**Narragansett Bay (NAR) National Estuarine Research Reserve Meteorological Metadata**

January – December 2002

Latest Update: **October 10, 2023**

**I. Data Set & Research Descriptors**

**1) Principal investigator & contact persons:**

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**2) Entry verification**

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 Data Logger Program (nbnerr.csi) was loaded into the CR10X

and controls the sensors and data collection schedule (see 2b of the Entry

Verification section for the data collection schedule). The CR10X then

interfaced with the PC208W software supplied by Campbell Scientific.

This software was located on a laptop computer at the reserve to which data

was downloaded via the RS232 interface connection. The data was saved at

regular intervals to a data file (mmddyy.dat) onto the computer's hard drive

and backed up to a desktop computer, also located at the reserve.

Once an entire month of data was available, the CDMO Weather Data Management

Program (WDMP) was used to convert the files to 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 are three main steps the

WDMP performs. First, it converts the comma delimited monthly raw data file

into an Access Database. Secondly, it checks the data against a predetermined

set of error criteria (see Part C of this section). Finally, it produces error

and summary reports. Any anomalous data were investigated and are noted below in

the Anomalous Data section. Any data corrections that were performed are noted

in the Data Correction section below.

Common errors noted in the monthly error reports were temperature change of

greater than 3 C in a 15-minute period and relative humidity difference of

greater than 25% in 15 minutes. Hourly and daily averages and/or totals were

removed in instances when data were missing for a portion of the sampling

period. Both raw data files and Access databases were saved to Zip Disks for

backup. Robin Weber performed all data QA/QC.

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 principal objective is to record long-term meteorological data for

Narragansett Bay in order to observe any environmental changes or trends over

time. These data are also used in support of both water quality and biological

sampling data.

**4) Research methods:**

The Campbell Scientific weather station samples every 5 seconds to produce both

hourly and daily averages of those measurements of air temperature, relative

humidity, barometric pressure, rainfall, wind speed and wind direction. An

instantaneous sample is taken every 15 minutes and that data is stored in array

150. An approximate two week sampling interval was chosen so that the CR10X

datalogger would not run out of memory and overwrite data. The short

haul modem link was inoperable so the data had to be downloaded periodically

from the storage module to a laptop computer. Sensors on the weather station

are inspected monthly for damage or debris. If any is found, it is repaired

and/or cleaned. There were no other analyses done on the meteorological data at

present.

**5) Site location and character:**

The NBNERR consists of 4376 acres of diverse estuarine and terrestrial habitats

ranging from open estuarine water to salt marshes to forested uplands. The land

holdings include 60% of Prudence Island, most of nearby Patience Island, all

of Hope Island off the west shore of Prudence Island, and Dyer Island located in

the East Passage of Narragansett Bay.

The reserve is located close to the geographic center of Narragansett Bay in

Rhode Island. The bay has a drainage basin of 1,800 square miles.

The weather station is located on Prudence Island, east of Potter's Cove at

41° 38.335’N, 71° 20.362’W. The Wind Sentry and the Temperature and Humidity

sensor are located on an aluminum tower approximately 10m in height. The Licor

sensor is located on a shorter (3m) aluminum tower. The tipping Bucket Rain gauge

is located to the NW away from the tower and the platform. The barometer is

located within the housing of the CR10X.

Descriptions of the specific sampling station follows:

The Potter's Cove weather station is in a grassland area bordering the cove.

This location is approximately 100 yards from a water quality monitoring station

maintained by the NBNERR since 1995. The water quality in the cove is

considered to be adversely affected by boater's wastes and storm runoff from

urban areas. Locating the weather station near this site might help to

determine whether meteorological factors further influence water quality within

the cove.

**6) Data collection period:**

Weather data has been collected at the Potter's Cove weather station since 1992.

The current datalogger was installed February of 2002, replacing an inoperable

CR21X datalogger. Data has been collected from February 6 through December 31

2002.

**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 NERR Water Quality Monitoring Project has a station located nearby at

Potter's Cove. The principal objective of this study is to record long-term

water quality data for Narragansett Bay in order to observe any physical changes

or trends in water quality over time. Four sites were selected; one to

represent an impacted site, two in open water (at both the surface and near-

bottom), and one located in a salt marsh tidal creek. The Potter's Cove site is

located on Prudence Islands' northeastern shore and is impacted by boat traffic

and storm runoff from mainland urban and residential areas.

Measurements are taken every 30 minutes over a roughly two week collecting

periods at all water quality monitoring locations throughout the year.

A Physical Oceanographic Real-Time System (PORTS) meteorological station is

housed in the NERRS weather station at Potter's Cove and independently records

wind speed, wind direction, atmospheric pressure, and air temperature. This

is one of six PORTS meteorological stations in Narragansett Bay. The purpose of

PORTS is to support safe and cost efficient navigation. Data is available real-

time and the system is managed for quality control.

Volunteers from the Prudence Conservancy have maintained a drum-recorder rain

gauge located at the Potter's Cove weather station since 1992. The volunteers

clean the rain gauge periodically, as well as replace the recording pens and

paper as necessary. The data are managed by the NBNERR.

**II. Physical Structure Descriptors**

**9) Sensor specifications, operating range, accuracy, date of last calibration**

Eppley Black and White Pyranometer

Model # 8-48

Resistance: 353 O at 23°C

Temperature Compensation Range: -20 to +40°C

Sensitivity: 10.35 X 10-6 volts/watts meter-2

7.22 millivolts/cal cm-2 min-1

Date of last calibration: Unknown

LiCor Quantum Sensor

Model # LI190SB

Stability: <±2% change over 1 yr

Operating Temperature: -40 to 65°C

Sensitivity: typically 5 µA per 1000µmoles s-1 m-2

Light spectrum wavelength: 400 to 700 nm

Date of last calibration: Unknown

Wind Sentry

Model # 03001

Range: 0-50 m/s; 360° mechanical

Date of last calibration: 7-01-02 (new sensor installed)

Temperature and Relative Humidity

Model #: HMP45C

Operating Temperature: -40 to +60°C

Temperature Measurement Range: -40 to +60°C

Temperature Accuracy: ± 0.2 °C @ 20°C

Relative Humidity Measurement Range: 0-100% non-condensing

RH Accuracy: +/-2% RH (0-90%) and +/-3% (90-100%)

Uncertainty of calibration: ± 1.2% RH

Date of Last calibration: 1-31-02

Barometric Sensor

Model # CS-105

Operating Range: Pressure: 600-1060 mb

Temperature: -40 to +60C

Humidity: non-condensing

Accuracy: ±0.5 to 6.0 mb (+20-60C)

Stability: ± 0.1 mb per year

Date of Last calibration: Unknown

Tipping Bucket Rain Gauge

Model #: TE 525

Range: 0.1 mm

Accuracy: 1.0% at <2"/hr

Date of Last calibration: 2-6-02

**10) Coded variable indicator and variable code definitions:**

Site Definitions: PC = Potter's Cove

**11) Data anomalies/Data Corrections:**

**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](http://www.nerrsdata.org/get/landing.cfm) throughout the fall of 2022.

February 2002:

Data corrections:

Samples were removed which were recorded while the datalogger was being re-wired

(first use of the CR10X).

Array Day Date Time Error Message

150 1 32 1430 Technician changed entire 150 Array data from 1 ( 32) 1430 to 1 ( 32) 1445

150 6 37 1345 Technician changed entire 150 Array data at 6 ( 37) 1345

Hourly and daily samples were removed on day 1 and day 6 due to station re-wiring which

resulted in erroneous values.

Array Day Date Time Error Message

101 1 32 1500 Technician changed entire 101 Array data at 1 ( 32) 1500

102 1 32 1500 Technician changed entire 102 Array data at 1 ( 32) 1500

101 6 37 1500 Technician changed entire 101 Array data at 6 (37) 1400

102 6 37 1500 Technician changed entire 102 Array data at 6 (37) 1400

241 1 32 2400 Technician changed entire 241 Array data at 1 ( 32) 2400

242 1 32 2400 Technician changed entire 242 Array data at 1 ( 32) 2400

243 1 32 2400 Technician changed entire 243 Array data at 1 ( 32) 2400

244 1 32 2400 Technician changed entire 244 Array data at 1 ( 32) 2400

241 6 37 2400 Technician changed entire 241 Array data at 6 (37) 2400

242 6 37 2400 Technician changed entire 242 Array data at 6 (37) 2400

243 6 37 2400 Technician changed entire 243 Array data at 6 (37) 2400

244 6 37 2400 Technician changed entire 244 Array data at 6 (37) 2400

All values for temperature and relative humidity were changed to read 55555

(unless they previously read -99999) on the following dates.

Array Day Date Time Error Message

150 6 37 1415 Technician changed RH and WDir data in 150 Array datafrom 6 ( 37) 1415 to 28 ( 59) 2400

101 6 37 1500 Technician changed RH in 101 Array data from 6 ( 37) 1500to 28 ( 59) 2400

241 6 37 2400 Technician changed RH in 241 Array data from 6 ( 37) 2400to 28 ( 59) 2400

243 6 37 2400 Technician changed RH in 243 Array data from 6 ( 37) 2400to 28 ( 59) 2400

244 6 37 2400 Technician changed RH in 244 Array data from 6 ( 37) 2400 to 28 ( 59) 2400

243 20 51 2400 Technician changed Temp in 243 Array data at 20 ( 51) 2400

Data for wind direction were removed from hourly and daily sampling periods.

Array Day Date Time Error Message

102 6 37 1500 Technician changed WDir 102 Array data from 6 ( 37) 1500 to 28 ( 59) 2400

242 6 37 2400 Technician changed WDir 242 Array data from 6 ( 37) 2400 to 28 ( 59) 2400

Precipitation data was removed from the 15-minute sample data. The sensor was being tested

at this time.

Array Day Date Time Error Message

151 6 37 1415 Technician changed 151 Array at 6 ( 37) 1415

Collapsed duplicate records (by date and time) for Licor totals (array 105).

One record removed for each duplicate by totaling values.

Date Time Record 1 Record 2 Corrected Value

2/14 1400 2866.57 1514.55 Total = 4381.12

2/20 1400 951.56 177.07 Total = 1148.63

Collapsed duplicate records (by date) for Licor EOD totals (array 245). Removed

the value which did not match PAR

totals (from WDMP) and sum by day.

Date Original Value Corrected Value

2/14 17751.54 22694.99

2/20 9028.80 12140.61

2/28 6840.10 25713.31

March 2002:

These data appear to be correct.

Array Day Date Time Error Message

150 31 90 515 Air temp difference from 31 ( 90) 515 ( 7.3154) to 31 ( 90) 530 ( 10.74) is greater than 3.0 degrees C

150 31 90 515 Rel hum difference from 31 ( 90) 515 ( 89.396) to 31 ( 90) 530 ( 58.794) is greater than 25%

Data corrections:

Wind direction was removed from 15 minute sample data throughout the month.

Array Day Date Time Error Message

150 1 60 15 Technician changed WDir 150 Array data from 1 ( 60) 15 to 27 ( 86) 1400

150 27 86 1430 Technician changed WDir 150 Array data at 27 ( 86) 1430 to 31 ( 90) 2400

Due to power down on March 27 at 1415 resulting in 5 second data loss, hourly data (101 and

102) at 1500 and daily data (241-244) at 2400 were deleted.

Array Day Date Time Error Message

101 27 86 1500 Technician changed 101 Array data at 27 ( 86) 1500

102 27 86 1500 Technician changed 102 Array data at 27 ( 86) 1500

241 27 86 2400 Technician changed 241 Array at 27 ( 86) 2400

242 27 86 2400 Technician changed 242 Array data at 27 ( 86) 2400

243 27 86 2400 Technician changed 243 Array data at 27 ( 86) 2400

244 27 86 2400 Technician changed 244 Array data at 27 ( 86) 2400

All values for temperature and relative humidity were changed to read 55555

(unless they previously read -99999) on the following dates until 3/28/02 at 1400 when

the temperature and relative humidity sensor was installed. (There was a short break

in the dataset when the first installation of the sensor was attempted on 3/27/02).

Array Day Date Time Error Message

101 1 60 100 Technician changed RH 101 Array data from 1 ( 60) 100 to 28 ( 87) 1400

241 1 60 2400 Technician changed RH 241 Array from 1 ( 60) 2400 to 28 ( 87) 2400

241 28 87 2400 Technician changed Temp 241 Array at 28 ( 87) 2400

243 28 60 2400 Technician changed RH 243 Array data from 1 ( 60) 2400 to 28 ( 87) 2400

243 28 87 2400 Technician changed Temp 243 Array at 28 ( 87) 2400

244 1 60 2400 Technician changed RH 244 Array data from 1 ( 60) 2400 to 28 ( 87) 2400

244 28 87 2400 Technician changed Temp 244 Array at 28 ( 87) 2400

Data for wind direction were removed from hourly and daily sampling periods.

Array Day Date Time Error Message

102 1 60 100 Technician changed 102 Array data at 1 ( 60) 100 to 31 ( 90) 2400

242 1 60 2400 Technician changed 242 Array data at 1 ( 60) 2400 to 31 ( 90) 2400

All Eppley data were removed. This sensor was not functioning properly.

Array Day Date Time Error Message

112 1 60 15 Technician changed 112 Array from 1 ( 60) 15 to 27 ( 86) 1400

112 28 87 1415 Technician changed 112 Array data at 28 ( 87) 1415 to 31 ( 90) 2400

Collapsed duplicate records (by date) for Licor totals (array 245). Removed the

record which did not match PAR totals from WDMP output.

Date Original Value Corrected Value

3/27 4607.39 9182.45

3/28 27720.69 34120.99

April 2002:

These data appear to be correct.

Array Day Date Time Error Message

150 17 107 1000 Air temp difference from 17 ( 107) 1000 ( 22.554) to 17 ( 107) 1015

( 26.506) is greater than 3.0 degrees C

150 17 107 2015 Air temp difference from 17 ( 107) 2015 ( 25.4) to 17 ( 107) 2030

( 20.508) is greater than 3.0 degrees C

150 18 108 1115 Air temp difference from 18 ( 108) 1115 ( 22.208) to 18 ( 108) 1130

( 18.719) is greater than 3.0 degrees C

150 18 108 1130 Air temp difference from 18 ( 108) 1130 ( 18.719) to 18 ( 108) 1145

( 21.902) is greater than 3.0 degrees C

150 21 111 1500 Rel hum difference from 21 ( 111) 1500 ( 59.198) to 21 ( 111) 1515

( 28.375) is greater than 25%

150 21 111 1815 Rel hum difference from 21 ( 111) 1815 ( 36.403) to 21 ( 111) 1830

( 65.292) is greater than 25%

150 26 116 845 Pressure difference from 26 ( 116) 845 ( 1017.3) to 28 ( 118) 2315

( 999.09) is greater than 5 mb

101 21 111 1600 Relative humidity average in 1 hour data ( 31.646) is greater than 15 minute maximum ( 28.375) by at least 10%

Data corrections:

The weather station was off-line briefly on from 1030-1145 on 4/2/02 while re-wiring the

temperature and relative humidity sensor. This required a program code change, so hourly

averages were altered to reflect values from both before and after the programming change

occurred. The junction box, which houses lengthened sensor wires, was removed between

915 and 1015 on 4/8/02 resulting in missing data during the direct re-wiring of the sensors

to the CR10X. This required additional changes to EOD maximums, minimums and averages.

Array Day Date Time Error Message

101 2 92 1100 Technician changed 101 Array data from 2 ( 92) 1100 to 2 ( 92) 1200

101 8 98 1000 Technician changed 101 Array data from 8 ( 98) 1000 to 8 ( 98) 1100

102 2 92 1100 Technician changed 102 Array data from 2 ( 92) 1100 to 2 ( 92) 1200

102 8 98 1000 Technician changed 102 Array data from 8 ( 98) 1000 to 8 ( 98) 1100

241 2 92 2400 Technician changed 241 Array from 2 ( 92) 2400

241 8 98 2400 Technician changed 241 Array from 8 ( 98) 2400

242 2 92 2400 Technician changed 242 Array from 2 ( 92) 2400

242 8 98 2400 Technician changed 242 Array from 8 ( 98) 2400

243 2 92 2400 Technician changed 243 Array data from 2 ( 92) 2400

243 8 98 2400 Technician changed 243 Array data from 8 ( 98) 2400

244 2 92 2400 Technician changed 244 Array data from 2 ( 92) 2400

244 8 98 2400 Technician changed 244 Array data from 8 ( 98) 2400

Due to power loss or wet wiring from April 26 to 28 @ 2300 resulting in a loss of 5 second data,

the following hourly and daily arrays occurring on April 28 @ 2400 were deleted.

Array Day Date Time Error Message

101 28 118 2400 Technician changed 101 Array data from 28 ( 118) 2400

102 28 118 2300 Technician changed 102 Array data at 28 ( 118) 2300

241 28 118 2400 Technician changed 241 Array from 28 ( 118) 2400

242 28 118 2400 Technician changed 242 Array data at 28 ( 118) 2400

243 28 118 2400 Technician changed 243 Array data from 28 ( 118) 2400

244 28 118 2400 Technician changed 244 Array data from 28 ( 118) 2400

All wind direction data were removed for the month.

Array Day Date Time Error Message

150 1 91 15 Technician changed WDir 150 Array data from 1 ( 91) 15 to 26 ( 116) 845

150 28 118 2315 Technician changed WDir 150 Array data at 28 ( 118) 2315 to 30 ( 120) 2400

102 1 91 100 Technician changed WDir 102 Array from 1 ( 91) 100 to 26 ( 116) 800

102 28 118 2300 Technician changed WDir 102 Array data at 28 ( 118) 2300 to 30 ( 120) 2400

242 1 91 2400 Technician changed WDir 242 Array from 1 ( 91) 2400 to 25 ( 115) 2400

242 28 118 2400 Technician changed WDir 242 Array data at 28 ( 118) 2400 to 30 ( 120) 2400

All Eppley data were removed. This sensor was not functioning properly.

Array Day Date Time Error Message

112 1 91 15 Technician changed 112 Array from 1 ( 91) 15 to 26 (116) 845

112 28 118 2315 Technician changed 112 Array data at 28 ( 118) 2315 to 30 ( 120) 2400

Collapsed duplicate records (by date and time) for Licor totals (array 105).

One record was removed for each duplicate by totaling values.

Date Time Record 1 Record 2 Corrected Value

4/2 1000 4189.37 2026.97 Total = 6216.34

4/8 900 593.49 1052.27 Total = 1645.76

The Licor totals for 4/26/02 and 4/28/02 do not accurately reflect daily totals

as the datalogger was off-line during these days.

May 2002:

These data appear to be correct.

Array Day Date Time Error Message

150 14 134 1715 Air temp difference from 14 ( 134) 1715 ( 13.271) to 14 ( 134) 1730

( 9.9497) is greater than 3.0 degrees C

150 20 140 1830 Rel hum difference from 20 ( 140) 1830 ( 64.618) to 20 ( 140) 1845

( 38.282) is greater than 25%

Data corrections:

(Note: No data were available from 5/24/02 at 930 due to a file overwrite.)

All Eppley data were removed. This sensor was not functioning properly.

Array Day Date Time Error Message

112 1 121 15 Technician changed 112 Array from 1 ( 121) 15 to 24 ( 144) 915

All wind direction data were removed for the month (includes hourly averages, 15

minute data, and EOD averages).

Array Day Date Time Error Message

102 1 121 100 Technician changed WDir 102 Array from 1 ( 121) 100 to 24 ( 144) 900

150 1 121 15 Technician changed WDir 150 Array data from 1 ( 121) 15 to 24 ( 144) 915

242 1 121 2400 Technician changed WDir 242 Array from 1 ( 121) 2400 to 23 ( 143) 2400

June 2002:

Data corrections:

All Eppley data were removed. This sensor was not functioning properly.

Array Day Date Time Error Message

112 7 158 2045 Technician changed 112 Array data at 7 ( 158) 2045 to 30 ( 181) 2400

All wind direction data were removed for the month (includes both hourly averages and

15 minute sample data).

Array Day Date Time Error Message

102 7 158 2100 Technician changed WDir 102 Array data at 7 ( 158) 2100 to 30 ( 181) 2400

150 7 158 2100 Technician changed WDir 150 Array data at 7 ( 158) 2100 to 30 ( 181) 2400

Hourly averages were removed as all data was missing through 6/7/02 at 2045 due to a file

overwrite.

Array Day Date Time Error Message

101 7 158 2100 Technician changed entire 101 Array data at 7 ( 158) 2100

102 7 158 2100 Technician changed entire 102 Array data at 7 ( 158) 2100

EOD values for all arrays (241-244) were removed for 6/7/02 because they were not truly

representative of the day.

Array Day Date Time Error Message

241 7 158 2400 Technician changed entire 241 Array from 7 ( 158) 2400

242 7 158 2400 Technician changed entire 242 Array from 7 ( 158) 2400

243 7 158 2400 Technician changed entire 243 Array data from 7 ( 158) 2400

244 7 158 2400 Technician changed entire 244 Array data from 7 ( 158) 2400

July 2002:

All values for temperature and relative humidity were changed to read 55555 (unless they

previously read -99999) on the following dates. The sensor was beginning to fail this month.

As a result, all days which contained data which were definitely incorrect (either extremely

high or low values) were removed in their entirety for these two parameters. Data removal

occurred for the following dates: 7/2/02 – 7/4/02, 7/17/02 – 7/19/02, 7/23/02, and 7/29/02 –

7/31/02.

Array Day Date Time Error Message

101 2 183 100 Technician changed Temp & RH 101 Array data from 2 ( 183) 100 to 4

( 185) 1000

101 4 185 1400 Technician changed Temp & RH 101 Array data from 4 ( 185) 1400 to 4

( 185) 2400

101 17 198 100 Technician changed Temp & RH 101 Array data from 17 ( 198) 100 to 19 ( 200) 2400

101 23 204 100 Technician changed Temp & RH 101 Array data from 23 ( 204) 100 to 23 ( 204) 2400

101 29 210 100 Technician changed Temp & RH 101 Array data at 29 ( 210) 100 to 31

( 212) 2400

150 1 182 15 Technician changed Temp & RH 150 Array data from 1 ( 182) 15 to 19

( 200) 2400

150 23 204 15 Technician changed Temp & RH 150 Array data from 23 ( 204) 15 to 23 ( 204) 2400

150 29 210 15 Technician changed Temp & RH 150 Array data at 29 ( 210) 15 to 31

( 212) 2400

241 2 183 2400 Technician changed Temp & RH 241 Array from 2 ( 183) 2400 to 2

( 183) 2400

241 17 198 2400 Technician changed Temp & RH 241 Array from 17 ( 198) 2400 to 19

( 200) 2400

241 23 204 2400 Technician changed Temp & RH 241 Array from 23 ( 204) 2400 to 23

( 204) 2400

241 29 210 2400 Technician changed Temp & RH 241 Array data at 29 ( 210) 2400 to 31 ( 212) 2400

243 2 183 2400 Technician changed Temp & RH 243 Array data from 2 ( 183) 2400 to 4 ( 185) 2400

243 17 198 2400 Technician changed Temp & RH 243 Array data from 17 ( 198) 2400 to 19 ( 200) 2400

243 23 204 2400 Technician changed Temp & RH 243 Array data from 23 ( 204) 2400 to 23 ( 204) 2400

243 29 210 2400 Technician changed Temp & RH 243 Array data at 29 ( 210) 2400 to 31 ( 212) 2400

244 2 183 2400 Technician changed Temp & RH 244 Array data from 2 ( 183) 2400 to 2 ( 183) 2400

244 17 198 2400 Technician changed Temp & RH 244 Array data from 17 ( 198) 2400 to 19 ( 200) 2400

244 23 204 2400 Technician changed Temp & RH 244 Array data from 23 ( 204) 2400 t 23 ( 204) 2400

244 29 210 2400 Technician changed Temp & RH 244 Array data at 29 ( 210) 2400 to 31 ( 212) 2400

A new wind sentry was installed on 7/17/02 at 1230 (testing of this sensor occurred at 1300).

All wind direction data was removed prior to this time.

Array Day Date Time Error Message

150 1 182 0015 Technician changed WDir 150 Array from 1 ( 182) 100 to 17 ( 198) 1215

102 1 182 100 Technician changed WDir 102 Array from 1 ( 182) 100 to 17 ( 198) 1300

242 1 182 2400 Technician changed WDir 242 Array from 1 ( 182) 2400 to 17 ( 198) 2400

An erroneous maximum wind speed value was recorded on July 17 in array 243 and was deleted.

243 17 198 2400 Technician changed Wind Speed maximum at 17 (198) 2400

All Eppley data were removed. This sensor was not functioning properly.

Array Day Date Time Error Message

112 1 182 15 Technician changed 112 Array data at 1 ( 182) 15 to 31 ( 212) 2400

August 2002:

The following negative wind direction (offset value) occurred when there was no wind; hence,

this value was converted to zero.

Array Day Date Time Error Message

150 9 221 215 Wind direction is greater than 360 or less than 0 on 9 ( 221) 215

(-.09525)

All Eppley data were removed. This sensor was not functioning properly.

Array Day Date Time Error Message

112 1 213 15 Technician changed 112 Array data at 1 ( 213) 15 to 31 ( 243) 2400

The temperature and relative humidity sensor was failing so all data for 8/1/02

– 8/6/02, 8/10/02, 8/12/02 – 8/21/02, and 8/25/02 – 8/31/02 were removed. All remaining

temperature and relative humidity data for the month should be viewed with suspicion as

the sensor was definitely not recording valid measurements for most days.

Array Day Date Time Error Message

101 1 213 100 Technician changed Temp & RH 101 Array data from 1 ( 213) 100 to 6

( 218) 2400

101 10 222 100 Technician changed Temp & RH 101 Array data from 10 ( 222) 100 to 10 ( 222) 2400

101 12 224 100 Technician changed Temp & RH 101 Array data from 12 ( 224) 100 to 21 ( 233) 2400

101 25 237 100 Technician changed Temp & RH 101 Array data at 25 ( 237) 100 to 31

( 243) 2400

150 1 213 15 Technician changed Temp & RH 150 Array data from 1 ( 213) 15 to 6

( 218) 2400

150 10 222 15 Technician changed Temp & RH 150 Array data from 10 ( 222) 15 to 10 ( 222) 2400

150 12 224 15 Technician changed Temp & RH 150 Array data from 12 ( 224) 15 to 21 ( 233) 2400

150 25 237 15 Technician changed Temp & RH 150 Array data at 25 ( 237) 15 to 31

( 243) 2400

241 1 213 2400 Technician changed Temp & RH 241 Array from 1 ( 213) 2400 to 6

( 218) 2400

241 10 222 2400 Technician changed Temp & RH 241 Array from 10 ( 222) 2400 to 10

( 222) 2400

241 12 224 2400 Technician changed Temp & RH 241 Array from 12 ( 224) 2400 to 21

( 233) 2400

241 25 237 2400 Technician changed Temp & RH 241 Array data at 25 ( 237) 2400 to 31 ( 243) 2400

243 1 213 2400 Technician changed Temp & RH 243 Array data from 1 ( 213) 2400 to 6 ( 218) 2400

243 10 222 2400 Technician changed Temp & RH 243 Array data from 10 ( 222) 2400 to 10 ( 222) 2400

243 12 224 2400 Technician changed Temp & RH 243 Array data from 12 ( 224) 2400 to 21 ( 233) 2400

243 25 237 2400 Technician changed Temp & RH 243 Array data at 25 ( 237) 2400 to 31 ( 243) 2400

244 1 213 2400 Technician changed Temp & RH 244 Array data from 1 ( 213) 2400 to 6 ( 218) 2400

244 10 222 2400 Technician changed Temp & RH 244 Array data from 10 ( 222) 2400 to 10 ( 222) 2400

244 12 224 2400 Technician changed Temp & RH 244 Array data from 12 ( 224) 2400 to 21 ( 233) 2400

244 25 237 2400 Technician changed Temp & RH 244 Array data at 25 ( 237) 2400 to 31 ( 243) 2400

Although the temperature and relative humidity data were retained for some dates, the

EOD minimum values on both 8/7/02 and 8/11/02 were negative values. This suggests that

the sensor was not recording properly throughout the entire day. However, the 15-minute

sample data appeared to be reasonable, so the EOD minimums (array 244) for both the minimum

record and time fields were replaced for these dates from the 15-minute sample data (array 150)

The error messages suggest that the sensor failed at least part of the hour (1500 on 8/7/02

and 1100 on 8/11/02) resulting in lower 1 hour average data. These data should be considered

suspect although they were retained in the dataset.

Array Day Date Time Error Message

101 11 223 1100 Air temp average in 1 hour data ( 19.216) is less than 24 hour minimum ( 19.358)

101 11 223 1100 Relative humidity average in 1 hour data ( 58.516) is less than 24 hour minimum ( 63.414)

101 7 219 1500 Air temp average in 1 hour data ( 20.793) is less than 15 minute minimum ( 24.708) by at least 10%

101 11 223 1100 Air temp average in 1 hour data ( 19.216) is less than 15 minute minimum ( 26.323) by at least 10%

September 2002:

These data appear to be correct.

Array Day Date Time Error Message

151 23 266 400 Precip difference from 23 ( 266) 400 ( 1.27) to 23 ( 266) 415 ( 8.89) is greater than 5 mm

151 23 266 415 Precip difference from 23 ( 266) 415 ( 8.89) to 23 ( 266) 430 ( 2.54) is greater than 5 mm

All Eppley data were removed for the month of September. Unlike preceding months, the

datalogger recorded missing samples (as 11111) during this month. Although generally

these values are not altered, the data values were changed to read 55555 by the technician

to avoid the associated 14 pages of error messages. None of the data were valid as the

Eppley sensor has not been functioning properly.

Array Day Date Time Error Message

112 1 244 15 Technician changed 112 Array data at 1 ( 244) 15 to 30

( 273) 2400

All temperature and relative humidity data for the month were removed with the

exception of the last two days. This sensor had been getting progressively worse for the

past few months. At the end of the month, a change to the amount of tension on the sensor

wiring may have been enough to improve the data, although all remaining temperature and

relative humidity data should be considered suspect.

Array Day Date Time Error Message

101 1 244 100 Technician changed Temp & RH 101 Array data from 1 ( 244) 100 to 28

( 271) 2400

150 1 244 15 Technician changed Temp & RH 150 Array data from 1 ( 244) 15 to 28

( 271) 2400

241 1 244 2400 Technician changed Temp & RH 241 Array from 1 ( 244) 2400 to 28

( 271) 2400

243 1 244 2400 Technician changed Temp & RH 243 Array data from 1 ( 244) 2400 to 28 ( 271) 2400

244 1 244 2400 Technician changed Temp & RH 244 Array data from 1 ( 244) 2400 to 28 ( 271) 2400

Duplicate Licor records occurred on 9/27/02 at 1200. The first record (968.84)

was retained in favor of the second record (673.05) based on sums of the 15-minute data

for that hour and PAR totals. Duplicate EOD records for this day also occurred. The larger

value (5999.257) was retained as the smaller (2741.874) represented the sum of data through

1200 only.

October 2002:

These data appear to be correct. The error regarding pressure change is a function of

missing data over a period of days.

Array Day Date Time Error Message

150 3 276 845 Air temp difference from 3 ( 276) 845 ( 18.729) to 3 ( 276) 900

( 22.854) is greater than 3.0 degrees C

150 16 289 915 Pressure difference from 16 ( 289) 915 ( 1010.9) to 21 ( 294) 45

( 1017.2) is greater than 5 mb

The temperature and relative humidity sensor was recording anomalous data for

portions of the day on 10/2/02 from 1015-1530 and 10/5/02 from 1015-1630. These data were

removed. Although the 15-minute (array 150) and hourly (array 101) data were removed, it

was also necessary to remove daily values as these are based on the 5-second samples.

Array Day Date Time Error Message

101 2 275 1100 Technician changed Temp & RH 101 Array data from 2 ( 275) 1100 to 2

( 275) 1600

101 5 278 1100 Technician changed Temp & RH 101 Array data from 5 ( 278) 1100 to 5

( 278) 1700

150 2 275 1015 Technician changed Temp & RH 150 Array data from 2 ( 275) 1015 to 2 ( 275) 1530

150 5 278 1015 Technician changed Temp & RH 150 Array data from 5 ( 278) 1015 to 5 ( 278) 1630

241 2 275 2400 Technician changed Temp & RH 241 Array from 2 ( 275) 2400

243 2 275 2400 Technician changed Temp & RH 243 Array data from 2 ( 275) 2400

244 2 275 2400 Technician changed Temp & RH 244 Array data from 2 ( 275) 2400

244 5 278 2400 Technician changed Temp & RH 244 Array data from 5 ( 278) 2400

All relative humidity data from October 11-13 should be considered suspect.

Also, the daily minimum values (array 244) for Temp and RH on October 3 were considered

suspect and deleted from record.

All Eppley data were removed. Missing values (11111) were changed to read 55555

by the technician in order to avoid multiple pages of errors. This sensor has not been

functioning and none of the data were valid.

Array Day Date Time Error Message

112 1 274 15 Technician changed 112 Array data at 1 ( 274) 15

to 31 ( 304) 2400

Daily maximums for pressure, wind speed, and battery voltage were not recorded after 10/20/02

(array fields 10 – 15 contained zeros). Pressure and wind speed values were changed to read

55555 to avoid the corresponding error messages. Although data values were recorded for the

daily minimum of these parameters, they did not appear to be valid (e.g. hourly pressure

averages were always less than the daily minimum values, and wind speeds were much higher

than any minimums recorded earlier in the month). All pressure and wind speed records were

changed to read 55555.

Array Day Date Time Error Message

243 21 294 2400 Technician changed 243 Array data at 21 ( 294)

2400 to 31 ( 304) 2400

244 21 294 2400 Technician changed 244 Array data at 21 ( 294)

2400 to 31 ( 304) 2400

Daily totals for par and rainfall (arrays 245 and 246) on 10/16/02 are calculated from

15 minute totals through 915 only.

November 2002:

These data appear to be correct.

Array Day Date Time Error Message

101 2 306 2300 Air temp average in 1 hour data ( .09211) is less than 15 minute minimum ( .10729) by at least 10%

All Eppley data were changed to read 55555 including values that were originally

recorded as missing (11111) in order to avoid multiple pages of error messages.

This sensor does not work properly and the data were not valid.

Array Day Date Time Error Message

112 1 305 15 Technician changed 112 Array data at 1 ( 305) 15 to 30 ( 334) 2400

December 2002:

These data appear to be correct.

Array Day Date Time Error Message

150 25 359 1900 Pressure is greater than 1040 or less than 980 on 25 ( 359) 1900

( 979.91)

150 25 359 1915 Pressure is greater than 1040 or less than 980 on 25 ( 359) 1915

( 979.91)

150 25 359 1930 Pressure is greater than 1040 or less than 980 on 25 ( 359) 1930

( 979.28)

150 25 359 1945 Pressure is greater than 1040 or less than 980 on 25 ( 359) 1945

( 978.92)

150 25 359 2000 Pressure is greater than 1040 or less than 980 on 25 ( 359) 2000

( 978.79)

150 25 359 2015 Pressure is greater than 1040 or less than 980 on 25 ( 359) 2015

( 978.87)

150 25 359 2030 Pressure is greater than 1040 or less than 980 on 25 ( 359) 2030

( 978.7)

150 25 359 2045 Pressure is greater than 1040 or less than 980 on 25 ( 359) 2045

( 978.63)

150 25 359 2100 Pressure is greater than 1040 or less than 980 on 25 ( 359) 2100

( 978.89)

150 25 359 2115 Pressure is greater than 1040 or less than 980 on 25 ( 359) 2115

( 979.13)

150 25 359 2130 Pressure is greater than 1040 or less than 980 on 25 ( 359) 2130

( 979.46)

150 25 359 2145 Pressure is greater than 1040 or less than 980 on 25 ( 359) 2145

( 979.69)

All Eppley data were changed to read 55555 including values that were originally

recorded as missing (11111) in order to avoid multiple pages of error messages.

This sensor does not work properly and the data were not valid.

Array Day Date Time Error Message

112 1 335 15 Technician changed 112 Array data at 1 ( 335) 15 to 31 ( 365) 2400

**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](http://www.nerrsdata.org/get/landing.cfm) throughout the fall of 2022.

January 2002:

The data was not online until 2/6/02 at 1430.

February 2002:

The datalogger was not online until 2/6/02 at 1430.

Array Day Date Time Error Message

150 1 32 30 Missing 150 Array data (15 minute data) from 1 ( 32) 30 to 1 ( 32) 1415

150 1 32 1500 Missing 150 Array data (15 minute data) from 1 ( 32) 1500 to 6 ( 37) 1330

150 6 37 1400 Missing 150 Array (15 minute data)

101 1 32 100 Missing 101 Array data (Hourly Averages) from 1 ( 32) 100 to 6 ( 37) 1400

102 1 32 100 Missing 102 Array data (Hourly Average Wind Parameters) from 1 ( 32) 100 to 6 ( 37) 1400

241 1 32 2400 Missing 241 data (Daily Averages) from 1 ( 32) 2400 to 5 ( 36) 2400

242 1 32 2400 Missing 242 data (Daily Average Wind Parameters) from 1 ( 32) 2400 to 5 ( 36) 2400

243 1 32 2400 Missing 243 data (Daily Max/Time Values) from 1 ( 32) 2400 to 5 ( 36) 2400

244 1 32 2400 Missing 244 data (Daily Min/Time Values) from 1 ( 32) 2400 to 5 ( 36) 2400

March 2002:

Data are missing. The datalogger was off-line during an initial installation

attempt for the temperature and relative humidity sensor.

Array Day Date Time Error Message

150 27 86 1415 Missing 150 Array (15 minute data)

April 2002:

All data are missing from 4/26/02 at 900 to 4/28/02 at 2300. This was probably

a result of power loss or wet wiring (as there was a heavy rainfall on 4/25/02).

Array Day Date Time Error Message

150 26 116 900 Missing 150 Array data (15 minute data) from 26 ( 116) 900 to 28

( 118) 2300

101 26 116 900 Missing 101 Array data (Hourly Averages) from 26 ( 116) 900 to 28

( 118) 2300

102 26 116 900 Missing 102 Array data (Hourly Average Wind Parameters) from 26

( 116) 900 to 28 ( 118) 2200

241 26 116 2400 Missing 241 data (Daily Averages) from 26 ( 116) 2400 to 27 ( 117) 2400

242 26 116 2400 Missing 242 data (Daily Average Wind Parameters) from 26 ( 116) 2400 to 27 ( 117) 2400

243 26 116 2400 Missing 243 data (Daily Max/Time Values) from 26 ( 116) 2400 to 27

( 117) 2400

244 26 116 2400 Missing 244 data (Daily Min/Time Values) from 26 ( 116) 2400 to 27

( 117) 2400

May 2002:

All data are missing due to a file overwrite from 5/24/02 at 930 to the end of

the month. Missing EOD arrays should read as missing through 5/31/02 at 2400.

Array Day Date Time Error Message

150 24 144 930 Missing 150 Array data (15 minute data) from 24 ( 144) 930 to 31

( 151) 2400

101 24 144 1000 Missing 101 Array data (Hourly Averages) from 24 ( 144) 1000 to 31

( 151) 2400

102 24 144 1000 Missing 102 Array data (Hourly Average Wind Parameters) from 24

( 144) 1000 to 31 ( 151) 2400

241 24 144 2400 Missing 241 data (Daily Averages) from 24 ( 144) 2400 to 31 ( 151) 2400

242 24 144 2400 Missing 242 data (Daily Average Wind Parameters) from 24 ( 144) 2400 to 31 ( 151) 2400

243 24 144 2400 Missing 243 data (Daily Max/Time Values) from 24 ( 144) 2400 to 31

( 151) 2400

244 24 144 2400 Missing 244 data (Daily Min/Time Values) from 24 ( 144) 2400 to 31

( 151) 2400

June 2002:

All data are missing due to a file overwrite from the beginning of the month

through 6/7/02 at 2045.

Array Day Date Time Error Message

150 1 152 30 Missing 150 Array data (15 minute data) from 1 ( 152) 30 to 7 ( 158) 2045

101 1 152 100 Missing 101 Array data (Hourly Averages) from 1 ( 152) 100 to 7 ( 158) 2000

102 1 152 100 Missing 102 Array data (Hourly Average Wind Parameters) from 1

( 152) 100 to 7 ( 158) 2000

241 1 152 2400 Missing 241 data (Daily Averages) from 1 ( 152) 2400 to 6 ( 157) 2400

242 1 152 2400 Missing 242 data (Daily Average Wind Parameters) from 1 ( 152) 2400 to 6 ( 157) 2400

243 1 152 2400 Missing 243 data (Daily Max/Time Values) from 1 ( 152) 2400 to 6

( 157) 2400

244 1 152 2400 Missing 244 data (Daily Min/Time Values) from 1 ( 152) 2400 to 6

( 157) 2400

July through September 2002:

NONE

October 2002:

These data are missing due to a file overwrite.

Array Day Date Time Error Message

150 16 289 930 Missing 150 Array data (15 minute data) from 16 ( 289) 930 to 21 ( 294) 30

101 16 289 1000 Missing 101 Array data (Hourly Averages) from 16 ( 289) 1000 to 20

( 293) 2400

102 16 289 1000 Missing 102 Array data (Hourly Average Wind Parameters) from 16

( 289) 1000 to 20 ( 293) 2400

241 16 289 2400 Missing 241 data (Daily Averages) from 16 ( 289) 2400 to 20 ( 293) 2400

242 16 289 2400 Missing 242 data (Daily Average Wind Parameters) from 16 ( 289) 2400 to 20 ( 293) 2400

243 16 289 2400 Missing 243 data (Daily Max/Time Values) from 16 ( 289) 2400 to 20

( 293) 2400

244 16 289 2400 Missing 244 data (Daily Min/Time Values) from 16 ( 289) 2400 to 20

( 293) 2400

November through December 2002:

NONE

**13) Other Remarks/notes**

**On 10/10/2023 this dataset was updated to include embedded QAQC flags for anomalous/suspect data.** System-wide monitoring data beginning in 2007 were processed to allow for QAQC flags and codes to be embedded in the data files rather than detailed in the metadata alone (as in the anomalous/suspect, deleted, and missing data sections above). Prior to 2007, rejected data were deleted from the dataset so they are unavailable to be used at all, but suspect data were only noted in the metadata document. Suspect data flags <1> were embedded retroactively in order to allow suspect data to be easily identified and filtered from the dataset if desired for analysis and reporting purposes. No other flags or codes were embedded in the dataset and users should still refer to the detailed explanations above for more information.

**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](http://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](http://www.nerrsdata.org/get/landing.cfm) throughout early 2023.

In June 2009, in order to repopulate data tables, the Centralized Data Management Office removed all -99999 from SWMP weather data files and replaced them with -99.

The Centralized Data Management Office converted all SWMP weather data collected with CR10X

program versions prior to version 4.0 which was distributed in October 2003. This was necessary

in order to merge the old data format (12 array output) with the new data format found in version 4.0

(3 array output). The new format produces averages, maximums and minimums every fifteen minutes

(array 15), every hour (array 60) and every day (array 144) for any sensors hooked up to the CR10X.

Specifically, the 150 and 151 fifteen minute data were converted to the new 15 array;

the hourly 101, 102, 105 and 106 data were converted to the new 60 array; and the daily 241, 242,

243, 244, 245 and 246 data were converted to the new 144 array. With the new format, the use of

55555's to code for deleted data and 11111's to code for missing data has been abandoned.

Hence, all 55555's or 11111's contained in the SWMP weather data collected prior to Version 4.0

of the CR10X program were removed and left blank.

Duplicate records for Licor data often occurred during dates and times when the

data was uploaded. A review of the data during these periods made identification of

these duplicate records possible, as they did not appear on the WDMP error report.

The temperature and relative humidity sensor failed for short periods throughout

the year, the last occurrence was during the month of October. At this time,

the tension of the sensor wiring was reduced. It may be that the high tension

had affected the seal on the wire connection threads, allowing moisture to

accumulate and influence the sensor readings. At present the sensor appears to work

well indicating that this must have been the problem.

Raw data for the period April 26 through June 7 are not available due to the

loss of a laptop computer.

From February through July, the wind direction sensor was stuck in the northwest quadrant.

Rain Events:

Note: monthly totals are not available during those months where data was missing

due to power down or reload or re-wiring.

February

Date RainAmount (mm)

7 1.016

10 3.302

11 10.922

12 .254

17 3.048

21 7.366

27 6.350

28 1.270

March

Date RainAmount (mm)

2 1.524

3 24.638

9 .508

10 12.954

13 4.826

15 .254

16 1.778

18 10.160

19 .254

20 18.796

26 17.018

27 15.240

30 6.096

31 9.144

April

Date RainAmount (mm)

1 20.066

3 2.540

10 11.938

14 1.016

15 1.524

18 1.524

20 .254

22 4.826

25 20.574

28 1.016

29 1.270

30 1.778

May

Date RainAmount (mm)

2 12.954

3 .254

9 1.016

10 1.270

12 8.382

13 35.052

14 9.144

15 .254

17 1.778

18 34.798

June

Date RainAmount (mm)

12 9.144

14 1.778

15 7.620

16 7.620

19 6.858

22 .508

26 3.556

27 1.524

28 .254

July

Date RainAmount (mm)

9 1.016

10 .254

19 2.032

23 1.778

24 .508

28 4.064

29 .254

"Monthly Total" 9.9

August

Date Rainamount (mm)

2 3.556

20 7.112

22 2.794

24 .254

25 .508

29 12.192

30 .508

"Monthly Total" 26.9

September

Date RainAmount (mm)

2 29.464

4 6.858

15 7.112

16 22.352

22 2.032

23 25.654

26 8.128

27 9.906

28 .508

"Monthly Total" 112.0

October

Date Rainamount (mm)

11 6.350

12 3.302

13 3.048

16 7.620

23 3.048

26 52.578

November

Date Rainamount (mm)

4 .508

6 11.938

10 6.096

11 .254

12 13.208

13 18.288

16 16.764

17 28.194

18 1.524

21 .254

22 14.732

27 10.160

29 2.540

"Monthly Total" 124.5

December

Date RainAmount (mm)

6 1.270

7 2.794

11 12.700

12 10.668

13 2.540

14 25.908

16 5.080

20 30.226

25 18.034

26 .762

31 2.286

"Monthly Total" 112.3