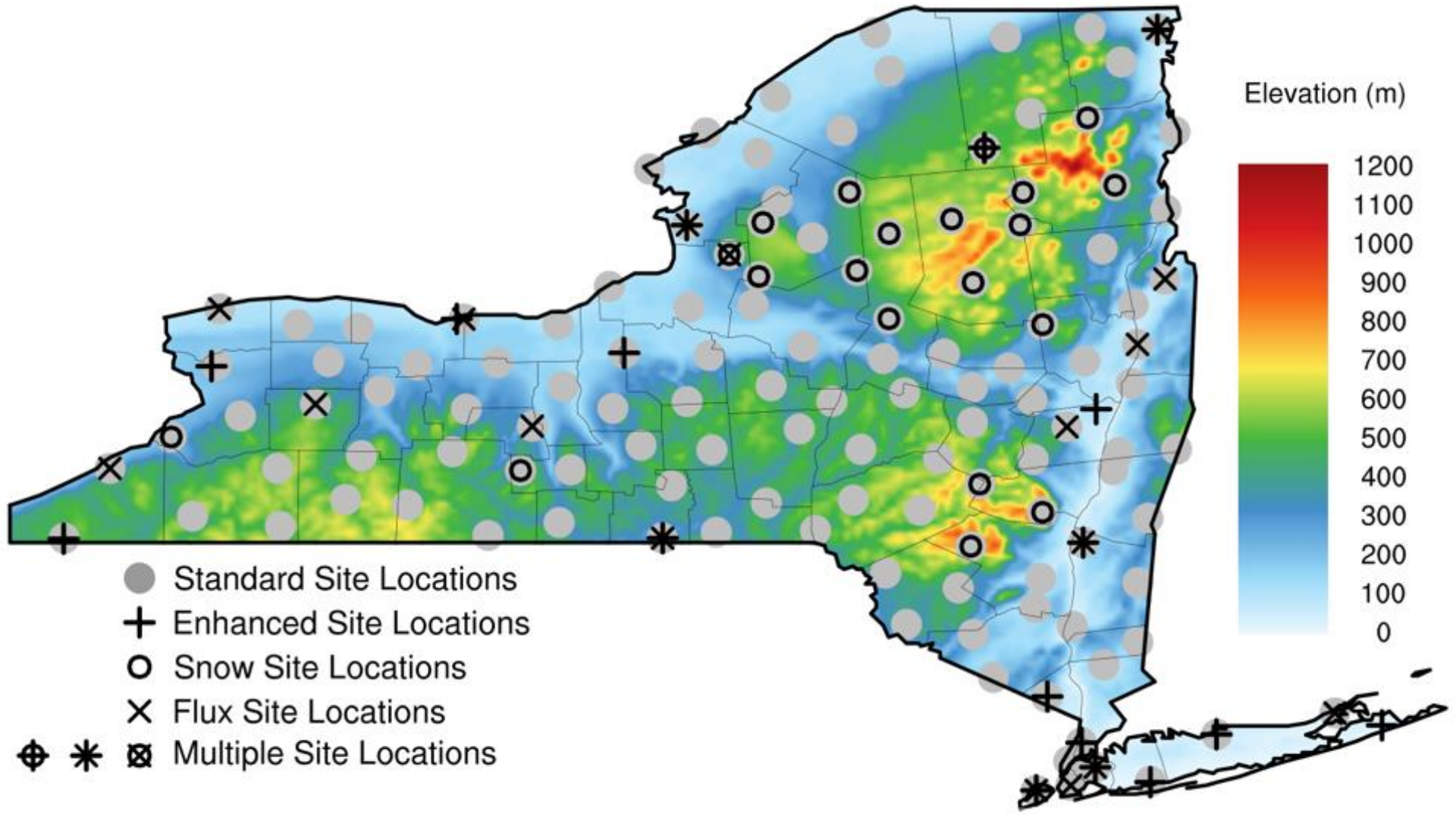

Central Square (Esker Farm)

Standard Site Locations & Identifiers



Elevation & Station Locations

Network Map


Elevation (m)
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
Standard Site Locations
Enhanced Site Locations
Snow Site Locations
Flux Site Locations
Multiple Site Locations

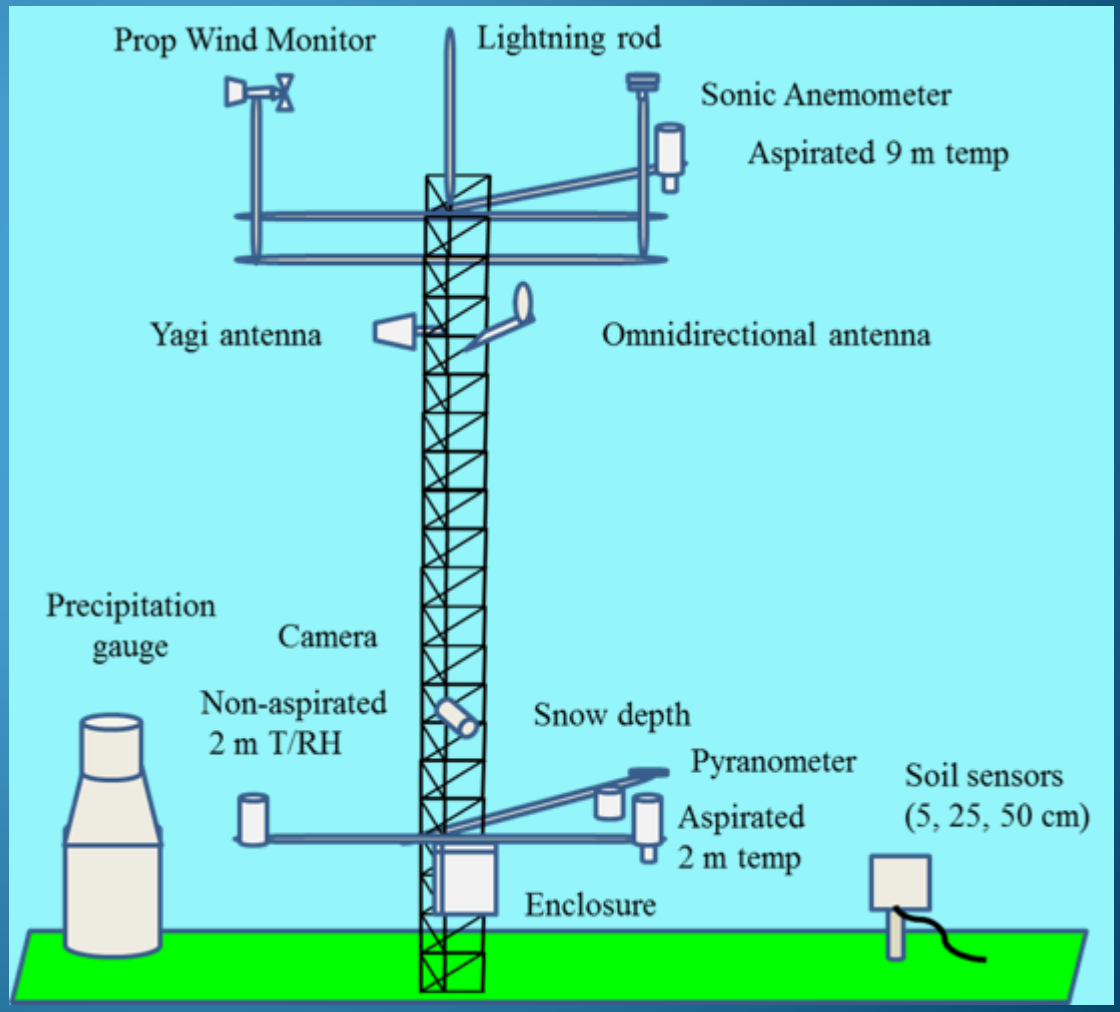
Standard Network

Standard Observations

- Precipitation
- Temperature (2/9 m)
- Wind Speed
- Wind Direction
- Surface Pressure
- Humidity (2 m)

Additional Obs

- Soil Moisture
- Soil Temperature
- Solar Radiation
- Photos
- Snow depth



Site Longevity

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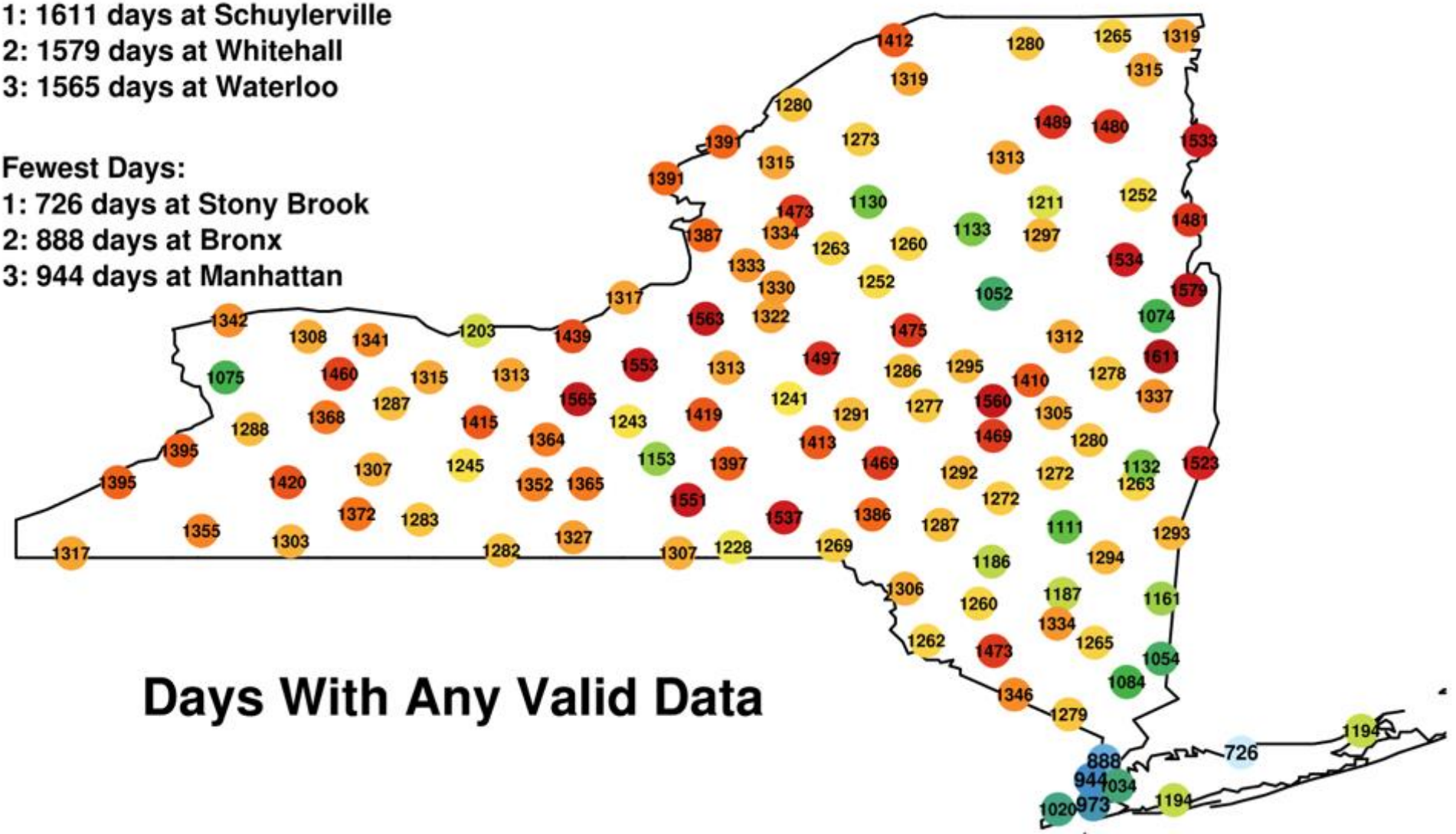
Most Days:
1: 1611 days at Schuylerville
2: 1579 days at Whitehall
3: 1565 days at Waterloo

Fewest Days:
1: 726 days at Stony Brook
2: 888 days at Bronx
3: 944 days at Manhattan



Days With Any Valid Data

Standard Network

Most Sites

Adirondack Sites

NYC Sites

First Mesonet Camera Network

NYS Mesonet
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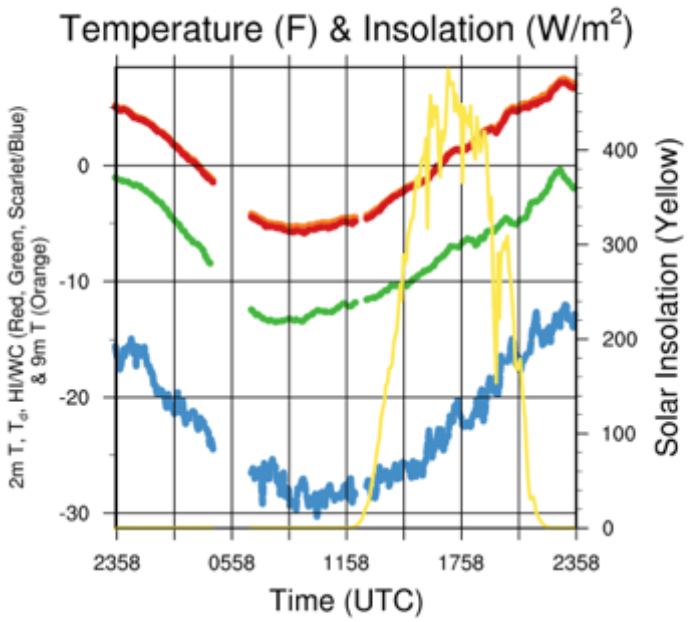
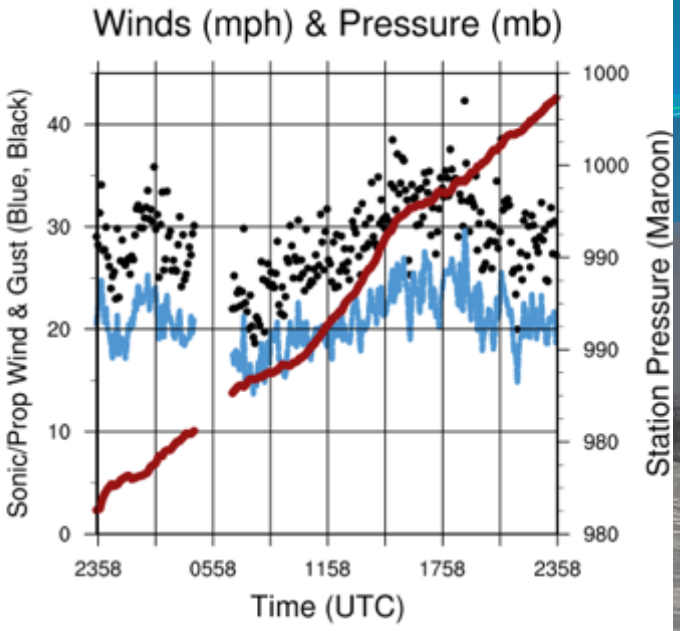
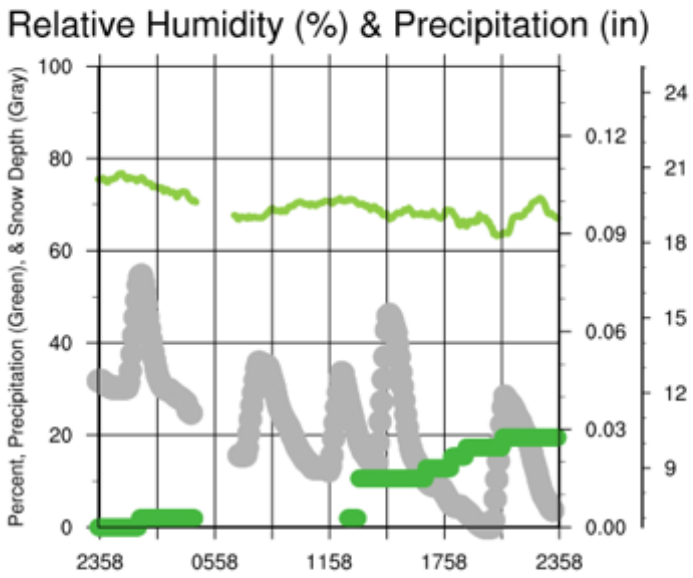
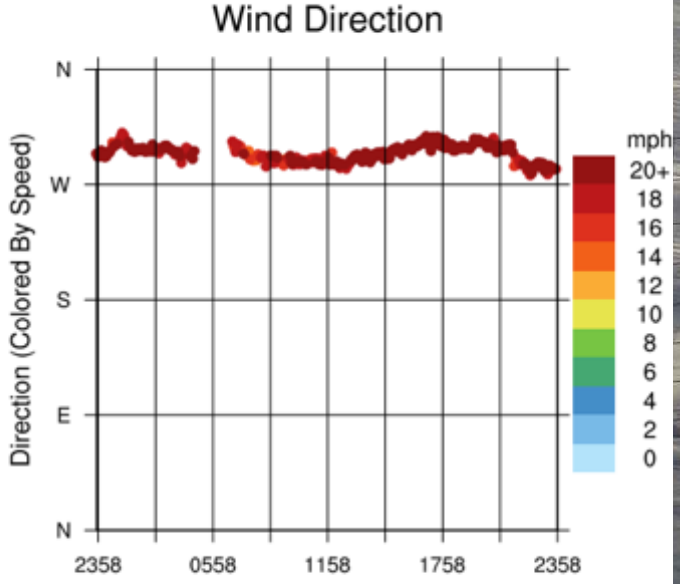
Snow Drifting

(Click to Watch)









Location: Penn Yann
Station elevation: 250.668 m
Station lat/lon: 42.6558; -76.9875
Figure created on Mon, 2019-01-21, at 23:58 UTC
Most recent data timestamp: 2019/01/21 23:55:00

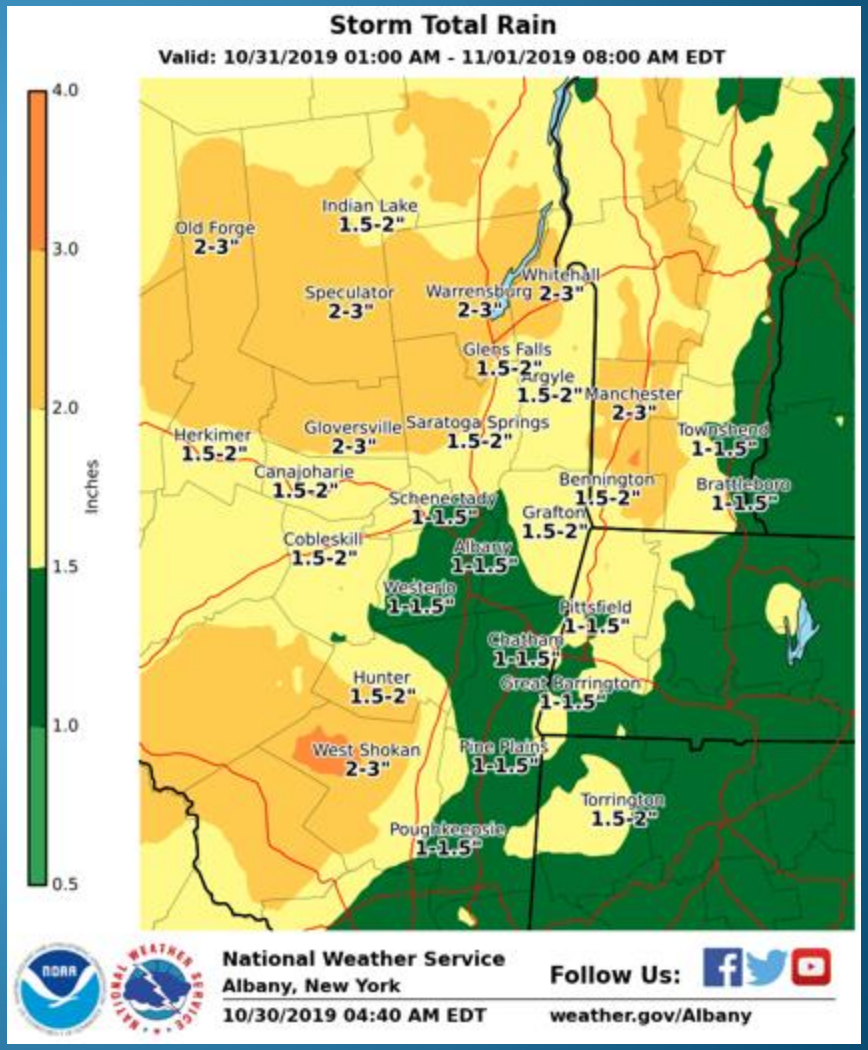
Extremes For Past 24 Hours
(High/Low/Max Wind/Precipitation/Snow Depth)
7.2/-5.8/29.6/0.03/16.7
Max Gust: 42.3 mph On 01/21 at 1905 UTC

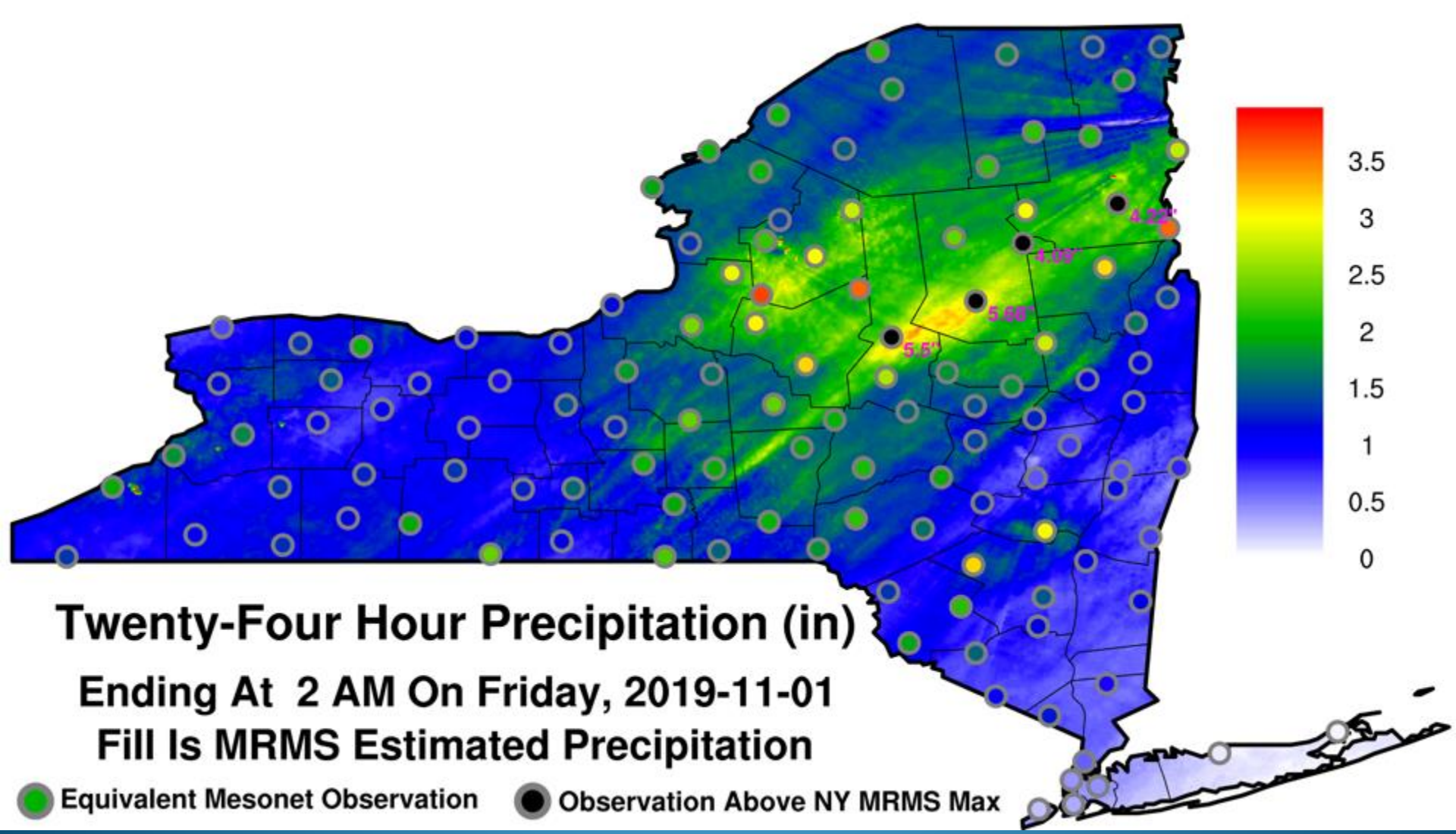
Created By Nick Bassill Using Data Provided By The NYS Mesonet

Societal Benefits

2019 Halloween Storm

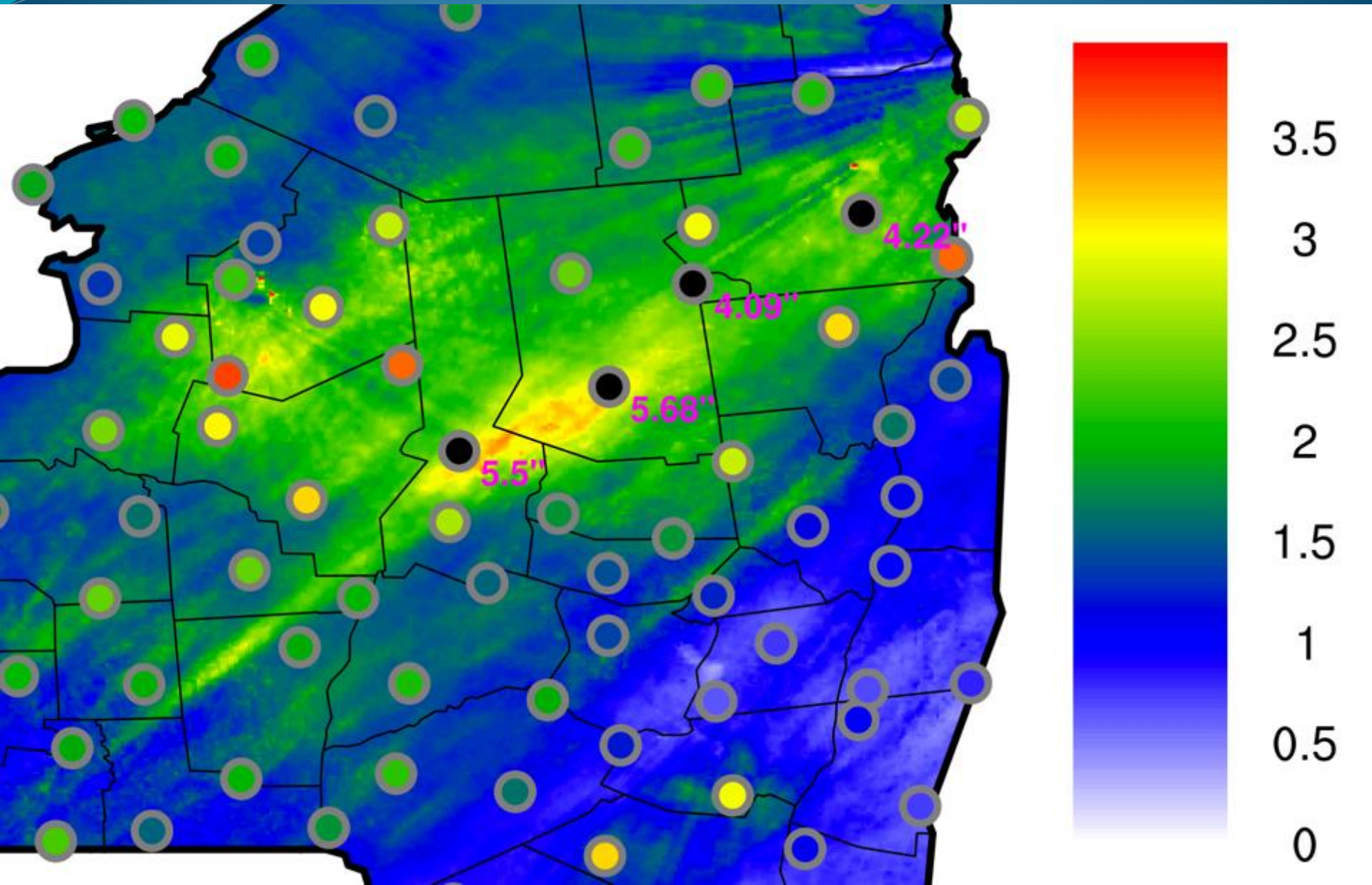
- The National Weather Service rainfall forecast issued a day before the event highlights the regions expected to get the heaviest rainfall
- The following NYS Mesonet products were available in **real-time**.





Real-time NYS Mesonet rainfall observations were 2-3" more than radar estimates, which depicted about 3" of rain

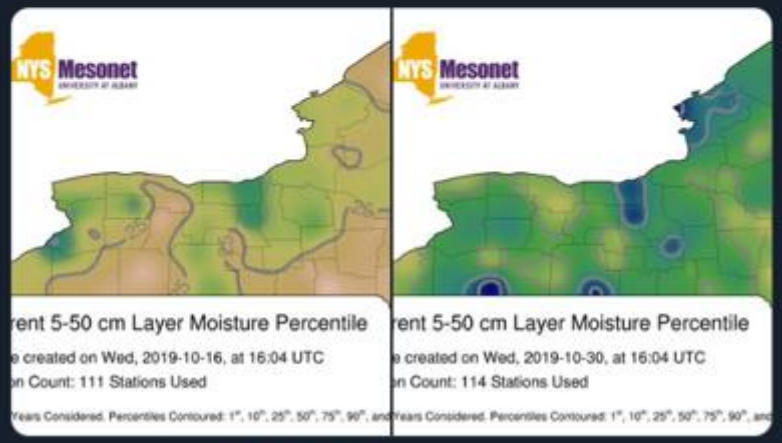
Significant Area Of 4”+



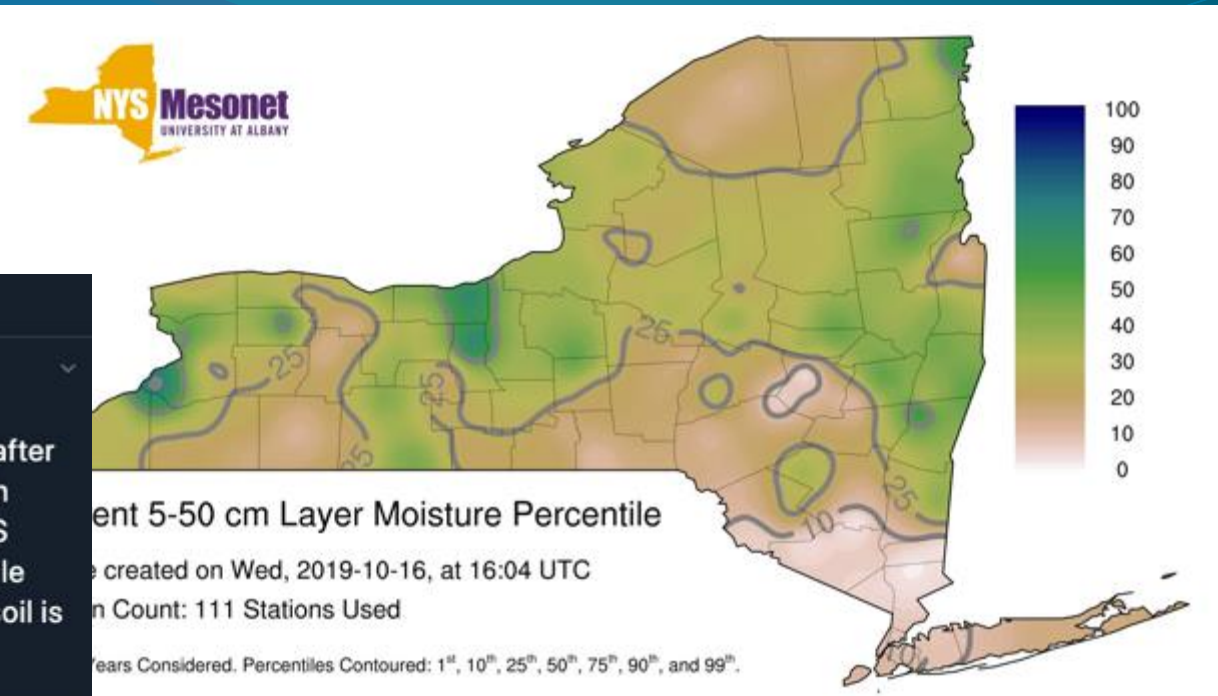
Tweet

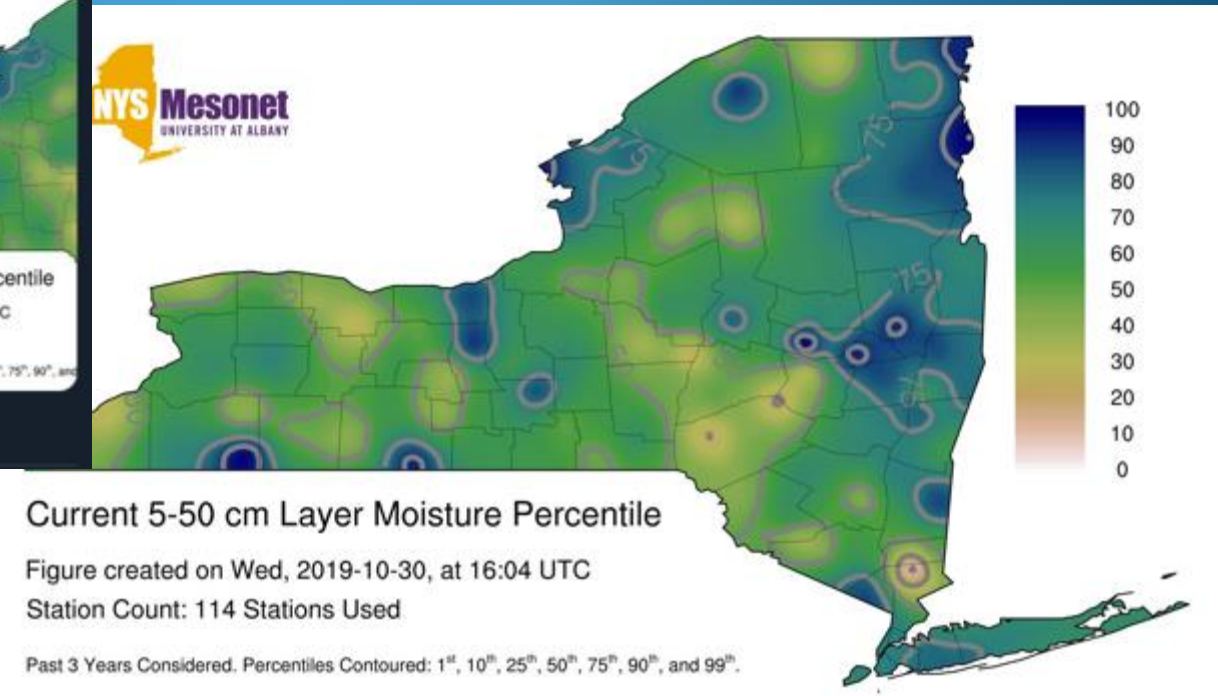
Nick P Bassill
@NickPBassill

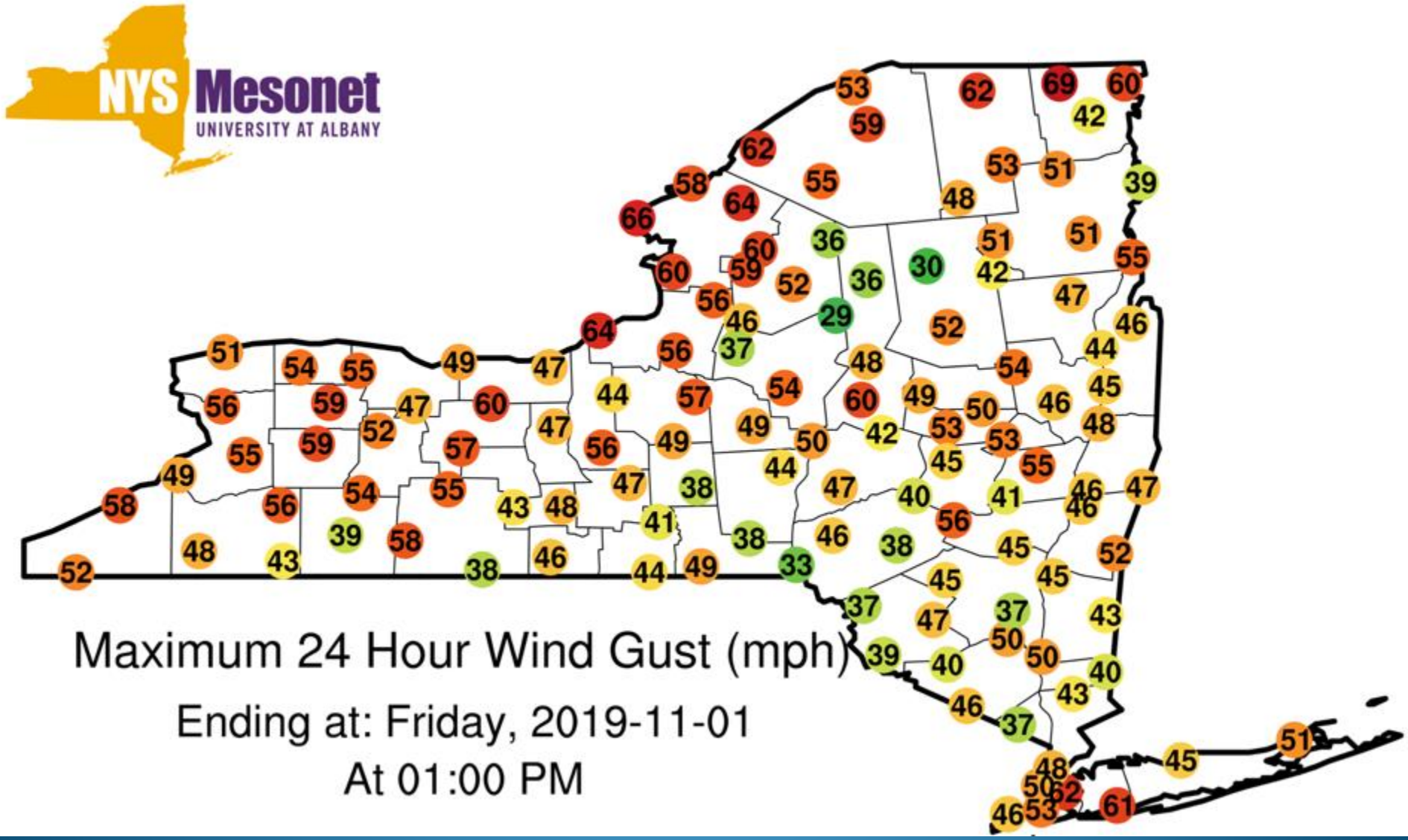
Tomorrow's #NY storm will arrive almost 2 weeks after the last big storm. Both were forecast to be big rain producers, but this one has more widespread NWS flood products. Why? These soil moisture percentile maps made with @nysmesonet data indicate the soil is wetter now. #nywx



11:22 PM · Oct 30, 2019 · Twitter Web App







- Many locations across NY received 50+ mph wind gusts
- Many of these gusts occurred after significant rainfall

NYS Mesonet Value

Major flooding in parts of Herkimer County due to very anomalous moist **flow** anchored to terrain just north of the Mohawk River. Over 5 inches of rain in that area seen in NY State **Mesonet** observations is running off into rivers and creeks causing **major flooding** and mud slides. Areal flooding occurring in parts of Hamilton County and Fulton County. The ongoing flooding will continue to be addressed with river **flood** warnings and areal **flood** warnings. The NY State **Mesonet** observations have been key to assessing near term **flood** potential and wind threats with the storm.

NWS forecast discussion from the morning of Nov. 1st

- The National Weather Service used NYS Mesonet observations in real-time to issue flood and wind related products, which likely saved lives and property
- NYS Mesonet data also assisted with post-storm assessment by National Grid and other organizations
- ***"What you have provided here would have taken us days to come up with and we would not have come close to how complete the information is. This is EXTREMELY helpful."***
  – Director of Emergency Planning, National Grid

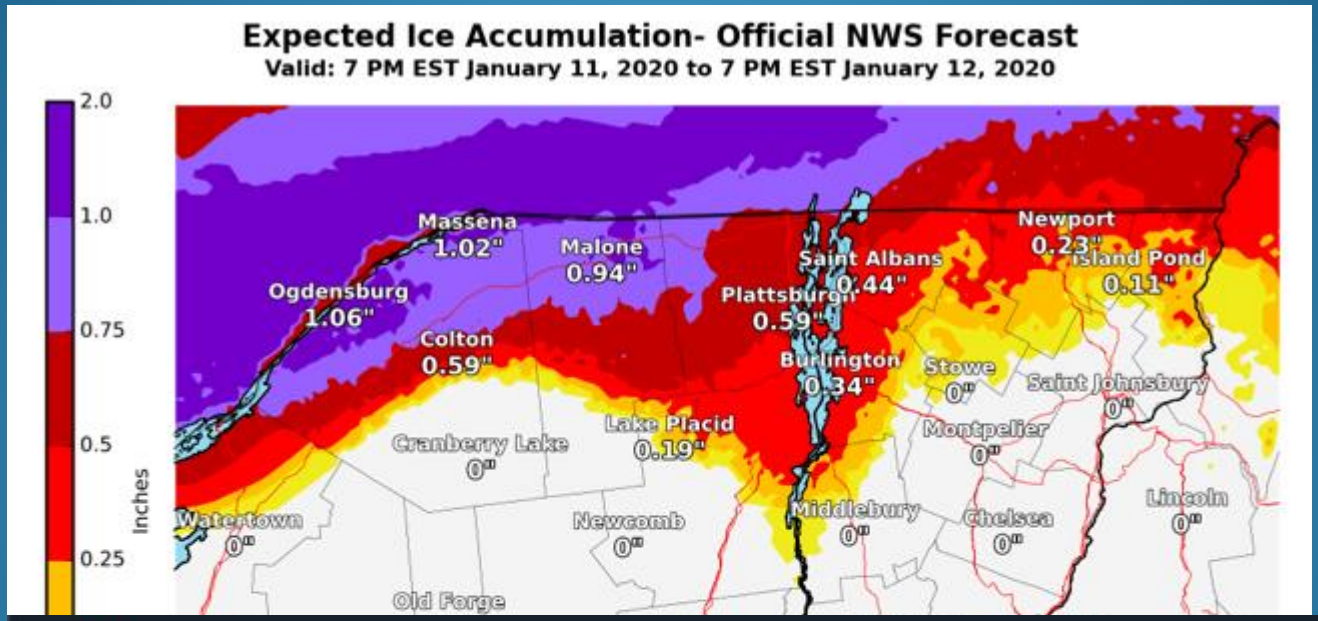
NOVEMBER 27, 2019 | Albany, NY

Governor Cuomo Calls on Federal Government to Grant Disaster Declaration for Devastating October 31 Storm

NYS Mesonet data is used to make the case for disaster assistance

The National Weather Service and New York State Mesonet data indicate upstate New York received a widespread two to five inches of rain with isolated amounts up to seven inches during the storm. Although it began on October 31 and lasted into November 1, most rain fell within a six-hour period. This storm produced heavy rainfall, flash flooding and strong winds. In fact, flooding reached record levels on the West Canada Creek at the Hinckley Dam and Kast Bridge, Sacandaga River at Hope and Mohawk River at Little Falls. Some residents in the Mohawk Valley also needed to be evacuated, including residents in the Village of Frankfort in Herkimer County near Moyer Creek and in Chadwicks in Oneida County near Sauquoit Creek. Forty State and local members of Task Force 2, the State's swift water rescue team, rescued 65 people and 14 animals during the storm. www.governor.ny.gov/news/governor-cuomo-calls-federal-government-grant-disaster-declaration-devastating-october-

January 10-12, 2020 (Ice+Wind)

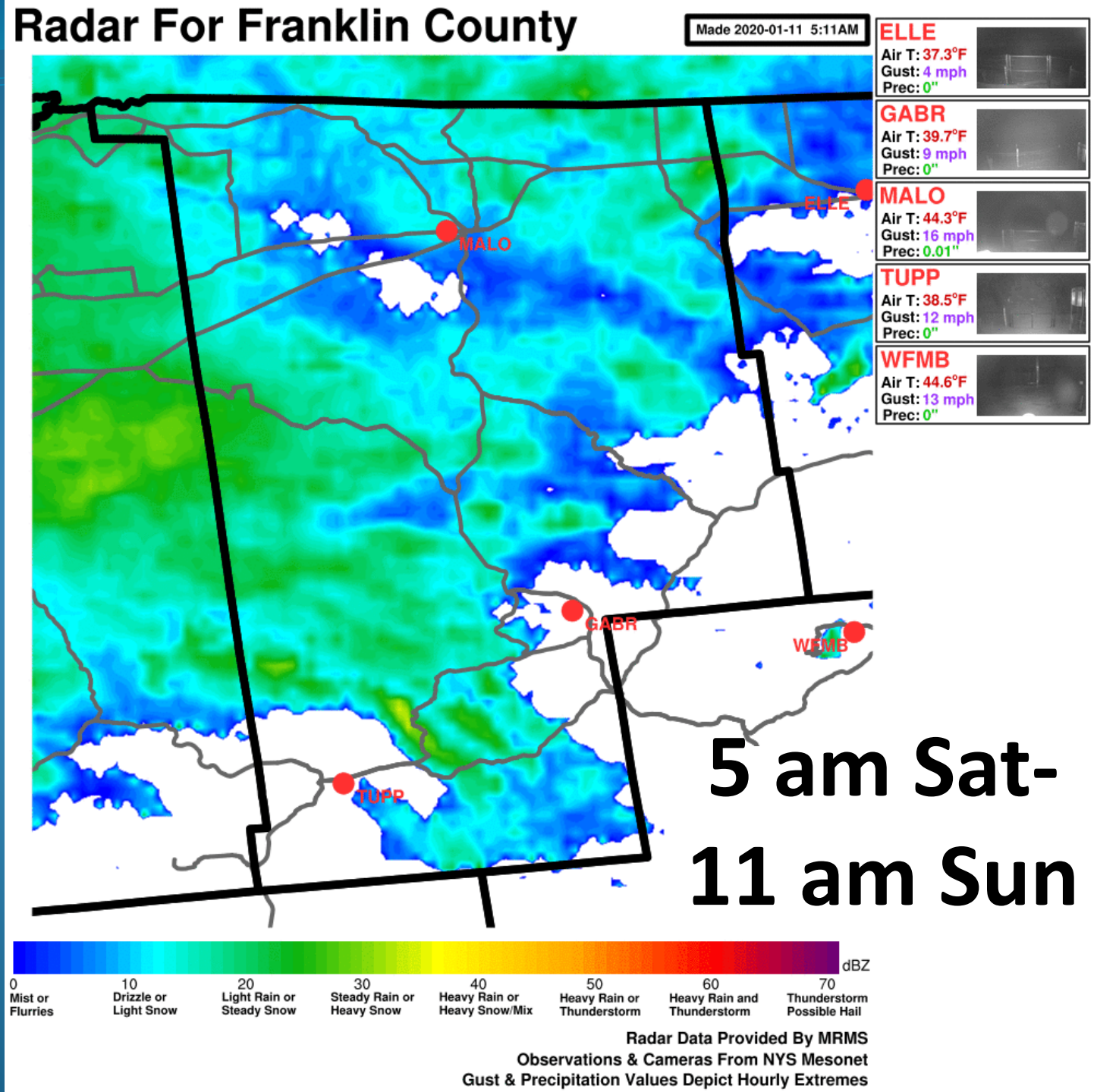


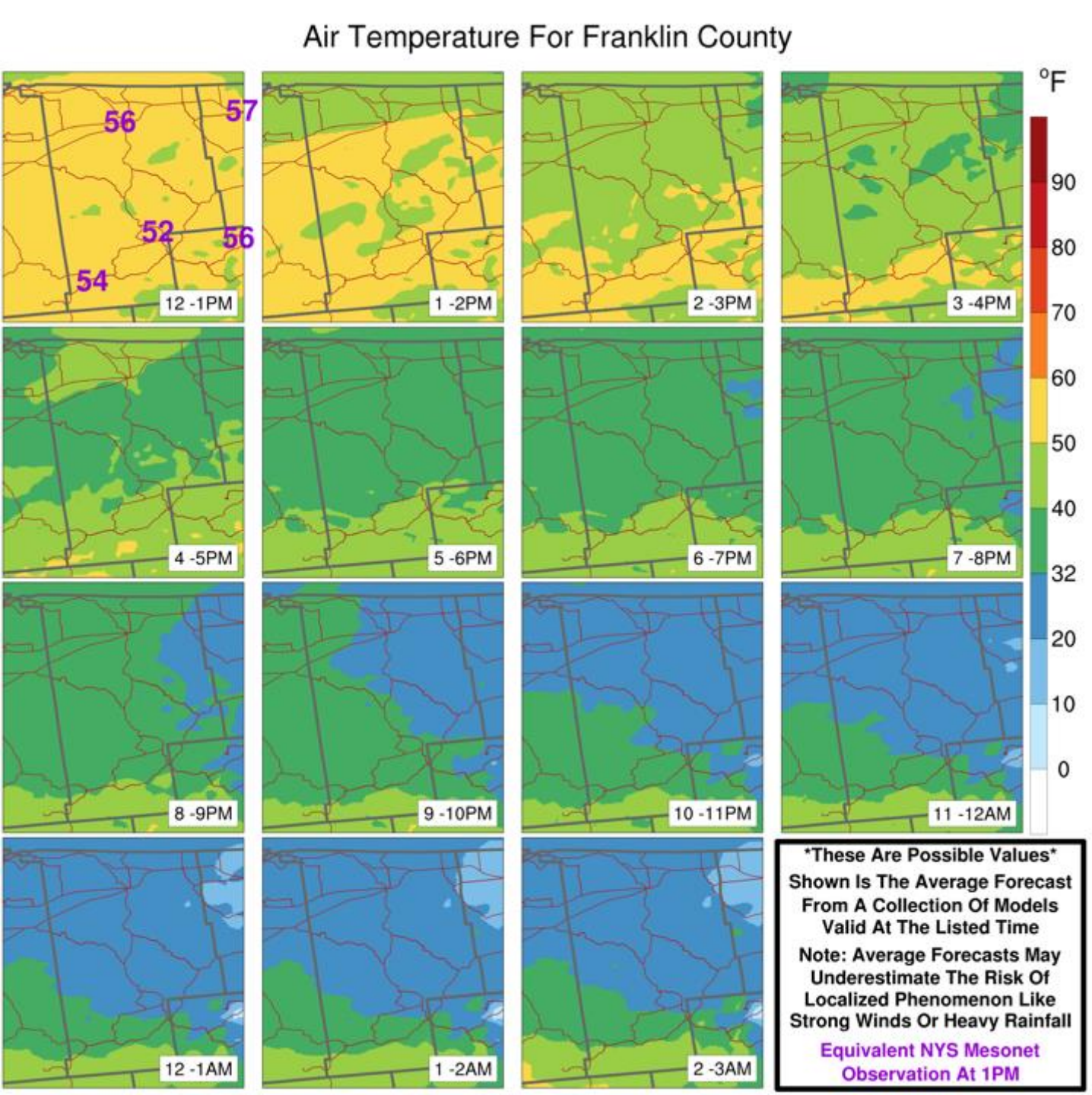
NWS Burlington ✓
@NWSBurlington

Key hazards from Saturday evening through Sunday:
** Freezing rain. Where accumulation is expected to exceed 0.5" an ice storm warning has been issued.
** Flooding. Rainfall amounts of 1 to 2.5 inches will combine with snow melt to cause a flood risk of rivers and streams.

Putting Data In Context:

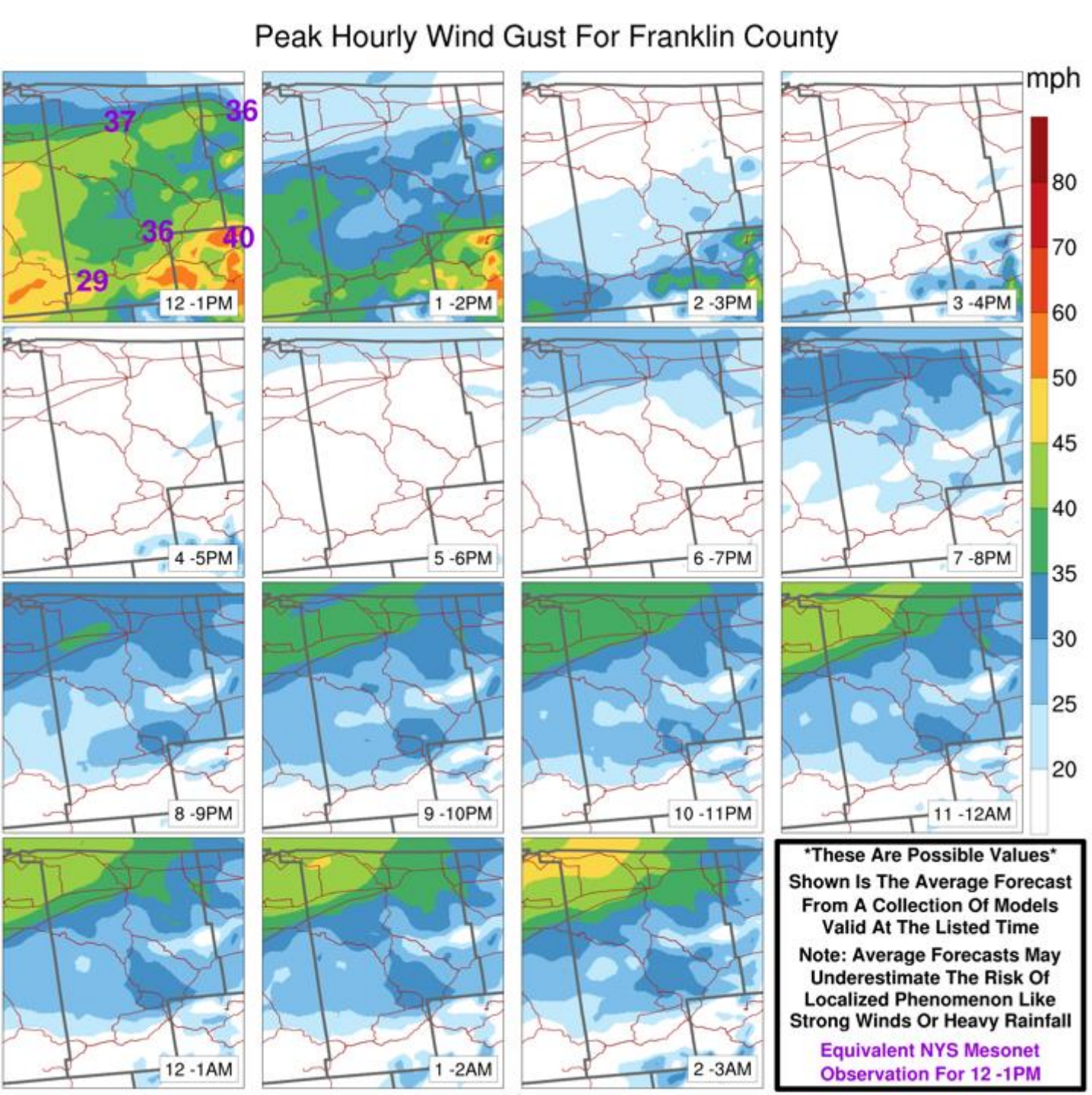
Radar





Putting Data In Context:

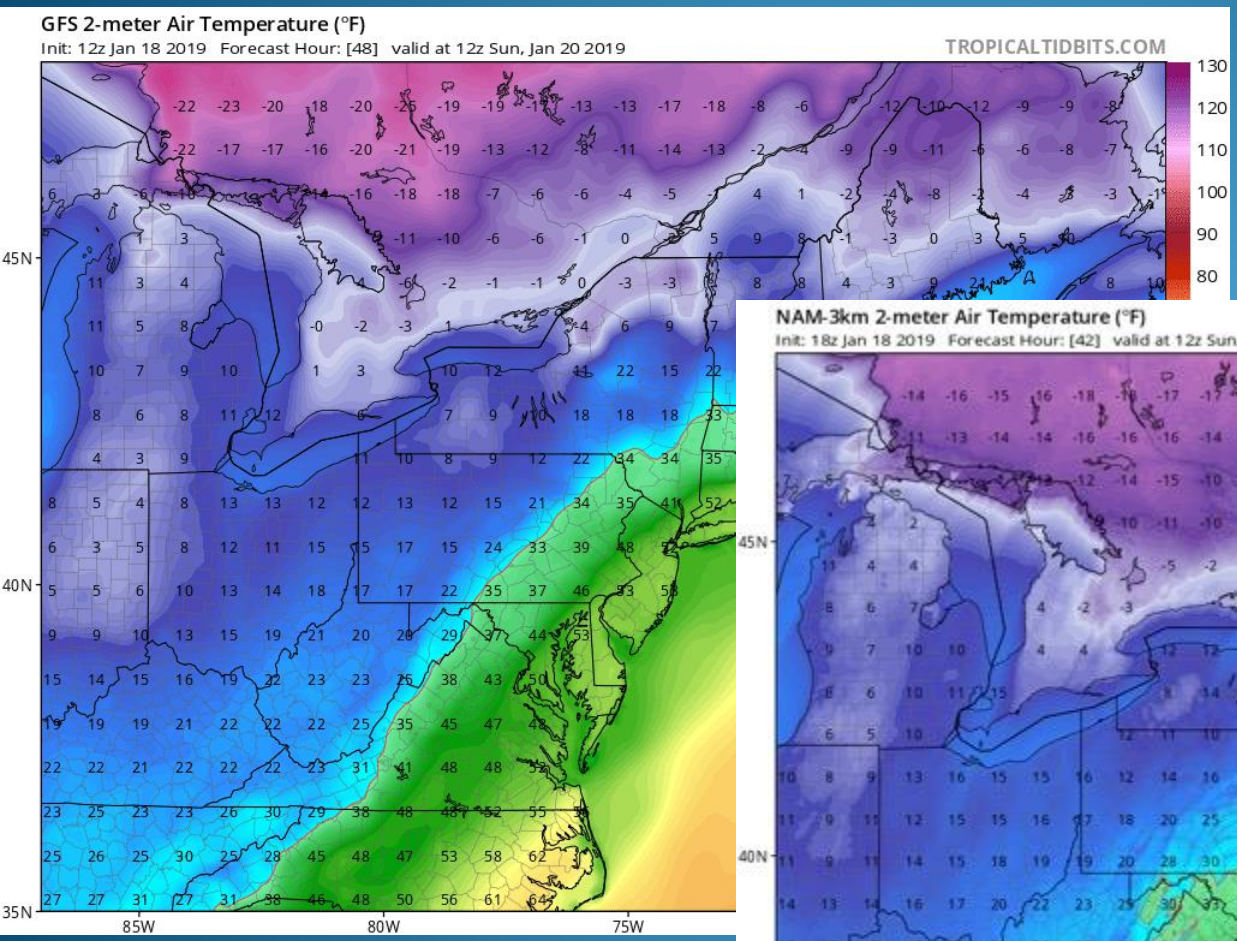
Models

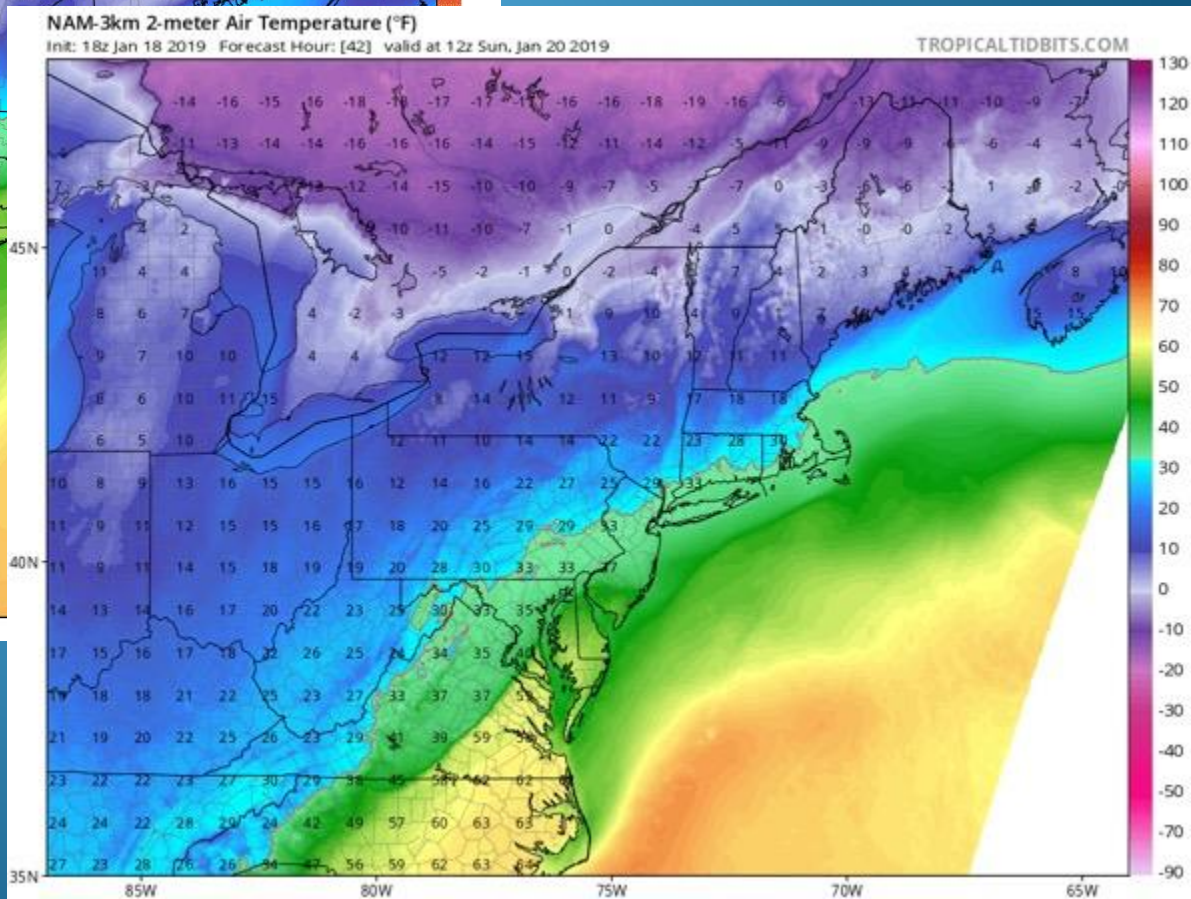


Putting Data In Context:

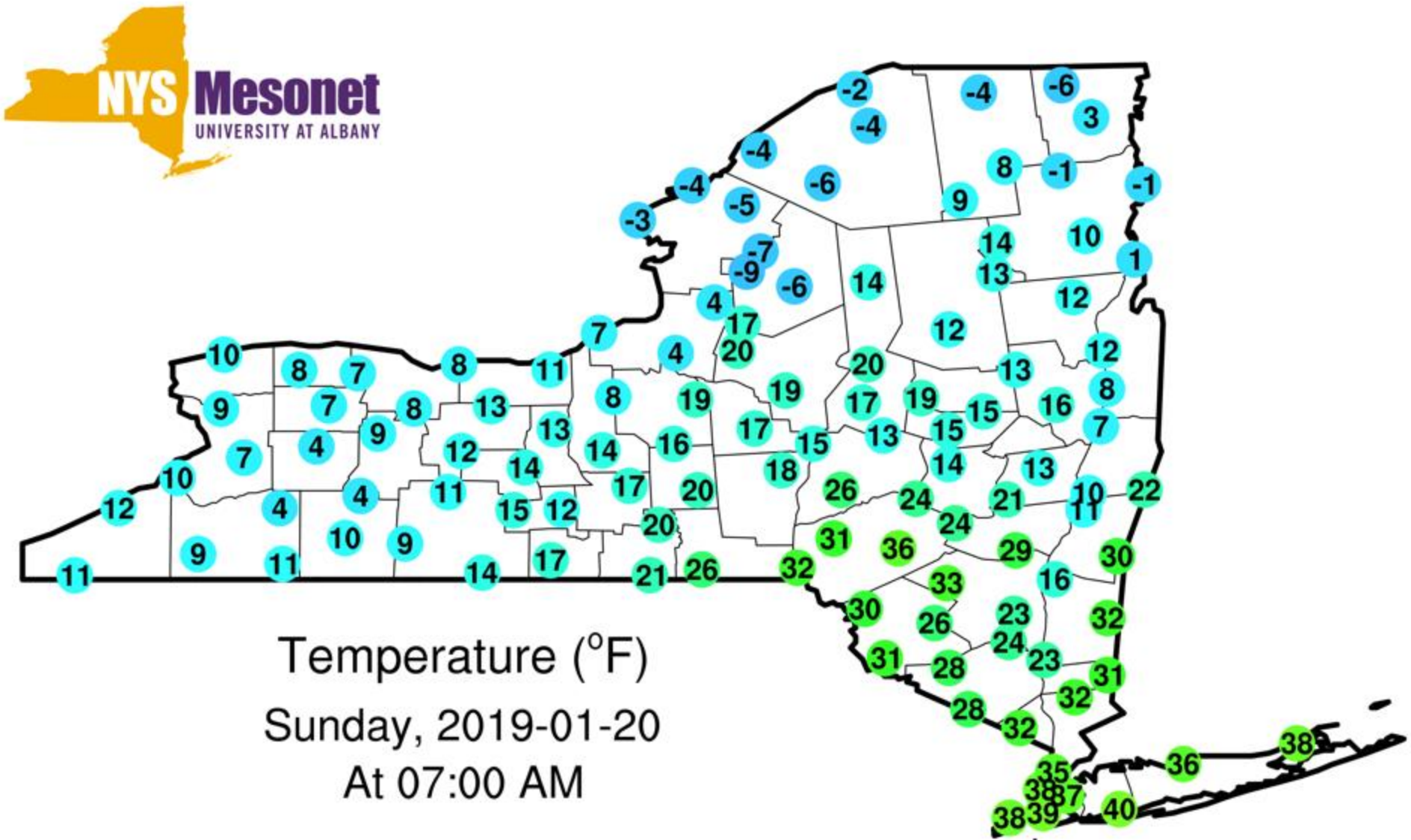
Models

January 20-21, 2019 Winter Storm





January 20-21, 2019 Winter Storm



Many Other Uses

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State University of New York

Return to Statewide

University at Albany

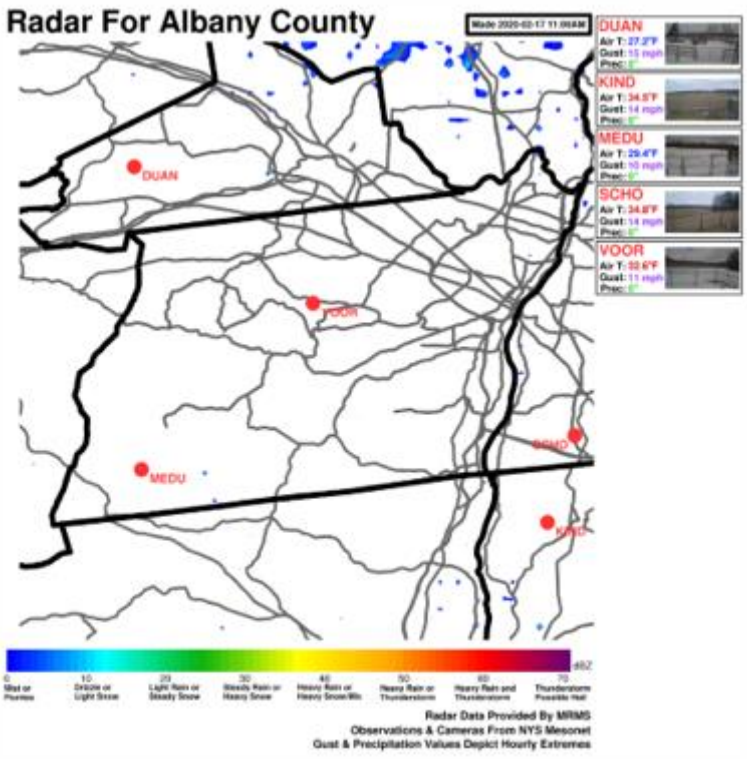
Hourly Products Update Each Hour | Current Radar Overview Map Updates Every 10 Minutes | Click Cameras For Loop |

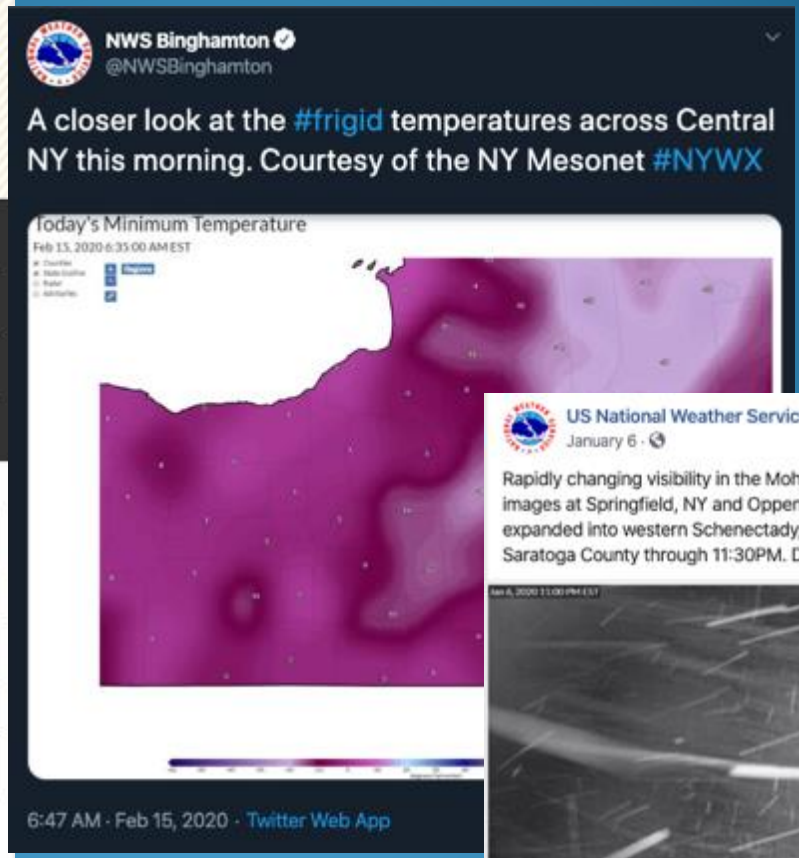
Update Dashboard:

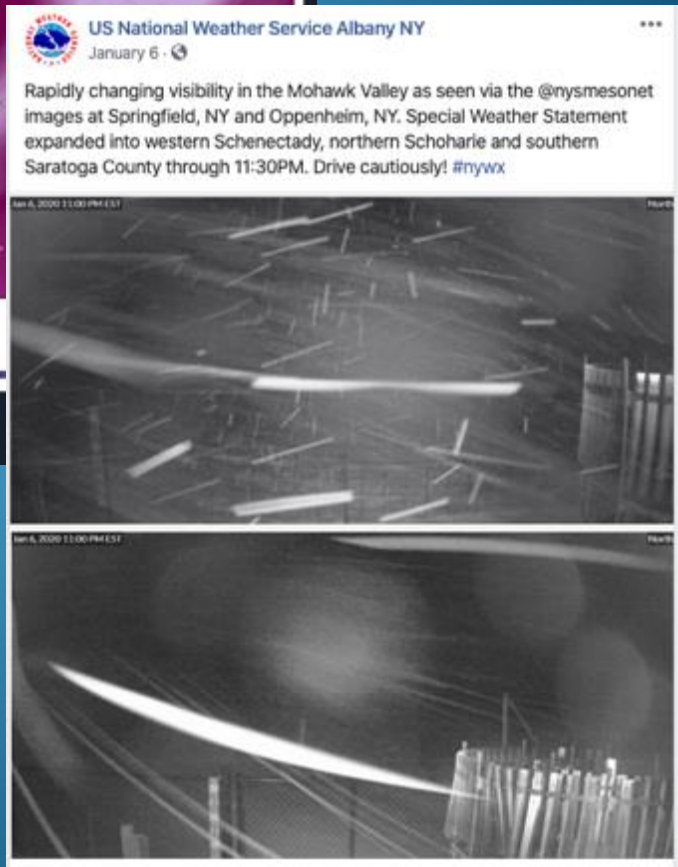
Weather Maps

Time Range

Risks







Questions?