**Jobos Bay (JOB) National Estuarine Research Reserve Meteorological Metadata**

January - December 2002

Latest Update: **February 8, 2023**

I. Data Set & Research Descriptors

1) Principal investigator(s) & contact persons

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2) Entry verification

Collected data is verified (QA/QC), using the CDMO Weather Data Management Program.

a) Data Input Procedures:

The 15-minute, 1-hour average, and 24-hour meteorological data was downloaded from each

instrument of the weather station to a Campbell Scientific CR10X datalogger. The CDMO

Data Logger Program (nerr30.csi) was loaded into the CR10X datalogger that controls the

sensors and data collection schedule (see 2b of the Entry Verification section for the

data collection schedule). The CR10X was then interfaced with the PC208W software

supplied by Campbell Scientific.

Data was downloaded through a storage module, at the beginning of every month, via a

direct connection to a computer located in Jobos Bay Laboratory. The data was saved as a

monthly raw data file (RAWjan02.dat) onto a separate hard drive and backed up onto Zip

disk and CD. 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 NERR Meteorological Data

Collection Schedule (see 2b of the Entry Verification section for the data collection

schedule). The WDMP automatically imports and converts 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 Appendix

G for the CDMO Meteorological Data Collection Error/Anomalous Data Criteria). Finally,

it produces error and summary reports. Any anomalous data was investigated and noted

below in the Anomalous Data Section. All data corrections performed are noted in the

Data Correction Section below. Common errors noted in the monthly error report include

wind speeds below the 0.5 m/s criteria, temperature change greater than 3 C in a 15 minute

period, and precipitation difference greater than 5mm in 15 minutes. All errors of this

type were double checked with other data that could support such "anomalous" weather

changes and noted in the sections that follow. Both raw data files and Access databases

were saved on Compact Disc.

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 (Campbell Weather Station):

The principal objective is to record long-term meteorological data to track changes in

meteorological conditions that can be associated to changes in estuarine habitats and

conditions. A secondary objective is to promote the access and use of reliable baseline

information by federal and local agencies, universities, researchers, educators and local

communities to enhance the process by which they make decisions regarding their daily

activities. This data is also invaluable in the identification and development of future

monitoring and research activities.

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. The data is downloaded

from the storage module to the laboratory computer by direct connection. Sensors on the

weather station are inspected periodically for damage or debris. If any are found,

sensors are repaired and/or cleaned. The rain gauge tends to collect the most debris

and needs to be cleaned every few days. Sensors are removed and sent to Campbell

Scientific for calibration at a minimum of every two years. There were no other analyses

done on the meteorological data.

5) Site location and character:

The Jobos Bay National Estuarine Research Reserve (JBNERR) is located on the southern

coastal plain of the island of Puerto Rico, the reserve is within the West Indies

geographical area. JBNERR is formed by two major components: (1) Mar Negro, located on

the western margin of the Bay, and (2) Cayos Caribe, a chain of 15 tear-shaped islets

located to the southeast. The Mar Negro component comprises the bulk of the Reserve, and

consists of mangrove forests and a complex system of lagoons and channels interspersed

with salt and mud flats. Coral reefs and sea grass beds, with small beach

deposits and upland areas fringe Cayos Caribe mangrove islands.

The weather station is situated in front of the Visitor's Center, located in the

community of Aguirre, Salinas, Puerto Rico. The Wind Sentry, Temperature and Humidity

sensor, Barometric Sensor and LiCor Sensor are all located on a 10m aluminum tower

following the descriptions outlined in the CDMO Manual V 4.0. The Tipping Bucket Rain

gauge is located to the SW side of the tower. The sensors were wired to the CR10X

following the protocol in the CDMO Manual.

A description of the specific sampling station follows:

The weather station is located in front of JBNERR Visitor's Center. Its coordinates are latitude 17o 57' 23.34"; longitude 66o 13' 22.56".

6) Data collection period:

The current weather station was deployed in 1999. Data has been collected for years 2000,

2001 and 2002. All data collected since year 2000 has been edited using the CDMO Weather

Program.

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 is collected will be contacted and fully acknowledged in any

subsequent publications in which any part of the data is 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:

Jobos Bay NERR system-wide monitoring program has four YSI's continuous sampling stations

(s9,s10,s19,s20) that collect long term water quality data, every 30 minutes, to track

changes in water quality in the Bay. Parameters include temperature, dissolve oxygen (%

saturation, mg/L), specific conductivity, salinity, depth, pH and turbidity. Stations 9

and 10 were selected to represent sites that could compare human impact gradients, with

Station 9 being an impacted site and station 10 the reference site. Stations 19 and 20 were

just recently established (July 2002) to compare an ecosystem gradient.

Station 19 was deployed over sea grass beds, Thalassia testudinum, in the bay and station

20 was deployed over sea grass bed communities near Cayos Caribe coral reefs.

II. Physical Structure Descriptors

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

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: 07-22-99

Wind Sentry

Model # 03001

Range: 0-50 m/s; 360° mechanical

Date of last calibration: 08-16-99

Temperature and Relative Humidity

Model #: HMP35C

Operating Temperature: -35 to +50°C

Temperature Measurement Range: -35 to +50°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: 07-24-99

Barometric Sensor

Model # CS-105

Operating Range: Pressure – 600 to 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: 05-16-99

Tipping Bucket Rain Gauge

Model #: RG-2000-C

Range: 0.254 mm

Accuracy: 1.0% at <14"/hr

Date of Last calibration: 8-14-01

10) Coded variable indicator and variable code definitions:

Site definitions: JB = Jobos Bay

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.

All relative humidity data (RH) from January 1 through July 9 0830 was eliminated

because the protective cap was not removed from the humidity sensor, resulting in

inaccurate readings.

January 2002

All relative humidity data (RH) for this month was eliminated. The technician that

assembled the Weather Station forgot to remove the protection cap of the humidity sensor

causing erroneous readings during all the month. The erroneous data was erased and the

values were exchanged for the code 55555 on the Arrays 101,150, 241, 243 and 244.

Array Date Day Time Error Message

101 1 1 100 Technician changed 101 Array data at 1 ( 1) 100 to 31 ( 31) 2400

150 1 1 15 Technician changed 150 Array data at 1 ( 1) 15 to 31 ( 31) 2400

241 1 1 2400 Technician changed 241 Array data at 1 ( 1) 2400 to 31 ( 31) 2400

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

244 1 1 2400 Technician changed 244 Array data at 1 ( 1) 2400 to 31 ( 31) 2400

The following data appear to be correct:

Array Date Day Time Error Message

150 29 29 1545 Air temp difference from 29 ( 29) 1545 ( 27.668) to 29 (29) 1600 (24.387) is greater than 3.0 degrees C

February 2002

All relative humidity data (RH) for this month was eliminated. The technician that

assembled the Weather Station forgot to remove the protection cap of the humidity sensor

causing erroneous readings during all the month. The erroneous data was erased and the

values were exchanged for the code 55555 on the Arrays 101, 150, 241, 243 and 244.

Array Date Day Time Error Message

101 1 32 100 Technician changed 101 Array data at 1 ( 32) 100 to 28 (59) 2400

150 1 32 15 Technician changed 150 Array data at 1 ( 32) 15 to 28 (59) 2400

241 1 32 2400 Technician changed 241 Array data at 1 ( 32) 2400 to 28 (59) 2400

243 1 32 2400 Technician changed 243 Array data at 1 ( 32) 2400 to 28 (59) 2400

244 1 32 2400 Technician changed 244 Array data at 1 ( 32) 2400 to 28 (59) 2400

The following data appears to be correct:

Array Date Day Time Error Message

102 4 35 2100 Wind speed is less than 0.5 m/s from 4 ( 35) 2100 to 5 ( 36) 900

102 17 48 1900 Wind speed is less than 0.5 m/s from 17 ( 48) 1900 to 18 ( 49) 800

102 18 49 1900 Wind speed is less than 0.5 m/s from 18 ( 49) 1900 to 19 ( 50) 700

102 25 56 2000 Wind speed is less than 0.5 m/s from 25 ( 56) 2000 to 26 ( 57) 1000

March 2002

All relative humidity data (RH) for this month was eliminated. The technician that

assembled the Weather Station forgot to remove the protection cap of the humidity sensor

causing erroneous readings during all the month. The erroneous data was erased and the

values were exchanged for the code 55555 on the Arrays 101,150, 241, 243 and 244.

Array Date Day Time Error Message

101 1 60 100 Technician changed 101 Array data at 1 ( 60) 100 to 31 (90) 2400

150 1 60 15 Technician changed 150 Array data from 1 ( 60) 15 to 1 (60) 715

150 1 60 745 Technician changed 150 Array data at 1 ( 60) 745 to 31 (90) 2400

241 1 60 2400 Technician changed 241 Array data at 1 ( 60) 2400 to 31 (90) 2400

243 1 60 2400 Technician changed 243 Array data at 1 ( 60) 2400 to 31 (90) 2400

244 1 60 2400 Technician changed 244 Array data at 1 ( 60) 2400 to 31 (90) 2400

The following hourly and daily data were deleted on March 1 due to the power down at 0800, resulting

in 5 second data loss:

Array Date Day Time Error Message

101 1 60 800 Technician changed 101 Array data at 1 ( 60) 800

102 1 60 800 Technician changed 102 Array from 1 ( 60) 800

241 1 60 2400 Technician changed 241 Array data at 1 ( 60) 2400

242 1 60 2400 Technician changed 242 Array data at 1 ( 60) 2400

243 1 60 2400 Technician changed 243 Array data at 1 ( 60) 2400

244 1 60 2400 Technician changed 244 Array data at 1 ( 60) 2400

The following data appears to be correct:

Array Date Day Time Error Message

151 28 87 515 Precip difference from 28 ( 87) 515 ( 6.604) to 28 ( 87)

530 ( 1.016) is greater than 5 mm

102 10 69 2000 Wind speed is less than 0.5 m/s from 10 ( 69) 2000 to 11

( 70) 800

102 28 87 1900 Wind speed is less than 0.5 m/s from 28 ( 87) 1900 to 29

( 88) 900

102 29 88 1900 Wind speed is less than 0.5 m/s from 29 ( 88) 1900 to 30

( 89) 900

April 2002

All relative humidity data (RH) for this month was eliminated. The technician that

assembled the Weather Station forgot to remove the protection cap of the humidity sensor

causing erroneous readings during all the month. The erroneous data was erased and the

values were exchanged for the code 55555 on the Arrays 101,150, 241, 243 and 244.

Array Date Day Time Error Message

101 1 91 100 Technician changed 101 Array data at 1 ( 91) 100 to 30 (120) 2400

150 1 91 15 Technician changed 150 Array data at 1 ( 91) 15 to 30 (120) 2400

241 1 91 2400 Technician changed 241 Array data at 1 ( 91) 2400 to 30 (120) 2400

243 1 91 2400 Technician changed 243 Array data at 1 ( 91) 2400 to 30 (120) 2400

244 1 91 2400 Technician changed 244 Array data at 1 ( 91) 2400 to 30 (120) 2400

The following data appears to be correct:

Array Date Day Time Error Message

150 7 97 1345 Air temp difference from 7 ( 97) 1345 ( 27.804) to 7 (97) 1400 ( 24.464) is greater than 3.0 degrees C

151 20 110 830 Precip difference from 20 ( 110) 830 ( 2.032) to 20 (110) 845 ( 13.97) is greater than 5 mm

151 20 110 845 Precip difference from 20 ( 110) 845 ( 13.97) to 20 (110) 900 ( 5.588) is greater than 5 mm

151 20 110 900 Precip difference from 20 ( 110) 900 ( 5.588) to 20 (110) 915 ( .508) is greater than 5 mm

151 20 110 915 Precip difference from 20 ( 110) 915 ( .508) to 20 ( 110) 930 ( 10.16) is greater than 5 mm

151 20 110 930 Precip difference from 20 ( 110) 930 ( 10.16) to 20 (110) 945 ( 3.302) is greater than 5 mm

102 12 102 2000 Wind speed is less than 0.5 m/s from 12 ( 102) 2000 to 13 ( 103) 800

102 21 111 1700 Wind speed is less than 0.5 m/s from 21 ( 111) 1700 to 22 ( 112) 800

102 22 112 2000 Wind speed is less than 0.5 m/s from 22 ( 112) 2000 to 23 ( 113) 800

102 23 113 2000 Wind speed is less than 0.5 m/s from 23 ( 113) 2000 to 24 ( 114) 800

102 25 115 1900 Wind speed is less than 0.5 m/s from 25 ( 115) 1900 to 26 ( 116) 800

102 26 116 1600 Wind speed is less than 0.5 m/s from 26 ( 116) 1600 to 27 ( 117) 800

May 2002

All relative humidity data (RH) for this month was eliminated. The technician that

assembled the Weather Station forgot to remove the protection cap of the humidity sensor

causing erroneous readings during all the month. The erroneous data was erased and the

values were exchanged for the code 55555 on the Arrays 101,150, 241, 243 and 244.

Array Date Day Time Error Message

101 1 121 100 Technician changed 101 Array data at 1 ( 121) 100 to 31 (151) 2400

150 1 121 15 Technician changed 150 Array data at 1 ( 121) 15 to 31 (151) 2400

241 1 121 2400 Technician changed 241 Array data at 1 ( 121) 2400 to 31 ( 151) 2400

243 1 121 2400 Technician changed 243 Array data at 1 ( 121) 2400 to 31 ( 151) 2400

244 1 121 2400 Technician changed 244 Array data at 1 ( 121) 2400 to 31 ( 151) 2400

The following data appears to be correct:

Array Date Day Time Error Message

151 29 149 2115 Precip difference from 29 ( 149) 2115 ( 2.286) to 29 (149) 2130 ( 14.732) is greater than 5 mm

151 29 149 2145 Precip difference from 29 ( 149) 2145 ( 15.24) to 29 (149) 2200 ( 4.826) is greater than 5 mm

102 1 121 2000 Wind speed is less than 0.5 m/s from 1 ( 121) 2000 to 2 ( 122) 800

June 2002

All relative humidity data (RH) for this month was eliminated. The technician that

assembled the Weather Station forgot to remove the protection cap of the humidity sensor

causing erroneous readings during all the month. The erroneous data was erased and the

values were exchanged for the code 55555 on the Arrays 101,150, 241, 243 and 244.

Array Date Day Time Error Message

101 1 152 100 Technician changed 101 Array data at 1 ( 152) 100 to 30 (181) 2400

150 1 152 15 Technician changed 150 Array data at 1 ( 152) 15 to 30 (181) 2400

241 1 152 2400 Technician changed 241 Array data at 1 ( 152) 2400 to 30 ( 181) 2400

243 1 152 2400 Technician changed 243 Array data at 1 ( 152) 2400 to 30 ( 181) 2400

244 1 152 2400 Technician changed 244 Array data at 1 ( 152) 2400 to 30 ( 181) 2400

The following data appears to be correct:

Array Date Day Time Error Message

150 5 156 1045 Air temp difference from 5 ( 156) 1045 ( 26.365) to 5 (156) 1100 (23.271) is greater than 3.0 degrees C

150 11 162 1015 Air temp difference from 11 ( 162) 1015 ( 28.153) to 11 (162) 1030 (25.124) is greater than 3.0 degrees C

151 4 155 45 Precip difference from 4 ( 155) 45 ( .508) to 4 ( 155) 100 ( 7.874) is greater than 5 mm

151 4 155 100 Precip difference from 4 ( 155) 100 ( 7.874) to 4 ( 155) 115 ( 1.778) is greater than 5 mm

151 11 162 1045 Precip difference from 11 ( 162) 1045 ( 6.096) to 11 ( 162) 1100 ( .254) is greater than 5 mm

151 18 169 330 Precip difference from 18 ( 169) 330 ( 2.032) to 18 ( 169) 345 ( 12.954) is greater than 5 mm

151 18 169 345 Precip difference from 18 ( 169) 345 ( 12.954) to 18 ( 169) 400 ( 1.016) is greater than 5 mm

102 6 157 2000 Wind speed is less than 0.5 m/s from 6 ( 157) 2000 to 7 ( 158) 800

July 2002

All relative humidity data (RH) from July 1 to July 9 was eliminated. The technician that

assembled the Weather Station forgot to remove the protection cap of the humidity sensor

causing erroneous readings during all the month. The erroneous data was erased and the

values were exchanged for the code 55555 on the Arrays 101,150, 241, 243 and 244. Error was

corrected on July 9, 02 @ 8:45.

Array Date Day Time Error Message

101 1 182 100 Technician changed 101 Array data from 1 ( 182) 100 to 9 ( 190) 800

150 1 182 15 Technician changed 150 Array data from 1 ( 182) 15 to 9 ( 190) 845

241 1 182 2400 Technician changed 241 Array from 1 ( 182) 2400 to 8 ( 189) 2400

243 1 182 2400 Technician changed 243 Array data from 1 ( 182) 2400 to 8 ( 189) 2400

244 1 182 2400 Technician changed 244 Array data from 1 ( 182) 2400 to 8 ( 189) 2400

The following data appears to be correct:

Array Date Day Time Error Message

150 9 190 845 Air temp difference from 9 ( 190) 845 ( 29.2) to 9 ( 190) 900 ( 34.689) is greater than 3.0 degrees C

151 7 188 2100 Precip difference from 7 ( 188) 2100 ( .254) to 7 ( 188) 2115 ( 5.842) is greater than 5 mm

102 11 192 2000 Wind speed is less than 0.5 m/s from 11 ( 192) 2000 to 12 ( 193) 800

102 30 211 2100 Wind speed is less than 0.5 m/s from 30 ( 211) 2100 to 31 ( 212) 900

August 2002

The following data appears to be correct:

Array Date Day Time Error Message

150 30 242 1700 Air temp difference from 30 ( 242) 1700 ( 29.395) to 30 ( 242) 1715 (25.496) is greater than 3.0 degrees C

151 11 223 30 Precip difference from 11 ( 223) 30 ( .254) to 11 ( 223) 45 ( 6.604) is greater than 5 mm

102 1 213 1900 Wind speed is less than 0.5 m/s from 1 ( 213) 1900 to 2 ( 214) 900

102 11 223 2000 Wind speed is less than 0.5 m/s from 11 ( 223) 2000 to 12 ( 224) 800

September 2002

The following data appears to be correct:

Array Date Day Time Error Message

150 7 250 1200 Air temp difference from 7 ( 250) 1200 ( 30.249) to 7 (250) 1215 (27.049) is greater than 3.0 degrees C

150 15 258 1145 Air temp difference from 15 ( 258) 1145 ( 30.508) to 15 (258) 1200 (26.718) is greater than 3.0 degrees C

150 24 267 1215 Air temp difference from 24 ( 267) 1215 ( 32.331) to 24 (267) 1230 (28.787) is greater than 3.0 degrees C

150 24 267 1245 Air temp difference from 24 ( 267) 1245 ( 27.591) to 24 (267) 1300 (24.015) is greater than 3.0 degrees C

150 24 267 1245 Rel hum difference from 24 ( 267) 1245 ( 72.624) to 24 (267) 1300 ( 100) is greater than 25%

151 15 258 2100 Precip difference from 15 ( 258) 2100 ( 8.89) to 15 (258) 2115 ( 3.302) is greater than 5 mm

151 15 258 2115 Precip difference from 15 ( 258) 2115 ( 3.302) to 15 (258) 2130 ( 11.176) is greater than 5 mm

151 15 258 2130 Precip difference from 15 ( 258) 2130 ( 11.176) to 15 (258) 2145 ( .254) is greater than 5 mm

151 25 268 345 Precip difference from 25 ( 268) 345 ( .254) to 25 ( 268) 400 ( 13.97) is greater than 5 mm

151 25 268 400 Precip difference from 25 ( 268) 400 ( 13.97) to 25 (268) 415 ( 2.286) is greater than 5 mm

102 1 244 1800 Wind speed is less than 0.5 m/s from 1 ( 244) 1800 to 2 ( 245) 900

102 2 245 1900 Wind speed is less than 0.5 m/s from 2 ( 245) 1900 to 3 ( 246) 900

102 3 246 1900 Wind speed is less than 0.5 m/s from 3 ( 246) 1900 to 4 ( 247) 800

102 4 247 1900 Wind speed is less than 0.5 m/s from 4 ( 247) 1900 to 5 ( 248) 800

102 5 248 2000 Wind speed is less than 0.5 m/s from 5 ( 248) 2000 to 6 ( 249) 800

102 6 249 2000 Wind speed is less than 0.5 m/s from 6 ( 249) 2000 to 7 ( 250) 800

102 17 260 1800 Wind speed is less than 0.5 m/s from 17 ( 260) 1800 to 18 ( 261) 900

102 18 261 1600 Wind speed is less than 0.5 m/s from 18 ( 261) 1600 to 19 ( 262) 1000

102 20 263 1900 Wind speed is less than 0.5 m/s from 20 ( 263) 1900 to 21 ( 264) 800

102 25 268 1800 Wind speed is less than 0.5 m/s from 25 ( 268) 1800 to 26 ( 269) 900

102 26 269 1700 Wind speed is less than 0.5 m/s from 26 ( 269) 1700 to 27 ( 270) 900

102 27 270 2000 Wind speed is less than 0.5 m/s from 27 ( 270) 2000 to 28 ( 271) 900

October 2002

Values were edited for Array 150 for relative humidity for day 24 from 1945 to 2215, 2300

and 2330, and exchanged for 55555. The sensor was not functioning, indicating humidity

values near 0% during the night and under a short period of rain.

Array Date Day Time Error Message

101 24 297 2000 Technician changed 101 Array data from 24 ( 297) 2000 to 24 ( 297) 2400

150 24 297 1945 Technician changed 150 Array data from 24 ( 297) 1945 to 24 ( 297) 2215

150 24 297 2300 Technician changed 150 Array data from 24 ( 297) 2300

150 24 297 2330 Technician changed 150 Array data from 24 ( 297) 2330

The following data appears to be correct:

Array Date Day Time Error Message

150 10 283 1400 Air temp difference from 10 ( 283) 1400 ( 26.907) to 10 ( 283) 1415 (23.808) is greater than 3.0 degrees C

151 10 283 1415 Precip difference from 10 ( 283) 1415 ( 6.096) to 10 (283) 1430 ( 11.684) is greater than 5 mm

151 10 283 1430 Precip difference from 10 ( 283) 1430 ( 11.684) to 10 (283) 1445 ( 4.318) is greater than 5 mm

151 24 297 1930 Precip difference from 24 ( 297) 1930 ( .762) to 24 (297) 1945 ( 6.35) is greater than 5 mm

151 24 297 1945 Precip difference from 24 ( 297) 1945 ( 6.35) to 24 (297) 2000 ( .254) is greater than 5 mm

102 1 274 2000 Wind speed is less than 0.5 m/s from 1 ( 274) 2000 to 2 ( 275) 800

102 2 275 2000 Wind speed is less than 0.5 m/s from 2 ( 275) 2000 to 3 ( 276) 800

102 6 279 2000 Wind speed is less than 0.5 m/s from 6 ( 279) 2000 to 7 ( 280) 800

102 7 280 1800 Wind speed is less than 0.5 m/s from 7 ( 280) 1800 to 8 ( 281) 800

102 9 282 1800 Wind speed is less than 0.5 m/s from 9 ( 282) 1800 to 10 ( 283) 800

102 12 285 1900 Wind speed is less than 0.5 m/s from 12 ( 285) 1900 to 13 ( 286) 900

102 13 286 1700 Wind speed is less than 0.5 m/s from 13 ( 286) 1700 to 14 ( 287) 800

102 14 287 1900 Wind speed is less than 0.5 m/s from 14 ( 287) 1900 to 15 ( 288) 800

102 20 293 1900 Wind speed is less than 0.5 m/s from 20 ( 293) 1900 to 21 ( 294) 800

102 21 294 1900 Wind speed is less than 0.5 m/s from 21 ( 294) 1900 to 22 ( 295) 800

102 23 296 1900 Wind speed is less than 0.5 m/s from 23 ( 296) 1900 to 24 ( 297) 800

102 30 303 2000 Wind speed is less than 0.5 m/s from 30 ( 303) 2000 to 31 ( 304) 800

November 2002

The following data appears to be correct:

Array Date Day Time Error Message

150 17 321 1400 Air temp difference from 17 ( 321) 1400 ( 29.998) to 17 ( 321) 1415 (24.905) is greater than 3.0 degrees C

102 2 306 2000 Wind speed is less than 0.5 m/s from 2 ( 306) 2000 to 3 ( 307) 900

102 6 310 1900 Wind speed is less than 0.5 m/s from 6 ( 310) 1900 to 7 ( 311) 900

102 7 311 2000 Wind speed is less than 0.5 m/s from 7 ( 311) 2000 to 8 ( 312) 900

102 8 312 2000 Wind speed is less than 0.5 m/s from 8 ( 312) 2000 to 9 ( 313) 800

102 12 316 2000 Wind speed is less than 0.5 m/s from 12 ( 316) 2000 to 13 ( 317) 800

102 27 331 1900 Wind speed is less than 0.5 m/s from 27 ( 331) 1900 to 28 ( 332) 800

102 28 332 2000 Wind speed is less than 0.5 m/s from 28 ( 332) 2000 to 29 ( 333) 900

102 29 333 2000 Wind speed is less than 0.5 m/s from 29 ( 333) 2000 to 30 ( 334) 900

December 2002

The following data appears to be correct:

Array Date Day Time Error Message

150 2 336 1515 Air temp difference from 2 ( 336) 1515 ( 30.406) to 2 (336) 1530 (26.922) is greater than 3.0 degrees C

150 2 336 1630 Air temp difference from 2 ( 336) 1630 ( 27.698) to 2 (336) 1645 (24.596) is greater than 3.0 degrees C

150 4 338 1415 Air temp difference from 4 ( 338) 1415 ( 29.836) to 4 ( 338) 1430 (26.276) is greater than 3.0 degrees C

150 12 346 1200 Air temp difference from 12 ( 346) 1200 ( 27.702) to 12 ( 346) 1215 (23.905) is greater than 3.0 degrees C

150 24 358 1200 Air temp difference from 24 ( 358) 1200 ( 27.964) to 24 ( 358) 1215 (24.847) is greater than 3.0 degrees C

151 16 350 215 Precip difference from 16 ( 350) 215 ( .762) to 16 ( 350) 230 ( 6.096) is greater than 5 mm

102 14 348 2000 Wind speed is less than 0.5 m/s from 14 ( 348) 2000 to 15 ( 349) 900

102 16 350 1700 Wind speed is less than 0.5 m/s from 16 ( 350) 1700 to 17 ( 351) 1000

102 17 351 1900 Wind speed is less than 0.5 m/s from 17 ( 351) 1900 to 18 ( 352) 1000

102 18 352 1900 Wind speed is less than 0.5 m/s from 18 ( 352) 1900 to 19 ( 353) 1000

102 21 355 1900 Wind speed is less than 0.5 m/s from 21 ( 355) 1900 to 22 ( 356) 1000

102 22 356 1900 Wind speed is less than 0.5 m/s from 22 ( 356) 1900 to 23 ( 357) 900

102 25 359 2000 Wind speed is less than 0.5 m/s from 25 ( 359) 2000 to 26 ( 360) 1000

102 26 360 1700 Wind speed is less than 0.5 m/s from 26 ( 360) 1700 to 27 ( 361) 800

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

None

February 2002

None

March 2002

The following error message was caused when the data was downloaded from the storage

module.

Array Date Day Time Error Message

150 1 60 730 Missing 150 Array (15 minute data)

April 2002

None

May 2002

None

June 2002

None

July 2002

None

August 2002

None

September 2002

None

October 2002

None

November 2002

None

December 2002

None

**13) Other remarks:**

**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.

Rain Events:

January

Date RainAmount (mm)

6 .254

13 .254

14 .254

16 .254

18 .254

22 1.016

23 .508

25 1.778

27 .508

28 3.810

31 .254

"Monthly Total" 9.1

February

Date RainAmount (mm)

1 1.016

3 2.540

19 .762

24 1.270

"Monthly Total" 5.6

March

Date RainAmount (mm)

1 1.016

8 .508

13 .508

18 .254

23 1.016

27 3.048

28 10.922

29 1.778

30 1.524

"Monthly Total" 20.6

April

Date RainAmount (mm)

3 4.318

4 4.064

6 9.652

7 13.208

15 1.778

16 1.778

20 48.006

21 17.780

"Monthly Total" 100.6

May

Date RainAmount (mm)

18 1.016

22 .762

23 .254

27 8.890

28 1.270

29 39.624

30 10.414

31 6.604

"Monthly Total" 68.8

June

Date RainAmount (mm)

2 2.794

3 6.858

4 28.702

5 14.732

8 .508

9 .508

11 9.906

13 3.302

14 .254

17 8.128

18 28.194

21 9.144

27 4.572

"Monthly Total" 117.6

July

Date RainAmount (mm)

2 .762

7 11.684

8 .254

14 14.986

17 .254

28 .762

29 .254

"Monthly Total" 29.0

August

Date Rainamount (mm)

6 3.048

7 .508

8 2.286

10 .254

11 14.732

14 .762

16 5.842

18 .508

29 6.350

30 8.890

31 9.652

"Monthly Total" 52.8

September

Date RainAmount (mm)

1 5.334

7 3.048

10 .508

14 .254

15 49.530

16 5.588

24 5.334

25 26.162

26 .762

28 .762

29 1.016

30 4.318

"Monthly Total" 102.6

October

Date Rainamount (mm)

2 1.778

4 1.016

8 2.286

10 26.162

11 7.112

12 .254

15 .508

16 .762

24 7.366

25 .254

26 2.286

27 .254

30 .508

31 1.524

"Monthly Total" 52.1

November

Date Rainamount (mm)

8 .508

10 2.286

11 16.002

13 1.270

17 5.588

18 .254

19 .508

21 .508

22 1.016

23 3.556

26 .762

"Monthly Total" 32.3

December

Date RainAmount (mm)

1 1.270

2 3.048

4 .762

5 3.556

6 .254

9 1.778

10 4.572

11 3.810

12 5.588

13 .254

14 .254

15 4.064

16 13.970

18 4.826

20 .254

21 .508

24 1.016

25 .508

"Monthly Total" 50.3