

State Climate Extremes Committee Memorandum

FOR: Russell Vose
Acting Chief, Monitoring Section, Climatic Sciences and Services Division
National Centers for Environmental Information (NCEI), Asheville, NC

FROM: Chris Stachelski
Observing and Climate Services Program Leader
National Weather Service, Eastern Region Headquarters, Bohemia, NY

DATE: 1 February 2022

SUBJECT: State Climate Extremes Committee Decision Regarding 24-Hour State
Snowfall Record for New Jersey

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Summary

Starting on 31 January 2021 and extending until 3 February 2021, a significant, long-duration winter storm impacted metropolitan New York City, including northern New Jersey. Snowfall totals in excess of two feet were common in a large area of northwestern New Jersey and reports of storm total snowfall of 30 inches or more were received from a number of locations in that area of the state. As February 2021 continued along, an active weather pattern in the region contributed to additional storm systems that produced more snowfall over the New York City metropolitan area. As a result of observed snowfall totals in northern New Jersey, the National Weather Service's Eastern Region Headquarters Climate Program Manager began investigating currently accepted state snowfall records and discussing his findings via e-mail with the Office of the New Jersey State Climatologist (ONJSC) and the National Weather Service (NWS) Office in Mount Holly, New Jersey, which has responsibility for all of the state except the 5 northeastern-most counties.

During this time, several potential snow records were called into question either as new records or with respect to existing snow records. While the event of 31 January to 3 February did result in a climatologically significant snowfall event in parts of northwestern New Jersey, a review of totals concluded that the snow values were significant largely with respect to a longer duration event and not 24-hour snowfall. However, the 24-hour state snowfall record initially listed on the State Climate Extremes Committee website for New Jersey was 32.0 inches ending on 14 December 1915 in Rutherford at a cooperative observer station, COOP ID 28-7833. A review of station metadata records at the National Centers for Environmental Information (NCEI) and the ONJSC confirmed this station was not present then. Further investigation of NCEI values determined there was a 32.0 inch value measured at a cooperative station at Charlotteburg, COOP ID 28-1582, on the same date in the Global Historical Climatology Network daily (GHCNd) database and the value was likely a mix-up. Through e-mail correspondence, the ONJSC and NCEI changed the value's station to Charlotteburg. However, the scan of the original observer form later called this value into question as the observer denoted an asterisk in the snowfall column on the previous date, 13 December, which would indicate the 32.0 inch value was clearly a multi-day total. As a result, this left the real 24-hour snowfall value for New Jersey in limbo and a State Climate Extremes Committee (SCEC) was convened to investigate the candidates for the best value.

Starting in July 2021 and lasting through September 2021, a series of teleconferences were held by the SCEC to investigate the highest values reported as daily values in New Jersey in one calendar day based on a search of the GHCNd database. Several of these values generated concerns about the snowfall not occurring in a 24-hour period, despite a total value that looked accurate or within reason, and the list was combed through extensively until a best candidate was found and each reviewed value was put to vote. Ironically, the two best candidates were from the storm of 26-27 December 1947 out of a total of 8 values

reviewed from 7 stations from 5 different snow events.

Following the final SCEC teleconference on 23 September 2021, the SCEC voted 5-0 to accept as a new record for the State of New Jersey a value of 29.7 inches at Long Branch measured from 26-27 December 1947. **The following observation was examined by the SCEC to determine its validity and potential status as the greatest 24-hour snowfall total measured in New Jersey and is considered to be the true and valid record:**

- **Location:** Long Branch, New Jersey
- **Site Type:** National Weather Service Cooperative Weather Observing Station
- **COOP Station ID:** 28-4987
- **24-Hour Snowfall Value:** 29.7 inches
- **Date:** 26-27 December 1947

About the State Climate Extremes Committee (SCEC)

This State Climate Extremes Committee (SCEC) was composed of members representing the National Weather Service Forecast Offices located in Mount Holly, New Jersey and Upton, New York, the National Weather Service's Eastern Region Headquarters System Operations Division (SOD) in Bohemia, New York, the Northeast Regional Climate Center in Ithaca, New York, the Office of the New Jersey State Climatologist at Rutgers University, and the National Centers for Environmental Information in Asheville, North Carolina. The voting rights by a local National Weather Service Office were given to the office that has responsibility for that area which resulted in some values being voted on by the Mount Holly office and others by the New York/Upton office. The SCEC is convened to adjudicate potential records for validity. If validated, the observation is considered the state record for that record type. More details about the SCEC are available online at <https://www.ncdc.noaa.gov/extremes/scec/details>.

Previous 24-Hour Snowfall Observation

Although the SCEC table listed a 24-hour snowfall record for New Jersey, the latest value listed of 32.0 inches at Charlotteburg, COOP ID 28-1582, reported on 14 December 1915, was called into question after a review of the original observation form. The original form as shown in Figure 1 clearly indicates an asterisk in the snowfall column for the daily value for the 13th, which, at that time, was used by an observer to denote a precipitation event had commenced but a value was not taken that day and the amount that fell was incorporated into the next daily report value, which, in this instance, was on 14 December. Additionally, a start time of 0300 local standard time was denoted in the precipitation time of beginning on the 13th. Lastly the snow depth column on the 13th reported 12 inches of snow on the ground at the 1600 local standard observation time on the 13th. Based on these facts, there was a unanimous decision by a 5-0 SCEC vote on 2 August 2021 that the

32.0 inches was an invalid 24-hour state snowfall record and that it should be replaced by a new value given in the official GHCNd dataset. It was corrected to a two day multi-day record following a review of the scan of the original observation form.

Charlotteburg is located about 30 miles northwest of New York City and roughly 12 miles south of the New Jersey-New York border in the hill country of northwestern New Jersey within the southern portion of West Milford Township at roughly 780 feet in elevation. The Charlotteburg cooperative weather station was first established on April 1, 1893, at a railroad pumping station about three-tenths of a mile north of the present location which is on the eastern side of the Charlotteburg Reservoir (Figures 2 and 3). The pumping station was associated with the rail line for the New York, Susquehanna and Western Railway which had a train station here. The pumping station location is very near where present-day New Jersey State Route 23 passes today. Observations were taken by the same observer through December 1921 when they were relocated to the present location at what is today the Charlotteburg Reservoir. Eventually much of what was Charlotteburg was covered by the reservoir when it was built.

Daily weather maps as shown in Figures 4 and 5 indicate that an area of low pressure off the North Carolina coast on 13 December 1915 moved rapidly northeast towards Maine by 14 December 1915. Event snowfall totals closer to New York City ranged from 6 to 10 inches, however, amounts increased significantly in the higher terrain to the west with 30.0 inches measured at both Sussex and Dover, New Jersey, which supports the 32.0 inch event value at Charlotteburg. A 30.0 inch value was measured over the border in Warwick, New York. According to *Climatological Data - New Jersey* the storm caused considerable damage to electrical lines in northern and central New Jersey.

COOPERATIVE OBSERVERS' METEOROLOGICAL RECORD:

Month of December, 1915, Station, Charlotteburg, County, Greene
 State, N.J.; Latitude, 40°; Longitude, 74° 21'; Time used on this form, 55

DATE	TEMPERATURE			WIND DIRECTION	WIND VELOCITY	PRECIPITATION		CHARACTER OF SKY	WIND DIRECTION	WIND VELOCITY	MISCELLANEOUS REMARKS
	Max.	Min.	Humid.			Amount	Time of Onset				
12	39	21	18	35				W			
13	36	24	15	32				NW			
14	36	26	10	32				NW			
15	32	23	9	29				NW			
16	33	21	12	28				NW			
17	32	21	11	27				NW			
18	31	25	6	27				NW			
19	33	25	8	32				SW			
20	38	28	10	28				W			
21	29	19	10	23				NW			
22	29	16	13	25				W			
23	34	11	22	27				SW			
24	28	15	13	28	3 AM			NW			
25	31	24	9	26	2 1/2 hr	2.15	32 M 32"	W			
26	29	16	13	24				NW			
27	33	24	9	28				W			
28	32	17	13	27	8 AM			NE			
29	28	28	20	33				SW			
30	38	32	6	34		2 PM	0.56	W			
31	36	32	10	37				NW			
1	32	24	12	27				NW			
2	33	3	30	18				SW			
3	41	7	37	37				E			
4	46	29	11	36				E			
5	46	20	26	42				E			
6	57	24	22	30	7 AM		0.80	NW			
7	40	12	28	35				SW			
8	42	33	9	36	4 1/2 hr			SW			
9	37	26	11	28	4 1/2 hr	0.24		E			
10	30	19	11	24				W			
11	35	12	23	38				W			
Total	441	256	220	144			4.35	320	NW		

CHARLOTTEBURG NJ

REMARKS:
 Snow all day on 12-22
 4 Pul 12" on 12-22
 Total 3.2" 12-11

REC'D. TRENTON, N. J.
 JAN 3 1916
 LOCAL OFFICE, WEATHER BUREAU

George E. M... Cooperative Observer
 Post-Office address, Charlotteburg, N.J.

Figure 1. Scan of original observation form at Charlotteburg from December 1915.

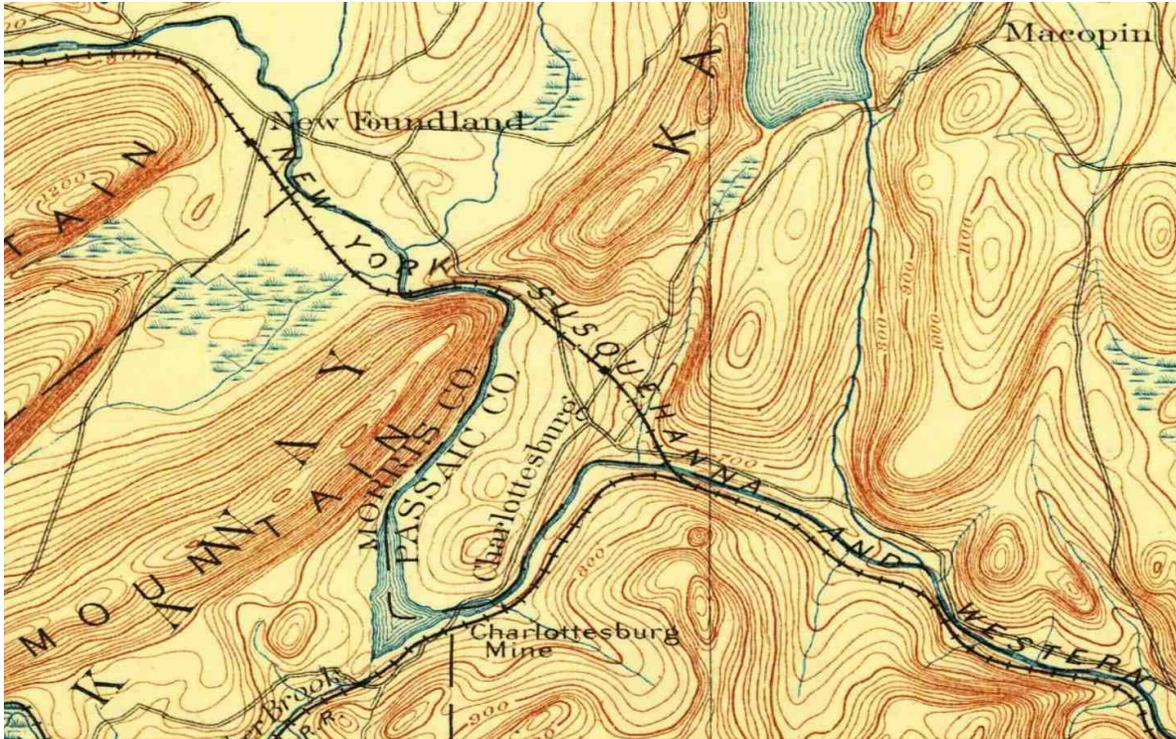


Figure 2. Zoomed in view of Charlotteburg on the 1903 USGS Greenwood Lake, NJ, quad map. The black box denotes the railroad station, which the cooperative station was near.

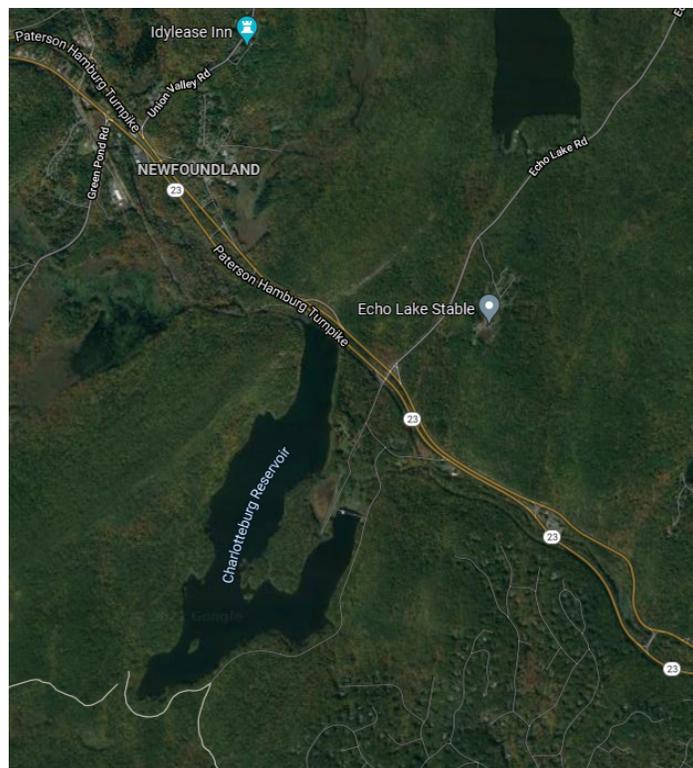


Figure 3. Satellite map of Charlotteburg today. Credit: Google Maps.

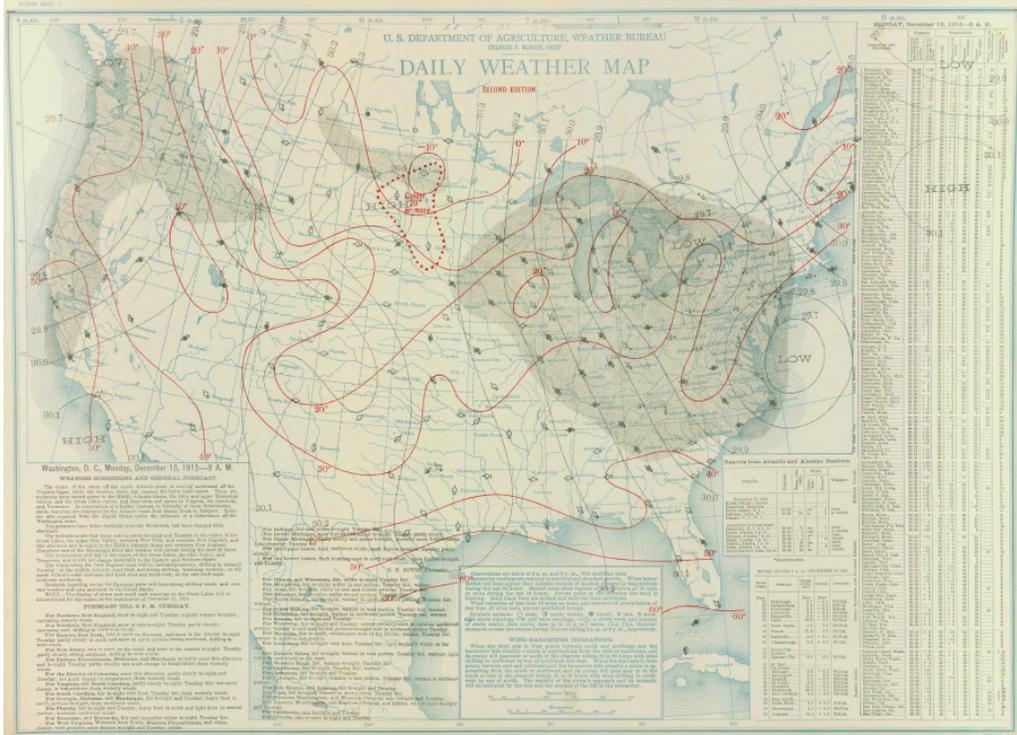


Figure 4. Daily weather map from 13 December 1915 from the U.S. Weather Bureau.

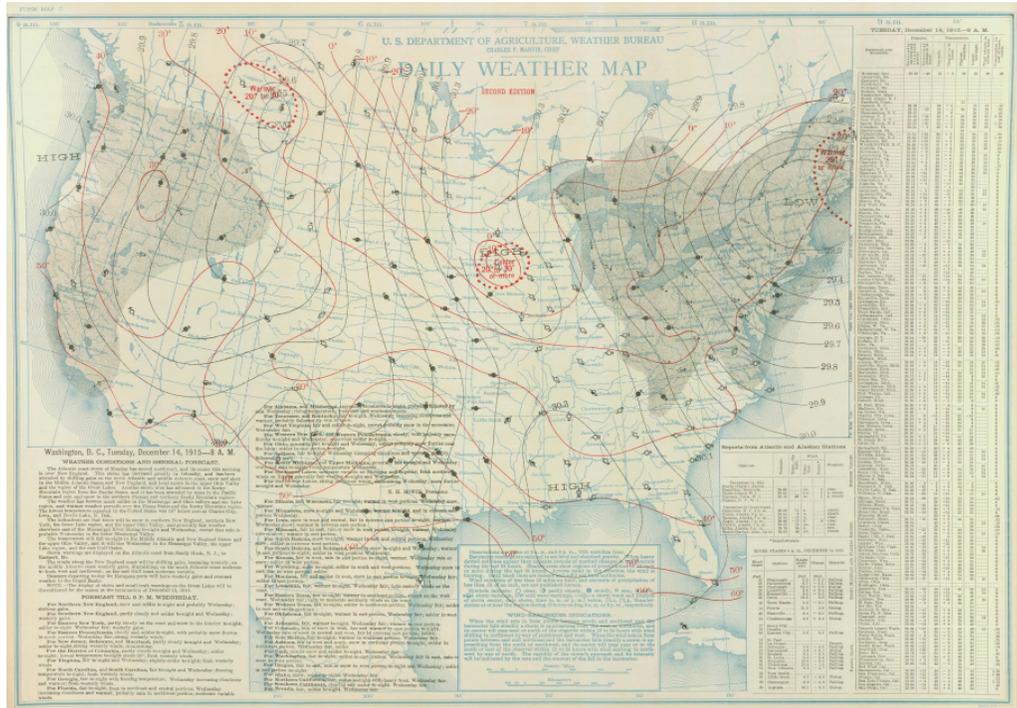


Figure 5. Daily weather map from 14 December 1915 from the U.S. Weather Bureau.

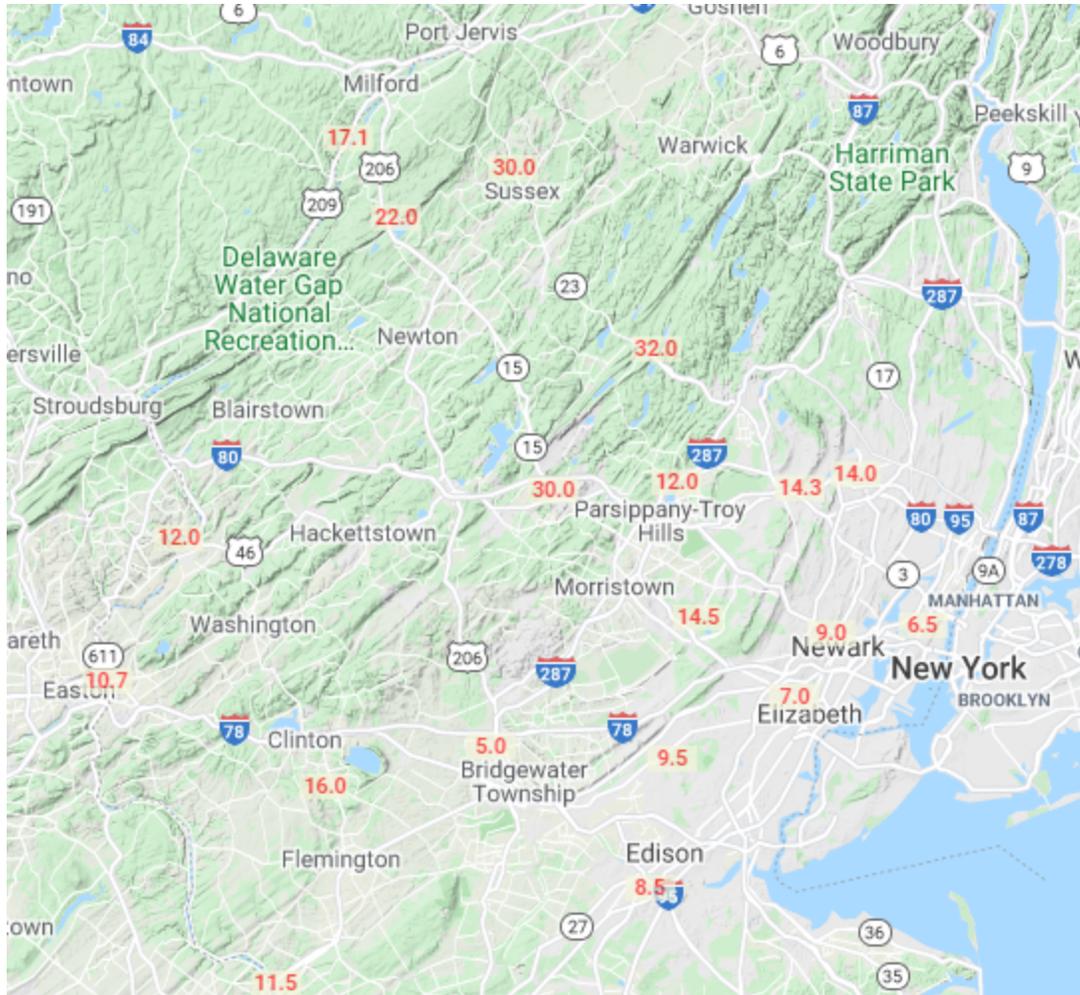


Figure 6. Plot of observed snowfall totals from 13-14 December 1915 based on values in the GHCNd database (courtesy xmACIS).

About the 24-Hour Sussex Snowfall Observation and Station

After voting and discussing the Charlotteburg value on 2 August 2021, the SCEC sought to review and vote on the highest 24-hour snowfall value for New Jersey taken from a search of the GHCNd database. Weather Forecast Office (WFO) Mt. Holly was the participating NWS office vote for this site. Single observation-day values in GHCNd are to not exceed a 24-hour period regardless of the set observation time so a list of single-day observation day values was searched. The highest value was a tie of 30.0 inches, one which was a value of 30.0 inches at a cooperative observer site in Sussex from 26 January 1905. The observer noted 30.0 inches of snow on 26 January 1905, which had a liquid equivalent of 3.00 inches with a maximum temperature of 14 degrees and a minimum temperature of minus 5 degrees along with the remark of "Blizzard" on the preceding day, 25 January 1905, with

both the precipitation and snow observations blank that day. On 24 January 1905 the observer noted 1.0 inch of new snow with 0.10 inch liquid equivalent. No snow depth was taken on any of these dates nor all month.

The Borough of Sussex is located in far northwestern New Jersey in a high valley that is oriented southwest to northeast and, at its lowest points, is around 400 feet in elevation. It is surrounded by hilly to mountainous forested terrain that rises 200 to 400 feet above the valley floor. Drainage in the valley flows into the Wallkill River, which flows north into New York state.

The Borough of Sussex was originally formed as Deckertown in October 1891. Prior to this in February 1891, a cooperative weather station was established about 4 miles east in an area known as Pochuck Mountain in what is today Vernon Township at about 800 feet in elevation, which jointly reported to the U.S. Weather Bureau and New Jersey State Weather Service. On 1 June 1895, the site moved west to Sussex Borough to a residential location on Walnut Street on the northern side of the community. The elevation was noted as 492 feet by the Weather Bureau substation report with equipment that consisted of maximum and minimum liquid in glass thermometers in a cotton region shelter over sod that was 12 feet from a tree and a rain gauge that was 25 feet from a tree. No details were noted for snow measuring equipment. The observation time was noted as sunset. Despite being on a valley floor, the immediate terrain is still hilly in nature. Shortly after the station moved Deckertown was renamed Sussex. The Sussex observation remained at this location until 3 August 1910 when the site briefly closed. It was reestablished on 1 November 1910 at a new site in Sussex with a new observer and has moved multiple times since. Today the site is known as Sussex 1 NW. Sussex observations are all under COOP ID 28-8644.

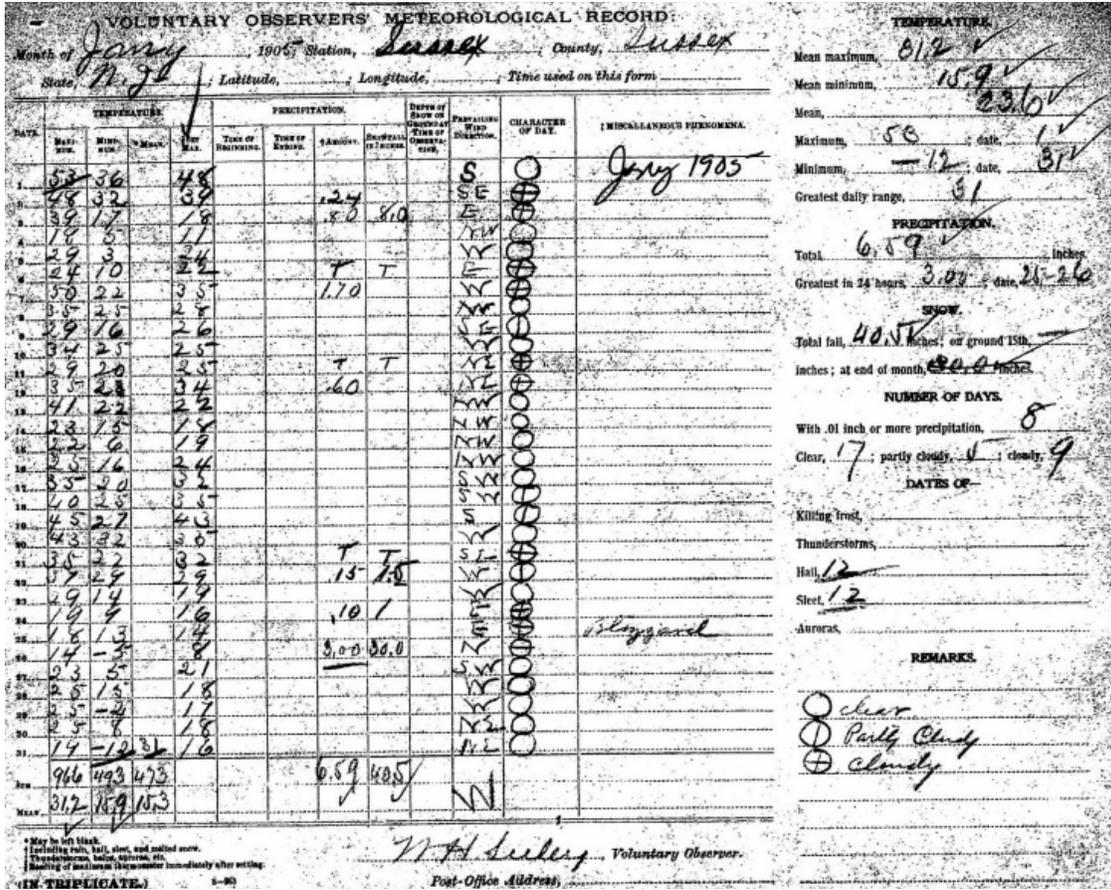


Figure 7. Scan of original Sussex, NJ, monthly observation form from January 1905.

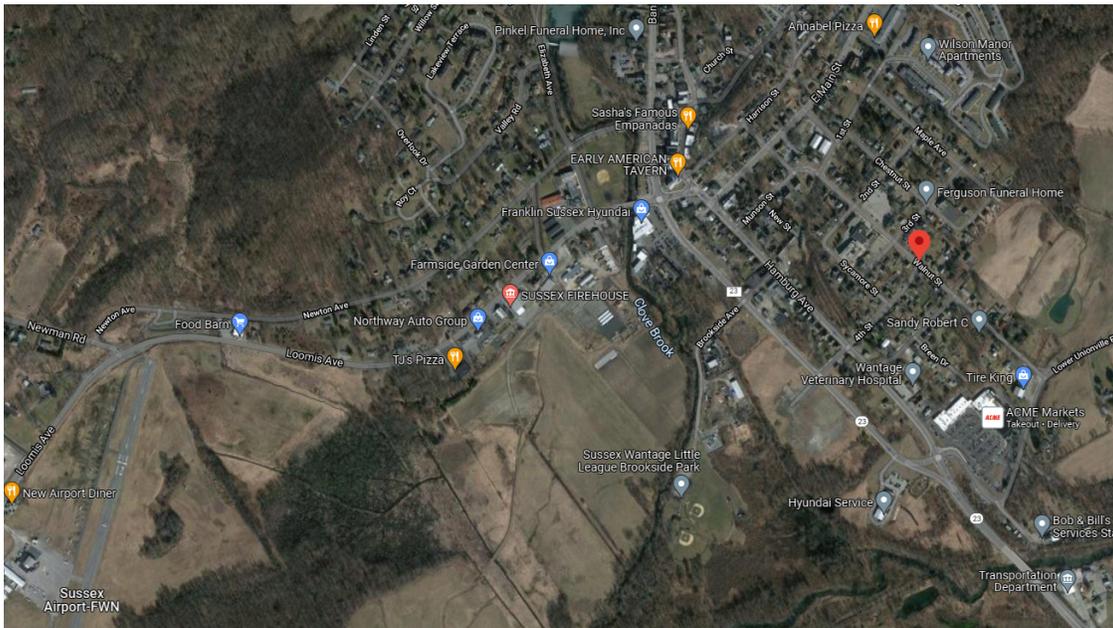


Figure 8. Map of Sussex Borough today with the approximate January 1905 station location denoted by the red marker. Credit: Google Maps.

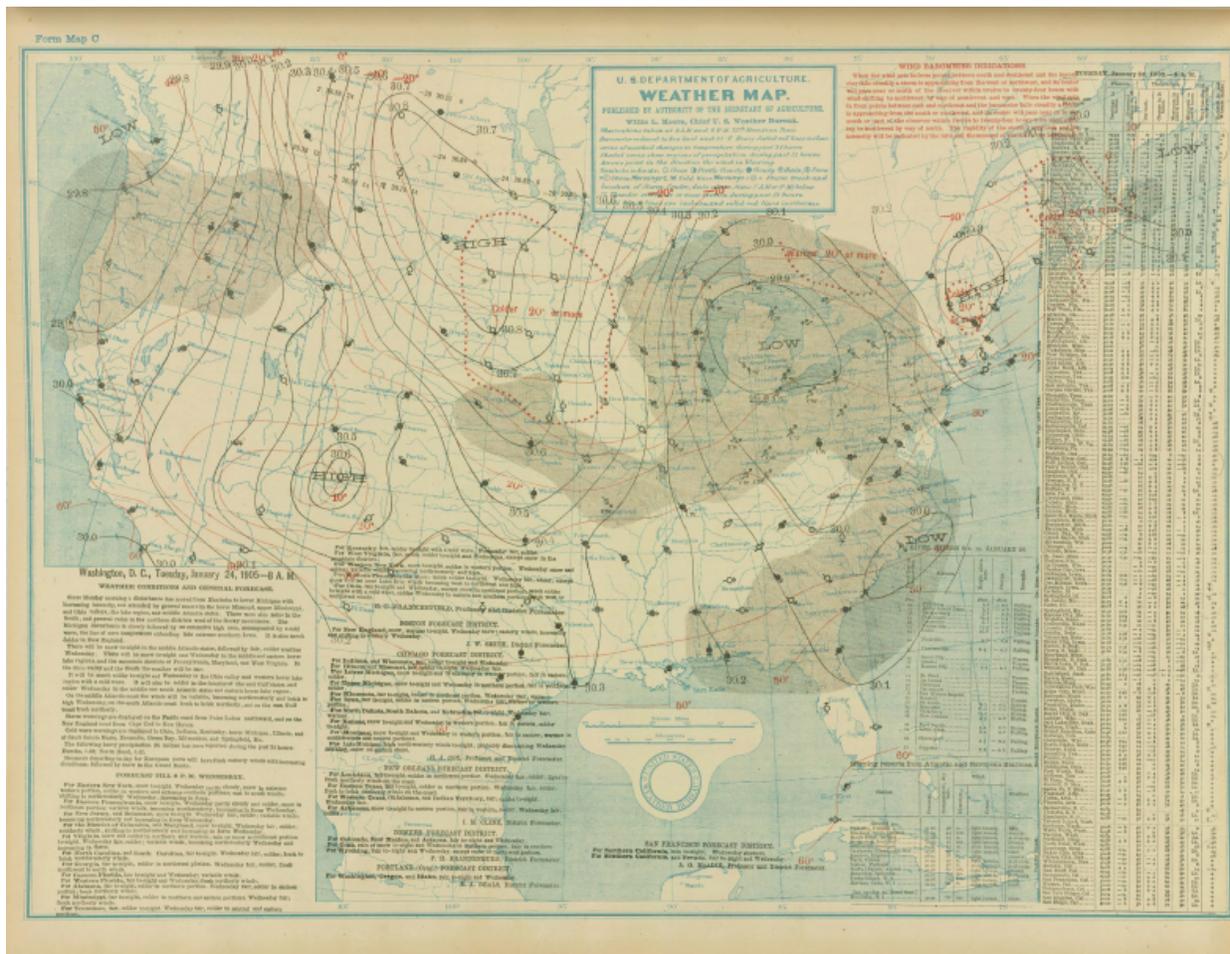
Meteorological Plausibility of the 24-Hour Sussex Snowfall Observation

Archived U.S. Weather Bureau daily 8 AM Eastern Time weather maps show an area of high pressure over northern New England on 24 January 1905 with two areas of low pressure: one near the North Carolina coast and a second over the Great Lakes. By 25 January the low over the Great Lakes had transferred its energy to the coastal low near the Mid-Atlantic states that rapidly moved northeast and intensified. By 26 January the low was over the Canadian Maritimes. Observations from a number of cooperative observers indicate that snow commenced in northern New Jersey and southeast New York on the morning of the 24th, continued through the 25th, and ceased on the early morning of the 26th at the latest (Figures 9–11).

Numerous reports on original cooperative observer forms as well as published newspaper articles remark on the high winds from the northeast on the 24th and 25th that accompanied the snow, creating blizzard conditions that blocked roads and rail transportation. According to an article in the *New York Times* published on 26 January 1905, this storm was considered the worst in New York City itself due to the wind drifting the snow since the legendary Blizzard of 1888. Food and fuel were in short supply in the city and the snow shoveler program to clear streets struggled to accomplish the task due the combination of the cold temperatures and wind forcing most to quit as a result of the harsh working conditions. A similar comparison to this event being the worst since the Blizzard of 1888 was made by a cooperative observer in Bergen Point in Hudson County, NJ. A cooperative observer in Dover, NJ, in Morris County remarked drifts reached 10 to 15 feet around their station. The U.S. Weather Bureau reported the fall in Manhattan had ceased by midnight on the 26th, so it's unlikely that significant accumulation took place in New Jersey then.

Based on nearby reports, the SCEC felt the 30.0 inch measurement at Sussex was a reasonable event total but several concerns were raised over the event falling in a 24-hour period based on surrounding station reports and remarks. A major flag was noted when reviewing the *Climate and Crops* publication, which denoted the liquid precipitation of 3.00 inches shifted to the 25th to match other stations' reports and marked by an asterisk on the 24th, indicating this would have been a multi-day total for precipitation. It was also noted that the event liquid measurement for this storm as well as all other measurable snow events that month directly used a 10 to 1 ratio raising concerns that the observer did not attempt to accurately perform a melt of the fallen snow and over their liquid precipitation measurement practices. Additionally, the official measurement time in metadata was noted as sunset. Thus, it was questioned if the 30.0 inches was measured late on the 26th or even time shifted. The numerous reports of high winds and blizzard conditions and lack of depth measurements also were noted as concerns, making it difficult to tell if the measurement was taken in an area impacted by drifting.

Given the clear evidence from surrounding stations, the SCEC voted unanimously 5-0 to reject the Sussex 30.0 inch measurement as a new 24-hour measurement for the State of New Jersey on 2 August 2021. The SCEC agreed the value should stand as a multi-day event total but be corrected in GHCNd. When combined with the 1.0 inch report on the 24th, the 31.0 inch value was the highest in New Jersey for this event at official stations. Given the historical significance of this event combined with general favorability for the hilly terrain of Sussex County, NJ, to enhance snowfall, it was felt the value was supported by the 26.0 inches at Newton and 24.0 inches at Dover.



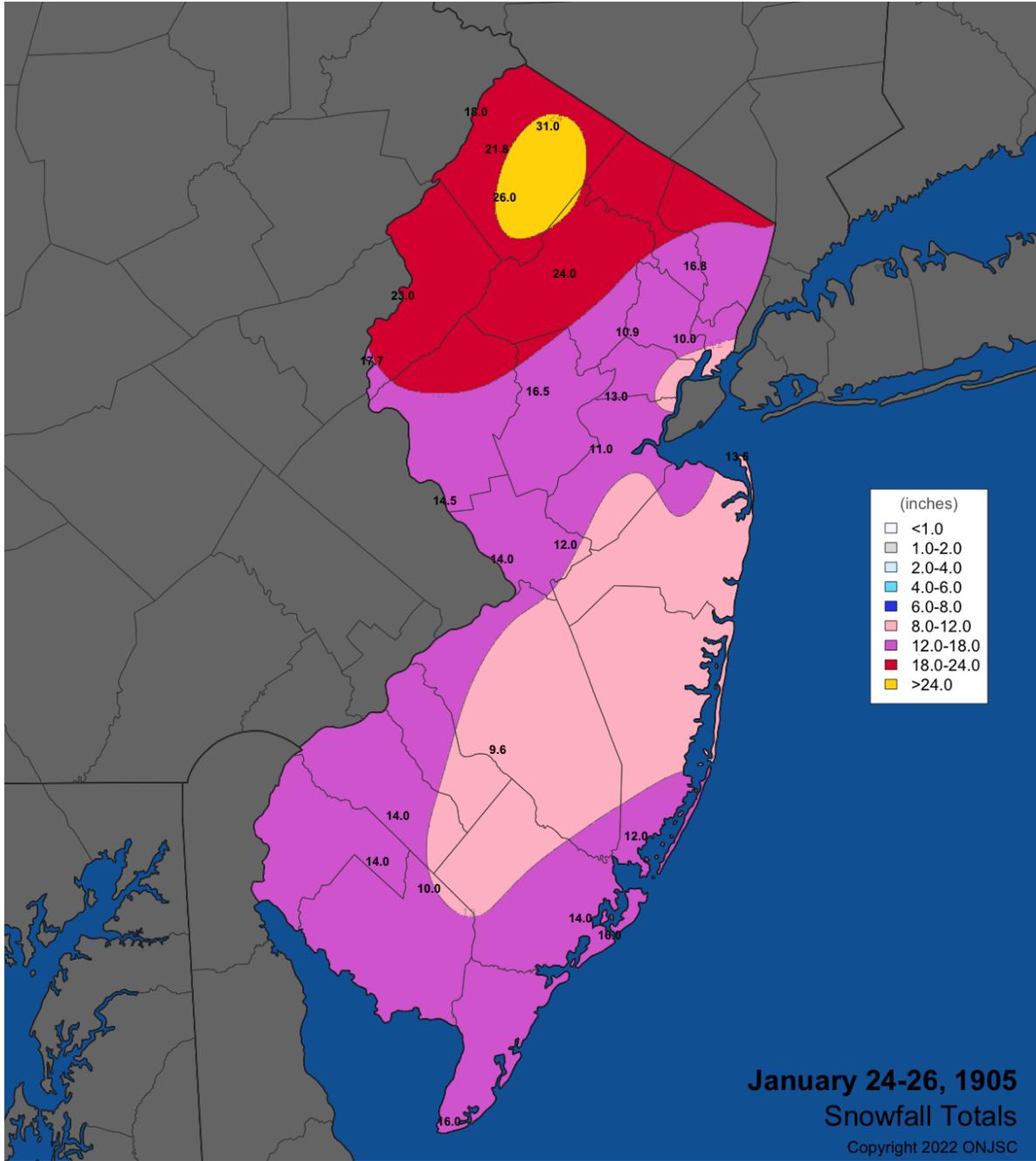


Figure 12. Observed snowfall totals from official U.S. Weather Bureau stations from 24-26 January 1905 based on values in the GHCNd database. Image courtesy of the ONJSC.

About the 24-Hour Bernards Township Snowfall Observation and Station

Following the Sussex vote on 2 August 2021, the SCEC sought to review and vote on the tied highest 24-hour snowfall value for New Jersey within a search of the GHCNd database,

a value of 30.0 inches during January 2016 reported by an observer in Bernards Township from the Community Collaborative Rain, Hail and Snow Network (CoCoRaHS). WFO Mt. Holly was also the participating NWS office vote for this site. The ONJSC serves as the State Coordinator for CoCoRaHS in New Jersey.

Bernards Township is located in Somerset County in central New Jersey about 32 miles west-southwest of Midtown Manhattan. The area is mainly semi-flat to flat with rolling hills. The most prominent topographic rise is about 2 to 3 miles southwest to south of the Township where the southern extent of the Watchung Mountains extends and rises roughly 100 to 200 feet over the nearby valley floors.

A CoCoRaHS observer at station NJ-SM-53, Bernards Township 1.5 S, took observations intermittently between 22 July 2013 and 4 March 2019 at a location near the southern end of the Township. Based on the metadata provided, the station was located at an elevation of 225 feet and appears to have been in a townhome community. However, a review of Google Streets, which filmed the area around where the observer provided latitude and longitude, showed the station did not show any signs of equipment despite these areas being open and in plain view. Thus, either the coordinates given were off slightly or the observer may have intermittently placed equipment outside. The area is overall residential and lightly wooded, with some open areas.

The report from the Bernards Township observer was originally taken at 2200 Local Standard Time on 23 January 2016 but submitted by the observer that day at 2317 Local Standard Time and reported 30.0 inches of snow, a 30 inch snow depth with 3.00 inches of precipitation. This was the only report sent by the observer all month and the observer's last report was on 23 July 2015. The next report was on 5 February 2016. In a subsequent review of observations, the ONJSC, through correspondence with the observer, corrected the liquid precipitation value to 1.75 inches based on a snow core measurement the observer took. This correction was done on 10 February 2016.

The site is believed to have utilized a 4 inch plastic CoCoRaHS rain gauge for precipitation and snow core measurements but no record of what was used to measure snow exists.

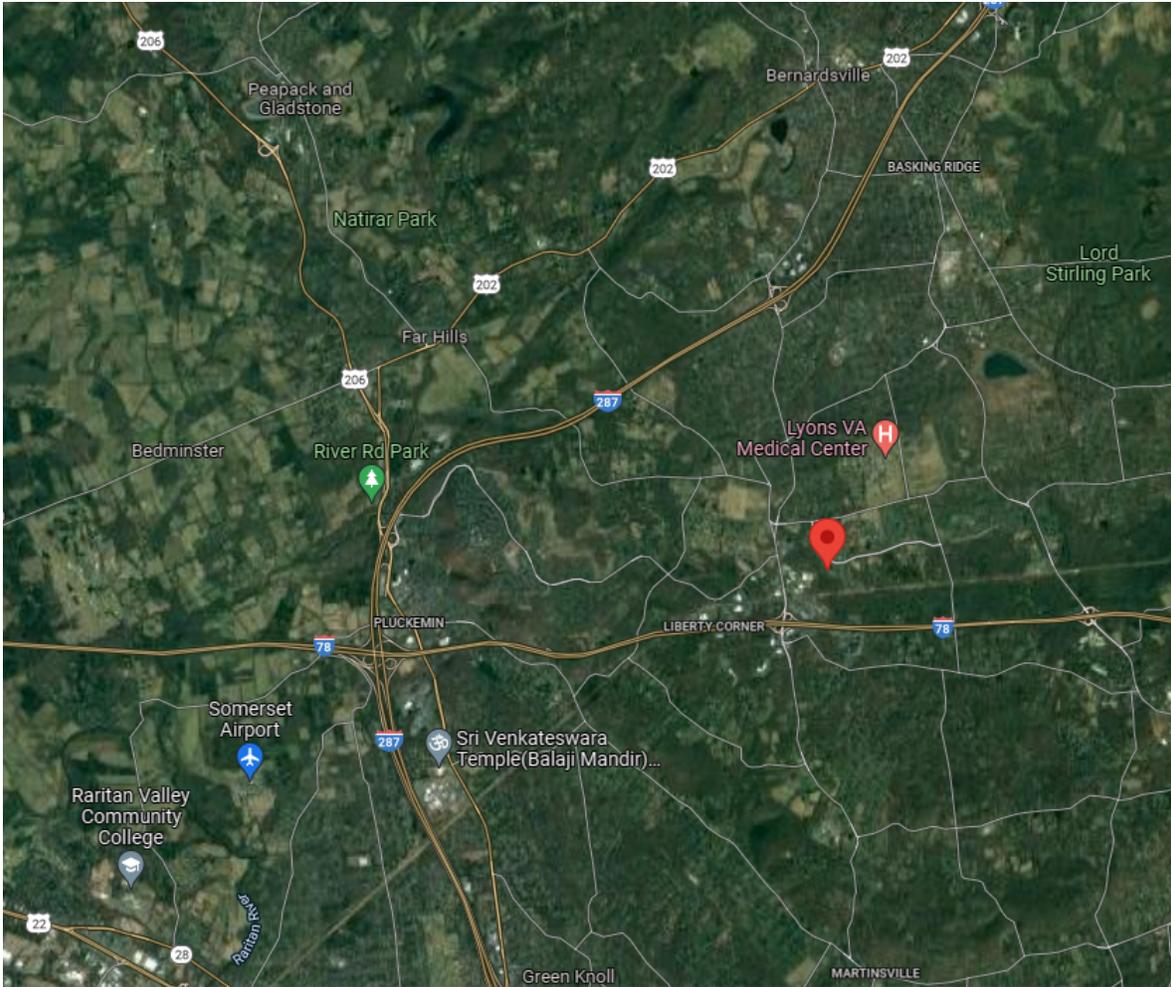


Figure 13. Map showing area where the Bernards Township 1.5 South CoCoRaHS observer was located as indicated by the red marker. Credit: Google Maps.

Daily Precipitation Report	
Station Number: NJ-SM-53	Station Name: Bernards Twp 1.5 S
Observation Date	1/23/2016 10:00 PM
Submitted	2/10/2016 3:20 PM
Total Precip Amount	1.75 in.
Notes	Sent via CoCoRaHS Observer for iOS (MG note: Set 3.00" prcp to 1.75", as confirmed by observer from core. Original report submitted 1/23/2016 11:17 PM)
Taken at registered location	Yes
Snow Information	
New Snow Depth	30.0 in.
New Snow Water Equivalent	1.75 in.
Total Snow Depth	30.0 in.
Total Snow Water Equivalent	NA
Duration Information	
Precipitation Began	--
Precipitation Ended	--
Heavy Precip Began	--
Heavy Precip Lasted	--
Duration Time Accuracy	--
Additional Information	
Additional Data Recorded	No
Submitted	2/10/2016 3:20 PM
Flooding	--

Figure 14. Observation for 23 January 2016 for the Bernards Township 1.5 S observer as retrieved from the CoCoRaHS website.

Meteorological Plausibility of the 24-Hour Bernards Township Snowfall Observation

Surface weather maps show that an area of low pressure began to develop in the southern Gulf of Mexico early on 22 January 2016. This low pressure moved northeastward into the Tennessee Valley before reforming as a coastal low off North Carolina. By 23 January, the low pressure system moved slowly northeast along the Mid-Atlantic coastline. By 24 January, the low pressure system moved out to sea. Snow began to develop from south to north starting late on the 22nd in central New Jersey and became moderate to heavy at times on the 23rd. By the afternoon hours of the 23rd, intense snow bands with rates of 2-4 inches per hour set up in north-central New Jersey. The snow lightened in intensity by later in the evening on the 23rd and tapered off early in the morning of the 24th (Figures 15–18). Winds were very gusty topping out between 30-50 mph for most of New Jersey and were even higher at the shore.

This event produced the heaviest snow in New Jersey roughly between Interstates 78 and 80, where most areas saw near or just over two feet of accumulation. The highest totals were in pockets of central and southern Morris and northern Hunterdon Counties where amounts topped or fell just shy of 30.0 inches in isolated spots. At Newark Liberty International Airport, the primary climate station in North Jersey, the storm-total snowfall was one of only 4 snowstorms ever to reach or surpass 2 feet in the Newark area based on records back to 1843. Thus, there is significant evidence this was a major snowstorm in this area.

The SCEC had significant concerns over the lack of reports from the observer. While this general area had zero to trace amounts of snow on the ground going into this event, the lack of regular measurements raised concerns about measurement frequency and timely observing practices. The reliability of a timely and accurate liquid equivalent was also raised and the fact it was changed raised further questions over measurement practices. The lack of knowledge about the snow measurement area, measurement frequency, and even the use or not of a snowboard were raised. Additionally, based on the observer's infrequent reporting, it was tough to determine a routine reporting time schedule. This was critical since the record covers a 24-hour period and based on radar and surrounding observations, it was evident this event exceeded 24 hours. Although snow for the first and last few hours was light, there were spots in the general area that still measured accumulations during this time.

Although it was felt the 30.0 inch amount exceeded 24 hours by the SCEC, further questions were even raised as to an event total when nearby stations were examined. Two other CoCoRaHS stations are located in Bernards Township and both reported daily during this event. One site in the northwest part of the Township measured an event total of 23.6 inches and another on the east side measured 27.0 inches. These sites reported maximum depths on 24 January of 23.5 and 27 inches, respectively. Spotter reports to WFO Mount Holly from the same general area in Somerset County reported 20 to 27 inches. Thus, the 30 inch fall and depth were felt to be slightly high, especially given no dramatic difference in the terrain at the location.

The SCEC voted unanimously 5-0 to reject the Bernards Township 1.5 S observation as a new 24-hour record for New Jersey on the 2 August 2021 call. The snowfall amount has since been invalidated given the concerns cited above.

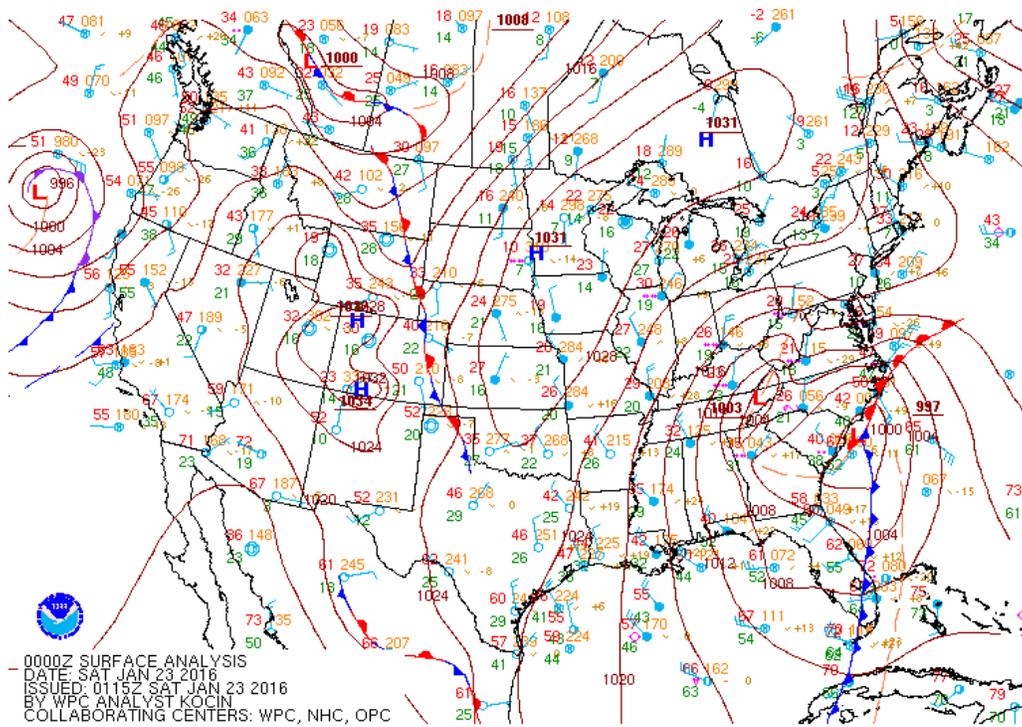


Figure 15. National Weather Service Weather Prediction Center analyzed surface map for 0000 UTC (Coordinated Universal Time) 23 January 2016.

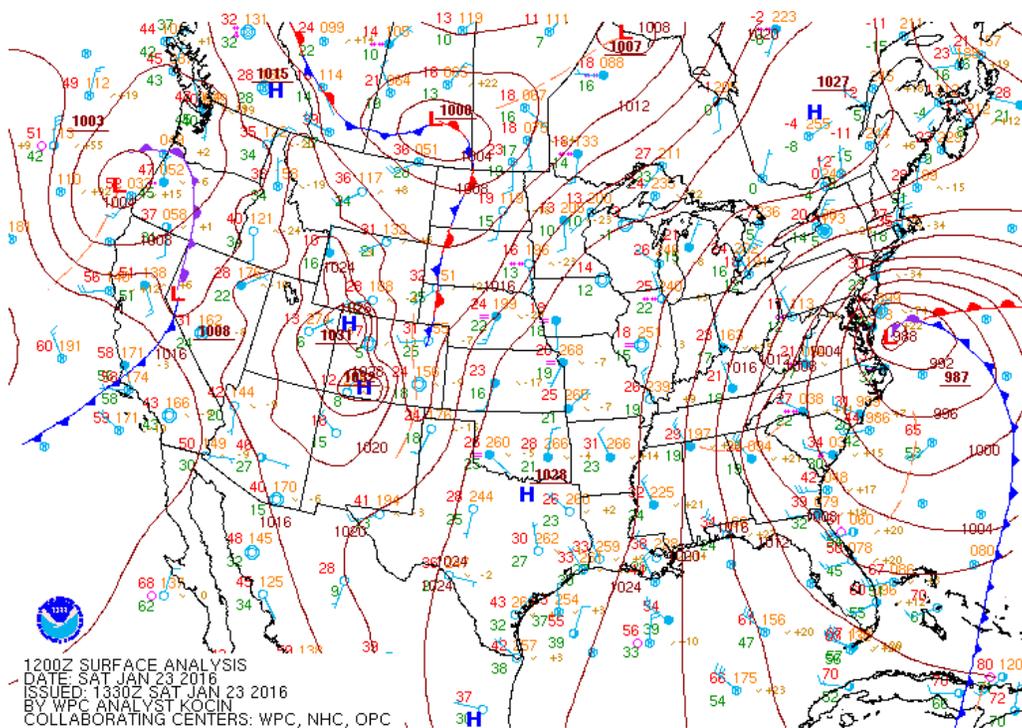


Figure 16. National Weather Service Weather Prediction Center analyzed surface map for 1200 UTC 23 January 2016.

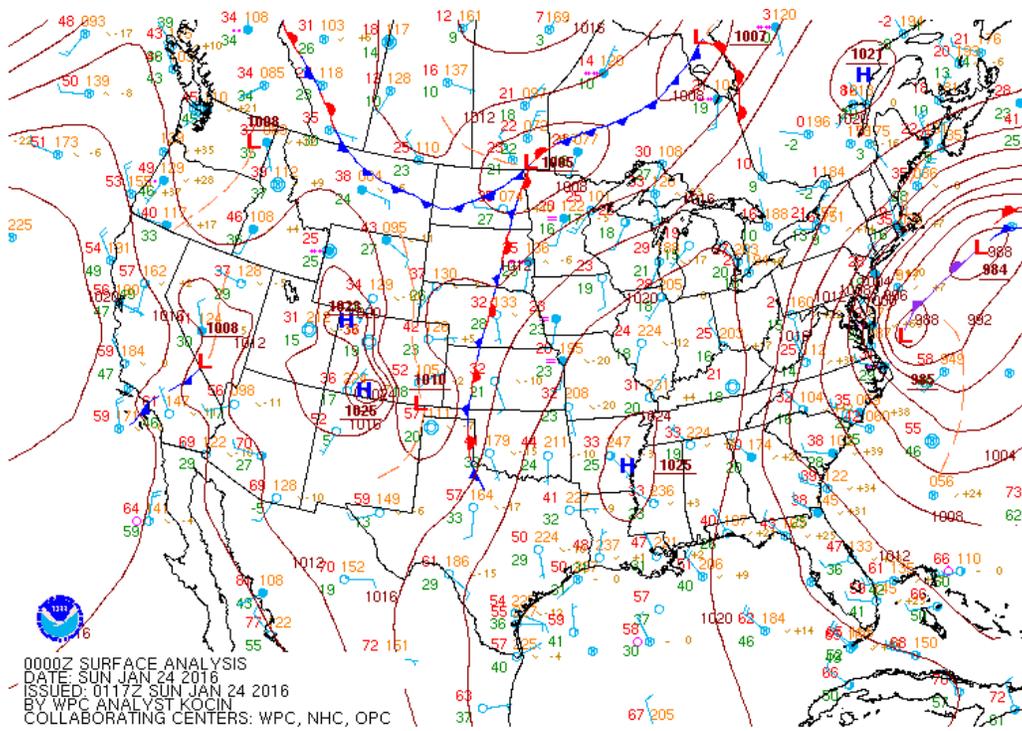


Figure 17. National Weather Service Weather Prediction Center analyzed surface map for 0000 UTC 24 January 2016.

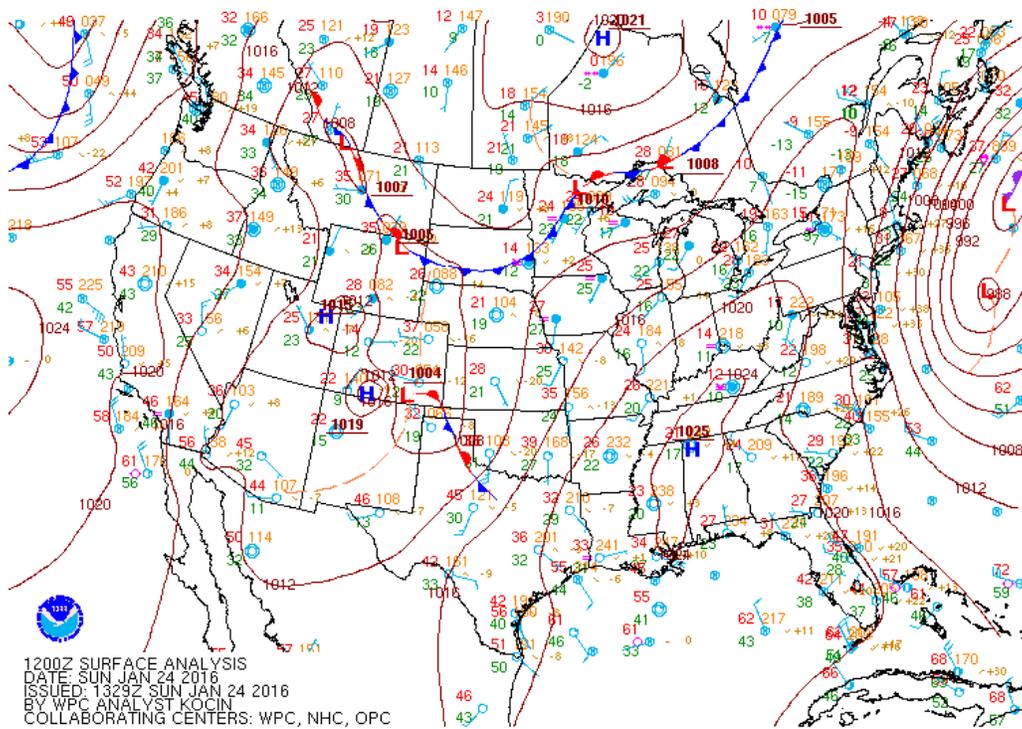


Figure 18. National Weather Service Weather Prediction Center analyzed surface map for 1200 UTC 24 January 2016.

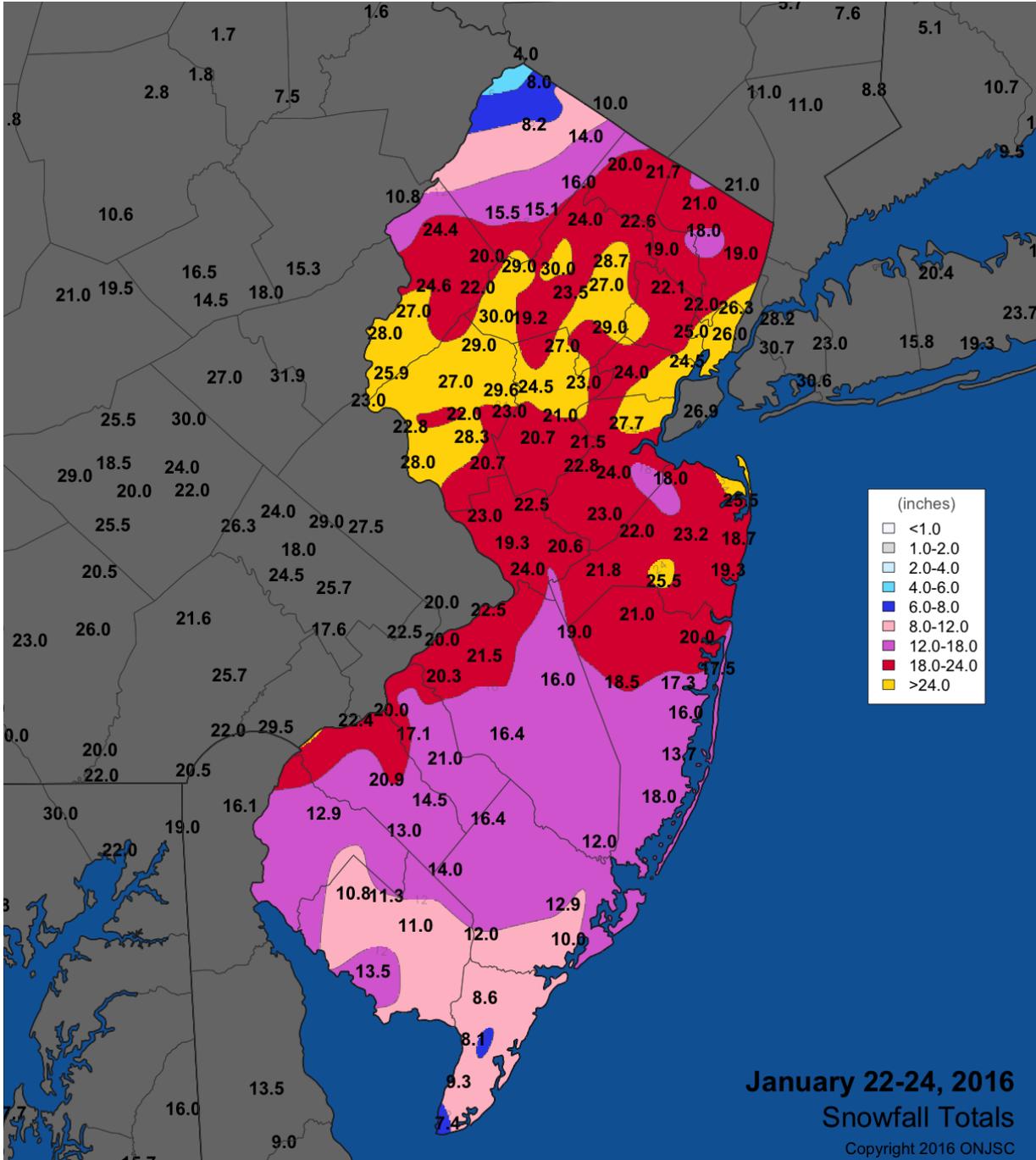


Figure 19. Map of selected snowfall totals in New Jersey from the 22-24 January 2016 reported by the National Weather Service and CoCoRaHS from a variety of sources. Image courtesy of the ONJSC.

About the 24-Hour Westfield Snowfall Observation and Station

On 2 September 2021 the SCEC conveyed again, this time with WFO New York to discuss the next highest value, since the site of interest fell in their area of responsibility. A search of GHCNd daily showed the next highest value was a measurement of 29.8 inches on 27 December 2010 from a CoCoRaHS observer in the community of Westfield. This event has colloquially been referred to by some in the weather community as the “Boxing Day II Storm,” since the bulk of the event occurred on 26 December 2010.

Westfield is located in Union County in central New Jersey, about 20 miles southwest of Midtown Manhattan. The Town of Westfield is fairly level and rises highest in the northwest part of the town that approaches the Watchung Mountains. Southern portions of the town feature a number of creeks that eventually drain into the Rahway River. The area is fairly densely developed, though the town itself is suburban in development.

A CoCoRaHS observer at station NJ-UN-7, known as Westfield 1.0 NE, participated in the CoCoRaHS program from 20 July 2009 through 13 February 2015. The observer was more consistent with submitting reports during the earlier half of their participation. The station was located in the far northeast part of Westfield, very near the Cranford border, in a residential neighborhood of single family homes that was flat with scattered mature landscape trees and located at an elevation of 95 feet. The observer’s snow measurement equipment was unknown but it is believed they utilized a 4 inch CoCoRaHS rain gauge, though no photos of the exact siting exist nor was the site ever visited by a CoCoRaHS representative.

The Westfield 1.0 NE observer was diligent in this time era at taking their observations daily at 0700 Local Time. The report on 27 December 2010 reported 29.8 inches of new snowfall, a depth of 30.0 inches, and a precipitation from melted snow of 1.80 inches. The observer submitted their report into CoCoRaHS at 1247 Local Standard Time on 29 December 2010. Reports were submitted on the preceding and subsequent days but did not include snow depth.

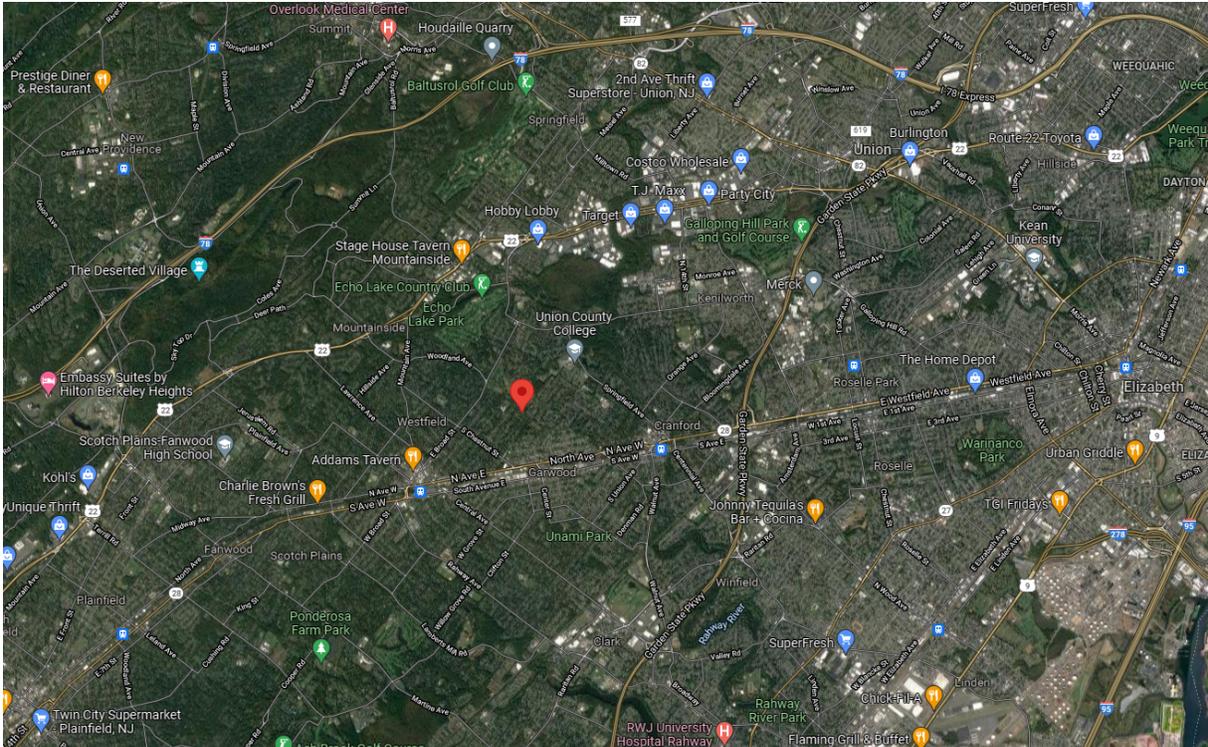


Figure 20. Map showing area where the Westfield 1.0 NE CoCoRaHS observer was located as indicated by the red marker. Credit: Google Maps.

Daily Precipitation Report	
Station Number: NJ-UN-7	Station Name: Westfield 1.0 NE
Observation Date	12/27/2010 7:00 AM
Submitted	12/29/2010 12:47 PM
Total Precip Amount	1.80 in.
Notes	--
Taken at registered location	Yes
Snow Information	
New Snow Depth	29.8 in.
New Snow Water Equivalent	1.80 in.
Total Snow Depth	30.0 in.
Total Snow Water Equivalent	1.80 in.
Duration Information	
Precipitation Began	--
Precipitation Ended	--
Heavy Precip Began	--
Heavy Precip Lasted	--
Duration Time Accuracy	--
Additional Information	
Additional Data Recorded	No
Submitted	12/29/2010 12:47 PM
Flooding	No

Figure 21. Observation for 27 December 2010 for the Westfield 1.0 NE observer as retrieved from the CoCoRaHS website.

Meteorological Plausibility of the 24-Hour Westfield Snowfall Observation

Surface weather maps show a rapidly intensifying low pressure system tracked from off the southeast United States coast on 25 December 2010 and then past the Mid-Atlantic coast on 26 December 2010 to just east of Long Island by the early morning of 27 December 2010. This intense low pressure system spread snowfall into the east-central and northeast portions of New Jersey on the morning of 26 December with bands of heavy snow plus embedded thunderstorms and very strong winds affecting the region that afternoon into the night. The heavy snow was accompanied by areawide winds of 25 to 40 mph and gusts in excess of 60 mph in the afternoon to evening hours of 26 December into the early morning of 27 December resulting in near-whiteout conditions with blowing and drifting snow and making travel extremely difficult to nearly impossible. The strong winds were the result of a tight surface pressure gradient that set up as a result of a rapidly-intensifying low pressure system tracking just southeast of Long Island and a polar high anchored across the central United States (Figures 22–24).

The track of this storm resulted in a unique set up snowfall across New Jersey in which amounts were lightest near the Delaware River on both ends of the state then increased greatly to the east, especially once one moved east of the Garden State Parkway. The highest amounts fell right along the Jersey Shore from Atlantic City northward and were heaviest along the northern Jersey Shore and in the vicinity of New York Harbor and Newark Bay. Totals in these areas exceeded two feet. Newark Liberty International Airport measured 24.2 inches, making it the greatest December snowstorm there since 1947 and marking one of only four snowstorms at Newark to reach or exceed two feet of snow based on records for greater Newark dating back to 1843.

Although there were several spotter and publicly-sourced reports at or above 30 inches in this event, the measurement equipment and methodology of these were not documented at the time. Given the considerable winds and blowing and drifting snow with this event, a review of a measurement location would have needed to be conducted to even consider review of these for a state record in addition to equipment and measurement frequency. Public reports communicated to the National Weather Service rarely provide an exact measurement location to the street address level that would be needed to better verify a measurement's validity.

Radar and surface observations clearly indicate that this event unfolded not just in Westfield but in other areas in New Jersey that saw significant snow in 24 hours or less. Surface observations at Newark Liberty International Airport show light snow commenced at 1048 Local Standard Time on 26 December 2010 and reports from CoCoRaHS observer Westfield 0.5 NNW, a different observer in the program in the same community, as well as a cooperative weather observer for the National Weather Service in nearby Cranford,

indicate snow began at 1200 Local Standard Time that day. Snow was reported to be heaviest by the Westfield 0.5 NNW observer from 1700 Local Standard Time on 26 December to 0100 Local Standard Time on 27 December 2010. Snowfall rates of 2 to 3 inches per hour were reported by the Westfield 0.5 NNW observer, with the heaviest being 3.5 inches in an hour between 2000 and 2100 Local Standard Time on 26 December. This observer reported that snow ceased at 0500 on 27 December while the Cranford observer reported that snow ceased at 0200 that day. Given the nighttime hours when it is presumed observers may be sleeping, these end times should be treated with caution. Newark Liberty Airport reported steady snow through 0430 Local Standard Time on 27 December with snow ending for good at 0854 Local Standard Time that day. Radar imagery did show several snowbands set up across Union County during the time the ground reports reported snowfall rates of 2 inches an hour or more, including at Newark.

Snow is variable in all storms in the amount of fall in a given area. However, a review of neighboring reports by the SCEC raised the most flags of concern over the total reported by the Westfield 1.0 NE observer. Coincidentally, the Cranford cooperative observer was located about a half of a mile northeast of the Westfield 1.0 NE CoCoRaHS observer and reported 19.0 inches of new snow, a 19 inch depth, and a liquid equivalent of snowfall of 1.67 inches. The Cranford observer had a report time of 0700 Local Standard Time on 27 December. The snow depth in Cranford was 17 inches on 28 December. About 6 miles southwest, another National Weather Service cooperative observer in South Plainfield measured 1.42 inches of melted snow and reported a depth of 25 inches at 1900 Local Standard Time on 26 December with no report of depth the following day. Further, another CoCoRaHS observer in Westfield, Westfield 0.5 NNW, only measured 26.5 inches of fall and depth with a liquid equivalent of 1.12 inches in a report taken for a 0700 Local Standard Time observation submitted at 1252 that day. This site did not submit a report on the subsequent day and was not a frequent reporter. Thus, the high variance in nearby totals caused some concern from the SCEC that the measurement of 29.8 inches from Westfield 1.0 NE may have been high or regarding how it was measured. Further, the larger increase in totals was evident about 10 to 15 miles east, raising concern the 29.8 inches was a high outlier relative to its location. The SCEC was also concerned that there was no information regarding how the Westfield observer measured the snow or where on the property this was done.

CoCoRaHS reports were not part of the GHCNd database in 2010 and thus the value would not have been raised in a search of xmACIS then for a search of extreme snowfall values. Thus, there would not have been an opportunity to consider such a value for a state record in that era and a thorough investigation then was not done. Given the inconsistent area readings plus a lack of documentation of the siting, the equipment, and unknowns regarding measurement technique, the members of the SCEC voted unanimously 5-0 to reject the Westfield 1.0 NE value of 29.8 inches on 27 December 2010 as a new 24-hour snowfall value for New Jersey. Enough uncertainty surrounds this reading to make it as questionable, and the lack of a solid footing makes such a value hard to justify as a state

record.

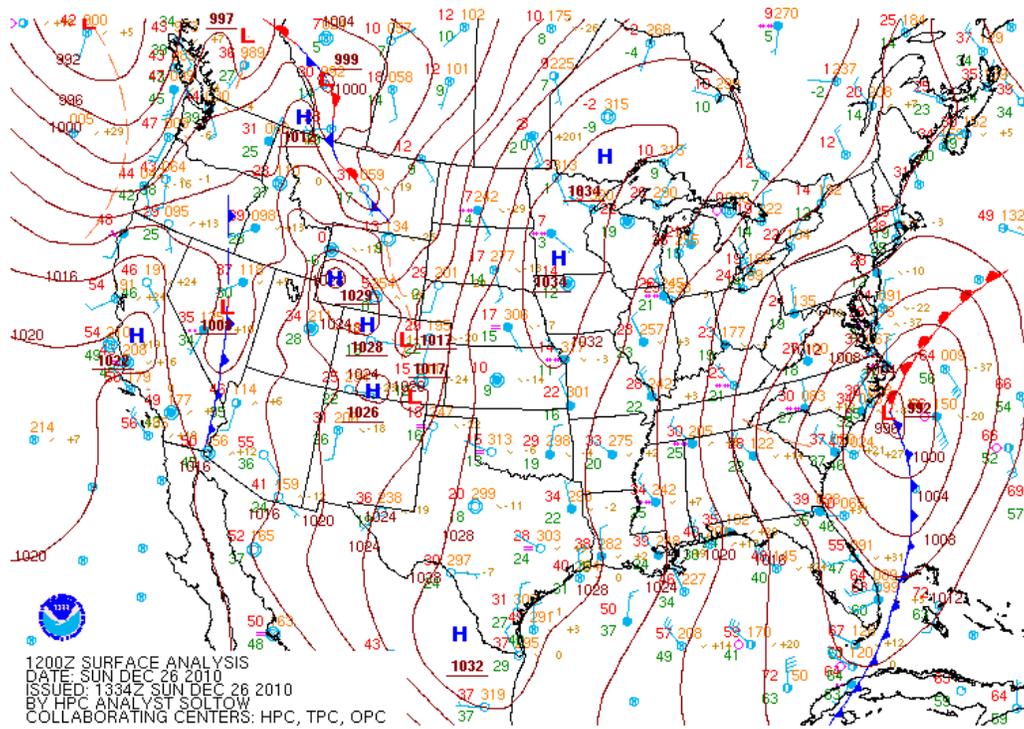


Figure 22. National Weather Service Weather Prediction Center analyzed surface map for 1200 UTC 26 December 2010.

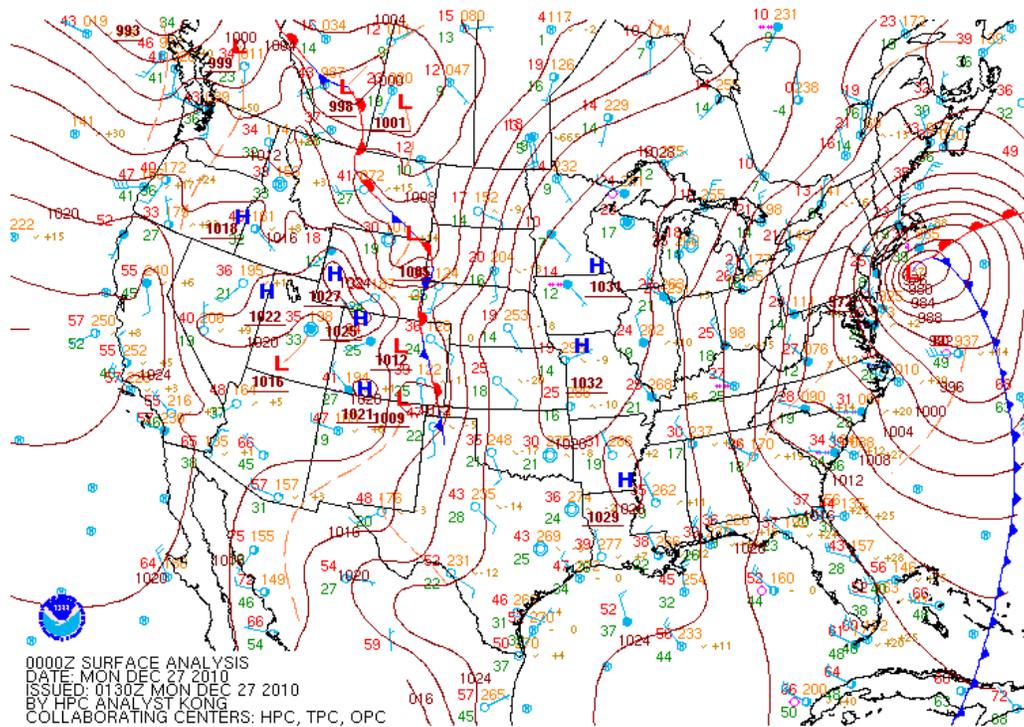


Figure 23. National Weather Service Weather Prediction Center analyzed surface map for 0000 UTC 27 December 2010.

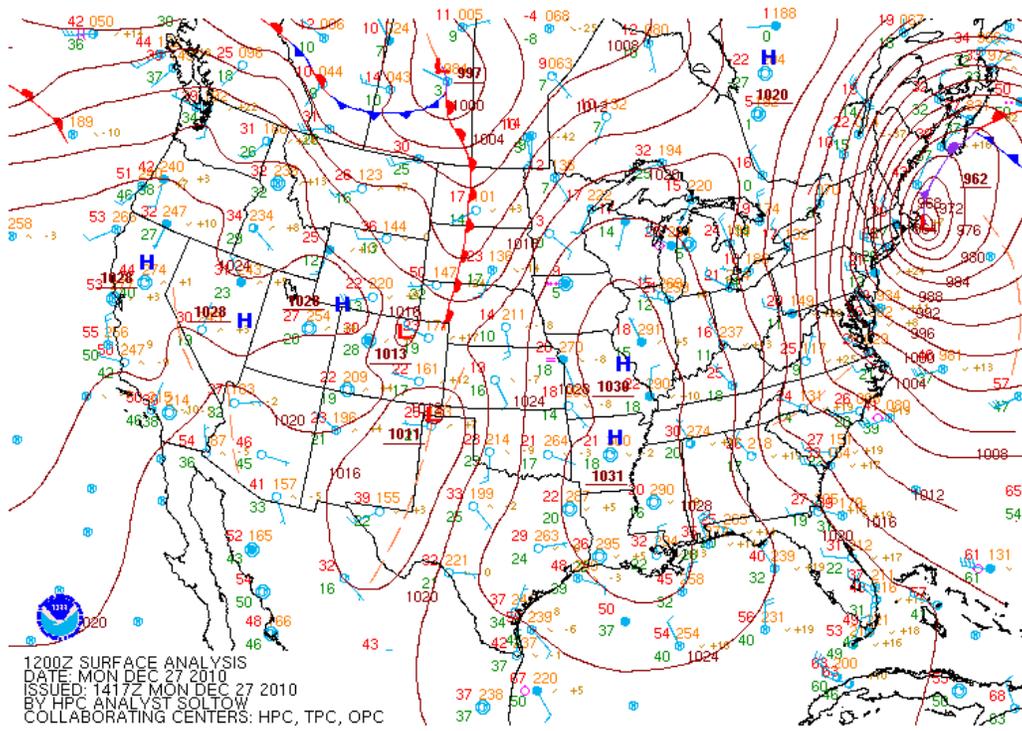


Figure 24. National Weather Service Weather Prediction Center analyzed surface map for 1200 UTC 27 December 2010.

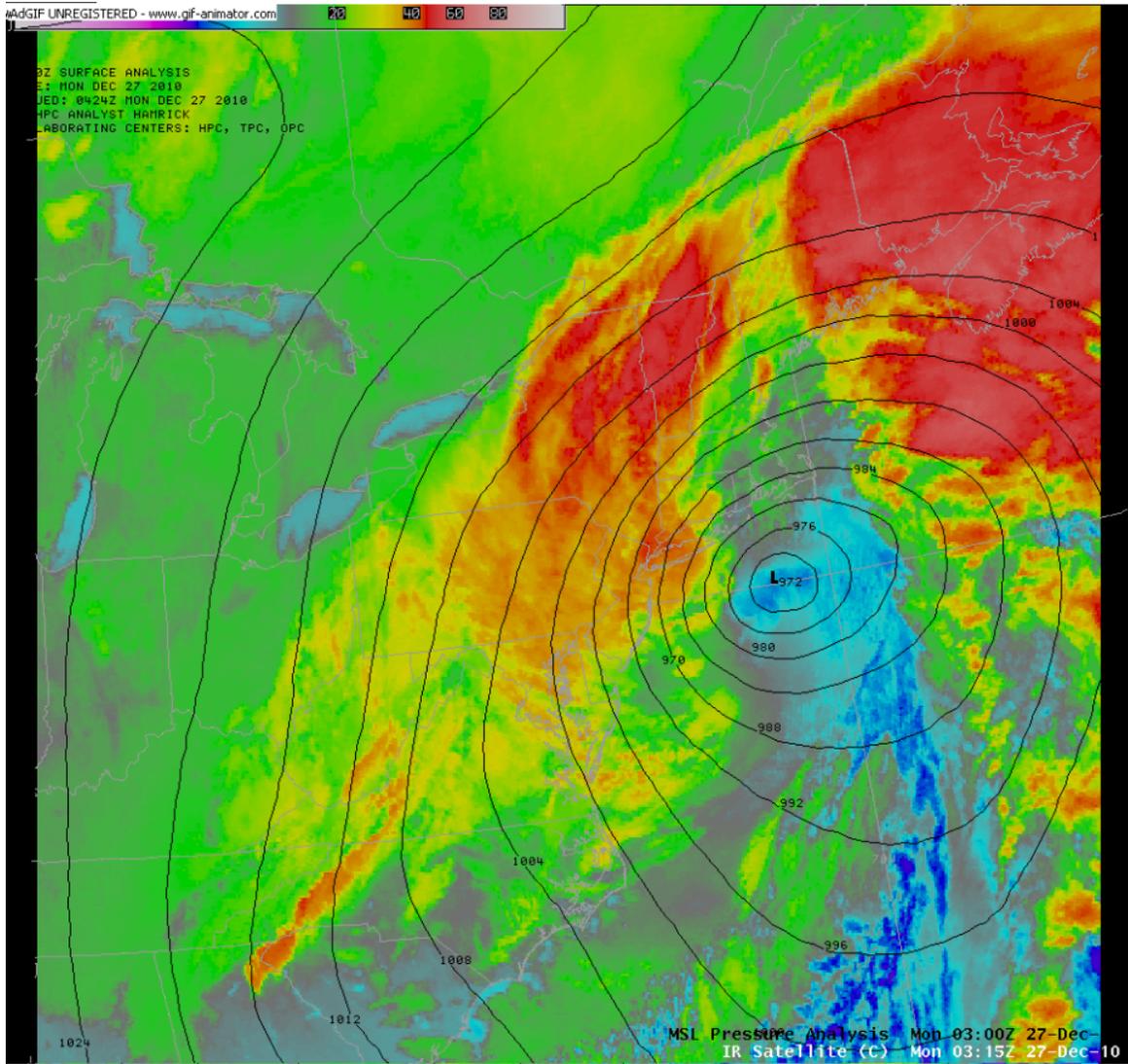


Figure 25. Infrared satellite image from 0315 UTC on 27 December 2010 and 0300 UTC WPC mean sea level pressure analyzing a 972 millibar surface low east of New Jersey. Image from WFO New York.

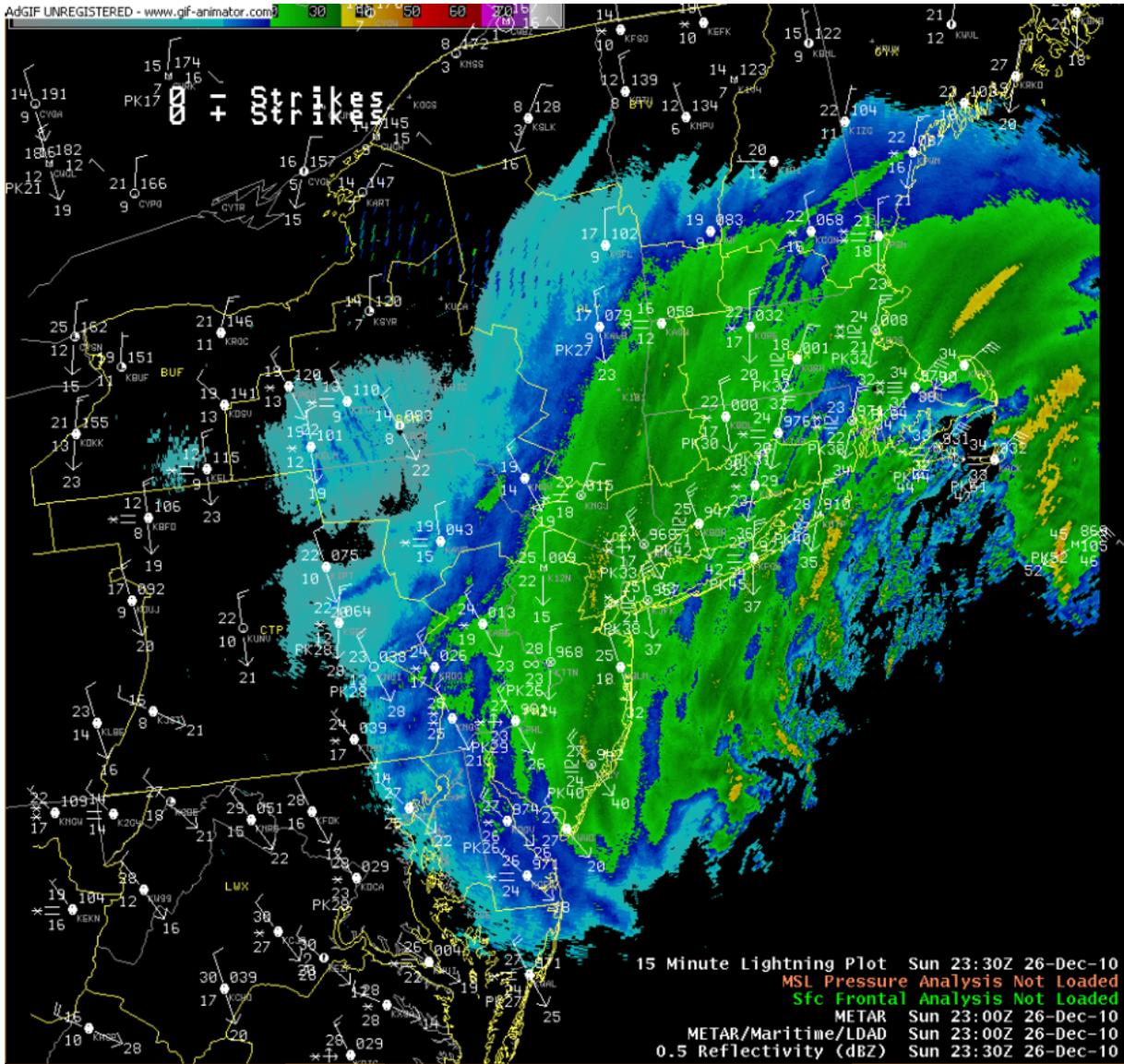


Figure 26. 0.5 degree WSR-88D radar reflectivity image at 2330 UTC on 26 December 2010 with surface observations plotted for 2300 UTC 26 December 2010. A heavy snow band can be noted extending across New Jersey from western Bergen County south through Union County and toward Atlantic County. Image from WFO New York.

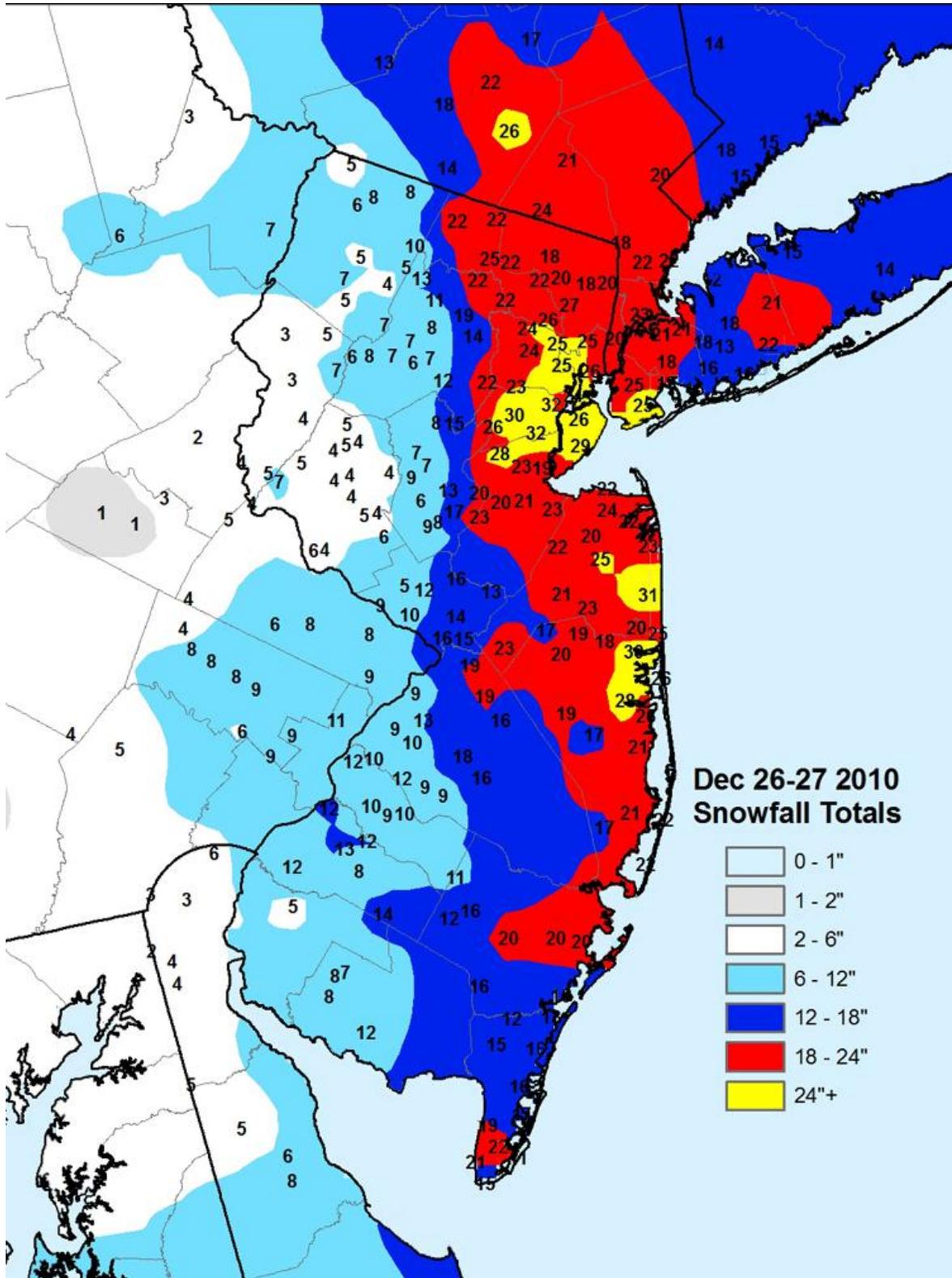


Figure 27. Observed snowfall map of New Jersey area snowfall totals reported to the National Weather Service and CoCoRaHS from various sources. Not all reports are official. Courtesy of the ONJSC.

About the 24-Hour Essex Fells Snowfall Observation and Station

On 7 September 2021 the SCEC conveyed yet again with WFO New York as the NWS representative voting office to discuss the next highest value since the site of interest this time also fell in their area of responsibility. The value reviewed on this call was a snowfall measurement of 29.5 inches reported at a National Weather Service cooperative observer station at Essex Fells, New Jersey, ending on 8 January 1996. WFO Mount Holly was also present during this call.

Essex Fells is located in northern New Jersey in Essex County, about 17 miles west-northwest of Midtown Manhattan. Essex Fells is a fairly developed suburban community with semi-rolling land. Drainage in the western part of the Borough runs into creeks that flow into the Passaic River. The Watchung Mountains rise about one and a half miles to the east. Lightly-wooded parcels exist in small patches with mature landscape trees near developed areas.

A National Weather Service cooperative observer site briefly operated in Essex Fells from March through November of 1903. In January of 1945, a cooperative weather site was re-established in the municipality at the sewage plant under COOP ID 28-2773. On 15 May 1949, a new cooperative observing site was established at the Essex Fells Service Building under COOP ID 28-2768 at an elevation of 350 feet. The observations were initially taken by the Borough Engineer using a recording rain gauge they operated as well as liquid in glass thermometers housed in a shelter, along with precipitation using a standard 8 inch rain gauge. At the time of interest, the site took observations in January 1996 daily at 0800 Local Standard Time with a precipitation gauge consisting of a National Weather Service 8 inch standard rain gauge, a Fischer-Porter rain gauge for recording hourly precipitation, and an electronic maximum-minimum National Weather Service temperature sensor. No documentation of snow observation equipment is listed but the site property had a large open area south of the equipment and snow was likely measured in this area or in the rear of the facility in a smaller clearing.

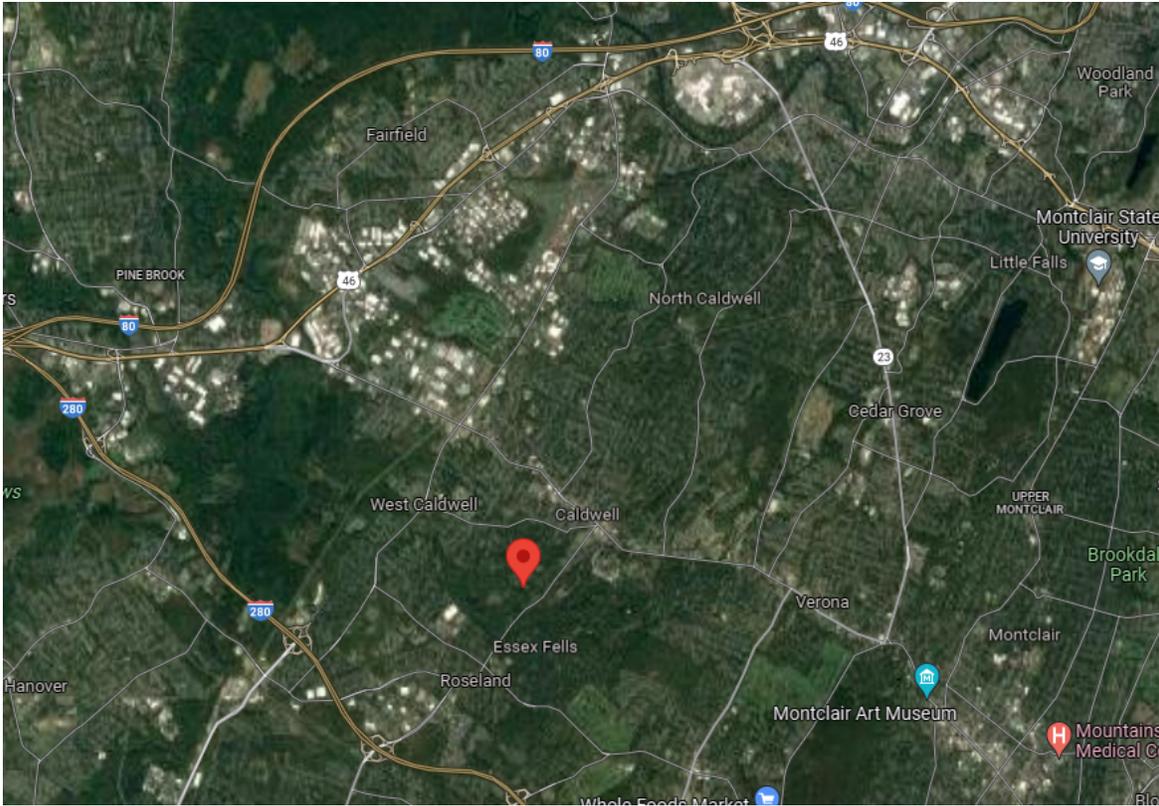


Figure 28. Map showing area where the Essex Fells Service Building station is located as indicated by the red marker. Credit: Google Maps.



Figure 29. Photo of the Essex Fells station facing northeast taken in November 1989. Photo from National Weather Service archives.



Figure 30. Photo of the Essex Fells station facing northwest taken in November 1989. Photo from National Weather Service archives.

the Mid-Atlantic during most of 7 and 8 January 1996 that generated wind gusts of 25-35 mph across most of New Jersey. These gusty winds did coincide with the occurrence of the heaviest snow. However, it is worth noting that the gust speeds in most areas did not hit 35 mph and, although surface visibilities of a quarter of a mile or less were observed, the wind gusts not reaching 35 mph meant in most areas of New Jersey and the megalopolis, this did not technically qualify as a blizzard. However, given that the name “Blizzard of ‘96” was coined prior to the worst of the storm’s impact unfolding, the name has stuck years later, even in meteorological circles, despite it being meteorologically incorrect.

This event occurred during the early operational era of the “Weather Surveillance Radar, 1988, Doppler” (WSR-88 D). As a result, archived radar imagery was reviewed and provided valuable information to the SCEC in estimating start and end times of snow in the area of interest. Radar showed snow spread north across New Jersey during the morning of 7 January 1996 and increased in intensity at times by later in the day into the early morning hours of 8 January 1996. Radar imagery notes heavier snowbands developed over central New Jersey on the afternoon of 7 January and, by the late afternoon into the evening, spread into northeastern New Jersey. More pronounced snowbands remained over northern New Jersey through the 8th, though the snow lightened in intensity in much of northeast New Jersey late in the morning of the 8th before increasing in intensity by the early afternoon. Snow largely tapered off across New Jersey by the early evening hours on the 8th.

Additionally, archived surface observations at 4 North Jersey airport observing sites — Newark International Airport, Teterboro Airport, Caldwell/Essex County Airport and the Morristown Municipal Airport — were reviewed. Observations at these locations still had a manual component to them in January 1996 instead of being taken primarily by ASOS. As a result, Caldwell and Morristown did not report twenty-four hours each day. Observations at Teterboro, located northeast of Essex Fells, reported light snow from 0540 to 0630 Local Standard Time on 7 January 1996 before steadier snow commenced at 0915 that day. Snow fell at Teterboro continuously until 1545 on 8 January then fell again from 1638 to 1740. Teterboro reported sleet and thunder with the snow for 35 minutes in the early morning of 8 January. Morristown, located to the west, reported light snow continuously on 8 January as late as 1745 Local Standard Time. Newark Airport, to the east, reported that snow commenced as early as 0519 on 7 January. Snowfall rates of one inch per hour were observed at Newark as early as 1200 on 7 January and were reported each hour through 0700 on 8 January when the depth reached an all-time record for the site of 30 inches (this record depth was broken the next morning at 31 inches). Newark also reported thundersnow with occasional lightning from 0048 to 0144 along with a period of sleet mixing in and thunder again from 0213 to 0235 on 8 January, with snow tapering in the evening around 2215 Local Standard Time. Additionally, another cooperative observer, just to the south of Essex Fells at Canoe Brook in Short Hills, reported snow fell on 8 January as late as 1400 Local Standard Time.

The total fall of snow for this event at the National Weather Service office at Newark Airport from 7 to 8 January 1996 was 27.8 inches, and this surpassed anything in Newark-area weather records back to 1843 as the biggest single-event snowfall on record. The greatest 24-hour snowfall on record also occurred at Newark with 27.4 inches, falling from 7-8 January 1996. The only other official report in Essex County during this event was from Canoe Brook, which did not measure any amount on 8 January 1996 and estimated a fall of 18 inches at 0800 Local Standard Time on 9 January 1996. It is worth noting the depth at Canoe Brook went from 8 inches on 7 January 1996 at the 0800 observation time to only 22 inches at observation time on 9 January. In surrounding counties, amounts included 25.0 inches in Bergen County at Teterboro Airport and unofficially in Saddle Brook, and 24.0 inches from a weather enthusiast in River Vale. In Hudson County, 27.0 inches was reported from an experienced weather spotter in Harrison, and 24.0 and 29.4 inches in Jersey City from a cooperative observer and an unofficial source, respectively. In Union County, 28.8 inches was reported in Elizabeth and 22.0 inches in Linden from unofficial sources, and 25.0 inches from a cooperative observer in Rahway. In Passaic County, 21.0 to 25.0 inches was reported from cooperative observers in West Milford and 21.0 inches from a weather enthusiast in Hawthorne. In Morris County, 24.0 inches was reported from an unofficial source in Chatham, 25.0 inches from a cooperative observer in Long Valley, 26.0 inches from a cooperative observer in Split Rock Pond, and 28.0 inches from a cooperative observer in Boonton. Thus, the 29.2 inches at Essex Fells value, while the highest in Essex County or any adjacent counties reported to the National Weather Service with respect to this event, is very close to many nearby event reports.

The observation time officially at Essex Fells is 0800 Local Time daily. On 8 January, the significance of the amount of snow that fell along with travel conditions raised concerns to some SCEC members that the observer may not have measured the 29.2 inches at the designated observation time and the measurement may have been made later that day. This value's time duration became questionable after noting no precipitation or snow was reported on the 7th and no snow was reported on the 9th despite a report of precipitation (0.20 inches), contrary to radar, surrounding surface airport observations, and cooperative observers that reported additional precipitation and snow on the 9th. The SCEC felt that despite no snow depth observation, the 29.2 inch snowfall value at Essex Fells was a reasonable event total over multiple days but could not have reasonably occurred in a 24-hour period. As a result, the SCEC voted unanimously 5-0 to reject the 29.2 inches at Essex Fells on 8 January 1996 as a single day value capable of being a 24-hour state snowfall record for New Jersey.

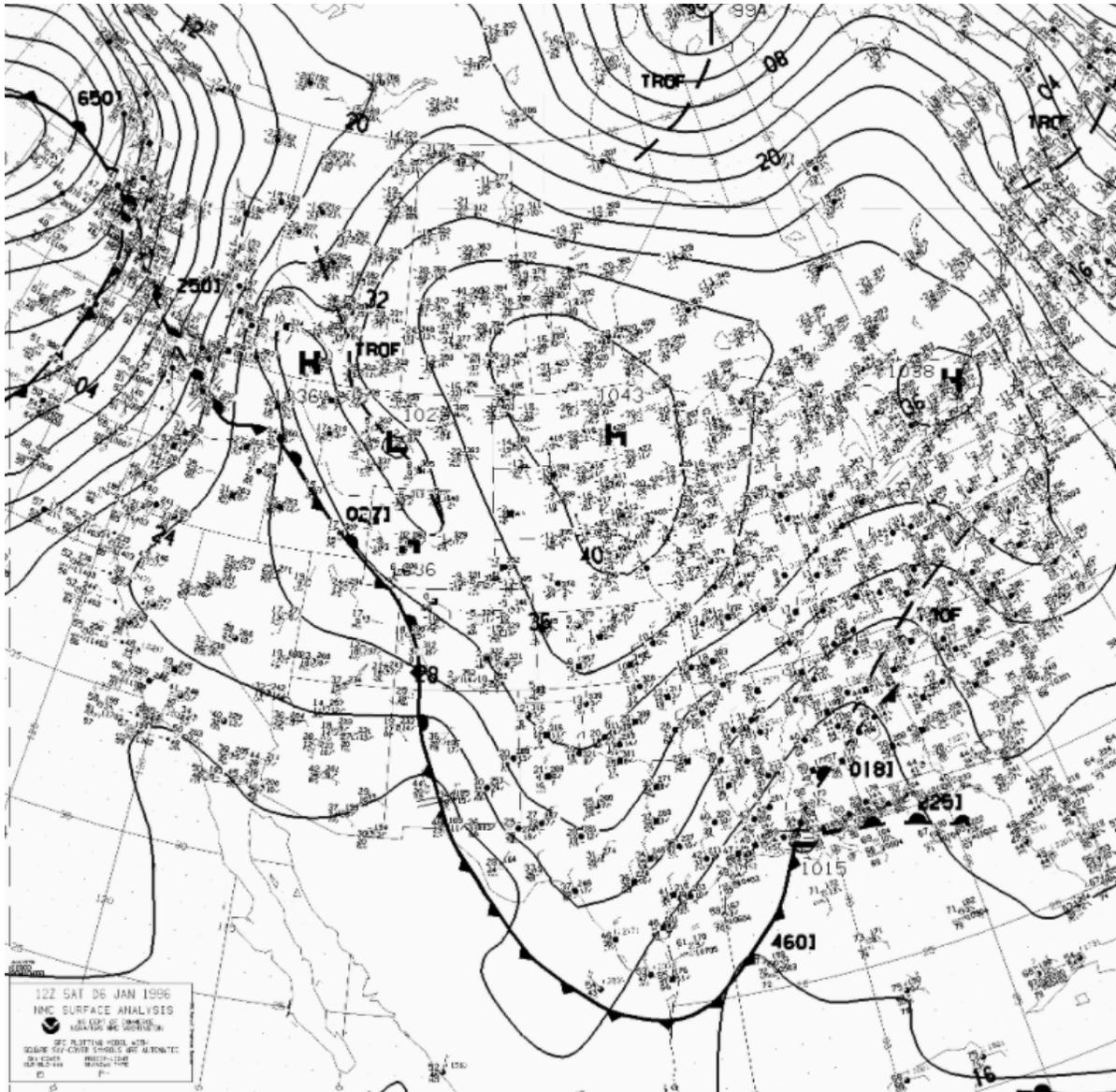


Figure 32. National Weather Service analyzed surface map for 1200 UTC 6 January 1996.

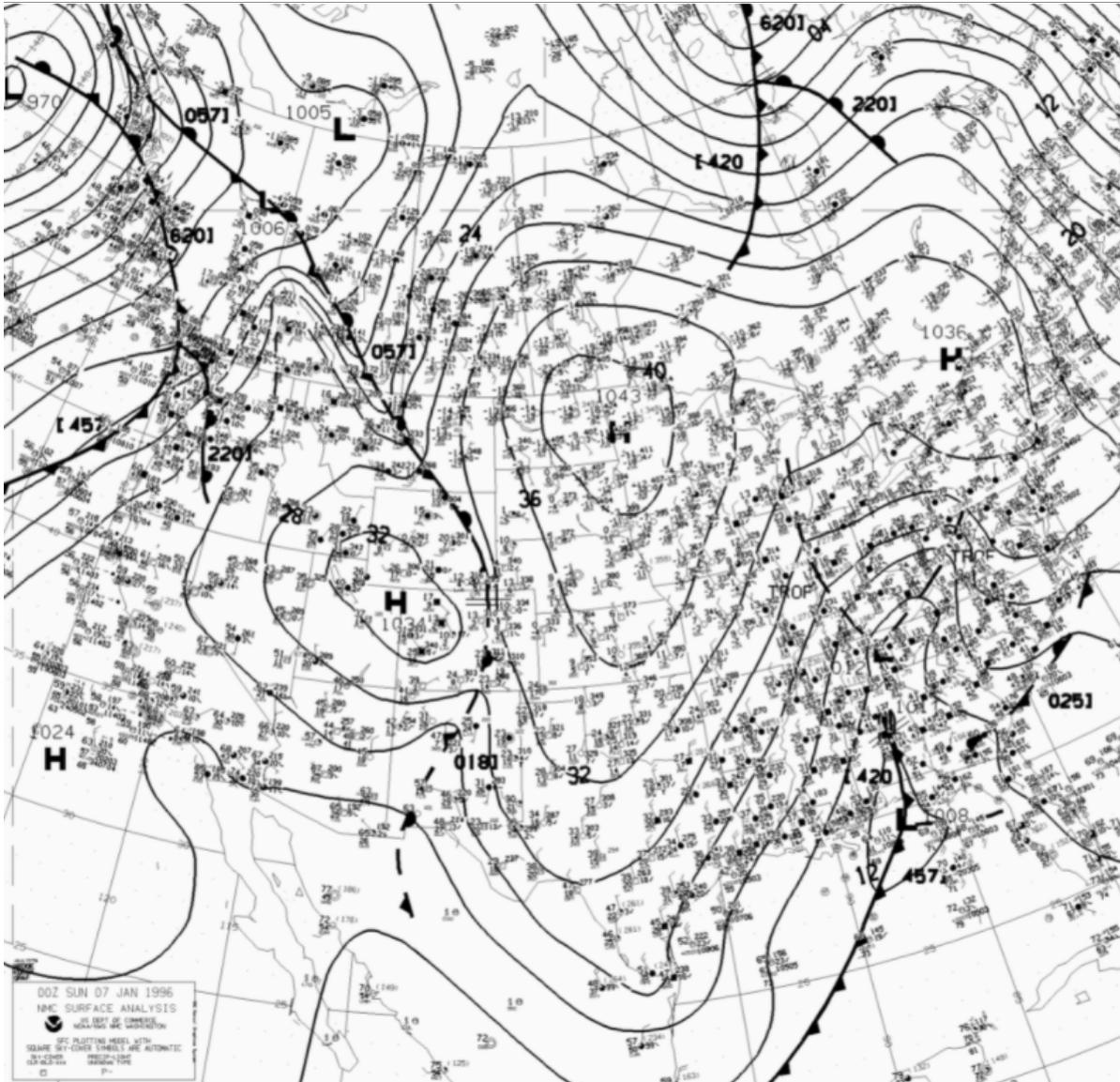


Figure 33. National Weather Service analyzed surface map for 0000 UTC 7 January 1996.

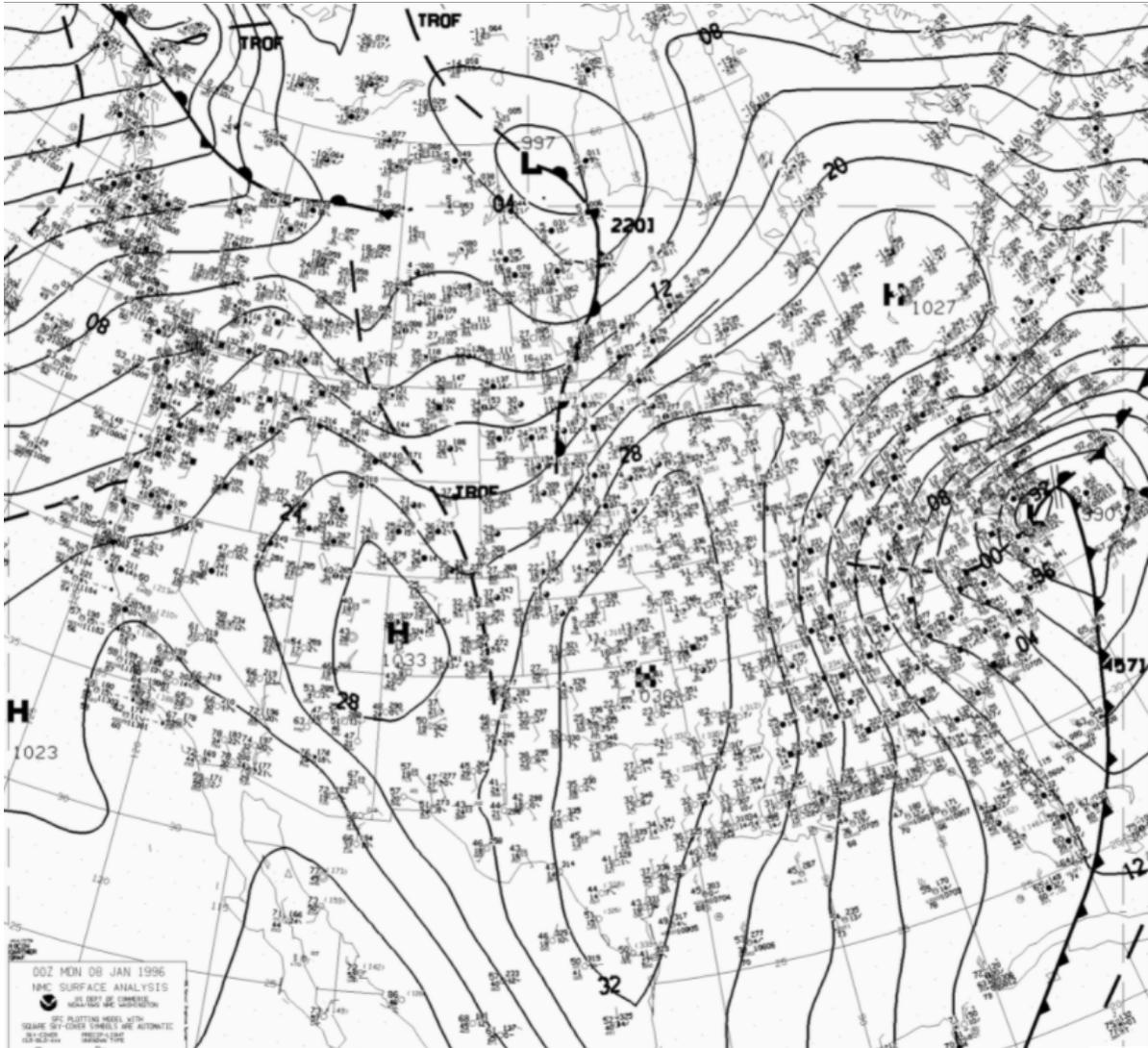


Figure 35. National Weather Service analyzed surface map for 0000 UTC 8 January 1996.

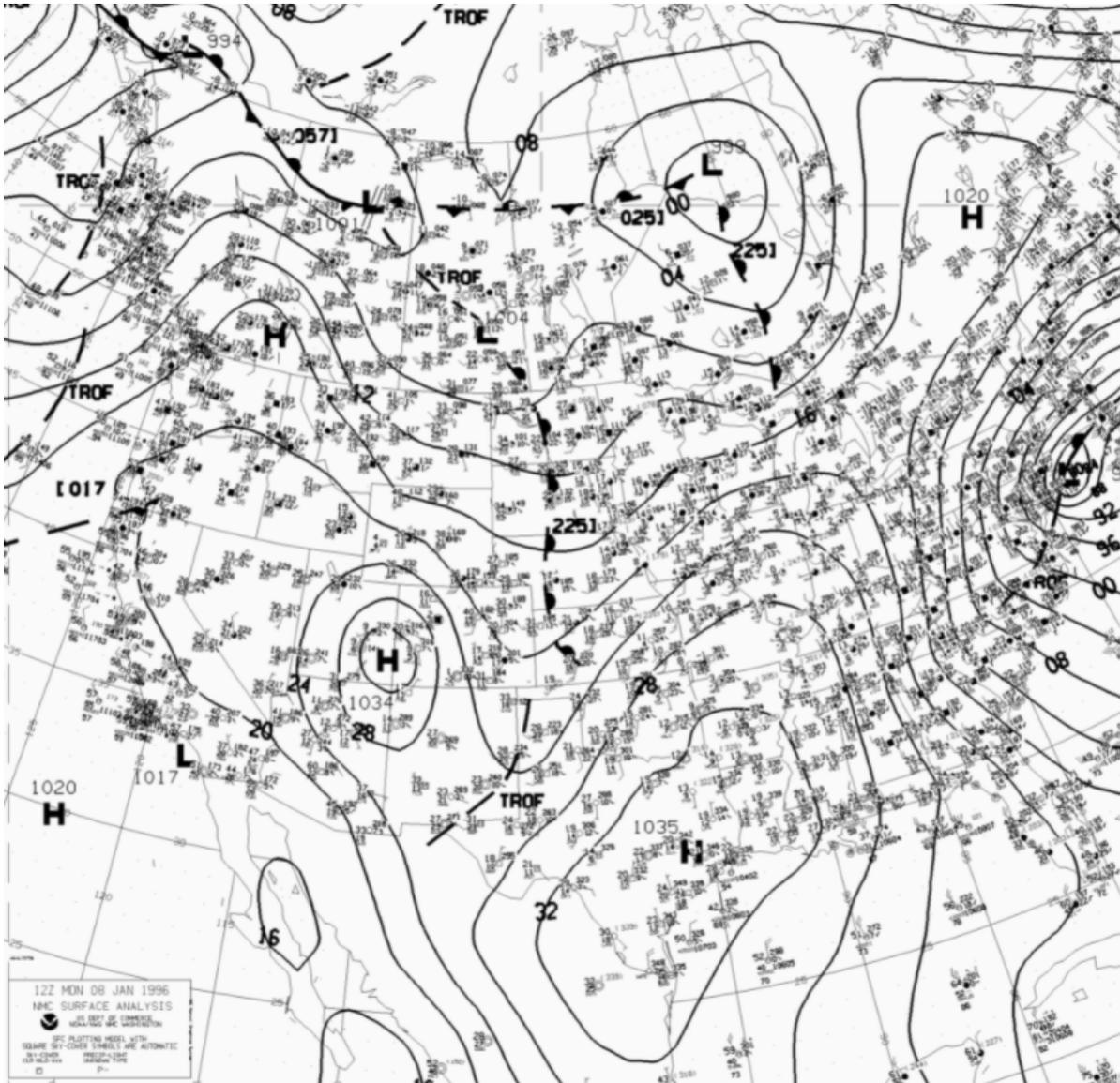


Figure 36. National Weather Service analyzed surface map for 1200 UTC 8 January 1996.

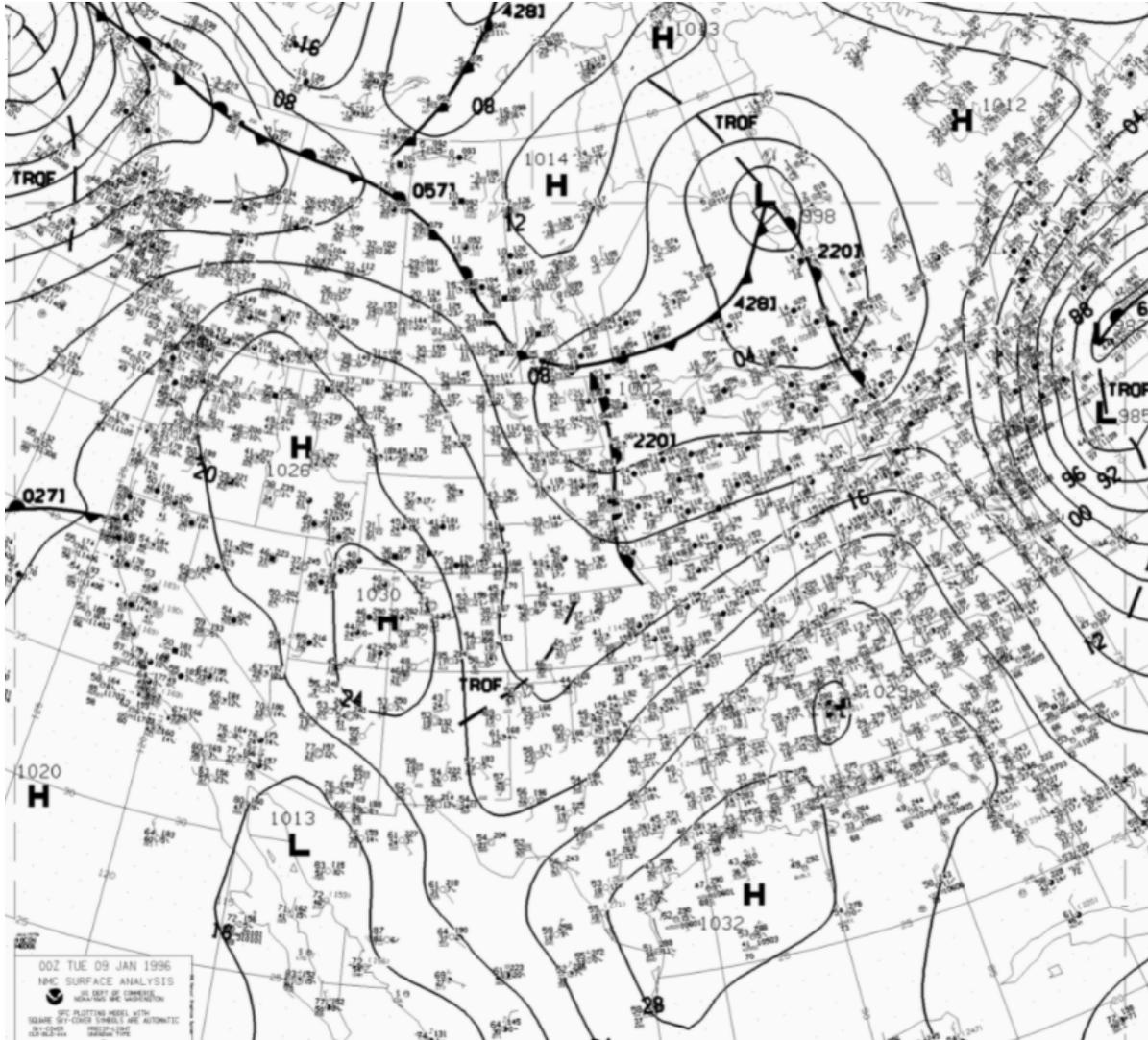


Figure 37. National Weather Service analyzed surface map for 0000 UTC 9 January 1996.

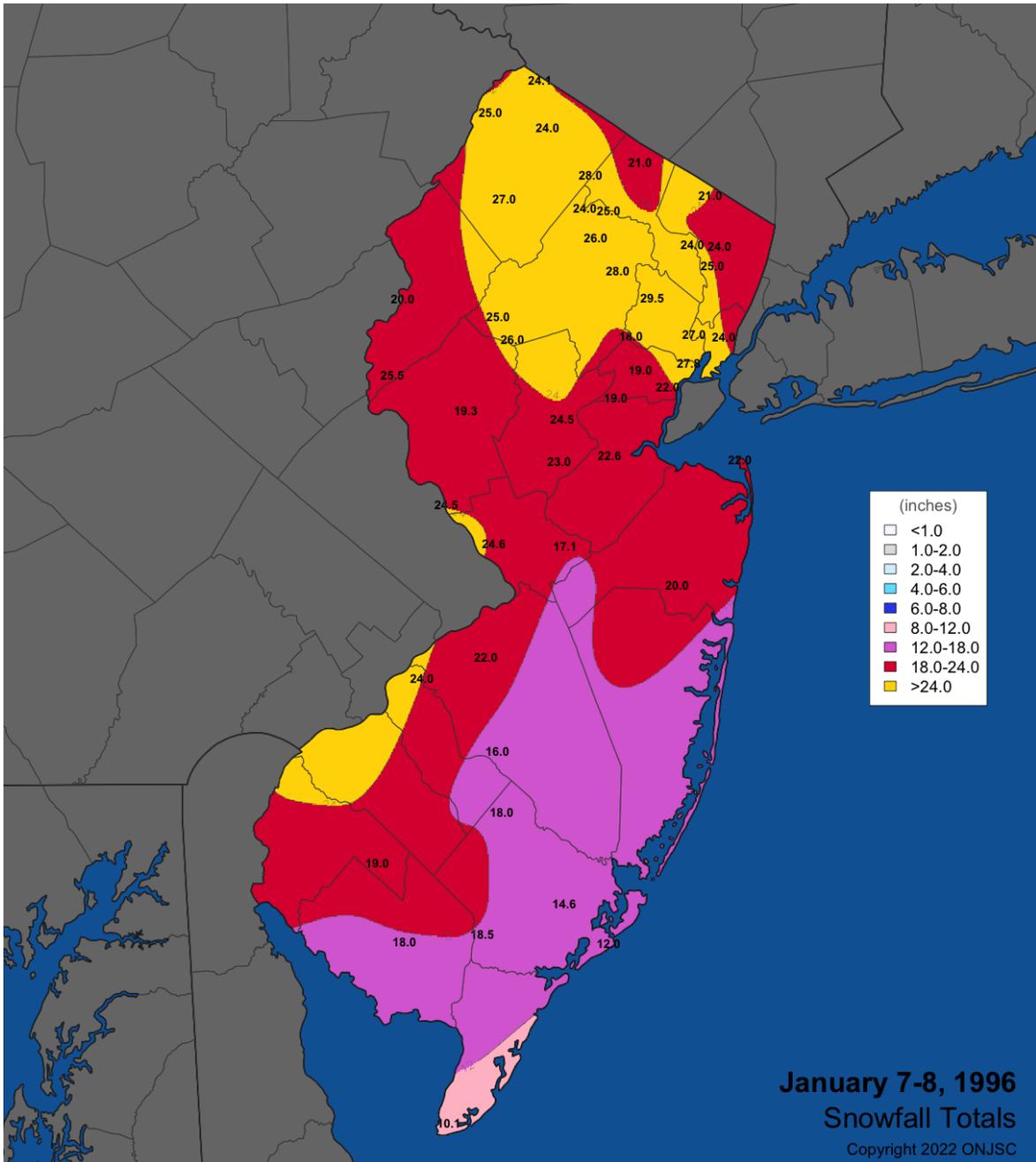


Figure 38. Observed snowfall map of New Jersey area snowfall totals reported to the National Weather Service from various sources along with select reports from the North Jersey Weather Observers. Not all reports are official. Courtesy ONJSC.

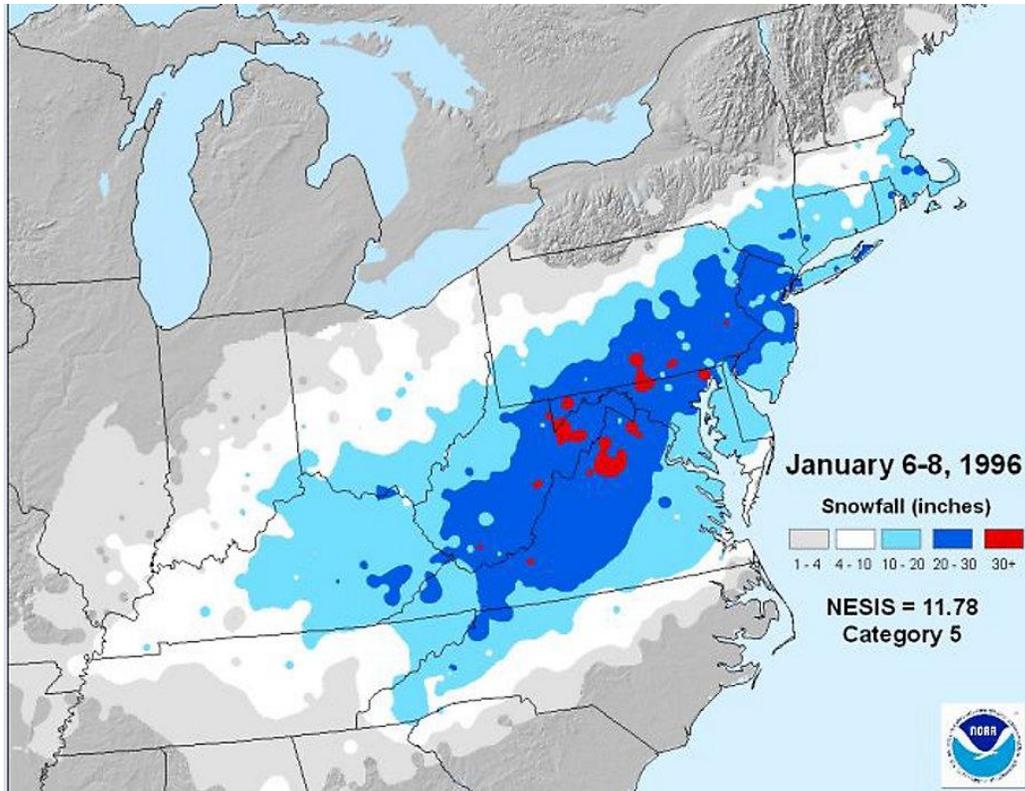


Figure 39. Total snowfall amounts from official sources. Note the general 20 to 30 inch fall across most of northern New Jersey. In 2004, the Northeast Snowfall Impact Scale (NESIS) that ranks Northeast snowstorms was developed. NESIS ranks the Blizzard of '96 as the second most severe Northeast snowstorm on record behind the March 1993 Superstorm or "Storm of the Century" as it was commonly called then, rating it as one of only two Category 5 snow events to have occurred in the Northeast.

About the 24-Hour Rutherford Snowfall Observation and Station

Following the discussion and vote on the Essex Fells record on 7 September 2021, the SCEC began discussion on a series of values set in the 26-27 December 1947 snowstorm that were the next highest values on the list. Due to limited time, a thorough discussion was not possible on this date and so the SCEC conveyed and for a final time on 23 September 2021 to wrap up discussion. Due to the stations being in various areas of New Jersey, both WFOs in Mount Holly and New York participated. WFO New York held voting rights should the record be opted to come from either the Rutherford or Macopin Intake stations while WFO Mount Holly held the right in the event Long Branch was considered.

The Borough of Rutherford sits in northeastern New Jersey in Bergen County along a north-south oriented ridge that rises to over 100 feet in elevation and extends along the western edge of the New Jersey Meadowlands. The eastern side of the borough extends

toward the Hackensack River and is marshy. The slightly higher western side drops down and drains into the Passaic River. Rutherford was an early suburb of New York City and urban North Jersey and sits roughly 8 miles west of Midtown Manhattan. Even as far back as the 1940s, a fair amount of the borough was developed into largely small-lot residential single family homes. Due to the marshy landscape, the eastern area remains more open even today. Rutherford sits in an area that is within the broader North Jersey urban heat island though, due to its suburban development, even in the era of the event in examination, would not have it run as warm as industrialized areas such as the City of Passaic 2 miles to the northwest, which had a noted concentration of factories in this era along the Passaic River. Teterboro Airport, located 3 miles roughly to the northeast of Rutherford, sits in drained Meadowlands marshland and existed as an official U.S. Weather Bureau aviation reporting station in the 1940s.

The establishment of a cooperative weather observer station in Rutherford was unique for the era it operated in. A gentleman who graduated from the School of Meteorology at New York University lived within the borough at the time and had already purchased an eight inch standard rain gauge and built his own temperature shelter. Based on substation history records, the gentleman does not appear to have been a United States Weather Bureau Employee but no record of his exact employment was noted. It was noted the observer's interest in weather and no cost to the government due to self-furnished equipment, as well as the area's population size, were cited in reasons for establishing this station and assigned COOP ID 28-7833.

The observer's equipment was located in their backyard of a single-family residential neighborhood on the far-western side of Rutherford about 350 feet east of the Passaic River. A cluster of five trees was noted around the rain gauge with the observer's house to the south of the yard and a freestanding garage to the southwest. This street is semi-level but slopes up to the east. Houses surrounded the property in all directions. No record of the exact snow measurement equipment was noted. The property was noted to slope sharply in the backyard near the house.

The Rutherford station officially commenced observations in August 1944 as a precipitation-only station. On 20 March 1945, temperatures were also reported daily. The observer's daily report time in December 1947 was 2000 Local Standard Time. The observer was fairly detailed with precipitation times and remarks through the period of record. The station reported through the close of February 1951, after which observations ceased for unknown reasons. The station, after being inactive for several months, was closed by the Weather Bureau in March 1952 due to the lack of observations and proximity to other stations and was never replaced.

A snow event on 23 December 1947 deposited 2.8 inches of snow at this location and a depth of 2.5 inches was reported. Although snow depth today is reported in the nearest whole inch, the observer here took depth readings to tenths of an inch. This depth

decreased to 1.7 inches at observation on Christmas Day. On 26 December, the observer reported 29.1 inches of snow with a depth of 30.4 inches and 3.04 inches of liquid equivalent of snowfall. The observer reported a maximum of 30 degrees and a minimum of 20 degrees with north to northwest winds. No start time for the snow was noted, but the observer noted that snow ceased at 2045 Local Standard Time, then commenced again at 2100. The following day on 27 December, 0.5 inch of snow was reported with 0.05 inch liquid equivalent and a depth of 25.0 inches. No start or end times were noted. The maximum rose to 35 degrees and the minimum was 22 degrees. A more detailed summary was provided by the observer on the reverse of the form. Although the scan at NCEI did not have this, the ONJSC archives had a carbon copy of this which was scanned and reviewed by the SCEC. Among the remarks, the observer noted a brief period of snow pellets, lightning, and drifts to over 6 feet during the event.

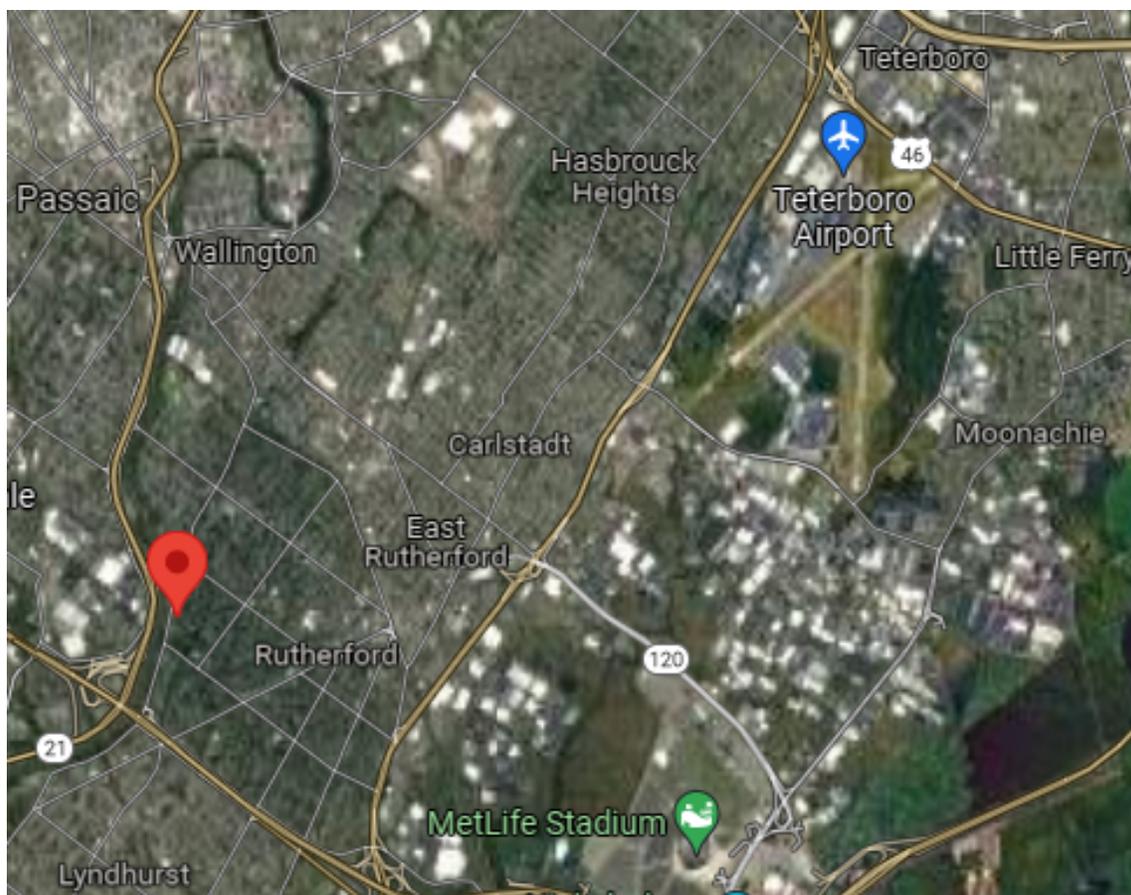


Figure 40. Map showing area where the Rutherford station was located as indicated by the red marker. Credit: Google Maps.

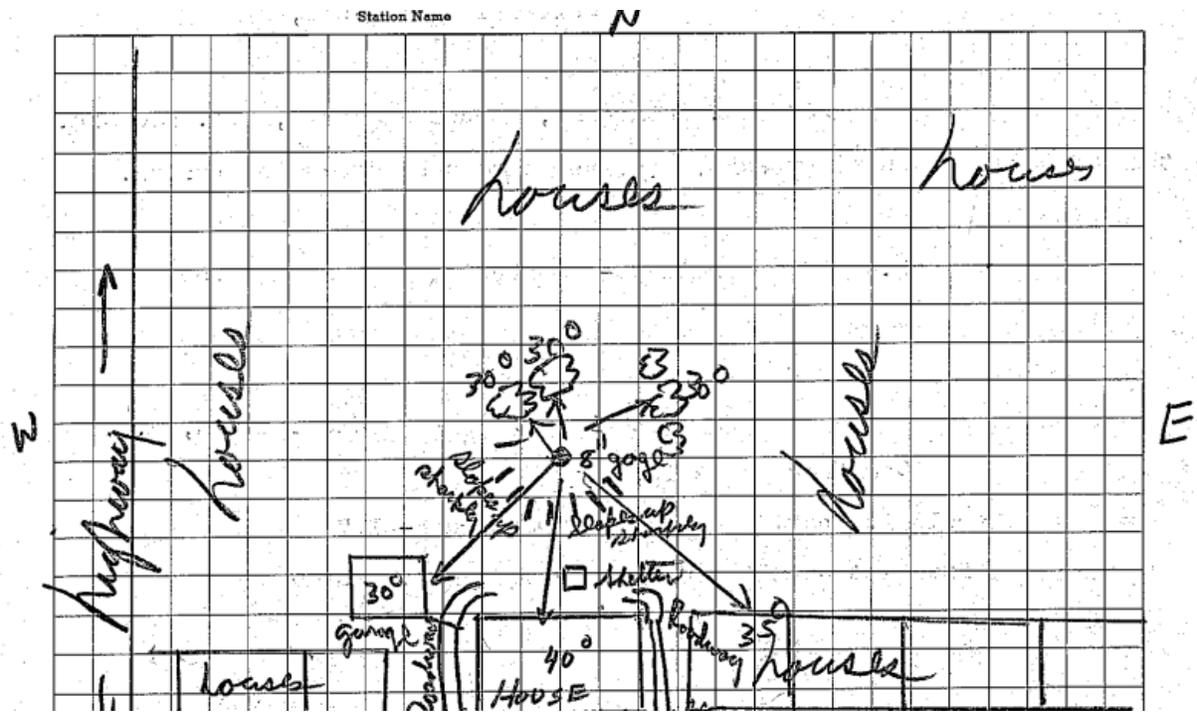


Figure 41. Sketch showing the Rutherford station at the time of operation. U.S. Weather Bureau archives.

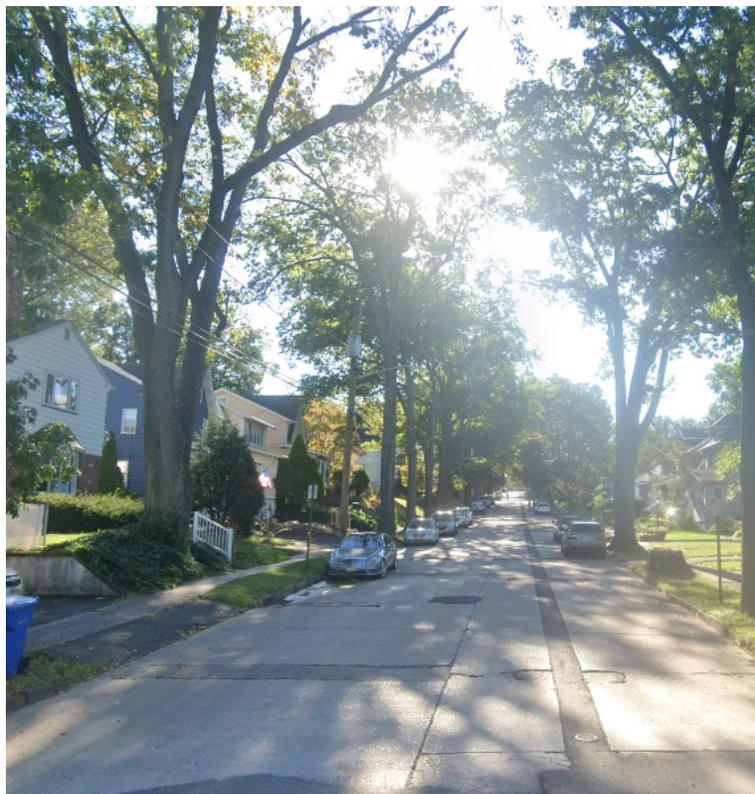


Figure 42. Street and neighborhood where the Rutherford station was located in 2021. Credit: Google.

**U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU
CLIMATOLOGICAL OBSERVERS' METEOROLOGICAL RECORD**

Station RUTHERFORD, County BERGEN, State NEW JERSEY Month DECEMBER 1947
 Standard of time in use EST Altitude 40.49 N., Longitude 75.01 W., Elevation 57 ft.
 Hour of observation: If once daily 5:00 PM; if at different times, temperature _____, precipitation _____

Date	Temperature			Precipitation (All types)				Snowfall (measured) inches and tenths		Prevailing wind direction for the day	Character of day except by sunset (Ave. obs.) (13)	Other weather conditions and notes including character of precipitation, as drizzle, show, sleet, glaze, hail, shower, squalls, and high winds, fog, fog, discharges, tornadoes, etc.
	Max. (1)	Min. (2)	1 Set max. (3)	Time of beginning (4)	Time of ending (5)	Time of beginning (6)	Time of ending (7)	Amount since last observation (8)	New snow since last observation (10)			
M 1	42	18	36					0		NW	0	
T 2	45	24	40					0		SW	7	
W 3	60	28	50					0		SW	8	
T 4	52	32	32					0		NW	8	
F 5	35	26	35	10:00A RAZ P	10:30A 8:07 P	11:00 P	11:00 P	0.08	0.1	NE	10	ONE HIGH WIND 5-10 S-S-TO 2-2-AM L-PM
S 6	42	29	29					0		NW	4	
S 7	44	29	40	4:27P	6:09P			0.04		SW	10	RW-
M 8	43	38	45	Na	7:39A			0.20		S	7	R-
T 9	45	32	32					0		NW	10	WINDY ALL DAY
W 10	40	26	32	5:47P	5:52P	7:30P	---	0.1	0.1	NW	4	E-NETLY S-EVE
T 11	39	28	31	---	Na			0.13	1.1	NW	4	S-
F 12	40	21	30					0	0.4	NW	1	
S 13	36	21	26					0	0.2	NW	7	
S 14	34	16	31					0	0.1	W	8	
M 15	40	20	36	7:00P	---			0.01	0	T SW	10	L-F PM
T 16	35	34	38	---	Na			0.77	0	NW	10	WINDY ALL DAY
W 17	39	27	32					0		NW	3	
T 18	42	25	26					0		NW	7	WINDY AFTN
F 19	35	19	27					0		NW	4	
S 20	36	14	25					0		NW	0	
S 21	43	23	34					0		NW	9	WINDY AFTN
M 22	43	29	34					0		NW	5	HA
T 23	35	27	29	7:30P	9:38P	9:50P	9:12P	0.30	2.8	NE	10	5-AM; S-PM; S-AM
W 24	38	20	24					0	2.0	NW	0	
T 25	35	11	22					0	1.7	N	0	
F 26	30	20	29	Na	8:45P	9:04P	---	0.04	29.1	NW	9	SEE REVERSE SIDE
S 27	35	22	35	---	Na			0.05	0.5	NW	9	5-6-AM; 7-8-AM; 10-11-AM
M 28	34	24	24	Na	8:00A	8:24A	9:09A	0.01	0.3	NW	4	5-6-AM; 7-8-AM
W 29	27	17	20					0	2.7	NW	1	
T 30	35	14	28					0	21.8	W	3	
M 31	33	25	30	11:43A	11:45A			T	19.8	N	10	SEE REVERSE SIDE
T 1st	32							0.73				
SUN	48	14	19					4.65	34.2	NW	10	13

(IN TRIPPLICATE)

(OVER)

HAROLD E. SCOTT
RUTHERFORD, NEW JERSEY

Station RUTHERFORD, NEW JERSEY
Month DECEMBER, 1947

16-6000-1 U. S. GOVERNMENT PRINTING OFFICE

Figure 43. Scan of original observation form from December 1947 for Rutherford.

ADDITIONAL DATA ON SNOW STORM
26-27 DECEMBER 47

1. HEAVY CONTINUOUS SNOW ALL DAY.
2. SKY OBSCURED BY SNOW.
3. WIND FROM N TILL NOON.
(VEERING ^{TO SW} & INCREASING AFTER 1200)
4. SNOW BEGIN DRIFTING AFTER 1200.
(SOME PLACES DRIFTS WERE 6 FT & MORE)
5. SNOW PELLETS, FELL BETWEEN
1930E - 2015E.
6. LIGHTNING OBSERVED AT THIS
STATION 2100E TO 2130E.
(NO THUNDER HEARD, HOWEVER, DUE TO
NOISE OF WIND & DRIFTING SNOW.)
7. MANY ROADS NOT PASSABLE ONE
WEEK AFTER STORM.
8. (APPROX) 200-250 CARS, TRUCKS, ect
became unmovable during 26 Dec 47. (AT RUT)
9. TWO DEATHS ~~AT~~ IN THIS AREA
(NAMES OF PERSONS UNK)

Figure 44. Scan of original observation form comments on reverse side from December 1947 for Rutherford.

About the 24-Hour Macopin Intake Snowfall Observation and Station

West Milford Township is a sprawling municipality which occupies the entire western half of upper Passaic County in northern New Jersey about 30 miles northwest of Manhattan. The upper portion of Passaic County is rugged hilly to mountainous terrain with lower valleys and is heavily wooded with numerous small natural lakes, creeks, and rivers. Elevations in the hills and mountains extend over 1000 feet in elevation in many cases to as high as 1490 feet.

In the 1800s, Newark, NJ, government officials had to develop supplying the city with clean drinking water due to its industrial base polluting local water sources. The East Jersey Water Company, which owned land in West Milford, agreed to supply Newark with a water system and proposed a dam in the Pequannock River and built reservoirs to store a supply of water (Amendment to the Northeast Water Quality Management Plan, Total Maximum Daily Load to Address Temperature in the Pequannock River Northeast Water Region,

Watershed Management Area 3 (Pequannock, Wanaque, Pompton and Ramapo Watersheds), 2005). The Macopin Reservoir was formed in the Pequannock River Valley by damming the river around 1890. A precipitation-only cooperative observer station began operating by the City of Newark Water Department on 1 January 1941 south of the intake to this dam on a small, slightly rugged land parcel with observations taken by staff who also maintained the nearby Charlotteburg site taking precipitation measurements with a water department-owned eight inch standard rain gauge. Snow measurements were taken but no equipment was documented. A water-level reader was later added. On 6 November 1960 the Newark Water Department discontinued the station. It later opened again in 1970 slightly downriver with various automated water level equipment owned by various entities before closing for good in 2016. The station in all instances used COOP ID 28-5071.

The Macopin Intake station reported at 0900 Local Time daily. A depth of 3 inches of snow was present on Christmas morning 1947. Snow commenced around 0145 Local Time on 26 December 1947 and, by report time, totaled 3.0 inches, yielding a liquid equivalent of 0.25 inch and increasing the depth to 6 inches. On 27 December 1947 the snow was reported to have ceased by the observer at 0400 Local Time and at observation the fall for the 24-hour period was 29.0 inches with 2.00 inches of liquid equivalent and a depth of 35.0 inches. Cloudy conditions were reported at observation time.

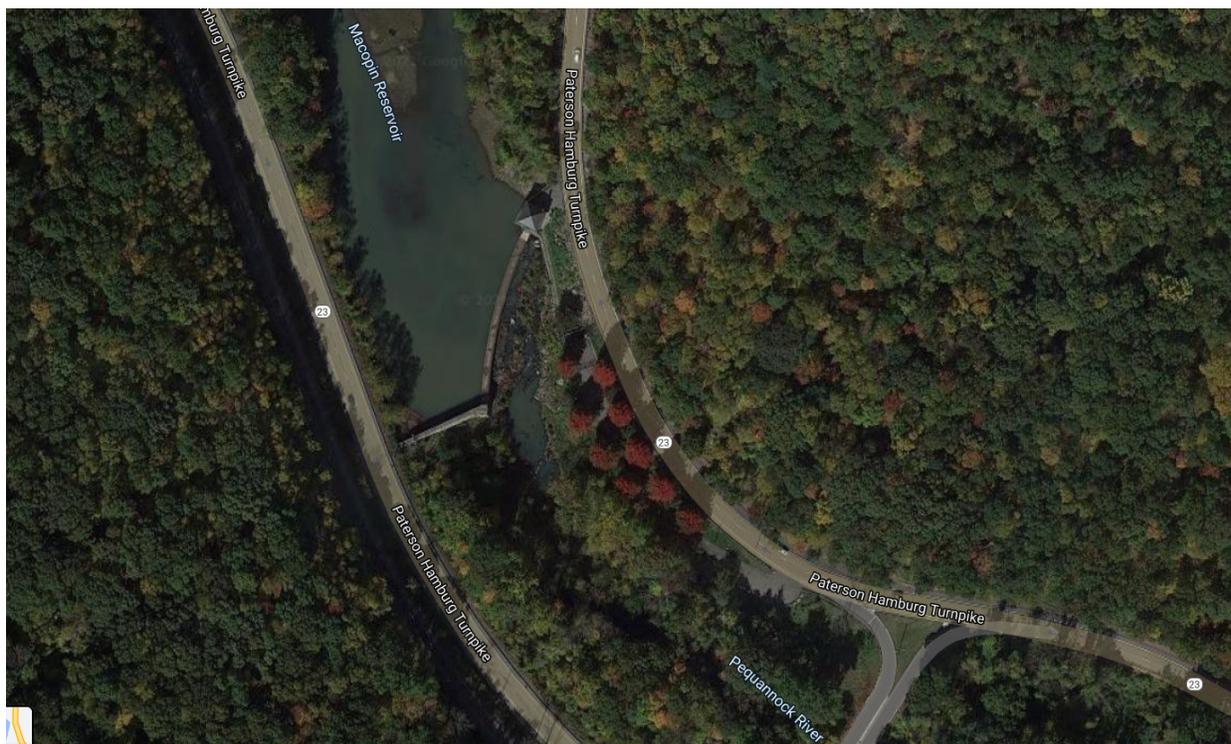


Figure 45. Map showing area where the Macopin Intake station was with the location near the northwest end of the red colored trees south of the dam near the center of this image.

Credit: Google Maps.

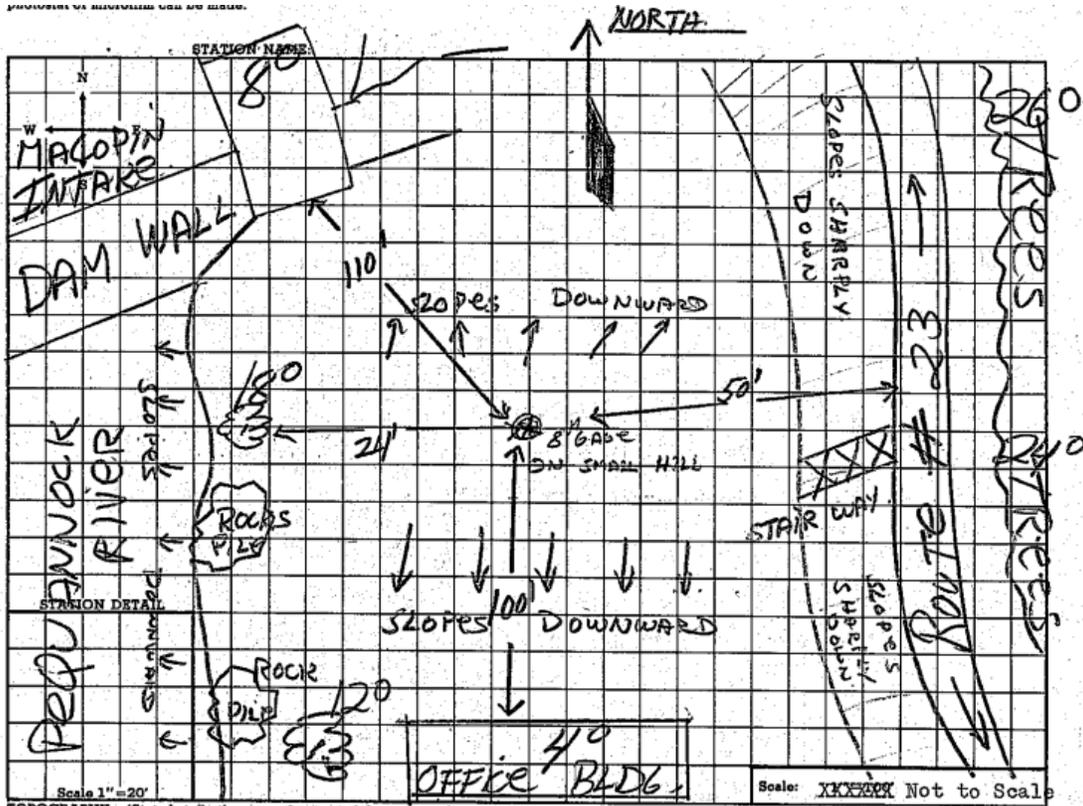


Figure 46. Sketch showing the Macopin Intake station in 1948. Credit: U.S. Weather Bureau archives.



Figure 47. Looking north from State Route 23 South toward the Macopin Intake site in 2018. Credit: Google.

U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU

Report of River Rainfall Station at Macopin Intake ^{NY} on the

Pogonogorsk River Drainage Area for the month of December, 1947

Time of observation 9:22 AM Meridian of time _____

THIS MARGIN FOR BINDING: MAKE NO ENTRIES

DATE	RIVER		PRECIPITATION					STATE OF WEATHER AT TIME OF OBSERVATION	REMARKS, SPECIAL OBSERVATIONS, GUEST STAGES, CHECK-GAN READINGS, ETC. Check last day preceding month:
	GRADE	CHANNEL NO.	TIME OF BEGINNING	TIME OF ENDING	AMOUNT	SNOWFALL IN INCHES	SNOW ON GROUND (INCHES)		
1								Clear	
2								Clear	
3								Clear	
4								Cloudy	
5			9:30 AM	7:30 PM				Cloudy	JAN 5 1948
6					0.18	X		Partly cloudy	
7			9:30 AM					Cloudy	
8				9:30 AM	0.25	X		Rain	
9								Clear	
10			6:30 PM					Clear	
11				1:00 PM	0.17	X		Clear	
12								Clear	
13								Clear	
14								Clear	
15			7:35 PM					Clear	Check last
16				9:15 AM	1.20	X		Cloudy	
17								Clear	
18								Clear	
19								Clear	
20								Clear	
21								Cloudy	
22								Clear	
23			9:30 AM		5.19	X	3.0	3.0	Snow
24				10:30 AM	5.18	X	1.0	3.0	Clear
25								3.0	Clear
26			1:25 PM		5.25	X	3.0	6.0	Snow
27				9:00 AM	5.00	X	5.0	35.0	Cloudy
28								3.0	Cloudy
29								3.0	Clear
30								5.0	Clear
31								3.0	Cloudy
Jan					9.37	X	35.0		

CONDITION OF RIVER AT GAGE
 (a) Obstructed by rough ice. (g) Ice gorge below gage.
 (b) Frozen, but open at gage. (h) Shore ice.
 (c) Upper surface of smooth ice (not included in gage and amount). (i) Floating ice.
 (d) Ice gorge above gage. (j) Pool stage.

Readings made from (Check one)
 Weigh-weight gage.
 Chain and weight gage.
 Staff or slope gage.
 Float tape.
 Boarding chart.
 Distance indicator.
 Telemeter.

Flood stage ft.
 Warning stage ft.
 Elevation of zero ft.
 Normal pool stage ft.

Examined by _____
 District center _____

9180 Item No. 2 on cover. 18-5740-1
 9180a Ruler precipitation of _____
 _____ Observer.

Figure 48. Scan of original observation form from December 1947 for Macopin Intake.

About the 24-Hour Long Branch Snowfall Observation and Station

Long Branch is a city on the northern Jersey shore in central New Jersey in Monmouth County located 32 miles due south of Midtown Manhattan. It was founded as a resort city and was a popular early-summer resort along the Jersey Shore as far back as the 1800s. The city is flat with a gradual slope to the east and borders directly against the Atlantic Ocean to the east. Elevations range to near 30 feet a few miles in inland parts of the city. Creeks on the northern side of the city drain north into the Shrewsbury River.

In 1896, a Storm Warning display station was established in Long Branch near the ocean at a telephone company building under the jurisdiction of the U.S. Weather Bureau. A cooperative weather station, COOP ID 28-4987, in Long Branch was initially established on 1 October 1907 and remained with a separate observer at their residence until 31 April 1912. In December 1909, William D. Martin became the Storm Warning observer, and on 1 May 1912 also became the cooperative weather observer as the station became co-located with the Storm Warning display station. This location on Broadway near the ocean at a telephone company building was one in which Mr. Martin also hoisted flags for weather forecasts issued by the U.S. Weather Bureau. Observations were taken twice each day at 0800 and 2000 Local Time. In June 1925, the cooperative observations were moved inland 1.4 miles to the observer's residence, however, the Storm Warning tower did not. The residence's equipment was located on the east side and rear of the house. In September 1925 Mr. Martin passed away and Carrie Martin took over as the warning flag display person. Eventually his son, William D. Martin, Jr. took over as station director and the observation time was changed to daily at 0700 and 1900 Local Time. The residence equipment became extensive with a cotton region shelter equipped with maximum and minimum thermometers, an eight inch standard rain gauge, tipping bucket gauge, wind recorder, wind vane, anemometer, barograph, hygrograph, and thermograph. The station was considered a Special Meteorological Station at this point and the observer was given a small payment for their services by the government. In 1933, the Storm Warning tower was moved to the residence. By June of 1939, the equipment consisted of maximum and minimum thermometers, both dry and wet, housed in a shelter, a thermograph, a thermograph-hygrograph, tipping bucket rain gauge, snow gauge with tripod, 8 inch standard rain gauge with a brass tube, two wind vanes, an anemometer, a sunshine recorder, a triple register wind recorder, a barograph, and both aneroid and mercurial barometers. A remark on a station visit states the observer has a complete meteorological station and kept all records as a regular U.S. Weather Bureau office would, with some parameters logged hourly. He also operated a tide gauge at the Long Branch pier and collected water temperatures and salinity data for the U.S. Army Corps of Engineers.

William D. Martin, Jr. also provided extensive interviews to area newspapers on the area's weather and climate as well as radio and phone forecasts. He remained as an observer

through the end of September 1965. After his passing in 1975, his widow donated the collection of the original weather record books the Martin family kept for over 50 years to the library at nearby Monmouth University. The Long Branch Storm Warning service was discontinued with Mr. Martin's death, however, the cooperative station was relocated then and several times since.

In December 1947, precipitation observations were taken by the observer from midnight to midnight with temperature readings occurring at 1930 Local Standard Time. The observer noted start and end times for precipitation on all events that month. The observer did denote snow depth readings to tenths of an inch. On Christmas Day, the observer reported a depth of 0.6 inch. On 26 December 1947, snow was reported to have begun at 0400 and fell to an amount of 28.4 inches at midnight with a liquid equivalent of 3.43 inches and pushing the depth to 28.4 inches. Temperatures never cracked freezing. On 27 December 1947, snow fell through 0400 and, upon ceasing, totaled 1.3 inches of snow with 0.13 inch liquid equivalent, with the depth recorded as 29.7 inches.

The observation-day total of 28.4 inches on 26 December 1947 comes up as a searchable amount in the GHCNd database. However, upon examining the form's monthly summary comment, the observer remarked not only that the snow on the 26th was the greatest on record, but that the greatest fall in any 24 hours was 29.7 inches on 26-27 December. This matched with the observer's precipitation start and end times. Thus, this 24-hour value at the Long Branch station would be investigated by the SCEC as well. It does not directly appear within the GHCNd database as a single value.

As stated, Mr. Martin was known for his interviews with area newspapers and a search of local newspapers revealed additional insight into his snowfall measurement technique during this event. According to a front page article in the 27 December 1947 edition of the *Asbury Park Evening Press*, Mr. Martin reported a fall that was attained after "several tests." Thus, the observer made several measurements and compared them for accuracy to determine the amount of snowfall.

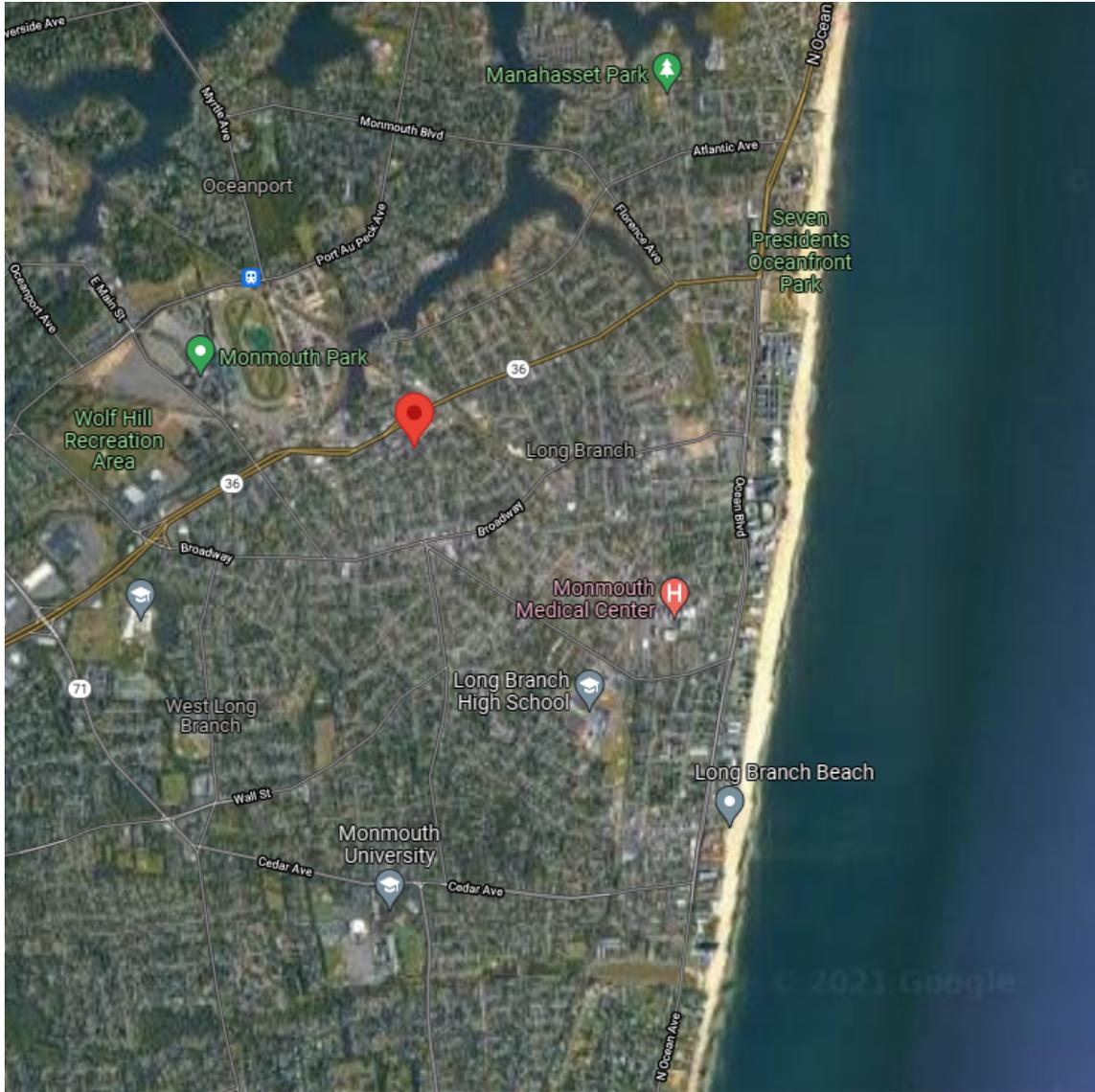


Figure 49. Map showing area where the Long Branch station was located in 1947 as indicated by the red marker. Credit: Google Maps.

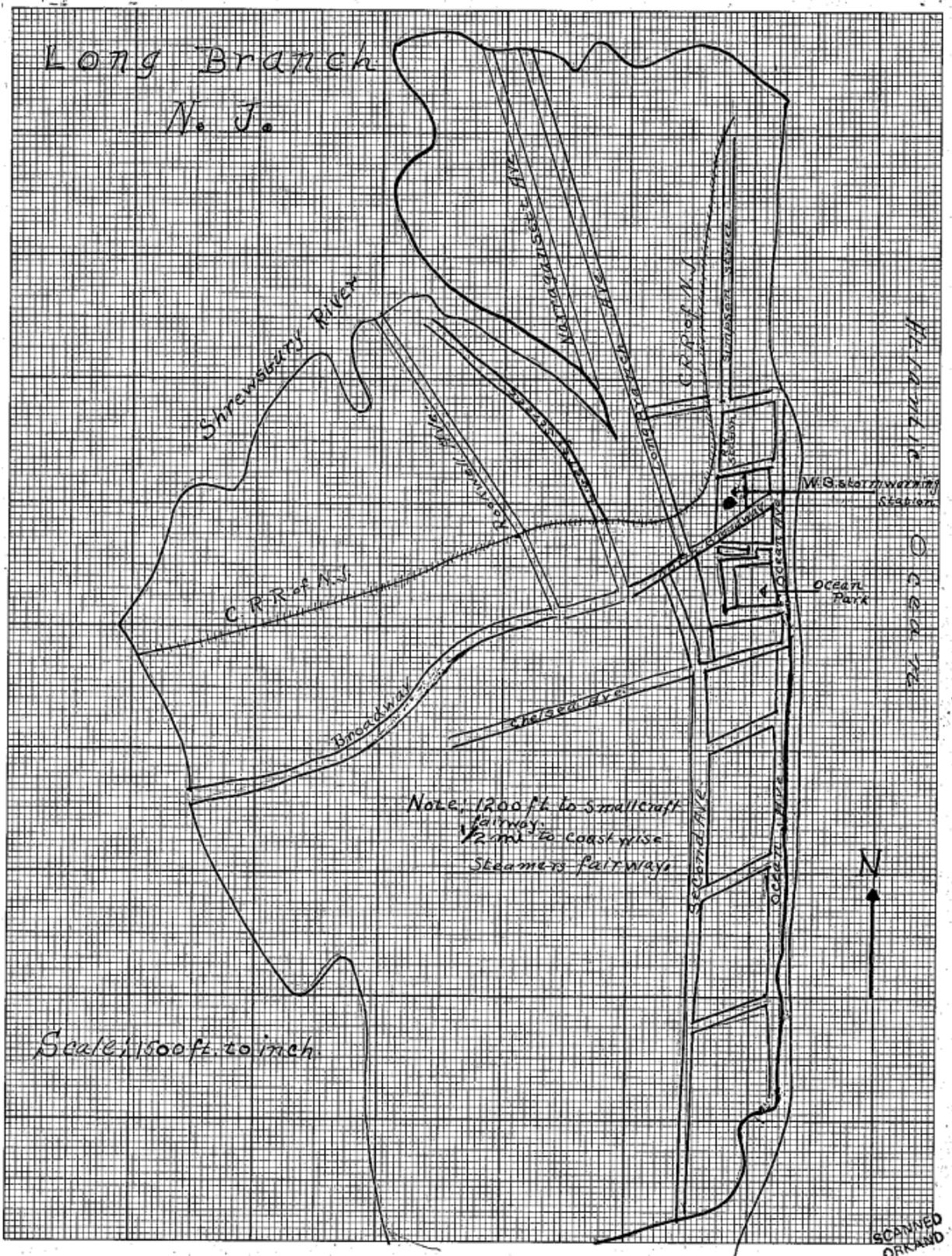


Figure 50. Location of Storm Warning station in Long Branch in 1938. Credit: U.S. Weather Bureau archives.

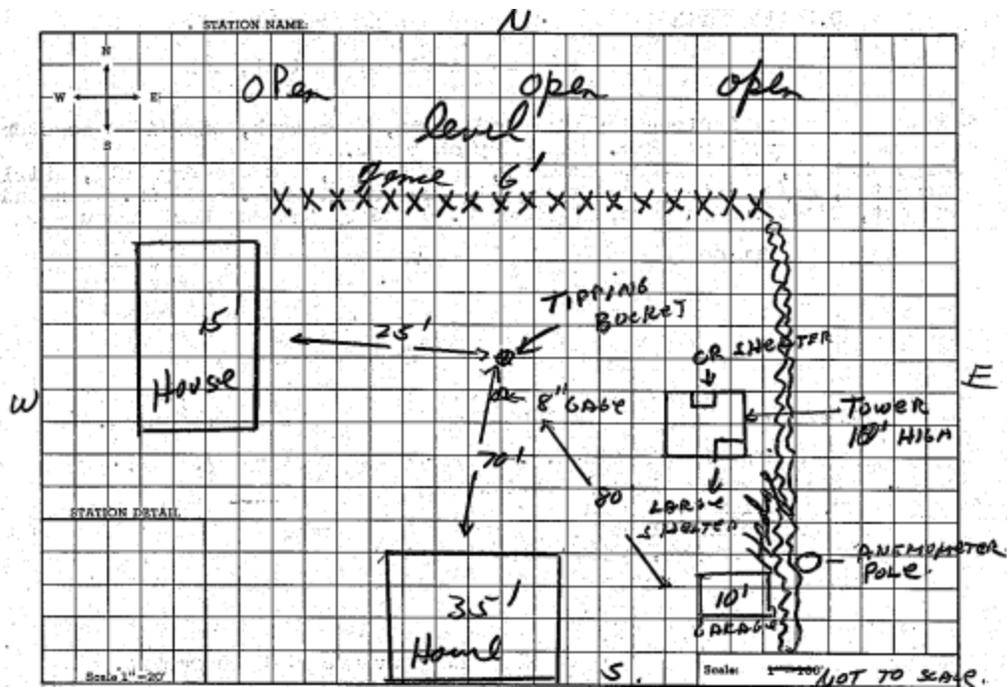


Figure 51. Sketch showing the Long Branch station in 1951. Credit: U.S. Weather Bureau archives.



Figure 52. Mr. Martin at the Long Branch station in 1960. Credit: U.S. Weather Bureau

archives.



Figure 53. Mr. Martin at the Long Branch station in 1960 checking equipment. Credit: U.S. Weather Bureau archives.

U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU
CLIMATOLOGICAL OBSERVERS' METEOROLOGICAL RECORD

Station Long Branch County Hudson State N. J. Month December 1947
 Elevation of time in use 18 Latitude 40 18 N, Longitude 74 00 W, Elevation 94 ft.
 Type of observation: If once daily 7:30 P.M.; if at different times, temperature _____, precipitation _____

Date	Temperature			Precipitation (all types)				Snowfall (inches and tenths)			Character of day (12)			Other weather conditions and notes including direction of precipitation, if any, snow, sleet, rain, drizzle, fog, etc., and time, amount, form, etc., if any, for rain, snow, sleet, etc.
	Max.	Min.	1st	Time of beginning	Time of ending	Time of beginning	Time of ending	Amount	Time of beginning	Time of ending	Time of beginning	Time of ending	12	
23	48	39	33					0.0	0.0	0.0	W	✓		
24	52	24	43					0.0	0.0	0.0	W	✓		Snow Halo
25	63	33	52					0.0	0.0	0.0	W	✓		
26	52	34	37					0.0	0.0	0.0	W	✓		
27	44	33	44	10 A	105 P	3 P	915 P	.12	0.0	0.0	S	✓		
28	44	33	38					0.0	0.0	0.0	NW	✓		
29	44	32	42					0.0	0.0	0.0	W	✓		
30	46	39	48	1130 A	350 A	630 A	846 A	.10	0.0	0.0	W	✓		
31	40	30	36					0.0	0.0	0.0	NW	✓		
1	39	24	37	6 P				.16	1.5	7	NW	✓		
2	38	22	35		230 A			.22	0.2	1.0	NW	✓		
3	39	22	31					0.0	0.0	0.0	NW	✓		
4	36	22	28					0.0	0.0	0.6	NW	✓		
5	36	18	28					0.0	0.0	0.2	W	✓		
6	40	31	36	655 P				.19	0.0	0.0	SW	✓		
7	52	33	38		445 A			.79	0.0	0.0	NW	✓		
8	37	27	29					0.0	0.0	0.0	W	✓		
9	48	26	29					0.0	0.0	0.0	N	✓		
10	36	23	28					0.0	0.0	0.0	N	✓		
11	34	17	26					0.0	0.0	0.0	W	✓		
12	43	22	34					0.0	0.0	0.0	NW	✓		
13	39	27	33					0.0	0.0	0.0	E	✓		Snow Halo
14	44	29	29	645 A	935 A	349 P	7 P	.31	1.5	1.3	N	✓		
15	32	22	26		1207 A			7	7	.8	NW	✓		
16	32	15	24					0.0	0.0	0.6	E	✓		Snow Halo
17	32	25	29	*A				3.43	28.4	28.7	NW	✓		
18	34	26	29		4 A			.13	1.3	1.9	NW	✓		
19	34	24	26	1030 A	1027 A	1177 A	1138 A	7	7	28.0	NW	✓		
20	27	16	23					0.0	0.0	27.0	NW	✓		
21	30	13	23					0.0	0.0	26.5	NW	✓		
22	37	24	35					0.0	0.0	25.0	NW	✓		
23	36							.47				✓		
SUN	267	761						5.29	32.9					

1 Reading of maximum thermometer immediately after writing and while hanging vertically.
 2 Including rain, hail, sleet, and melted snow. Enter on day of measurement.
 3 Enter temperature and precipitation for 1st day of following month.

Station Long Branch Month Dec 1947

Figure 54. Scan of original observation form from December 1947 for Long Branch.

Meteorological Plausibility of the 26-27 December 1947 Snowfall Observations

On the early morning of Christmas Day 1947, the surface weather map showed a wave of low pressure developing over Florida and another low pressure system over the Great Lakes. Additionally, an upper level trough set up over the Great Lakes. The low over Florida moved northeast and was east of the South Carolina coast on the afternoon of Christmas Day, then moved northeast and, by the morning of 26 December, was east of Norfolk, VA. By the afternoon of 26 December, the approaching upper level trough over the Great Lakes helped pull the surface coastal low on a more northward trajectory and it was then located southeast of eastern Long Island, NY, and slowed as it was blocked by a surface high that had been over New England a day earlier (Figures 55-56). By the morning of 27 December,

the low had moved slowly to near the islands off southeastern Massachusetts. Meanwhile, a surface high pressure was centered over eastern Canada. This set up a tight pressure gradient over New Jersey helping to generate gusty winds as the low worked east of New Jersey. Wind gusts were greatest late on 26 December in south Jersey gusting to 36 mph at Lakehurst Naval Air Station and early on 27 December in North Jersey when gusts reached 45 mph at Newark Airport and 35 mph at Teterboro Airport. Despite the winds, reports from the U.S. Weather Bureau at the time indicate drifting of snow was not as severe as that seen in March 1888.

With sufficient moisture, cold air, and lift in place and a storm that slowed enough in forward speed as it passed by offshore, snow fell across New Jersey spreading from south to north on 26 December. Lakehurst reported snow commenced at 0035 Local Time and by 0346 snow began at Newark. Snow was greatest in intensity at Lakehurst in the late morning when visibility dropped to a half-mile. The U.S. Weather Bureau station at Sandy Hook noted in their six hour synoptic observations that 12.0 inches of snow fell on the 26th from 0730 to 1330 Local Standard Time. Newark reported heavy snow with a quarter-mile visibility from 1759 through 2015 on the 26th. During this time, the U.S. Weather Bureau station in Manhattan at The Whitehall Building across from Battery Park measured snowfall rates of 3 inches an hour or greater. Snow intensity decreased in the evening and snow grains were reported late on the 26th and early on the 27th briefly at Newark and Teterboro. Snow finally ended at Newark at 0225 on 27 December and 0325 at Teterboro.

The Tri-State Area had grinded to a standstill due to the rapid and heavy snowfall amounting to all-time single-storm records being set at the climate stations at Newark Airport and Central Park of 26.0 inches and 26.4 inches, respectively. These records held until 7-8 January 1996 at Newark and 11-12 February 2006 at Central Park. The heaviest totals were over two feet across Bergen, Hudson, Passaic, Essex, and much of Union counties, as well as pockets of eastern Monmouth County. Event totals surpassed 30.0 inches at cooperative stations in West Milford in Passaic County, with 28.0 to 29.0 inches falling in nearby Ringwood and Wanaque as well as 26.0 inches in Little Falls and 24.0 inches in Paterson. In Bergen County, 27.0 inches fell in Lyndhurst, Old Tappan, and Ridgewood at unofficial locations and by a cooperative observer in Ridgefield. Jersey City in Hudson County reported 26.2 inches at their cooperative observing site. Cooperative observers in Union County measured 26.0 inches in Elizabeth, Rahway, and Westfield. Amounts tapered off west and south, with the exception of parts of northern and eastern Morris County and the Monmouth County coast, which received below 20 inches. Snowfall amounts in Monmouth County unofficially reached as high as 30.0 inches at Keyport and Red Bank, while 20.0 inches was measured at Fort Hancock on Sandy Hook and only 16.0 inches in Freehold. Amounts were as low as 5.0 inches at the Millville Municipal Airport in South Jersey. The heavier snow fell in areas closer to where the storm had moved more slowly.

A total of 23 deaths were attributed to the storm in New Jersey by the U.S. Weather Bureau.

Many perished in vehicles. Workers were trying to get home from work in the snow. Numerous accidents occurred, motorists were stranded, and access into many areas was cut off as roads were not immediately cleared of snow, threatening deliveries of supplies to area businesses. Articles in the *Bergen Evening Record* newspaper reported that 200 people spent the night of the 26th stranded at the Hackensack Municipal Bus Terminal and 5 people slept in unoccupied jail cells at the nearby police station. Others trekked into stores to buy out cots and blankets to use in offices as makeshift hotels. In another instance, nurses walked to a hospital to get to work. On the reverse side, taverns in areas with stranded workers reported busy business.

The SCEC found the highest 3 values in GHCND to be of excellent quality with the observers all providing valuable details, especially precipitation start and end times, remarks, realistic liquid equivalent values, and reasonable increases in snow depth during the event and decreases from compaction afterwards. The meteorology credentials of the Rutherford observer and the exceptional dedication by the Long Branch observer further boosted confidence in their reports. All of the 3 sites had complete daily data for the month including snow depth. The SCEC felt the Long Branch observer totaling the snow from two separate daily entries was acceptable since the precipitation start- and end-times captured the fall entirely within 24 hours. In addition, the observer clearly remarked that they measured 29.7 inches in 24 hours. Surrounding surface observations at airport stations supported this event occurred over 24 hours or less, as did various area newspaper reports. The SCEC agreed unanimously to put the Long Branch 24-hour total to vote and accepted it 5-0 as the new 24-hour state snowfall record for New Jersey. No vote was held on either the totals from Rutherford or Macopin Intake of 29.1 inches and 29.0 inches respectively, as they were exceeded by the Long Branch 24-hour total of 29.7 inches. Similarly, the 28.4 inches at Long Branch on 26 December 1947 was surpassed by the 24-hour total there and not voted on.

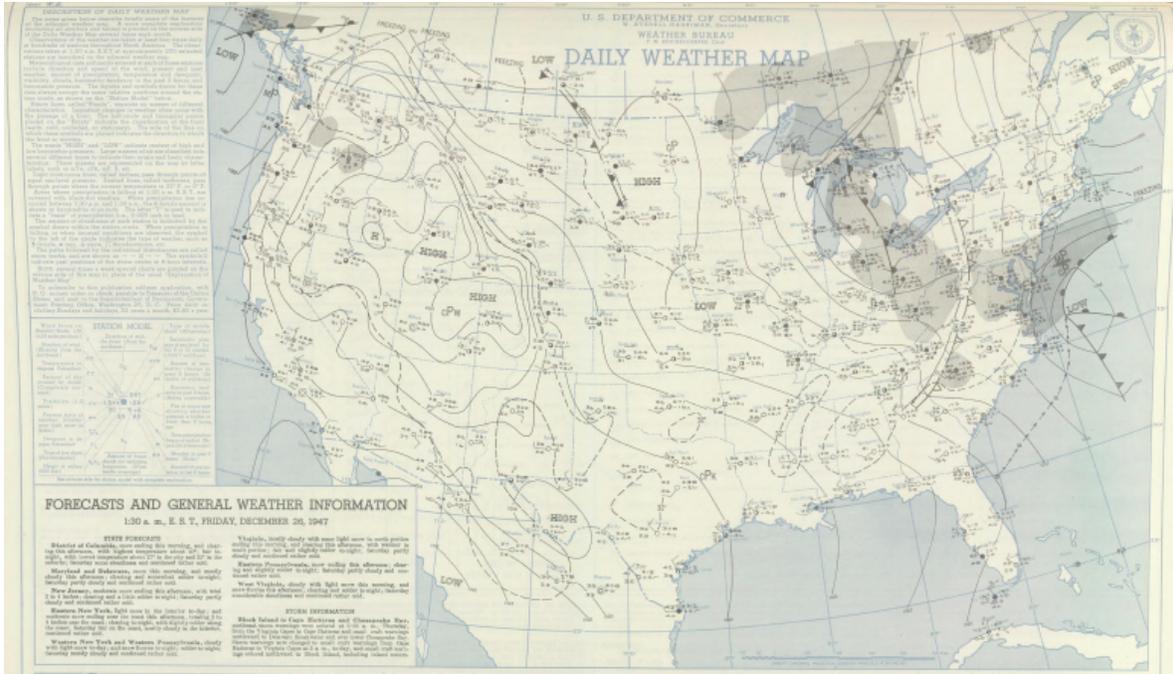


Figure 55. Daily weather map from 26 December 1947 from the U.S. Weather Bureau.

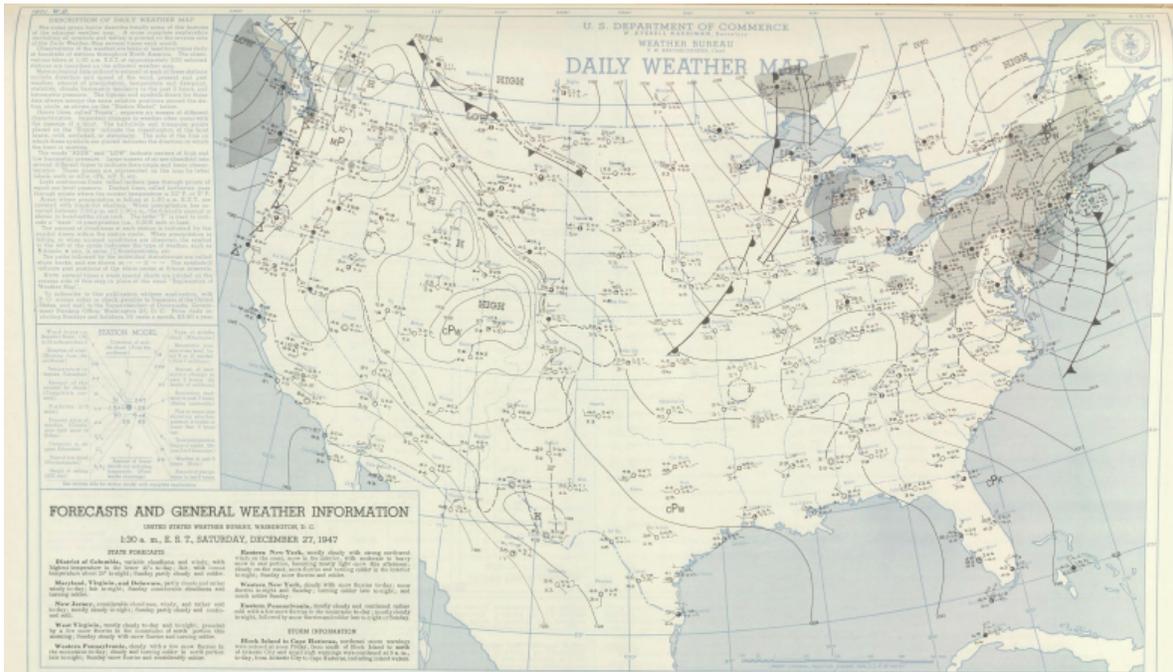


Figure 56. Daily weather map from 27 December 1947 from the U.S. Weather Bureau.

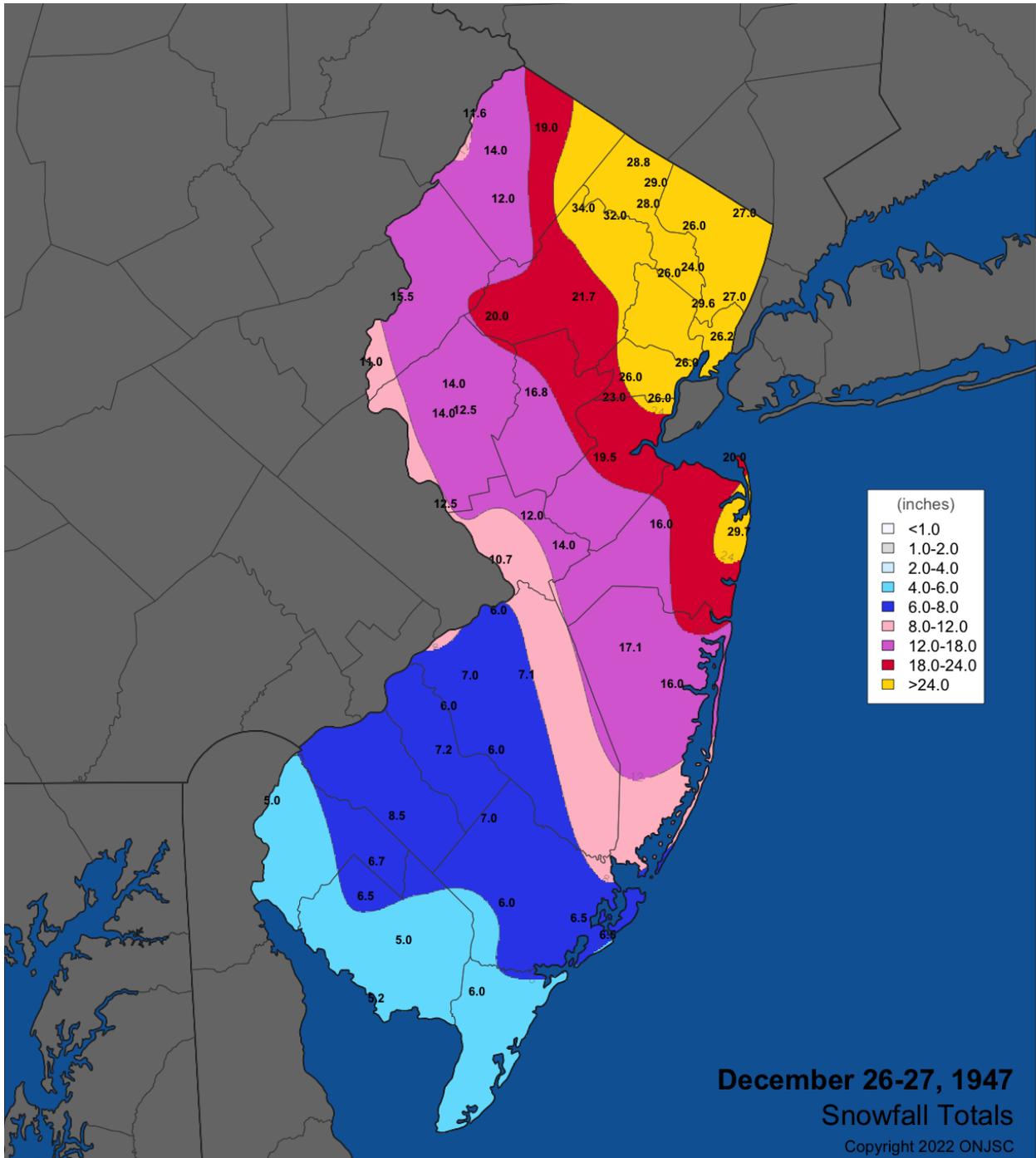


Figure 57. Observed snowfall map of New Jersey area snowfall totals reported to the U.S. Weather Bureau from various sources with select supplemental reports from published newspapers. Not all reports are official. Courtesy ONJSC.

30-Inch Snow Blankets Shore

New York City Is Paralyzed By Snowstorm

Metropolis Struggles to Dig Out From 25.8-Inch Fall—26 Die

In Storm Area

NEW YORK (AP)—The nation's greatest metropolis made a dash for life today as it struggled to dig out from under a record 25.8-inch snowfall that paralyzed much of its vast transportation system and virtually closed traffic from its normally crowded streets.

Increasing the 30-inch down-fall left by the famous blizzard of 1946, the storm event in with precipitation fell early yesterday, piled the area with an average monthly fall of 1.8 inches and ended officially 13 hours and 15 minutes later. More than three inches melted once between 3 and 4 p. m. today.

In left deep snow deposits and a death toll of at least 21 in the storm belt which embraced parts of New England, Pennsylvania, New Jersey and northwestern New York and extended south to include Washington, New Jersey, reported twelve dead and New York alone a total of three attributed to complications in handling the glass.

The snow was heaviest in the metropolitan area. Technically not a blizzard since it was accompanied by high winds and near-free temperatures, the snowed wrought conditions known during the day to many it, and a temporary halt in the weather history.

Transportation Crippled

It closed and in some cases stopped railroad transportation. Virtually all bus lines, interstate highways and air routes were brought to a standstill.

Nearly all scheduled harbor craft departed under the snow. The area of remained tied to in the port, while ferry boats, a major metropolitan lifeline, ground to a halt in the morning. In 15 minutes to a half hour behind schedule.

The city's subway and elevated lines stopped well behind schedule and homebound drivers on a snow-bound street.

The Hudson valley which connects the city to West Orange, within the hours under the Hudson river. The heavy blanket of 181 inch low stations were filled to overflowing and it was clear the situation grew as more additional problems were expected to hamper the system—and other transportation.

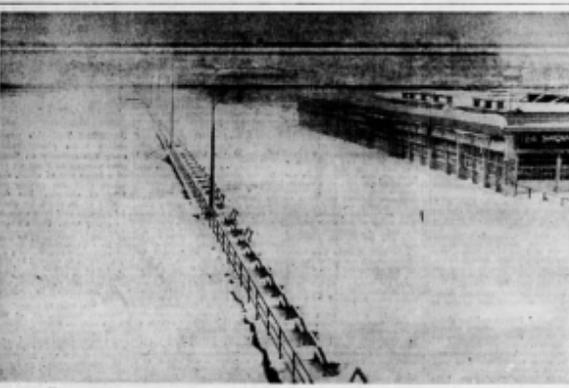
City's usually congested streets all were congested and by the time the snow stopped falling, the city was a sea of white. The snow was piled high with drifts, with a few feet in some places.

The city's night shift was still in the transportation work. Transportation work was hampered because reported hours of 12 to 15 percent and Broadway street was virtually blank.

Commuters Stranded in Thousands of commuters sought hotel rooms in the city, awaiting or arranged themselves in overnight at hotels.

A wholesale shortage of fuel was seen by one and all dealers who reported long lines of cars waiting for at least five days and to ask further deliveries will shortly be cleared. Fuel deliveries, which were expected to be in short supply, were expected to be in short supply.

All available sources were expected to be in short supply.



SHOW PROMENADE—A beautiful promenade was presented on the Asbury Park beachfront today but only a few people were to see the show. A Press photographer took this picture from the top of Convention Hall. (Press Photo—Sunday)



MODERN DESIGN—These smooth white rounds were a typical sight around the Shore this morning as the snow drifted over the cars during the night. The picture was taken on Sixth avenue near the boardwalk. (Press Photo)



SHOVEL WEATHER, SHOVEL—Many persons spent a good many hours yesterday and this morning with shovels in their hands. The gentleman in the picture was found unearthing his car on Summerfield avenue. The snow was falling about as fast as he could clear the last layer away. (Press Photo)

Traffic Paralyzed By 24-Hour Fall

Many Snowbound, Cut Off From Food and Fuel Deliveries, by Record-Breaking Storm—Two Deaths

Two and a half feet of snow blanketed the Shore today, paralyzing traffic, leaving many persons snowbound in their homes and cutting many off from deliveries of food, fuel and other supplies. New Jersey was digging out of the heaviest snowstorm ever recorded.

At least two persons were dead as a direct result of the storm and a half dozen others were hurt in auto accidents and in falls reported at a late hour this morning in the district. Three persons collapsed while walking.

The storm began at Asbury Park about 11 p. m. and continued to pile up snow until 11 a. m. today when it stopped in that still heaviest snowfall of 1947 was 25.8 inches and the top wind was only 15 miles per hour.

In 1941, winds of gale intensity and heavy snow accompanied the storm. The heaviest snowfall of 1947 was 25.8 inches and the top wind was only 15 miles per hour.

Communication lines were snarled through most of the town. Telephone lines suffered little immediate damage and traffic, the all year old that system must dig out their cables and wires.

Communication lines were snarled through most of the town. Telephone lines suffered little immediate damage and traffic, the all year old that system must dig out their cables and wires.

Communication lines were snarled through most of the town. Telephone lines suffered little immediate damage and traffic, the all year old that system must dig out their cables and wires.

Storm Brings Odd Incidents

Wrecked Fall on Record

The Shore this morning was digging itself out of a snowfall of 25.8 inches, the heaviest weather-recording amount. From the start of a 24-hour storm, the last blizzard since snow down to 10 inches, the storm had been in every snow record.

Confusion still was the heaviest and the shore area. Snow again was piled up on the shore. The snow was piled up on the shore. The snow was piled up on the shore.

The North Jersey Shore got out of the snow of the storm which began over the entire northern shore of the metropolitan area had a little over 25 inches of snow. At about 11 p. m. today, the snow was piled up on the shore.

William E. Martin, the U. S. weather observer at Long Beach, said that the snow had fallen at 25 inches. The figure was obtained after several tests, he announced.

In the first 24 hours of the storm, snowfall of that heaviest there was only 20 inches. Forecasters said that today, temperatures there were lower than those of yesterday and today and winds of north westerly nature, up greater drifts than those which contributed snow-covered areas.

City Man Found Dead

An Asbury Park man was found dead of a heart attack in his room at the Hotel Elmer, Ocean Township, last night.

A car was towed off the truck by a lumberer at the beachfront of the Elmer Hotel, a trucker, truck stalled on the truck at night's close. Police were called to help by a man at 3 a. m. today. They were called to the shore.

Two men were found dead in the storm. One was a man who was found dead in the storm. The other was a man who was found dead in the storm.

Former Sheriff Discontinues Suit

Former Sheriff Morris J. Wood, who today dismissed voluntarily a libel action which he brought against The Press and its editor in 1946, he asked that he be allowed to discontinue with the suit.

Wood, who was a member of the New Jersey State Bar, said that he was a member of the New Jersey State Bar, said that he was a member of the New Jersey State Bar.

WHO'S KIDDING WHOM?

The sign in this picture seems of no account but we will indicate the law today on the deep drifts will prevent a car from getting within 10 feet of the curb. Joseph Moore manages a waste on his sign around the way in sign.

The sign in this picture seems of no account but we will indicate the law today on the deep drifts will prevent a car from getting within 10 feet of the curb. Joseph Moore manages a waste on his sign around the way in sign.

Figure 58. The front page of the *Asbury Park Evening Press* on 27 December 1947 which references the Long Branch cooperative snowfall observer measurement and methodology in an article.

Finding of Committee on 24-Hour Snowfall Record

For many years, the *New Jersey Weather Book* published by David Ludlum in 1982 served as a pseudo-official record book for New Jersey state records due to a table assembled at the front of the book by the author from National Weather Service-sourced data. The author opted to recognize then the 28.4 inches of snow at Long Branch on 26 December 1947 as the highest 24-hour snowfall in New Jersey. In the days prior to the existence of the SCEC, such a value may have been cited in sources as a state record. Even then, the latest finding by the SCEC at this same station has discovered a higher value.

In summary, the table below lists the station name, COOP or GHCNd ID number, value, date of occurrence, vote, and decision by the SCEC over the New Jersey records investigated in this report.

Station Name	ID	Value	Date of Occurrence	Vote	SCEC Decision
Sussex	COOP Station 28-8644	30.0 inches*	26 January 1905	5-0	Reject
Bernards Township 1.5 S	CoCoRaHS NJ-SM-53	30.0 inches	23 January 2016	5-0	Reject
Westfield 0.1 NE	CoCoRaHS NJ-UN-7	29.8 inches	27 December 2010	5-0	Reject
Essex Fells Service Building	COOP Station 28-2768	29.5 inches*	8 January 1996	5-0	Reject
Long Branch	COOP Station 28-4987	29.7 inches	26-27 December 1947	5-0	Accept
Rutherford	COOP Station 28-7833	29.1 inches	26 December 1947	No vote	Valid value but not record
Macopin Intake	COOP Station 28-5071	29.0 inches	26-27 December 1947	No vote	Valid value but not record
Long Branch	COOP Station 28-4987	28.4 inches	26 December 1947	No vote	Valid value but exceeded by 24-hour total noted by observer

The SCEC requests NCEI remedy the values denoted by an asterisk (*) to respective multi-day values as noted in detail in the report. This removes them from consideration for a state record for 24-hour snowfall. Additionally, the SCEC requests the 30.0 inch value at Bernards Township be invalidated and removed from the GHCNd database as well as the Westfield 29.8 inch value.

The following observation was examined by the SCEC to determine its validity and potential status as the greatest 24-hour snowfall total measured in New Jersey and is considered to be the true and valid record:

- **Location:** Long Branch, New Jersey
- **Site Type:** National Weather Service Cooperative Weather Observing Station
- **COOP Station ID:** 28-4987
- **24-Hour Snowfall Value:** 29.7 inches

- **Date:** 26-27 December 1947

The unanimous agreement of the SCEC, based on evidence as stated above, has determined that the 29.7 inches measured at Long Branch from 26-27 December 1947 should stand as the record for 24-hour snowfall for the State of New Jersey. The SCEC made their determination on the call held on 23 September 2021.

NCEI Climate Monitoring Chief Decision:

Approved

as recommended in boldface above:

Not approved

returned to SCEC with no action taken:

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Committee Members (Voting) on Long Branch record:

- Valerie Meola, Meteorologist, NWS Mount Holly, NJ
- Chris Stachelski, Observing and Climate Program Leader, NWS Eastern Region
- Keith Eggleston, Regional Climatologist, Northeast Regional Climate Center
- Dr. David Robinson, New Jersey State Climatologist
- Karin Gleason, National Centers for Environmental Information, Asheville, NC

Voting members above also represented the Sussex and Bernards Township votes. For Westfield and Essex Fells the NWS voting member was changed to Tim Morrin, Observing Program Leader at NWS New York.

Additional teleconference participants:

- Lee Robertson, Observing Program Leader, NWS Mount Holly, NJ
- Alex Staarmann, Meteorologist, NWS Mount Holly, NJ
- Ross Dickman, Meteorologist-in-Charge, NWS New York, NY
- Mathieu Gerbush, Assistant New Jersey State Climatologist
- Bryant Korzeniewski, National Centers for Environmental Information, Asheville, NC

References

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