Delaware (DEL) NERR Meteorological Metadata
January 01, 2024 – December 31, 2024
Latest Update: June 27, 2025

I. Data Set and Research Descriptors

1) Principal investigator(s) and contact persons –

Mollie Yacano, Ph.D. Research Coordinator (P.I.), mollie.yacano@delaware.gov
Michael G. Mensinger, Environmental Scientist, mike.mensinger@delaware.gov

Address:
Delaware National Estuarine Research Reserve
818 Kitts Hummock Road
Dover, DE 19901

Phone: 302-739-6377
Fax: 302-739-3446

Michael G. Mensinger is responsible for the design, implementation and continuation of the meteorological data set as well as data management.

2) Entry verification –

Data are uploaded from the CR1000/CR1000X data logger to a personal computer (Dell laptop) with a Windows 7 or newer operating system. LoggerNet software, installed on the DNERR laptop, is utilized to download the most recent data. The data are saved as a raw data file (SJ_RAW.dat) onto a separate hard drive and backed up onto Delaware Coastal Programs' (DCP) server. Files are exported from LoggerNet in a comma-delimited format and uploaded to the CDMO where they undergo automated primary QAQC and become part of the CDMO's online provisional database. During primary QAQC, data are flagged if they are missing or out of sensor range. The edited file is then returned to the Reserve where it is opened in Microsoft Excel and processed using the CDMO's NERRQAQC Excel macro. The macro inserts station codes, creates metadata worksheets for flagged data and summary statistics, and graphs the data for review. It allows the user to apply QAQC flags and codes to the data, append files, and export the resulting data file to the CDMO for tertiary QAQC and assimilation into the CDMO's authoritative online database. For more information on QAQC flags and QAQC codes, see Sections 11 and 12. Michael G. Mensinger conducts all data collection, data management, and QA/QC activities.

All errors were double checked with other data that could support such "anomalous" weather changes. Wind speeds below the 0.5 m/s are common between 1900 and 0600 hours.

3) Research objectives –

The principal objective is to record long-term meteorological data for the St. Jones component of the Delaware National Estuarine Research Reserve in order to observe any environmental changes or trends over time. The data are also used for specific research studies relating to atmospheric deposition of nutrients and pesticides, and nutrient runoff influences from encroaching urbanization on estuarine systems. The meteorological data also serves a supporting role for the SWMP water quality and nutrient data sets since meteorological conditions directly impact these projects.

4) Research methods –

The Campbell Scientific weather station sampled every 5 seconds to produce both 15-minute averages of the measurements of air temperature, relative humidity, barometric pressure, wind speed and wind direction and 15-minute totals of precipitation and photosynthetically active radiation. Data are collected in Eastern Standard Time (EST) for the entire year. The CR1000, installed on 09/18/06, contains 2 Mbytes of memory. On a monthly basis, the data are downloaded from the CR1000 to a laptop computer following procedures in the CDMO Operations Manual and the sensors are inspected for damage or debris. If any is found, it is repaired and/or cleaned. Sensors are removed and sent back to Campbell Scientific for calibration at the intervals listed below.

Campbell Scientific data telemetry equipment was installed at the St. Jones station on 11/16/2005 and transmits data to the NOAA GOES satellite, NESDIS ID #3B00F7FE. The transmissions are scheduled hourly with a transmit time at 0:40:10 and contain four (4) data sets reflecting fifteen-minute data sampling intervals. Upon receipt by the CDMO, the data undergoes the same automated primary QAQC process detailed in Section 2 above. The "real-time" telemetry data become part of the provisional dataset until undergoing secondary and tertiary QAQC and assimilation in the CDMO's authoritative online database. Provisional and authoritative data are available at http://cdmo.baruch.sc.edu.

The 15-minute Data are collected in the following formats for the **CR1000/CR1000X**:

i) Averages from 5-second data:
Air Temperature (°C), Relative Humidity (%), Barometric Pressure (mb), Wind Speed (m/s), Wind Direction (degrees), Battery Voltage (volts)
ii) Maximum and Minimum Air Temperature (°C) and their times from 5-second data (these data are available from the Reserve)
iii) Maximum Wind Speed (m/s) and time from 5-second data
iv) Wind Direction Standard Deviation (degrees)
v) Totals:
Precipitation (mm), PAR (millimoles/m^2), and Cumulative Precipitation (mm) (Cumulative precipitation is no longer available via export from the CDMO. Please contact the Reserve or the CDMO for more information or to obtain these data.)

Recommended calibration frequency for the MET station sensors:

- Temperature/Humidity- yearly recalibration
- Rain Gauge- yearly recalibration
- Wind Speed/Direction- yearly or every 2 years (depending on the sensor)
- Barometric Pressure- every 2 years recalibration CS-105 and CS – 106; yearly recalibration BaroVUE10
- PAR- every 2 years recalibration (Delaware recalibrates yearly)
- CR1000/CR1000X - every 5 years

5) Site location and character –

The Delaware National Estuarine Research Reserve is comprised of two component sites, the St. Jones River and Blackbird Creek components. Both components are located along the Delaware Bay Coast. The St. Jones River Component is located in central Kent County Delaware, east of the State capitol city, Dover. The Blackbird Creek component is located in the unincorporated area of Southern New Castle County. The meteorological station site, is located in the St. Jones DNERR component. It is located in a tidal marsh area with a wooded fringe area 100 m to the north, 75 m to east, 75 m to the west and 1+ km to south. The wooded area is of an approximate average height of 16 m.

Position: Latitude 39 degree 05' 20.05" N

Longitude 75 degree 26' 12.78" W

The weather station is located approximately 2 km from the water quality datasonde at Scotton Landing, approximately 4km from the water quality station at Lebanon Landing, and approximately 10km away from the water quality monitoring station at Division Street.

Tower and sensor heights	**Height (*meters*)**	**Notes**
Tower	*3.0 m*	*Above marsh surface; 1 meter east of boardwalk; highest point (lightning rod) is 4.9 meters above marsh surface*
Platform (*if applicable)*	*1.1 m*	*Above marsh surface*
		Above marsh surface
Temperature/Relative Humidity	*2.9 m*	*Above marsh surface*
Barometric Pressure	*2.2 m*	*Above marsh surface*
Wind	*4.5 m*	*Above marsh surface*
PAR	*4.5 m*	*Above marsh surface*
Precipitation gauge	*2.4 m*	*Above marsh surface and 3 meters south of tower*

SWMP Station Timeline:

Station code	SWMP status	Station name	Location	Active dates	Reason decommissioned	Notes
DELSJMET	P	St. Jones River	39° 5' 20.05 N, 75° 26' 12.78 W	10/1997-Current	NA	NA

6) Data collection period –

The meteorological monitoring program was started in October 1997 at the DNERR and has been continuous through the present. The data collection format has followed NERRS protocol since standardized meteorological program development in November of 1998. The 2024 data set runs from January 1, 2024 (00:00 EST) through December 31, 2024 (23:45 EST).

Monthly data were downloaded from the station on the following dates and times:

Download date and time (EST)
01/02/2024 (11:46)
02/12/2024 (12:53)
03/04/2024 (12:20)
04/10/2024 (14:25)
05/13/2024 (14:25)
06/04/2024 (10:37)
07/02/2024 (12:27)
08/05/2025 (09:56)
08/27/2024 (09:16)
09/25/2024 (07:28)
09/25/2024 (14:49)
09/25/2024 (15:01)
09/26/2024 (13:17)
10/07/2024 (09:46)
11/04/2024 (09:07)

12/09/2024 (09:43)
01/13/2025 (13:12)

Raw files start and end on the following:

File start date and time (EST)	File end date and time (EST)	Filename
12/13/2023 (08:45)	01/02/2024 (11:45)	delsjmet121323.dat
01/02/2024 (12:00)	02/12/2024 (12:45)	delsjmet010224.dat
02/12/2024 (13:00)	03/04/2024 (12:15)	delsjmet021224.dat
03/04/2024 (12:30)	04/10/2024 (14:15)	delsjmet030424.dat
04/10/2024 (14:30)	05/13/2024 (14:00)	delsjmet041024.dat
05/13/2024 (14:15)	06/04/2024 (10:30)	delsjmet051324.dat
06/04/2024 (10:45)	07/02/2024 (12:15)	delsjmet060424.dat
07/02/2024 (12:30)	08/05/2024 (09:45)	delsjmet070224.dat
08/05/2024 (10:00)	08/27/2024 (09:15)	delsjmet080524.dat
08/28/2024 (11:30)	09/25/2024 (07:15)	delsjmet082824.dat
09/25/2024 (07:30)*	09/26/2024 (13:15)*	delsjmet092524.dat
09/26/2024 (13:30)	10/07/2024 (09:30)	delsjmet092624.dat
10/07/2024 (09:45)	11/04/2024 (09:00)	delsjmet100724.dat
11/04/2024 (09:15)	12/09/2024 (09:30)	delsjmet110424.dat
12/09/2024 (09:45)	01/13/2025 (13:00)	delsjmet120924.dat

*Composed of three combined fragment files

7) Distribution –

NOAA retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The NERRS retains the right to be fully credited for having collected and processed the data. Following academic courtesy standards, the NERR site where the data were collected should be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. The data set enclosed within this package/transmission is only as good as the quality assurance and quality control procedures outlined by the enclosed metadata reporting statement. The user bears all responsibility for its subsequent use/misuse in any further analyses or comparisons. The Federal government does not assume liability to the Recipient or third persons, nor will the Federal government reimburse or indemnify the Recipient for its liability due to any losses resulting in any way from the use of this data.

Requested citation format:
NOAA National Estuarine Research Reserve System (NERRS). System-wide Monitoring Program. Data accessed from the NOAA NERRS Centralized Data Management Office website: http://www.nerrsdata.org/; *accessed* 12 October 2024.

NERR meteorological data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see Principal Investigators and Contact Persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under the general information link on the CDMO home page) and online at the CDMO home page www.nerrsdata.org. Data are available in comma delimited format.

8) Associated researchers and projects –

As part of the SWMP long-term monitoring program, DEL NERR also collects 15-minute water quality data and monthly grab and diel samples for nutrient/pigment data which may be correlated with this meteorological dataset. These data are available at www.nerrsdata.org.

II. Physical Structure Descriptors

9) Sensor specifications –

Parameter: Temperature
Units: Celsius
Sensor type: Pt1000 Class A
Model #: EE181 Temperature and Relative Humidity Probe
Operating Temperature: -40°C to +60°C
Range: -40°C to +60°C
Accuracy: ±0.2 °C @ 23°C

Serial number: 19221600016915
Date of calibration: 05/11/2023
Dates of sensor use: 05/24/2023 – 08/21/2024

Serial number: 233116002872B6
Date of calibration: 10/08/2023 (brand new)
Dates of sensor use: 08/21/2024 – current as of 12/31/2024

Parameter: Relative Humidity
Units: Percent
Sensor type: HC101
Model #: EE181 Temperature and Relative Humidity Probe
Range: 0-100% non-condensing
Accuracy: –15 to 40 °C: ≤90% RH ± (1.3 + 0.003 • RH reading) % RH
–15 to 40 °C: >90% RH ± 2.3% RH
–25 to 60 °C: ± (1.4 + 0.01 • RH reading) % RH
–40 to 60 °C: ± (1.5 + 0.015 • RH reading) % RH
Temperature dependence of RH measurement: typically 0.03% RH/°C
Note: This sensor caps relative humidity values at 100%, measured values >100% are altered to 100%

Serial number: 19221600016915
Date of calibration: 05/11/2023
Dates of sensor use: 05/24/2023 – 08/21/2024

Serial number: 233116002872B6
Date of calibration: 10/08/2023
Dates of sensor use: 08/21/2024 – current as of 12/31/2024

Parameter: Barometric Pressure
Units: millibars (mb)
Sensor type: Vaisala Barocap © silicon capacitive pressure sensor
Model #: CS-106 (PTB110)
Operating Range: Pressure: 500 to 1100 mb; Temperature: -40°C to +60°C
Humidity: non-condensing
Accuracy: ± 0.3 mb at +20°C, ± 0.6 mb at 0°C to 40°C, ± 1 mb at -20°C to +45°C, ± 1.5 mb at -40°C to +60°C
Stability: ± 0.1 mb per year

Serial number: J513002
Date of calibration: 05/11/2023

Dates of sensor use: 05/24/2023 – 08/27/2024 (discontinued use of this model)

Parameter: Barometric Pressure
Units: millibars (mb)
Parameter: Barometric Pressure
Units: millibars (mb)
Sensor type: digital, silicon capacitive pressure sensor
Model#: BaroVUE 10
Operating Range: Pressure: 500 to 1100 mb; temperature: -40°C to +60°C
Humidity: non-condensing
Accuracy: ±0.3 hPa (at 20°C), ±0.5 hPa (at -40° to +60°C)
Stability: ± 0.1 mb per year

Serial number: 3021
Date of calibration:07/27/2023
Dates of sensor use: 08/28/2024 (installed brand new) – current as of 12/31/2024

Parameter: Wind speed
Units: meter per second (m/s)
Sensor type: 18 cm diameter 4-blade helicoids propeller molded of polypropylene
Model #: R.M. Young 05103 Wind Monitor
Range: 0-60 m/s (134 mph); gust survival 100 m/s (220 mph)
Multiplier: 0.0980
Accuracy: +/- 0.3 m/s

Serial number: 169338
Date of calibration: 05/15/2023
Dates of sensor use: 07/25/2023 – current as of 12/31/2024

Parameter: Wind direction
Units: degrees
Sensor type: balanced vane, 38 cm turning radius
Range: 360° mechanical, 355° electrical
Accuracy: ± 3 degrees

Serial number: 169338
Date of calibration: 05/15/2023
Dates of sensor use: 07/25/2023 – current as of 12/31/2024

Parameter: Photosynthetically Active Radiation (PAR)
Units: mmoles m-2 (total flux)
Sensor type: Quantum Sensor; high stability silicon photodiode (blue enhanced) in anodized aluminum case with acrylic diffuser
Model #SQ110 Apogee Quantum Sensor
Light spectrum waveband: 410 to 655 nm
Temperature dependence: 0.06+/-0.06% per °C
Stability: <±2% change over 1 yr
Operating Temperature: -40°C to 70°C; Humidity 0 to 100%
Cosine Response: 45° zenith angle: +/- 2%; 75° zenith angle: +/- 5%
Sensitivity: 0.2mV per μmol s-1 m-2
Multiplier: 0.025 (this does not change) – used 06/05/2015 – 08/27/2024

Serial number: 23191
Date of calibration: 05/15/2023
Dates of sensor use: 05/24/2023 – 08/27/2024 (discontinued use of this model)

Parameter: Photosynthetically Active Radiation (PAR)
Units: mmoles m-2 (total flux)
Sensor type: Quantum Sensor; high stability silicon photodiode (blue enhanced) in anodized aluminum case with acrylic diffuser
Model: CS310 (SQ-500)
Light spectrum waveband: 389 to 692 nm
Temperature dependence: –0.11 ± 0.04%/°C
Stability: < ±2% change over a 1-year period
Operating temperature: –40 to 70 °C
Cosine Response: ±5% at 75° zenith angle
Sensitivity: 0.01 mV per µmol/m2/s
Multiplier: 0.5 (this does not change) – used 08/27/2024 – current as of 12/31/2024

Serial number: SQ-500-SS_5081
Date of calibration: 04/08/2024
Dates of sensor use: 08/28/2024 (installed brand new) – current as of 12/31/2024

Parameter: Precipitation
Units: millimeters (mm)
Sensor type: Tipping Bucket Rain Gauge
Model #: TE525
Rainfall per tip: 0.01 inch
Operating range: Temperature: 0° to 50°C; Humidity: 0 to 100%
Accuracy: +/- 1.0% up to 1 in./hr; +0, -3% from 1 to 2 in./hr; +0, -5% from 2 to 3 in./hr

Serial number: 93489-1222
Date of calibration: 01/24/2023 (factory calibration), 03/25/2024 (in-field calibration)
Dates of sensor use: 03/22/2023 (installed brand new) – current as of 12/31/2024

Datalogger:
CR1000:
The CR1000 has 2 MB of Flash EEPROM that is used to store the Operating System. Another 128 K Flash is used to store configuration settings. A minimum of 2 MB SRAM is (4 MB optional upgrade) available for program storage (16K), operating system use, and data storage. Additional storage is available by using a compact flash card in the optional CFM100 Compact Flash Module.

Serial number: 12310
Date CR1000 installed: 01/10/2020 - 08/27/2024
Date CR1000 calibrated: installed brand new, so no calibration date

CR1000 firmware version: OS27.05 (installation date unavailable)

CR1000 program version:
delsjmet_CR1000_5.5_050422 (05/09/2022 (10:10 EST) – 08/27/2024 (07:03 EST)

CR1000X:
The CR1000X has a total onboard memory of 128 MB of flash and 4MB of battery backed SRAM. There is 8 MB of flash memory reserved for loading the operating system and 1MB of flash reserved for configuration

settings. SRAM is used for the CRBasic program operating memory, communication memory, and data storage, with 72 MB of flash for extended data storage. Additional data storage expansion is available with a removable microSD flash memory card of up to 16 GB.

Serial number: 40327
Date CR1000X installed: 08/27/2024 – current as of 12/31/2024
Date CR1000X calibrated: Brand new at time of installation

CR1000/CR1000X firmware version (s): updated to 7.2.0 and installed on 08/26/2024

CR1000X program version(s):
delsjmet_CR1000X_6.0.3_082824.CR1X (08/28/2024 (11:25 EST) – 09/25/2024 (14:52 EST)
delsjmet_CR1000X_6.0.5_092524.CR1X (09/25/2024 (14:52 EST) – 09/26/2024 (13:17 EST)
delsjmet_CR1000X_6.0.5_092624.CR1X (09/26/2024 (13 :17 EST) – current as of 12/31/2024

GOES transmitters:
Model number: TX321-G (discontinued use on 08/27/2024)
Serial number: 2304
Date installed: not available

Model Number: TX325
Serial Number: 300002236
Date Installed: 08/27/2024

10) Coded variable definitions -

Sampling station:	Sampling site code:	Station code:
St. Jones	SJ	delsjmet

11) QAQC flag definitions –

QAQC flags provide documentation of the data and are applied to individual data points by insertion into the parameter's associated flag column (header preceded by an F_). During primary automated QAQC (performed by the CDMO), -5, -4, and -2 flags are applied automatically to indicate data that is above or below sensor range, or missing. All remaining data are then flagged 0, as passing initial QAQC checks. During secondary and tertiary QAQC 1, -3, and 5 flags may be used to note data as suspect, rejected due to QAQC, or corrected.

-5 Outside High Sensor Range
-4 Outside Low Sensor Range
-3 Data Rejected due to QAQC
-2 Missing Data
-1 Optional SWMP supported parameter
0 Passed Initial QAQC Checks
1 Suspect Data
2 *Open - reserved for later flag*
3 *Open - reserved for later flag*
4 Historical Data: Pre-Auto QAQC
5 Corrected Data

12) QAQC code definitions –

QAQC codes are used in conjunction with QAQC flags to provide further documentation of the data and are also applied by insertion into the associated flag column. There are three (3) different code categories, general, sensor, and comment. General errors document general problems with the CR1000/CR1000X, sensor errors are sensor specific, and comment codes are used to further document conditions or a problem with the data. Only one general or sensor error and one comment code can be applied to a particular data point, but some comment codes (marked with an * below) can be applied to the entire record in the F_Record column.

General Errors

GIM	Instrument malfunction
GIT	Instrument recording error, recovered telemetry data
GMC	No instrument deployed due to maintenance/calibration
GMT	Instrument maintenance
GPD	Power down
GPF	Power failure / low battery
GPR	Program reload
GQR	Data rejected due to QA/QC checks
GSM	See metadata

Sensor Errors

SDG	Suspect due to sensor diagnostics
SIC	Incorrect calibration constant, multiplier or offset
SIW	Incorrect wiring
SMT	Sensor maintenance
SNV	Negative value
SOC	Out of calibration
SQR	Data rejected due to QAQC checks
SSD	Sensor drift
SSN	Not a number / unknown value
SSM	Sensor malfunction
SSR	Sensor removed

Comments

CAF	Acceptable calibration/accuracy error of sensor
CCU	Cause unknown
CDF	Data appear to fit conditions
CML	Snow melt from previous snowfall event
CRE*	Significant rain event
CSM*	See metadata
CVT*	Possible vandalism/tampering
CWE*	Significant weather event

13) Other remarks/notes –

Data are missing due to equipment or associated specific sensors not being deployed, equipment failure, time of maintenance or calibration of equipment, or repair/replacement of a sampling station platform. Any NANs in the dataset stand for "not a number" and are the result of low power, disconnected wires, or out of range readings. If additional information on missing data is needed, contact the Research Coordinator at the reserve submitting the data.

Relative Humidity data greater than 100 are within range of the sensor accuracy of +/-3% and are flagged and coded as suspect, <1> (CAF). Values greater than 103 are rejected <-3>.

Data recorded for all parameters (with the exception of cumulative precipitation) at the midnight timestamp (00:00) are the 15 minute averages and totals for the 23:45-23:59 time period of the previous day. Cumulative precipitation data at the midnight timestamp (00:00) are the sum of raw (unrounded) precipitation data from 00:00 to 23:59 of the previous day. Summing each individual 15-minute total precipitation value from the same period will result in small differences from cumulative precipitation due to rounding. It is especially important to note how data at the midnight timestamp are recorded when using January 1st and December 31st data. **Note: Cumulative precipitation is no longer available via export from the CDMO. Please contact the reserve or the CDMO for more information or to obtain these data.**

Precipitation data collected with rain gauges that are not designed specifically for measuring frozen precipitation (snow/ice/hail), including heated gauges and those that use antifreeze to melt frozen precipitation, may not be measured accurately. Blowing wind, sublimation, and rate of snowfall/ice melt all effect the amount of recorded precipitation. The reserve has made attempts to accurately record dates and times when frozen precipitation and subsequent melting has occurred. Snowfall accumulation took place in Dover, Delaware on 01/15/2024 (2.0"), 01/19/2024 (5.0") and 02/17/2024 (1.9") according to the Delaware Environmental Observation System's Snowstorm Archive (located at https://deos.udel.edu/applications/snow-conditions/#/archive) and CSM codes have been used, as documented below, to denote precipitation values that coincide with snowfall/melting. The 01/15/2024 and 01/19/2024 snow events have no documented accumulation or melt but are coded for the entire day. The 02/17/25 snowstorm is the only storm of the three listed where potential melt was identified in the dataset.

"See Metadata Comment" (CSM Code) Explanations:

1. There were noticeable changes in PAR values following the swap to a freshly calibrated sensor (assumed to be accurate) on 08/28/2024. Post deployment drift for the sensor that was installed on 05/24/2023 and removed on 08/28/2024 is not available. All PAR data 1 year prior the sensor swap, from 08/28/2023 00:15 to 08/27/2024 09:15, when the station was powered down, are flagged and coded as <1> SSD CSM. PAR data for the remainder of this deployment, 05/24/2023 13:15 – 08/28/2023 00:00 are flagged and coded <0> CSM and users should note that drift for that period may have exceeded acceptable limits as well.

2. Precipitation data were recorded on the following dates/times which coincide with documented snowfall events. As such, these data may represent delayed snowfall melt as opposed to rainfall at the recorded times:

   02/17/2024 (02:15 EST): 0.3 mm
   02/17/2024 (02:30 EST): 0.3 mm
   02/17/2024 (02:45 EST): 0.5 mm
   02/17/2024 (10:15 EST): 0.5 mm
   02/17/2024 (10:30 EST): 1.0 mm
   02/17/2024 (10:45 EST): 1.3 mm
   02/17/2024 (11:00 EST): 1.0 mm
   02/17/2024 (11:15 EST): 0.8 mm
   02/17/2024 (11:30 EST): 1.0 mm
   02/17/2024 (11:45 EST): 0.3 mm

3. Data from 08/27/2024 (09:30 EST) to 08/28/2024 (11:15 EST) are missing from the dataset due to the implementation of multiple code changes and numerous program uploads taking place during this timeframe corresponding to the transition from the CR1000 to CR1000X.

4. The 08/28/2024 (11:30 EST) reading contains the first official data collected with the CR1000X and finalized SWMP program code. These values were rejected due to the 15-minute readings lacking the entirety of the 5-second instantaneous readings. Both barometric pressure and PAR values were rejected due to maintenance to swap those sensors. Total Precipitation and Cumulative precipitation were not rejected since rainfall did not occur at this time or throughout the remainder of the day.

5. Total Precipitation and Cumulative Precipitation data from 09/18/2024 (00:15 EST) to 09/19/2024 (00:00) were rejected due to spider webbing preventing the tipping bucket mechanism from moving and recording rainfall during that timeframe.

6. Total Precipitation data on 09/25/2024 (15:00 and 15:30 EST) and Cumulative Precipitation data from 09/25/2024 (15:00, 15:30 EST) to 09/26/2024 (00:00 EST) were not rejected due to a program reload since rainfall was not taking place at this time.

7. The precipitation value on 09/26/2024 (13:30 EST) was not rejected due to a program reload since rainfall was not taking place at this time. As such, all cumulative precipitation from 09/26/2024 (13:30 EST) to 09/27/2024 (00:00 EST) are valid as well.