

Hudson River (HUD) NERR Meteorological Metadata

January - December 2001

Latest Update: **August 23, 2024**

I. Data Set & Research Descriptors

1. Principal Investigator: William C. Nieder, Research Coordinator

Contact Person: William C. Nieder
Hudson River NERR
c/o Bard College Field Station
Annandale, NY 12504
wcnieder@gw.dec.state.ny.us

2. Entry verification

Person responsible for data verification: Erik Bedan, Research Assistant

a) Data Input Procedures:

The 15-minute, 1-hour average, and 24-hour data were downloaded from each instrument on the weather station to a Campbell Scientific CR10X datalogger. The CDMO Datalogger Program (hud30.csi) was loaded into the CR10X, which controls the sensors and the data collection schedule (see 2b of the Entry Verification section for the data collection schedule). For data storage, the CR10X stored the data, via cable, on a Campbell Scientific SM 192 storage module. The storage module was manually retrieved at the end of every month. Using the PC208W software supplied by Campbell Scientific, the data were downloaded from the storage module and stored on computer. All raw data files were archived at the CDMO and at the reserve on ditto tapes, and CD-ROM. Anomalous or missing data were either deleted or identified in sections 11 & 12.

When the entire month of data were stored on computer, the CDMO Weather Data Management Program (WDMP) was used to convert the data into an Access database. This program was developed in Visual Basic to interface with the NERRS data collection schedule (see 2b of the Entry Verification section for the data collection schedule). The WDMP will automatically input and convert the monthly raw data file into an Access Database. There were three main tasks completed by the WDMP. First, it converted the comma delimited monthly raw data file into an Access Database. Secondly, it checked the data against a predetermined set of error criteria (see Part C of this section). Finally, it produced error and summary reports. Any anomalous data were investigated and were noted below in Anomalous Data section. Any data corrections that were performed were noted in the Data Correction section below. Most common errors from monthly reports were wind speeds below the 0.5m/s criteria.

b) Data Collection Schedule

i) Data is collected in the following formats:

1) 15 minute data are instantaneous readings except for PAR and precipitation data that are totalized from 5 second samples sorted by date and time.

(Arrays 150 and 151)

2) Hourly averages (Arrays 101 and 102) are calculated from 5 second samples sorted by date and time except for PAR and precipitation data that are hourly totals calculated from 15 minute totals (Arrays 105 and 106).

3) Daily average (arrays 241 and 242), maximum with time, and minimum with time (arrays 243 and 244) are calculated from 5 second samples sorted by date and time except for PAR and precipitation data which are 24 hour totals calculated from hourly totals (arrays 245 and 246).

ii) 15 minute sample point parameters: Date, Time, Air Temperature (°C), Relative Humidity (%), LiCor (PAR), Barometric Pressure (mb), Wind Speed (m/s), Wind Direction (Array 150); Rainfall (mm) (Array 151)

iii) Hourly average parameters: Date, Time, Air Temperature (°C), Relative Humidity (%), Barometric Pressure (mb) (Array 101); Wind Speed (m/s), Wind Direction, Wind Speed Maximum (Array 102)

iv) Hourly total parameters: LiCor (PAR) (Array 105); Rainfall (mm) (Array 106)

v) Daily Average parameters: Date, Time, Air Temperature (°C), Relative Humidity (%), Barometric Pressure (mb) (Array 241); Wind Speed (m/s), Wind Direction, Wind Direction Standard Deviation (using Yamartino's Algorithm) (Array 242)

vi) Daily Total parameter: LiCor (PAR) (Array 245); Rainfall (mm) (Array 246)

vii) Daily Maximum parameters: Date, Time, Air Temperature (°C), Time, Relative Humidity (%), Time, LiCor (PAR), Time, Barometric Pressure (mb), Time, Wind Speed (m/s), Time, Battery Voltage, Time (Array 243)

viii) Daily Minimum parameters: Date, Time, Air Temperature (°C), Time, Relative Humidity (%), Time, LiCor (PAR), Time, Barometric Pressure (mb), Time, Wind Speed (m/s), Time, Battery Voltage, Time (Array 244)

c) Error/Anomalous Data Criteria

Air Temp:

- 15 min sample greater than max for the day
- 15 min sample less than the min for the day
- 15 min sample greater than 3.0 °C from the previous 15 minutes
- Max and Min values not recorded for the day
- 1-hour average greater than 10% above the greatest 15 min sample recorded in the hour

Relative Humidity:

- Changed by more than 25% from the previous 15 minutes
- Max and Min values not recorded for the day

- 1-hour average greater than 10% above the greatest 15 min sample recorded in the hour

Rainfall:

- Precipitation greater than 5 mm in 15 minutes
- No precipitation for the month

Wind Speed:

- Wind speed greater than 30 m/s
- Wind speed less than 0.5 m/s

Wind Direction:

- Wind direction greater than 360 degrees
- Wind direction less than 0 degrees

Pressure:

- Pressure greater than 1040 mb or less than 980 mb
- Pressure changes greater than 5 mb per hour
- Max and Min values not recorded for the day
- 1-hour average greater than 10% above the greatest 15 min sample recorded in the hour

Time:

- 15-minute interval not recorded

For all data:

- Duplicate interval data

3. Research objectives:

The objective of this study is to monitor the meteorological conditions at the Tivoli Bays component of the Hudson River National Estuarine Research Reserve. Measurements are taken all year long at one location in accordance with section 2b of the Entry Verification section. A water quality-monitoring program has been ongoing for ten years at this component site, and the meteorological data will help provide ancillary data to that program. In turn, this will help us to better understand the relationships between the atmospheric and aquatic environments at this site.

4. Research methods:

For data collection, the CR10X datalogger is programmed at intervals that are in accordance with section 2b of the Entry Verification section. Data are retrieved and stored from the datalogger via the Campbell Scientific storage module at the end of each month. The data are analyzed using only the Weather Data Management Program (WDMP). The program creates a database and error report for each month of raw data. The error reports are used to aid in the QA/QC of the data, along with the guidelines in section 2c. Any errors are reported and corrected (if necessary) in sections 11 & 12. For routine maintenance,

sensors are investigated at least once a week to ensure there is no damage or blockage to the sensors. According to Campbell Scientific, for proper data collection, sensors are to be calibrated every two 2 years. After that time, the sensors are removed from the tower, and shipped to their respective manufacturer. Calibration methods are performed by the manufacturers for proper and professional calibration. In order to avoid missing data, a second set of sensors will be calibrated and available to be installed on the tower to continue data collection.

5. Site location and character:

The Hudson River National Estuarine Research Reserve (HUDNERR) is a multicomponent site composed of approximately 5,000 acres of tidal wetland, open water, and adjacent upland buffer habitat. The four component sites of the Reserve are located on the Hudson River in New York State by river miles (RM) proceeding north from the southern tip of Manhattan. These include: Stockport Flats (RM 124)(42°02'30"N 73°46'00"W), Columbia County; Tivoli Bays (RM 98)(42°02'15"N 73°55'10"W), Dutchess County; and Iona Island (RM 45)(41°18'15"N 73°58'45"W) and Piermont Marsh (RM 24)(41°02'30"N 73°54'15"W), Rockland County. These four components are located along 100 river miles of the Hudson River and are representative of the diverse plant and animal communities that occupy the salinity gradient within the Hudson estuary. Development within the watersheds of Hudson River NERR component sites ranges from predominantly urban/suburban to forested/agricultural.

The weather station where the data is collected is located at the Tivoli Bays component site with a position of 4652363.868N 589163.567W. The main office for the Hudson River NERR is at the same site. Outside the office building is a 24'x 18' wood deck, 9 feet off the ground, on the west side of the building. The weather station tower is affixed to this deck with the sensors atop a 30' tower, except for the following. A heated rain gauge is attached to the building, next to the tower, 7 feet up from deck. The temperature/barometer sensor is next to the tower, attached to the railing, 3 feet up from the deck. Although trees surround the area, the tree line begins approximately 60 feet from the tower in most directions and the sensors are not shaded. It is not yet known if there is any wind blockage from the trees because both tower and trees are at similar heights. The tower is approximately 1.2 miles Southeast of the TS water quality monitoring station, 2.3 miles Southeast of the TN water quality monitoring station, and 0.2 miles Northwest of the SK water quality monitoring station.

6. Data collection period:

The first data were recorded on January 10, 2001 at 15:15 hours EST, and ended on December 31, 2001 at 2400 hours EST.

7. Distribution

According to the Ocean and Coastal Resource Management Data Dissemination Policy for the NERRS System-wide Monitoring Program, NOAA/ERD retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The PI retains the right to be fully credited for having collected and processed the data. Following academic courtesy standards, the PI and NERR site where the data were collected will be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. Manuscripts resulting from the NOAA/OCRM supported research that are produced for publication in open literature, including refereed scientific journals, will acknowledge that the research was conducted under an award from the Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration. The data set enclosed within this package/transmission is only as good as the quality assurance/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. NERR weather data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see Section 1 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 <http://cdmo.baruch.sc.edu>. Data are available in text format and Access data tables.

8. Associated researchers and projects:

The Hudson River NERR water quality-monitoring program examines the physical and chemical constituents of the tributary waters and the tidal waters discharging into the HUDNERR marshes and marsh waters. Measurements include total suspended solids (TSS), dissolved oxygen (DO), alkalinity, pH, temperature, salinity, and conductivity, as well as, concentrations of nitrate, phosphate, sulphate, and chloride. Associated researchers with work at Tivoli Bays include: scientists from the Institute of Ecosystem Studies, Millbrook, NY; Yale School of Forestry and Environmental Studies, New Haven, CT; and Rensselaer Polytechnic Institute, Troy, NY.

II. Physical Structure Descriptors

9. Sensor specifications, operating range, accuracy, date of last calibration

Li-Cor Quantum Sensor

Model # LI190SB

Stability: $\pm 2\%$ change over 1 yr

Operating Temperature: -40 to 65°C

Sensitivity: typically 5 μA per 1000 $\mu\text{moles s}^{-1}\text{ m}^{-2}$
Light spectrum wavelength: 400-700 nm
Date of last calibration: December 2000

Wind Sentry
Model # 03001
Operating Range: 0-50 m/s; 360° mechanical
Date of last calibration: December 2000

Temperature and Relative Humidity
Model #: HMP35C
Operating Range: -35°C to 50°C
Temperature Accuracy: $\pm 0.2^\circ\text{C}$ @ 20°C
Relative Humidity Measurement Range: 0-100% non-condensing
RH Accuracy: $\pm 2\%$ RH (0-90%) and $\pm 3\%$ (90-100%)
Uncertainty of calibration: $\pm 1.2\%$ RH
Date of Last calibration: December 2000

Barometric Pressure Sensor
Model # CS105
Operating Range: 600 to 1060 mb
Operating Temperature: -40°C to 60°C
Humidity: non-condensing
Accuracy: ± 0.5 to 6.0 mb (+20°C to 60°C)
Stability: ± 0.1 mb per year
Date of Last calibration: December 2000

Tipping Bucket Rain and Snow Gauge
Model #: 375-L
Operating Range: -20°C to 50°C; 0-100% RH
Resolution: 0.1mm
Accuracy: $\pm 0.5\%$ at $<12.5\text{mm/hr}$; $\pm 2.0\%$ @ $<75\text{mm/hr}$ rate
Date of Last calibration: December 2000

10. Coded variable indicator and variable code definitions:

Field Station at Tivoli Bays = FS

11. Data anomalies:

Arrays:

During 2022 all pre-2007 weather data were revisited by the CDMO. Historically those datasets included 15 minute, hourly (60), and daily data arrays (144). As directed by the NERRS Data Management Committee, the CDMO removed the hourly and daily data arrays leaving only the 15 minute data to make the entire NERRS SWMP weather dataset consistent in its reporting. All references to the 60 and 144 arrays were left in the metadata document as they may still provide valuable information, but users should be aware that they are largely no longer relevant. The updated datasets were uploaded to the

database and made available through the various data applications at www.nerrsdata.org/get/landing.cfm throughout the fall of 2022.

PAR flagging update August 2024:

During SWMP data synthesis work it was noted that PAR values were anomalously high beginning in 2001 and returned to more expected values following the sensor swap on June 3, 2002. PAR data flagging was changed by the CDMO to suspect from January 10, 2001 15:15 through June 3, 2002 07:45.

January 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were listed many times in the WDMP error report for this month as possible errors. We are certain the sensor was operating properly, most likely there was simply no wind. The data were left in.

Hourly and daily data were deleted on day 16 due to maintenance on the station which results in 5 second data loss.

Array ID	Julian	Day	Time	Error
101 16	16	900		Technician changed 101 Array data from 16 (16) 900 to 16 (16) 900
102 16	16	900		Technician changed 102 Array from 16 (16) 900 to 16 (16) 900
241 16	16	2400		Technician changed 241 Array from 16 (16) 2400 to 16 (16) 2400
242 16	16	2400		Technician changed 242 Array from 16 (16) 2400 to 16 (16) 2400
243 16	16	2400		Technician changed 243 Array data from 16 (16) 2400 to 16 (16) 2400
244 16	16	2400		Technician changed 244 Array data from 16 (16) 2400 to 16 (16) 2400

February 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were listed many times in the WDMP error report for the month as possible errors. We are certain the sensor was operating properly, most likely there was simply no wind. The data were left in.

Data points were reviewed before and after this error, and there was a notable change, but the data were consistent. Most other parameters changed along with the relative humidity, it was most likely an event. The data were left in.

Array	Julian	Day	Time	Error
150 33	2	2045		Rel hum difference from 2 (33) 2045 (97.213) to 2 (33) 2100 (64.048) is greater than 25%

Before and after data, from the data below, were found to be consistent. The sensor measures up to 1040mb, but the data were within the percent error of the instrument. The data were left in.

Array	Julian	Day	Time	Error	
12 (43) 530 (1040.1)	150	43	12	530	Pressure is greater than 1040 or less than 980 on
12 (43) 545 (1040.4)	150	43	12	545	Pressure is greater than 1040 or less than 980 on
12 (43) 600 (1040.4)	150	43	12	600	Pressure is greater than 1040 or less than 980 on
12 (43) 615 (1040.3)	150	43	12	615	Pressure is greater than 1040 or less than 980 on
12 (43) 630 (1040.3)	150	43	12	630	Pressure is greater than 1040 or less than 980 on
12 (43) 645 (1040.2)	150	43	12	645	Pressure is greater than 1040 or less than 980 on
12 (43) 700 (1040.3)	150	43	12	700	Pressure is greater than 1040 or less than 980 on
12 (43) 715 (1040.6)	150	43	12	715	Pressure is greater than 1040 or less than 980 on
12 (43) 730 (1040.7)	150	43	12	730	Pressure is greater than 1040 or less than 980 on
12 (43) 745 (1040.6)	150	43	12	745	Pressure is greater than 1040 or less than 980 on
12 (43) 800 (1040.7)	150	43	12	800	Pressure is greater than 1040 or less than 980 on
12 (43) 815 (1040.5)	150	43	12	815	Pressure is greater than 1040 or less than 980 on
12 (43) 830 (1040.5)	150	43	12	830	Pressure is greater than 1040 or less than 980 on
12 (43) 845 (1040.4)	150	43	12	845	Pressure is greater than 1040 or less than 980 on
12 (43) 900 (1040.2)	150	43	12	900	Pressure is greater than 1040 or less than 980 on

March 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were listed many times in the WDMP error report for the month as possible errors. We are certain the sensor was operating properly, most likely there was simply no wind. The data were left in.

April 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were listed many times in the WDMP error report for the month as possible errors. We are certain the sensor was operating properly, most likely there was simply no wind. The data were left in.

Data points were reviewed before and after this error, and there was a notable change, but the data were consistent. Most other parameters change along with the relative humidity, it was most likely an event. The data were left in.

Array	Julian	Day	Time	Error
-------	--------	-----	------	-------

150	99	9	1915	Rel hum difference from 9 (99) 1915 (53.417) to 9 (99) 1930 (80.899) is greater than 25%
-----	----	---	------	--

This error is possible because the "1 hour data" is averaged from 5-second readings taken during that hour while the "15 minute data" (in this case the 15 minute minimum) is not averaged, and only recorded at 15-minute intervals. Given the situation, these data can be very different. The data were left in.

Array	Julian	Day	Time	Error
-------	--------	-----	------	-------

101	119	29	1800	Relative humidity average in 1 hour data (19.65) is less than 15 minute minimum (21.839)
-----	-----	----	------	--

May 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were listed many times in the WDMP error report for the month as possible errors. We are certain the sensor was operating properly, most likely there was simply no wind. The data were left in.

Data points were reviewed before and after this error, and there was a notable change, but the data were consistent. Most other parameters change along with the air temperature, it was most likely an event. The data were left in.

Array	Julian	Day	Time	Error
-------	--------	-----	------	-------

150	148	28	1130	Air temp difference from 28 (148) 1130 (20.015) to 28 (148) 1145 (15.657) is greater than 3.0 degrees C
-----	-----	----	------	---

Data points before and after the following were reviewed, and there were notable changes, but the data were consistent. Most other parameters change along with the relative humidity, they were all most likely an event. The data were left in.

Array	Julian	Day	Time	Error
-------	--------	-----	------	-------

150 134 14 1115 Rel hum difference from 14 (134) 1115 (43.837)
to 14 (134) 1130 (71.047) is greater than 25%
150 134 14 1130 Rel hum difference from 14 (134) 1130 (71.047)
to 14 (134) 1145 (39.947) is greater than 25%

The following error is from calculations the WDMP made with data that were
several days apart because there were a number of days with missing data
recorded (i.e. 11111's). The data were left in.

Array	Julian	Day	Time	Error
-------	--------	-----	------	-------

150	121	1	1130	Pressure difference from 1 (121) 1130 (1016.6) to 9 (129) 1030 (1021.7) is greater than 5 mb
-----	-----	---	------	---

There was an unexplained low daily minimum pressure value of 925mb recorded
on May 15 at 925.

June 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were
listed many times in the WDMP error report for the month as possible errors. We
are certain the sensor was operating properly, most likely there was simply no
wind. The data were left in.

Data points before and after the following were reviewed, and there were a
notable changes, but the data were consistent. Most other parameters change
along with the air temperature, they were all most likely an event. The data
were left in.

Array	Julian	Day	Time	Error
-------	--------	-----	------	-------

150	154	3	800	Air temp difference from 3 (154) 800 (17.33) to 3 (154) 815 (11.583) is greater than 3.0 degrees C
150	171	20	1515	Air temp difference from 20 (171) 1515 (31.433) to 20 (171) 1530 (26.801) is greater than 3.0 degrees C
150	181	30	1730	Air temp difference from 30 (181) 1730 (28.483) to 30 (181) 1745 (22.946) is greater than 3.0 degrees C

Data points before and after the following were reviewed, and there were notable
changes, but they were all most likely an event. The data were left in.

Array	Julian	Day	Time	Error
-------	--------	-----	------	-------

151	154	3	800	Precip difference from 30 (154) 800 (.254) to 30 (154) 815 (13.97) is greater than 5 mm
151	154	3	815	Precip difference from 30 (154) 815 (13.97) to

30 (154) 830 (4.064) is greater than 5 mm

151 162 11 1830 Precip difference from 30 (162) 1830 (1.27) to

30 (162) 1845 (7.62) is greater than 5 mm

July 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were listed many times in the WDMP error report for this month as possible errors.

We are certain the sensor was operating properly, most likely there was simply no wind. The data were left in.

Data points were reviewed before and after the following errors. There was a notable change, but the data were consistent. Other parameters changed along with the air temperature, it was most likely an event. The data were left in.

Array	JulD	CalD	Time	Error Message
150	186	5	1145	Air temp difference from 5 (186) 1145 (26.849) to 5 (186) 1200 (21.77) is greater than 3.0 degrees C
150	196	15	1415	Air temp difference from 15 (196) 1415 (25.632) to 15 (196) 1430 (21.714) is greater than 3.0 degrees C

Data points were reviewed before and after the following error. There was a notable change, and it was most likely an event. The data were left in.

Array	JulD	CalD	Time	Error Message
151	185	4	2000	Precip difference from 4 (185) 2000 (5.588) to 4 (185) 2015 (.508) is greater than 5 mm

August 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were listed many times in the WDMP error report for this month as possible errors.

We are certain the sensor was operating properly, most likely there was simply no wind. The data were left in.

Data points were reviewed before and after the following errors. There was a notable change, and it was most likely an event. The data were left in.

Array	JulD	CalD	Time	Error Message
151	225	13	1315	Precip difference from 13 (225) 1315 (4.572) to 13 (225) 1330 (10.414) is greater than 5 mm
151	225	13	1330	Precip difference from 13 (225) 1330 (10.414) to 13 (225) 1345 (1.016) is greater than 5 mm
151	243	31	2145	Precip difference from 31 (243) 2145 (1.016) to 31 (243) 2200 (8.89) is greater than 5 mm

September 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were listed many times in the WDMP error report for this month as possible errors. We are certain the sensor was operating properly, most likely there was simply no wind. The data were left in.

Data points were reviewed before and after the following error. There was a notable change, but the data were consistent. Other parameters changed along with the air temperature, it was most likely an event. The data were left in.

Array	JulD	CalD	Time	Error Message
150	266	23	1530	Air temp difference from 23 (266) 1530 (24.141) to 23 (266) 1545 (27.272) is greater than 3.0 degrees C

Data points were reviewed before and after the following error. There was a notable change, and it was most likely an event. The data were left in.

Array	JulD	CalD	Time	Error Message
151	256	13	1945	Precip difference from 13 (256) 1945 (5.588) to 13 (256) 2000 (.254) is greater than 5 mm

October 2001

No data is available for this month. Upon retrieval of data, it was found to have improper dates and times for the month. One explanation maybe that the datalogger lost power, and reset all memory when power was re-established.

November 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were listed many times in the WDMP error report for this month as possible errors. We are certain the sensor was operating properly, most likely there was simply no wind. The data were left in.

Data points were reviewed before and after the following error. There was a notable change, but the data were consistent. It was most likely an event. The data were left in.

Array	JulD	CalD	Time	Error Message
150	313	9	300	Rel hum difference from 9 (313) 300 (81.087) to 9 (313) 315 (54.93) is greater than 25%

At this site, wintery weather requires us to utilize a heating tipping bucket for precipitation data. The heater may not have been functioning this month, precipitation data are suspect.

December 2001

Anomalous criteria for wind speed (i.e. "wind speed is less than 0.5m/s") were listed many times in the WDMP error report for this month as possible errors. We are certain the sensor was operating properly, most likely there was simply no wind. The data were left in.

At this site, wintery weather requires us to utilize a heating tipping bucket for precipitation data. The heater may not have been functioning this month, precipitation data are suspect.

12. Missing data:

Arrays:

During 2022 all pre-2007 weather data were revisited by the CDMO. Historically those datasets included 15 minute, hourly (60), and daily data arrays (144). As directed by the NERRS Data Management Committee, the CDMO removed the hourly and daily data arrays leaving only the 15 minute data to make the entire NERRS SWMP weather dataset consistent in its reporting. All references to the 60 and 144 arrays were left in the metadata document as they may still provide valuable information, but users should be aware that they are largely no longer relevant. The updated datasets were uploaded to the database and made available through the various data applications at www.nerrsdata.org/get/landing.cfm throughout the fall of 2022.

Data are missing due to equipment failure, or no probes deployed, or maintenance of equipment. To find out more details about missing data, contact the Research Coordinator at the site submitting the data.

January 2001

Array	Julian	Day	Time	Error
101	1	1	100	Missing 101 Array data (Hourly Averages) from 1 (1) 100 to 10 (10) 1500
102	1	1	100	Missing 102 Array data (Hourly Average Wind Parameters) from 1 (1) 100 to 10 (10) 1500
241	1	1	2400	Missing 241 data (Daily Averages) from 1 (1) 2400 to 9 (9) 2400
242	1	1	2400	Missing 242 data (Daily Average Wind Parameters) from 1 (1) 2400 to 9 (9) 2400
243	1	1	2400	Missing 243 data (Daily Max/Time Values) from 1 (1) 240 to 9 (9) 2400
244	1	1	2400	Missing 244 data (Daily Min/Time Values) from 1 (1) 2400 to 9 (9) 2400
150	1	1	15	Missing 150 Array data (15 minute data) from 1 (1) 15 to 10 (10) 1500
150	16	16	845	Missing 150 Array (15 minute data)

May 2001

Array	Julian	Day	Time	Error
150	1	121	1015	Missing 150 Array data (15 minute data) from 1 (121) 1145 to 9 (129) 1015
150	21	141	815	Missing 150 Array data (15 minute data) from 21 (141) 815 to 21 (141) 1430
101	1	121	1200	Missing 101 Array data (Hourly Averages) from 1 (121) 1200 to 9 (129) 1000
101	21	141	900	Missing 101 Array data (Hourly Averages) from 21 (141) 900 to 21 (141) 1400
102	1	121	1200	Missing 102 Array data (Hourly Average Wind Parameters) from 1 (121) 1200 to 9 (129) 1000
102	21	141	800	Missing 102 Array data (Hourly Average Wind Parameters) from 21 (141) 800 to 21 (141) 1400
241	1	121	2400	Missing 241 data (Daily Averages) from 1 (121) 2400 to 8 (128) 2400
242	1	121	2400	Missing 242 data (Daily Average Wind Parameters) from 1 (121) 2400 to 8 (128) 2400
243	1	121	2400	Missing 243 data (Daily Max/Time Values) from 1 (121) 2400 to 8 (128) 2400
244	1	121	2400	Missing 244 data (Daily Min/Time Values) from 1 (121) 2400 to 8 (128) 2400

October 2001

No data is available for this month. Upon retrieval of data, it was found to have improper dates and times for the month. One explanation maybe that the datalogger lost power, and reset all memory when power was re-established.

13. Other Remarks/notes:

Arrays:

During 2022 all pre-2007 weather data were revisited by the CDMO. Historically those datasets included 15 minute, hourly (60), and daily data arrays (144). As directed by the NERRS Data Management Committee, the CDMO removed the hourly and daily data arrays leaving only the 15 minute data to

make the entire NERRS SWMP weather dataset consistent in its reporting. All references to the 60 and 144 arrays were left in the metadata document as they may still provide valuable information, but users should be aware that they are largely no longer relevant. The updated datasets were uploaded to the database and made available through the various data applications at www.nerrsdata.org/get/landing.cfm throughout the fall of 2022.

Precipitation:

During the initial years of NERRS SWMP weather data collection the CR10X programming was inconsistent in how precipitation values were recorded. For most reserves, zeros were not recorded when rainfall had not occurred between 2001-2003, instead no rainfall was represented by a blank cell. The CDMO verified which datasets were impacted by this issue for the 2001-2006 datasets and inserted zeros when the metadata indicated that no precipitation occurred and data were not missing for other reasons. In some cases, zero values for precipitation data were evaluated and removed where the metadata confirmed that no rainfall should have been in the dataset. The pre-2007 data did not go through a thorough QAQC process again at that time (in addition to previous QAQC); however, if discrepancies were noticed between what was documented in the metadata and what was in the dataset, additional updates may have been made. The updated datasets were uploaded to the database and made available through the various data applications at www.nerrsdata.org/get/landing.cfm throughout early 2023.

PAR flagging update August 2024:

During SWMP data synthesis work it was noted that PAR values were anomalously high beginning in 2001 and returned to more expected values following the sensor swap on June 3, 2002. PAR data flagging was changed by the CDMO to suspect from January 10, 2001 15:15 through June 3, 2002 07:45.

Please note, monthly totals are not available in months where there was missing data.

Rain Events:

January

Date	RainAmount (mm)
15	.508
19	3.048
21	8.128
30	11.684
31	.254

February

Date	RainAmount (mm)
5	16.002
6	.254
9	1.778
10	.254
14	.762
16	1.524
22	1.524
23	.254

25 9.652

"Monthly Total"32.0

March

Date	RainAmount (mm)
4	1.524
5	15.748
6	4.572
9	7.112
13	12.700
17	1.270
21	12.192
22	2.794
29	.762
30	37.846

"Monthly Total"96.5

April

Date	RainAmount (mm)
6	2.286
7	1.778
8	7.366
9	1.524
12	1.016
21	.762

"Monthly Total"14.7

May

Date	RainAmount (mm)
22	31.750
23	29.210
24	1.016
25	2.540
26	7.620
27	15.240
28	4.064

June

Date	RainAmount (mm)
1	6.858
2	30.734
3	21.082

11	12.192
17	19.304
20	.762
21	.254
23	17.780
29	.254
30	8.128

"Monthly Total"117.3

July

Date	RainAmount (mm)
4	7.112
5	4.826
1	2.540
8	1.270
9	2.286
11	5.334
15	.508
17	1.778
26	11.430
Monthly Total	37.1

August

Date	Rainamount (mm)
3	.508
4	4.064
10	1.016
12	12.192
13	22.606
17	1.016
20	2.794
28	1.524
31	10.668
Monthly Total	56.4

September

Date	RainAmount (mm)
4	3.302
10	1.016
13	12.446
14	13.970
20	21.844
21	5.842
24	1.016
25	12.700
28	6.096
Monthly Total	78.2

November

Date	RainAmount (mm)
------	-----------------

20	4.318
----	-------

24	.508
----	------

25	12.446
----	--------

28	.762
----	------

29	4.318
----	-------

30	11.684
----	--------

Monthly Total	34.0
---------------	------

December

Date	RainAmount (mm)
------	-----------------

9	.508
---	------

10	1.778
----	-------

11	9.652
----	-------

12	.762
----	------

13	2.032
----	-------

14	9.652
----	-------

17	7.366
----	-------

18	7.112
----	-------

23	2.032
----	-------

24	6.858
----	-------

25	.254
----	------

Monthly Total	48.0
---------------	------