Great Smoky Mountain Rain Gauge Network Field Report   29 November 2017

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Volunteer assistants (other):
Don Elliott (Waynesville Watershed Field Manager), Lindsey De May, Alex Flynt, Jonathan Miller, Sydney Wilson

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Table 1: Gauge visits during the autumn 2017 campaign. Comments: DD=gauge data download, MN=general gauge maintenance (cleaning, re-level), CA= rain gauge calibration, CV= vegetation clearing, and BR = data logger battery replacement.

Date	Gauges Visited	Technicians	Comments
10/7/2017	3; 11; 107; 109	Doug, Jonathan	DD, MN, CV, BR
10/10/2017	4; 104, 110, 105	Doug	DD, MN, CV, BR
10/13/2017	2; 5; 8; 106; 10	Doug, Don Elliott	DD, MN, CV, BR
10/18/2017	108;	Doug, Sydney, Lindsey	DD, MN, CV, BR
10/22/2017	111, 112, 311	Doug	DD, MN, CV, BR
10/27/2017	101, 102, 103, 100T, 104	Doug, Zach, Alex	DD, MN, CV, BR
10/30/2017	304, 307	Doug	DD, MN, CV, BR
11/4/2017	303s, 306, 308	Doug, Rachel	DD, MN, CV, BR
11/11/2017	305, 309, 310	Doug, Rachel	DD, MN, CV, BR
11/18/2017	301, 302, 300	Doug, Samuel	DD, MN, CV, BR

Gauge visitation in support of the Duke Great Smoky Mountain Rain Gauge Network (GSMRGN) during the autumn 2017 occurred over 10 days spanning a period of seven weeks from October – November 2017. The primary purpose of the visits in the autumn 2017 was [1] to perform downloads of gauge tip observations since the previous gauge visits in the summer 2017, [2] to complete maintenance tasks, [3] to clear vegetation and tree limbs and, [4] to replace ALL data logger batteries in anticipation of cold winter weather, when lithium batteries respond with a drop in operating voltage. Eight technicians and volunteers (listed on the front page) made the visits and performed the required work. It is important to note that the volunteers were NOT directly involved in any of the gauge visit tasks, but were volunteering to assist with personal safety should someone get injured during a particular series of gauge visits.

The general tasks completed at **every** gauge visit consist of (1) gauge data download from the data loggers [DD in Table 1], (2) general gauge maintenance and ML1 logger condition monitoring [MN in Table 1], (3) clear vegetation within a five foot radius of the rain gauge [CV in Table 1], and, (4) replacement of lithium data logger or HOBO batteries [BR in Table 1]. Specialized tasks were the trimming of tree limbs using an extension saw at several locations to improve the sky view that couldn't be completed during some of the visits in the summer 2017 (at gauge sites 002, 003, 005, 008, 304, 307, 305, 309, 310), the replacement of four AA batteries of the T/RH sensor at the fire tower on Mount Sterling (near g310) to record air temperature during the cool season, and a visit at g107 to check that the drain ports had not clogged (as they had in the summer 2017) in anticipation of the arrival of Tropical Depression Irma. Task (1) merely required a serial port link between the field study laptop and the gauge data logger and consisted of pulling the data (often in files having raw [*.txt] and CSV formats) onto a desktop folder on the laptop, checking for completeness of the data, and comparing the data logger time and date to the actual GPS time and date (making a screen capture of the time comparison). The standard that has been chosen for this study is to maintain the clocks on Eastern Daylight Time, since most of the "warm" precipitation will be occurring during the season when EDT is in effect. Most ML1-FL data logger times have been adjusted (using "TA" command) during previous gauge visits to coincide with the EDT given by the GPS locator. Two ML1 loggers showed a poor response using the TA command (g104 and g110,

TA error "Adjustment too big") and might require replacement during the spring 2018 visit. Task (2) required the cleaning of debris from the funnel filter, cleaning the tipping buckets of debris (if necessary), cleaning the gauge drain ports and siphon, re-leveling the gauge if it has come unleveled, and fixing or replacing the gauge mesh if it had been damaged. Task (3) consisted of cutting briars, tree branches, rhododendron, and mountain laurel within a five foot radius of the gauge using clippers or a saw. Five gauge sites (g003, g005, g008, g304, and g309) had tree limbs removed using an extension saw and one location (g305) will need tree limbs cleared during the autumn 2018 visit. Task (4) was completed successfully in every data logger at each of the rain gauge locations. The lithium battery voltage of the ML1-420 and ML1-FL loggers was good (greater than 3.50 Volts) at all but three (g010, g300, g311) of the gauge locations upon arrival during the autumn months. A battery voltage and internal temperature file (using "DUBVT" command) was downloaded at g300 to share with Hydrological Services of America as the ML1-420 logger at this location drains the lithium battery so rapidly that a new lithium battery is required at nearly every visit.

Challenges encountered during some of the gauge visits in the autumn 2017 were; (i) the severe time drift at g104 and g110 due to the TA of +1 s every 1-h, which makes the logger time much faster than the actual (GPS) time, and (ii) the ripping off of the gauge cover at g010 by a bear that had also happened late in the summer 2016. Otherwise, the gauge network was functioning as smoothly as is possible. It should be noted that a new Davis Pro weather station has been installed near the Mount Sterling fire tower (which is now locked, but we have a functioning key!), next to g310. The owner of the weather station (and data) at Duke Power is being pursued so the observations can be used to help diagnose the phase of falling precipitation during the cold season.

Details of every gauge visit along with precipitation raw and CSV files (and some internal temperature and battery voltage files) can be found via Google Drive at https://drive.google.com/open?id=0B9P8oUaRiBOwTHlQNEtUMkZsMWc which contains sub-folders for each gauge that consist of the individual data files (often having at least two different formats), pictures taken at the gauge site during the visit, screenshots of the GPS (laptop) and ML1 logger time comparison, and a MS Word document that mirrors the notes made in the field journal during each visit.

Noteworthy precipitation events of September and October 2017 as observed at KAVL are highlighted in yellow in **Appendix A**. Events on 8, 23, and 28 October would be particularly interesting to study as the dominant airstreams have different origins and could nicely contrast heavy precipitation in the Pigeon River Basin with southerly and westerly flow.

Plans for the spring months of 2018

Table 2: Planned gauge visits during the spring 2018 campaign. DD=gauge data download, MN=general gauge maintenance (cleaning, re-level), CA= rain gauge calibration, CV= vegetation clearing, and BR = data logger battery replacement.

Date	Gauges Visited	Technicians	Comments
3/??/2018	3; 11	Doug, two students	DD, MN, CA, CV
3/??/2018	2; 5; 8*	Doug, one student	DD, MN, CA, CV
3/??/2018	100T, 105, 104	Doug, one student	DD, MN, CA, CV
3/??/2018	300, 308	Doug, two students	DD, MN, CA, CV
4/??/2018	106, 10	Doug, one student	DD, MN, CA, CV
4/??/2018	304, 307	Doug, two students	DD, MN, CA, CV
4/??/2018	4, 108, 109	Doug, one student	DD, MN, CA, CV
4/??/2018	311, 110	Doug, one student	DD, MN, CA, CV
4/??/2018	111, 112, 107	Doug, one student	DD, MN, CA, CV
5/??/2018	303s, 306	Doug, two students	DD, MN, CA, CV
5/??/2018	101, 102, 103	Doug, two students	DD, MN, CA, CV
5/??/2018	305, 309, 310	Doug, two students	DD, MN, CA, CV
5/??/2018	301, 302	Doug, two students	DD, MN, CA, CV

Gauge visitation in support of the Duke GSMRGN during the spring 2018 will occur over at least thirteen days spanning March through early May 2018. The primary purpose of the visits will be to download precipitation observations that were made since the previous gauge visits in October - November 2017 [DD in Table 2], perform maintenance and check if the ML1 logger times have drifted between visits and make the corresponding needed adjustments [MN in Table 2], calibrate every rain gauge [last calibration in autumn 2016, CA in Table 2], and clear vegetation (and tree branches) from overhanging gauges [CV in Table 2]. Calibrations are scheduled at **<u>ALL</u>** rain gauge locations during the spring season due to the increased availability of daylight hours (over autumn) and to a seasonal (March, April, May) minimum in precipitation observed in the Pigeon River Basin (soon to be published in WaF in 2018).

Details of every gauge visit along with each gauge precipitation record will be posted online and shall contain sub-folders for each gauge that consist of the individual data files (often having at least two different formats), pictures taken at the gauge site during the visit, screenshots of the GPS (laptop) and ML1 logger time comparison, and a MS Word document that mirrors the notes made in the field journal during the visit.

The current technician roster during the 2017-2018 academic year consists of Rachel Dunn, Samuel O'Donnell, and Zachary Tuggle. New undergraduate research students at UNC Asheville will be recruited as field technicians for the Duke GSMRGN project in the spring 2018 as Samuel and Rachel will be graduating from UNC Asheville in May 2018.

Table 3: The Duke Great Smoky Mountain Rain Gauge Network is currently (valid as of 29 November 2017) composed of 32 tipping bucket rain gauges.

Gauge #	Location	Latitude	Longitude	Altitude
RG002	Lickstone Bald	35°25.5' N	82°58.2' W	5680 ft.
RG003	High Top	35°23.0' N	82°54.9' W	5280 ft.
RG004	Lickstone Ridge S	35°22.0' N	82°59.4' W	6305 ft.
RG005	Deep Gap	35°24.5' N	82°57.8' W	4986 ft.
RG008	Double Summer Gap	35°22.9' N	82°58.4' W	5700 ft.
RG010	Beaty Summer Gap	35°27.3' N	82°56.8' W	4849 ft.
RG011	near Deep Gap	35º23.7' N	82º54.9' W	4081 ft.
RG100T	Purchase Knob	35°35.1' N	83°04.3' W	4905 ft.
RG101	The Swag	35°34.5' N	83°05.2' W	4986 ft.
RG102	Hemphill Bald	35°33.8' N	83°06.2' W	5365 ft.
RG103	JR Property	35°33.2' N	83°07.0' W	5539 ft.
RG104	Cat. Ski Area	35°33.2' N	83°05.2' W	5208 ft.
RG105	KH Property	35°38.0' N	83°02.4' W	4412 ft
RG106	Pinnacle Ridge	35°25.9' N	83°01.7' W	3969 ft
RG107	Lookout Point	35°34.0' N	82°54.4' W	4459 ft
RG108	Utah Mountain	35°33.2' N	82°59.3' W	4188 ft
RG109	Eaglesnest Ridge	35°29.7' N	83°02.4' W	4922 ft
RG110	JH Property	35°32.8' N	83°08.8' W	5128 ft
RG111	Hurricane Ridge	35°43.7' N	82°56.8' W	4573 ft
RG112	Ore Knob	35°45.0' N	82°57.8' W	3884 ft
RG300	Camel Hump Knob	35°43.5' N	83°13.0'W	5110 ft
RG301	Mt Guyot	35°42.3'N	83°15.3'W	6570 ft
RG302	Snake Den Ridge	35°43.2'N	83°14.8'W	6104 ft
RG303s	Mt Cammerer	35°45.7'N	83°09.7'W	4887 ft
RG304	Big Cataloochee	35°40.2'N	83°10.9'W	5971 ft

RG305	Mt Sterling 1	35°41.4'N	83°07.9'W	5349 ft
RG306	Sunup Knob	35°44.7'N	83°10.2'W	5039 ft
RG307	Balsam Mountain	35°39.0'N	83°11.9'W	5327 ft
RG308	Cosby Knob	35°43.8' N	83°10.9'W	4826 ft
RG309	Mt Sterling 2	35°40.9'N	83°09.0'W	5262 ft
RG310	Mt Sterling 3	35°42.1'N	83°07.3'W	5761 ft
RG311	Big Creek	35°45.9'N	83°08.4'W	3398 ft

Appendix A

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CXUS52 KGSP 010817
CF6AVL
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)


                                      STATION:   ASHEVILLE NC
                                      MONTH:     SEPTEMBER
                                      YEAR:      2017
                                      LATITUDE:   35 25 N
                                      LONGITUDE:  82 33 W


   TEMPERATURE IN F:        :PCPN:    SNOW:   WIND          :SUNSHINE: SKY       :PK WND
==========================================================================================
1    2    3    4    5   6A  6B    7     8    9    10   11   12   13    14   15    16    17   18
                                           12Z  AVG  MX  2MIN
DY  MAX  MIN  AVG  DEP HDD CDD   WTR   SNW  DPTH SPD  SPD DIR  MIN  PSBL S-S  WX    SPD  DR
==========================================================================================

 1   77   65   71    0   0   6  0.29   0.0    0  9.5  18  190    M    M    6 138    27  190
 2   74   59   67   -3   0   2  0.00   0.0    0  6.5  16  210    M    M    7         21  220
 3   80   55   68   -2   0   3  0.00   0.0    0  5.5  15  340    M    M    0         19  330
 4   81   53   67   -3   0   2  0.00   0.0    0  4.0  13  170    M    M    0         18  150
 5   82   55   69   -1   0   4  1.33   0.0    0  4.0  22  330    M    M    3  13    30  330
 6   69   51   60  -10   5   0  0.72   0.0    0  8.1  20  330    M    M    4  13    24  340
 7   71   45   58  -11   7   0  0.00   0.0    0  4.5  14  330    M    M    2   1    16  340
 8   75   47   61   -8   4   0  0.00   0.0    0  2.9   8   10    M    M    1         11  310
 9   74   50   62   -7   3   0  0.00   0.0    0  3.3  12   10    M    M    2  12    16   10
10   64   49   57  -11   8   0  0.00   0.0    0  2.6   9  360    M    M    1         16   80
11   60   55   58  -10   7   0  1.00   0.0    0  5.7  16   20    M    M    9   1    27   10
12   65   59   62   -6   3   0  0.41   0.0    0  8.1  18  160    M    M   10   1    31  170
13   73   56   65   -2   0   0     T   0.0    0  6.8  22  190    M    M    9         28  220
14   74   58   66   -1   0   1     T   0.0    0  3.1  14  340    M    M    8   1    16  340
15   78   56   67    0   0   2  0.00   0.0    0  2.2  16  340    M    M    6  12    20  340
16   82   56   69    3   0   4  0.00   0.0    0  2.5  14  340    M    M    4 128    16  340
17   84   55   70    4   0   5  0.00   0.0    0  3.9  13  340    M    M    0   1    16  350
18   82   55   69    3   0   4  0.00   0.0    0  4.1  14  340    M    M    0         17  340
19   83   56   70    5   0   5  0.00   0.0    0  2.2  13  340    M    M    2         17  340
20   85   61   73    8   0   8  0.00   0.0    0  4.3  14  340    M    M    1 128    19  330
21   85   58   72    7   0   7     T   0.0    0  3.5  14  340    M    M    1   3    19  330
```

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22  84  59  72    8   0   7 0.00  0.0    0  2.3  9 160   M    M    5 123    13 160
23  84  63  74   10   0   9 0.00  0.0    0  2.7 12 170   M    M    6 123    14 170
24  83  61  72    8   0   7 0.00  0.0    0  2.4  9  20   M    M    2 12     14  10
25  83  58  71    8   0   6 0.00  0.0    0  2.5  9 100   M    M    0        13 110
26  85  59  72    9   0   7 0.00  0.0    0  5.4 16 330   M    M    1        20 340
27  86  58  72   10   0   7 0.00  0.0    0  5.5 16 340   M    M    0        23 340
28  86  59  73   11   0   8 0.00  0.0    0  6.4 16 330   M    M    0        20 340
29  79  63  71    9   0   6    T  0.0    0  4.8 15 340   M    M    7        19 340
30  77  50  64    3   1   0 0.00  0.0    0  7.0 16 330   M    M    4        20 340
================================================================================
SM 2345 1684         38 110  3.75       0.0 136.3         M        101
================================================================================
AV 78.2 56.1                              4.5 FASTST   M    M    3     MAX(MPH)
                              MISC ---->  # 22 330                # 31  170
================================================================================
NOTES:
# LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2


                                    STATION:   ASHEVILLE NC
                                    MONTH:     SEPTEMBER
                                    YEAR:      2017
                                    LATITUDE:   35 25 N
                                    LONGITUDE:  82 33 W
```

[TEMPERATURE DATA]   [PRECIPITATION DATA]   SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 67.2   TOTAL FOR MONTH: 3.75   1 = FOG OR MIST
DPTR FM NORMAL: 0.8   DPTR FM NORMAL: -0.06   2 = FOG REDUCING VISIBILITY
HIGHEST: 86 ON 28,27 GRTST 24HR 2.05 ON 5- 6   TO 1/4 MILE OR LESS
LOWEST: 45 ON 7   3 = THUNDER
                        SNOW, ICE PELLETS, HAIL   4 = ICE PELLETS
                        TOTAL MONTH: 0.0 INCH   5 = HAIL
                        GRTST 24HR   0.0   6 = FREEZING RAIN OR DRIZZLE
                        GRTST DEPTH: 0   7 = DUSTSTORM OR SANDSTORM:
                                                       VSBY 1/2 MILE OR LESS
                                                   8 = SMOKE OR HAZE
[NO. OF DAYS WITH]   [WEATHER - DAYS WITH] 9 = BLOWING SNOW
                                                   X = TORNADO
MAX 32 OR BELOW: 0   0.01 INCH OR MORE: 5
MAX 90 OR ABOVE: 0   0.10 INCH OR MORE: 5
MIN 32 OR BELOW: 0   0.50 INCH OR MORE: 3
MIN 0 OR BELOW: 0   1.00 INCH OR MORE: 2

[HDD (BASE 65)]
TOTAL THIS MO.   38   CLEAR (SCALE 0-3) 16
DPTR FM NORMAL   -17   PTCLDY (SCALE 4-7) 11
TOTAL FM JUL 1   38   CLOUDY (SCALE 8-10) 3
DPTR FM NORMAL   -19

[CDD (BASE 65)]
TOTAL THIS MO.   110
DPTR FM NORMAL   15   [PRESSURE DATA]
TOTAL FM JAN 1   976   HIGHEST SLP 30.35 ON 10
DPTR FM NORMAL   124   LOWEST SLP 29.72 ON 12

[REMARKS]
#FINAL-09-17#

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the
National Climatic Data Center (NCDC). Therefore, these data are subject to revision.
Final and certified climate data can be accessed at the NCDC -
http://www.ncdc.noaa.gov.
WFO Monthly/Daily Climate Data

634
CXUS52 KGSP 032031
CF6AVL
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

```
                                        STATION:   ASHEVILLE NC
                                        MONTH:     OCTOBER
                                        YEAR:      2017
                                        LATITUDE:  35 25 N
                                        LONGITUDE: 82 33 W

   TEMPERATURE IN F:          :PCPN:    SNOW:   WIND        :SUNSHINE: SKY     :PK WND
================================================================================
 1    2   3   4   5  6A  6B    7      8    9   10   11  12  13    14    15    16   17  18
                                          12Z  AVG MX 2MIN
 DY MAX MIN AVG DEP HDD CDD   WTR   SNW  DPTH SPD SPD DIR MIN  PSBL  S-S WX    SPD  DR
================================================================================

  1  67  43  55  -6  10   0  0.00   0.0    0  2.5 14 170   M     M    0         20 180
  2  71  40  56  -5   9   0  0.00   0.0    0  3.5 13 170   M     M    M 1       16 180
  3  73  45  59  -1   6   0  0.00   0.0    0  1.7 13 180   M     M    2         18 180
  4  77  44  61   1   4   0  0.00   0.0    0  2.3 10 170   M     M    1 12      14 160
  5  79  43  61   1   4   0  0.00   0.0    0  2.2 12 170   M     M    1 12      18 160
  6  78  47  63   4   2   0  0.00   0.0    0  2.2 12 150   M     M    1         16 140
  7  75  61  68   9   0   3  0.00   0.0    0  4.7 13 190   M     M    9         15 190
  8  74  68  71  12   0   6  2.33   0.0    0  7.1 26 180   M     M    9 12      34 170
  9  82  71  77  19   0  12  0.01   0.0    0  5.8 15 180   M     M    8         20 200
 10  84  69  77  19   0  12  0.86   0.0    0  4.2 15 210   M     M    7 1       20 220
 11  85  65  75  17   0  10  0.00   0.0    0  2.7 14 360   M     M    5 128     23 360
 12  83  63  73  15   0   8  0.33   0.0    0  5.2 13 170   M     M    3 18      17 150
 13  72  63  68  11   0   3     T   0.0    0  5.5 15 160   M     M    8         19 170
 14  81  63  72  15   0   7  0.00   0.0    0  4.0 13 170   M     M    6         18 160
 15  80  60  70  13   0   5     T   0.0    0  3.7 13 190   M     M    6 12      16 200
 16  66  46  56   0   9   0  0.28   0.0    0 16.4 31 340   M     M    2 1       41 340
 17  65  38  52  -4  13   0  0.00   0.0    0  2.3  9 160   M     M    0         12 160
 18  67  37  52  -4  13   0  0.00   0.0    0  2.4 13 160   M     M    2 12      16 160
 19  75  37  56   1   9   0  0.00   0.0    0  2.9 13 340   M     M    2 12      15 350
 20  80  39  60   5   5   0  0.00   0.0    0  2.1  9 160   M     M    0         12 160
 21  75  42  59   4   6   0  0.00   0.0    0  1.8 12 170   M     M    0         15 150
 22  70  44  57   3   8   0  0.02   0.0    0  4.7 14 160   M     M    5 1       20 140
 23  68  53  61   7   4   0  3.52   0.0    0  6.1 29 180   M     M    7 1       37 180
 24  64  44  54   0  11   0  0.00   0.0    0  7.2 18 300   M     M    1         23 310
 25  55  38  47  -7  18   0  0.00   0.0    0  6.9 17  10   M     M    2         23 350
 26  64  33  49  -4  16   0  0.00   0.0    0  2.6 10 330   M     M    0 8       11 330
 27  71  36  54   1  11   0  0.00   0.0    0  5.5 22 180   M     M    2 12      28 180
```

8

28	56	43	50	-3	15	0	2.29	0.0	0	5.5	22	340	M	M	10	1		29	340
29	45	33	39	-13	26	0	0.04	T	0	21.6	37	340	M	M	8	1		48	330
30	61	32	47	-5	18	0	T	T	0	8.1	25	340	M	M	1			35	340
31	68	34	51	-1	14	0	0.00	0.0	0	5.9	22	350	M	M	0			26	340

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================================================================================
SM 2211 1474     231 66 9.68    T     159.3         M      108
================================================================================
AV 71.3 47.6                         5.1 FASTST   M    M   4    MAX(MPH)
                          MISC ---->  # 37 340                # 48  330
================================================================================
```

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

```
                              STATION:  ASHEVILLE NC
                              MONTH:    OCTOBER
                              YEAR:     2017
                              LATITUDE:  35 25 N
                              LONGITUDE: 82 33 W
```

[TEMPERATURE DATA]   [PRECIPITATION DATA]   SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 59.4   TOTAL FOR MONTH: 9.68   1 = FOG OR MIST
DPTR FM NORMAL: 3.0   DPTR FM NORMAL: 6.77   2 = FOG REDUCING VISIBILITY
HIGHEST: 85 ON 11   GRTST 24HR 3.52 ON 23-23   TO 1/4 MILE OR LESS
LOWEST: 32 ON 30   3 = THUNDER
                           SNOW, ICE PELLETS, HAIL   4 = ICE PELLETS
                           TOTAL MONTH: T   5 = HAIL
                           GRTST 24HR   T ON 30-30 6 = FREEZING RAIN OR DRIZZLE
                           GRTST DEPTH: 0   7 = DUSTSTORM OR SANDSTORM:
                                                          VSBY 1/2 MILE OR LESS
                                                      8 = SMOKE OR HAZE
[NO. OF DAYS WITH]   [WEATHER - DAYS WITH]   9 = BLOWING SNOW
                                                     X = TORNADO
MAX 32 OR BELOW: 0   0.01 INCH OR MORE: 9
MAX 90 OR ABOVE: 0   0.10 INCH OR MORE: 6
MIN 32 OR BELOW: 1   0.50 INCH OR MORE: 4
MIN 0 OR BELOW: 0   1.00 INCH OR MORE: 3

[HDD (BASE 65)]
TOTAL THIS MO.   231   CLEAR (SCALE 0-3) 18
DPTR FM NORMAL   -47   PTCLDY (SCALE 4-7)   6
TOTAL FM JUL 1   269   CLOUDY (SCALE 8-10) 6
DPTR FM NORMAL   -66

[CDD (BASE 65)]
TOTAL THIS MO.   66
DPTR FM NORMAL   56   [PRESSURE DATA]
TOTAL FM JAN 1 1042   HIGHEST SLP 30.55 ON 3
DPTR FM NORMAL   180   LOWEST SLP 29.61 ON 29

[REMARKS]
#FINAL-10-17#