

HISTORY OF WEATHER OBSERVATIONS
Columbus, Mississippi
1856 - 1956

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Connie Lisowski, Wing Historian at the Columbus Air Force Base, took time to review base historical archives regarding weather observing at the base during the 1940s and 1950s. Connie also met with the author and reviewed what she had found. Thanks to her time and work, the locations of weather observations at the base during the 1940s and early 1950s were better defined.

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HISTORY OF WEATHER OBSERVATIONS

Columbus, Mississippi

1856 – 1956

Gary Grice

INTRODUCTION

Historical Overview

Columbus, MS is located in Lowndes County (county seat) in northeast Mississippi (Figure 1).

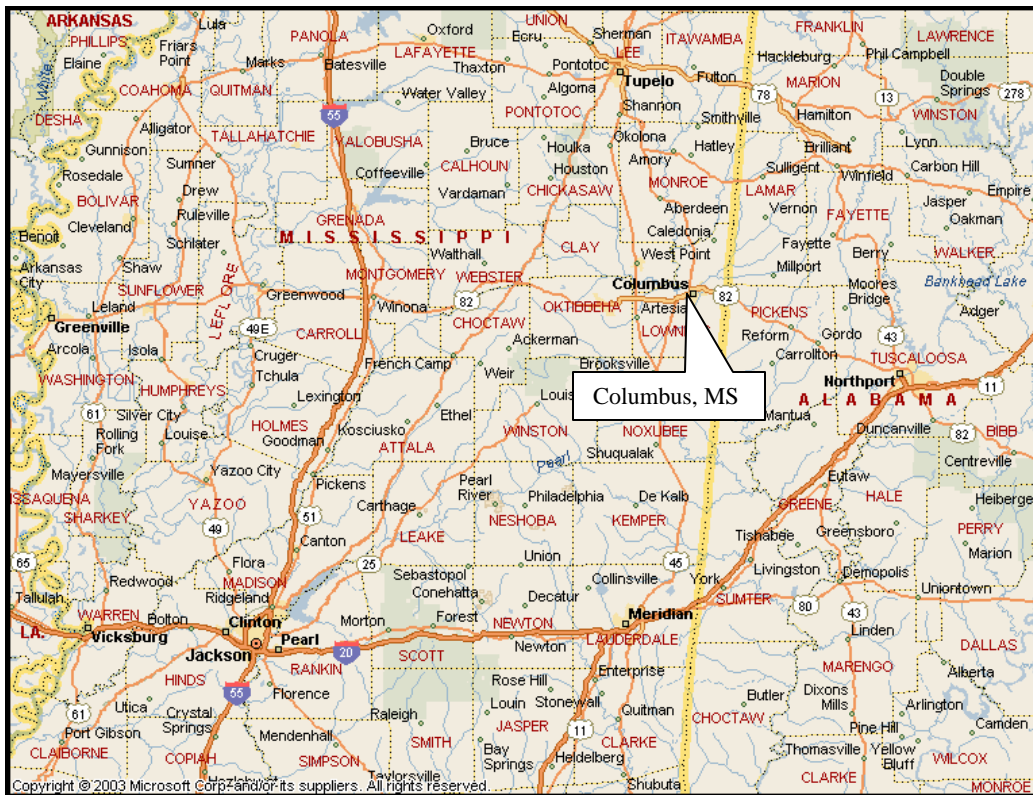


Figure 1. Location of Columbus, MS. East-west distance across the map is approximately 240 miles.

The city is situated just north of the juncture of the Tombigbee River and Luxapalila Creek, with the former bordering the west side of the city center and the latter the east side (Figure 2). The topography of southern and eastern Columbus is relatively flat with northwest Columbus consisting of rolling hills.



Figure 2. Downtown Columbus with respect to Tombigbee River and Luxapalila Creek. Information is plotted on a current map of Columbus. North is at the top of the page. East-west distance across the map approximately eight miles.

Choctaw and Chickasaw Indians initially inhabited the area around Columbus with Hernando De Soto and his men the first European explorers to the area. The first settlement at Columbus was made in 1817 when Thomas Thomas built a small log-hut near the current downtown area. The town was first called “SHOOK-HUTTAH-TOM-A-HAH,” an Indian name for “Opossum Town.” During the winter of 1819-1820, the U.S. Army opened a “Military Road” from New Orleans to Nashville, passing through the center that was to become Columbus. The city was founded in 1821 and the first steamboat (named Cotton Plant) arrived in 1822.

Columbus grew during the mid 1800s as cotton and other agricultural goods were grown in the surrounding area and shipped to market by river transportation. Steamboats transported cotton and other crops downriver to Mobile, Alabama, returning in approximately five days with furniture and other merchandise to be sold in local stores.

The period from 1835 through 1860 was the Golden Age for Columbus. Cotton production was thriving and the area booming. Ornate homes, built by expert craftsmen for elegant entertaining, were springing up across the city. By the early 1850s the city had a population of 3,500 with a number of churches, stores, blacksmiths, hotels, and livery stables. In 1852, 37 manufacturing establishments were operating, producing approximately \$120,000 annually. Six schools were operating with 300 students.

Columbus was spared much of the ravages and destruction of the Civil War; however, it did serve as a hospital town for wounded soldiers, both Confederate and Union. Following the Battle of Shiloh, approximately 3,000 wounded Confederate troops were brought to Columbus. The impact on the city was so large that many city buildings and residences had to be converted into makeshift hospitals. Because Columbus was not the center of combat during the Civil War, many of its antebellum homes survived, making its collection of homes second in the state only to Natchez.

Following the Civil War and for the remainder of the 1800s, Columbus grew both financially and in prominence -- growth that continued through the first half of the 20th Century. On 13 January 1942, an Army Air Field opened approximately 10 miles north of the city as a flight training school. In March 1942, the base was named Columbus Army Flying School, becoming the Columbus Army Air Field. The air field saw considerable activity during World War II, but in 1946, the War Department deactivated the base as the country reduced military activity after the war. On 20 December 1950, Columbus Air Force Base reopened, and on 1 April 1955, became part of the Strategic Air Command (SAC), continuing into the 1960s. In the early 1950s, the Columbus-Lowndes County Airport opened in southeast Columbus.

The history of weather observing at Columbus is unique in that no Signal Service or Weather Bureau offices were in the city. Weather observations from 1856 through 1956 primarily were taken by individual citizens, although the U.S Army Medical Department took observations in the late 1860s and supplemental aviation weather observations were taken by the U.S. Army Air Corps, U.S. Air Force, and by Southern Airways during the 1940s and early 1950s.

Earliest observations (in the National Climatic Data Center database) at Columbus were in 1856, taken by James S. Lull as part of the Smithsonian program. Mr. Lull continued to take observations until 1871. John F. Tarrant took observations in Columbus for the Smithsonian from 1871 into 1872 and U.S. Army surgeons took observations in 1868 and 1869.

From 1883 through 1956, weather observing in Columbus was part of the Signal Service/Weather Bureau Cotton Region, Voluntary, or Cooperative Observing Programs. Individual citizens observed the weather at various locations in Columbus for the 73 year period. In 1942, a supplemental aviation weather observing program was started at the Columbus Army Flying School, located approximately 10 miles north of the city. These observations continued until 1945. In 1949, supplemental aviation weather observations began again at the Columbus Air Force Base, but were moved to the Columbus Municipal Airport (Columbus-Lowndes County Airport; located approximately three miles southeast of the city) in 1953. Supplemental aviation weather observations continued at the Columbus Municipal Airport through 1956.

Goal of the Study

The goal of this study is to document the primary weather observational path at Columbus, MS from its beginning in the mid 1800s, through the mid 1950s. Descriptions of Columbus weather observations since the mid 1950s are available through easily obtainable climatic records, with the challenge being to identify and define the roots of the path that began in the mid 1800s and continued into the 20th Century. Extrinsic observations, i.e., those by Voluntary (or Cooperative) observers, were the primary source of climatic information at Columbus since neither the Signal Service nor Weather Bureau had a weather office in this city. This report focuses on those events that led to the routine, formal weather observing program of modern times.

LOCATION OF OBSERVATIONS

NOTE – Between 1885 and 1890, the names of most of the streets in Columbus were changed. The new naming system employed street numbers with avenues oriented primarily east-west and streets north-south, replacing a system of proper names for all streets. Between 1900 and 1905 the avenue numbers were changed again with each avenue numbered one number larger, e.g., 5th Avenue North became 6th Avenue North. This was caused by 1st Avenue North and 1st Avenue South being changed to 2nd Avenue North and 2nd Avenue South respectively. Only minor changes occurred subsequently, e.g., 2nd Avenue South was changed to College Street. The current system will be used in this report with previous street names included in parenthesis (for stations up to 1893).

Smithsonian Observers (1856-1872)

Figure 3 shows the locations of weather observers in Columbus for the period 1856 to 1906 and Figure 4 shows the locations of weather stations (not including aviation weather observing stations) from 1906 through 1956.

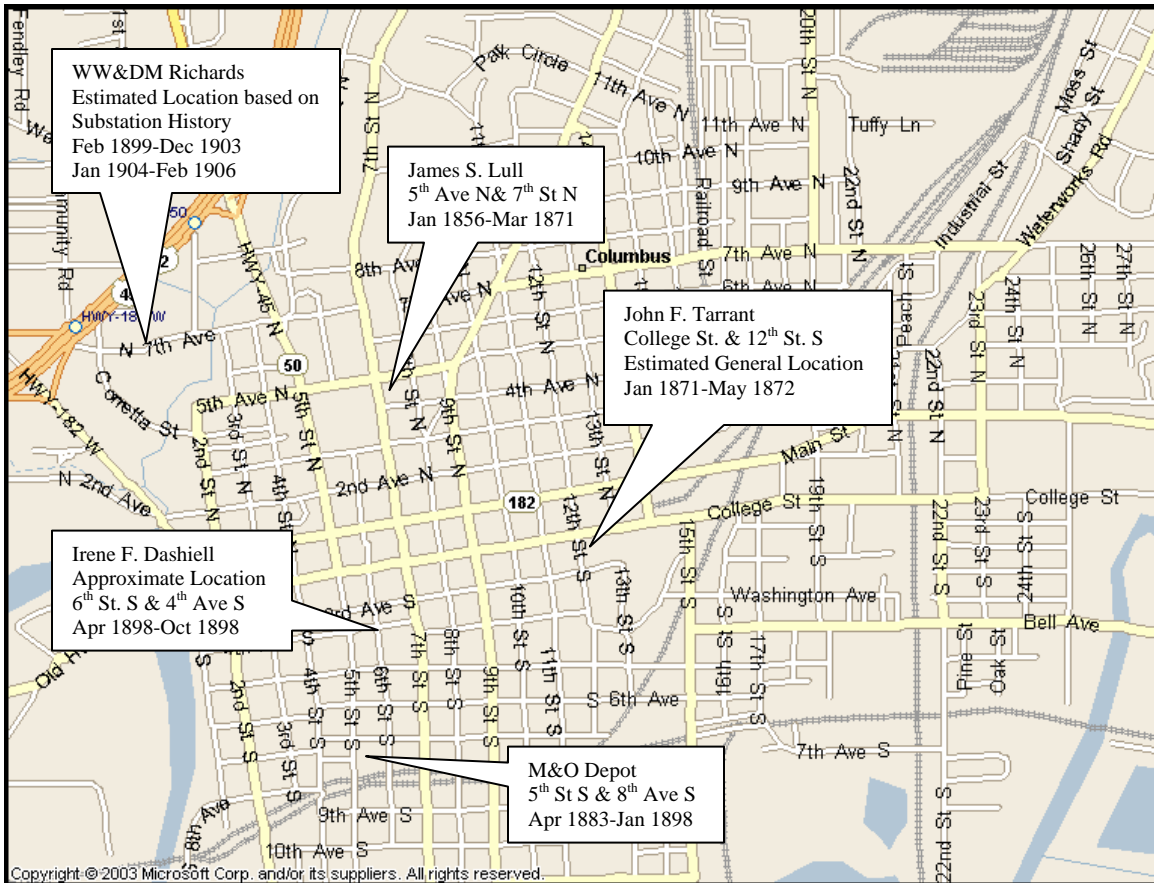


Figure 3. Locations of weather observers in Columbus, MS for the period 1856 to 1906, plotted on a current map of Columbus. North is at the top of the page. East-west distance across the map is approximately two and one-half miles.

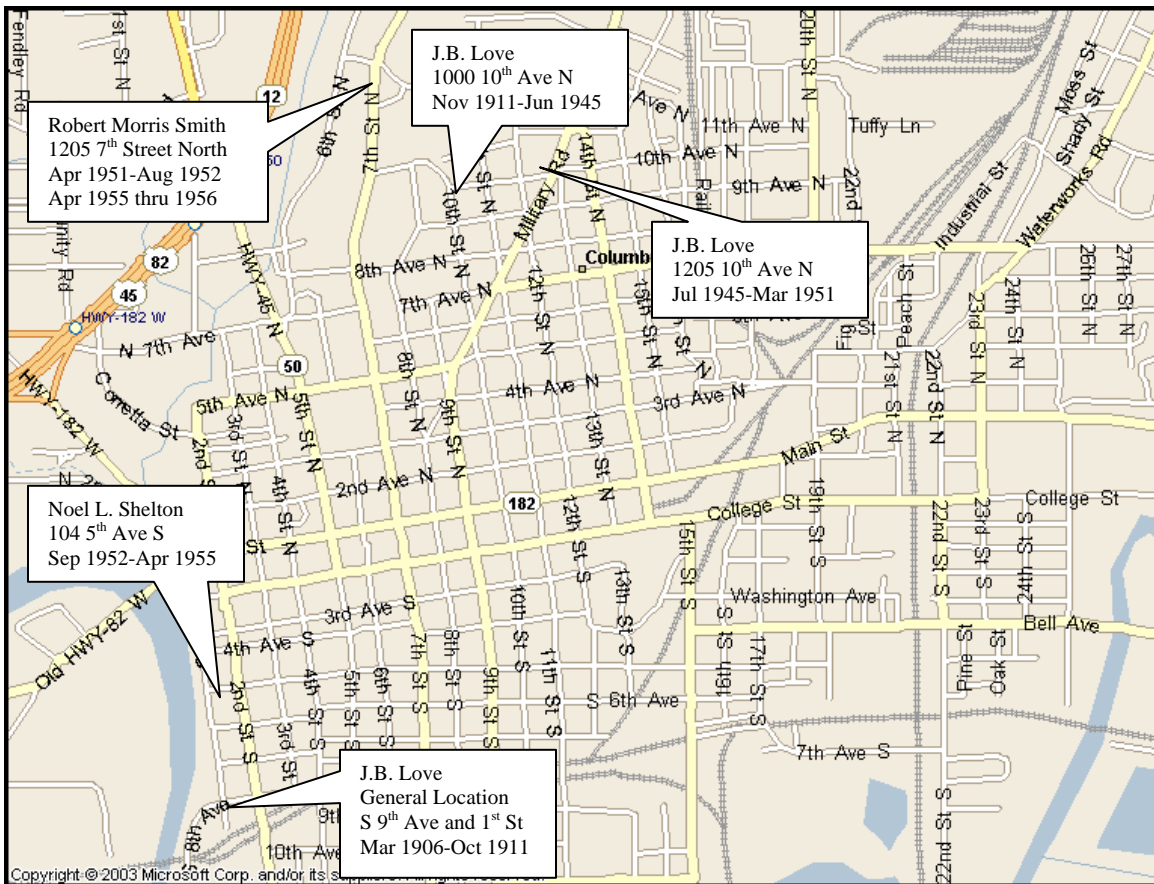


Figure 4. Locations of weather observers in Columbus, MS for the period 1906 through 1956. Information is plotted on a current map of Columbus. North is at the top of the page. East-west distance across the map is approximately two and one-half miles.

*James S. Lull (January 1856-March 1871)
Southeast Corner of 5th Avenue North and 7th Street North*

The first weather observation in the National Climatic Data Center (NCDC) database for Columbus, MS was taken on 1 January 1856 by James S. Lull as part of the Smithsonian Observing Program. Smithsonian records indicated that Mr. Lull took weather observations as part of that program from 1855 through 1859 and 1869 through 1871. The NCDC database contains an almost continuous period of weather observing for this observer from 1856 into 1871. The last observation by Mr. Lull was 26 March 1871. Elevation on the observation forms was listed as 227 feet above sea level.

During the period that Mr. Lull took weather observations, he lived, and may have worked (as an architect) at his home (historic and prominent house in Columbus called “Camellia Place;” see section of this report entitled “The Observers”) located on the southeast corner of 5th Avenue North (Pushmataha Street) and 7th Street North (Caledonia Street). Based on comments on the observational forms, as well as a letter

Mr. Lull wrote to the Smithsonian Institution on 31 December 1869, some, if not most of the observations were taken at Camellia Place. His home was large with the grounds occupying the entire city block. GPS coordinates for this site were 33°29'59"N 88°25'35"W. Elevation was 225 feet above sea level.

John F. Tarrant (January 1871-May 1872)

Estimated General Location – College Street and 12th Street South

The first observation by John F. Tarrant was 1 January 1871 (based on NCDC database and Smithsonian records). Mr. Tarrant and Mr. Lull took weather observations concurrently in Columbus from 1 January 1871 through 26 March 1871. The last observation by John Tarrant was 31 May 1872. The time period indicated in the NCDC database agrees with Smithsonian records. He also listed his elevation as 227 feet above sea level.

No information could be found regarding the exact location of John Tarrant's weather observations. However, Reverend Tarrant was a pastor who was president of the Columbus Female Institute in Columbus. Most likely, Reverend Tarrant also lived at the Institute and probably took the observations somewhere on campus. Best estimate for the general location for Reverend Tarrant's observations would be near the current intersection of College Street (Washington Street) and 12th Street South (Barry Street).

Weather Observations by Army Surgeons (1868–1869)

(Location Unknown)

First weather observation in Columbus by field Army surgeons was 1 January 1868 with the last observation 28 February 1869 (according to the NCDC database). No information could be found regarding the location of the Army hospital during this period. A local historian (recommended by the Columbus-Lowndes Public Library) stated that a regiment of less than 1,000 Union troops was stationed in Columbus following the Civil War as part of the Reconstruction process. He indicated Union regiments usually included an Army surgeon and that the Columbus troops were stationed in the southern part of the city. The troops left in 1869.

The historian stated an old Confederate hospital had been located in southern Columbus (he did not know the exact location) and the Union troops may have used this hospital. Based on all available information, the best estimate is that the weather observations may have been taken somewhere in the vicinity of 4th Street South (St. John Street) and 7th Avenue South (Frances Street). A painting completed in 1870 that is hung in the Columbus-Lowndes Public Library suggests the presence of a small military post near the 4th Street South and 7th Avenue South position, i.e., in south Columbus. However, the information for the location of this station was far from conclusive.

Cotton Region Observers (1883-1896)

Based on available records, a gap in weather observations existed from the last observation by John Tarrant on 31 May 1872 until the first cotton region observation by W.B. Hopkins on 1 April 1883.

The year 1883 was the beginning of a path of continuous weather observations in Columbus. These observations were made under the Signal Service/Weather Bureau Cotton Region, Voluntary, and Cooperative Observing Programs. These observations were continued by a number of individuals through 1956.

In September 1881, the U.S. Signal Service inaugurated a system of weather observations across the southern U.S. for the benefit of the cotton industry, including growing, processing, and shipping this important agricultural product. During the growing season, usually April through October (start and stopping times varied depending on available funding), cotton region observers across the southern U.S. took daily weather observations that were telegraphed to the nearest Signal Service center. These reports were published in newspapers and in bulletins at cotton exchanges. Cotton region observations continued into the early Weather Bureau years.

*W.B. Hopkins (April 1883-August 1893)
M&O Depot – 5th Street South and 8th Avenue South*

NOTE – Information regarding the location of the weather instruments was sparse and conflicting for cotton region and voluntary observers from 1883 until 1906. Best estimate is presented with the conflicting reports also included.

In Columbus, the first cotton region observations were taken 1 April 1883 by W.B. Hopkins (according to the NCDC database). Weather Bureau Substation History forms prepared in the mid 1950s stated observations at this station began 1 April 1882, but no record of these observations could be found. The last observation by W.B. Hopkins was 31 August 1893.

According to Weather Bureau Substation History records, the cotton region observations were taken at the southeast end of the Mobile & Ohio (M&O) Depot (it was customary for cotton region observations to be taken at a railroad depot or near the telegraph office) which was approximately one-half mile south of the Post Office. Elevation was listed as 188 feet above sea level.

Based on Sanborn Insurance Maps, the M&O Depot was located immediately southeast of the intersection of 5th Street South (Market Street) and 8th Avenue South (Cotton Street). Figure 3 shows the location of the depot. GPS coordinates for this station were 33°29'20"N 88°25'34"W. Elevation was 180 feet.

William B. Hopkins (agent for M&O Railroad) took cotton region weather observations during the growing season (beginning in April or May and ending around November) from 1883 through August 1893. The Monthly Bulletin of the Mississippi Weather Service for 1889 indicated Dr. H.M. Lanier (January-November 1889) and Miss H. Quinche (December 1889) were weather observers in Columbus in addition to W.B. Hopkins, but no observations were recorded in the monthly bulletins, or the NCDC database, for those individuals.

W.N. Monroe (October 1893-June 1895)
M&O Depot – 5th Street South and 8th Avenue South

James A. Barry took the cotton region observations in September 1893, with W.N. Monroe assuming responsibility 1 October 1893. W.N. Monroe took the observations through 30 June 1895. The observations continued to be taken at the M&O Depot at 5th Street South (Market Street) and 8th Avenue South (Cotton Street). See Figure 3.

W.B. Hopkins (July 1895-October 1896)
M&O Depot – 5th Street South and 8th Avenue South

W.B. Hopkins assumed responsibility for cotton region observations at Columbus on 1 July 1895, with the last observation for this observer on 15 October 1896. The observations continued to be taken at the M&O Depot at 5th Street South (Market Street) and 8th Avenue South (Cotton Street). See Figure 3. Weather Bureau Substation History forms in the 1950s stated Mr. Hopkins took the observations from 1897 through 1898, but actual observing forms contained Hopkins' signature were for July 1895 through 1896.

Voluntary/Cooperative Observers (1896-1956)

Beverly Hopkins (November 1896-January 1898)
M&O Depot – 5th Street South and 8th Avenue South

Beverly Hopkins (clerk at the M&O Railroad) assumed responsibility for the observing program on 1 November 1896. Also, in November 1896 the observer became part of the Weather Bureau Voluntary Observing Program whereby observations were taken throughout the year (as opposed to only during the growing season with the Cotton Region Program). Beverly Hopkins last observation was 31 January 1898. The observations continued to be taken at the M&O Depot at 5th Street South (Market Street) and 8th Avenue South (Cotton Street). See Figure 3.

Weather Bureau Substation History forms in the mid 1950s stated that W.B. Hopkins took the observations from 1897 through 1898. However, actual Weather Bureau Voluntary Observing Forms contained the name, "Beverly Hopkins" from November 1897 through January 1898. Based on the Columbus city directories, W.B. Hopkins and Beverly Hopkins were different individuals.

Irene F. Dashiell (April 1898-October 1898)
Approximate Location – 6 Street South and 4th Avenue South

Irene Dashiell assumed observing responsibility (voluntary observer) 1 April 1898, with her last observation 31 October 1898. The station was located three-tenths mile southeast of the Post Office and three-tenths mile north-northeast of the previous station (according to Substation History). This would place the station in the vicinity of 6th Street South and 4th Avenue South. No records were found regarding exact location of this station. Elevation was listed as 188 feet.

Weather Bureau Substation History forms in the mid 1950s stated Ms. Dashiell took the observations from August 1898 through July 1899, but actual observing forms indicated the observing period to be April 1898 through January 1899.

W.W. Richards (February 1899-December 1903)
Position Uncertain and Estimated based on Substation History

W.W. Richards' first observation was 8 February 1899, with the last observation 31 December 1903. Weather Bureau Substation History indicated this station was six-tenths of a mile northwest of the Post Office and eight-tenths mile northwest of the previous station (i.e., Irene Dashiell). Elevation was listed as 188 feet above sea level.

The exact location of this station is in question. Weather Bureau Substation History documents (prepared in the 1950s) listed this station in northwest Columbus (based on distance/direction from Post Office and previous station; see Figure 3). However, Columbus city directories, listed the residential address for both W.W. Richards and D.M. Richards (subsequent observer who was located at the same address) as 403 9th Street South. The occupation in the city directory for W.W. Richards was a telephone operator for the Mobile & Ohio Railroad (located at the intersection of 5th Street South and 8 Avenue South) and D.M. Richards was indicated to be in general merchandise at 122 5th Street North. Neither location was near the position indicated by the Substation History documents. The Substation History position is used in this report due to lack of supporting documentation for the other addresses.

NOTE – Completed observation forms by voluntary/cooperative observers cease in the NCDC database after December 1902. Considerable reliance after this date was placed on observer information in the monthly Weather Bureau publications entitled, *Mississippi Section of the Climate and Crop Service of the Weather Bureau*.

D.M. Richards (January 1904-February 1906)
Position Uncertain and Estimated based on Substation History

D.M. Richards' first observation was 1 January 1904, with the last observation 28 February 1906. Location of this station was uncertain (see explanation under W.W.

Richards) and was defined based on the Weather Bureau Substation History publication. The station remained at the same location as the previous observer (W.W. Richards).

J.B. Love (March 1906-March 1951)

J.B. Love provided cooperative weather observations at Columbus from March 1906 through March 1951, a period of 41 years. Conflicts were found with regard to the most likely locations of the weather instruments during that period. According to Substation History documents prepared in the 1950s, Mr. Love took weather observations at the following locations:

1 March 1906 – 11 October 1911 – 1014 2nd Street South
18 October 1911 – 22 November 1939 – 100 10th Avenue North
23 December 1939 – 21 October 1941 – 1000 8th Street North
22 October 1941 – 30 June 1945 – 1000 10th Street North
1 July 1945 through 31 March 1951 – 1205 10th Avenue North

Based on a detailed review of the Columbus city directories from 1906 through 1952, it is readily apparent that Mr. Love lived at only three locations during this period. Beginning in 1906, the city directory states that he lived near the 1014 2nd Street South address stated in Substation History documents, although the directory listed his address as “South 9th Avenue and 1st Street.” At that time, he worked for the Mobile & Ohio Railroad. The 1912 directory indicated that Mr. Love had changed jobs and was “Proprietor of the Columbus Transfer Company and Agent for the Gulf Refining Company of Louisiana.” Also in the 1912 directory his residence was listed as 1000 10th Avenue North where he also apparently ran his businesses (see the section of this report entitled, “The Observers.”). According to city directories, the address of J.B. Love did not change from around 1911 or 1912 until the mid 1940s when he moved to 1205 10th Avenue North. It is the opinion of the author that, for some reason, erroneous information was incorporated into a couple of early inspection reports, and perpetuated over the years into the Substation History documents. Conflicts among information sources will be cited.

J.B. Love (March 1906 – October 1911)

1014 2nd Street South (Substation History Address)

(City directory in 1906 listed the address for J.B. Love as “South 9th Avenue and 1st Street”)

Figure 4 shows the general location of Joseph B. Love’s residence 1906-1911. The first observation at this location was 1 March 1906 and the last observation 11 October 1911. Substation History states this station was approximately eight-tenths mile south-southwest of the Post Office and 1.2 miles south of the previous location (D.M. Richards). Elevation was listed as 188 feet above sea level. GPS coordinates for this site were 33°29’13”N 88°25’49”W. Elevation was around 190 feet (approximate due to uncertainty of exact station location).

*J.B. Love (November 1911 - June 1945)
1000 10th Avenue North*

The first observation by J.B. Love at this location was 18 November 1911 and the last observation 30 June 1945. This station was located at 1000 10th Avenue North. The 1000 block of 10th Avenue North and 900 Block of 10th Street North met at the northwest corner of Mr. Love's property (see Figure 5). This station was approximately one and one-third miles north-northeast of the previous site. Elevation was listed as 191 feet above sea level. GPS coordinates were 33°30'19"N 88°25'23"W. Elevation was 249 feet. Based on the Columbus city directories, Mr. Love also managed his businesses from this location (see the section of this report entitled, "The Observers").

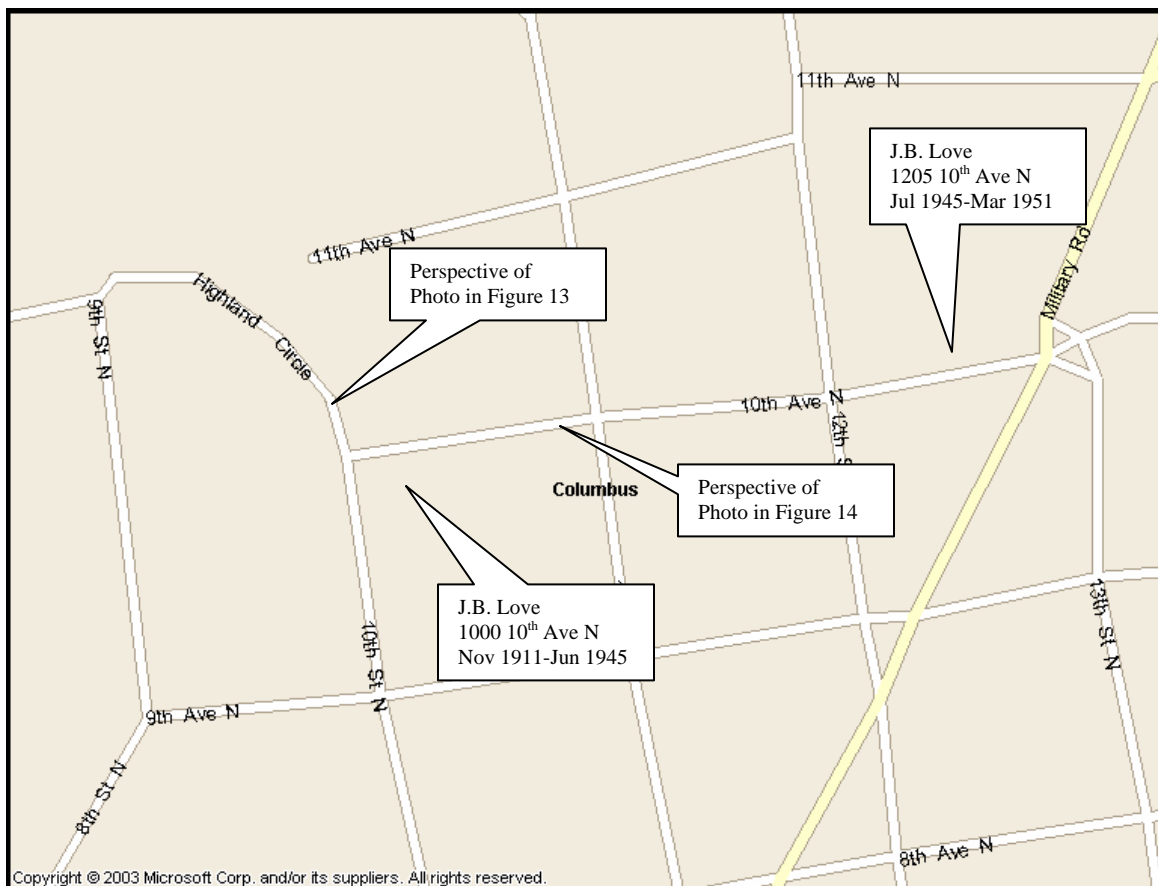


Figure 5. Locations of observing sites for Joseph B. Love for the period November 1911 through March 1951, plotted on a current map of Columbus. North is at the top of the page. East-west distance across the map approximately one-third mile.

*J.B. Love (July 1945-March 1951)
1205 10th Avenue North*

The first observation by J.B. Love at this location was 1 July 1945 and the last observation 31 March 1951. This station was located at 1205 10th Avenue North (Figure

4 and Figure 5). Elevation was listed as 191 feet above sea level. GPS coordinates were 33°30'19"N 88°25'17"W and elevation 203 feet.

Robert M. Smith (April 1951-August 1952)
1205 7th Street North

The first observation by Robert Morris Smith was 1 April 1951 and the last observation 31 August 1952. Mr. Smith worked at the courthouse. This station was located at 1205 7th Street North (Figure 4) and was approximately four-tenths mile west-northwest of the previous location (J.B. Love at 1205 10th Ave North). Elevation was listed as 191 feet above sea level. GPS coordinates were 33°30'35"N 88°25'33"W and elevation 193 feet.

Noel L. Shelton (September 1952-April 1955)
104 5th Avenue South

The first observation by Noel M. Shelton was 1 September 1952 and the last observation 19 April 1955. This station was located at 104 5th Avenue South (Figure 4) which was approximately one and one-quarter miles south southwest of the previous station (Robert M. Smith). Elevation was listed as 191 feet above sea level. GPS coordinates were 33°29'27"N 88°25'55"W and elevation 209 feet.

Morris Smith (April 1955 through 1956)
1205 7th Street North

This observer was the same Robert Morris Smith that took cooperative weather observations at the same location from April 1951 through August 1952. The first observation by Morris Smith was 20 April 1955 and he continued taking observations through 1956. The observer worked at the courthouse. This station was located at 1205 7th Street North (Figure 4) which was approximately one and one-quarter miles north-northeast of the previous station (Noel L. Shelton). Elevation was listed as 188 feet above sea level. GPS coordinates were 33°30'35"N 88°25'33"W and elevation 193 feet.

Aviation Observations (1942-1956)

Figure 6 shows the general locations of the aviation weather stations with respect to downtown Columbus.

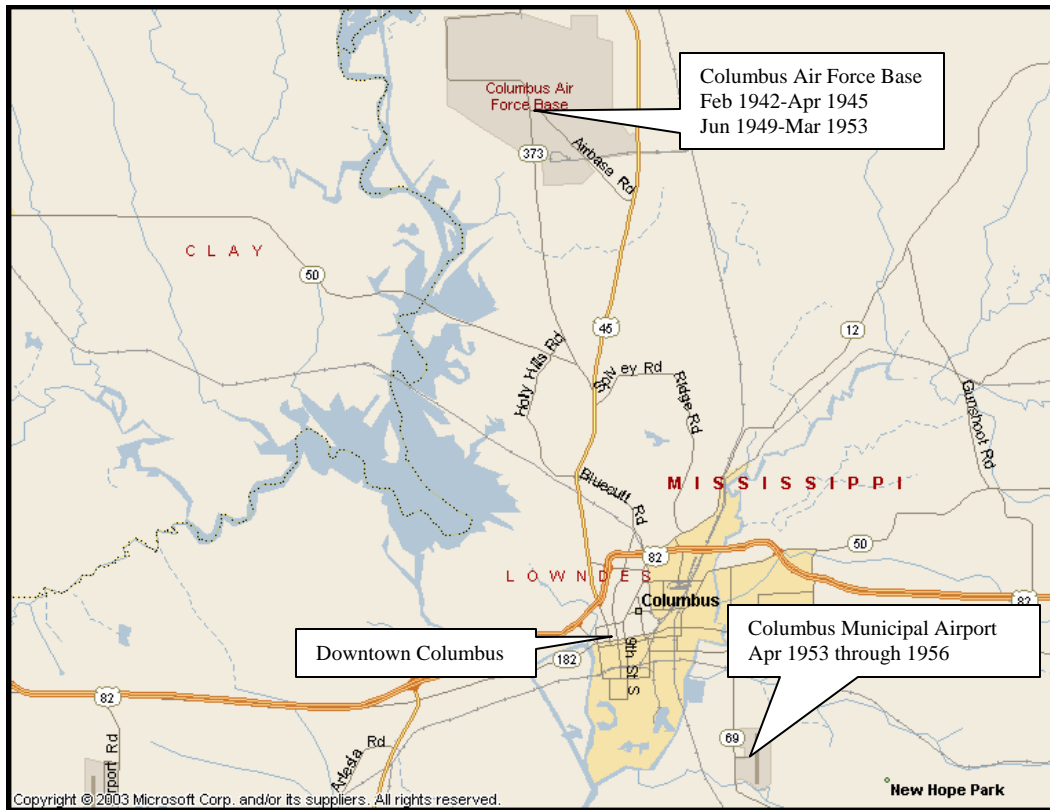


Figure 6. Location of Supplementary Aeronautical Weather Reporting Stations (SAWRS) at Columbus Air Force Base and Municipal Airport with respect to downtown Columbus. Information is plotted on a current map of Columbus and surrounding area. North is at the top of the page and east-west distance across the map is approximately 18 miles.

SAWRS Observations at the Columbus Army Flying School (February 1942-April 1945)

The first aviation weather observations taken at Columbus were at the Columbus Army Flying School, located approximately 10 miles north of the city (now Columbus Air Force Base). Although these observations are not in the NCDC database, Station Records and inspection reports prepared by the Weather Bureau during the early and mid 1940s indicated this observation station was established 11 February 1942 as a SAWRS (Supplementary Aeronautical Weather Reporting Station). It was located in the Operations Building at the base. Elevation of the barometer was listed as 211 feet above sea level. Observations stopped 15 April 1945 and the base was deactivated in 1946.

SAWRS Observations at Columbus Air Force Base (June 1949-March 1953)

On 31 May 1949 a SAWRS (Supplementary Aeronautical Weather Reporting Station) was established at the Columbus Army Air Base located approximately 10 miles north of the Columbus Post Office. Observations were first recorded 1 June 1949 and are contained in the NCDC database. This was approximately 19 months before the base was officially re-activated on 20 December 1950. Based on available information, it appears that Southern Airways operated the SAWRS at the base, using some equipment

installed by the U.S. Army. The last SAWRS observation at the base was 31 March 1953 (the SAWRS was transferred to the Columbus Municipal Airport). Ground elevation was 205 feet above sea level.

It appears the SAWRS was located at two locations within the base complex. From 1 June 1949 until 31 May 1951, the station was located at/near the operations building on the northeast side of the base complex (building T-228) and on 1 June 1951, the station was moved approximately one-half mile west-northwest. A Weather Bureau report on 18 July 1951 stated the Southern Airways station was located, “in building T-2502, the last building to the west of aircraft parking ramp.” See the section entitled “Instrumentation.” On 31 March 1953 the SAWRS was moved to Columbus Municipal Airport (Columbus-Lowndes County Airport).

SAWRS Observations at Columbus Municipal Airport (April 1953 through 1956)

On 1 April 1953 a SAWRS (Supplementary Aeronautical Weather Reporting Station) was established at the Columbus Municipal Airport (moved from Columbus Air Force Base) located approximately 3.2 miles southeast of downtown Columbus. The station was located at the Administration Building that was approximately four-tenths of one mile due east of the airport entrance and was operated by Southern Airways. This station was located approximately 12 miles south-southeast of the previous SAWRS at the Columbus Air Force Base. Ground elevation at this site was listed as 186 feet above sea level. Official coordinates for the airport are 33°27'55"N 88°22'49"W, elevation 188 feet.

INSTRUMENTATION

Smithsonian Observations (1856-1872)

*James S. Lull (January 1856-March 1871)
Southeast Corner of 5th Avenue North and 7th Street North*

First observations in the NCDC database for Columbus were taken by James S. Lull, beginning 1 January 1856, although Smithsonian records indicated he began taking observations in 1855. His last observation was 26 March 1871.

Observations from January 1856 through March 1856 were intermittent, with essentially continuous observations beginning in April 1856. Weather observations by James Lull were absent 10 October 1860 until 31 October 1860 and sporadic in November 1860 and December 1860. Essentially continuous observations resumed 6 January 1861.

Mr. Lull observed/measured the following parameters at 7 a.m., 2 p.m., and 9 p.m. (Figures 7 and 8):

1. Barometric pressure
2. Temperature – From attached and detached thermometers
3. Atmospheric moisture – Dry bulb and wet bulb
4. Cloudiness – Amount, type, and movement
5. Winds – Direction and force

He also reported daily the beginning, ending, and amount of precipitation. In addition, Mr. Lull included significant weather on a separate Smithsonian form entitled, “Casual Phenomena.”

REGISTER OF METEOROLOGICAL OBSERVATIONS UNDER THE DIRECTION OF THE SMITHSONIAN INSTITUTION FOR HIS AGRICULTURAL REPORT

Place of Observation Columbus County of Lowndes State of Mississippi
 Latitude 33° 30' Longitude 11° 28' 42" W Height above the sea 227 Feet

Day of Month	BAROMETER												THERMOMETER IN THE OPEN AIR					PSYCHROMETER, OR HYGROMETER						RAIN AND SNOW			
	CORRECTED HEIGHT			THERMOMETER ATTACHED TO BAROMETER			BAROMETER HEIGHT REDUCED TO SEASIDE POINT											WET BULB									
	7 a.m.	2 p.m.	9 p.m.	7 a.m.	2 p.m.	9 p.m.	7 a.m.	2 p.m.	9 p.m.	Mean	7 a.m.	2 p.m.	9 p.m.	Mean	7 a.m.	2 p.m.	9 p.m.	7 a.m.	2 p.m.	9 p.m.	Time of beginning of rain or snow	Time of ending of rain or snow	Amount of rain or melted snow in gauge, in inches	Depth of snow, in inches	Amount of snow, in inches		
1	30.05	29.98	29.95	48	52	57	30.02	29.92	29.88		50	58.9	57	22.6	48	52	58	48	52	58	S. by N	S. by N	1.11		9		
2	29.87	29.78	29.79	57	61	65	29.74	29.70	29.70		53.8	62	62	41.85	54	70	62	53	66	62					10		
3	29.86	29.86	29.81	60	70	64	29.78	29.78	29.78		52.4	58.6	57	43.55	76	59	52	62	52					5 W			
4	29.94	29.81	29.83	60	64	59	29.86	29.72	29.85		51.3	62.1	55.2	47.35	51	68	54	48	54	54	6.2 A	7.2 A	1.08		5 W		
5	30.05	29.94	29.94	52	57	58	29.97	29.90	29.86		53.7	58.8	47.6	45.0	44	60	48	40	48	44					0 1		
6	29.87	29.70	29.65	48	62	62	29.82	29.61	29.49		43.7	68	55.9	55.8	44	68	54	46	58	50					9 W		
7	29.74	29.80	29.81	55	62	61	29.67	29.71	29.80		51.4	67.8	58.8	47.35	51	68	58	46	57	53					10		
8	30.01	30.03	30.03	58	66	66	29.94	29.93	29.93		48.8	72.0	68.8	47.7	49	73	59	46	60	56					0		
9	30.14	30.10	30.10	59	65	70	30.08	29.99	29.99		50.2	78.1	68.5	65.35	51	78	64	44	62	59					0		
10	30.08	30.02	29.98	63	78	74	29.99	29.87	29.86		54.1	83.4	69.3	61	54	83	70	52	62	61					1		
11	29.96	29.90	29.87	64	75	75	29.87	29.77	29.74		58.8	89.4	76.1	71.8	60	88	71	58	62	61					0		
12	29.94	29.89	29.87	73	78	77	29.83	29.76	29.77		64	81.6	68.4	71.6	64	82	68	59	66	62					2		

Figure 7. Left side of the weather observing form for observations taken by James S. Lull in April 1856 (first complete record). Only the top half of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

DIRECTION OF THE SMITHSONIAN INSTITUTION, ADOPTED BY THE COMMISSIONER OF PATENTS FOR HIS AGRICULTURAL REPORT.

Mississippi
 Name and address of Observer James S. Lull, Columbus, Miss.
 For the Month of April 1856.
 At Columbus, Miss. on the 25th day of April 1856.

Day of Month	RAIN AND SNOW				CLOUDS								WINDS						FORCE OR PRESSURE OF VAPOUR, IN INCHES			RELATIVE HUMIDITY OR FRACTION OF SATURATION		
	Time of beginning of rain or snow	Time of ending of rain or snow	Amount of rain or melted snow in gauge, in inches	Depth of snow, in inches	7 A.M.		2 P.M.		9 P.M.		7 A.M.		2 P.M.		9 P.M.		7 a.m.	2 p.m.	9 p.m.	7 a.m.	2 p.m.	9 p.m.		
	Direction	Force	Direction	Force	Direction	Force	Direction	Force	Direction	Force	Direction	Force	Direction	Force	Direction	Force	Direction	Force	Direction	Force	Direction	Force		
29					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30	S. by N	S. by N	1.11		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
31					5 W	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	6.2 A	7.2 A	1.08		5 W	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3					5 W	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5					5 W	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10					1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12					2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Figure 8. Right side of the weather observing form for observations taken by James S. Lull in April 1856 (first complete record). Only the top half of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

Smithsonian records stated James Lull had the following weather instruments:

1. Barometer
2. Thermometer
3. Psychrometer
4. Rain Gage

This station may also have had a wind vane (made locally or purchased by the observer), with wind force estimated.

It could not be determined where James Lull took his weather observations from 1856 to 1871. His residence for approximately 24 years (1847 to 1871) was “Camellia Place,” a recognized profound antebellum mansion (see the section in this report entitled “The Observers”), and some of the observations were taken at this location. However, comments on his observation forms below suggest observations may have been taken at more than one location, i.e., at his residence, at a friend’s house (location unknown), and perhaps at other places. Yet, based on a letter he sent to the Smithsonian on 31 December 1869, it is obvious at least some, if not most of the observations were taken at Camellia Place. Camellia Place was located on a north-south knoll with gently sloping terrain to the east and a sharp drop of approximately 30 feet immediately west of the house grounds (across 7th Street). See Figure 25 in the section of this report entitled “The Observers.”

The June 1860 observation form by Mr. Lull contained the following note:

“This day all my instruments were moved to a different locality in town, when I left for the North, was absent until the 27th of September; during my absence I got a friend William Baldwin to continue the observations.”

The September 1860 form (specific day not indicated) contained the following note:

“Instruments moved back to the place where they had been for nearly five years.”

The October 1860 form contained the following note:

“(on 13th) Dwelling house destroyed by fire. Observations interrupted.”

Although no specific information could be found regarding location, and/or exposure of Mr. Lull’s weather instruments, general descriptions regarding weather instruments were published in 1854 by the Smithsonian Institution through its Annual Report. This general descriptions can be found in the Minneapolis/St. Paul, MN report under this contract (see Bibliography). Smithsonian instructions to observers were published in 1856 in its Annual Report.

On 31 December 1869, Mr. Lull wrote a letter to Joseph Henry at the Smithsonian Institution describing his observation program during the 1860s. He stated that he ran out of blank observing forms during 1861 (due to the Civil War) and reduced his observations. Beginning 1 January 1862, he restricted his measuring/observing program to temperature (7 a.m., 2 p.m., and 9 p.m.), amount of clouds (7 a.m., 2 p.m., and 9 p.m.), wind direction (7 a.m., 2 p.m., and 9 p.m.) and daily precipitation. Wind direction recordings were sporadic from January 1862 until February 1867. On 1 November 1869, he began the full observation program that was in effect prior to 1 January 1862 (i.e., pressure, temperature, precipitation, clouds and wind) except atmospheric moisture measurements were not made because the psychrometer was broken (according to his letter). These observations continued until his last one was taken on 26 March 1871.

James Lull went on to state in his letter that all of his instruments were of the best quality. He stated he had “two standard thermometers, made by Green, scaling tenth degrees, and scales verified all through.” He also stated his barometer was made by Green. He indicated that he had been forced to move the instruments several times during the time that his residence was being rebuilt (following the fire on 13 October 1860). He also stated that he was in ill health; however, he continued to take weather observations until 26 March 1871.

John F. Tarrant (January 1871-May 1872)
Estimated General Location – College Street and 12th Street South

John F. Tarrant took weather observations from 1 January 1871 through 31 May 1872 as part of the Smithsonian program. Originally, he made the following measurements/observations at 7 a.m., 2 p.m., and 9 p.m.:

1. Temperature
2. Clouds – Amount, type, and movement
3. Winds – Direction and force

In addition, he recorded the beginning, ending, and amount of daily precipitation.

Mr. Tarrant initially had a thermometer, rain gage, and possibly a wind vane (wind force likely was estimated). He may have had a barometer and psychrometer but measurements were not recorded from those instruments initially, i.e., not listed on the forms in the NCDC database. A note on the October 1871 form stated the barometer and psychrometer were broken but were to be repaired in November 1871. Psychrometric readings were included beginning 1 November 1871 and barometric readings included beginning 8 December 1871. This complete set of observations continued until the last observation on 31 May 1872. No information was found with regard to the type, exact location or exposure of the instruments.

Weather Observations by Army Surgeons (1868–1869) (Location Unknown)

The first observation in Columbus by the U.S. Army Medical Department was on 1 January 1868 (in the NCDC database) and the last observation 28 February 1869. The following were measured/observed at 7 a.m., 2 p.m., and 9 p.m.:

1. Temperature
2. Dew point temperature
3. Wind direction and force
4. Sky condition
5. Significant weather in the Remarks Section

In addition, the beginning and ending of precipitation was indicated. The surgeons did not measure daily rainfall due to lack of a rain gage. By February 1869, a rain gage had been delivered to the station and daily precipitation was included on the observation forms. This station also had a thermometer, psychrometer, and likely a wind vane (wind force probably was estimated).

In November 1868, new observation forms were used by the surgeons that included a column labeled for maximum and minimum temperatures. However, the surgeons continually indicated the station did not have maximum/minimum thermometers. For additional general information regarding instruments used by the U.S. Army Medical Department during this period, as well as observing instructions from the U.S. Army Surgeon General, refer to the reports on Fort Gibson, OK, Fort Union, NM, or Fort Snelling, MN under this contract (see Bibliography).

Cotton Region Observers (1883-1896)

W.B. Hopkins (April 1883-August 1893)
M&O Depot – 5th Street South and 8th Avenue South

Figure 9 shows the first cotton region observations in Columbus take by W.B. Hopkins. The first observation by W.B. Hopkins was 1 April 1883 with the last observation 31 August 1893.

(FORM No. 144 A.)

MONTHLY RECORD OF OBSERVATIONS TAKEN AT STATIONS IN THE COTTON REGION.

Signal Service, U. S. A.,
 Station: *Columbus Miss*
 Month of *April*, 188*3*

6 119

DATE.	MAXIMUM TEMPERATURE.	MINIMUM TEMPERATURE.	RAINFALL.	TIME OBSERVATION WAS TAKEN.	TIME REPORT WAS FILED AT TELEGRAPH OFFICE.	EXPLANATIONS AND REMARKS.
1	78	53	0	4.45	5. pm	
2	67	43	"	"	"	
3	67	37	"	"	"	
4	73	44	"	"	"	
5	82	60	"	"	"	
6	82	61	2.00	"	"	
7	70	61	.70	"	"	
8	70	60	0	"	"	
9	68	53	1.40	"	"	
10	76	58	0	"	"	
11	85	67	"	"	"	
12	84	67	1.30	"	"	

Figure 9. First cotton region observations taken at Columbus (April 1883). Only the top of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

Signal Service instructions directed cotton region observers to record the maximum temperature, minimum temperature, 24 hour rainfall, and the occurrence of light or killing frost, thunderstorms, or tornadoes (under the Remarks section). Observations at Columbus were transmitted once daily at 5 p.m.(Columbus time). In November 1892, the beginning and ending times of precipitation were included. The August 1892 form contained the following note:

“The thermometer here has an eastern exposure to sun until about 2 p.m. The readings are higher than those shown at other places in circuit. I bet to say the public may be misled by these observations...”

No mention was ever made as to whether the thermometer was moved.

According to Signal Service instructions, each cotton region station was provided the following:

1. One instrument shelter with lock and key
2. One board and support for thermometers

3. One maximum thermometer
4. One minimum thermometer
5. One rain gage
6. One rain gage measuring stick
7. One copy of Instructions to Cotton-region Observers
8. Forms and envelopes for recording observations

This was the first station at Columbus that was indicated to have a river gage, with subsequent stations also taking river observations. Additional information on cotton region observations, as well as instructions from Signal Service Headquarters, is contained in the report on Natchez, MS under this contract (see Bibliography).

No information could be found with regard to exposure of the instruments other than the observations were taken at the southeast end of the depot. Figure 10 shows the location and orientation of the depot in 1890 and Figure 11 shows the terrain around the depot.

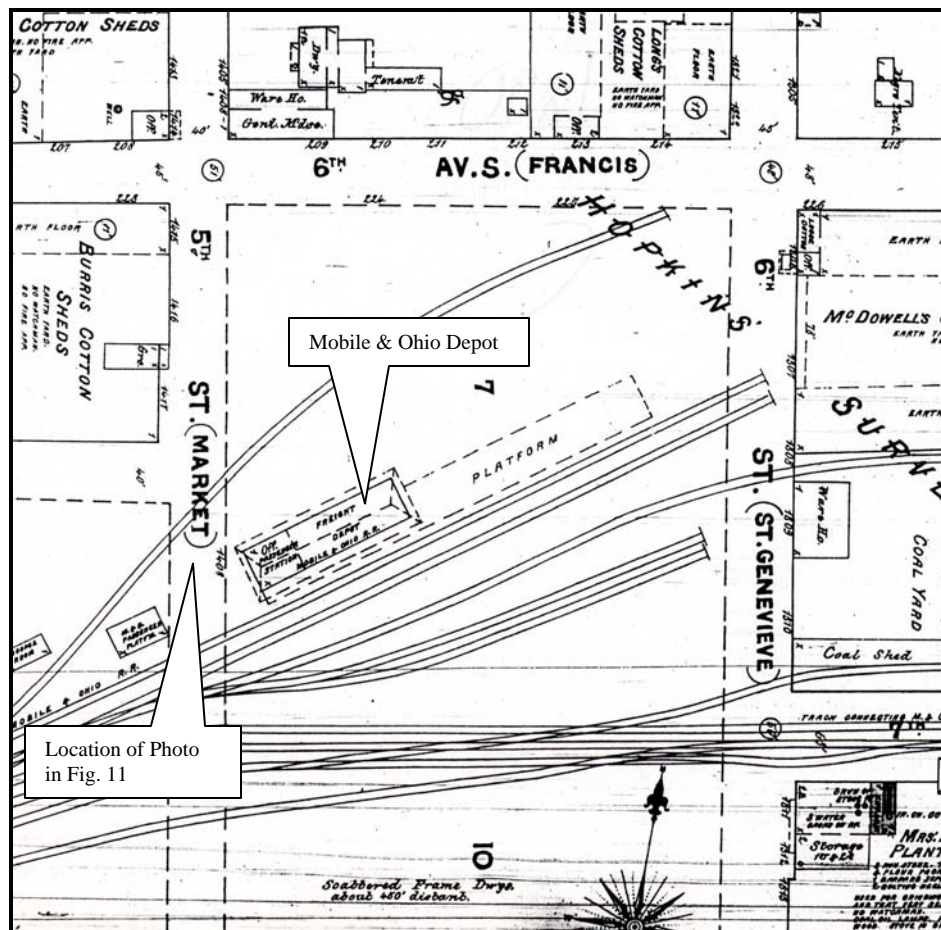


Figure 10. Sanborn Map from 1890 showing the location of the Mobile and Ohio Depot in Columbus. North is at the top of the page. The northern boundary of the depot was named Francis Street, later named 6th Avenue between 1885 and 1890, and renamed 7th Avenue (name used today) between 1900 and 1905. From the Columbus-Lowndes County Public Library.

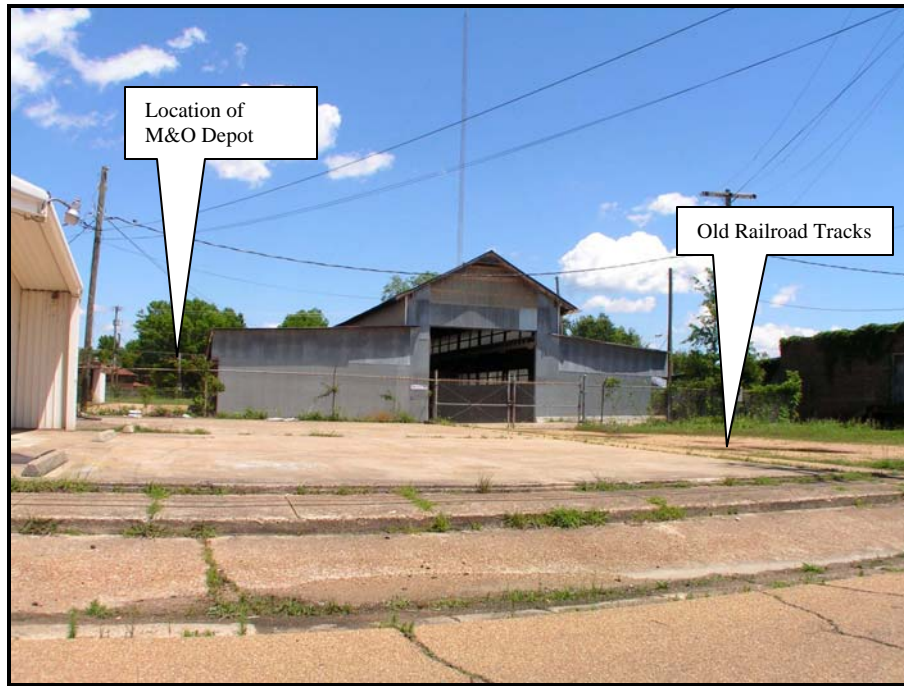


Figure 11. Approximate location of M&O Depot (location of photograph depicted in Figure 10). View is east-southeast. Depot building no longer exists, but photograph shows the flatness of the terrain. Photograph taken by the author.

W.N. Monroe (October 1893-June 1895)
M&O Depot – 5th Street South and 8th Avenue South

James A. Barry took the cotton region observations in September 1893, with W.N. Monroe assuming responsibility 1 October 1893. W.N. Monroe took the observations through 30 June 1895. Information regarding the instruments used by W.B. Hopkins applies to this observer.

W.B. Hopkins (July 1895-October 1896)
M&O Depot – 5th Street South and 8th Avenue South

W.B. Hopkins again assumed responsibility for cotton region observations at Columbus on 1 July 1895, with the last observation by this observer on 15 October 1896. Information on instruments used by previous cotton region observers also applies to this observer. On 1 September 1895, the observation time changed from 5 p.m. to 8 a.m. and on 16 April 1896, the observation time changed to 6 a.m. In April 1896, the observer began including sky conditions at the time of the observation.

Voluntary/Cooperative Observers (1896-1956)

Beverly Hopkins (November 1896-January 1898)
M&O Depot – 5th Street South and 8th Avenue South

Beverly Hopkins took observations from 1 November 1896 through 31 January 1898. Information on instruments used by previous cotton region observers also applies to this observer.

Irene F. Dashiell (April 1898-October 1898)
Approximate Location – 6 Street South and 4th Avenue South

Irene Dashiell assumed observing responsibility (voluntary observer) 1 April 1898, with her last observation 31 October 1898. This station had a cotton region instrument shelter, maximum thermometer, minimum thermometer, and a standard rain gage.

W.W. Richards (February 1899-December 1903)
Position Uncertain and Estimated based on Substation History

W.W. Richards' first observation was 8 February 1899, with the last observation 31 December 1903. This station had a cotton region instrument shelter, maximum thermometer, minimum thermometer, and standard rain gage. The Substation History stated "Thermometers on porch until 1 January 1902.

D.M. Richards (January 1904-February 1906)
Position Uncertain and Estimated based on Substation History

D.M. Richards' first observation was 1 January 1904, with the last observation 28 February 1906. This station had the same instruments as the previous station (W.W. Richards).

J.B. Love (March 1906-October 1911)
1014 2nd Street South (Substation History Address)
(City directory in 1906 listed the address as "South 9th Avenue and 1st Street")

The first observation by J.B. Love at this location was 1 March 1906 and the last observation 11 October 1911. This station had a cotton region shelter, maximum/minimum thermometers, and a standard rain gage. All equipment was listed as the property of the Weather Bureau.

A Weather Bureau inspection on 3 March 1906 listed the shelter as being over cultivated ground, 90 feet south of a building 40 feet high. The floor of the shelter was approximately five feet above ground, and the door was oriented correctly toward the north. The rain gage was on a post, six feet north of the shelter. The top of the gage was

approximately eight feet above ground. Time of observations was listed as 7 a.m. local time. Figure 12 shows the general slope of the terrain at this location.



Figure 12. General area where J.B. Love’s weather station was located 1906-1911. Exact location not known, but photograph shows the general slope of the terrain. View is west. Photograph taken by the author.

*J.B. Love (November 1911 – June 1945)
1000 10th Avenue North*

The first observation at this location was 18 November 1911 and the last observation 30 June 1945. This station had a cotton region shelter, maximum thermometer, minimum thermometer, and standard rain gage.

The station was located near the top of a hill that extended to the west and was elongated to the southwest. Terrain was almost flat at the residence (where the weather instruments were located) for a distance of approximately one city block to the north, west, through the southwest. Elevation fell approximately 30 feet in one block from the northeast, through east, to southeast (Figures 13 and 14).

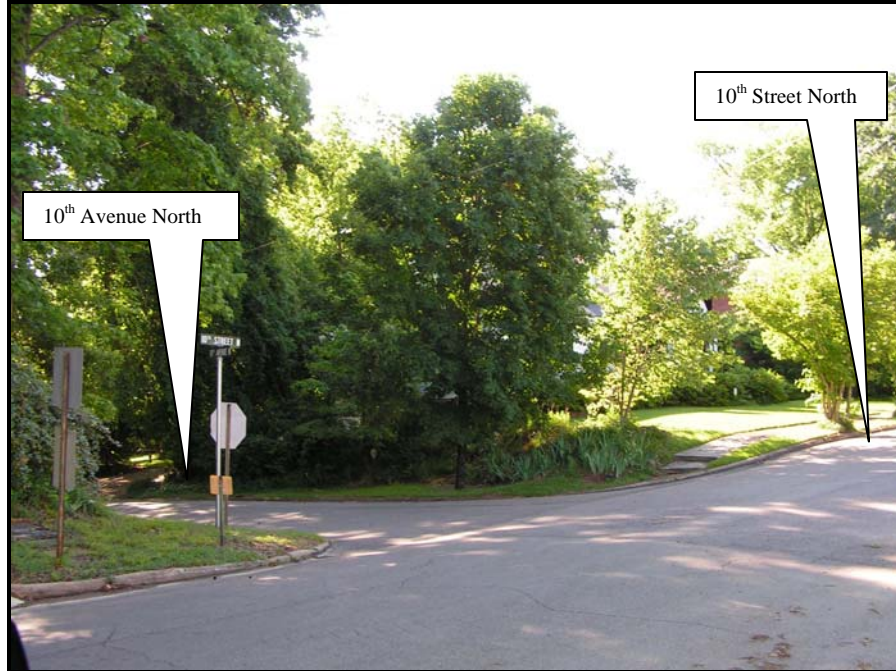


Figure 13. Intersection of 10th Avenue North and 10th Street North looking southeast. Joseph B. Love's residence and weather observing station were in the lot just southeast of the intersection (in the center of the photograph). Terrain is relatively flat to the right and left in the photograph (along 10th Street North), but slopes down rapidly along 10th Avenue North (see Figure 14). Photograph taken by author.

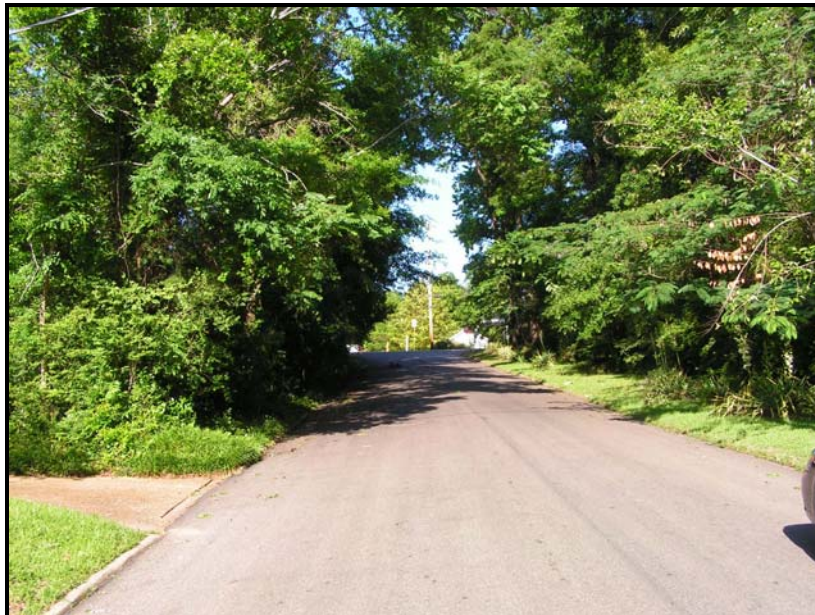


Figure 14. View along 10th Avenue North, looking west. The lot that contained J.B. Love's house and weather station was located to the left of the avenue near the top of the hill. Photograph taken by author.

Six Weather Bureau inspection reports were available for this station: 18 November 1911, 29 October 1928, 21 March 1938, 25 March 1939, 23 December 1939, and 22 October 1941.

The inspection report on 18 November 1911 stated the instrument shelter was located in the garden (did not specify where the garden was located) with the nearest building 70 feet from the shelter. The nearest tree was 300 feet from the shelter and the soil not cultivated within 10 feet of the shelter. The floor of the shelter was approximately five feet above ground. The rain gage was six feet from the shelter with the shelter the only nearby object. The top of the rain gage was approximately four feet above ground. Time of observations was listed as 7 a.m. local time.

The next Weather Bureau inspection report was made 29 October 1928 and stated the instrument shelter was located in a chicken lot that was “bare of grass.” By the next inspection (21 March 1938), the shelter was reported to be over turf. The bottom of the shelter was approximately five feet above ground. The shelter was painted between 21 March 1938 and 25 March 1939 (painting of the shelter not mentioned otherwise from 1911 through 1945).

The standard rain gage was evaluated by the inspector on 29 October 1928 as being too close to the instrument shelter and was moved slightly (direction or distance of the move not specified). The top of the gage was approximately four feet above ground. Exposure of the gage was rated as satisfactory. The inspection report on 25 March 1939 stated the gage was “...probably a little too close to shrubbery but better location not available.”

The Weather Bureau inspection report on 22 October 1941 stated the instrument shelter was located over turf with the floor of the shelter approximately five feet above ground. The rain gage was reported as approximately four feet above ground. The 1941 inspection also stated an obstruction was east of the gage and approximately 50 feet above the top of the gage.

The inspection report on 23 December 1939 stated “Equipment is located at #1000 Eighth St. N.” However, city directories in 1938 and 1940 did not list an address of 1000 Eighth Street North (anywhere in the directory) or indicate any building or establishment with that address. The inspection report on 22 October 1941 indicated the observing equipment was located at 1000 10th Avenue North..

*J.B. Love (July 1945-March 1951)
1205 10th Avenue North*

The first observation by J.B. Love at this location was 1 July 1945 and the last observation 31 March 1951. This station had a cotton region instrument shelter, maximum/minimum thermometers, and standard rain gage. Figure 15 shows the location

of this observing site. Terrain sloped gently up from right to left in the photograph, i.e., east to west.



Figure 15. Residence of J.B. Love July 1945 through March 1951. House may be original from the time period. View is northeast. Photograph taken by author.

*Robert M. Smith (April 1951-August 1952)
1205 7th Street North*

The first observation by Robert M. Smith was 1 April 1951 and the last observation 31 August 1952. The weather instruments were located at the residence of Mr. Smith (Figure 16).



Figure 16. Location of Robert Morris Smith residence (and weather station) at 1205 7th Street North. View is south-southwest. House likely is original from the time period. Weather instruments were located behind the house, i.e., to the right of the picture (now covered by shrubs and trees). Photograph taken by author.

Terrain around Mr. Smith's residence was relatively flat from 7th Street westward to a stream approximately 200 yards from the instruments. The terrain immediately east of 7th Street rose over 50 feet within one city block. The terrain was relatively flat north and south of the residence.

The instrument shelter was located approximately 30 feet west of residence house (behind the house) and the rain gage was about 25 feet southwest of the shelter. The gage also was approximately 20 feet east of a 6 foot high hedge (Figure 17). According to the Weather Bureau inspection report, the observing equipment was owned by the observer. Time of observations was listed as 7 a.m. local time for precipitation and 7 p.m. for temperature.

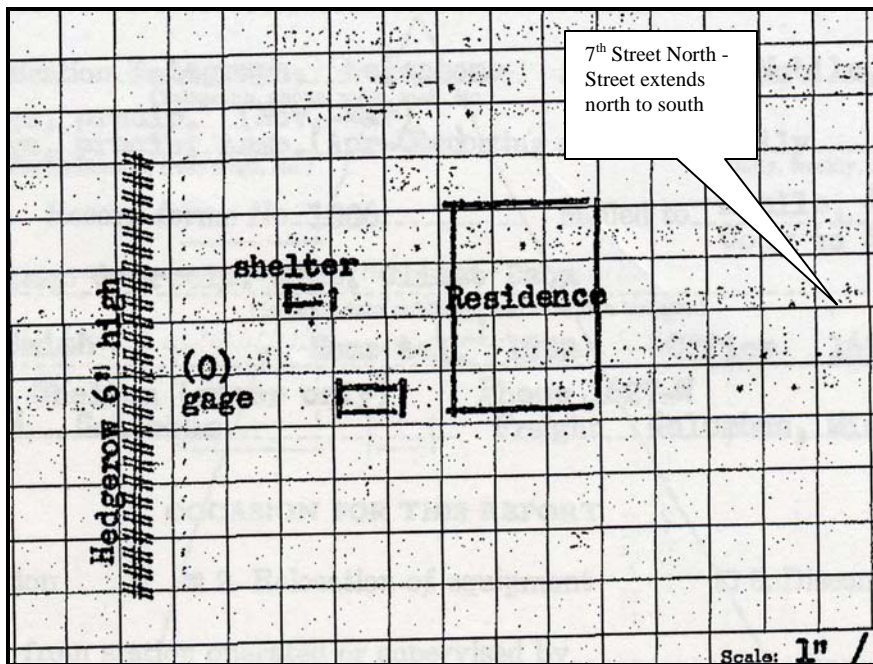


Figure 17. Diagram from the Weather Bureau Inspection Report on 1 April 1951 showing the location of the instrument shelter and rain gage at the residence of Robert Morris Smith. North is at the top of the figure. From the official station history files at the National Climatic Data Center.

*Noel L. Shelton (September 1952-April 1955)
104 5th Avenue South*

The first observation by Noel M. Shelton was 1 September 1952 and the last observation 19 April 1955. This station had a cotton region instrument shelter with maximum/minimum thermometers and a standard rain gage. The shelter and all instruments were new (according to the Weather Bureau inspection report) since the instruments at the previous station were owned by the observer. The instruments were at the observer's residence. Time of observations was 7 a.m.

Figure 18 shows the location of the residence and slope of the terrain. The terrain in the vicinity of 104 5th Avenue South was relatively flat in all directions, except a steep bank down to the river was located just west of 1st Street South.



Figure 18. Residence of Noel L. Shelton at 104 5th Avenue South. View is southwest. Instrument shelter and rain gage were located behind Mr. Shelton's house. The house shown is likely the original house for the period. Photograph taken by the author.

The instrument shelter was approximately 30 feet south of a tree and the rain gage 40 feet southwest of the tree. The height of the tree was not indicated. A hedge row was approximately 30 feet south of the shelter and 30 feet south of the rain gage, with another hedge row approximately 35 feet west of the gage (Figure 19)

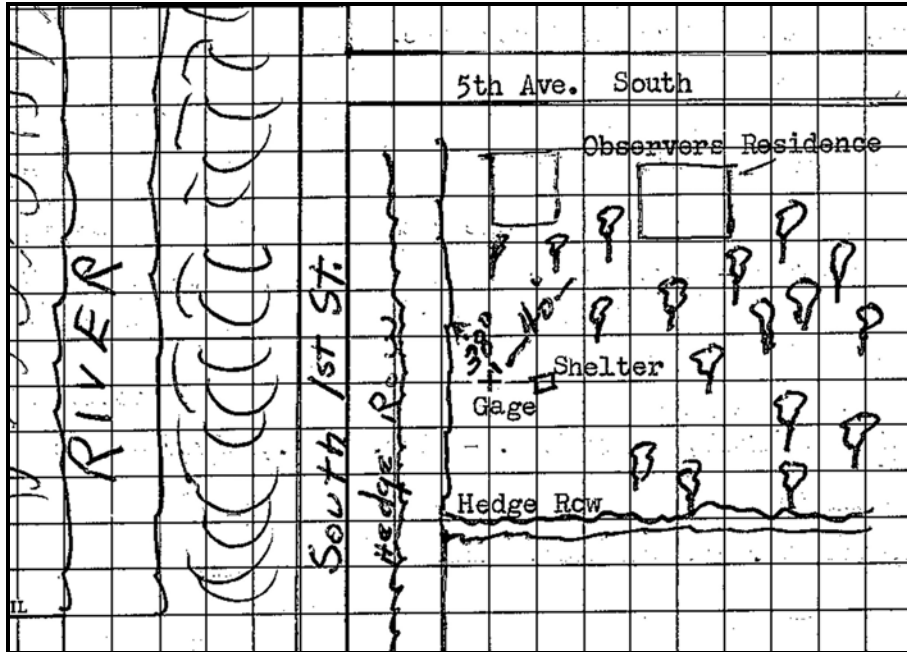


Figure 19. Location of instrument shelter and rain gage at the residence of Noel L. Shelton (1 May 1953). North is at the top of the figure. From the official station history files at the National Climatic Data Center.

*Morris Smith (April 1955 through 1956)
1205 7th Street North*

The first observation by Morris Smith was 20 April 1955 and he continued taking cooperative observations at this site through 1956. This station had a cotton region shelter, maximum/minimum thermometers, standard rain gage, microbarograph (Friez), anemometer, and a sling psychrometer. The instrument shelter was approximately 30 feet west of the residence house and the rain gage approximately 50 feet west. The rain gage also was approximately 20 feet southwest of the instrument shelter. A hedge row (approximately 6 foot high) was approximately 50 feet north of the shelter and 50 feet west. The hedge row was approximately 70 feet north of the rain gage and 30 feet west. It appears the instrument shelter and rain gage were located near the same positions as previously (April 1951-August 1952) when Mr. Smith took the cooperative observations. No information could be found as to whether Mr. Smith used his own instruments that he used in 1951 and 1952, or whether the instruments were moved from Mr. Shelton's station. Observation times for precipitation were at 7 a.m. and at 6 p.m. for temperature.

With this observer, the weather and river responsibility were separated, with river reporting given to another observer (Frank M. Franklin) who took precipitation and river readings. Mr. Franklin's address was 106 5th Avenue South. Mr. Franklin took the

hydrologic readings from 21 April 1955 to 30 June 1956, then Ms. Eugenia M. Loftis (104 5th Avenue South) took the readings from 1 July 1956 until 30 October 1956. On 30 October 1956, a telemark was installed by the USGS and the cooperative river station discontinued, but Mr. Smith's observations continued.

Aviation Observations (1942-1956)

SAWRS Observations at the Columbus Army Flying School (February 1942-April 1945)

According to Weather Bureau records, the SAWRS (Supplementary Aeronautical Weather Reporting Station) at the Columbus Army Flying School existed from 11 February 1942 to 15 April 1945. The base was deactivated in 1946.

No information could be found with regard to the exact location of the weather instruments; however, based on a conversation with the Wing Historian of the Columbus Air Force Base, as well as old maps of the base made during the mid 1940s, a best estimate of the general location can be made. Weather Bureau records stated the instruments were at, or near the Operations Building, and the old maps indicated the operational area to be in the northeast part of base complex. Figure 20 shows the best estimated general location where the observations were taken.

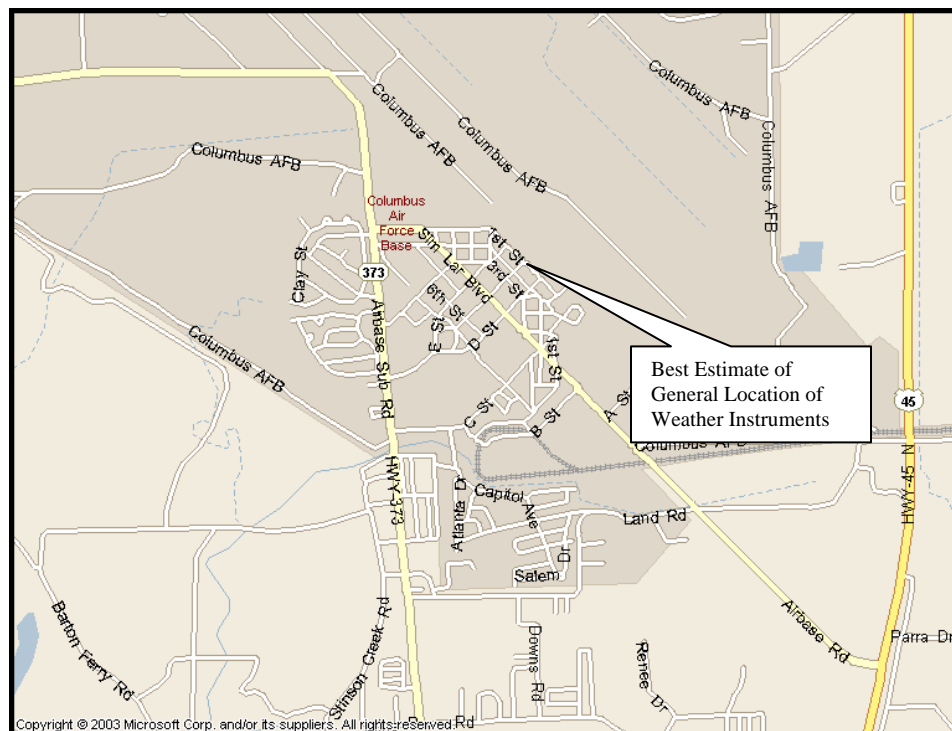


Figure 20. Best estimate of general location of weather instruments used for the SAWRS by the Columbus Army Flying School 1942-1945. Plotted on a current map of Columbus Air Force Base. North is at the top of the page and east-west distance across the map is approximately three and one-half miles.

The SAWRS had the following instruments:

Barometer – This station initially had a four-day barograph and aneroid barometer with a mercurial barometer added by 15 April 1943. Elevation of the mercurial barometer was 211 feet above sea level.

Instrument Shelter – The instrument shelter initially was a cotton region type located approximately eight feet above the roof of the building. By 15 April 1943, it was replaced by an airways shelter located four-feet above the ground. The station had an exposed thermometer, maximum/minimum thermometers, sling psychrometer (whirling apparatus), and a thermograph.

Rain Gage – A standard eight-inch rain gage was added by 15 April 1943.

Wind Instruments – The station had a three-cup anemometer and a three-foot wind vane. The Weather Bureau Instrument Report indicated the wind instruments were 24 feet above the roof of the building and 55 feet above ground.

SAWRS Observations at Columbus Air Base (June 1949-April 1953)

On 31 May 1949 a SAWRS (Supplementary Aeronautical Weather Reporting Station) was established by Southern Airways at the Columbus Air Force Base (which was re-activated approximately 19 months later) located approximately 10 miles north of the Columbus Post Office. Observations were first recorded 1 June 1949 and are contained in the NCDC database. The last SAWRS observation at Columbus Air Force Base was 31 March 1953 (the station was moved to the Columbus Municipal Airport).

According to available information, the station initially was located in the northeast part of the base complex in building T-2228. On 1 June 1951 Southern Airways moved the SAWRS approximately one-half mile to the west-northwest to building T-2502. Figure 21 shows the approximate locations of the weather stations.

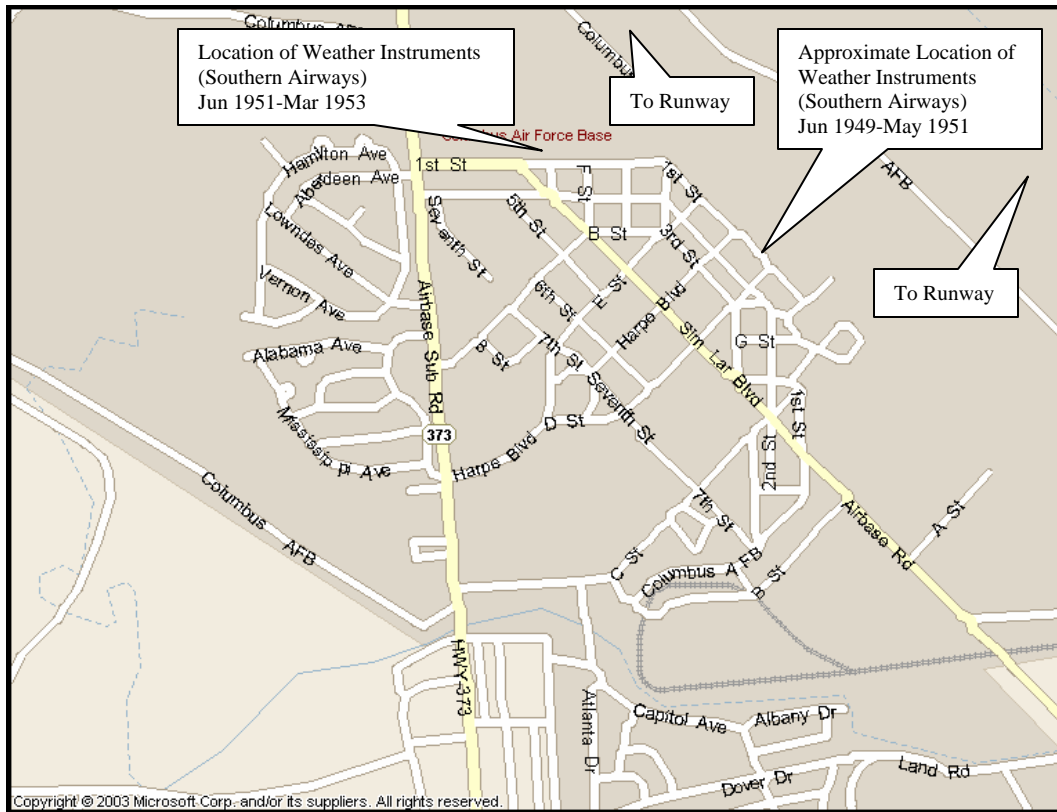


Figure 21. Locations of SAWRS weather instruments at Columbus Air Force Base from June 1949 through March 1953. Information is plotted on a current map of Columbus Air Force Base. North is at the top of the page and east-west distance across the map is approximately one and three-quarters miles.

Barometer – This station did not have a barometer. Ground elevation was listed as 205 feet above sea level.

Instrument Shelter - This station had a cotton region instrument shelter. Exact location of the shelter was not indicated other than approximately 30 feet northeast of a hangar (prior to 1 June 1951). However, maps of the base from the 1940s indicated building T-228 (which was near the weather instruments) . was on the northeast side of the base complex. The floor of the shelter was approximately 4 feet above sod. The shelter contained an exposed thermometer and fan psychrometer.

On 1 June 1951, the instrument shelter was moved approximately one-half mile west-northwest and was located about 90 feet northeast of the new Southern Airways office.

Rain Gage – This station did not have a rain gage.

Wind Instruments – The anemometer (Selsyn) and wind vane (three foot) were located 15 feet above the roof of a hangar on the base (northeast part of the base

complex) and 55 feet above ground. The wind instruments were installed by the Army.

Between 28 October 1950 and 1 June 1951, the Army wind instruments were replaced by instruments purchased by Southern Airways. The new instruments were located 5 feet above the roof and 23 feet above ground (same location). On 1 June 1951 the anemometer and wind vane were moved to the roof of the east end of the Southern Airways office (approximately one-half mile west-northwest of the previous position).

Weather parameters observed at the SAWRS (as opposed to those measured by the instruments) included sky condition, visibility and weather/obstructions to visibility.

SAWRS Observations at Columbus Municipal Airport (April 1953 through 1956)

On 1 April 1953 a SAWRS (Supplementary Aeronautical Weather Reporting Station; moved from Columbus Air Force Base) was established at the Columbus Municipal Airport (now Columbus-Lowndes County Airport) located approximately 3.2 miles southeast of downtown Columbus. Observations continued through 1956. Figure 22 shows the location of the Airport Administration Building where the weather observations were taken.

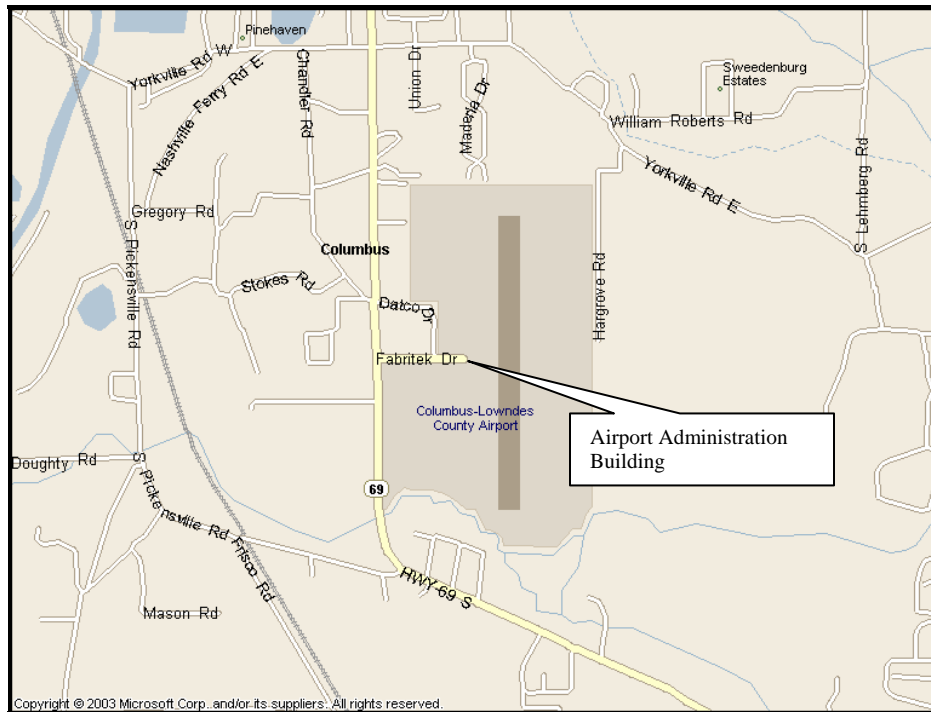


Figure 22. Location of the Airport Administration Building at the Columbus Municipal Airport (Columbus-Lowndes County Airport) plotted on a current map of Columbus. North is at the top of the map. East-west distance across the map is two and three-quarters miles.

Barometer – This station did not have a barometer. Ground elevation was listed as 186 feet above sea level.

Instrument Shelter – The instrument shelter was an airways (or small) type that was located on a post over level sod about 30 feet east-southeast of the Administration Building. Weather Bureau inspections stated the Administration Building was approximately eight feet higher than the shelter. A concrete ramp was approximately 15 feet east of the instrument shelter.

The shelter had an exposed thermometer and fan psychrometer located five feet above ground. Exposure of the instruments was rated as good.

Rain Gage – This station did not have a rain gage.

Wind Instruments – The wind instruments were on a pole at the south end of the Administration Building. The instruments were about 5 feet above the roof of the building and 19 feet above ground. The nearest obstruction was a wooden pole located about 6 feet to the west and was about 10 inches in diameter. The pole extended to a height about 30 feet above the wind instruments. The anemometer was made by Stewart (model not known).

The weather instruments were owned by Southern Airways. Figure 23 shows the Administration Building at the airport and Figure 24 shows approximate location of the instrument shelter.



Figure 23. Administration Building at the Columbus-Lowndes County Airport. Airport officials stated this was the building that housed Southern Airways and the SAWRS in the early 1950s. View is southeast. Photograph by the author.

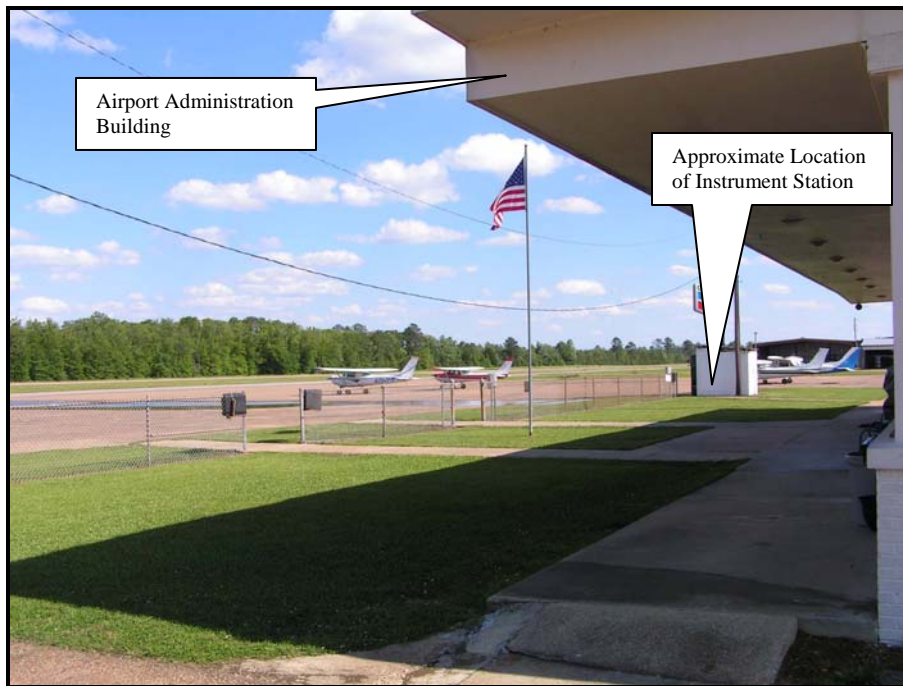


Figure 24. Approximate location of the instrument shelter at the SAWRS maintained by Southern Airways 1953-1956. View is southeast from the northwest corner of the Airport Administration Building. Photograph taken by the author.

THE OBSERVERS

James S. Lull

James Lull took weather observations in Columbus for the Smithsonian Institution for over 15 years, including through the Civil War. Mr. Lull was a highly respected architect of the community, as well as a town elder, serving as “Selectman” of the city for a number of years. He also served as trustee of the Franklin Academy.

Little was found regarding James Lull’s early years (a newspaper article in the *Columbus Pilgrim* referred to Lull as “the mystery man”), only that he moved to Columbus from Vermont in 1837, residing in the city until his death. It appears that he took weather observations for the Smithsonian up until just before his death in 1871.

James Lull was a renowned architect and an outstanding carpenter. He designed and built a number of antebellum homes in Columbus, as well as the Lowndes County Court House. He was responsible for introducing the use of Greek Revival architectural style to Columbus. His most significant building accomplishment was the completion in 1847 of Camellia Place whose house and grounds occupy an entire city block (Figure 25). James Lull lived in Camellia Place until he died in 1871.



Figure 25. Camellia Place, the home of James S. Lull from the late 1840s until early 1870s. View is toward the south. Photo by the author.

Joseph B. Love

J.B. Love (Figure 26) took cooperative weather observations in Columbus from March 1906 through March 1951, a period of 41 years. Mr. Love was a highly respected citizen of Columbus during his life.



Figure 26. Mr. Joseph B. Love (photo taken in 1956). From the Columbus-Lowndes Public Library.

When J.B. Love began taking weather observations in early 1906, he worked for the Mobile & Ohio Railroad. Around 1911, he quit his railroad job and moved from southern Columbus to the northern part of the city to open his trucking business, the Columbus Transfer Company (Figure 27). He also became an agent for the Gulf Refining Company. He was involved with the trucking company until the late 1930s and with the Gulf Company until around 1950.



Figure 27. Advertisement in 1925 for the Columbus Transfer Company owned by J.B. Love. From the Columbus-Lowndes Public Library.

In the late 1940s, Mr. Love became the Superintendent of the Friendship Cemetery. Friendship Cemetery has a long and respected history in Columbus and Mississippi. It was founded on May 30, 1849, in southern Columbus. During the Civil War years, portions of the cemetery were dedicated to the burial of confederate soldiers. However, following the Battle of Shiloh in 1862, 3,000 wounded Confederate and Union soldiers were brought to Columbus. Consequently, both confederate and union soldiers are buried in the cemetery. J.B. Love served as the cemetery's Superintendent for several years.

Mr. Love stopped taking cooperative weather observations in March 1951. His wife, Frances, told *The Birmingham News* on 7 February 1956, "I retired him on April 1, 1951. It was every day and night and it just wasn't worth it to him. People would call at all times during the night for weather predictions. One man called in the middle of the night and said he was 'one of the Jones boys.'"

OTHER OBSERVATIONS

The Weather Bureau Substation History prepared 1 December 1955 stated a private diary existed that contained a narrative of weather observations for Columbus from March 1837 through October 1838. No information could be found on this diary.

The Substation History also indicated weather observations were taken in Columbus from 1 January 1875 through 31 October 1888 as part of the Mississippi State Weather Service Program. No information could be found regarding these observations. A document prepared by the U.S. Signal Service in 1890 also mentioned the State Weather Service observations. The Signal Service document stated the observations were sporadic over the 13 year period and that only temperature was observed. The Substation History document stated the site was in the middle of the city and had a maximum thermometer, minimum thermometer, and a standard rain gage. The Substation History also indicated no data were available from this site.

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APPENDIX

Methodology

The timeline for weather observing at Columbus differed significantly from other stations researched as part of this project. Timelines for most stations followed the evolution of observing beginning with Army surgeons or Smithsonian observers in the mid to late 1800s, with the U.S. Signal Service and Weather Bureau assuming responsibility in the late 1800s. In Columbus individual citizens took the observations, beginning with Smithsonian observers and continuing with cotton region, voluntary, and cooperative observers. These individual observers were responsible for the Columbus observing history from 1856 through 1956, with Army surgeons recording the weather during 1868 and 1869. Hourly aviation observations were started in Columbus in 1942 when a SAWRS was established at the Army Air Base approximately 10 miles north of the city. This SAWRS stopped in 1945, with another started in 1949 (by Southern Airways) that continued through 1956, moving to the Municipal Airport (3 miles southeast of downtown) in 1953. Consequently, the methodology followed for this report differed from previous approaches.

Entries from local Climate Record Books at the National Climate Data Center provided the backbone for locations and general exposures for barometers, instrument shelters (especially thermometers), rain gages, and anemometers/wind vanes. However, conflicts were found between information on these documents (which were written in the 1950s) and material contained in Weather Bureau inspection reports prepared at the time of interest, e.g., inspection reports, reports on instruments, etc. When the conflict could not be resolved with other sources of information, the inspection reports generally were followed.

Of particular help were the archives of cotton region and voluntary/cooperative observations for Columbus in the NCDC database beginning in April 1883 and continuing through December 1902. These records were important for establishing the transition from part-time cotton region observations (during the growing season) to continuous observations through the year by voluntary observers (and later by cooperative observers) that began in 1896. Also important were the monthly listing of voluntary/cooperative observers for Mississippi stations contained in Monthly Bulletin of the Mississippi Weather Service that began in 1888 (in the NCDC database), later evolving to the Weather Bureau Climate and Crop Service, and finally to Climatological Data. These publications allowed for the monthly tracking of voluntary/cooperative observers at Columbus.

City directories for Columbus and Sanborn Insurance Maps (at the Columbus-Lowndes Public Library) were invaluable in establishing timelines for observer residences and locations of commercial offices. In particular, the city directories were essential in determining the residences of J.B. Love from 1906 through 1951. The directories also were crucial in determining or confirming the addresses of other

observers. Sanborn Insurance Maps for the appropriate period helped define relevant commercial sites, e.g., the M&O Railroad Depot.

The Wing Historian at Columbus Air Force Base provided maps and documents that helped specify the locations of the SAWRS at that base. In particular, maps of the base prepared in the 1940s were crucial in identifying the general location of the weather instruments used by the Army Flying School, and later by Southern Airways.

Information regarding duration of observations by Smithsonian Institution weather observers in the Columbus area was obtained from yearly Smithsonian Institution reports, as well as from the NCDC data base. Local newspaper archives (microfilm) also provided information on the Smithsonian observers.

Other information and data sources checked (by person, telephone, or through the Internet) during this study were the Mississippi Department of Archives and History, and Mississippi State University Library. Also, relevant information was obtained from the Dallas, TX Public Library, Oklahoma State University Library, the National Library of Medicine at Bethesda, MD, and NOAA Library.