



Ground Truth Observations & Importance of Data Quality

February 1, 2021

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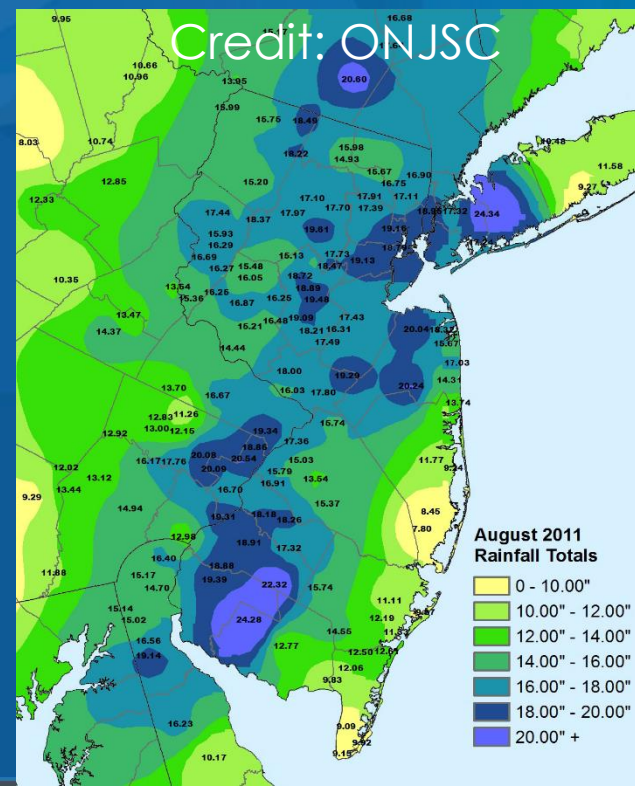
Outline

- My Background
- Define “Ground Truth Observations”
- Weather Instruments & Data Networks
- Why Should We Care?
- Conclusion



My Background

- Bachelor's Degree in Meteorology Rutgers University 2007-2011
- Weather Observer for New Brunswick Cooperative Weather Station
- Research Assistant for NJ State Climatologist
- Operational Meteorologist Private Sector 2011-2016
- Joined NWS Albany Staff Jan 2017



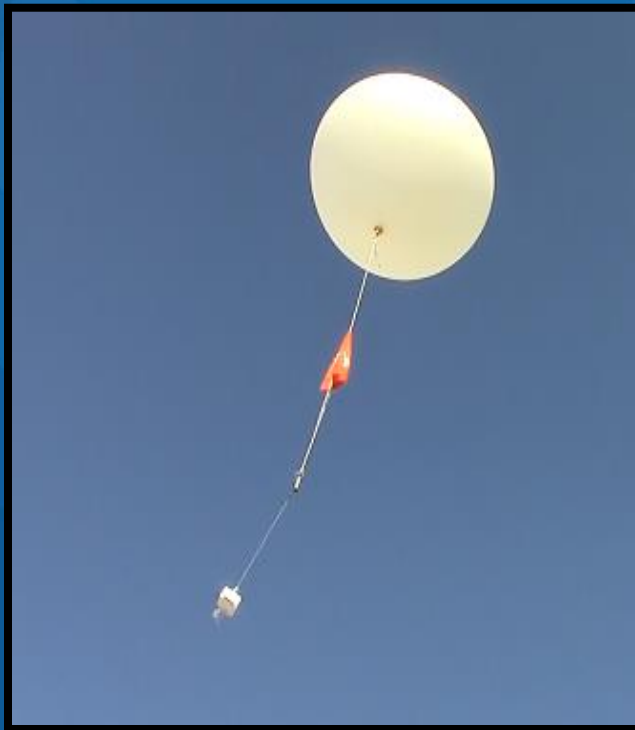


Define" Ground Truth Observations"

Snow, rain, wind or temperatures measured with weather instruments at the ground. Models give us a prediction but we need to verify our forecasts using real weather instruments.



25 inches of snow!
December 2020



Weather Balloons
NWS Albany



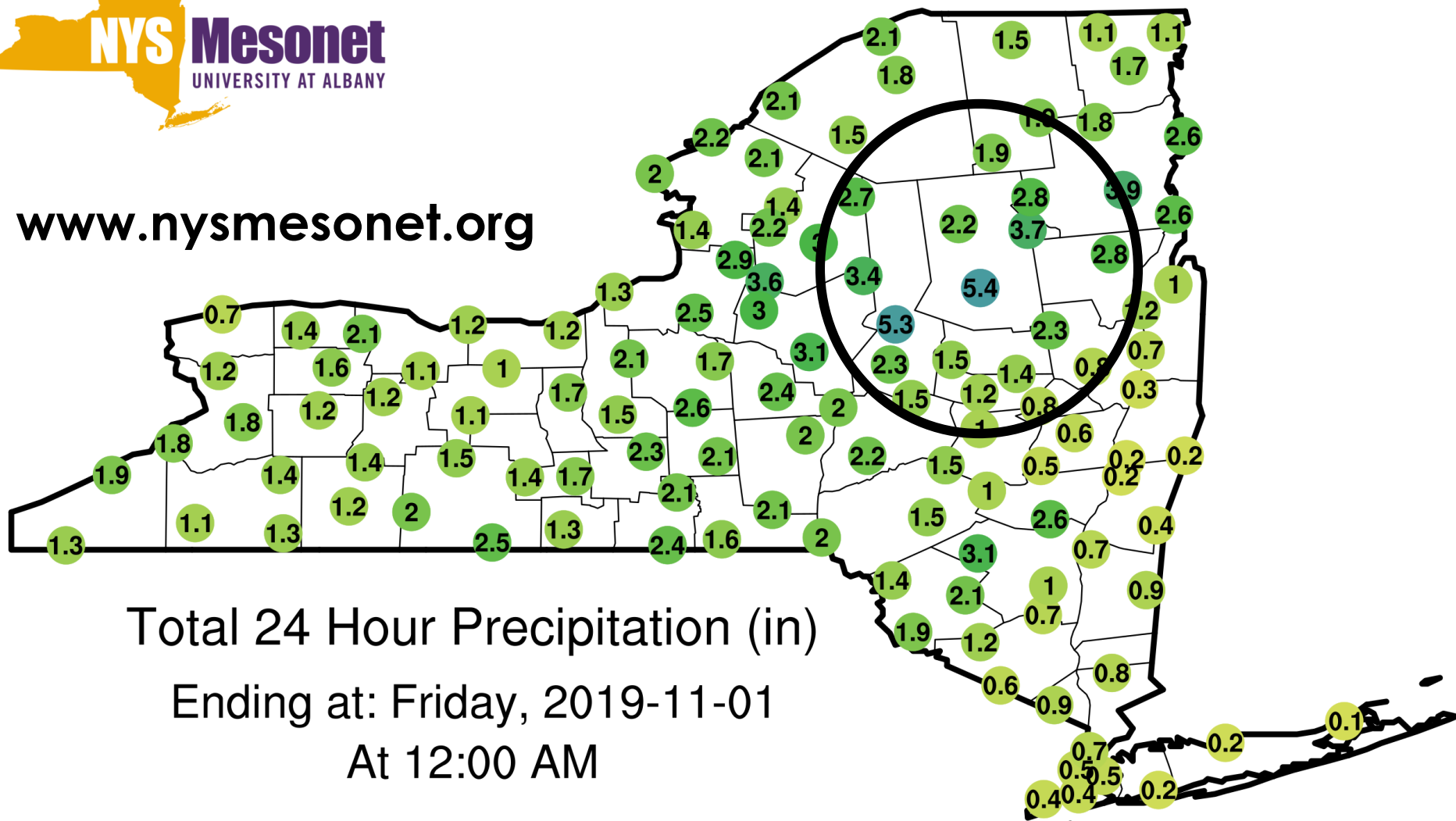
7.40 inches of rain!
Jul 30 – Aug 14, 2018



Halloween 2019 Flooding Event



www.nysmesonet.org



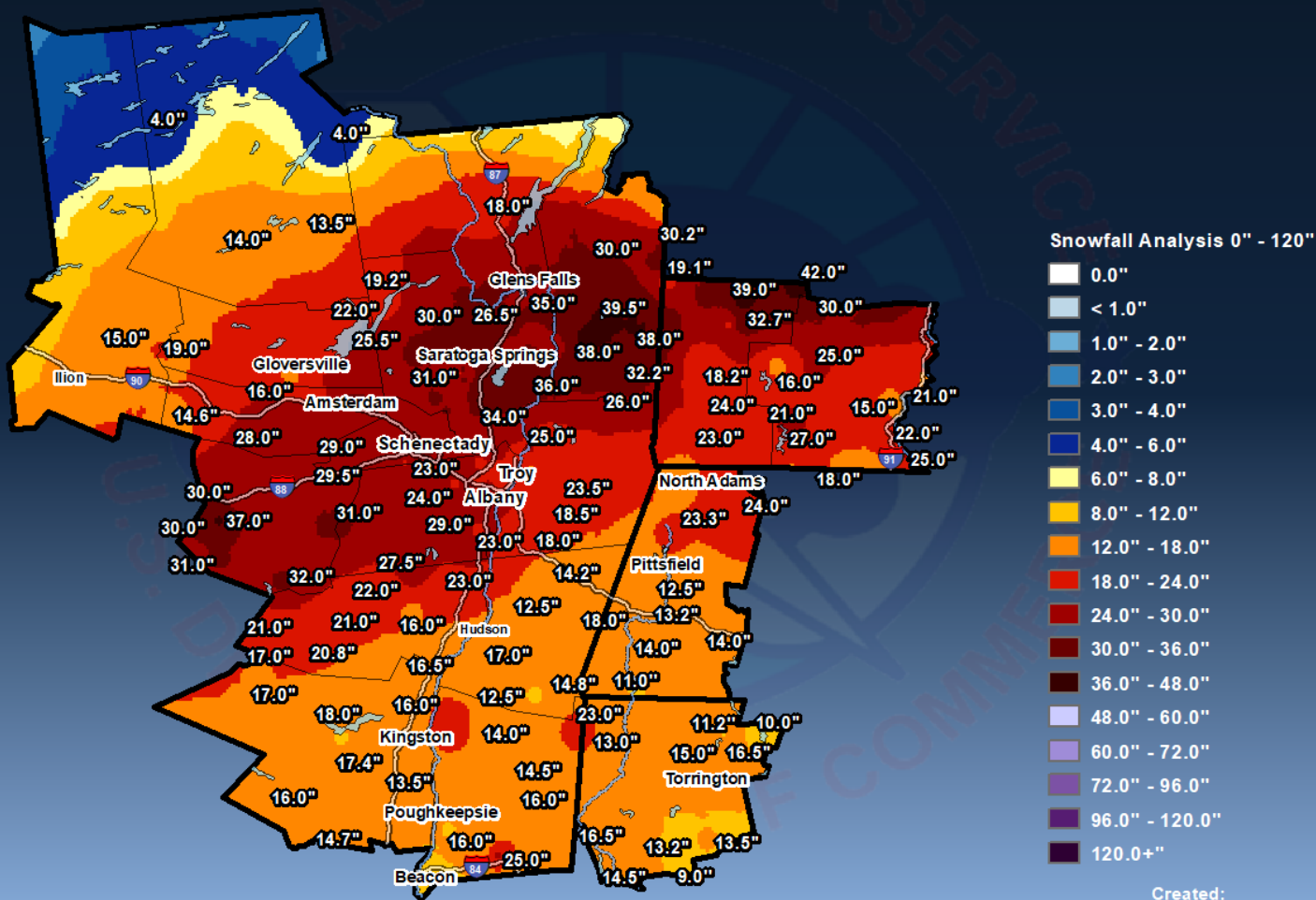


December 1 – 3, 2019 Snow Storm

National Weather Service Albany New York

Historic Snowstorm 16-17 December 2020

Analysis Data Source: Regional Observations





Weather Instruments & Data Networks

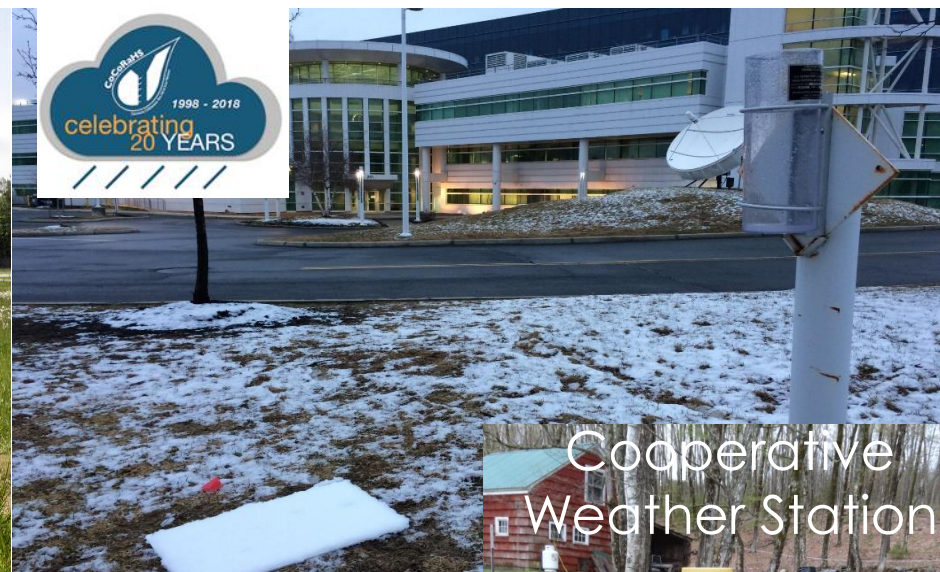
Let's Discuss! What are examples of climate data networks?



Weather Instruments & Data Networks



ASOS



Cooperative Weather Station



ASOS



Cooperative Weather Station



Cooperative Weather Station



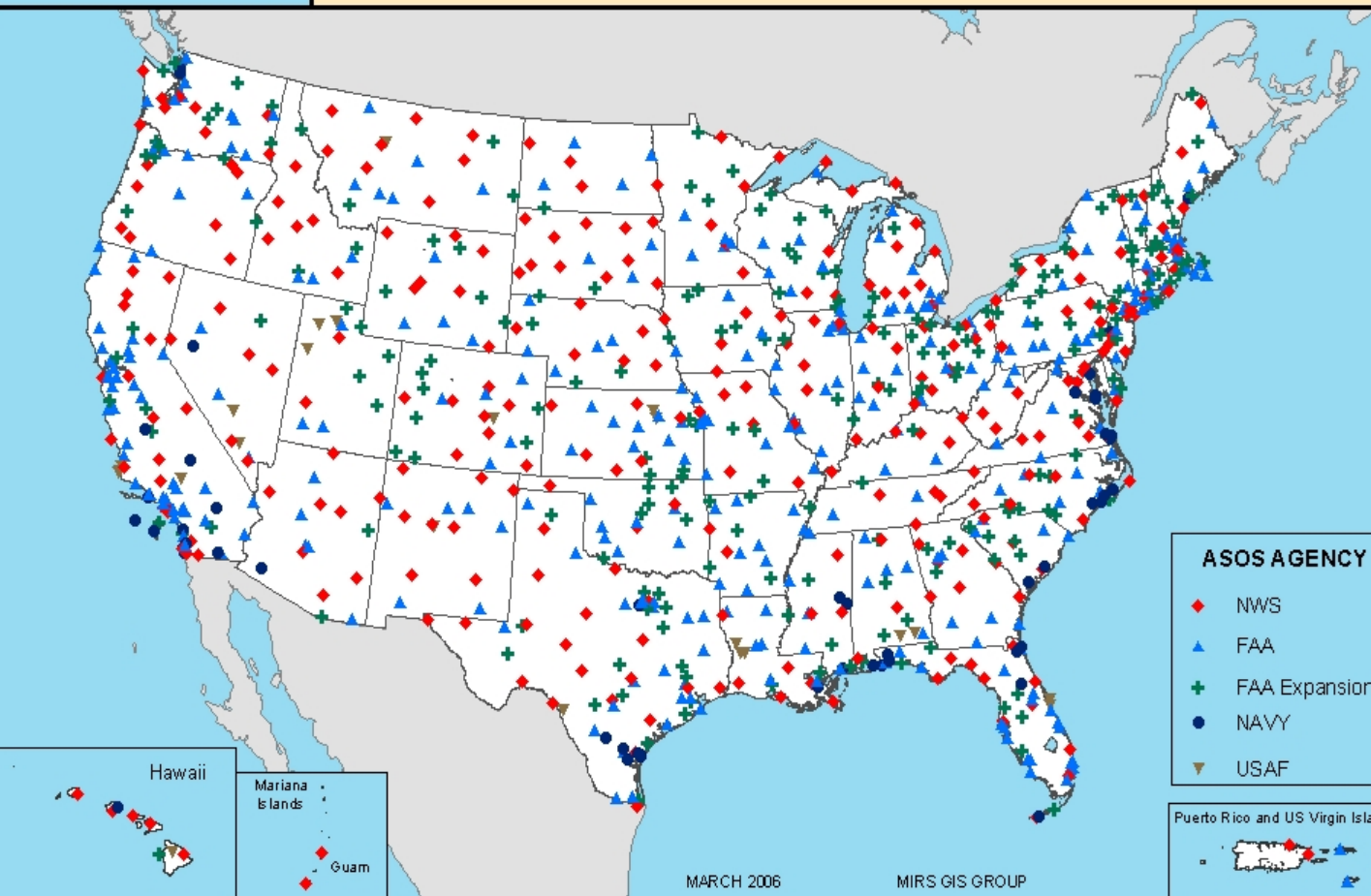
Weather Instruments & Data Networks



Alaska

NATIONAL WEATHER SERVICE ASOS SITES

Automated Surface Observing System (ASOS)



ASOS Measure Calendar Day....

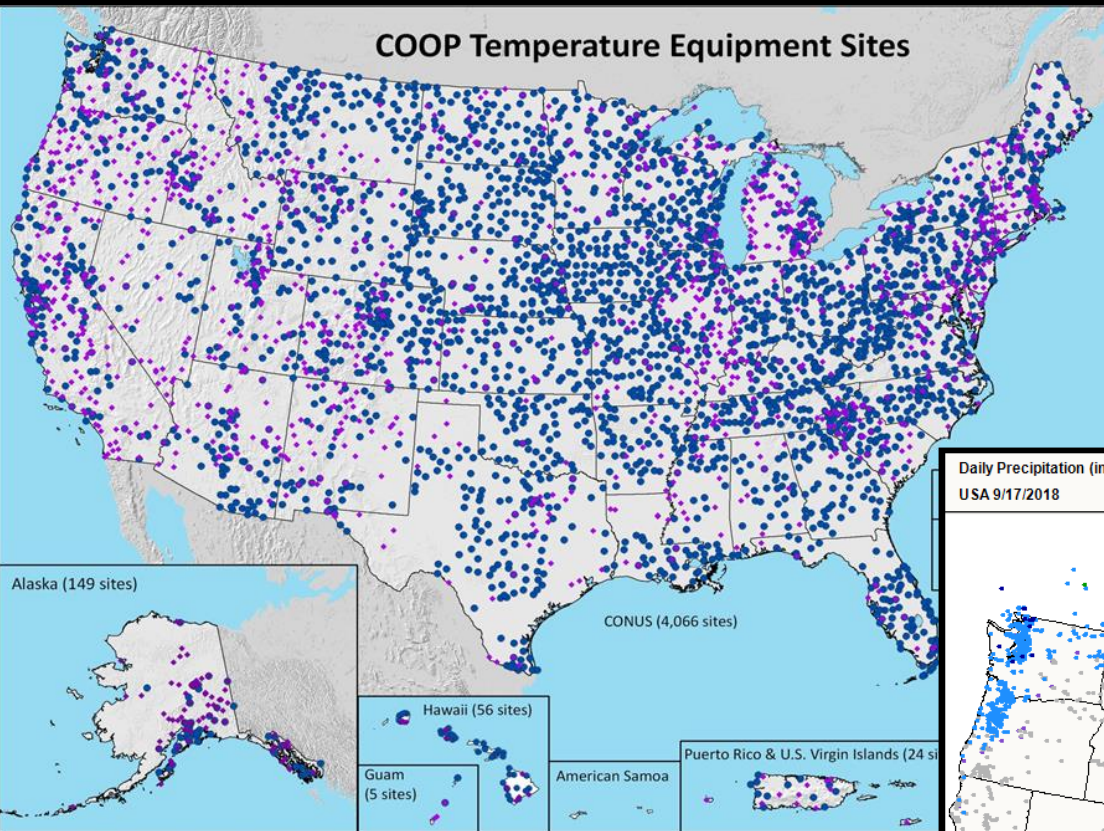
- Temperature
- Precipitation Amount & Type
- Wind speed & direction
- Pressure
- Cloud Coverage & Ceilings
- Ice Accretion
- Lightning
- Visibility

Major Airports have Contract Weather Observers (CWO)- Measure snowfall!



Weather Instruments & Data Networks

COOP Temperature Equipment Sites



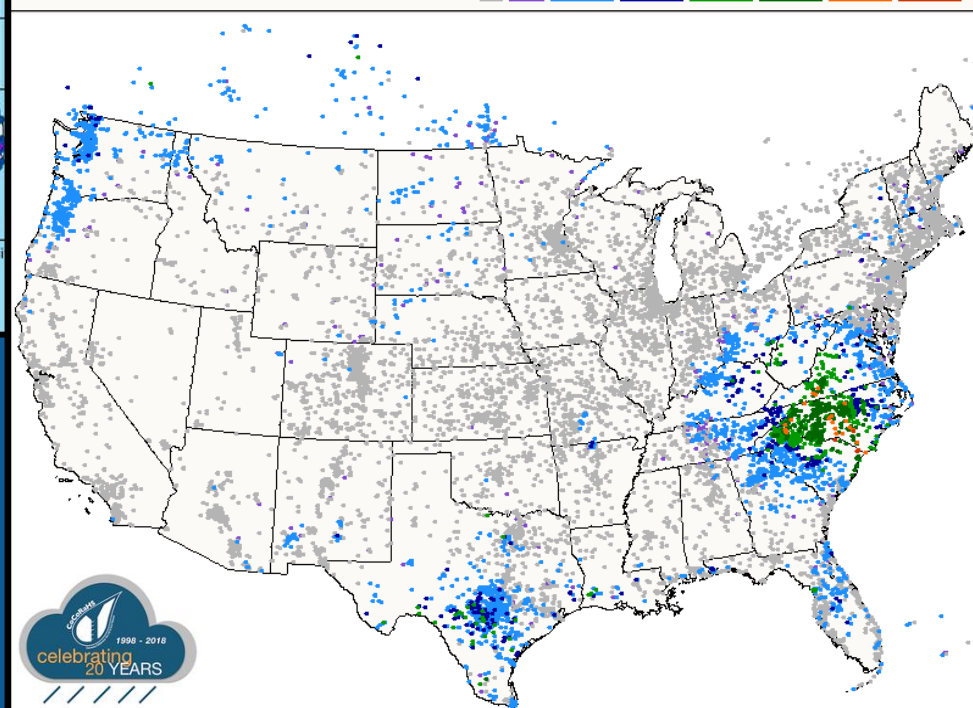
CoCoRaHs Stations **Measure**
7/8am-7/8am

- Snowfall and Precipitation

Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

USA 9/17/2018

0.0 Trace 0.01-0.58 0.59-1.16 1.17-2.91 2.92-7.00 7.01-10.50 10.51-11.68



Cooperative Weather Stations
(Coop) **Measure 7/8am-7/8am**....

- Temperature (Max/Min/Obs)
- Snowfall and Precipitation



NYS Mesonet

Courtesy of Daily Gazette

Anemometer

*Temperature/Dew Point
Sensors*

Rain Gauge

n (ft)
4200
3600
3000
2400
1800
1200
600
0

Ele



Why Should We Care?

Let's Discuss! Why is it important to find out the “ground truth”?



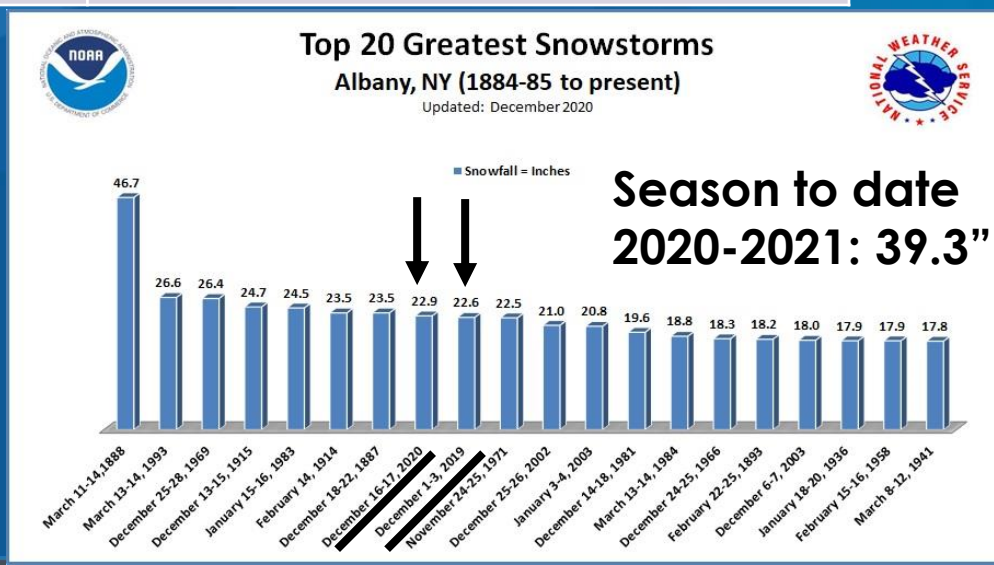
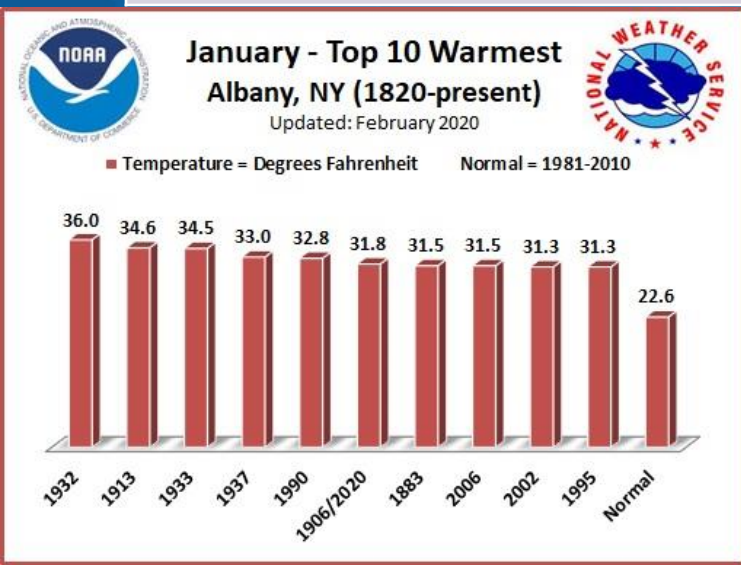
Why Should We Care?

- Learn current conditions, verify forecasts & learn about model biases
- Maintain the integrity of climate database (need to quality control data!)
- Create 30 year climate normals (NCEI)
- Disaster Declarations from FEMA



Fast Climate Facts

	Albany, NY
Normal Seasonal (Oct – Apr) Snowfall	60.3"
Normal Annual Precipitation	39.35"
Normal Monthly Temperature for January	22.6°F (Jan 2020 +9.9°F above normal as of 1/26/20)





Why Should We Care?

U.S. Drought Monitor Northeast

October 13, 2020

(Released Thursday, Oct. 15, 2020)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	32.76	67.24	49.35	24.58	5.85	0.00
Last Week 10-06-2020	32.76	67.24	49.35	27.27	5.85	0.00
3 Months Ago 07-14-2020	32.41	67.59	24.59	1.71	0.00	0.00
Start of Calendar Year 12-31-2019	99.61	0.39	0.00	0.00	0.00	0.00
Start of Water Year 09-29-2020	29.83	70.17	45.34	26.30	3.91	0.00
One Year Ago 10-15-2019	49.89	50.11	11.55	3.66	0.00	0.00

Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

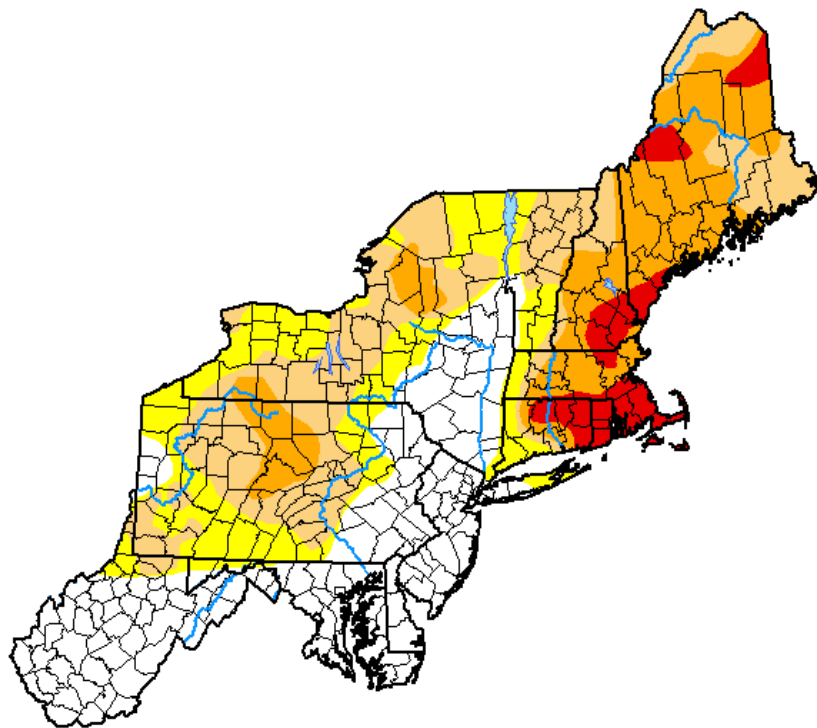
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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National Drought Mitigation Center



droughtmonitor.unl.edu



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Alaska RC

Pacific RCSD

★ National Center for
• Asheville, NC
• Boulder, CO
• Silver Spring, MD
• Stennis Spaceport, MS



Measure Rain & Snow from Home!

CoCoRaHS



The Community Collaborative Rain,
Hail and Snow Network



Join at
www.cocorahs.org





References

- NWS Albany Climate Page
(www.weather.gov/aly/climate)
- Northeast Regional Climate Center
(<http://www.nrcc.cornell.edu/>)
- National Center for Environmental Information
(www.ncei.noaa.gov)
- CoCoRaHs
(www.cocorahs.org)