

Reserve Name: JOB NERR Meteorological Metadata
Months and year the documentation covers: 01/01/2023 to 12/31/2023
Latest Update: 09/20/2024

I. Data Set and Research Descriptors

1) Principal investigator(s) and contact persons

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2) Entry verification

Data is uploaded from the CR1000 data logger to a personal computer with a Windows 7 or newer operating system. Files are exported from LoggerNet in a comma-delimited format and uploaded to the CDMO where they undergo automated primary QAQC and become part of the CDMO's online provisional database. During primary QAQC, data are flagged if they are missing or out of sensor range. The edited file is then returned to the Reserve where it is opened in Microsoft Excel and processed using the CDMO's NERRQAQC Excel macro. The macro inserts station codes, creates metadata worksheets for flagged data and summary statistics, and graphs the data for review. It allows the user to apply QAQC flags and codes to the data, append files, and export the resulting data file to the CDMO for tertiary QAQC and assimilation into the CDMO's authoritative online database. For more information on QAQC flags and QAQC codes, see Sections 11 and 12.

Data management was performed by Angel Dieppa and Edlyn Jusino (beginning November 2023).

3) Research objectives

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 and regionally as well. 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.

This meteorological weather station is located 0.40 Km off the Jobos Bay coast and records data and information on the conditions affecting the estuary. The station is part of a System Wide Monitoring Program (SWMP) designed to evaluate the relative contributions of climate on coastal forcing and watershed inputs to hydrodynamics, nutrient dynamics, and other

ecological processes within the estuary. Data is used as a reference of atmospheric conditions for ongoing research projects at the Reserve as support from NERR and for other short and long-term environmental monitoring projects within the Reserve.

4) Research methods

Campbell Scientific data telemetry equipment was installed at the JOJBMET station on 07/20/06 and transmits data to the NOAA GOES satellite, NESDIS ID #3B018394. The transmissions are scheduled hourly at 0:00:10 after the hour and contain four (4) data sets reflecting fifteen-minute data sampling intervals. Upon receipt by the CDMO, the data undergoes the same automated primary QAQC process detailed in Section 2 above. The “real-time” telemetry data becomes part of the provisional dataset until undergoing secondary and tertiary QAQC and assimilation in the CDMO’s authoritative online database. Provisional and authoritative data are available at <http://cdmo.baruch.sc.edu>. <http://cdmo.baruch.sc.edu> or <http://nerrsdata.org>.

All data recorded in Atlantic Standard Time (AST) year-round.

The 15-minute Data are collected in the following formats for the **CR1000**:

Averages from 5-second data:

Air Temperature (°C), Relative Humidity (%), Barometric Pressure (mb),
Wind Speed (m/s), Wind Direction (degrees), Battery Voltage (volts),
Maximum and Minimum Air Temperature (°C) and their times from 5-second
data (these data are available from the Reserve).
Maximum Wind Speed (m/s) and time from 5-second data
Wind Direction Standard Deviation (degrees)

Totals:

Precipitation (mm), PAR (millimoles/m²), and Cumulative Precipitation
(mm) (Cumulative precipitation is no longer available via export from the
CDMO. Please contact the Reserve or the CDMO for more information or
to obtain these data).

Calibration information:

Recommended calibration frequency for the MET station sensors:

- Temperature/Humidity- yearly recalibration
- Rain Gauge- yearly recalibration
- Wind Speed/Direction- yearly or every 2 years (depending on the sensor)
- Barometric Pressure- every 2 years’ recalibration
- PAR- every 2 years’ recalibration
- CR1000-every 5 years (required beginning 2014, one-year initial grace period)

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, a reserve within the West Indies geographical area. JBNERR is composed of two major areas: (1) Mar Negro, located on the western margin of the Bay, and (2) Cayos Caribe (a chain of 17 tear-shaped islets located to the southeast) and Cayos Barca (a chain of 7 tear-shaped islets located to the southwest boundaries) both with a back-reef system. 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 sea grass beds, with small beach deposits and upland areas fringe Cayos Caribe and Cayos Barca mangrove islands.

A description of the specific sampling station follows:

The weather station is situated in front of the JBNERR Visitor's Center, located in the community of Aguirre in Salinas, Puerto Rico. Its coordinates are latitude 17° 57' 23.34" N and longitude 66° 13' 22.56" W. The tower base is about 9m above sea level, approximately 110m north of Jobos Bay's southern shoreline. The station is installed in a 10-meter tower in front of the Main Building, the wind and PAR sensors are above the building height. At 11 meters to the northwest side of the tower there is a tree with a height of 15 meters presenting a minor obstruction to the sensors. In the southern region of Puerto Rico where JBNERR is located the winds persist from southeast and northeast, therefore the tree does not represent a significant obstruction for the winds. The high of the sensors is as follow: wind sensor (9.75 m high), Temperature/ Humidity sensor (2.7m high), Barometric Pressure sensor (2.7 m high and inside the CR1000 enclosure), and PAR Sensor (9.60 m high) are all located on a 10m galvanized tower following the descriptions outlined in the NERR SWMP MET SOP. The Tipping Bucket Rain gauge is located 3.80 meters away and to the SW side of the tower 1 meter over the ground. The sensors are wired to a CR1000 following the protocol in the MET SOP

Station measurements:

Tower and sensor heights	Height (<i>meters</i>)	Notes
Tower	10	base 9 m above sea level
Platform (<i>if applicable</i>)	N/A	
Temperature/Relative Humidity	2.7	
Barometric Pressure	2.7	inside enclosure
Wind	9.75	
PAR	9.6	
Precipitation gauge	1.0	3.8 m from the tower

The weather station is at the following distance from SWMP stations used for water quality monitoring:

- 2.2 Km. from Station 09
- 4.2 Km. from Station 10
- 1.8 Km. from Station 19
- 3.1 Km. from Station 20

SWMP Station Timeline

Station Code	Station Name	SWMP Status	Location	Active Dates	Reason Decommissioned	Notes
jobjbm	Jobos Bay Weather	P	17° 57' 23.34 N, 66° 13' 22.56 W	01/01/2001 –	NA	NA

6) Data collection period

The weather station was installed in 1999. On 7/20/06 new telemetry equipment was installed. From January 1st to December 31, 2023, data were collected and saved in a computer where the meteorology station is connected via wire and transmitted via NOAA-GOES near real time telemetry.

During the year 2023 data is acquired following SWMP SOP's. This is in 15 minutes' interval year-round.

Raw file start and end dates and times:

File Start Date and Time	File End Date and Time
12/13/2022 13:00	01/09/2023 08:15
01/09/2023 08:30	01/25/2023 08:15
01/25/2023 08:30	02/07/2023 08:00
02/07/2023 08:15	02/21/2023 07:30
02/21/2023 07:45	03/07/2023 08:15
03/07/2023 08:30	03/21/2023 08:15
03/21/2023 08:30	04/04/2023 15:15
04/04/2023 15:30	04/28/2023 14:45
04/28/2023 15:00	06/01/2023 08:00
06/01/2023 08:15	07/03/2023 09:00
07/03/2023 09:15	08/02/2023 13:15
08/02/2023 13:30	09/11/2023 09:45
09/11/2023 10:00	10/02/2023 14:15
10/02/2023 14:30	11/02/2023 15:30
11/02/2023 15:45	12/01/2023 08:30
12/04/2023 09:15	01/02/2024 08:00

7) Distribution

NOAA retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The NERRS retains the right to be fully credited for having collected and processed the data. Following academic courtesy standards, the NERR site where the data were collected should be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. The data set enclosed within this package/transmission is only as good as the quality assurance and 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.

Requested citation format:

NOAA National Estuarine Research Reserve System (NERRS). System-wide Monitoring Program. Data accessed from the NOAA NERRS Centralized Data Management Office website: <http://www.nerrsdata.org/>; accessed 12 October 2023.

NERR meteorological data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see 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 www.nerrsdata.org. Data are available in comma delimited format.

8) Associated researchers and projects

The Jobos Bay NERR maintains four water quality monitoring stations as part of the System Wide Monitoring Program (SWMP) to monitor variability in the estuarine environment. Meteorological station collects continuous information that support water quality data

intended to address short-term variability and long-term changes in estuarine water parameters within the bay (i.e., localized impacts of seasonal storms and hurricane events, variability due to tidal circulation, seasonal and inter-annual differences in rainfall, magnitude and influence of major events such hurricanes, the spatial extent of oceanic and tidal forcing.

Our water quality monitoring program is a key component of SWMP. Variables measured include Temperature, Dissolved Oxygen, Turbidity, pH, Salinity, Chl-a fluorescence, and Depth in 4 permanent stations equipped with YSI data sondes. At the same stations, nitrogen, phosphorus, and chlorophyll are measured monthly.

II. Physical Structure Descriptors

9) Sensor specifications

Sensors working from 10/11/2018 to 05/06/2021.

Parameter: Temperature

Units: Celsius

Sensor type: Platinum resistance temperature detector (PRT)

Model #: HMP45C Temperature and Relative Humidity Probe

Operating Temperature: -40°C to +60°C

Range: -40°C to +60°C

Accuracy: $\pm 0.2^\circ\text{C}$ @ 20°C

Serial Number: F16400118

Date of Calibration: 03/16/2018

Dates of Sensor Use: 10/11/2018– 05/06/2021

Parameter: Relative Humidity

Units: Percent

Sensor type: Vaisala HUMICAP® 180 capacitive relative humidity sensor

Model #: HMP45C Temperature and Relative Humidity Probe

Range: 0-100% non-condensing

Accuracy at 20°C: $\pm 2\%$ RH (0-90%) and $\pm 3\%$ (90-100%)

Temperature dependence of RH measurement: $\pm 0.05\%$ RH/°C

Serial Number: F16400118

Date of Calibration: 03/16/2018

Dates of Sensor Use: 10/11/2018– 05/06/2021

Parameter: Barometric Pressure

Units: millibars (mb)

Sensor type: Vaisala Barocap © silicon capacitive pressure sensor

Model #: PTB110 (CS106)

Operating Range: Pressure: 500 to 1100 mb;

Temperature: -40°C to +60°C;

Humidity: non-condensing

Accuracy: ± 0.3 mb @ 20°C; ± 0.6 mb @ 0°C to 40°C; ± 1 mb @ -20°C to 45°C; ± 1.5 mb @ -40°C to 60°C

Stability: ± 0.1 mb per year

Serial Number: F1610094

Date of Calibration: 03/14/2018

Dates of Sensor Use: 10/11/2018– 05/06/2021

Parameter: Wind speed
Units: meter per second (m/s)
Sensor type: 18 cm diameter 4-blade helicoids propeller molded of polypropylene
Model #: R.M. Young 05103-L Wind Monitor
Range: 0-60 m/s (134 mph); gust survival 100 m/s (220 mph)
Accuracy: +/- 0.3 m/s
Wind sensor Mod 051003-L
Serial Number: 100693
Date of Calibration: 03/16/2018
Dates of Sensor Use: 10/11/2018– current as of 05/06/2021

Parameter: Wind direction
Units: degrees
Sensor type: balanced vane, 38 cm turning radius
Wind sensor Mod 051003-L
Serial Number: 100693
Date of Calibration: 03/16/2018
Dates of Sensor Use: 10/11/2018– 05/06/2021
**Sensor oriented to True North.

Parameter: Photosynthetically Active Radiation (PAR)
Units: mmoles m⁻² (total flux)
Sensor type: High stability silicon photovoltaic detector (blue enhanced)
Model #: LI190SB
Light spectrum waveband: 400 to 700 nm
Temperature dependence: 0.15% per °C maximum
Stability: <±2% change over 1 yr
Operating Temperature: -40°C to 65°C; Humidity: 0 to 100%
Sensitivity: typically 5 µA per 1000 µmoles s⁻¹ m⁻²
Serial Number: Q43066
PAR Multiplier = 1.379691
Date of Calibration: 03/21/2018
Dates of Sensor Use: 10/11/2018– 05/06/2021

Parameter: Precipitation (non-heated rain gauge)
Units: millimeters (mm)
Sensor type: Tipping Bucket Rain Gauge
Model #: TR-525USW(Texas Instrument)/TE525WS(Campbell Scientific)
Rainfall per tip: 0.01 inch
Operating range: Temperature: 0° to 50°C; Humidity: 0 to 100%
Accuracy: +/- 1.0% up to 1 in./hr; +0, -3% from 1 to 2 in./hr; +0, -5% from 2 to 3 in./hr
Rain Gauge SN 43619-410
Most recent calibration: 04/21/2021, 05/07/2019, 06/04/2018

New set of sensors working from 05/06/2021 to current as of 12/31/2023

Parameter: Temperature
Units: Celsius
Sensor type: 1000 Ω Platinum Resistance Thermometer (PRT)
Model #: EE181 Temperature and Relative Humidity Probe
Operating Temperature: -40°C to +60°C
Range: -40°C to +60°C

Accuracy: $\pm 0.2^{\circ}\text{C}$ @ $+23^{\circ}\text{C}$
Serial Number: 201516001280B1
Date of Calibration: 4/16/2020
Dates of Sensor Use: 05/06/2021– current as of 12/31/2023

Parameter: Relative Humidity
Units: Percent
Sensor type: HC101
Model #: EE181 Temperature and Relative Humidity Probe
Range: 0-100% non-condensing
Accuracy: -15 to 40°C : $\leq 90\% \text{ RH} \pm (1.3 + 0.003 \cdot \text{RH reading}) \% \text{ RH}$
 -15 to 40°C : $> 90\% \text{ RH} \pm 2.3\% \text{ RH}$
 -25 to 60°C : $\pm (1.4 + 0.01 \cdot \text{RH reading}) \% \text{ RH}$
 -40 to 60°C : $\pm (1.5 + 0.015 \cdot \text{RH reading}) \% \text{ RH}$
Temperature dependence of RH measurement: typically $0.03\% \text{ RH}/^{\circ}\text{C}$
Note: This sensor caps relative humidity values at 100%, measured values $> 100\%$ are altered to 100%
Serial Number: 201516001280B1
Date of Calibration: 4/16/2020
Dates of Sensor Use: 05/06/2021 – current as of 12/31/2022

Parameter: Barometric Pressure
Units: millibars (mb)
Sensor type: Vaisala Barocap © silicon capacitive pressure sensor
Model #: PTB110 (180CA)
Operating Range: Pressure: 500 to 1100 mb; Temperature: -40°C to $+60^{\circ}\text{C}$;
Humidity: non-condensing
Accuracy: $\pm 0.3 \text{ mb}$ at $+20^{\circ}\text{C}$, $\pm 0.6 \text{ mb}$ at 0°C to 40°C , $\pm 1 \text{ mb}$ at -20°C to $+45^{\circ}\text{C}$, $\pm 1.5 \text{ mb}$ at -40°C to $+60^{\circ}\text{C}$
Stability: $\pm 0.1 \text{ mb}$ per year
Serial Number: S1720920
Date of Calibration: 4/27/2020
Dates of Sensor Use: 05/06/2021– current as of 12/31/2023

Parameter: Wind speed
Units: meter per second (m/s)
Sensor type: 18 cm diameter 4-blade helicoids propeller molded of polypropylene
Model #: R.M. Young 05108-L Wind Monitor
Range: 0-100 m/s (0-224 mph)
Accuracy: $\pm 0.3 \text{ m/s}$ ($\pm 0.6 \text{ mph}$) or 1% of reading
Resolution: $(0.1666 \text{ m/s})/(\text{scan rate in seconds})$ or $(0.3726 \text{ mph})/(\text{scan rate in seconds})$
Serial Number: WM179096
Date of Calibration: 07/23/2020
Dates of Sensor Use: 05/06/2021– current as of 12/31/2023

Parameter: Wind direction
Units: degrees
Sensor type: balanced vane, 38 cm turning radius
Wind sensor Mod 05108-L
Serial Number: WM179096
Date of Calibration: 07/23/2020
Dates of Sensor Use: 05/06/2021– current as of 12/31/2023
**Sensor oriented to True North.

Parameter: Photosynthetically Active Radiation (PAR)
Units: mmol m⁻² (total flux)
Sensor type: High stability silicon photovoltaic detector (blue enhanced)
Model #: Apogee SQ-110-SS
Light spectrum waveband: 410 to 655 nm
Temperature dependence: 0.06 ± 0.06 % per °C
Stability: <±2% change over 1 yr
Operating Temperature: -40°C to 70°C; Humidity: 0 to 100%
Sensitivity: 0.2 μmol.m⁻²s⁻¹
Serial Number: SQ-110-SS-L10_31176
PAR Multiplier = 0.025
Date of Calibration: 05/06/2021
Dates of Sensor Use: 05/06/2021–12/31/2023

Parameter: Precipitation (non-heated rain gauge)
Units: millimeters (mm)
Sensor type: Tipping Bucket Rain Gauge
Model #: RG-2000-C
Rainfall per tip: 0.01 inch
Operating range: Temperature: 0° to 50°C; Humidity: 0 to 100%
Accuracy: +/- 1.0% up to 1 in./hr; +0, -3% from 1 to 2 in./hr; +0, -5% from 2 to 3 in./hr
Rain Gauge SN 43619-410
Most recent calibration: 12/21/2022

Datalogger:

CR1000:

The CR1000 has 2 MB of Flash EEPROM that is used to store the Operating System. Another 128 K Flash is used to store configuration settings. A minimum of 2 MB SRAM is (4 MB optional upgrade) available for program storage (16K), operating system use, and data storage. Additional storage is available by using a compact flash card in the optional CFM100 Compact Flash Module.

Data logger Campbell Sci.
CR1000-RMA
Serial Number: 5248 (incorrectly identified as 5278 in previous documents)
Date of Calibration: 05/29/2015
Date Installed: 06/19/2015 – current as of 12/31/2023

CR1000 Firmware Version (s): New firmware 06/19/2015, version unknown

CR1000.Std.28, date of update unknown
CR1000.Std.32.05, date of update unknown

CR1000 Program Version(s):

JOBJBMET_V5.5_041608 used from 04/16/2008 to 02/27/2015
JOBJBMET_V5.5_022715 used from 02/27/2015 to 06/17/2015
JOBJBMET_V5.5_022715 used from 06/17/2015 to 10/10/2018
JOBJBMET_V5.5.1_101018.cri used from 10/11/2018 to 04/20/2021
JOBJBMET_V5.5.4_050621 used from 05/06/2021 as of 12/31/2023

10) Coded variable definitions

Sampling station:	Sampling site code:	Station code:
Jobos Meteorology	jb	jobjbmnet

11) QAQC flag definitions

QAQC flags provide documentation of the data and are applied to individual data points by insertion into the parameter's associated flag column (header preceded by an F_). During primary automated QAQC (performed by the CDMO), -5, -4, and -2 flags are applied automatically to indicate data that is above or below sensor range or missing. All remaining data are then flagged 0, as passing initial QAQC checks. During secondary and tertiary QAQC 1, -3, and 5 flags may be used to note data as suspect, rejected due to QAQC, or corrected.

- 5 Outside High Sensor Range
- 4 Outside Low Sensor Range
- 3 Data Rejected due to QAQC
- 2 Missing Data
- 1 Optional SWMP supported Parameter
- 0 Passed Initial QAQC Checks
- 1 Suspect Data
- 2 *Open - reserved for later flag*
- 3 *Open - reserved for later flag*
- 4 Historical Data: Pre-Auto QAQC
- 5 Corrected Data

12) QAQC code definitions

QAQC codes are used in conjunction with QAQC flags to provide further documentation of the data and are also applied by insertion into the associated flag column. There are three (3) different code categories, general, sensor, and comment. General errors document general problems with the CR1000, sensor errors are sensor specific, and comment codes are used to further document conditions or a problem with the data. Only one general or sensor error and one comment code can be applied to a particular data point, but some comment codes (marked with an * below) can be applied to the entire record in the F Record column.

General Errors

GIM	Instrument malfunction
GIT	Instrument recording error, recovered telemetry data
GMC	No instrument deployed due to maintenance/calibration
GMT	Instrument maintenance
GPD	Power down
GPF	Power failure / low battery
GPR	Program reload
GQR	Data rejected due to QA/QC checks
GSM	See metadata

Sensor Errors

SDG	Suspect due to sensor diagnostics
SIC	Incorrect calibration constant, multiplier or offset
SIW	Incorrect wiring
SMT	Sensor maintenance

SNV	Negative value
SOC	Out of calibration
SQR	Data rejected due to QAQC checks
SSD	Sensor drift
SSN	Not a number / unknown value
SSM	Sensor malfunction
SSR	Sensor removed
Comments	
CAF	Acceptable calibration/accuracy error of sensor
CCU	Cause unknown
CDF	Data appear to fit conditions
CML	Snow melt from previous snowfall event
CRE*	Significant rain event
CSM*	See metadata
CVT*	Possible vandalism/tampering
CWE*	Significant weather event

13) Other remarks/notes

Data are missing due to equipment or associated specific sensors not being deployed, equipment failure, time of maintenance or calibration of equipment, or repair/replacement of a sampling station platform. Any NANs in the dataset stand for “not a number” and are the result of low power, disconnected wires, or out of range readings. If additional information on missing data is needed, contact the Research Coordinator at the reserve submitting the data.

Relative Humidity data greater than 100 are within range of the sensor accuracy of +/-3% and are flagged and coded as suspect, <1> (CAF). Values greater than 103 are rejected <-3>.

Data recorded for all parameters (with the exception of cumulative precipitation) at the midnight timestamp (00:00) are the 15-minute averages and totals for the 23:45-23:59 time period of the previous day. Cumulative precipitation data at the midnight timestamp (00:00) are the sum of raw (unrounded) precipitation data from 00:00 to 23:59 of the previous day. Summing each individual 15-minute total precipitation value from the same period will result in small differences from cumulative precipitation due to rounding. It is especially important to note how data at the midnight timestamp are recorded when using January 1st and December 31st data. **Note: Cumulative precipitation is no longer available via export from the CDMO. Please contact the Reserve or the CDMO for more information or to obtain these data.**

All data for the year are coded with {CSM} in the F_Record to refer to the comments below that pertain to an entire record. When CSM is used in the individual record there are additional comments for that specific sensor/parameter.

Suspect Out of Calibration Data:

All data are considered suspect for the entire year, unless otherwise flagged as rejected or missing, due to the out of calibration CR1000, {CSM}, <1> [SOC]. The datalogger has been out of calibration since 2020. In addition, temperature and relative humidity are considered suspect from 05/06/2023 through the end of the year due to an out of calibration sensor, <1>[SOC](CSM). Although flagged as corrected, wind speed and max wind speed values are included in the out of calibration coding. Corrected data are considered suspect <5> [SOC] (CSM).

Suspect Power Failure Data:

Beginning 10/28/2023 02:00 battery power at the station dropped to below 10 volts. The CR1000 shuts down when the power drops below 9.6 volts. In addition to being considered suspect due to the out of calibration logger, data are also considered suspect once the battery voltage began to drop. See below under rejected data; data recorded when the voltage was 9.6 or lower were rejected. Even though the data appear to be accurate, battery voltage drops over the 15-minute interval could have resulted in missing 5-second readings that are used to calculate averages and totals. Suspect timestamps when voltage dropped below 10.0 volts but not below 9.6 volts:

03/30/2023 23:45	10/30/2023 07:45	11/14/2023 19:00
03/31/2023 00:00	10/30/2023 10:00	11/15/2023 18:00
03/31/2023 03:00	10/30/2023 18:00	11/16/2023 18:15
03/31/2023 04:00	10/31/2023 19:15	11/16/2023 18:30
03/31/2023 05:00	11/01/2023 07:15	11/17/2023 07:45
03/31/2023 06:00	11/02/2023 18:00	11/17/2023 18:00
03/31/2023 06:15	11/02/2023 18:15	11/18/2023 17:30
10/28/2023 02:00	11/02/2023 18:30	11/19/2023 17:15
10/28/2023 02:15	11/02/2023 18:45	11/21/2023 15:00
10/28/2023 02:30	11/02/2023 19:00	11/21/2023 15:45
10/28/2023 02:45	11/03/2023 17:30	11/21/2023 16:00
10/28/2023 03:00	11/03/2023 17:45	11/21/2023 16:15
10/28/2023 03:15	11/04/2023 07:45	11/21/2023 16:45
10/28/2023 03:30	11/04/2023 17:30	11/21/2023 17:00
10/28/2023 03:45	11/04/2023 17:45	11/22/2023 07:45
10/28/2023 04:00	11/04/2023 18:00	11/22/2023 17:15
10/28/2023 04:15	11/05/2023 17:45	11/23/2023 18:00
10/28/2023 04:30	11/06/2023 17:15	11/24/2023 17:45
10/28/2023 04:45	11/06/2023 17:30	11/28/2023 17:00
10/28/2023 05:00	11/07/2023 07:45	11/28/2023 17:15
10/28/2023 05:15	11/07/2023 17:30	11/29/2023 17:00
10/28/2023 05:30	11/09/2023 09:15	12/12/2023 17:00
10/28/2023 05:45	11/09/2023 17:00	12/21/2023 16:30
10/28/2023 06:00	11/09/2023 17:30	12/26/2023 18:00
10/28/2023 06:15	11/10/2023 14:30	12/27/2023 19:30
10/28/2023 06:30	11/10/2023 14:45	12/27/2023 19:45
10/28/2023 06:45	11/10/2023 15:15	12/27/2023 20:00
10/28/2023 07:00	11/11/2023 17:45	12/27/2023 20:15
10/28/2023 19:00	11/12/2023 18:00	12/27/2023 20:30
10/29/2023 07:15	11/12/2023 18:15	12/27/2023 20:45
10/29/2023 07:30	11/12/2023 18:30	12/29/2023 02:45
10/29/2023 07:45	11/13/2023 18:15	12/29/2023 03:00
10/29/2023 08:00	11/13/2023 18:30	12/29/2023 03:15
10/29/2023 16:00	11/13/2023 18:45	12/29/2023 03:30
10/29/2023 16:15	11/13/2023 19:00	12/29/2023 03:45
10/29/2023 16:30	11/14/2023 18:15	12/29/2023 04:00
10/30/2023 07:15	11/14/2023 18:30	
10/30/2023 07:30	11/14/2023 18:45	

Suspect/Corrected Data:

The logger program uploaded on 05/06/2021 did not include updated coding for the newly installed wind sensor, model number 5108. Instead, the multiplier used after the upload in

2021 and until early 2024 was for the model number 5103 wind sensor. Wind speed and maximum wind speed were corrected during tertiary review by the CDMO. Corrected wind speed data are considered suspect not only due to corrections but also because of the out of calibration CR1000, <5> [SOC] (CSM)

5103 multiplier for m/s wind speed measurement: 0.098

5108 multiplier for m/s wind speed measurement: 0.1666

$(\text{Incorrect wind speed}/0.098)*0.1666 = \text{corrected wind speed}$

10/04/2023 @ 17:15 Total precipitation measurements affected by clogged funnel, the funnel was unclogged and pluviometer measured accumulated water. Data are considered suspect. See significant rain even table below.

Rejected Data:

All barometric pressure data was rejected for the year due to sensor problems, <-3> [SSM] (CSM).

Data on 03/30/2023 at 09:15 and 19:15 are mostly likely an incomplete 15 minutes of 5-second averages and totals due to the power failures at 09:00 and 19:00 that were caused by corrosion on the battery, <-3> [GPF] (CSM).

Data on 04/06/2023 at 05:15 are mostly likely an incomplete 15 minutes of 5-second averages and totals due to the power failure at 05:00 that was caused by corrosion on the battery, <-3> [GPF] (CSM). Cumulative precipitation values are not accurate following the power failure and are rejected from 05:15 through the end of the day.

When battery power drops below 9.6 volts the CR1000 shuts down resulting in either inaccurate data collection or no data collection. Voltage drops began occurring more often at the weather station beginning 10/28/2023. Any data recorded when battery volts were 9.6 or lower are rejected due to power failure, {CSM}, <-3> [GPF]. If cumulative precipitation values are rejected, the data are rejected for the remainder of the day for that parameter.

10/28/2023 19:15	10/29/2023 00:00	10/29/2023 04:45
10/28/2023 19:30	10/29/2023 00:15	10/29/2023 05:00
10/28/2023 19:45	10/29/2023 00:30	10/29/2023 05:15
10/28/2023 20:00	10/29/2023 00:45	10/29/2023 05:30
10/28/2023 20:15	10/29/2023 01:00	10/29/2023 05:45
10/28/2023 20:30	10/29/2023 01:15	10/29/2023 06:00
10/28/2023 20:45	10/29/2023 01:30	10/29/2023 06:15
10/28/2023 21:00	10/29/2023 01:45	10/29/2023 06:30
10/28/2023 21:15	10/29/2023 02:00	10/29/2023 06:45
10/28/2023 21:30	10/29/2023 02:15	10/29/2023 07:00
10/28/2023 21:45	10/29/2023 02:30	10/29/2023 16:45
10/28/2023 22:00	10/29/2023 02:45	10/29/2023 17:00
10/28/2023 22:15	10/29/2023 03:00	10/29/2023 17:15
10/28/2023 22:30	10/29/2023 03:15	10/29/2023 17:30
10/28/2023 22:45	10/29/2023 03:30	10/29/2023 17:45
10/28/2023 23:00	10/29/2023 03:45	10/29/2023 18:00
10/28/2023 23:15	10/29/2023 04:00	10/29/2023 18:15
10/28/2023 23:30	10/29/2023 04:15	10/29/2023 18:30
10/28/2023 23:45	10/29/2023 04:30	10/29/2023 18:45

10/29/2023 19:00	10/30/2023 19:00	10/31/2023 19:30
10/29/2023 19:15	10/30/2023 19:15	10/31/2023 19:45
10/29/2023 19:30	10/30/2023 19:30	10/31/2023 20:00
10/29/2023 19:45	10/30/2023 19:45	10/31/2023 20:15
10/29/2023 20:00	10/30/2023 20:00	10/31/2023 20:30
10/29/2023 20:15	10/30/2023 20:15	10/31/2023 20:45
10/29/2023 20:30	10/30/2023 20:30	10/31/2023 21:00
10/29/2023 20:45	10/30/2023 20:45	10/31/2023 21:15
10/29/2023 21:00	10/30/2023 21:00	10/31/2023 21:30
10/29/2023 21:15	10/30/2023 21:15	10/31/2023 21:45
10/29/2023 21:30	10/30/2023 21:30	10/31/2023 22:00
10/29/2023 21:45	10/30/2023 21:45	10/31/2023 22:15
10/29/2023 22:00	10/30/2023 22:00	10/31/2023 22:30
10/29/2023 22:15	10/30/2023 22:15	10/31/2023 22:45
10/29/2023 22:30	10/30/2023 22:30	10/31/2023 23:00
10/29/2023 22:45	10/30/2023 22:45	10/31/2023 23:15
10/29/2023 23:00	10/30/2023 23:00	10/31/2023 23:30
10/29/2023 23:15	10/30/2023 23:15	10/31/2023 23:45
10/29/2023 23:30	10/30/2023 23:30	11/01/2023 00:00
10/29/2023 23:45	10/30/2023 23:45	11/01/2023 00:15
10/30/2023 00:00	10/31/2023 00:00	11/01/2023 00:30
10/30/2023 00:15	10/31/2023 00:15	11/01/2023 00:45
10/30/2023 00:30	10/31/2023 00:30	11/01/2023 01:00
10/30/2023 00:45	10/31/2023 00:45	11/01/2023 01:15
10/30/2023 01:00	10/31/2023 01:00	11/01/2023 01:30
10/30/2023 01:15	10/31/2023 01:15	11/01/2023 01:45
10/30/2023 01:30	10/31/2023 01:30	11/01/2023 02:00
10/30/2023 01:45	10/31/2023 01:45	11/01/2023 02:15
10/30/2023 02:00	10/31/2023 02:00	11/01/2023 02:30
10/30/2023 02:15	10/31/2023 02:15	11/01/2023 02:45
10/30/2023 02:30	10/31/2023 02:30	11/01/2023 03:00
10/30/2023 02:45	10/31/2023 02:45	11/01/2023 03:15
10/30/2023 03:00	10/31/2023 03:00	11/01/2023 03:30
10/30/2023 03:15	10/31/2023 03:15	11/01/2023 03:45
10/30/2023 03:30	10/31/2023 03:30	11/01/2023 04:00
10/30/2023 03:45	10/31/2023 03:45	11/01/2023 04:15
10/30/2023 04:00	10/31/2023 04:00	11/01/2023 04:30
10/30/2023 04:15	10/31/2023 04:15	11/01/2023 04:45
10/30/2023 04:30	10/31/2023 04:30	11/01/2023 05:00
10/30/2023 04:45	10/31/2023 04:45	11/01/2023 05:15
10/30/2023 05:00	10/31/2023 05:00	11/01/2023 05:30
10/30/2023 05:15	10/31/2023 05:15	11/01/2023 05:45
10/30/2023 05:30	10/31/2023 05:30	11/01/2023 06:00
10/30/2023 05:45	10/31/2023 05:45	11/01/2023 06:15
10/30/2023 06:00	10/31/2023 06:00	11/01/2023 06:30
10/30/2023 06:15	10/31/2023 06:15	11/01/2023 06:45
10/30/2023 06:30	10/31/2023 06:30	11/01/2023 07:00
10/30/2023 06:45	10/31/2023 06:45	11/01/2023 19:45
10/30/2023 07:00	10/31/2023 07:00	11/01/2023 20:00
10/30/2023 09:45	10/31/2023 07:15	11/01/2023 20:15
10/30/2023 18:15	10/31/2023 07:30	11/01/2023 20:30
10/30/2023 18:30	10/31/2023 07:45	11/01/2023 20:45
10/30/2023 18:45	10/31/2023 08:00	11/01/2023 21:00

11/01/2023 21:15	11/10/2023 14:15	11/16/2023 19:45
11/01/2023 21:30	11/10/2023 15:00	11/16/2023 20:00
11/01/2023 21:45	11/10/2023 15:30	11/17/2023 07:30
11/01/2023 22:00	11/10/2023 15:45	11/17/2023 18:15
11/01/2023 22:15	11/11/2023 08:15	11/17/2023 18:30
11/01/2023 22:30	11/11/2023 18:00	11/17/2023 18:45
11/01/2023 22:45	11/11/2023 18:15	11/17/2023 19:00
11/01/2023 23:00	11/11/2023 18:30	11/17/2023 19:15
11/01/2023 23:15	11/11/2023 18:45	11/17/2023 19:30
11/02/2023 19:15	11/12/2023 07:30	11/17/2023 19:45
11/02/2023 19:30	11/12/2023 07:45	11/18/2023 17:45
11/03/2023 07:45	11/12/2023 08:30	11/18/2023 18:00
11/03/2023 18:00	11/12/2023 18:45	11/18/2023 18:15
11/03/2023 18:15	11/12/2023 19:00	11/18/2023 18:30
11/03/2023 18:30	11/12/2023 19:15	11/18/2023 18:45
11/03/2023 18:45	11/12/2023 19:30	11/18/2023 19:00
11/03/2023 19:00	11/12/2023 19:45	11/18/2023 19:15
11/04/2023 07:30	11/12/2023 20:00	11/18/2023 19:30
11/04/2023 18:15	11/12/2023 20:15	11/18/2023 19:45
11/04/2023 18:30	11/13/2023 07:30	11/19/2023 17:30
11/04/2023 18:45	11/13/2023 19:15	11/19/2023 17:45
11/04/2023 19:00	11/13/2023 19:30	11/20/2023 13:45
11/05/2023 07:45	11/13/2023 19:45	11/20/2023 14:15
11/05/2023 08:00	11/13/2023 20:00	11/20/2023 15:45
11/05/2023 18:00	11/13/2023 20:15	11/20/2023 16:00
11/05/2023 18:15	11/13/2023 20:30	11/20/2023 16:15
11/06/2023 07:30	11/13/2023 20:45	11/21/2023 08:30
11/06/2023 07:45	11/13/2023 21:00	11/21/2023 08:45
11/06/2023 17:45	11/14/2023 07:30	11/21/2023 16:30
11/06/2023 18:00	11/14/2023 19:15	11/22/2023 07:30
11/07/2023 07:30	11/14/2023 19:30	11/23/2023 18:15
11/07/2023 17:45	11/14/2023 19:45	11/23/2023 18:30
11/07/2023 18:00	11/14/2023 20:00	11/23/2023 18:45
11/07/2023 18:15	11/14/2023 20:15	11/24/2023 18:00
11/07/2023 18:30	11/14/2023 20:30	11/24/2023 18:15
11/07/2023 18:45	11/14/2023 20:45	11/24/2023 18:30
11/08/2023 09:00	11/14/2023 21:00	11/25/2023 07:45
11/08/2023 17:00	11/14/2023 21:15	11/25/2023 17:30
11/09/2023 08:30	11/15/2023 07:30	11/27/2023 17:00
11/09/2023 10:00	11/15/2023 18:15	11/27/2023 17:15
11/09/2023 17:15	11/15/2023 18:30	11/28/2023 07:30
11/09/2023 17:45	11/15/2023 18:45	11/29/2023 17:45
11/10/2023 11:30	11/15/2023 19:00	11/30/2023 17:00
11/10/2023 11:45	11/15/2023 19:15	11/30/2023 17:15
11/10/2023 12:00	11/15/2023 19:30	12/01/2023 07:30
11/10/2023 12:15	11/15/2023 20:00	12/12/2023 16:30
11/10/2023 12:30	11/15/2023 20:15	12/12/2023 17:15
11/10/2023 12:45	11/15/2023 20:30	12/23/2023 17:15
11/10/2023 13:00	11/15/2023 20:45	12/23/2023 17:30
11/10/2023 13:15	11/16/2023 18:45	12/25/2023 17:45
11/10/2023 13:30	11/16/2023 19:00	12/25/2023 18:00
11/10/2023 13:45	11/16/2023 19:15	12/26/2023 07:30
11/10/2023 14:00	11/16/2023 19:30	12/26/2023 18:15

12/26/2023 18:30	12/27/2023 21:30	12/29/2023 05:15
12/26/2023 18:45	12/27/2023 21:45	12/29/2023 05:30
12/26/2023 19:00	12/27/2023 22:00	12/29/2023 05:45
12/26/2023 19:15	12/27/2023 22:15	12/29/2023 06:00
12/26/2023 19:30	12/27/2023 22:30	12/29/2023 06:15
12/26/2023 19:45	12/27/2023 22:45	12/29/2023 06:30
12/26/2023 20:00	12/29/2023 04:15	12/29/2023 06:45
12/26/2023 20:15	12/29/2023 04:30	12/29/2023 07:00
12/27/2023 21:00	12/29/2023 04:45	12/29/2023 07:15
12/27/2023 21:15	12/29/2023 05:00	

Data were rejected for the timestamp following missing data due to power failure, {CSM}, <-2> [GPF], since those values were not a full 15 minutes of averages and totals, {CSM}, <-3> [GPF].

11/02/2023 07:45	11/24/2023 07:45	12/10/2023 17:00
11/03/2023 07:45	11/25/2023 07:45	12/11/2023 07:45
11/04/2023 07:30	11/25/2023 08:15	12/11/2023 17:00
11/05/2023 07:45	11/25/2023 17:15	12/12/2023 07:30
11/06/2023 07:30	11/26/2023 09:00	12/13/2023 07:45
11/07/2023 07:30	11/26/2023 17:15	12/13/2023 15:30
11/08/2023 09:00	11/27/2023 07:30	12/14/2023 07:30
11/09/2023 08:15	11/28/2023 07:30	12/15/2023 07:30
11/09/2023 10:00	11/29/2023 07:45	12/16/2023 07:30
11/09/2023 10:45	11/30/2023 07:45	12/17/2023 07:45
11/10/2023 10:15	12/01/2023 07:30	12/17/2023 08:30
11/11/2023 08:15	12/01/2023 08:00	12/17/2023 09:00
11/12/2023 07:30	12/01/2023 08:30	12/18/2023 08:00
11/13/2023 07:30	12/04/2023 09:15	12/19/2023 07:30
11/13/2023 08:15	12/04/2023 17:15	12/19/2023 16:15
11/14/2023 07:30	12/05/2023 08:15	12/20/2023 07:30
11/15/2023 07:30	12/05/2023 17:15	12/21/2023 07:30
11/16/2023 08:00	12/06/2023 07:45	12/21/2023 15:45
11/17/2023 07:30	12/06/2023 17:00	12/22/2023 07:45
11/18/2023 08:30	12/07/2023 07:30	12/23/2023 07:30
11/19/2023 08:45	12/07/2023 17:00	12/24/2023 07:45
11/20/2023 13:45	12/08/2023 07:30	12/25/2023 07:30
11/20/2023 14:15	12/08/2023 17:00	12/26/2023 07:30
11/21/2023 08:00	12/09/2023 08:15	12/27/2023 07:45
11/22/2023 07:30	12/09/2023 17:00	12/28/2023 08:00
11/23/2023 08:00	12/10/2023 08:15	

Cumulative precipitation (not included in the dataset but available from the reserve or CDMO) were rejected from 11/02/2023 07:45 until 12/29/2023 00:00. Cumulative precipitation values did not reset to 0.0 after power failures resulted in missing data. Total precipitation values are much more reliable although rainfall may have been missed when the station was without power.

Missing Data:

Missing data on 03/30/2023 at 09:00 and 19:00 were likely caused by a corrosion on the battery, <-2> [GPF] (CSM).

Missing data on 04/06/2023 at 05:00 were likely caused by a corrosion on the battery, <-2> [GPF] (CSM).

Battery voltage at the station dropped low enough that the logger shut down, {CSM}, <-2> [GPF] beginning 11/01/2023 23:30 and continuing almost nightly through 12/28/2023 07:45.

Other Events:

Significant rain events: Significant rain events at JOB NERR are rainfall >0.75 inches (19mm) that may influence water quality. Coded as [SOC](CSM) for both total (duration of rain event) and cumulative precipitation (coded until the midnight timestamp).

Date	Precipitation (mm)	Comments about precipitation data
04/08/2023	33.5	
05/22/2023	31.7	
05/28/2023	38.4	
06/28/2023	19.6	
06/29/2023 – 06/30/2023	58.4	
08/10/2023	29.0	
08/21/2023	23.4	
08/26/2024	44.5	
10/03/2023	53.8	
10/04/2023	107.9	Clogged funnel at 26.2 affected amount measured for 15-minute interval at 17:15. Data are suspect.
10/23/2023	19.8	
10/29/2023	53.3	these data are not coded as a rain event due to power failure and data rejections
10/31/2023	23.1	these data are not coded as a rain event due to power failure and data rejections

New sensor installation:

Sensors installed on 05/06/2021 and current through 12/31/2023:

Inventory for JOB - MET							
Logger-CR100006192015-IN SERVICE			Serial Number	Manufacture Year	Date in Service	SWMP	Last Update
5278	2004	06/19/2015	Yes	05/14/2016			
Type	Code	Model	Serial Number	Manufacture Year	Date in Service	SWMP	Last Update
precip	precip05072019	precip06042018	43619-410	2004	05/07/2019	Yes	05/13/2022
PAR	PAR05062021	SQ-110	SQ-110-SS-L10_31176	2020	05/06/2021	Yes	05/13/2022
wind	wind05062021	05108-5A	WM179096	2020	05/06/2021	Yes	05/13/2022
temp/RH	tempRH05062021	EE181-M1A1	201516001280B1	2020	05/06/2021	Yes	05/13/2022
BP	BP05062021	PTB110	S1720920	2020	05/06/2021	Yes	05/13/2022