Title: New York State Mesonet Network Data

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1.0 Data Set Overview:

- Introduction to data: The New York State (NYS) Mesonet Early Warning Weather Detection System is an advanced, statewide observing network composed of several stand-alone sub-networks (Standard, Profiler, Flux, and Snow), all operating together to provide real-time weather information for operational and research applications. The backbone of the Mesonet is the Standard Network.

- The Standard Network comprises 126 stations, spaced an average 19 miles apart, with at least one Standard station located in each of New York's 62 counties. Each Standard site consists of a 30 ft tower centered within a 33 ft x 33 ft plot of land and measures surface temperature at two levels (2 m and 9 m), relative humidity, wind speed and direction, precipitation, solar radiation, atmospheric pressure, snow depth, and soil moisture and temperature at three depths (5, 25, and 50 cm). Still photos are also collected. All observation samples are averaged and collected every 5 minutes. All data are transmitted in real-time to the University at Albany, where the data are quality controlled and archived, and then disseminated to a variety of users.

- The Standard network is designed to facilitate high-quality data collection, and to be robust, able to continue operations through high-impact events. A majority of stations are run off of solar power and communicate via cellular. All data are transmitted hourly via GOES as backup to the cellular grid, providing redundant communications across the network. Should all communications fail, stations continue to autonomously collect and store data locally until those data can be retrieved; up to one month of data can be stored onsite. Extensive efforts went into the network design and station siting to ensure that all sites, where possible, satisfied World Meteorological Organization (WMO) weather station standards. Finally, comprehensive metadata have been compiled and are made available online to ensure all data are used and represented properly. (from: http://www.nysmesonet.org/networks/standard)

- Brotzge, J. A. and co-authors, 2020: A technical overview of the New York State Mesonet Standard Network . J. Atmos. Oceanic. Technol., 37, 1827-1845. https://doi.org/10.1175/JTECH-D-19-0220.1

- Time period covered by the data: January 1, 2022 – February 28, 2022

- Physical location: Site latitude, longitude and altitude information is contained in each netcdf file's global attributes

2.0 Instrument Description (from http://www.nysmesonet.org/about/sensors in April 2023):

- 10 m Winds (sonic)

    - Description: 10-meter (33 feet) wind speed and direction as measured by a sonic anemometer

    - Measured By: Lufft V200A

    - Sensor Description: Uses supersonic impulses to measure wind speed and wind direction

- 10 m Winds (prop)

    - Description: 10-meter (33 feet) wind speed and direction as measured by a prop/vane anemometer
    - Measured By: RM Young 05108
    - Sensor Description: Uses a propeller and vane to measure wind speed and wind direction

- 9 m Temperature

    - Description: 9-meter (30 feet) fast-response air temperature, aspirated with a fan
    - Measured By: RM Young 41342
    - Sensor Description: Fast response air temperature sensor

- 2 m Temperature

    - Description: 2-meter (6 feet) fast-response air temperature, aspirated with a fan
    - Measured By: RM Young 41342
    - Sensor Description: Fast response air temperature sensor

- Relative Humidity

    - Description: 2-meter (6 feet) relative humidity and secondary air temperature
    - Measured By: Vaisala HMP155
    - Sensor Description: HUMICAP® humidity and temperature probe

- Solar Insolation

    - Description: Incoming shortwave radiation
    - Measured By: LI-COR LI-200R Pyranometer

- Precipitation

    - Description: Liquid-equivalent precipitation, including both rain and frozen precipitation
    - Measured By: OTT Pluvio
    - Sensor Description: A precipitation gauge that measures the mass inside a bucket to determine the amount and intensity of liquid and frozen precipitation

- Snow Depth

    - Description: Snow depth
    - Measured By: Campbell Scientific SR50A
    - Sensor Description: An acoustic sensor that measures the distance from the sensor to a rigid snowboard. A reference distance and a temperature correction are applied to determine the snow depth.

- Camera

    - Description: Camera images

- Pressure

    - Description: Barometric pressure
    - Measured By: Vaisala PTB330
    - Sensor Description: A silicon capacitive, absolute pressure sensor

- 5 cm Soil

    - Description: Soil conditions at 5 cm below vegetated ground cover
    - Measured By: Stevens Hydra-Probe II
    - Sensor Description: Measures soil temperature, soil moisture, and soil salinity

- 25 cm Soil

    - Description: Soil conditions at 25 cm below vegetated ground cover
    - Measured By: Stevens Hydra-Probe II
    - Sensor Description: Measures soil temperature, soil moisture, and soil salinity

- 50 cm Soil

    - Description: Soil conditions at 50 cm below vegetated ground cover
    - Measured By: Stevens Hydra-Probe II
    - Sensor Description: Measures soil temperature, soil moisture, and soil salinity

3.0 Data Collection and Processing:

- The data were collected in real-time and had automated quality control applied in real-time. The staff also reviewed the data within hours/days and those results are reflected in this data set.

4.0 Data Format:

- The data are available in daily, netcdf files by site
- Units available in netcdf file headers. Netcdf file headers also contain FillValue and long_name for each variable.

5.0 Data Remarks:

- The time stamp is at the end of the interval, so time 00:00 is the last data point for the previous day