

Weeks Bay (WKB) NERR Meteorological Metadata
January - December 2001
Last Update: **March 1, 2023**

I. Data Set & Research Descriptors

1) Principal investigator & contact persons:

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2) Entry verification

a) Data Input Procedures:

The 15-minute, 1-hour average, and 24-hour data were downloaded from each instrument on the weather station to a Campbell Scientific CR10X datalogger. The CDMO Data Logger Program (nerr.csi) was loaded into the CR10X and controls the sensors and data collection schedule (see 2b of the Entry Verification section for the data collection schedule). The CR10X then interfaced with the Campbell SM716 memory module for long-term data storage.

Monthly, from January through August, the SM716 memory module was physically removed and brought into the Weeks Bay NERR laboratory and connected to a computer for data set download via the Campbell PC208W software program.

From September through December Campbell PC208W software was used to automatically dial up the weather station via a Campbell Com200 modem and upload data at five-minute intervals. Real time data management (RTDM) software produced joint photographic experts group (JPEG) image files displaying weather conditions at time of collection. In 2002 an YSI datalogger will also be deployed at the weather station site, adding water quality data to the display. The JPEG image files are exported to a network server maintained by Faulkner Community College in Fairhope, AL and are available for viewing using an Internet connection. At the end of the year monthly data files were compiled and the CDMO Weather Data Management Program (WDMP) was used to convert the files to an Access database. Data files for the months of May, June, July, and August are unavailable (see section 12, Missing Data). The WDMP program was developed in Visual Basic to interface with the NERRS data collection schedule (see 2b of the Entry Verification section for the data collection schedule).

The WDMP will automatically input and convert the monthly raw data file into and Access Database. There are three main steps the WDMP performs. First, it converts the comma delimited monthly raw data file into an Access Database. Secondly, it checks the data against a predetermined set of error criteria (see Part C of this section). Finally, it produces error and summary reports. Any anomalous data were investigated and are noted below in Anomalous Data section. Any data corrections that were performed are noted in the Data Correction section below. Eric Brunden and Scott Phipps error checked and compiled the 2001 weather data.

b) Data Collection Schedule

i) Data is collected in the following formats:

- 1) 15 minute data are instantaneous readings except for PAR and precipitation data that are totalized from 5 second samples sorted by date and time. (Arrays 150 and 151)
- 2) Hourly averages (Arrays 101 and 102) are calculated from 5 second samples sorted by date and time except for PAR and precipitation data that are hourly totals calculated from 15 minute totals (Arrays 105 and 106).
- 3) Daily average (arrays 241 and 242), maximum with time, and minimum with time (arrays 243 and 244) are calculated from 5 second samples sorted by date and time except for PAR and precipitation data which are 24 hour totals calculated from hourly totals (arrays 245 and 246).

ii) 15 minute sample point parameters: Date, Time, Air Temperature (°C), Relative Humidity (%), LiCor (PAR), Barometric Pressure (mb), Wind Speed (m/s), Wind Direction (Array 150); Rainfall (mm) (Array 151)

iii) Hourly average parameters: Date, Time, Air Temperature (°C), Relative Humidity (%), Barometric Pressure (mb) (Array 101); Wind Speed (m/s), Wind Direction, Wind Speed Maximum (Array 102)

iv) Hourly total parameters: LiCor (PAR) (Array 105); Rainfall (mm) (Array 106)

v) Daily Average parameters: Date, Time, Air Temperature (°C), Relative Humidity (%), Barometric Pressure (mb) (Array 241); Wind Speed (m/s), Wind Direction, Wind Direction Standard Deviation (using Yamartino's Algorithm) (Array 242)

vi) Daily Total parameter: LiCor (PAR) (Array 245); Rainfall (mm) (Array 246)

vii) Daily Maximum parameters: Date, Time, Air Temperature (°C), Time, Relative Humidity (%), Time, LiCor (PAR), Time, Barometric Pressure (mb),

Time, Wind Speed (m/s), Time, Battery Voltage, Time (Array 243)

viii) Daily Minimum parameters: Date, Time, Air Temperature (°C), Time, Relative Humidity (%), Time, LiCor (PAR), Time, Barometric Pressure (mb), Time, Wind Speed (m/s), Time, Battery Voltage, Time (Array 244)

c) Error/Anomalous Data Criteria

Air Temp:

- 15 min sample greater than max for the day
- 15 min sample less than the min for the day
- 15 min sample greater than 3.0 °C from the previous 15 minutes
- Max and Min values not recorded for the day
- 1-hour average greater than 10% above the greatest 15 min sample recorded in the hour

Relative Humidity:

- Changed by more than 25% from the previous 15 minutes
- Max and Min values not recorded for the day
- 1-hour average greater than 10% above the greatest 15 min sample recorded in the hour

Rainfall:

- Precipitation greater than 5 mm in 15 minutes
- No precipitation for the month

Wind Speed:

- Wind speed greater than 30 m/s
- Wind speed less than 0.5 m/s

Wind Direction:

- Wind direction greater than 360 degrees
- Wind direction less than 0 degrees

Pressure:

- Pressure greater than 1040 mb or less than 980 mb
- Pressure changes greater than 5 mb per hour
- Max and Min values not recorded for the day
- 1-hour average greater than 10% above the greatest 15 min sample recorded in the hour

Time:

- 15-minute interval not recorded

For all data:

- Duplicate interval data

3) Research objectives:

The principle objective is to record long-term meteorological data for Weeks Bay in order to observe any environmental changes or trends over time. Samples were taken every 5 seconds and 15 minutes.

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. Periodically, sensors on the weather station are inspected for damage or debris. If any is found, it is repaired and/or cleaned. The sensors and tower were obtained in the fall of 1996. However the sensors were not installed until the fall of 1998. Sensors have not been calibrated since. The barometric pressure sensor was new when deployed in August 2001. There were no other analyses done on the meteorological data at present.

5) Site location and character:

The Weeks Bay National Estuarine Research Reserve is located near the Gulf coast, southeast of the city of Fairhope, Alabama. Weeks Bay (30° 23' N, 87 50' W) is a small, shallow, microtidal sub-estuary, located on the eastern shore of Mobile Bay in the northern Gulf of Mexico. The bay is nearly diamond shaped, and its longitudinal axis (3.4 km long) runs nearly north-south from the head, where the Fish River flows in, to the mouth, where water is exchanged with Mobile Bay. Its widest point (3.1 km) is located near the center of the estuary, where the Magnolia River discharges into eastern side of Weeks Bay. Average depth is 1.4 m, although there are two areas where depths are significantly greater. The first is in the mouth of the bay, where the average depth is 6 m; the second is about 100 m upstream of the mouth of the Fish River, where the average depth is 3.5 m. Tides are principally diurnal, and have a mean range of 0.4 m.

The Fish River drainage basin encompasses 14300 hectares and contributes approximately 73% to the total incoming freshwater flow with the Magnolia River supplying the rest. Mean combined discharge is 9 cubic meters per second; although freshets up to 4 times larger occur throughout the year. These characteristics result in a freshwater residence time of 13 days under average discharge conditions, with a range from 0.5 to 100 days. Salinity in Weeks Bay varies substantially both temporally and spatially. During periods of high flow in the river, salinity in the bay may be fresh from the head to the mouth, except in the deeper holes of the estuary that are not as easily flushed. However, during periods of low flow in the river, wind velocity and tidal stage are strong factors influencing salinity structure. Salinity greater than 25 ppt is infrequently observed in Weeks Bay and is usually restricted to the southern portion of the estuary near the mouth.

The weather station is located on a reserve owned pier (lat 30° 24.89'N, long 87° 49.56'W) just south of the highway 98 bridge, on the west side of the mouth of the Fish River. Wind sentry, tipping bucket rain gauge, temperature/RH probe, and barometric pressure sensor are mounted along an aluminum tower between 4.8 and 7.6 meters above water surface. LI-COR quantum sensor was not deployed in 2001. Approximately 100 meters upstream is an YSI datalogger deployment site for the continuous monitoring of water quality.

6) Data collection period:

Weather data was collected from January 1 through December 31, 2001. This is the first year that Weeks Bay NERR compiled weather data for the System Wide Monitoring Program.

7) Distribution

According to the Ocean and Coastal Resource Management Data Dissemination Policy for the NERRS System-wide Monitoring Program,

NOAA/ERD retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The PI retains the right to be fully credited for having collected and processed the data. Following academic courtesy standards, the PI and NERR site where the data were collected will be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. Manuscripts resulting from the NOAA/OCRM supported research that are produced for publication in open literature, including refereed scientific journals, will acknowledge that the research was conducted under an award from the Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration. The data set enclosed within this package/transmission is only as good as the quality assurance/quality control procedures outlined by the enclosed metadata reporting statement. The user bears all responsibility for its subsequent use/misuse in any further analyses or comparisons. The Federal government does not assume liability to the Recipient or third persons, nor will the Federal government reimburse or indemnify the Recipient for its liability due to any losses resulting in any way from the use of this data.

NERR weather data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see Section 1 Principal investigators and contact persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under the general information link on the CDMO home page) and online at the CDMO home page <http://cdmo.baruch.sc.edu/>. Data are available in text format.

8) Associated researchers and projects:

The Geological Survey of Alabama, in cooperation with the United States Geological Survey, maintains two rain gauges within the Weeks Bay watershed. One is located at the highway 98 Magnolia River overpass; the other is located at the highway 104 Fish River overpass.

The following researchers have directly requested and received meteorological data generated from the Weeks Bay weather station for use as either primary or ancillary information significant to their respective projects.

Mastioff, Gerald. Case Western Reserve University. Erosion and transport of fine sediments from watersheds tributary to NERR estuaries.

Chin, Yu-Ping. Ohio State University. Distribution and phototransformation of non-point source agricultural pesticides in freshwater and marine NERR wetlands.

Caffrey, Jane. University of West Florida. Modeling estuarine ecosystem trophic status using continuous nitrate and water quality data.

Landers, Stephen. Troy State University. Environmental factors affecting the distribution and abundance of the benthic protozoological assemblages in Weeks Bay NERR.

Wilson, Chris. Case Western Reserve University. The movement of sediment and radionuclide through Weeks Bay NERR.

II. Physical Structure Descriptors

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

Li-Cor Quantum Sensor

Model # LI190SB

Stability: $<\pm 2\%$ change over 1 yr

Operating Temperature: -40 to 65°C

Sensitivity: typically $5\ \mu\text{A}$ per $1000\ \mu\text{moles s}^{-1}\text{ m}^{-2}$

Light spectrum wavelength: 400 to $700\ \text{nm}$

Date of last calibration: Unknown

Wind Sentry

Model # 03001

Range: 0 - $50\ \text{m/s}$; 360° mechanical

Date of last calibration: unknown

Temperature and Relative Humidity

Model #: HMP35C

Operating Temperature: -20 - $+60^{\circ}\text{C}$

Temperature Measurement Range: -35 - $+50^{\circ}\text{C}$

Temperature Accuracy: $\pm 0.4^{\circ}\text{C}$ over range of -24° to 48°C ; ± 0.9 over range of -38° to 53°

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

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

Date of Last calibration: Unknown

Barometric Sensor

Model # CS-105

Operating Range: Pressure - 600-1060 mb

Temperature: -40-+60C

Humidity: non-condensing

Accuracy: ± 0.5 to 6.0 mb (+20-60C)

Stability: ± 0.1 mb per year

Date of Last calibration: new

Tipping Bucket Rain Gauge

Model #: TE 525

Range: 0.1 mm

Accuracy: 1.0% at < 2 "/hr

Date of Last calibration: unknown

Note: The weather station was purchased and assembled prior to the current technician and research coordinator's position was filled. Complete records were not kept as to when the sensors were calibrated.

10) Coded variable indicator and variable code definitions:

wb = Weeks 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: Day=Julian Day and Date=Calendar Day.

January 2001

The following data appear to be correct:

Array	Date	Day	Time	Error message
150	5	5	1045	Air temp difference from 5 (5) 1045 (11.798) to

5 (5) 1100 (8.6628) is greater than 3.0 degrees C
 150 29 29 1830 Air temp difference from 29 (29) 1830 (17.702)
 to 29 (29) 1845 (13.905) is greater than 3.0 degrees C

150 4 4 1330 Relative hum difference from 4 (4) 1330 (79.003)
 to 4 (4) 1345 (48.597) is greater than 25%
 150 4 4 1400 Relative hum difference from 4 (4) 1400 (44.503)
 to 4 (4) 1415 (75.842) is greater than 25%
 150 6 6 1100 Relative hum difference from 6 (6) 1100 (67.715)
 to 6 (6) 1115 (42.475) is greater than 25%
 150 31 31 1430 Relative hum difference from 31 (31) 1430 (49.493)
 to 31 (31) 1445 (74.709) is greater than 25%

102 4 4 1800 Wind speed is less than 0.5 m/s from 4 (4) 1800 to 5 (5) 900
 102 23 23 1900 Wind speed is less than 0.5 m/s from 23 (23) 1900 to 24 (24) 900

The following negative wind direction values were reported due to stray voltage.
 Data were converted to zero:

Array	Date	Day	Time	Error message
150	1	1	715	Wind direction is greater than 360 or less than 0 on 1 (1) 715 (-.09543)
150	1	1	2000	Wind direction is greater than 360 or less than 0 on 1 (1) 2000 (-.09543)
150	1	1	2300	Wind direction is greater than 360 or less than 0 on 1 (1) 2300 (-.019089)
150	2	2	615	Wind direction is greater than 360 or less than 0 on 2 (2) 615 (-.09549)
150	2	2	1930	Wind direction is greater than 360 or less than 0 on 2 (2) 1930 (-.09542)
150	2	2	2000	Wind direction is greater than 360 or less than 0 on 2 (2) 2000 (-.19086)
150	2	2	2100	Wind direction is greater than 360 or less than 0 on 2 (2) 2100 (-.09544)
150	3	3	430	Wind direction is greater than 360 or less than 0 on 3 (3) 430 (-.09549)
150	3	3	515	Wind direction is greater than 360 or less than 0 on 3 (3) 515 (-.09549)
150	3	3	630	Wind direction is greater than 360 or less than 0 on 3 (3) 630 (-.09549)
150	3	3	2300	Wind direction is greater than 360 or less than 0 on 3 (3) 2300 (-.09553)
150	4	4	615	Wind direction is greater than 360 or less than 0 on 4 (4) 615 (-.09553)
150	8	8	1215	Wind direction is greater than 360 or less than 0 on 8 (8) 1215 (-.0953)
150	9	9	1130	Wind direction is greater than 360 or less than 0 on 9 (9) 1130 (-.09537)
150	10	10	2230	Wind direction is greater than 360 or less than 0 on 10(10) 2230 (-.09543)
150	10	10	2245	Wind direction is greater than 360 or less than 0 on 10(10) 2245 (-.09544)
150	10	10	2315	Wind direction is greater than 360 or less than 0 on 0 (10) 2315 (-.09545)
150	16	16	645	Wind direction is greater than 360 or less than 0 on 16 (16) 645 (-.09532)
150	24	24	145	Wind direction is greater than 360 or less than 0 on 24 (24) 145 (-.09544)
150	25	25	2000	Wind direction is greater than 360 or less than 0 on 25 (25) 2000 (-.09538)
150	25	25	2330	Wind direction is greater than 360 or less than 0 on 25 (25) 2330 (-.09543)
150	26	26	100	Wind direction is greater than 360 or less than 0 on 26 (26) 100 (-.09544)
150	26	26	115	Wind direction is greater than 360 or less than 0 on 26 (26) 115 (-.09545)
150	27	27	1130	Wind direction is greater than 360 or less than 0 27 (27) 1130 (-.09524)

February 2001

The following data appear to be correct:

Array	Date	Day	Time	Error message
150	9	40	2200	Air temp difference from 9 (40) 2200 (18.628) to 9 (40) 2215 (15.507) is greater than 3.0 degrees C
151	28	59	900	Precip difference from 28 (59) 900 (5.588) to 28 (59) 915 (.254) is greater than 5mm
102	1	32	1900	Wind speed is less than 0.5 m/s from 1 (32) 1900 to 2 (33) 800
102	4	35	2000	Wind speed is less than 0.5 m/s from 4 (35) 2000 to 5 (36) 800
102	5	36	1800	Wind speed is less than 0.5 m/s from 5 (36) 1800 to 6 (37) 1000
102	6	37	1900	Wind speed is less than 0.5 m/s from 6 (37) 1900 to 7 (38) 900

The following negative wind direction values were reported due to stray voltage.

Data were converted to zero:

Array	Date	Day	Time	Error message
150	1	32	615	Wind direction is greater than 360 or less than 0 on 1 (32) 615 (-.09532)
150	1	32	1645	Wind direction is greater than 360 or less than 0 on 1 (32) 1645 (-.09532)
150	1	32	2145	Wind direction is greater than 360 or less than 0 on 1 (32) 2145 (-.19067)
150	6	37	730	Wind direction is greater than 360 or less than 0 on 6 (37) 730 (-.09543)
150	6	37	2200	Wind direction is greater than 360 or less than 0 on 6 (37) 2200 (-.28605)
150	6	37	2315	Wind direction is greater than 360 or less than 0 on 6 (37) 2315 (-.28606)
150	7	38	115	Wind direction is greater than 360 or less than 0 on 7 (38) 115 (-.09538)
150	7	38	615	Wind direction is greater than 360 or less than 0 on 7 (38) 615 (-.09538)
150	7	38	715	Wind direction is greater than 360 or less than 0 on 7 (38) 715 (-.09538)
150	7	38	730	Wind direction is greater than 360 or less than 0 on 7 (38) 730 (-.28615)
150	7	38	2245	Wind direction is greater than 360 or less than 0 on 7 (38) 2245 (-.38127)
150	17	48	915	Wind direction is greater than 360 or less than 0 on 17 (48) 915 (-.09533)
150	17	48	945	Wind direction is greater than 360 or less than 0 on 17 (48) 945 (-.09533)
150	17	48	1015	Wind direction is greater than 360 or less than 0 on 17 (48) 1015 (-.09531)
150	17	48	1815	Wind direction is greater than 360 or less than 0 on 17 (48) 1815 (-.09527)
150	17	48	2000	Wind direction is greater than 360 or less than 0 on 17 (48) 2000 (-.09532)
150	17	48	2115	Wind direction is greater than 360 or less than 0 on 17 (48) 2115 (-.09533)
150	18	49	215	Wind direction is greater than 360 or less than 0 on 18 (49) 215 (-.09538)
150	26	57	2245	Wind direction is greater than 360 or less than 0 on 26 (57) 2245 (-.09522)

March 2001

The following data appear to be correct:

Array	Date	Day	Time	Error message
150	12	71	1245	Air temp difference from 12 (71) 1245 (21) to 12 (71) 1300 (17.09) is greater than 3.0 degrees C

150 14 73 1515 Relative hum difference from 14 (73) 1515 (53.034) to 14 (73) 1530 (79.52) is greater than 25%

151 3 62 1715 Precipitation difference from 3 (62) 1715 (.508) to 3 (62) 1730 (6.096) is greater than 5mm

151 3 62 1730 Precipitation difference from 3 (62) 1730 (6.096) to 3 (62) 1745 (11.684) is greater than 5mm

151 3 62 1745 Precipitation difference from 3 (62) 1745 (11.684) to 3 (62) 1800 (2.032) is greater than 5mm

151 12 71 1300 Precipitation difference from 12 (71) 1300 (1.016) to 12 (71) 1315 (11.176) is greater than 5mm

151 12 71 1315 Precipitation difference from 12 (71) 1315 (11.176) to 12 (71) 1330 (4.572) is greater than 5mm

151 14 73 2330 Precipitation difference from 14 (73) 2330 (1.524) to 14 (73) 2345 (7.112) is greater than 5mm

151 14 73 2345 Precipitation difference from 14 (73) 2345 (7.112) to 14 (73) 2400 (26.924) is greater than 5mm

151 14 73 2400 Precipitation difference from 14 (73) 2400 (26.924) to 15 (74) 15 (3.048) is greater than 5mm

102 7 66 1900 Wind speed is less than 0.5 m/s from 7 (66) 1900 to 8 (67) 100

102 13 72 1900 Wind speed is less than 0.5 m/s from 13 (72) 1900 to 14 (73) 700

The following negative wind direction values were reported due to stray voltage.
Data were converted to zero:

Array	Date	Day	Time	Error message
102	7	66	1900	Wind speed is less than 0.5 m/s from 7 (66) 1900 to 8 (67) 1000
102	13	72	1900	Wind speed is less than 0.5 m/s from 13 (72) 1900 to 14 (73) 700
150	7	66	1915	Wind direction is greater than 360 or less than 0 on 7 (66) 1915 (-.09528)
150	8	67	545	Wind direction is greater than 360 or less than 0 on 8 (67) 545 (-.09539)
150	10	69	545	Wind direction is greater than 360 or less than 0 on 10 (69) 545 (-.0954)
150	17	76	545	Wind direction is greater than 360 or less than 0 on 17 (76) 545 (-.09532)
150	19	78	1830	Wind direction is greater than 360 or less than 0 on 19 (78) 1830 (-.09532)
150	21	80	1115	Wind direction is greater than 360 or less than 0 on 21 (80) 1115 (-.09529)
150	21	80	1245	Wind direction is greater than 360 or less than 0 on 21 (80) 1245 (-.09527)
150	21	80	2100	Wind direction is greater than 360 or less than 0 on 21 (80) 2100 (-.09533)
150	25	84	2215	Wind direction is greater than 360 or less than 0 on 25 (84) 2215 (-.09534)
150	26	85	1800	Wind direction is greater than 360 or less than 0 on 26 (85) 1800 (-.09526)
150	28	87	430	Wind direction is greater than 360 or less than 0 on 28 (87) 430 (-.09534)

April 2001

The following data appear to be correct:

Array	Date	Day	Time	Error message
150	28	118	1630	Relative hum difference from 28 (118) 1630 (38.594) to 28 (118) 1645 (71.091) is greater than 25%.
150	30	120	1315	Relative hum difference from 30 (120) 1315 (72.247) to 30 (120) 1330 (33.773) is greater than 25%.

The following negative wind direction values were reported due to stray voltage.
Data were converted to zero:

Array	Date	Day	Time	Error message
150	1	91	2330	Wind direction is greater than 360 or less than 0 on 1 (91) 2330 (-.09533)
150	15	105	1745	Wind direction is greater than 360 or less than 0 on 15 (105) 1745 (-.09517)
150	15	105	2300	Wind direction is greater than 360 or less than 0 on 15 (105) 2300 (-.09522)
150	16	106	2030	Wind direction is greater than 360 or less than 0 on 16 (106) 2030 (-.09522)
150	17	107	1145	Wind direction is greater than 360 or less than 0 on 17 (107) 1145 (-.09522)
150	25	115	1130	Wind direction is greater than 360 or less than 0 on 25 (115) 1130 (-.09521)
150	29	119	430	Wind direction is greater than 360 or less than 0 on 29 (119) 430 (-.0953)

The following errors were associated with a powering down of the station on April 30 at 1400, which resulted in missing 5 second data which is used to calculate hourly and daily arrays. Therefore, hourly arrays (101, 102) for 1500 and all 24-hour arrays (241, 242, 243, 244) were deleted and replaced with 55555 for this date. Corrections are listed below:

Array	Date	Day	Time	Error
101	30	120	1500	Technician changed 101 Array data from 30 (120) 1500
102	30	120	1500	Technician changed 102 Array from 30 (120) 1500
241	30	120	2400	Technician changed 241 Array data at 30 (120) 2400
242	30	120	2400	Technician changed 242 Array data at 30 (120) 2400
243	30	120	2400	Technician changed 243 Array data at 30 (120) 2400
244	30	120	2400	Technician changed 244 Array data at 30 (120) 2400

May 2001

None

June 2001

None

July 2001

None

August 2001

None

September 2001

The following data appear to be correct:

Array	Date	Day	Time	Error message
150	10	253	1430	Air temp difference from 10 (253) 1430 (30.451) to 10 (253) 1445 (26.594) is greater than 3.0° C
150	12	255	1715	Air temp difference from 12 (255) 1715 (30.095) to 12 (255) 1730 (26.47) is greater than 3.0° C
150	12	255	1730	Air temp difference from 12 (255) 1730 (26.47) to 12 (255) 1745 (22.806) is greater than 3.0° C
151	3	246	1645	Precipitation difference from 3 (246) 1645 (8.89) to 3 (246) 1700 (1.016) is greater than 5mm
151	9	252	1215	Precipitation difference from 9 (252) 1215 (1.524) to 9 (252) 1230 (9.144) is greater than 5mm
151	9	252	1230	Precipitation difference from 9 (252) 1230 (9.144) to 9 (252) 1245 (2.286) is greater than 5mm
151	12	255	1745	Precipitation difference from 12 (255) 1745 (11.938) to 12 (255) 1800 (3.048) is greater than 5mm
102	5	248	2000	Wind speed is less than 0.5 m/s from 5 (248) 2000 to 6 (249) 800
102	14	257	2000	Wind speed is less than 0.5 m/s from 14 (257) 2000 to 15 (258) 800
102	15	258	2000	Wind speed is less than 0.5 m/s from 15 (258) 2000 to 16 (259) 800
102	19	262	1800	Wind speed is less than 0.5 m/s from 19 (262) 1800 to 20 (263) 800
102	21	264	1900	Wind speed is less than 0.5 m/s from 21 (264) 1900 to

22 (265) 1200

102 22 265 1900 Wind speed is less than 0.5 m/s from 22 (265) 1900 to
23 (266) 1100

October 2001

The following data appear to be correct:

Array	Date	Day	Time	Error message
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150	13	286	2015	Air temp difference from 13 (286) 2015 (26.306) to 13 (286) 2030 (19.951) is greater than 3.0°C
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150	14	287	330	Air temp difference from 14 (287) 330 (22.778) to 14 (287) 345 (19.252) is greater than 3.0°C
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150	26	299	1815	Relative hum difference from 26 (299) 1815 (45.254) to 26 (299) 1830 (70.339) is greater than 25%
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151	13	286	2030	Precipitation difference from 13 (286) 2030 (5.588) to 13 (286) 2045 (508) is greater than 5mm
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102	2	275	1900	Wind speed is less than 0.5 m/s from 2 (275) 1900 to 3 (276) 1100
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102	4	277	1600	Wind speed is less than 0.5 m/s from 4 (277) 1600 to 5 (278) 1100
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102	18	291	1800	Wind speed is less than 0.5 m/s from 18 (291) 1800 to 19 (292) 800
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102	30	303	1800	Wind speed is less than 0.5 m/s from 30 (303) 1800 to 31 (304) 800
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November 2001

The following data appear to be correct:

Array	Date	Day	Time	Error message
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150	17	321	1730	Relative hum difference from 17 (321) 1730 (48.659) to 17 (321) 1745 (75.874) is greater than 25%
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102	6	310	1600	Wind speed is less than 0.5 m/s from 6 (310) 1600 to 7 (311) 1100
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102	7	311	1900	Wind speed is less than 0.5 m/s from 7 (311) 1900 to 8 (312) 1200
-----	---	-----	------	---

102	9	313	1900	Wind speed is less than 0.5 m/s from 9 (313) 1900 to 10 (314) 1300
-----	---	-----	------	--

102	10	314	1700	Wind speed is less than 0.5 m/s from 10 (314) 1700 to 11
-----	----	-----	------	--

(315) 1100
 102 11 315 1900 Wind speed is less than 0.5 m/s from 11 (315) 1900 to 12 (316) 900
 102 16 320 1900 Wind speed is less than 0.5 m/s from 16 (320) 1900 to 17 (321) 900
 102 17 321 1700 Wind speed is less than 0.5 m/s from 17 (321) 1700 to 18 (322) 1100
 102 18 322 1700 Wind speed is less than 0.5 m/s from 18 (322) 1700 to 19 (323) 700
 102 20 324 1900 Wind speed is less than 0.5 m/s from 20 (324) 1900 to 21 (325) 900
 102 25 329 1900 Wind speed is less than 0.5 m/s from 25 (329) 1900 to 26 (330) 800

December 2001

The following data appear to be correct:

Array	Date	Day	Time	Error message
150	29	363	1530	Air temp difference from 29 (363) 1530 (19.801) to 29(363) 1545 (15.358) is greater than 3.0° C
150	21	355	1500	Relative hum difference from 21 (355) 1500 (31.317) to 21 (355) 1515 (58.004) is greater than 25%
150	29	363	1530	Relative hum difference from 29 (363) 1530 (58.79) to 29 (363) 1545 (99.682) is greater than 25%
151	14	348	415	Precipitation difference from 14 (348) 415 (9.144) to 14 (348) 430 (508) is greater than 5mm
151	23	357	600	Precipitation difference from 23 (357) 600 (.254) to 23 (357) 615 (6.35) is greater than 5mm
151	23	357	615	Precipitation difference from 23 (357) 615 (6.35) to 23 (357) 630 (24.892) is greater than 5mm
151	23	357	630	Precipitation difference from 23 (357) 630 (24.892) to 23 (357) 645 (3.048) is greater than 5mm
102	1	335	1500	Wind speed is less than 0.5 m/s from 1 (335) 1500 to 2 (336) 1000
102	6	340	1900	Wind speed is less than 0.5 m/s from 6 (340) 1900 to 7 (341) 1000
102	7	341	1800	Wind speed is less than 0.5 m/s from 7 (341) 1800 to 8 (342) 1200
102	18	352	1800	Wind speed is less than 0.5 m/s from 18 (352) 1800 to 19 (353) 900
102	20	354	2000	Wind speed is less than 0.5 m/s from 20 (354) 2000 to 21 (355) 900

102 21 355 1700 Wind speed is less than 0.5 m/s from 21 (355) 1700 to 22 (356) 700

102 28 362 2200 Wind speed is less than 0.5 m/s from 28 (362) 2200 to 29 (363) 1100

Original error report for array 101 days 335 through 343 (inclusive) noted a relative humidity average in 1hour data (100) greater than 24 hour maximum (reported as between .00559 to .02798). Probable that software malfunction occurred, reason unknown. Technician replaced 24hour maximum values in array 243 with 55555 to indicate technician deletion of data.

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.

General: LiCor Quantum Sensor (solar radiation) was not deployed for the year 2001. Barometric Sensor (Model # CS-105) was not deployed until 09/01/01.

Specifics:

January 2001: Solar radiation and barometric pressure missing

February 2001: Solar radiation and barometric pressure missing

March 2001: Solar radiation and barometric pressure missing

April 2001:

Solar radiation and barometric pressure missing.

The following data appear to be missing possibly due to weather station download:

Array	Date	Day	Time	Error message
150	30	120	1400	Missing 150 Array (15 minute data)
101	30	120	1400	Missing 101 Array (Hourly Averages)
102	30	120	1400	Missing 102 Array (Hourly Average Wind Parameters)

May through August (inclusive) 2001: All data missing, possibly due to the inadvertent overwriting of files or accidental deletion of files while administering software changes. Exact reason is unknown.

September 2001: Solar radiation missing

October 2001: Solar radiation missing

November 2001: Solar radiation missing

December 2001: Solar radiation missing

Array	Date	Day	Time	Error message
243	1	335	2400	Technician changed 243 Array data from 1 (335) 2400 to 9 (343) 2400

13) Other Remarks/notes

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.

A) The recent additions of a research coordinator and a technician to the staff at Weeks Bay NERR will result in improved maintenance of weather station

instruments, management of data, and record keeping.

B) Rain Events:

January

Date	RainAmount (mm)
7	2.540
8	2.032
11	9.652
15	2.794
16	12.446
17	.254
18	2.286
19	27.432
29	14.732
30	.762
Monthly Total 74.9	

February

Date	RainAmount (mm)
2	.254
5	.254
7	.254
9	16.256
10	.762
16	1.016
21	17.018
25	4.064
28	12.192
Monthly Total 52.1	

March

Date	RainAmount (mm)
2	1.778
3	25.400
9	9.398
12	46.482
14	46.736
15	8.128
17	3.556
18	5.334
19	1.270
20	.254
23	.254
25	2.540
28	10.668
29	5.334
Monthly Total 167.1	

April

Date	RainAmount (mm)
15	1.016
24	9.398
Monthly Total	10.4

May

Date	RainAmount (mm)
None available	

June

Date	RainAmount (mm)
None available	

July

Date	RainAmount (mm)
None available	

August

Date	Rainamount (mm)
None Available	

September

Date	RainAmount (mm)
1	.254
2	.762
3	23.368
4	20.320
8	3.556
9	13.462
10	3.302
11	4.572
12	16.002
19	18.034
20	.254
24	2.540
Monthly Total	106.4

October

Date	Rainamount (mm)
4	1.270

5	2.286
6	7.620
11	11.176
12	6.350
13	34.544
14	2.286
16	.254
20	.254
22	.254
23	.254
Monthly Total	66.5

November

Date	Rainamount (mm)
2	.254
7	.254
9	.254
19	.254
20	3.302
23	14.732
25	.254
28	1.524
29	7.620
Monthly Total	28.4

December

Date	RainAmount (mm)
1	.254
5	.254
6	.254
7	.254
8	.254
10	2.794
14	10.922
17	4.572
19	.254
23	43.434
29	.254
Monthly Total	63.5

C) Technician researched air temperature differences greater than 3° C in September, October, and December and found that the temperature drops are real events. Data from September and October coincide with increases in barometric pressure and rainfall events, indicating a storm front. December's temperature drop is slightly higher than normal but is still believable.