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 17^{o} 57' 23.34"; longitude. 66^{o} 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 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 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 throughout the fall of 2022.

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

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