Old Woman Creek (OWC) NERR Meteorological Metadata

May - December 2001

Latest Update: **February 15, 2023**

I. DATA SET AND RESEARCH DESCRIPTORS

1. Principal investigators and Contact Person

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2. Entry Verification

A. Data Input Procedures:

The 15 minute data, 1 hour average data, and the 24 hour data are downloaded

from each instrument at the weather station to a Campbell Scientific CR10X

datalogger (the CDMO Data Logger Program was loaded into the CR10X and

controls the sensors and data collection schedule (See Part B of this section

for the data collection schedule). The CR10X is then interfaced with the PC208W

software supplied by Campbell Scientific. The data is collected in a storage

module and retrieved monthly and then downloaded into a computer containing

the PC208W software. The data is also saved as a monthly raw data file

(month01.dat) onto a Jazz Disc Drive.

After an entire month of data are available, the files are converted to an

Access database by the CDMO Weather Data Management Program (WDMP). This

program was developed in Visual Basic to interface with the NERRS data

collection schedule. The WDMP will automatically input and convert the

monthly raw data files 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 Part C of this section). Finally, it produces error and

summary reports. Any anomalous data are investigated and are noted below in

the Anomalous Data Section. Any data corrections that are performed are noted

in the Data Anomalies/Missing Data Section (Section 8). Common errors noted

in the monthly error reports were wind speeds below the 0.5 m/s criteria,

temperature change of greater than 30 C in a 15-minute period, and the

precipitation of greater than 5 mm in 15 minutes. Each of these common errors

was checked and either accepted as valid or listed as anomalous data. Dave

Klarercompiled and reviewed all 2001 data.

The Centralized Data Management Office converted all SWMP weather data collected with CR10X

program versions prior to version 4.0 which was distributed in October 2003. This was necessary

in order to merge the old data format (12 array output) with the new data format found in version 4.0

(3 array output). The new format produces averages, maximums and minimums every fifteen minutes

(array 15), every hour (array 60) and every day (array 144) for any sensors hooked up to the CR10X.

Specifically, the 150 and 151 fifteen minute data were converted to the new 15 array;

the hourly 101, 102, 105 and 106 data were converted to the new 60 array; and the daily 241, 242,

243, 244, 245 and 246 data were converted to the new 144 array. With the new format, the use of

55555's to code for deleted data and 11111's to code for missing data has been abandoned.

Hence, all 55555's or 11111's contained in the SWMP weather data collected prior to Version 4.0

of the CR10X program were removed and left blank.

B. Data Collection Schedules

1. Data is collected in the following formats.

a. Sample data points are collected every 15 minutes.

b. Hourly averages are collected every 60 minutes.

c. Daily average, maximum with time, and minimum with time are

collected every day.

2. 15-Minute Sample Point Parameters:

Date, Time, Air Temperature (C), Relative Humidity (%), PAR

(millimoles/square meter), Barometric Pressure (mb), Wind Speed

(m/s), Wind Direction, Rainfall (mm)

3. Hourly Average Parameters:

Date, Time, Air Temperature (C), Relative Humidity (%), Barometric

Pressure (mb), Wind Speed (m/s), Wind Direction, Wind Speed Max

4. Daily Averages Parameters:

Date, Time, Air Temperature (C), Relative Humidity (%), PAR

(millimoles/square meter), Barometric Pressure (mb), Wind Speed

(m/s), Wind Direction, Wind Direction Standard Deviation (using Yamartino's

Algorithm)

5. Daily Maximum Parameters:

Date, Time, Air Temperature (C), Time, Relative Humidity (%), Time,

PAR (millimoles/square meter), Time, Barometric Pressure (mb),

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

6. Daily Minimum Parameters:

Date, Time, Air Temperature (C), Time, Relative Humidity (%), Time,

PAR (millimoles/square meter), Time, Barometric Pressure (mb),

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

C. Error/Anomalous Data Criteria

Air Temperature:

- 15-minute sample not greater than maximum for the day

- 15-minute sample not less than minimum for the day

- 15-minute sample not greater than 3 C different from the previous 15-minute

reading

- Maximum and minimum temperatures recorded for the day

- 1 hour average is not greater than 10% above the highest 15-minute reading

recorded in the hour

Relative Humidity:

-Difference less than 25% change from the previous 15-minutes

- Maximum and minimum relative humidity recorded for the day

- 1 hour average not greater than 10% above the highest 15-minute reading

recorded

Rainfall:

- Precipitation not greater than 5 mm in 15-minute period

- 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

- Wind direction less than 0

Barometric Pressure:

- Pressure not greater than 1040 mb nor less than 980 mb

- Pressure changes greater than 5 mb per hour

- Maximum and minimum values recorded for the day

- 1 hour average not greater than 10% above the highest 15-minute reading in the

hour

Time:

- 15-minute interval recorded

For all data:

- Duplicate interval data

3. Research Objectives

The objective of this work is to record the data over a long time period for Old

Woman Creek to look at long term trends and seasonal variability in weather

conditions. An added function is to provide the weather data necessary for researchers to

examine the impact of changing weather conditions on the ecology of the estuary.

4. Research Methods (Campbell Weather Station)

The Wind Sentry, temperature and relative humidity sensor,

barometric sensor and the LiCor PAR sensor are located on a 10-meter tower following the

descriptions outlined in the CDMO Manual V 4.0. The tipping rain gauge is

located about 5 meters southeast of the tower. The sensors are wired to the CR10X following

the protocol in the CDMO Manual.

The Campbell weather station samples every 5 seconds to produce

both hourly and daily averages of air temperature, relative humidity, barometric

pressure, rainfall, wind speed and direction, and PAR. An instantaneous sample is taken

every 15 minutes and is stored in array 150 and 151. The data is stored onsite in a SM4M

storage module. The modules are swapped at monthly intervals and the data is then

downloaded into a computer for processing.( see data input section 2). Periodically,

sensors on the weather station are inspected for damage and cleaned, if necessary. Sensors are

sent to Campbell Scientific for recalibration at least every two years.

5. Site Location and Character

The Old Woman Creek State Nature Preserve and National Estuarine Research

Reserve is located on the southern shore of Lake Erie east of the City of Huron, Ohio. The

reserve lies within the Lake Erie Biogeographic Region. Old Woman Creek drains

a primarily agricultural watershed with corn, soybeans, and winter wheat being

the most important crops. The weather station is located within the boundaries of the

reserve, due east of the parking lot at the Ohio Center for Coastal Research. The

coordinates of the station are 41 deg 22'40" N and 82 deg 30' 29"W.

6. Data Collection Period

Weather data was collected from 1 May though the end December, 2001.

7. Distribution

According to the Ocean and Coastal Resource Management Data Dissemination Policy

for the NERR System-wide Monitoring Program,

NOAA/ERD retains the right to analyze, synthesize, and publish summaries of the

NERRS System-wide Monitoring Program data. The OWC Research Coordinator (RC)

retains the right to be fully credited for having collected and processed the data.

Following academic courtesy standard, the RC and the 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.

The data set enclosed within this package/transmission is only as good as the

quality assurance and quality control procedures outlined in the enclosed metadata

reporting statement. The user bears all responsibility for its subsequent use/misuse in

any further analyses or comparisons. The Federal government and the State of Ohio do

not assume liability to the Recipient or third persons, nor will the Federal

government or the State of Ohio reimburse or

indemnify the Recipient for its liability due to any losses resulting in any way

from the use of this data.

NERR water quality 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 general information link on CDMO homepage) an online at the CDMO

homepage http://inlet.geol.sc.edu/cdmohome.html. Data are available in comma-delimited

and Access database format from the CDMO.

8. Associated Research and Monitoring Project

The two SWMP data loggers are located within 1 and ½ kilometers of this weather

station. The two sites were established to determine the role of the estuary in

mitigating storm flow though the system and the impact of Lake Erie on the estuary.

II. Physical Structure Descriptors

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

LiCor Quantum Sensor

Model #LI190SB

Stability: <+2% change over 1 year

Operating Temperature: -40 to +65 C

Sensitivity: typically 5 microA per 1000 micromoles/second/meter2

Light Spectrum Wavelength: 400 to 700 nm

Date of Last Calibration: January 18,2001

Wind Sentry

Model #03001

Range: 0-50 m/s; 0-360 deg mechanical

Date of Last Calibration: unknown; date of purchase- March 30, 2001

Temperature and Relative Humidity

Model # HMP45C

Operating Temperature Range: -40 to + 60C

Temperature Measurement Range: -40 to + 60C

Temperature Accuracy: + 0.2C @ 20C

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

RH Accuracy: +/- 2% RH (0-90%) and +/- 3% RH (90-100%)

Date of Last Calibration: March 2, 2001

Barometric Sensor

Model #Vaisala PTB 101B

Operating Range: Pressure 600-1060 mb

Temperature Range: -40 to + 60C

Humidity: non-condensing

Accuracy: + 4.0 mb (-40 to +60C)

Stability: + 0.1 mb per year

Date of Last Calibration: August 28, 2000

Tipping Bucket Rain Gauge

Model#: Met One Model 385 Heated Rain Gauge

Sensitivity: 0.2mm

Accuracy: +1% at 25 to 76 mm per hour at 210C

Date of Last Calibration: January 24, 2001

10. Coded variable indicator and variable code definitions:

OW=Old Woman Creek

11. Data Anomalies/Missing Data

**Arrays:**

During 2022 all pre-2007 weather data were revisited by the CDMO. Historically those datasets included 15 minute, hourly (60), and daily data arrays (144). As directed by the NERRS Data Management Committee, the CDMO removed the hourly and daily data arrays leaving only the 15 minute data to make the entire NERRS SWMP weather dataset consistent in its reporting. All references to the 60 and 144 arrays were left in the metadata document as they may still provide valuable information, but users should be aware that they are largely no longer relevant. The updated datasets were uploaded to the database and made available through the various data applications at [www.nerrsdata.org/get/landing.cfm](http://www.nerrsdata.org/get/landing.cfm) throughout the fall of 2022.

May 2001:

The following data appear to be correct:

Array ID Date Day Time Error Message

150 126 6 2145 Air temp difference from 6 ( 126) 2145 ( 13.621)

to 6 ( 126) 2200 ( 17.741) is greater than 3.0 degrees C

150 131 11 1600 Air temp difference from 11 ( 131) 1600 ( 25.383)

to 11 ( 131) 1615 ( 18.879) is greater than 3.0 degrees C

150 137 17 1200 Air temp difference from 17 ( 137) 1200 ( 24.274)

to 17 ( 137) 1215 ( 21.155) is greater than 3.0 degrees C

150 145 25 1500 Air temp difference from 25 ( 145) 1500 ( 16.973)

to 25 ( 145) 1515 ( 13.792) is greater than 3.0 degrees C

150 5 125 2145 Rel hum difference from 5 ( 125) 2145 ( 33.688)

to 5 ( 125) 2200 ( 62.591) is greater than 25%

150 6 126 2145 Rel hum difference from 6 ( 126) 2145 ( 84.319)

to 6 ( 126) 2200 ( 57.209) is greater than 25%

150 11 131 1600 Rel hum difference from 11 ( 131) 1600 ( 44.208)

to 11 ( 131) 1615 ( 79.988) is greater than 25%

150 12 132 2330 Rel hum difference from 12 ( 132) 2330 ( 97.673)

to 12 ( 132) 2345 ( 67.088) is greater than 25%

150 13 133 2200 Rel hum difference from 13 ( 133) 2200 ( 44.865)

to 13 ( 133) 2215 ( 70.788) is greater than 25%

150 141 21 1230 Pressure is greater than 1040 or less than 980

from 21 ( 141) 1230 ( 979.97) to 21 ( 141) 1845 ( 979.79)

June 2001

The following data appear to be correct:

Array ID Date Day Time Error Message

150 153 2 1615 Air temp difference from 2 ( 153) 1615 ( 17.444)

to 2 ( 153) 1630 ( 13.066) is greater than 3.0 degrees C

150 166 15 1700 Air temp difference from 15 ( 166) 1700 ( 31.225)

to 15 ( 166) 1715 ( 27.574) is greater than 3.0 degrees C

150 171 20 1415 Air temp difference from 20 ( 171) 1415 ( 26.191)

to 20 ( 171) 1430 ( 22.739) is greater than 3.0 degrees C

150 153 2 1615 Rel hum difference from 2 ( 153) 1615 ( 60.565)

to 2 ( 153) 1630 ( 89.793) is greater than 25%

150 152 1 1130 Pressure is greater than 1040 or less than 980 on

1 ( 152) 1130 ( 979.94)

150 152 1 1200 Pressure is greater than 1040 or less than 980 on

1 ( 152) 1200 ( 979.98)

150 153 2 330 Pressure is greater than 1040 or less than 980

from 2 ( 153) 330 ( 979.92) to 2 ( 153) 715 ( 979.37)

150 153 2 800 Pressure is greater than 1040 or less than 980

from 2 ( 153) 800 ( 979.98) to 2 ( 153) 1915 ( 979.98)

July 2001:

150 193 12 45 Air temp difference from 12 ( 193) 45 ( 14.618)

to 12 ( 193) 100 ( 18.804) is greater than 3.0 degrees C

August 2001:

150 214 2 1515 Air temp difference from 2 ( 214) 1515 ( 32.552)

to 2 ( 214) 1530 ( 29.233) is greater than 3.0 degrees C

150 221 9 1245 Air temp difference from 9 ( 221) 1245 ( 27.64)

to 9 ( 221) 1300 ( 23.329) is greater than 3.0 degrees C

151 215 3 730 Precip difference from 31 ( 215) 730 ( 1.016) to

31 ( 215) 745 ( 6.35) is greater than 5 mm

102 4 216 1800 Wind speed is less than 0.5 m/s from 4 ( 216) 1800 to

5 ( 217) 1100

September 2001:

150 250 7 1215 Air temp difference from 7 ( 250) 1215 ( 30.44)

to 7 ( 250) 1230 ( 25.793) is greater than 3.0 degrees C

150 252 9 2045 Air temp difference from 9 ( 252) 2045 ( 25.881)

to 9 ( 252) 2100 ( 20.169) is greater than 3.0 degrees C

150 254 11 300 Air temp difference from 11 ( 254) 300 ( 18.139)

to 11 ( 254) 315 ( 14.884) is greater than 3.0 degrees C

150 256 13 415 Air temp difference from 13 ( 256) 415 ( 15.681)

to 13 ( 256) 430 ( 19.668) is greater than 3.0 degrees C

150 264 21 1515 Air temp difference from 21 ( 264) 1515 ( 21.763)

to 21 ( 264) 1530 ( 15.786) is greater than 3.0 degrees C

150 271 28 1830 Air temp difference from 28 ( 271) 1830 ( 11.437)

to 28 ( 271) 1845 ( 14.627) is greater than 3.0 degrees C

150 272 29 600 Air temp difference from 29 ( 272) 600 ( 11.038)

to 29 ( 272) 615 ( 14.095) is greater than 3.0 degrees C

150 272 29 2030 Air temp difference from 29 ( 272) 2030 ( 8.1887)

to 29 ( 272) 2045 ( 13.506) is greater than 3.0 degrees C

150 250 7 1215 Rel hum difference from 7 ( 250) 1215 ( 54.573)

to 7 ( 250) 1230 ( 84.846) is greater than 25%

151 251 8 800 Precip difference from 30 ( 251) 800 ( 2.032) to

30 ( 251) 815 ( 8.382) is greater than 5 mm

151 251 8 815 Precip difference from 30 ( 251) 815 ( 8.382) to

30 ( 251) 830 ( .508) is greater than 5 mm

151 264 21 1530 Precip difference from 30 ( 264) 1530 ( .508) to

30 ( 264) 1545 ( 10.668) is greater than 5 mm

151 264 21 1545 Precip difference from 30 ( 264) 1545 ( 10.668)

to 30 ( 264) 1600 ( 1.016) is greater than 5 mm

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

6 ( 249) 700

October 2001:

The following data appear to be correct:

150 275 2 1015 Air temp difference from 2 ( 275) 1015 ( 23.031) to 2

( 275)

1030 ( 19.241) is greater than 3.0 degrees C

150 277 4 1130 Air temp difference from 4 ( 277) 1130 ( 21.375)

to 4 ( 277) 1145 ( 18.185) is greater than 3.0 degrees C

150 297 24 1930 Air temp difference from 24 ( 297) 1930 ( 21.906)

to 24 ( 297) 1945 ( 17.855) is greater than 3.0 degrees C

150 299 26 1315 Air temp difference from 26 ( 299) 1315 ( 5.8036)

to 26 ( 299) 1330 ( 1.6154) is greater than 3.0 degrees C

150 277 4 1130 Rel hum difference from 4 ( 277) 1130 ( 52.076)

to 4 ( 277) 1145 ( 79.838) is greater than 25%

150 299 26 1315 Rel hum difference from 26 ( 299) 1315 ( 63.886)

to 26 ( 299) 1330 ( 91.939) is greater than 25%

151 294 21 1430 Precip difference from 31 ( 294) 1430 ( 1.27) to

31 ( 294) 1445 ( 6.604) is greater than 5 mm

150 286 13 2315 Pressure is greater than 1040 or less than 980 on 13

( 286) 2315 ( 979.79)

150 286 13 2330 Pressure is greater than 1040 or less than 980 on 13

( 286) 2330 ( 979.18)

150 286 13 2345 Pressure is greater than 1040 or less than 980 on 13

( 286) 2345 ( 979.67)

150 286 13 2400 Pressure is greater than 1040 or less than 980 on 13

( 286) 2400 ( 979.3)

150 287 14 15 Pressure is greater than 1040 or less than 980 from 14

( 287) 15 ( 979.3) to 14 ( 287) 1315 ( 979.92)

150 289 16 800 Pressure is greater than 1040 or less than 980 from 16

( 289) 800 ( 979.99) to 16 ( 289) 1215 ( 979.78)

150 296 23 545 Pressure is greater than 1040 or less than 980 from 23

( 296) 545 ( 979.65) to 23 ( 296) 1800 ( 979.91)

150 296 23 2345 Pressure is greater than 1040 or less than 980 on 23

( 296) 2345 ( 979.95)

150 297 24 115 Pressure is greater than 1040 or less than 980 on 24

( 297) 115 ( 979.95)

150 297 24 130 Pressure is greater than 1040 or less than 980 on 24

( 297) 130 ( 979.82)

150 297 24 345 Pressure is greater than 1040 or less than 980 on 24

( 297) 345 ( 979.85)

150 297 24 400 Pressure is greater than 1040 or less than 980 on 24

( 297) 400 ( 979.72)

150 297 24 415 Pressure is greater than 1040 or less than 980 on 24

( 297) 415 ( 979.58)

150 297 24 430 Pressure is greater than 1040 or less than 980 on 24

( 297) 430 ( 979.94)

150 297 24 600 Pressure is greater than 1040 or less than 980 on 24

( 297) 600 ( 979.96)

150 297 24 1045 Pressure is greater than 1040 or less than 980 from 24

( 297) 1045 ( 979.68) to 24 ( 297) 2400 ( 976.97)

150 298 25 15 Pressure is greater than 1040 or less than 980 from 25

( 298) 15 ( 977.21) to 25 ( 298) 415 ( 979.96)

November 2001:

The following data appears to be correct:

150 312 8 1415 Air temp difference from 8 ( 312) 1415 ( 16.659)

to 8 ( 312) 1430 ( 12.011) is greater than 3.0 degrees C

150 323 19 1400 Air temp difference from 19 ( 323) 1400 ( 11.694)

to 19 ( 323) 1415 ( 7.8405) is greater than 3.0 degrees C

December 2001:

The following data appears to be correct:

Array ID Date Day Time Error Message

150 357 23 1915 Rel hum difference from 23 ( 357) 1915

( 72.032) to 23 ( 357) 1930 ( 97.24) is greater

150 348 14 1100 Pressure is greater than 1040 or less

than 980 from 14 ( 348) 1100 ( 979.62) to 14 ( 348) 1500 ( 978.64)

150 351 17 1230 Pressure is greater than 1040 or less

than 980 from 17 ( 351) 1230 ( 979.74) to 17 ( 351) 2145 ( 979.99)

150 361 27 1045 Pressure is greater than 1040 or less

than 980 from 27 ( 361) 1045 ( 979.87) to 27 ( 361) 1630 ( 979.99)

150 361 27 1915 Pressure is greater than 1040 or less

than 980 on 27 ( 361) 1915 ( 979.99)

150 361 27 2030 Pressure is greater than 1040 or less

than 980 from 27 ( 361) 2030 ( 979.93) to 27 ( 361) 2400 ( 978.77)

150 362 28 15 Pressure is greater than 1040 or less

than 980 from 28 ( 362) 15 ( 978.65) to 28 ( 362) 1545 ( 979.99)

12. Missing data

**Arrays:**

During 2022 all pre-2007 weather data were revisited by the CDMO. Historically those datasets included 15 minute, hourly (60), and daily data arrays (144). As directed by the NERRS Data Management Committee, the CDMO removed the hourly and daily data arrays leaving only the 15 minute data to make the entire NERRS SWMP weather dataset consistent in its reporting. All references to the 60 and 144 arrays were left in the metadata document as they may still provide valuable information, but users should be aware that they are largely no longer relevant. The updated datasets were uploaded to the database and made available through the various data applications at [www.nerrsdata.org/get/landing.cfm](http://www.nerrsdata.org/get/landing.cfm) throughout the fall of 2022.

May 2001: there appears to be no missing data

June 2001: there appears to be no missing data

July 2001: there appears to be no missing data

August 2001: there appears to be no missing data

September 2001: there appears to be no missing data

October 2001: there appears to be no missing data

November 2001: there appears to be no missing data

December 2001: there appears to be no missing data

13. Other remarks

**Arrays:**

During 2022 all pre-2007 weather data were revisited by the CDMO. Historically those datasets included 15 minute, hourly (60), and daily data arrays (144). As directed by the NERRS Data Management Committee, the CDMO removed the hourly and daily data arrays leaving only the 15 minute data to make the entire NERRS SWMP weather dataset consistent in its reporting. All references to the 60 and 144 arrays were left in the metadata document as they may still provide valuable information, but users should be aware that they are largely no longer relevant. The updated datasets were uploaded to the database and made available through the various data applications at [www.nerrsdata.org/get/landing.cfm](http://www.nerrsdata.org/get/landing.cfm) throughout the fall of 2022.

**Precipitation:**

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

The Centralized Data Management Office converted all SWMP weather data collected with CR10X

program versions prior to version 4.0 which was distributed in October 2003. This was necessary

in order to merge the old data format (12 array output) with the new data format found in version 4.0

(3 array output). The new format produces averages, maximums and minimums every fifteen minutes

(array 15), every hour (array 60) and every day (array 144) for any sensors hooked up to the CR10X.

Specifically, the 150 and 151 fifteen minute data were converted to the new 15 array;

the hourly 101, 102, 105 and 106 data were converted to the new 60 array; and the daily 241, 242,

243, 244, 245 and 246 data were converted to the new 144 array. With the new format, the use of

55555's to code for deleted data and 11111's to code for missing data has been abandoned.

Hence, all 55555's or 11111's contained in the SWMP weather data collected prior to Version 4.0

of the CR10X program were removed and left blank.

Rain events:

May:

Day RainAmount(mm)

8 7.366

11 3.81

12 5.842

15 6.096

16 7.112

18 2.54

21 5.08

22 1.778

23 0.254

24 1.27

25 1.016

26 9.144

27 2.286

28 1.016

29 0.254

June:

Day RainAmount(mm)

1 4.318

2 10.922

5 0.508

6 5.588

12 0.254

15 3.81

20 2.032

21 7.366

22 1.524

30 1.27

July:

Day RainAmount(mm)

1 4.826

3 1.524

17 2.032

21 0.254

22 0.254

25 16.002

29 0.762

August:

Day RainAmount(mm)

3 34.036

9 5.334

12 6.35

16 2.794

18 4.064

19 0.254

20 0.508

22 7.112

23 0.254

26 4.826

31 1.778

September:

Day RainAmount(mm)

7 4.064

8 12.7

9 11.684

10 0.508

13 3.302

18 1.016

19 10.668

21 15.494

23 5.08

24 14.732

25 12.7

26 6.35

28 2.286

October:

Day RainAmount(mm)

4 1.778

5 54.102

6 0.254

11 2.54

12 9.652

14 21.082

15 0.254

16 14.986

21 12.7

22 13.716

23 5.588

24 7.366

25 0.254

26 1.524

30 0.508

November:

Day RainAmount(mm)

2 7.62

8 2.54

14 2.032

19 6.35

24 2.286

25 5.08

27 3.048

28 8.382

29 13.208

30 8.128

December:

Day RainAmount(mm)

4 0.762

12 2.54

13 0.254

14 18.034

16 4.826

17 22.606

18 0.254

19 0.254

22 0.762

23 0.762

27 0.254

28 0.254