UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL ENVIRONMENTAL SATELLITE DATA
AND INFORMATION SERVICE
NATIONAL CLIMATIC DATA CENTER
151 PATTON AVE ROOM 120
ASHEVILLE NC 28801-5001

9 February 2012

MEMORANDUM

From: Karin Gleason, Climate Monitoring Branch, CSMD, NCDC
To: Thomas R. Karl, Director, NCDC
Subject: SCEC Decision: New record 24-hour precipitation for New York

On 1 February 2012, the State Climate Extremes Committee (SCEC) convened via teleconference to evaluate the validity of an apparent 24-hour precipitation record for the State of New York. The SCEC examined the 27-28 August 2011 24-hour precipitation accumulation of 11.6 inches at the Cooperative Observer station in Tannersville, NY (COOP identifier 308406). The SCEC examined several factors surrounding the value (intrinsic and extrinsic validity, methods and practices of observation and reporting, and comparison to the accepted record for New York). The SCEC voted unanimously (5-0) to accept the value. ***I request that the NCDC Director approve the SCEC's decision and recognize the 11.6 inch precipitation total which occurred between 3:00pm EST on 27 August 2011 and 2:59pm EST on 28 August 2011 as the new New York state record for 24-hour precipitation.***

Background and Metadata

Tannersville is a small village located in Greene County in the Catskill Mountains of southeastern New York. It is serviced by the National Weather Service's Albany, New York office. The station is located at the top of a mountain on private property and is secured by a gated fence. This station has been taking observations since July 1, 1974 and the data collected by the instrument are archived indefinitely. The B-44 sheets for Tannersville are provided in Appendix A.

The Tannersville rain gauge has been in its present location and setting since the mid-1990s. It is a Fischer Porter Universal Weighing rain gauge and records precipitation to the nearest one tenth of an inch every 15 minutes. Due to its single-digit precision, we will refer to all measured and accumulated values to the nearest tenth of an inch. The data are recorded on tape at the station and are also transmitted to the Albany NWS office each hour from a dial-up program initiated by the NWS office. As part of its regular maintenance, the gauge and associated equipment were inspected and calibrated most recently on 28 June 2011, 2 March 2011 and 12 July 2010.

On 20 September 2011, Timothy Scrom, Observation Program Manager, NWS Albany, conducted a site visit to the Tannersville station. Figure 1 shows the siting of the gauge at the observing location. Mr. Scrom determined that the gauge was in good working order following Hurricane Irene. The site is climatologically representative of the region and the observing platform meets or exceeds instrument and siting standards set forth by NOAA.

Final Approval: Tom Karl, 14 May 2012

Figure 1. Tannersville Cooperative Observer site with Fischer Porter rain gauge on September 20, 2011.

Since the Fischer Porter instrument only reports precipitation to the nearest tenth of an inch every 15 minutes, a question was raised about the precision with this instrument and if this 24-hour accumulation of 11.6 inches would be questioned when compared with other Cooperative rain gauges which measure precipitation to the nearest hundredth of an inch. As a rule, weighing gauges are more reliable than tipping gauges, which are known to underestimate rainfall during heavy rain rate periods. In addition, weighing rain gauges accumulate precipitation in a cylinder contained within the housing of the instrument. As such, the weight of the container at each 15 minute interval takes into consideration the weight of the previously occurring rainfall, which makes for a more accurate precipitation accumulation. Given these reasons and the difference between the current state record and the Tannersville value (a 0.45 inch difference), the committee members felt the difference in precision and in the method of measurement should not be a factor in determining the validity of this 24-hour accumulation.

Meteorological / Climatological Feasibility

The 11.6 inches of precipitation recorded at Tannersville was the result of the passage of Tropical Storm Irene traversing the region from the southeast to the northeast of Tannersville on 28 August 2011. The tropical characteristics of Irene – precipitable water values of 2.13 inches (~2.5 standard deviations above normal) on the Albany sounding of 12Z 28 August 2011 – combined with potent dynamics – northeast wind of 53 knots at 1000 ft MSL on same 12Z sounding all contributed to prolonged extreme rainfall rates in the Catskills. The Tannersville total was not the highest recorded in Greene County (which conceivably could have received the most rain along Irene's entire track). The NWS Cooperative Observer Station at East Jewett, NY, Greene County reported 12.85 inches of rain

from Irene spanning two separate calendar days (East Jewett reported 6.15 inches on 28 August and 6.70 inches on 29 August). A credible public storm total report of 18.12 inches was received from Maplecrest, NY. The relationship of these towns to each other is shown in Figure 2. Note the orientation of the towns and rainfall totals. The strong, low-level Northeast flow in a moist, tropical environment impinged upon the Catskills. It is likely that these factors contributed to the heaviest precipitation occurring where the low-level jet intersected the initial escarpment (Maplecrest).

East Jewett was not submitted for a record because the site only reports once per day and it was not possible to claim a verifiable 24-hour period in which all of the precipitation occurred. Maplecrest was not submitted because it was a public report and lacked valid metadata.

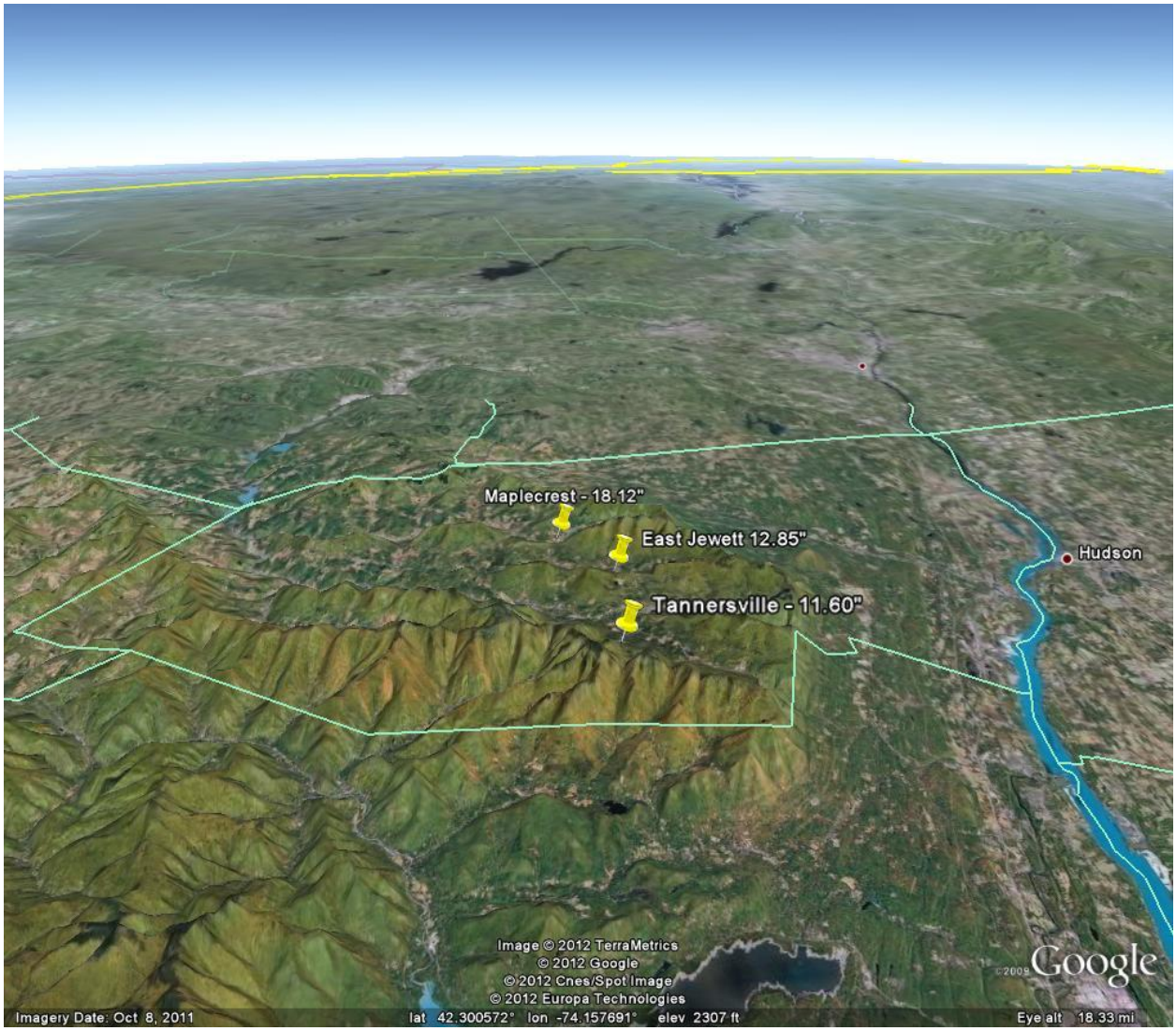

Figure 2. Image centered on Greene County, NY looking north. Towns of Tannersville, East Jewett, and Maplecrest along with rainfall totals from Irene are shown.

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Rainfall: Radar Estimated

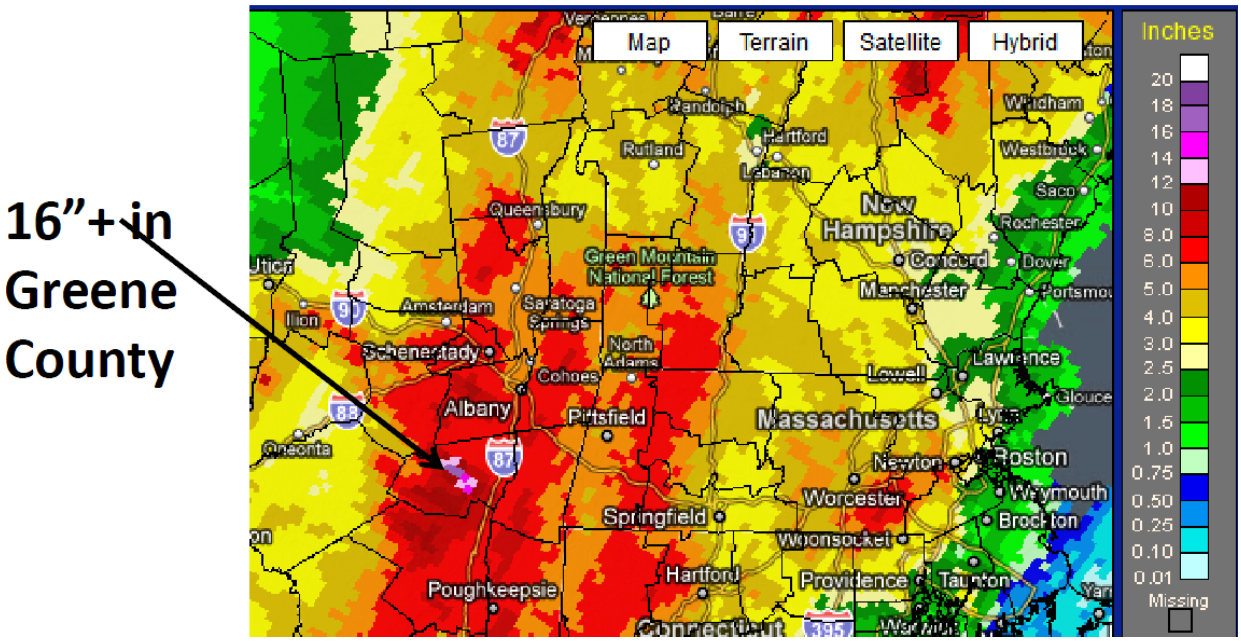


Figure 1. Radar estimated rainfall associated with Irene. Bullseye of heaviest precipitation is depicted in Greene County, NY.

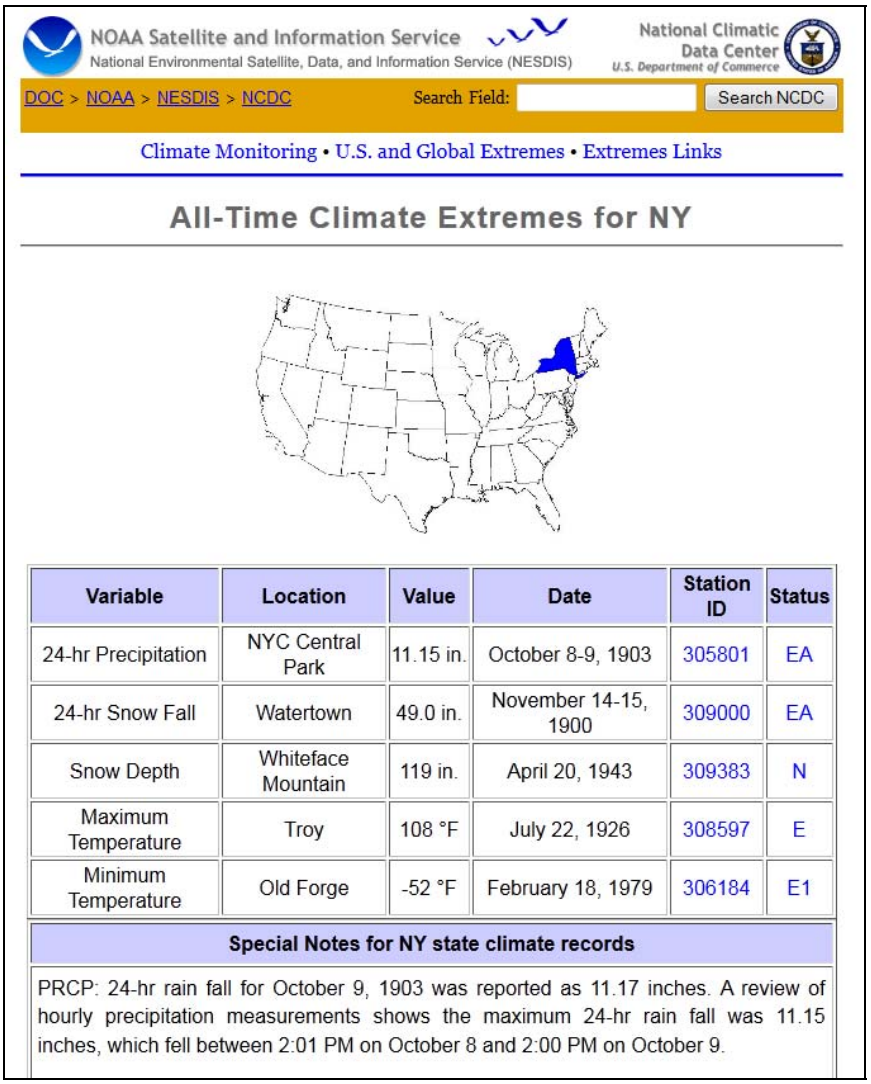
To further strengthen the plausibility of these rainfall totals, Figure 3 shows NWS radar estimated rainfall totals from Irene. Although radar estimates are known to over/underestimate actual precipitation accumulations, the gradients tend to be consistent with ground truth. This meteorological evidence supports the 11.6 inch total at Tannersville.

Data Transmission and Archive

Data initially received by the Albany NWS office were from the hourly telephone dial up routine (see Appendix B). Note that the period is from 2:45 pm EST 27 August 2011 to 12:45 pm EST 28 August 2011 and the accumulation for this period totaled 11.4 inches. An interruption to the dial up data feed occurred beyond 12:45 pm EST 28 August 2011 due to Irene. Initially, this precluded obtaining a complete 24-hour record. In an attempt to fill in the missing data, a request was submitted in December 2011 to NCDC to read the tape created by the Fischer Porter gauge. The tape read spreadsheet provided by NCDC is shown in Appendix C. For the 24-hour period from 3:00 pm EST 27 August 2011 to 2:59 pm EST 28 August 2011, 11.6 inches of precipitation was recorded by the Fischer Porter rain gauge as indicated by the tape read.

Evaluation of Existing Record

The NCDC-recognized state record for 24-hour precipitation of 11.15 inches occurred on 8-9 October, 1903 at New York City Central Park (Figure 4). Since this value has already gone through extensive evaluation by NCDC, further evaluation of this record is unnecessary.



NOAA Satellite and Information Service
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DOC > NOAA > NESDIS > NCDC Search Field: Search NCDC

Climate Monitoring • U.S. and Global Extremes • Extremes Links

All-Time Climate Extremes for NY

Variable	Location	Value	Date	Station ID	Status
24-hr Precipitation	NYC Central Park	11.15 in.	October 8-9, 1903	305801	EA
24-hr Snow Fall	Watertown	49.0 in.	November 14-15, 1900	309000	EA
Snow Depth	Whiteface Mountain	119 in.	April 20, 1943	309383	N
Maximum Temperature	Troy	108 °F	July 22, 1926	308597	E
Minimum Temperature	Old Forge	-52 °F	February 18, 1979	306184	E1

Special Notes for NY state climate records

PRCP: 24-hr rain fall for October 9, 1903 was reported as 11.17 inches. A review of hourly precipitation measurements shows the maximum 24-hr rain fall was 11.15 inches, which fell between 2:01 PM on October 8 and 2:00 PM on October 9.

Figure 4. New York State 24-hour record as obtained from the NCDC website on 1 February 2012.

Conclusion

The SCEC voted unanimously (5-0) to recognize the 11.6 inch 24-hour precipitation accumulation from Tannersville, New York on 27-28 August 2011 as the state record for 24-hour precipitation in New York.

Acknowledgements

NCDC has expressed its thanks for the fine work from the Albany office in collecting data and providing such a comprehensive and compelling summary. The Albany NWS office would like to thank Bryant

Korzeniewski of NCDC for quickly responding to their request to read the archived Fischer Porter tape for Tannersville. We would also like to thank Timothy Scrom, Observation Program Manager, NWS Albany for conducting the site visit after Irene inflicted catastrophic damage on Greene County. Furthermore, Mr. Scrom provided valuable assistance and insight in assuring that the Tannersville site meets NOAA standards for metadata.

State Climate Extremes ad hoc Committee Members:

Raymond G. O'Keefe, Meteorologist-in-Charge, National Weather Service, Albany, NY WFO [voting]
Kevin Murray, Public Information Officer, NWS Eastern Region Headquarters [voting]
Mark Wysocki, New York State Climatologist, Cornell University [voting]
Keith L. Eggleston, Regional Climatologist, Northeast Regional Climate Center [voting]
Timothy Scrom, Observation Program Manager, National Weather Service, Albany, NY WFO
Sam McCown, User Engagement and Services Branch, National Climatic Data Center [voting]
Karin Gleason, Climatologist, Climate Monitoring Branch, National Climatic Data Center

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Appendix A-1

B-44 Sheets for Cooperative Observer Site at Tannersville, NY

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NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION
NATIONAL WEATHER SERVICE

Page: 1

Identification Section

Rendition: 11
Network: COOPB-COOP STATION HYDRO (B)

Station Name: TANNERSVILLE 2 SE
Station No: 30-8406-02
Station ID: TNRN6
State: NEW YORK
Station Type: 92-COOPERATIVE OBSERVER STN
County: GREENE
Region: EASTERN REGION
Latitude: 42.1625 (42.09.45N)
Horiz Ref Datum: NAD83
Longitude: -74.1572 (74.09.26W)
Vert Ref Datum: NAGVD29
Elevation: 1950ft MSL (594M)
Lat/Lon Src: GPS - GARMIN MODEL III PLUS
Zero Datum:
Station Begin Date: 07/01/1974

Observer Section

Observer 1:
PAUL R. DIBBELL
P.O. BOX 2
ELKA PARK, NY 12427

Observer 2:

None

Type: INDIVIDUAL
Svc Date: 08/25/1998
Home Phone:
Fam Svc Date:
Office Phone:
Fax Number:
Office Ext:

Management Section

CPA: ALY HSA: ALY ET: ALY CWA: ALY RFC: TAR NWSREP: TES

Exposure/Topography/Directions Section

Exposure (AZIMUTH/RANGE/DISTANCE Nomenclature):

LARC SOLAR PANEL/ROOF PEAK 350-005/15-17/8-9 TREES 330-000/35-45/75-50 TREES 000-075/35-45/75-50
TREES 075-150/10-15/45-45 TREES 150-220/10-15/45-45 TREES 220-300/10-15/45-35
TREES 300-330/20-25/40-35

LARC 350/5

Topography:
STATION IS LOCATED IN THE MOUNTAINS SOUTH OF THE SCHOHARIE CREEK VALLEY. AREA WOODED AND MOUNTAINOUS.

Driving Directions:
GOING W ON RT 23A IN TANNERSVILLE TURN L. AT TRAFFIC LIGHT. BEAR LT ATINTER SCTN W/RTE 16. GO ABT 1 MI BEAR RT ON ELKA PARK RD. GO .3 MI OVRBRDG. RT ON GREEN HILL RD. GO .7 MI ON TO DIRT RD. SITE ON LEFT.

Miscellaneous Section

Remarks:
FIVE YEAR UPDATE.SITE TREATMENT PLANT CURRENTLY UNDERGOING CONSTRUCTION UPGRADE. EXPOSURES WILL CHANGE SLIGHTLY DURING THE UPCOMING MONTHS. WILL UPDATE STATION DATA AGAIN IN THE SPRING WHEN CONSTUCTION IS COMPLETED. CORRECTED ELEVATION ERROR AND RESUBMITTED

Reason for Report:
10 CHANGE

Effective Date: 11/19/2007
Authorizing Doc: B43
Authorization Date: 08/21/1990
Primary Sig: TIMOTHY SCROM
Second Sig:

Rev 5/2001

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Appendix A-2

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION
NATIONAL WEATHER SERVICE

Page: 2

Station Name: TANNERSVILLE 2 SE Station No: 30-8406-02 Rendition: 11

Observation/Publication/Reporting Section

Published in CD?: NO Elements:

Published in HPD?: YES Mailed to Observer?: NO

Observed Element: HPR-HOURLY PRECIPITATION REPORT Associated Equipment: F&P

Ob Time	Rep Meth	Recipient	Sponsor	$	Ingest	Spec Net	Mode	Relay	When?
MID	B18	ALY,NCDC	S&E	Y					
MID	TEL	AWIPS	S&E(H)	N					

Equipment Section

EQ Cat	EQ Code	Serial No	Owner	Tel	Exp	Equipment Description	Backup?
HPCPN	F&P	9D/7307M3/S3/6	NWS	Y		9D/7307M3/S3/6	N
TEL	LARC		NWS	N		DATA FROM SHAFT ENCODER ON F&P	N

Rev 5/2001

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Appendix B

Rainfall data received from a dial-up program originating at the NWS Albany, NY office from Tannersville, NY Automated Site. These data are archived in the local hydro database. Reading from the bottom up shows initial rain gauge reading of 7.1 inches recorded at 19:45 UTC (or 2:45 pm EST) 27 August 2011. Top-most entry of 18.5 inches was recorded at 17:45 UTC (or 12:45 pm EST) 28 August 2011. The difference between the two observations, 11.4 inches, represents the total accumulated precipitation during that period.

There was an interruption to the data feed beyond 12:45pm EST 28 August 2011 due to Hurricane Irene. In an attempt to fill in the missing data, a request was submitted in December 2011 to NCDC to read the tape created by the Fischer Porter gauge. Data provided from the tape are noted in Appendix C and are considered complete for this period noting a total of 11.6 inches.

```
Beginning Time(Z):  2011-08-26 14:00:00
Ending Time(Z):     2011-09-01 14:00:00
Station Identifier: TNRN6
Physical Element:   PC
Duration:
SHEF Type Source:   RP
SHEF Extremum:      Z

                    R S Q
 Value    Time(Z)   V Q C  Product      Time       Posted
-------- ---------- - - - ---------- ----------- -----------
  18.50 08/28 17:45 F Z G KALYRR1ALY 08/28 18:16 08/28 18:16
  18.40 08/28 16:45 F Z G KALYRR1ALY 08/28 17:16 08/28 17:16
  18.00 08/28 15:45 F Z G KALYRR1ALY 08/28 16:16 08/28 16:16
  17.30 08/28 14:45 F Z G KALYRR1ALY 08/28 15:16 08/28 15:16
  16.60 08/28 13:45 F Z G KALYRR1ALY 08/28 14:16 08/28 14:16
  15.60 08/28 12:45 F Z G KALYRR1ALY 08/28 13:16 08/28 13:16
  14.40 08/28 11:45 F Z G KALYRR1ALY 08/28 12:16 08/28 12:16
  13.30 08/28 10:45 F Z G KALYRR1ALY 08/28 11:16 08/28 11:16
  12.30 08/28 09:45 F Z G KALYRR1ALY 08/28 10:16 08/28 10:16
  11.40 08/28 08:45 F Z G KALYRR1ALY 08/28 09:16 08/28 09:16
  10.30 08/28 07:45 F Z G KALYRR1ALY 08/28 08:16 08/28 08:16
   9.70 08/28 06:45 F Z G KALYRR1ALY 08/28 07:16 08/28 07:16
   9.30 08/28 05:45 F Z G KALYRR1ALY 08/28 06:16 08/28 06:16
   8.60 08/28 04:45 F Z G KALYRR1ALY 08/28 05:16 08/28 05:16
   8.40 08/28 03:45 F Z G KALYRR1ALY 08/28 04:16 08/28 04:16
   8.40 08/28 02:45 F Z G KALYRR1ALY 08/28 03:16 08/28 03:16
   8.30 08/28 01:45 F Z G KALYRR1ALY 08/28 02:16 08/28 02:16
   8.30 08/28 00:45 F Z G KALYRR1ALY 08/28 01:16 08/28 01:16
   8.20 08/27 23:45 F Z G KALYRR1ALY 08/28 00:16 08/28 00:16
   7.90 08/27 22:45 F Z G KALYRR1ALY 08/27 23:16 08/27 23:16
   7.90 08/27 21:45 F Z G KALYRR1ALY 08/27 22:16 08/27 22:16
   7.70 08/27 20:45 F Z G KALYRR1ALY 08/27 21:16 08/27 21:16
   7.10 08/27 19:45 F Z G KALYRR1ALY 08/27 20:16 08/27 20:16
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Appendix C

Tannersville, NY Fischer Porter tape readout provided by NCDC. Hourly precipitation ending time (EST) is depicted across the top of the spreadsheet. August dates are shown on the left/right-most columns. Hourly data for the period of interest – 3:00 pm EST 27 August 2011 to 2:59 pm EST 28 August 2011 – is shown in red. The sum of the hourly precipitation for these periods is 11.6 inches.

NOAA Form 79-ID
(07-2000)

U.S Department of Commerce
National Oceanagraphic and Atmospheric Administration
Environmental Data and Information Service
National Climatic Data Center

STATION NUMBER: 30-8406
STATION NAME: Tannersville 2 SE, NY
MONTH: AUG
YEAR: 2011

HOURLY PRECIPITATION
Recorded by a Universal Weighing Rain Gauge

Date	1	2	3	4	5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	9	10	11	Mid't	TOTAL	Date
1																									0.00	1
2	0.10																								0.10	2
3																					0.10				0.10	3
4																									0.00	4
5																									0.00	5
6															0.10			0.10	0.10	0.10		0.10			0.50	6
7																		0.10							0.10	7
8																									0.00	8
9																0.30			0.10	0.40	0.10				0.90	9
10								0.10																	0.10	10
11																									0.00	11
12																									0.00	12
13																									0.00	13
14																					0.10		0.10	0.20	0.40	14
15	0.20	0.50	0.30	0.10	0.30	0.30	0.30	0.10			0.10			0.10		0.20	0.20				0.10				2.80	15
16	0.10			0.10		0.10		0.10		0.10															0.50	16
17										0.10															0.10	17
18																									0.00	18
19																									0.00	19
20																									0.00	20
21																			0.10					0.10	0.20	21
22																									0.00	22
23																									0.00	23
24																									0.00	24
25																		0.10							0.10	25
26																									0.00	26
27																0.60	0.20		0.30	0.10		0.10		0.20	1.50	27
28	0.60	0.50	0.50	1.10	0.90	1.00	0.90	1.40	1.00	0.70	0.70	0.40	0.20	0.20		0.10		0.10							10.30	28
29																									0.00	29
30																									0.00	30
31																									0.00	31
Date	1	2	3	4	5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	9	10	11	Mid't	TOTAL	Date

Amounts in inches,tenths and hundredths for hour ending at observation time; therefore, time distribution of amounts less than one hund
Times are Local Standard Time (LST)
* Amounts included in following measurement; time distribution unknown
M = No Record

Month Total: 17.70