Jobos Bay (JOB) National Estuarine Research Reserve Meteorological Metadata

January - December 2001

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 by Luis Encarnación.

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 then

interfaced with the PC208W software supplied by Campbell Scientific.

Data was uploaded 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 (RAWjan01.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 reports include wind speeds below the

0.5 m/s criteria, temperature change greater than 3 C in a 15minute 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. No anomalous data was

corrected for 2001 data. Data corrections were performed on some 24 hour

maximum and minimum values due to problems further described in the section.

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. At the same time, the collected information

will provide reliable baseline information to be used by federal and local

agencies, universities, researchers, educators and local communities in

decision-making processes and the development of valuable 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 is 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 (JOBNERR) is located on the

southern coastal plain of the island of Puerto Rico, the reserve is within the

West Indies geographical area. JOBNERR is composed of two major areas: (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 area 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

seagrass beds, with small beach deposits and upland areas fringe Cayos Caribe

mangrove islands.

The weather station is located in front of the Visitor Center in the community

of Aguirre. 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 Version 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 JOBNERR Visitor's Center. (latitude 17o 57' 23.34"; longitude. 66o 13' 22.56").

6) Data collection period:

The current weather station has been operational since 1999. Collect data (since

2000) has been edited using the CDMO Weather Program. Data was collected for

the entire year in 2001.

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.

8) Associated researchers and projects:

Jobos Bay NERR system-wide water quality monitoring program has four YSI

continuous sampling stations (s9,s10,s19,s20) that collect long term data, every

30 minutes, of different parameters to track changes in water quality in the

Bay. Parameters include temperature, dissolve oxygen (% saturation, mg/L),

specific conductivity, salinity, depth, pH and turbidity. Station 9 was

originally selected as an example of an impacted site and station 10 as the

reference site. Station 19 was deployed over seagrass beds, Thallasia

testudinum, in the bay and station 20 was deployed over sea grass bed

communities near Cayos Caribe 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 to 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.

\*Please note that both Julian Day and Calendar Day are recorded and indicated as

follows in the documentation below: Date=Julian Day and Day=Calendar Day.

\*\*All Relative Humidity data (150, 101, 241, 243 and 244) for the 2001 collection period

has been deleted for each month. It was found that the cap protector for the RH sensor

was erroneously left on; therefore relative humidity data was miscalculated.

January 2001

For the following dates and times the hourly averages and 24-hour data were

deleted due to resetting of the CR10X for programming changes on January 31 at 1330.

101 31 31 1400 Technician changed 101 Array data at 31 ( 31) 1400

102 31 31 1400 Technician changed 102 Array at 31 ( 31) 1400

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

242 31 31 2400 Technician changed 242 Array data at 31 ( 31) 2400

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

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

The following data appear to be correct:

Array ID Date Day Time Error Message

102 4 4 2200 Wind speed is less than 0.5 m/s from 4 (4) 2200

to 5 (5) 1000

102 5 5 1900 Wind speed is less than 0.5 m/s from 5 (5) 1900

to 6 (6) 1000

February 2001

The following data appears to be correct:

Array ID Date Day Time Error Message

150 1 32 915 Air temp difference from 1 (32) 915 (26.927) to

1 (32) 930 (23.86) is greater than 3.0 degrees C

150 9 40 1230 Air temp difference from 9 (40) 1230 (27.897) to

9 (40) 1245 (24.863) is greater than 3.0 degrees C

No hourly wind speed maximums (field6 of array 102) or wind speed standard deviations

(field6 of array 242) were recorded during the month due to use of an older CR10X program

that collected 103 and 104 arrays. This was corrected in July with the new program.

March 2001

Note: Problem with temperature sensor, wire accidentally disconnected from

CR10X on March 9, 12, and 13. Arrays 150, 101, 241, and 244 were affected during these

times (temperature output -99999).

The following data appears to be correct:

Array ID Date Day Time Error Message

151 21 80 2315 Precip difference from 21 (80) 2315 (.508) to 21

(80) 2330 (5.588) is greater than 5 mm

151 21 80 2330 Precip difference from 21 (80) 2330 (5.588) to

21 (80) 2345 (.254) is greater than 5 mm

151 22 81 230 Precip difference from 22 (81) 230 (4.064) to 22

(81) 245 (10.668) is greater than 5 mm

102 22 81 1900 Wind speed is less than 0.5 m/s from 22 (81)

1900 to 23 (82) 900

102 23 82 2100 Wind speed is less than 0.5 m/s from 23 (82)

2100 to 24 (83) 900

Data Corrections:

For the following dates and times the hourly averages and 24-hour data were

deleted due to resetting of the CR10X due to a power down on March 7 at 0900.

101 7 66 1000 Technician changed 101 Array data at 7 ( 66) 1000

102 7 66 1000 Technician changed 102 Array from 7 ( 66) 1000

241 7 66 2400 Technician changed 241 Array data at 7 ( 66) 2400

242 7 66 2400 Technician changed 242 Array at 7 ( 66) 2400

243 7 66 2400 Technician changed 243 Array data at 7 ( 66) 2400

244 7 66 2400 Technician changed 244 Array data at 7 ( 66) 2400

No hourly wind speed maximums (field6 of array 102) or wind speed standard deviations

(field6 of array 242) were recorded during the month due to use of an older CR10X program

that collected 103 and 104 arrays. This was corrected in July with the new program.

April 2001

Note:

Problem with temperature sensor, wire accidentally disconnected from CR10X from

April 11 @ 1700 to May 1 @ 745 (temperature output -99999).

The following data appears to be correct:

Array ID Date Day Time Error Message

150 11 101 1630 Air temp difference from 11 (101) 1630 (27.792)

to 11 (101) 1645 ( 20.827) is greater than 3.0 degrees C

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

2000 to 14 (104) 900

102 14 104 2000 Wind speed is less than 0.5 m/s from 14 (104)

2000 to 15 (105) 800

102 15 105 2000 Wind speed is less than 0.5 m/s from 15 (105)

2000 to 16 (106) 800

102 21 111 1800 Wind speed is less than 0.5 m/s from 21 ( 111)

1800 to 22 (112) 700

No hourly wind speed maximums (field6 of array 102) or wind speed standard deviations

(field6 of array 242) were recorded during the month due to use of an older CR10X program

that collected 103 and 104 arrays. This was corrected in July with the new program.

Data Corrections:

For the following dates and times the hourly averages and 24-hour data were

deleted due to resetting of the CR10X due to a power down on April 2 at 2300.

Array ID Date Day Time Error Message

101 2 92 2400 Technician changed 101 Array from 2 ( 92) 2400

102 2 92 2400 Technician changed 102 Array from 2 ( 92) 2400

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

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

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

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

May 2001

The following data appears to be correct:

Array ID Date Day Time Error Message

102 7 127 2000 Wind speed is less than 0.5 m/s from 7 (127)

2000 to 8 (128) 900

102 8 128 1400 Wind speed is less than 0.5 m/s from 8 (128)

1400 to 9 (129) 400

102 9 129 2000 Wind speed is less than 0.5 m/s from 9 (129)

2000 to 10 (130) 800

102 16 136 2000 Wind speed is less than 0.5 m/s from 16 (136)

2000 to 17 (137) 800

102 17 137 2000 Wind speed is less than 0.5 m/s from 17 (137)

2000 to 18 (138) 800

102 18 138 1700 Wind speed is less than 0.5 m/s from 18 (138)

1700 to 19 (139) 800

Note: Problem with temperature sensor, wire accidentally disconnected from CR10X

from April 11 @ 1700 to May 1 @ 745 (temperature output -99999).

No hourly wind speed maximums (field6 of array 102) or wind speed standard deviations

(field6 of array 242) were recorded during the month due to use of an older CR10X program

that collected 103 and 104 arrays. This was corrected in July with the new program.

June 2001

The following data appears to be correct:

Array ID Date Day Time Error Message

102 2 153 2000 Wind speed is less than 0.5 m/s from 2 (153)

2000 to 3 (154) 800

102 3 154 2000 Wind speed is less than 0.5 m/s from 3 (154)

2000 to 4 (155) 800

102 22 173 2000 Wind speed is less than 0.5 m/s from 22 (173)

2000 to 23 (174) 800

Negative wind direction on June 12 at 215 was corrected to zero. When no wind is recorded,

the wind sensor outputs the offset number (a negative number).

No hourly wind speed maximums (field6 of array 102) or wind speed standard deviations

(field6 of array 242) were recorded during the month due to use of an older CR10X program

that collected 103 and 104 arrays. This was corrected in July with the new program.

July 2001

The following data appears to be correct:

Array ID Date Day Time Error Message

150 4 185 1015 Air temp difference from 4 (185) 1015 (27.49) to

4 (185) 1030 (24.375) is greater than 3.0 degrees C

150 29 210 945 Air temp difference from 29 (210) 945 (31.44) to

29 (210) 1000 (28.368) is greater than 3.0 degrees C

Data Corrections:

For the following dates and times the hourly averages and 24-hour data were

deleted due to resetting of the CR10X due to a power down on July 2 at 0730.

101 2 183 0800 Technician changed 101 Array data at 2 ( 183) 0800

102 2 183 0800 Technician changed 102 Array from 2 ( 183) 0800

241 2 183 2400 Technician changed 241 Array data at 2 ( 183) 2400

242 2 183 2400 Technician changed 242 Array at 2 ( 183) 2400

243 2 183 2400 Technician changed 243 Array data at 2 ( 183) 2400

244 2 183 2400 Technician changed 244 Array data at 2 ( 183) 2400

August 2001

The following data appears to be correct:

Array ID Date Day Time Error Message

150 17 229 1400 Air temp difference from 17 (229) 1400 (32.902)

to 17 (229) 1415 (29.333) is greater than 3.0 degrees C

150 21 233 915 Air temp difference from 21 (233) 915 (29.595) to

21 (233) 930 (26.485) is greater than 3.0 degrees C

151 15 227 2100 Precip difference from 15 (227) 2100 (.762) to

15 (227) 2115 (7.874) is greater than 5 mm

151 15 227 2115 Precip difference from 15 (227) 2115 (7.874) to

15 (227) 2130 (.254) is greater than 5 mm

151 22 234 1900 Precip difference from 22 (234) 1900 (4.572) to

22 (234) 1915 (16.51) is greater than 5 mm

151 22 234 2000 Precip difference from 22 (234) 2000 (12.446) to

22 (234) 2015 (6.858) is greater than 5 mm

151 22 234 2045 Precip difference from 22 (234) 2045 (2.54) to

22 (234) 2100 (7.62) is greater than 5 mm

151 22 234 2100 Precip difference from 22 (234) 2100 (7.62) to

22 (234) 2115 (20.32) is greater than 5 mm

151 22 234 2130 Precip difference from 22 (234) 2130 (16.764) to

22 (234) 2145 (6.858) is greater than 5 mm

151 22 234 2145 Precip difference from 22 (234) 2145 (6.858) to

22 (234) 2200 (1.524) is greater than 5 mm

151 23 235 515 Precip difference from 23 (235) 515 (6.096) to

23 (235) 530 (.762) is greater than 5 mm

151 28 240 845 Precip difference from 28 (240) 845 (3.556) to

28 (240) 900 (19.05) is greater than 5 mm

151 28 240 900 Precip difference from 28 (240) 900 (19.05) to

28 (240) 915 (7.112) is greater than 5 mm

September 2001

The following data appears to be correct:

Array ID Date Day Time Error Message

150 1 244 1200 Air temp difference from 1 (244) 1200 (29.009) to

1 (244) 1215 (25.93) is greater than 3.0 degrees C

150 2 245 1400 Air temp difference from 2 (245) 1400 (30.701) to

2 (245) 1415 (26.784) is greater than 3.0 degrees C

150 14 257 1100 Air temp difference from 14 (257) 1100 (30.695)

to 14 (257) 1115 (27.247) is greater than 3.0 degrees C

150 18 261 1230 Air temp difference from 18 (261) 1230 (30.165)

to 18 (261) 1245 (24.882) is greater than 3.0 degrees C

150 26 269 1245 Air temp difference from 26 (269) 1245 (31.954)

to 26 (269) 1300 (27.836) is greater than 3.0 degrees C

102 6 249 1900 Wind speed is less than 0.5 m/s from 6 (249)

1900 to 7 (250) 900

102 10 253 2100 Wind speed is less than 0.5 m/s from 10 (253)

2100 to 11 (254) 900

102 11 254 2100 Wind speed is less than 0.5 m/s from 11 (254)

2100 to 12 (255) 900

102 14 257 1900 Wind speed is less than 0.5 m/s from 14 (257)

1900 to 15 (258) 900

102 15 258 1900 Wind speed is less than 0.5 m/s from 15 (258)

1900 to 16 (259) 800

102 16 259 2000 Wind speed is less than 0.5 m/s from 16 (259)

2000 to 17 (260) 800

102 19 262 1900 Wind speed is less than 0.5 m/s from 19 (262)

1900 to 20 (263) 1000

102 22 265 2000 Wind speed is less than 0.5 m/s from 22 (265)

2000 to 23 (266) 800

102 26 269 1900 Wind speed is less than 0.5 m/s from 26 (269)

1900 to 27 (270) 900

102 29 272 1900 Wind speed is less than 0.5 m/s from 29 (272)

1900 to 30 (273) 900

Data Corrections:

For the following dates and times the hourly averages and 24-hour data were

deleted due to resetting of the CR10X due to a power down on September 4 at 0730.

101 4 247 800 Technician changed 101 Array data at 4 ( 247) 800

102 4 247 800 Technician changed 102 Array from 4 ( 247) 800

241 4 247 2400 Technician changed 241 Array data at 4 ( 247) 2400

242 4 247 2400 Technician changed 242 Array from 4 ( 247) 2400

243 4 247 2400 Technician changed 243 Array data at 4 ( 247) 2400

244 4 247 2400 Technician changed 244 Array data at 4 ( 247) 2400

October 2001

The following data appears to be correct:

Array ID Date Day Time Error Message

150 3 276 1230 Air temp difference from 3 (276) 1230 (29.734) to

3 (276) 1245 (26.554) is greater than 3.0 degrees C

150 5 278 1100 Air temp difference from 5 (278) 1100 (30.033) to

5 (278) 1115 (25.948) is greater than 3.0 degrees C

150 15 288 1000 Air temp difference from 15 (288) 1000 (28.681)

to 15 ( 288) 1015 (24.863) is greater than 3.0 degrees C

150 16 289 1245 Air temp difference from 16 (289) 1245 (29.574)

to 16 (289) 1300 (25.234) is greater than 3.0 degrees C

102 22 295 2100 Wind speed is less than 0.5 m/s from 22 (295)

2100 to 23 (296) 900

November 2001

The following data appears to be correct:

Array ID Date Day Time Error Message

102 1 305 2000 Wind speed is less than 0.5 m/s from 1 (305)

2000 to 2 (306) 900

102 2 306 1900 Wind speed is less than 0.5 m/s from 2 (306)

1900 to 3 (307) 900

102 3 307 1700 Wind speed is less than 0.5 m/s from 3 (307)

1700 to 4 (308) 900

102 4 308 2000 Wind speed is less than 0.5 m/s from 4 (308)

2000 to 5 (309) 800

102 7 311 2200 Wind speed is less than 0.5 m/s from 7 (311)

2200 to 8 (312) 1200

102 8 312 2200 Wind speed is less than 0.5 m/s from 8 (312)

2200 to 9 (313) 1000

102 14 318 1900 Wind speed is less than 0.5 m/s from 14 (318)

1900 to 15 (319) 900

102 15 319 1700 Wind speed is less than 0.5 m/s from 15 (319)

1700 to 16 (320) 1000

102 16 320 1900 Wind speed is less than 0.5 m/s from 16 (320)

1900 to 17 (321) 1000

102 17 321 1900 Wind speed is less than 0.5 m/s from 17 (321)

1900 to 18 (322) 1000

102 18 322 1900 Wind speed is less than 0.5 m/s from 18 (322)

1900 to 19 (323) 1000

102 19 323 1800 Wind speed is less than 0.5 m/s from 19 (323)

1800 to 20 (324) 900

102 20 324 1700 Wind speed is less than 0.5 m/s from 20 (324)

1700 to 21 (325) 900

102 21 325 1800 Wind speed is less than 0.5 m/s from 21 (325)

1800 to 22 (326) 900

102 22 326 2000 Wind speed is less than 0.5 m/s from 22 (326)

2000 to 23 (327) 900

102 25 329 2000 Wind speed is less than 0.5 m/s from 25 (329)

2000 to 26 (330) 800

102 26 330 1800 Wind speed is less than 0.5 m/s from 26 (330)

1800 to 27 (331) 900

102 29 333 1700 Wind speed is less than 0.5 m/s from 29 (333)

1700 to 30 (334) 900

December 2001

The following data appears to be correct:

Array ID Date Day Time Error Message

150 4 338 1430 Air temp difference from 4 (338) 1430 (29.865) to

4 (338) 1445 (26.751) is greater than 3.0 degrees C

151 11 345 2015 Precip difference from 11 (345) 2015 (3.302) to

11 (345) 2030 (8.382) is greater than 5 mm

151 11 345 2030 Precip difference from 11 (345) 2030 (8.382) to

11 (345) 2045 (1.016) is greater than 5 mm

151 16 350 1530 Precip difference from 16 (350) 1530 (7.112) to

16 (350) 1545 (1.524) is greater than 5 mm

102 1 335 2100 Wind speed is less than 0.5 m/s from 1 (335)

2100 to 2 (336) 900

102 2 336 1800 Wind speed is less than 0.5 m/s from 2 (336)

1800 to 3 (337) 900

102 9 343 2100 Wind speed is less than 0.5 m/s from 9 (343)

2100 to 10 (344) 900

For the following dates and times the hourly averages and 24-hour data were

deleted due to resetting of the CR10X due to a power down on December 10 at 1100.

101 10 344 1200 Technician changed 101 Array data at 10 ( 344) 1200

102 10 344 1200 Technician changed 102 Array from 10 ( 344) 1200

241 10 344 2400 Technician changed 241 Array data at 10 ( 344) 2400

242 10 344 2400 Technician changed 242 Array from 10 ( 344) 2400

243 10 344 2400 Technician changed 243 Array data at 10 ( 344) 2400

244 10 344 2400 Technician changed 244 Array data at 10 ( 344) 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 2001

None

February 2001

None

March 2001

Note: Problem with temperature sensor, wire accidentally disconnected from

CR10X on March 9, 12, and 13. Arrays 150, 101, 241, and 244 were affected during these

times (temperature output -99999).

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

storage module on March 7 at 0900.

Array ID Date Day Time Error Message

150 7 66 900 Missing 150 Array (15 minute data)

101 7 66 900 Missing 101 Array (Hourly Averages)

102 7 66 900 Missing 102 Array (Hourly Average Wind Parameters)

April 2001

Note: Problem with temperature sensor, wire accidentally disconnected from

CR10X. April 11 @ 1400, and From April 11 @ 1700 to May 1 @ 745 (temperature output -99999).

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

storage module on April 2 at 2300.

Array ID Date Day Time Error Message

102 2 92 2300 Missing 102 Array (Hourly Average Wind Parameters)

May 2001

Note: Problem with temperature sensor, wire accidentally disconnected from

CR10X. From April 11 @ 1700 to May 1 @ 745 (temperature output -99999).

June 2001

None

July 2001

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

storage module on July 2 at 730.

Array ID Date Day Time Error Message

150 2 183 730 Missing 150 Array (15 minute data)

August 2001

None

September 2001

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

storage module on September 4 at 730.

Array ID Date Day Time Error Message

150 4 247 730 Missing 150 Array (15 minute data)

October 2000

None

November 2000

None

December 2001

The following data was missing due to weather station maintenance on December 10 at 1100:

Array ID Date Day Time Error Message

150 10 344 1100 Missing 150 Array data (15 minute data) from 10 (

344) 1100 to 10 ( 344) 1115

101 10 344 1100 Missing 101 Array (Hourly Averages)

102 10 344 1100 Missing 102 Array (Hourly Average Wind Parameters)

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.

Please note that for the south part of the island of Puerto Rico, the wind is blowing in from

60º to 240º most of the time. It is very rare to see wind blowing in NorthSout and WestEast directions.

Rain Events:

January

Date RainAmount (mm)

3 .508

8 2.540

9 .254

18 1.016

19 .762

20 .762

23 3.810

24 .254

26 .254

29 1.270

Monthly Total 11.4

February

Date RainAmount (mm)

1 .508

2 2.032

3 .254

4 .508

5 .508

9 1.016

11 6.858

12 1.016

23 .762

24 .254

Monthly Total 13.7

March

Date RainAmount (mm)

5 .254

14 1.270

20 2.540

21 29.464

22 61.468

24 .254

30 1.270

31 1.016

Monthly Total 97.5

April

Date RainAmount (mm)

7 .508

9 .254

11 6.096

12 2.032

19 .508

21 .254

30 .508

Monthly Total 10.2

May

Date RainAmount (mm)

6 .254

7 1.778

8 5.842

9 6.858

Monthly Total 14.7

June

Date RainAmount (mm)

23 .254

25 .254

28 .254

29 .254

30 .254

Monthly Total 1.3

July

Date RainAmount (mm)

4 1.016

5 1.778

19 .762

22 .508

23 .254

24 1.270

26 2.286

27 .254

30 .254

Monthly Total 8.4

August

Date Rainamount (mm)

2 4.572

9 .508

10 .254

14 .254

15 8.890

16 .762

17 7.620

18 5.080

19 .254

21 6.858

22 142.494

23 55.626

26 3.048

27 .508

28 64.262

Monthly Total 301.0

September

Date RainAmount (mm)

1 7.874

13 1.270

14 5.842

18 7.112

25 .508

Monthly Total 22.6

October

Date Rainamount (mm)

3 1.016

5 7.874

8 18.796

9 .762

10 .254

11 .508

14 1.270

15 13.462

16 10.668

17 2.540

19 11.176

20 .762

21 .762

28 5.842

29 .762

30 6.858

Monthly Total 83.3

November

Date Rainamount (mm)

2 1.270

6 1.778

8 10.160

11 1.016

12 .254

15 1.016

16 .254

18 .254

29 .254

Monthly Total 16.3

December

Date RainAmount (mm)

3 .508

4 16.510

5 .254

11 13.970

12 4.572

14 1.524

15 5.334

16 11.430

17 1.778

18 22.860

20 .254

22 8.382

Monthly Total 87.4