

**HISTORY OF WEATHER OBSERVATIONS
Columbia, South Carolina
1836-2006**

February 2006

**Prepared by:
Stephen R. Doty
Information Manufacturing Corporation
Rocket Center, West Virginia**

**Prepared in cooperation with:
Cary J. Mock, Department of Geography
University of South Carolina,
Columbia, South Carolina**

**This report was prepared for the Midwestern Regional Climate Center
under the auspices of the Climate Database Modernization Program,
NOAA's National Climatic Data Center, Asheville, North Carolina**

CONTENTS

	Page
Acknowledgements	iii
List of Illustrations	iv
Introduction	
Executive Summary	1
Goal of Study	1
Location of Observations	
Location maps	2
Chronology of Locations and Elevations	4
Observers and Instrumentation	6
Appendices	
Appendix 1, Observer Stories	41
Appendix 2, Methodology	46
References and Data Sources	46

ACKNOWLEDGEMENTS

I would like to thank Dr. Cary Mock for his help in the compilation of this report. The history of weather observing in Columbia has slowly been unraveled through the help of the South Caroliniana Library, the Richland County Library, and the South Carolina Governor's Mansion. A special thanks to Hope Mizzell, the South Carolina State Climatologist and her staff who even went as far as to take pictures off the wall so that they might be scanned. And finally, I would like to thank Leonard Vaughn, Vicki Stewart, and others at the Columbia National Weather Service Forecast Office for their assistance.

The author would also like to thank Glen Conner and Gary Grice for their advice and direction as it concerned the formulation of this report and its contents. And a special thanks to Joe Elms and the staff of the Climate Database Modernization Program at the National Climatic Data Center for their support and assistance.

LIST OF ILLUSTRATIONS

Maps	Page
1. The location of weather observing sites in the Columbia, South Carolina, vicinity, 1836-2006.	2
2. The location of weather observing sites in downtown Columbia, South Carolina, 1843-2006.	3
3. Map of Columbia, South Carolina, circa 1872.	4
4. The location of weather observing sites on the campus of the University of South Carolina, 1954-2006.	22
Figures	
1. The South Carolina Collegiate Female Institute, Columbia, South Carolina, circa 1860.	7
2. An example of Columbia, South Carolina weather observations as published in the Charleston, South Carolina newspaper, October 1854.	8
3. Colorized drawing of the Arsenal Academy and Barracks, Columbia, South Carolina, circa 1858.	9
4. The plan for the Post of Columbia, Columbia, South Carolina, August 1871.	11
5. Agriculture Hall on Main Street in Columbia, South Carolina, circa 1890.	12
6. A close-up view of Agriculture Hall, Columbia, South Carolina, circa 1890.	13
7. The original City Hall in Columbia, South Carolina, circa 1902.	15
8. The Barringer Building in Columbia, South Carolina, circa 1903.	16
9. The United States Weather Bureau Building in Columbia, South Carolina, circa 1910.	17
10. The Weather Bureau Building in Columbia, South Carolina, circa 1930.	18
11. The Sylvan Building in Columbia, South Carolina, circa 1950's.	19
12. The United States Court House in Columbia, South Carolina, circa late 1930's.	20
13. Layout of weather instruments at Fort Jackson, Columbia, South Carolina, November 1956.	21
14. Layout of weather instruments at the University of South Carolina, Columbia, South Carolina, September 1954.	23
15. Layout of weather instruments at the University of South Carolina, Columbia, South Carolina, October 1959.	24
16. Layout of weather instruments at the University of South Carolina, Columbia, South Carolina, June 1963.	24
17. Layout of weather instruments at the University of South Carolina, Columbia, South Carolina, December 1963.	25
18. Layout of weather instruments at the University of South Carolina, Columbia, South Carolina, January 1983.	26

19.	Weather observing site, University of South Carolina, Columbia, South Carolina, November 2005.	27
20.	Owens Field in Columbia, South Carolina, circa 1940.	28
21.	Sketch showing weather instrument placement on the Administration Building, Owens Field, Columbia, South Carolina, 7 May 1938.	29
22.	The Administration Building at Owens Field, Columbia, South Carolina, 23 July 1943.	30
23.	The Instruments on the roof of the Administration Building at Owens Field, Columbia, South Carolina, 23 July 1943.	30
24.	The Automated Surface Observing System, Downtown (Owen) Airport, Columbia, South Carolina, circa 1999.	32
25.	Columbia Owens Downtown Airport, Columbia, South Carolina, airport layout.	32
26.	An aerial view of the Columbia Owens Downtown Airport, Columbia, South Carolina, circa 2002.	33
27.	Building 317 at the Columbia Municipal Airport, Columbia, South Carolina, 20 February 1947.	34
28.	A view of the thermometer shelter and rain gage at Building 317, Columbia Municipal Airport, Columbia, South Carolina on 20 February 1947.	35
29.	The wind equipment at Building 317, Columbia Municipal Airport, Columbia, South Carolina, 20 February 1947.	36
30.	A view of the National Weather Service Building at the Columbia Metropolitan Airport, Columbia, South Carolina, circa 1980.	38
31.	National Weather Service instruments located in the rear of the Forecast Office, Columbia Metropolitan Airport, Columbia, South Carolina, November 2005.	38
32.	The Automated Surface Observing System at Columbia, South Carolina Airport, circa 2000.	39
33.	The layout of the Columbia Metropolitan Airport, Columbia, South Carolina, circa 1995.	40
34.	An aerial view of the Columbia Metropolitan Airport, Columbia, South Carolina, circa 2002.	41
35.	John C. Purvis at his weather desk, Columbia Municipal Airport, Columbia, South Carolina, 16 March 1948.	43
36.	John C. Purvis at work at the State Climatologist Office, Columbia, South Carolina, circa 1990.	44
37.	Bernard L. Palmer at the time of his retirement from the National Weather Service December 2005.	45

**HISTORY OF WEATHER OBSERVATIONS
Columbia, South Carolina
1836 – 2006**

**Stephen R. Doty
Information Manufacturing Corporation**

INTRODUCTION

Executive Summary

Weather observations in the Columbia, South Carolina, area began in 1836 when a meteorological journal was begun at the South Carolina Female Institute. The Charleston, South Carolina newspaper printed weather reports for Columbia from 1843 until 1857. In 1859 Dr. E. H. Barton served as a Smithsonian Institution observer. After the Civil War, beginning in 1872, the U. S. Army began to observe, first Army surgeons at the Post of Columbia and later Signal Service observers located downtown. In June 1887 the Signal Service established the first weather office in Columbia in the Agricultural Hall. The U. S. Weather Bureau assumed the observing duties in 1891, and they moved the office to the Federal Building in 1895, to the City Hall in 1901, and to the Barringer Building in 1903. The Weather Bureau constructed a building in 1905 [one of 28 identical buildings built between 1900 and 1910] remaining there until 1935 when the building was razed to make way for the new U. S. Courthouse. The office moved to the Sylvan Building in 1935 and then into the new Courthouse in 1936. With the closing of the Courthouse observing site in early 1954 another downtown location was required. So, later in 1954 a new Weather Bureau Cooperative station was established on the campus of the University of South Carolina. A site remains on the campus to this day.

As aviation began to take hold in Columbia an observing site was established by airline personnel at Owens Field in 1934. The Weather Bureau eventually assumed the observing duties and in 1938 they occupied new quarters on the grounds of Owen Field. Observations were taken at Owens Field until 1947 but were resumed in 1973. Observations continue to this day at Owens Field.

With the opening of the new Municipal Airport in 1947 the Weather Bureau once again moved. Their temporary quarters last some 20 years when they finally moved into the Weather Bureau/Federal Aviation Administration building in 1967. The building is presently known as the National Weather Service Forecast Office.

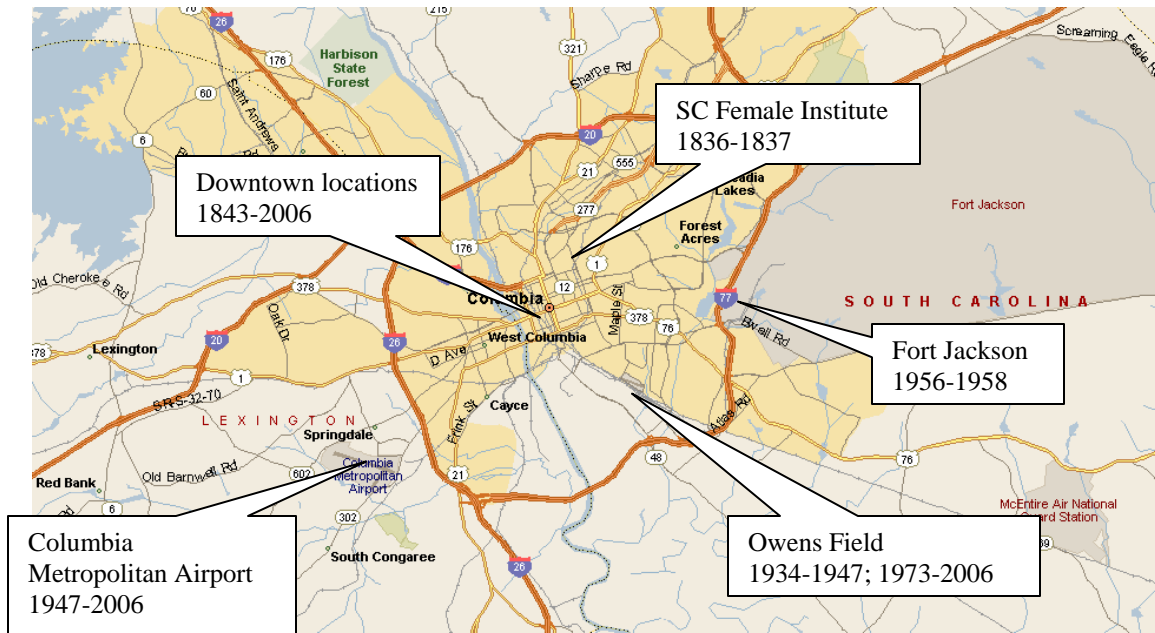
Goal of Study

The goal of this study is to document the primary weather observational path at Columbia, South Carolina. Throughout the research for and preparation of this study, the goal was to produce a document that future studies can use to evaluate the validity of the

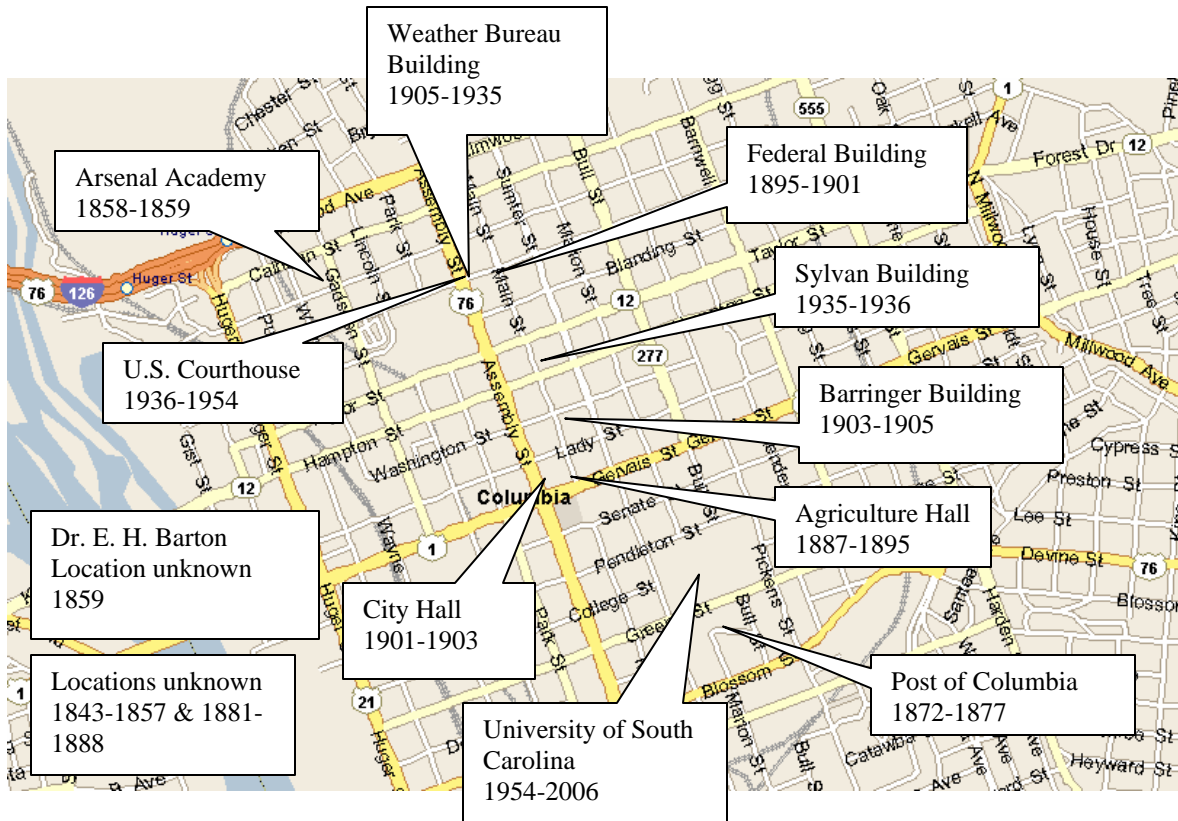
data that were collected here, judge the trustworthiness of the observers who collected them, and determine the climatological significance of the whatever variability may be discerned.

LOCATION OF OBSERVATIONS

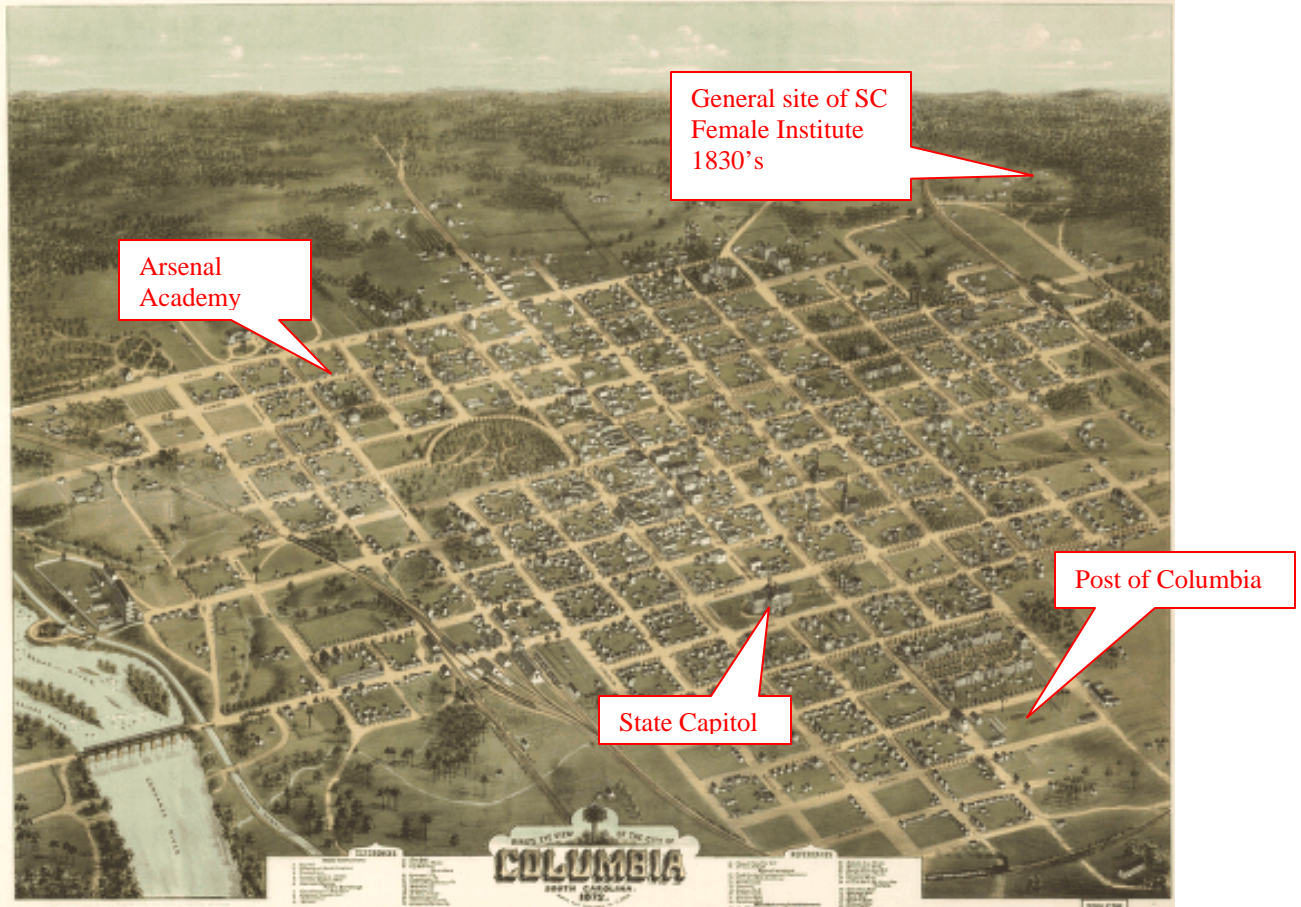
Location maps



Map 1. The location of weather observing sites in the Columbia, South Carolina, vicinity, 1836-2006.



Map 2. The location of weather observing sites in downtown Columbia, South Carolina, 1843-2006.



Map 3. Map of Columbia, South Carolina, circa 1872. North is to the top of the map.

Source: Library of Congress web site.

Chronology of locations and elevations

The following lists the chronology of weather station locations at Columbia, South Carolina, during the period 1836-2006: (The latitude and longitude entries, when listed to seconds, were derived using U. S. Geological Survey maps as presented on Topozone.com.)

Downtown and area locations:

1836 – 1837 – Elevation approximately 310 feet - 34° 02' N 81° 01'W

- South Carolina Female Institute, near 1900 Barhamville Road

1843 – 1857 – Elevation unknown

- Location unknown

April 1858 – November 1859 – Elevation 295 feet – 34° 00' 30"N 81° 02' 38"W

- Arsenal Academy, near 800 Richland Street

January 1859 – July 1859 – Elevation 233 feet

- Dr. E. H. Barton, location unknown

June 1872 – December 1877 – Elevation 295 feet – 34° 00' N 81° 02' W

- Post of Columbia, block bounded by Greene and Devine Streets; Sumter and Bull Streets

April 1881 – October 1888 – Elevation 295 feet

- Location unknown

June 1887 – June 1895 – Elevation 310 feet – 34° 00' 05"N 81° 02' 02"W

- Agricultural Hall, near northwest corner of Main and Gervais Streets

June 1895 – February 1901 – Elevation 322 feet – 34° 00' 33"N 81° 02' 15"W

- Federal Building, southwest corner Main and Laurel Streets

February 1901 – October 1903 – Elevation 310 feet – 34° 00' 05"N 81° 02' 02" W

- City Hall, northwest corner Main and Gervais Streets

October 1903 – March 1905 – Elevation 320 feet – 34° 00' 14"N 81° 02' 05"W

- Barringer Building, 1338 Main Street, southeast corner Main and Washington Streets

March 1905 – June 1935 – Elevation 340 feet – 34° 00' 32"N 81° 02' 19"W

- Weather Bureau Building, 1102 Laurel Street, southeast corner Laurel and Assembly Streets

June 1935 – August 1936 – Elevation 312 feet – 34° 00' 20"N 81° 02' 07"W

- Sylvan Building, northeast corner Main and Hampton Streets

August 1936 – June 1954 – Elevation 332 feet – 34° 00' 32"N 81° 02' 19"W

- United States Courthouse, southeast corner Laurel and Assembly Streets

November 1956 – June 1958 – Elevation 249 feet – 34° 00' 33"N 80° 56' 43"W

- Fort Jackson, near intersection Pickett and Early Streets

September 1954 – April 1973 – Elevation 312 feet – 33° 59' 56"N 81° 01' 33"W

- University of South Carolina Campus, Geology Building, Pickens Street

May 1973 – 2006 – Elevation 242 feet – 33° 59' 29"N 81° 01' 27"W

- University of South Carolina Campus, Bates House, 300 Bull Street

Airport locations:

March 1934 – March 1938 – Elevation 200 feet – 33° 58' 36" N 81° 00' 07" W

- Hangar, Municipal Airport, Owens Field

March 1938 – February 1947 – Elevation 202 feet – 33° 58' 39" N 81° 00' 05" W

- Administration Building, Municipal Airport, Owens Field

April 1973 – October 1998 – Elevation 210 feet - 33° 58' 20" N 80° 59' 39" W

- Operations Building, Columbia-Owens Downtown Airport

October 1998 – 2006 – Elevation 210 feet - 33° 58' 27" N 80° 59' 52" W

- ASOS location, Columbia-Owens Downtown Airport

February 1947 – January 1967 – Elevation 217 feet– 33° 57' N 81° 07' W

- Building 317, Columbia Airport (Columbia Metropolitan Airport)

January 1967 – September 1995 – Elevation 213 feet – 33° 56' 20" N 80° 07' 03" W

- Field location, Columbia Metropolitan Airport, Weather Bureau/FAA Building, 2909 Aviation Way

October 1995 – 2006 – Elevation 213 feet – 33° 56' 33" N 80° 07' 05" W (ASOS)

- ASOS location, Columbia Metropolitan Airport, Weather Bureau/FAA Building, later National Weather Service Forecast Office, 2909 Aviation Way

OBSERVERS AND INSTRUMENTATION

City Locations:

1836 – 1837:

From February 1836 until January 1837 weather observations were recorded in a "Meteorological Journal" at the South Carolina Female Institute. The Institute was located in the Barhamville area of Columbia, north and east of downtown. This appears to be near the present day 1900 block of Barhamville Road. See Figure 1.



Figure 1. The South Carolina Collegiate Female Institute, Columbia, South Carolina. circa 1860. View is looking northwest.

Source: “A Barhamville Miscellany” Edited by Henning Cohen, 1956

Thermometer – Temperature observations were taken three times a day at sunrise, 2pm and 9pm. Details as to the instrumentation, location, or exposure have not been found.

Rain gage – Daily rainfall observations were taken but no details have been found as to the gage in use, its location or exposure.

Wind instruments – Prevailing daily wind direction was recorded but no details have been found as to instrumentation, location, or exposure.

1843 – 1857:

The Charleston, South Carolina, newspapers printed weather observations for Columbia from January 1843 through August 1857. See Figure 2. No further information has been found as to the location of this observing site. Dr. Cary Mock at the University of South Carolina thinks this observer might have been Dr. Robert W. Gibbes who lived on Gervais Street downtown.

Diary of the Weather in Columbia, S. C.						
FOR THE WEEK, ENDING OCTOBER 28, 1854.						
DAYS	Thermometer.			Wind.	Weather.	Remarks.
	7 a. m.	2 p.m.	9 p.m.			
22	32	69	53	N.E.	Fair.	
23	50	70	54	N.E.	Fair.	
24	48	72	48	N.E.	Fair.	
25	52	70	60	N.E.	Fair.	
26	58	70	64	N.E.	Fair.	
27	62	62	59	N.E.	Rain.	} 2 inches $\frac{1}{8}$
28	66	70	58	N.E.	Rain.	

Figure 2. An example of Columbia, South Carolina weather observations as published in the Charleston, South Carolina newspaper, October 1854. Source: Dr. Cary Mock, University of South Carolina.

Thermometer – Temperature observations were taken three times a day at 7am, 2pm, and 9pm. Details as to the instrumentation, location, or exposure have not been found.

Rain gage – Daily precipitation measurements were recorded but no details have been found as to the gage in use, its location or exposure.

Wind instruments – Wind direction was being recorded however, no details have been found as to the vane in use, its location or exposure.

1856 – 1859:

As early as September and October 1856, weather observations were taken at the Arsenal Academy. See Figure 3. Observations resumed in April 1858 continuing until November 1859 under the auspices of the Smithsonian Institution. The Academy was located in the vicinity of what is now known as 800 Richland Street. The only Academy building to survive the burning of Columbia during the Civil War is now used as the South Carolina Governor’s mansion.

A series of men conducted the observations at the Academy including:

- Cadet F. H. Harleston (under direction of Lieutenant J. B. White professor of math)
- Captain C. C. Tew
Superintendent
- Captain J. B. White
- Cadet Chisolm (under direction of J. B. White)

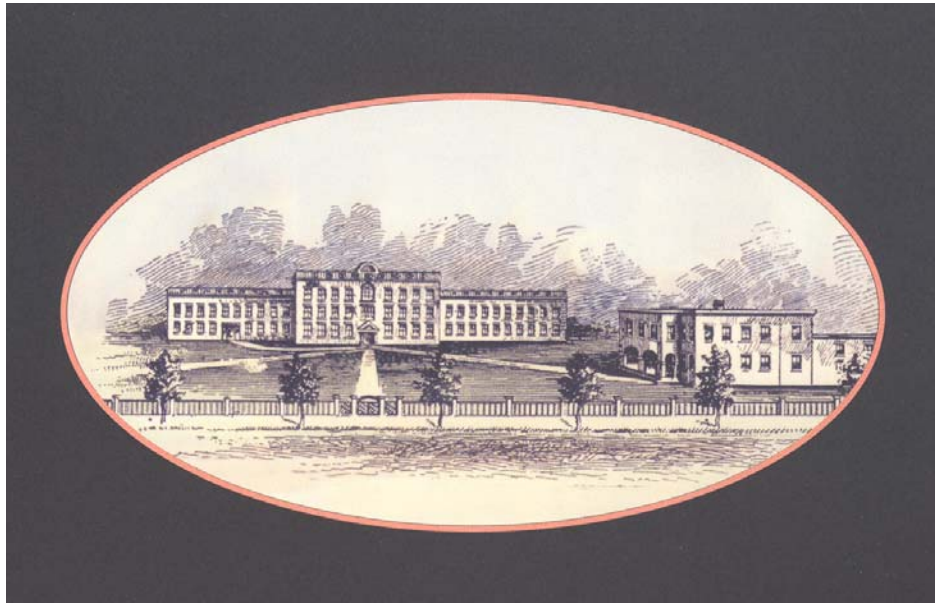


Figure 3. Colorized drawing of the Arsenal Academy and Barracks, Columbia, South Carolina, circa 1858. View is looking south towards downtown Columbia. The building to the right is now the South Carolina Governor’s Mansion. Source: Governor’s Mansion collection.

Information on the instruments in use at the Academy is sketchy at best.

Thermometer – Temperature observations were taken three times a day at 7am, 2pm, and 9pm. Details as to the instrumentation, location, or exposure have not been found.

Barometer – Barometric pressure was recorded three times a day at 7am, 2pm and 9pm. Details as to the type of barometer or its location have not been found.

Rain gage - Daily precipitation measurements were recorded but no details have been found as to gage in use, its location or exposure.

Wind instruments – Wind direction and force were observed at 7am, 2pm and 9pm. Details as to instrumentation, location, or exposure have not been found.

1859:

Dr. E. H. Barton, a Smithsonian Institution observer, recorded observations from January 1859 through July 1859. His exact location is not known nor have any details been found as to the instruments in use or their placement.

Thermometer – Temperature observations were taken three times a day at 7am, 2pm, and 9pm. Details as to the instrumentation, location, or exposure have not been found.

Barometer – Barometric pressure was recorded three times a day at 7am, 2pm and 9pm. Details as to the type of barometer or its location have not been found.

Rain gage - Daily precipitation measurements were recorded but no details have been found as to gage in use, its location or exposure.

Wind instruments – Wind direction and force were observed at 7am, 2pm and 9pm. Details as to instrumentation, location, or exposure have not been found.

1872 – 1877:

A series of U. S. Army surgeons recorded observations from June 1872 until December 1877 at the Post of Columbia. Information found in the National Archives and Record Administration files indicates that the Post was located around Sumter, Greene, Bull and Devine Streets. See Figure 4. This location would place the Post on the present day campus of the University of South Carolina. The Post was constructed in 1867, housing 320 men with stables for 11 horses. It was first occupied on 1 February 1871. It was listed as “open, and not in good order for cold weather.” A hand written note on the December 1877 observational form stated “Observations Suspended Instruments Packed Post of Columbia, S.C. discontinued December 18, 1877”.

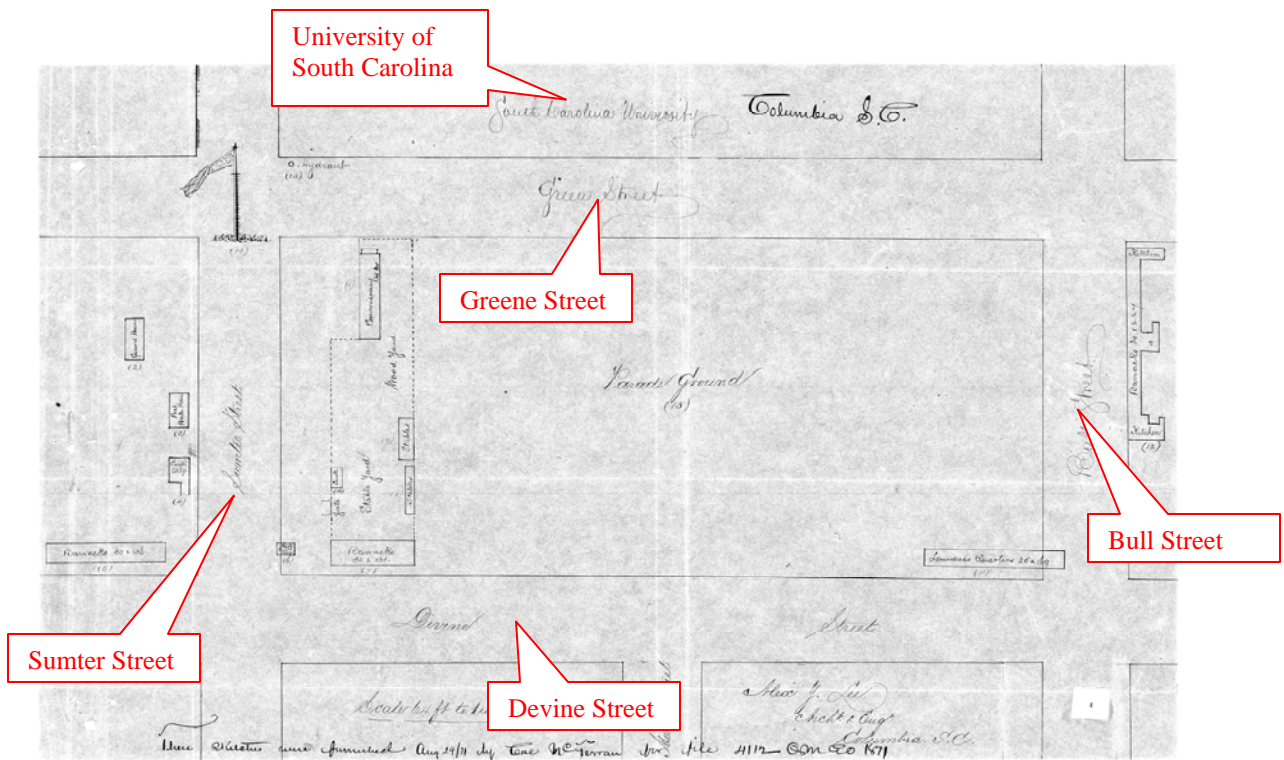


Figure 4. The plan for the Post of Columbia, Columbia, South Carolina, August 1871. North is to the top of the diagram.

Source: National Archives and Records Administration, Record Group 92, Map 103B.

Thermometer – Temperature observations were taken three times a day at 7am, 2pm, and 9pm. Details as to instrumentation, location, or exposure have not been found.

Rain gage – Daily rain fall observations were made until February 1877 when the observer indicated that the gage was unserviceable. The gage was reported to be unavailable throughout the remainder of the observational program at the Post. Further information as to gage type, its location or exposure has not been found.

Wind instruments – Wind direction and force were observed at 7am, 2pm and 9pm. Details as to instrumentation, location, or exposure have not been found.

1881 – 1888:

Several U. S. Army Signal Service personnel recorded observations from April 1881 until October 1888. Signal Service personnel also participated in the “Cotton

Region” network, recording daily observations of temperature and precipitation during the months of April to October for the years 1883 through 1888. The locations for these efforts were simply entered as “Columbia” and no further details are known.

Thermometer – Daily extreme temperatures were recorded. Details as to the instrumentation, location, or exposure have not been found.

Rain gage – Daily precipitation measurements were recorded. Details as to the gage in use, its location and exposure have not been found.

1887 – 1895:

Observations were taken at the Agricultural Hall from 5 June 1887 until 7 June 1895 when the building was razed. This location was near the northwest corner of Main and Gervais Streets. See Figures 5 and 6. The building was also known as the notorious Parker’s Hall (or Haul). This station, being a third-order station, only recorded one observation per day, at 8pm. The station was manned by U. S. Army Signal Service observers until 1 October 1891 when Weather Bureau personnel assumed the duties.



Figure 5. Agriculture Hall on Main Street in Columbia, South Carolina, circa 1890. View is looking west.

Source: Richland County Public Library.

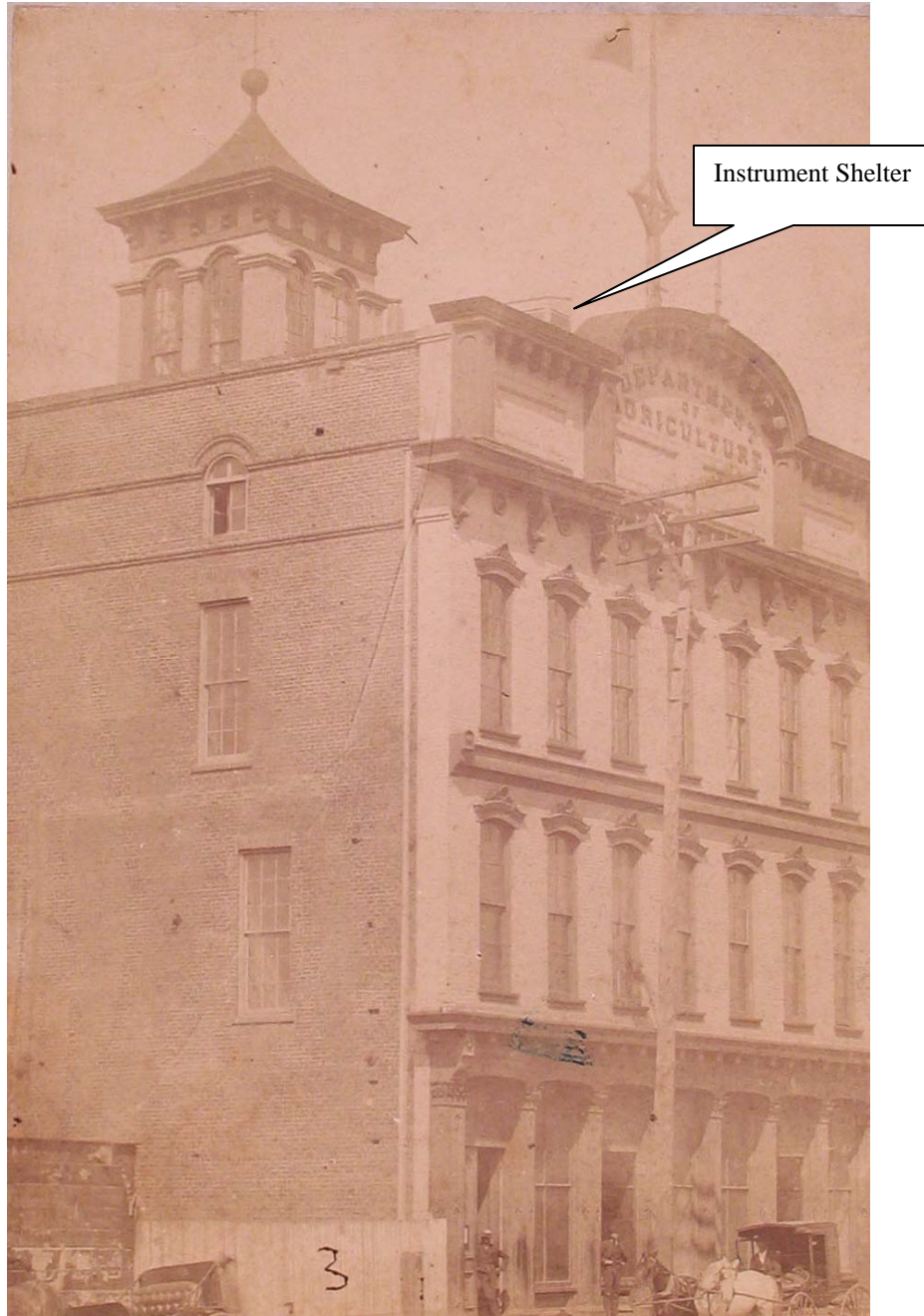


Figure 6. A close-up view of Agriculture Hall, Columbia, South Carolina, circa 1890. View is looking north. The instrument shelter is just visible on the roof. Source: Courtesy of South Caroliniana Library, University of South Carolina, Columbia. Used with permission.

Thermometer – The thermometers were located 73 feet above the ground. See Figure 6.

Rain gage – The eight-inch gage was located 63 feet above the ground.

1895 – 1901:

On 8 June 1895 the Weather Bureau observational program moved to the Federal Building where it remained until 15 February 1901. This location was on the southwest corner of Main and Laurel Streets. One observation per day was recorded that being at 8am. This was a move of 2,800 feet north northwest from the previous location.

Thermometer – The thermometers were located at five feet above the ground. Exposure was rated as fair with a building 35 feet high some 35 feet distance.

Rain gage – The eight-inch gage was located three feet above the ground. Exposure was rated as fair with a building 35 feet high some 35 feet distance.

1901 – 1903:

On 15 February 1901 the Weather Bureau moved the observational program to the City Hall building. The building was located on the northwest corner of Main and Gervais Streets. See Figure 7. This was a move of 2,800 feet south southeast from the previous location. At this time the station gained first-order status allowing it to take a full suite of observations. The Bureau remained at this location until 1 October 1903.

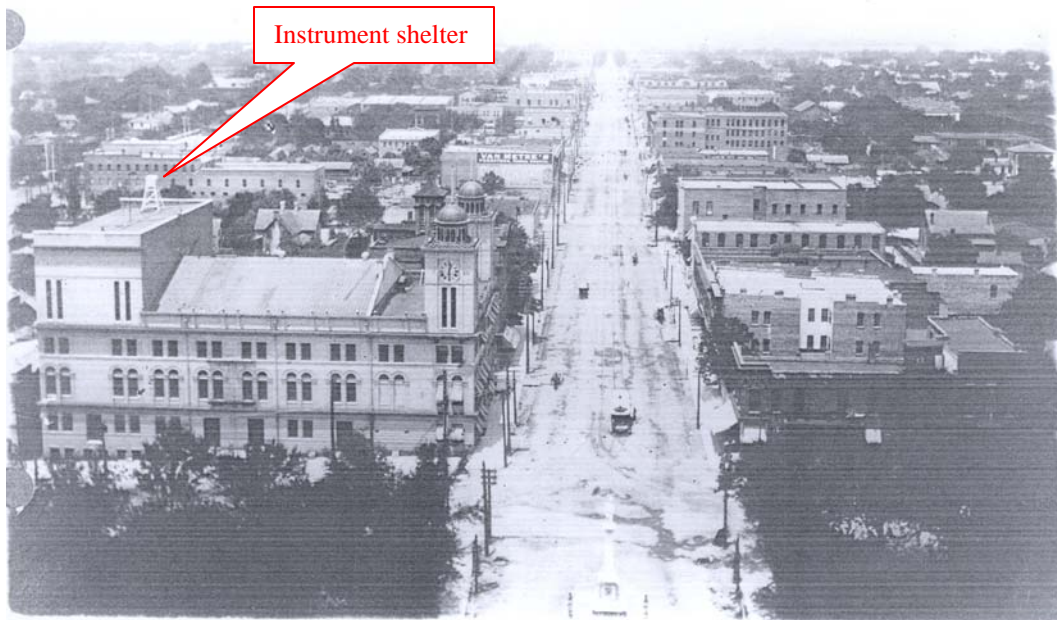


Figure 7: The original City Hall in Columbia, South Carolina, circa 1902. View is looking northeast up Main Street. The Agricultural Hall tower can be seen between the two towers on the front of City Hall. Source: Richland County Public Library.

Thermometer – The thermometers were located 114 feet above the ground. See Figure 7.

Barometer – The barometer, serial number 188, was located at 346.87 feet above mean sea level.

Rain gage – The eight-inch gage was located 107 feet above the ground.

Wind instruments – The wind instruments were located 122 feet above the ground.

1903 – 1905:

On 1 October 1903 the Weather Bureau moved to the Barringer Building occupied by the National Loan and Exchange Bank. The building was located on the southeast corner of Main and Washington Streets. See Figure 8. This was a move of 800 feet north. The Weather Bureau remained at this location until 1 March 1905.



Figure 8. The Barringer Building in Columbia, South Carolina, circa 1903. The wind vane can be seen on the left side of the roof. View is looking southeast. Source: Courtesy of South Caroliniana Library, University of South Carolina, Columbia. Used with permission.

Thermometer – The thermometers were located 167 feet above the ground.

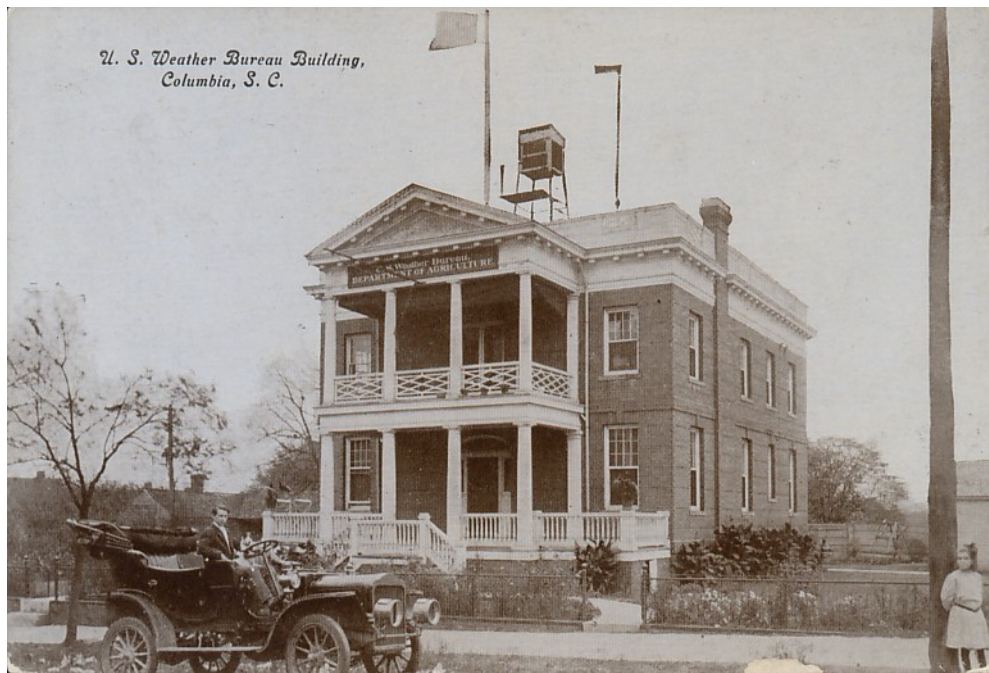
Barometer – The barometer, serial number 188, was located at 440.7 feet above mean sea level.

Rain gage – The eight-inch gage was located 159 feet above the ground. A tipping-bucket gage was installed at this time at the same height. The gages were within six feet of a roof parapet.

Wind instruments – The wind instruments were located 175 feet above the ground. See Figure 8.

1905 – 1935:

The Weather Bureau occupied its own building on 1 March 1905. The building was located at 1102 Laurel, on the southeast corner of Laurel and Assembly Streets. See Figures 9 and 10. This was a move of 2,000 feet northwest. They remained at this location until 3 June 1935 when the building was razed to make room for the new U. S. Courthouse. This building was one of 28 identical buildings that the Weather Bureau constructed between 1900 and 1910.



**Figure 9. The United States Weather Bureau Building in Columbia, South Carolina, circa 1910. View is looking north.
Source: Author's collection of post cards.**



Figure 10. The Weather Bureau Building in Columbia, South Carolina, circa 1930. View is looking north.

Source: Courtesy of South Caroliniana Library, University of South Carolina, Columbia. Used with permission.

Thermometer – The thermometers were located on the roof of the building at 41 feet above the ground. See Figures 9 and 10.

Barometer – The barometer, serial number 188, was located at 345.1 feet above mean sea level.

Rain gage – The station's eight-inch and tipping-bucket gages were located on the roof at a height of 32 feet above the ground.

Wind instruments – The wind instruments were located on the roof of the building at 57 feet above the ground. See Figures 9 and 10.

1935 – 1936:

On 3 June 1935 the Weather Bureau moved to the Sylvan Building located on the northeast corner of Main and Hampton Streets. This was a move of 1,350 feet southeast. Offices were located on the third floor. The Bureau remained in this location until 26 August 1936. See Figure 11.



Figure 11. The Sylvan Building in Columbia, South Carolina, circa 1950's. View is looking north.

Source: Courtesy of South Caroliniana Library, University of South Carolina, Columbia. Used with permission.

Thermometer – The thermometers were located 67 feet above the ground. Exposure rated as good.

Barometer – The barometer, serial number 188, was located 356.45 feet above mean sea level.

Rain gage – The tipping-bucket gage was located 58 feet above the ground.

Wind instruments – The wind instruments were located 73 feet above the ground.

1936 – 1954:

On 26 August 1936 the Weather Bureau moved to the new United States Courthouse located on the southeast corner of Laurel and Assembly Streets. See Figure 12. This was the former site of the Weather Bureau Building. This was a move of 1,350 feet northwest. Offices were located on the fourth floor. The Bureau remained in this location through the end of May 1954 when the downtown office was closed.



Figure 12. The United States Court House in Columbia, South Carolina, circa late 1930's. View is looking east. The wind instruments can be seen on the roof.
Source: Courtesy of South Caroliniana Library, University of South Carolina, Columbia. Used with permission.

Thermometer – The thermometers were located 70 feet above the ground and five and seven-tenths feet above the roof. They were located in a standard shelter.

Barometer – The station had a Green mercurial barometer, serial number 188, located at 387.93 feet above mean sea level. Barometer number 1266 was installed in September 1945.

Rain gage – The eight-inch and tipping-bucket gages were located 68 feet above the ground and three and eight-tenths feet above the roof. Exposure was rated as satisfactory.

Wind instruments – The wind instruments, a four-cup anemometer and a four foot wooden vane, were located 91 feet above the ground. The

anemometer cups were 27 feet above the roof and the vane 29 feet above the roof. See Figure 12.

1956-1958:

On 1 November 1956 an observing program was begun at Fort Jackson. The instruments were located southeast of Building 3494 near the intersection of Pickett and Early Streets. The site was surrounded by trees at a distance of between 40 and 50 feet. Observations continued at this location until 30 June 1958.

Thermometer – The maximum and minimum thermometers were housed in a Cotton Region Shelter. See Figure 13.

Rain gage – A standard eight-inch gage was being used. See Figure 13.

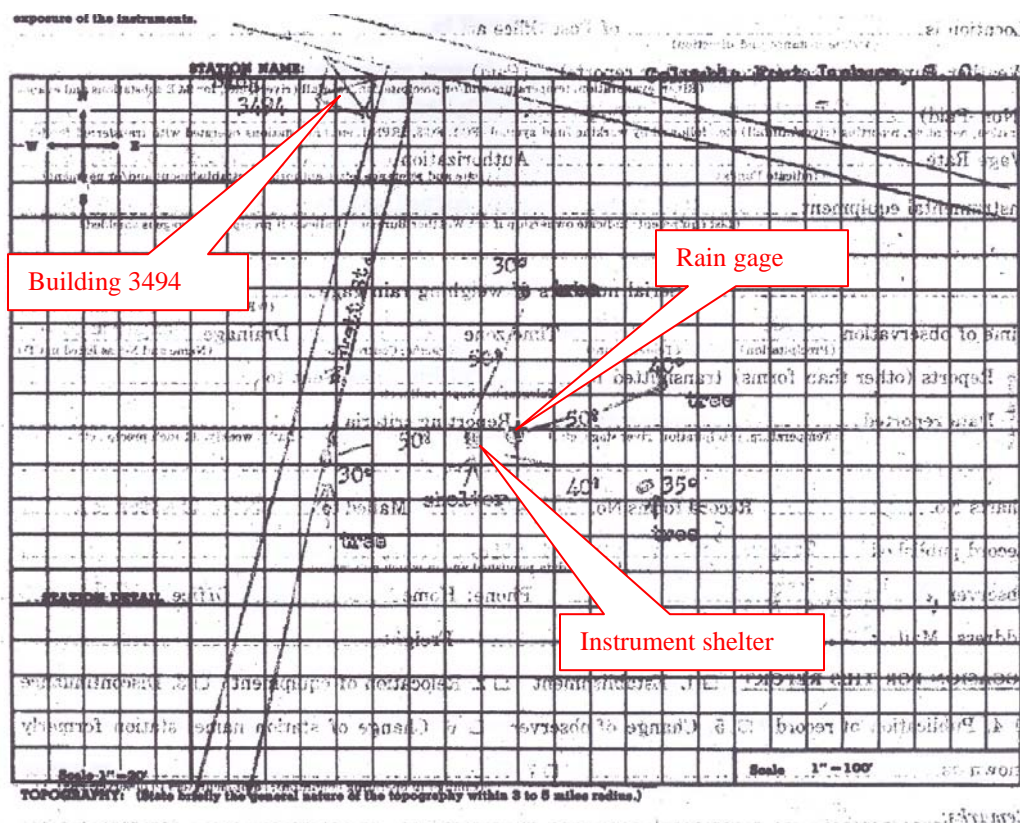
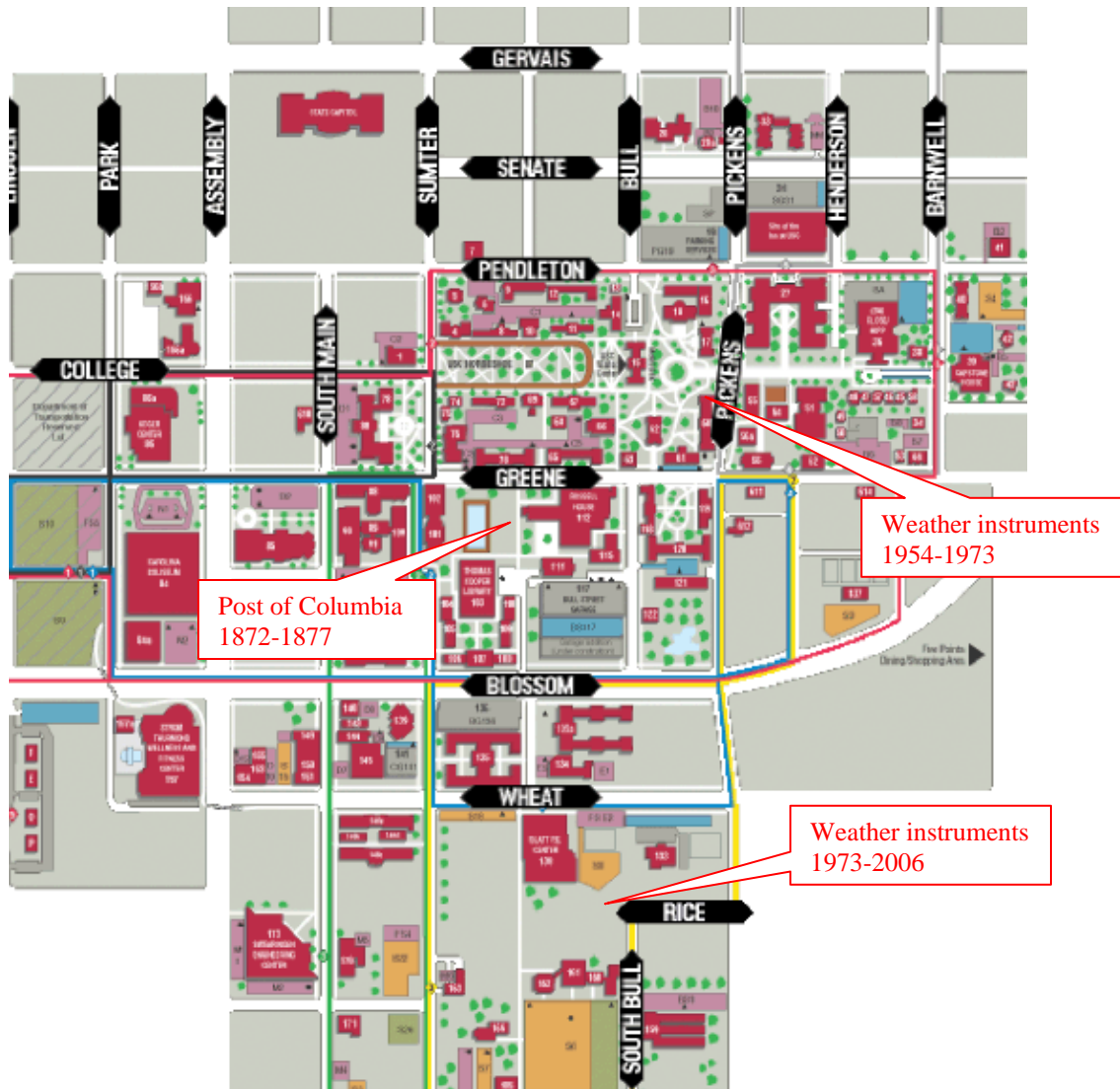


Figure 13. Layout of weather instruments at Fort Jackson, Columbia, South Carolina, November 1956. North is to top of diagram. Source: Official station history files at the National Climatic Data Center.

1954-1973:

On 1 September 1954 the Weather Bureau, wanting to continue an observation site in downtown Columbia, opened a cooperative observing station on the campus of the University of South Carolina. This site was north of the Geology Building, now known as the LeConte Building, on the west side of Pickens Street. See Map 4 and Figure 14. The Department of Geology and Geography was listed as the official observer.



Map 4. The location of weather observing sites on the campus of the University of South Carolina, 1954-2006. North is to the top of the map. For reference, the location of the Post of Columbia, 1872-1877, is indicated. Source: Map from www.sc.edu

Thermometer – The maximum and minimum thermometers were housed in a Cotton Region Shelter. See Figure 14. On 15 June 1963 the instrument shelter (IS) was relocated to make way for a new iron bar fence being constructed along Pickens Street. See Figure 16. This location was still near the Geology Building but details as to exact relationship were not found in the history files. On 4 December 1963 the shelter was relocated some 210 feet southwest for a better exposure. See Figure 17.

Rain gage – A standard eight-inch gage was being used. See Figure 14. On 21 October 1959 the gage was move 31 feet north northeast away from fast growing trees. See Figure 15. On 15 June 1963 the gage was relocated to make way for a new iron bar fence being constructed along Pickens Street. See Figure 16. This location was still near the Geology Building but details as to exact relationship were not found in the history files. On 4 December 1963 the shelter was relocated some 210 feet southwest for a better exposure. See Figure 17.

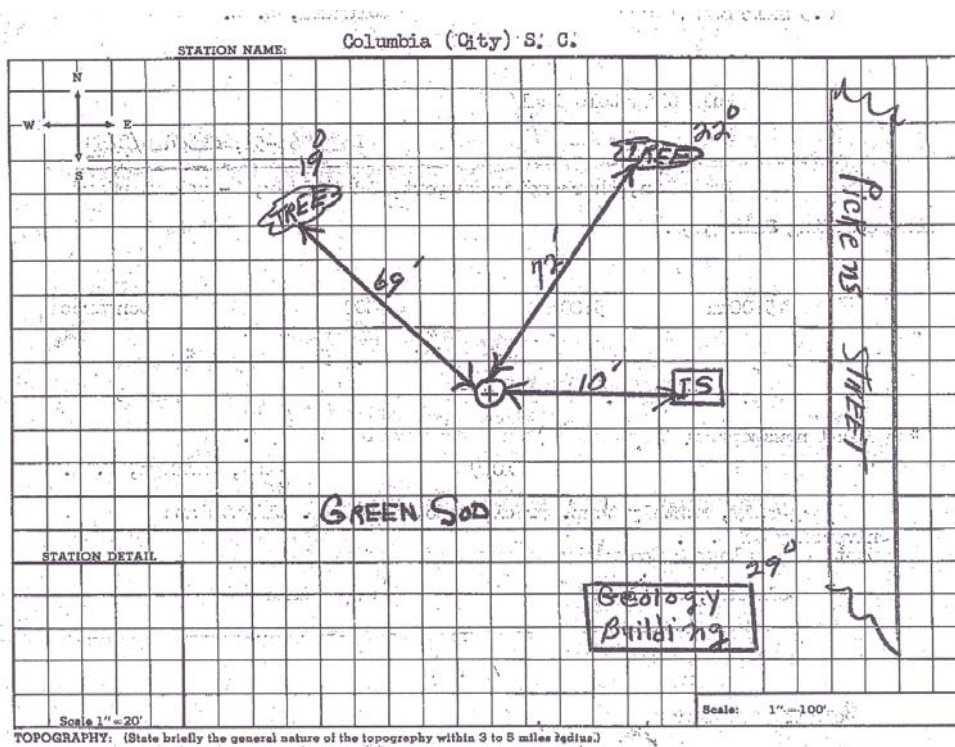


Figure 14. Layout of weather instruments at the University of South Carolina, Columbia, South Carolina, September 1954. North is to the top of the diagram. Source: Official station history files at the National Climatic Data Center.

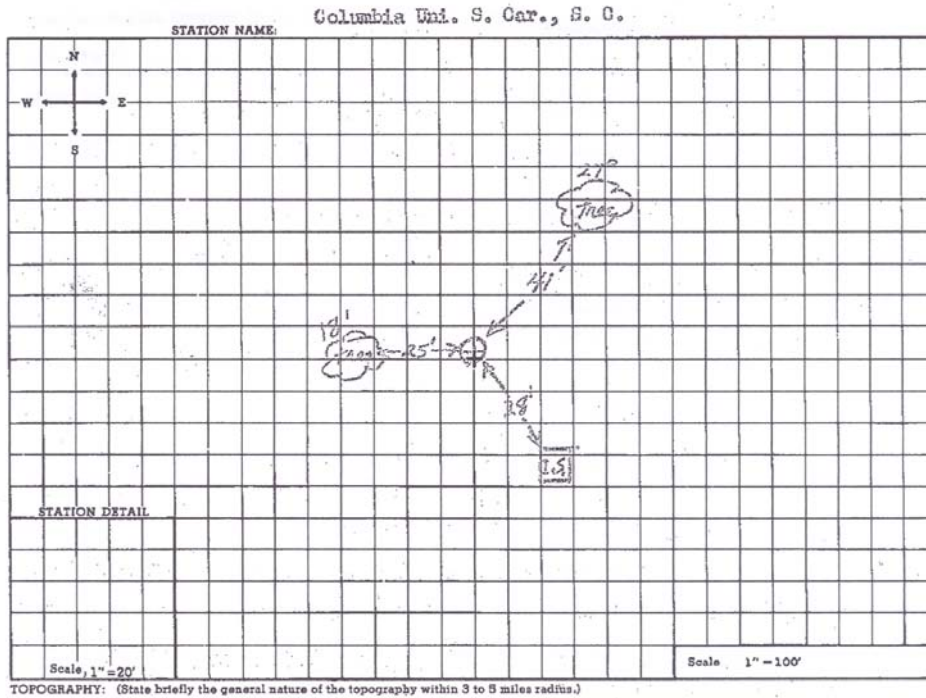


Figure 15. Layout of weather instruments at the University of South Carolina, Columbia, South Carolina, October 1959. North is to the top of the diagram. Source: Official station history files at the National Climatic Data Center.

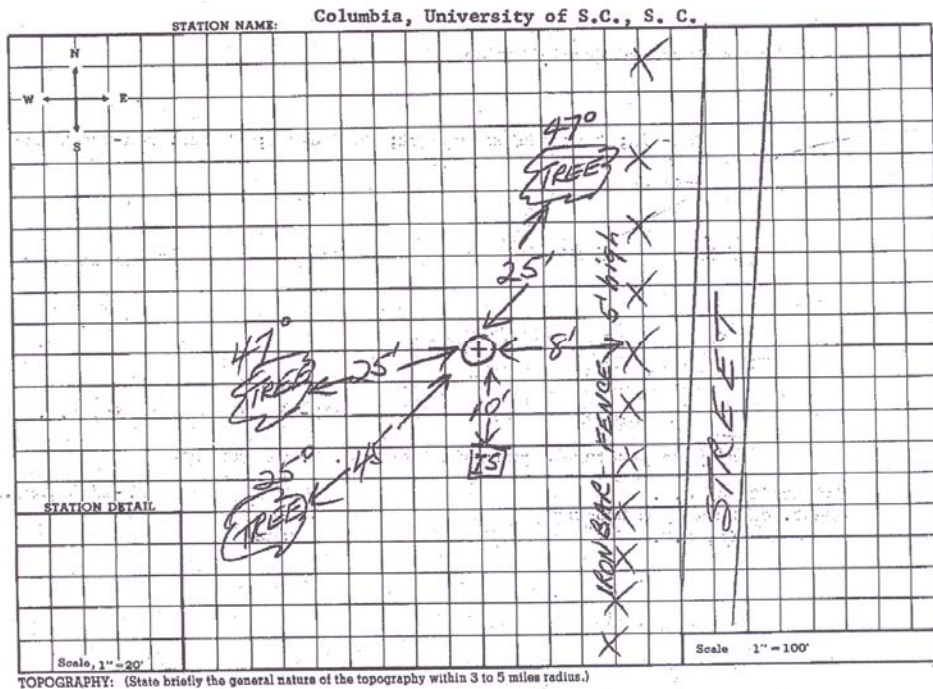


Figure 16. Layout of weather instruments at the University of South Carolina, Columbia, South Carolina, June 1963. North is to the top of the diagram. Source: Official station history files at the National Climatic Data Center.

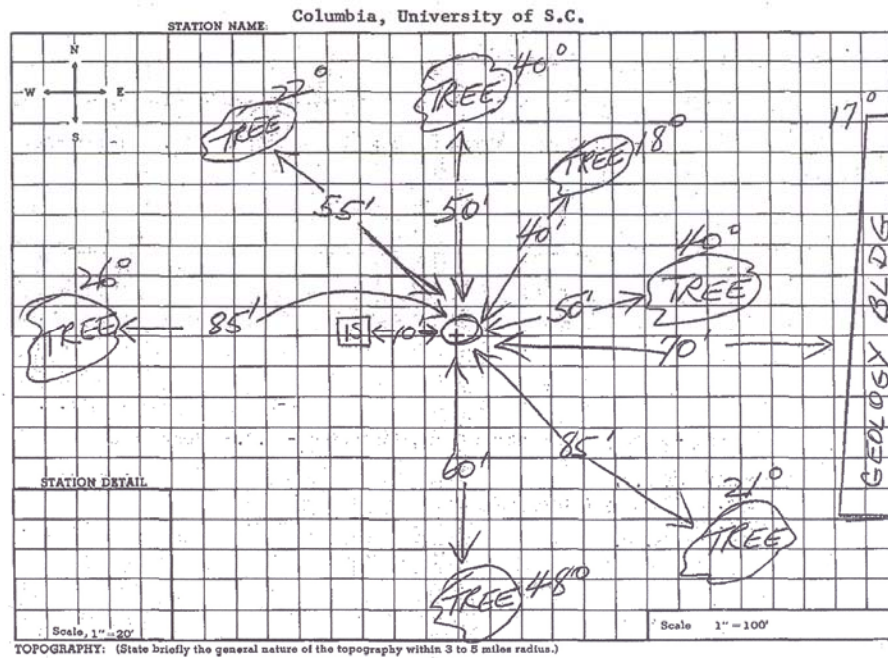


Figure 17. Layout of weather instruments at the University of South Carolina, Columbia, South Carolina, December 1963. North is to the top of the diagram. Source: Official station history files at the National Climatic Data Center.

1973-2006:

On 30 May 1973 the National Weather Service cooperative weather station was moved to a new location on the campus of the University of South Carolina due to construction at the old location. The new site was located at 300 Bull Street, 180 feet north of the Bates House, or approximately one-half mile southwest of the previous site. The Department of Geography remains the responsible observer. Other University Departments have installed air quality samplers and other instruments at the same location. See Figure 19.

Thermometer – The maximum and minimum thermometers are housed in a Cotton Region Shelter. See Figure 18 and 19.

Rain gage – A standard eight-inch gage is being used. A recording rain gage, owned by the University, was also installed at the site. See Figures 18 and 19.

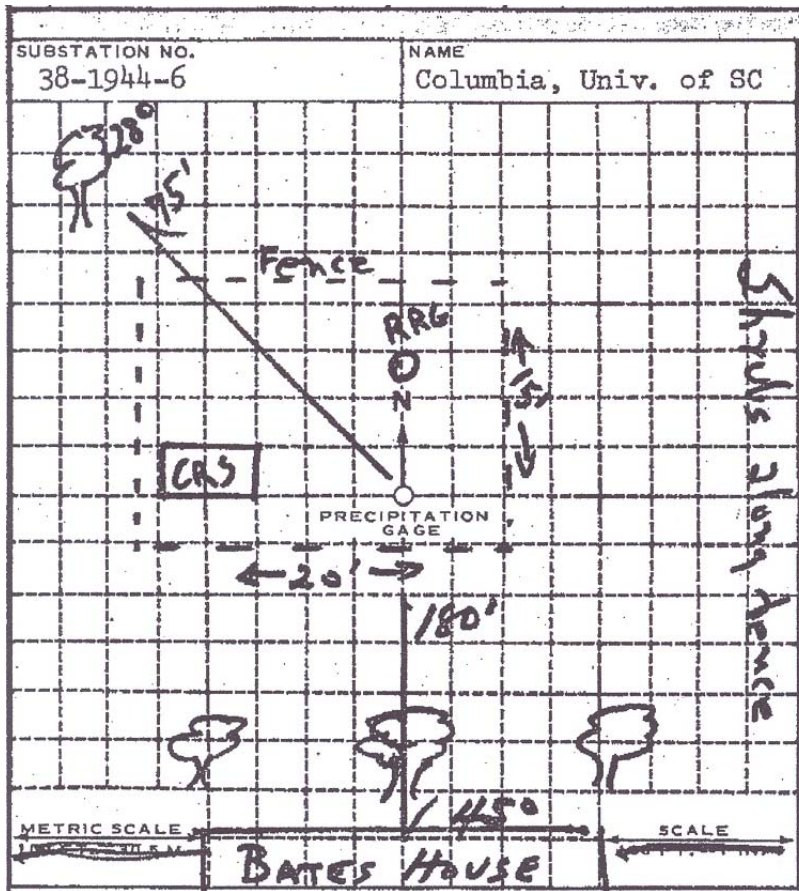


Figure 18. Layout of weather instruments at the University of South Carolina, Columbia, South Carolina, January 1983. North is to the top of the diagram. Source: Official station history files at the National Climatic Data Center.



Figure 19. Weather observing site, University of South Carolina, Columbia, South Carolina, November 2005. View is looking west. Bates House is in the background. Source: Photograph by author.

Columbia Airports

Downtown Owens Field

1934-1938:

On 11 March 1934 an observational program was established at the new Owens Field some four miles southeast of the Columbia Post Office. From the opening of the station until 31 July 1936 the observations were taken by airline personnel. Beginning on 1 August 1936 the program was assumed by the Weather Bureau. Observations were taken from the hangar until 24 March 1938. The original hangar building remains to this day, see Figure 20.

Thermometer – The thermometers were located four feet above the ground. The airways shelter was 35 feet south of the hangar. Door opened to the north. Exposure was rated as good with no obstructions.

Barometer – No barometer was available.

Rain gage – No rain gage was installed.

Wind instruments – The wind instruments were located 37 feet above the ground and 12 feet above the roof. The station had a three-cup anemometer and a three-foot wooden vane. No nearby obstructions interfered with the exposure.

1938-1947:

On 24 March 1938 the observational program was moved to the Administration Building on Owens Field. This was a move of 265 feet northeast. The program remained at this location until 14 February 1947. This original Administration Building no longer exists.

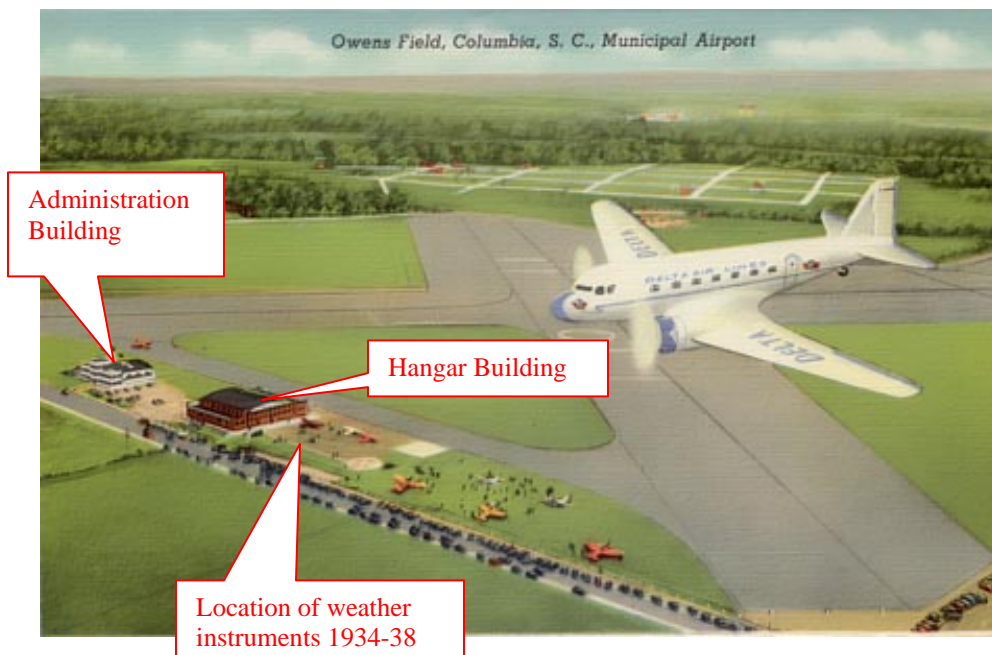


Figure 20. Owens Field in Columbia, South Carolina, circa 1940. View is looking east northeast. Runway 07-25 is shown from lower right (07) to upper center. Neither of the runways shown in the picture exist today.

Source: www.columbiasouthcarolina.com/owens.html

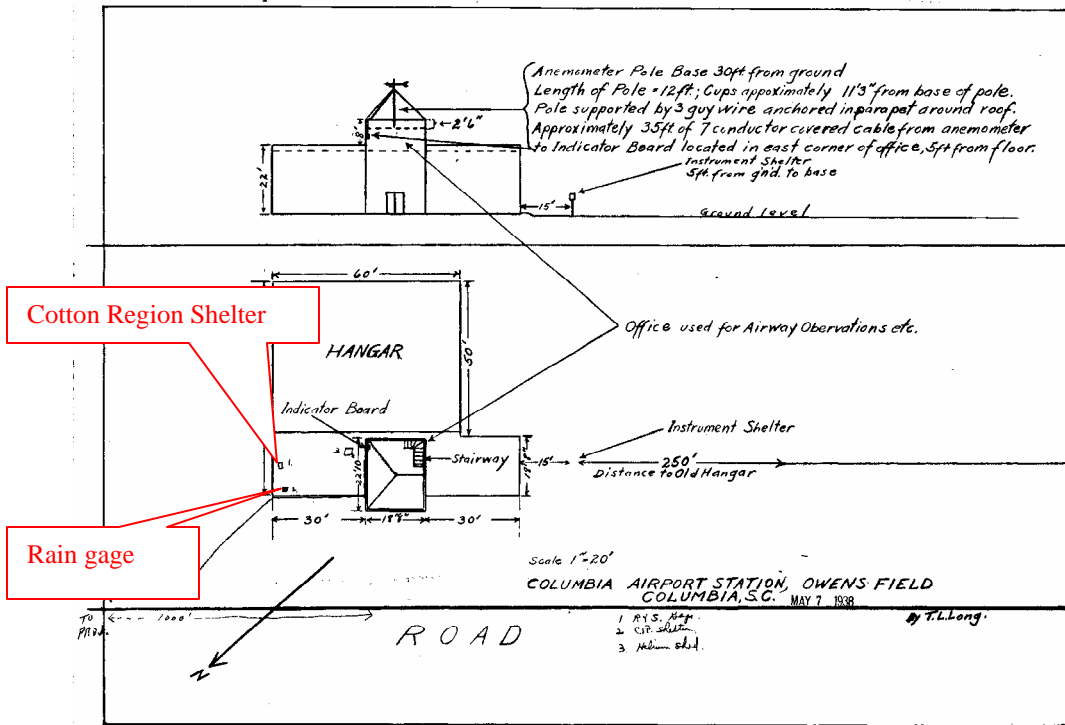


Figure 21. Sketch showing weather instrument placement on the Administration Building, Owens Field, Columbia, South Carolina, 7 May 1938. Note that north is to the lower left of the diagram.

Source: Official station history files at the National Climatic Data Center.



Figure 22. The Administration Building at Owens Field, Columbia, South Carolina, 23 July 1943. View is looking southeast.
Source: Official station history files at the National Climatic Data Center

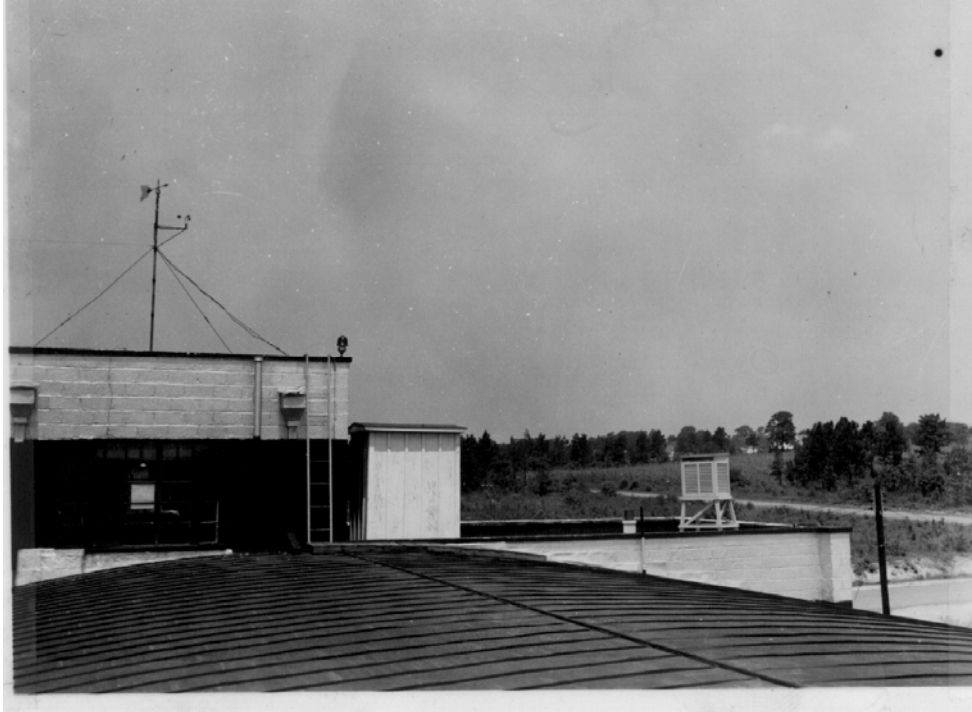


Figure 23. The Instruments on the roof of the Administration Building at Owens Field, Columbia, South Carolina, 23 July 1943. View is looking north.
Source: Official station history files at the National Climatic Data Center

Thermometer – The thermometers, mounted in a Cotton Region Shelter, were located 27 feet above the ground on the roof of the building. See Figures 21, 22 and 23. .

Barometer – The station barometer, serial number 1007, was located at a height of 224.6 feet above mean sea level.

Rain gage – The eight-inch gage was located on the roof 26 feet above the ground. See Figures 21 and 23. The second story office, 28 feet to the southwest, was eight feet above the gage.

Wind instruments – The wind instruments were located 42 feet above the ground and 11 feet above the roof. The station had a three-cup anemometer and a three-foot metal vane. See Figures 21, 22, and 23.

Additional information and details as to other instruments in use at Columbia can be found in the official station history archives at the National Climatic Data Center, Asheville, North Carolina.

1973-2006:

In April 1973 the National Weather Service established a Supplemental Airways Weather Recording Station (SAWRS) at the Operations/Terminal Building on the north side of the Columbia-Owens Downtown Airport. See Figures 25 and 26. In a November 2005 interview with Mr. Jim Hamilton, long time airport operator, he stated that he hired a private weather observer.

Thermometer – A dry bulb thermometer was installed five feet above the ground on 7 May 1973.

Barometer - A dual altimeter (calibrated) was installed on 24 August 1973.

Wind equipment - A Taylor Electric Speed instrument was installed on the roof of the terminal, 35 feet above the ground, on 20 April 1973.

On 15 October 1998 an Automated Surface Observing System (ASOS) system was commissioned at Owens Field. Mr. Hamilton was able to secure this system. The ASOS wind equipment is at 26 feet above the ground. See Figures 24 and 25.



Figure 24. The Automated Surface Observing System, Downtown (Owen) Airport, Columbia, South Carolina, circa 1999. View is looking west.
Source: National Climatic Data Center web site.

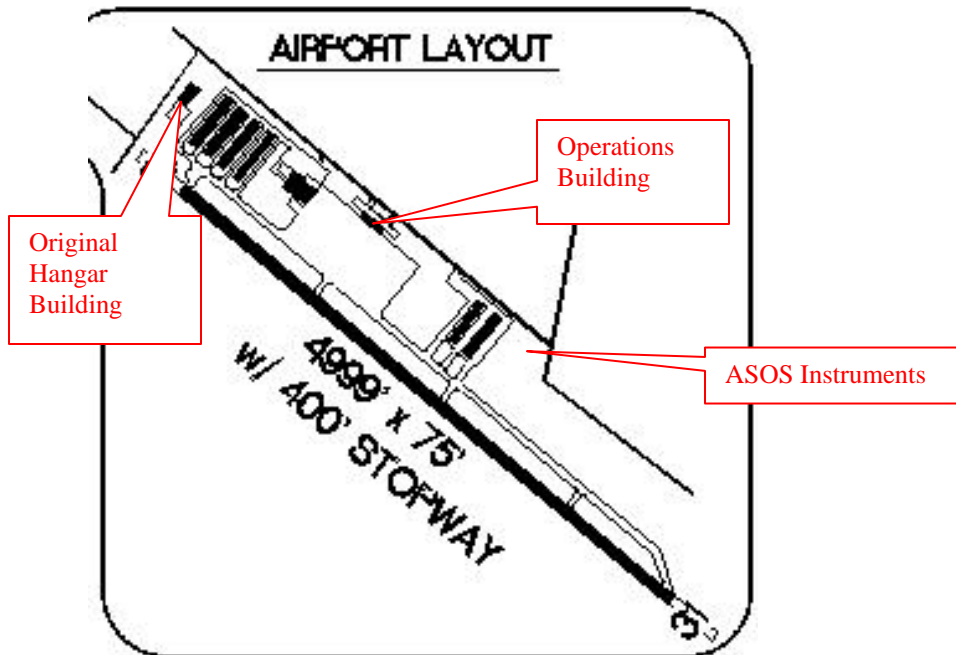


Figure 25. Columbia Owens Downtown Airport, Columbia, South Carolina, airport layout. North is to the top of the diagram.
Source: www.columbiasouthcarolina.com/owens.html



Figure 26. An aerial view of the Columbia Owens Downtown Airport, Columbia, South Carolina, circa 2002. North is to the top of the photograph. Source: www.scaeronautics.com/aerial.asp?faaid=CUB

Columbia Metropolitan Airport

1947 – 1967:

On 14 February 1947 the Weather Bureau moved to Building 317 at the new Columbia Municipal Airport some three and eight-tenths miles west southwest of previous location at Owens Field. Building 317 was 400 feet north of a paved runway. See Figure 33. The Bureau occupied these “temporary” quarters until 1967. The airport was renamed the Columbia Metropolitan Airport in January 1965.



**Figure 27. Building 317 at the Columbia Municipal Airport, Columbia, South Carolina, 20 February 1947. View is looking north northeast.
Source: Official station history files at the National Climatic Data Center.**



Figure 28. A view of the thermometer shelter and rain gage at Building 317, Columbia Municipal Airport, Columbia, South Carolina on 20 February 1947. Camera is facing south.

Source: Official station history files at the National Climatic Data Center



Figure 29. The wind equipment at Building 317, Columbia Municipal Airport, Columbia, South Carolina, 20 February 1947. Camera is facing east southeast. Source: Official station history files at the National Climatic Data Center.

Thermometer – The thermometers were located 5.5 feet above the ground in a standard shelter. The shelter was located over sod some 32 feet south of the building. See Figure 27 and 28. In June 1961 it was noted that the sandy soil and relatively poor air drainage favor considerable radiational effect on temperature.

Barometer – The barometer, serial number 1007, was located 220.405 feet above mean sea level.

Rain gage – The eight-inch gage was located three and six-tenths feet above the ground some 33 feet south of the office. The nearest obstruction was the office at a height of 18 feet above the ground. See Figures 27 and

28. A weighing gage was installed on 20 December 1953 some 32 feet south of the office. The office was the nearest obstruction as with the eight-inch gage. The top of the gage was four and two-tenths feet above the ground.

Wind instruments - The station had a windial type instrument mounted on the roof of the building at a height of 35.9 feet above the ground. This was 20 feet above the roof. On 17 February 1955 a F420B instrument was installed in the same location as the previous instrument.

Additional information and details as to other instruments in use at Columbia can be found in the official station history archives at the National Climatic Data Center, Asheville, North Carolina.

1967-1995:

The Weather Bureau moved the Weather Bureau/Federal Aviation Administration Building at 2909 Aviation Way, West Columbia, on 12 January 1967. This was a move of 2,000 feet west. See Figures 30 and 31. The building was renamed the National Weather Service Building in 1970.

Thermometer – A hygrothermometer was commissioned on 12 January 1967 at a field location 2,500 feet south of the previous location. See Figure 33. The instrument was as four feet above the ground. The type instrument was changed on 18 June 1985 from an HO-62 to an HO-83.

The instrument shelter remained at the previous location for comparison purposes until 4 May 1967 when it was moved to a site 48 feet southeast of the office. The thermometers were now 5 feet above the ground. The extreme thermometers were placed in a standby mode. By December 1969 the instruments must have been removed for they no longer appear on Columbia's "Station Description and Instrumentation" forms.

Barometer – Barometer, serial number 1149, was commissioned on 12 January 1967. The barometer was at 245.0 feet above mean sea level.

Rain gage – The eight-inch gage was located three feet above the ground and 40 feet southeast of the office. The weighing gage was located 4 feet above the ground and 43 feet southeast of the office. The office provided the nearest obstruction, rising 13 feet above the ground. A tipping-bucket gage was installed 7 September 1979 at a height of 4 feet above the ground and 44 feet southeast of the office.

Wind instruments – The wind instrument, an F420C, was located 20 feet above the ground at a field location. See Figure 33.



Figure 30. A view of the National Weather Service Building at the Columbia Metropolitan Airport, Columbia, South Carolina, circa 1980. View is looking north. Notice the WSR-57 radar tower.
Source: Photograph by Wes Tyler, South Carolina State Climatologist Office.



Figure 31. National Weather Service instruments located in the rear of the Forecast Office, Columbia Metropolitan Airport, Columbia, South Carolina, November 2005. View is looking northeast.
Source: Photograph by author.

1995-2006:

On 1 October 1995 the Automated Surface Observing System (ASOS) instruments were commissioned at a mid-field location, 500 feet south of the Control Tower. The wind equipment was located at 33 feet above the ground. See Figures 32, 33, and 34.



**Figure 32. The Automated Surface Observing System at Columbia, South Carolina Airport, circa 2000. View is looking north.
Source: National Climatic Data Center web site.**

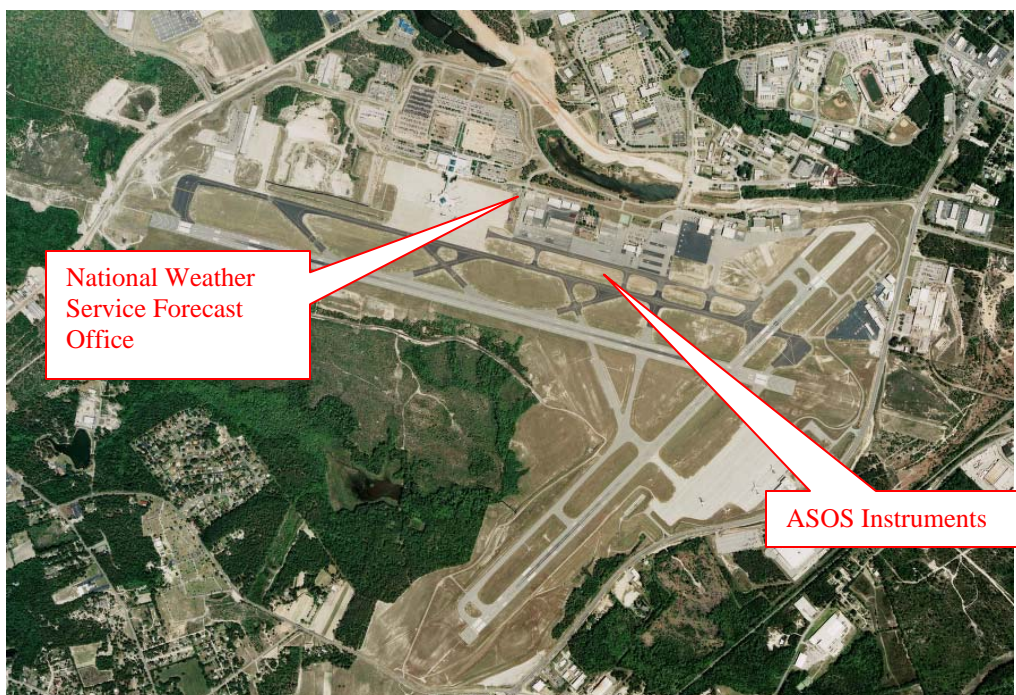


Figure 34. An aerial view of the Columbia Metropolitan Airport, Columbia, South Carolina, circa 2002. North is to the top of the photograph. Source: www.scaeronautics.com/aerial.asp?faaid=CAE

APPENDICES

Appendix 1 – Observer Stories

The Arsenal Academy

The following was extracted from *Columbia, Capital City of South Carolina, 1786-1936*:

“In accordance with the act of December 20, 1842, by which the Arsenal Academy in Columbia and the Citadel Academy in Charleston were created, the board of visitors met in the following January and elected officers for the Arsenal Academy: Captain Alfred Herber, Superintendent and Principal Professor; 1st Lieutenant Joseph Matthews, Second Professor; Dr. A. H. Angel, Surgeon; M. C Shaffer, Bursar. Eight beneficiary cadets were selected to report on or before March 20th. The students were formed into a corps and constituted a guard of the Arsenal at Columbia, which took the place of the regular guard.

The Arsenal and the Citadel were at first independent of each other. There were to be eighteen beneficiary students, or, as later styled, State Cadets, and the same number of pay cadets at the Arsenal. These numbers were afterwards

increased. At first there were two rectangular buildings extending along the southern side of the square; in these officers and cadets were lodged, and the classes were held. In 1852 a three-story brick building, the “main building,” with a wooden parapet, was erected between and uniting the two original structures. Three years later additional officers’ quarters, a brick tenement building, now known as the Executive Mansion, was built in front of the main building. A wing was afterward (1858) added to the main building, and in it was the new mess hall, with kitchen and store room.”

“With the approach of General Sherman the cadets of the Arsenal Academy were placed in charge of a small battery near the Congaree bridge; but on the firing of this by the Confederates, they returned to their barracks. During the following night, February 16, 1865, officers and cadets marched out with the retreating army of General Beauregard. The corps endured weary marching into North Carolina and back to Greenville, near which it encamped. On the 9th of May it had moved to Newberry, where it was disbanded, thus ending the career of the Arsenal Academy. The buildings except the officer’ quarters and some out-buildings, were destroyed in the conflagration of February 17th.”

John C. Purvis

The following article, written by Dawn Mills Campbell, was originally published in *South Carolina Wildlife*.

At Your Service: John C. Purvis

“After all, he has more than 59 year of experience dealing with weather. According to his colleagues at the state DNR’s climatology office, Purvis is “a walking history” of meteorology and climatology.

Perhaps it would be more accurate to say a “running history,” since Purvis, a former marathon runner, has been a fixture in Columbia’s rush-hour scene for years, running to work with his briefcase in hand.

It all started in 1940 when Purvis joined the U.S. Weather Bureau at Spartanburg in what was to be the beginning of a long and challenging career in meteorology and climatology.

After a year with the Bureau, Purvis was transferred to Washington, D.C, where an analysis center was being established, working with a team that plotted weather maps. As World War II escalated, Purvis left to serve his country until the war ended. Later, he took a position at the U.S. Weather Bureau offices in Charlotte and was transferred from there to Columbia, where he had made his home since 1947.”



Figure 35. John C. Purvis at his weather desk, Columbia Municipal Airport, Columbia, South Carolina, 16 March 1948.

Source: Official station history files at the National Climatic Data Center.

“In 1953, Purvis was named meteorologist-in-charge at the Columbia Metropolitan Airport. Ten year later, Purvis witnessed the beginning of major change in weather forecasting when one of the first agricultural weather forecasting centers in the nation was established in the state.

Under Purvis’ leadership, the Columbia office became the forecast center for the state in 1968. Throughout the 1970s, he introduced to the people of South Carolina all the new weather-related technologies, ushering in a modern warning system that would save many lives as well as property.

On December 26, 1981, Purvis retired from the National Weather Service and soon began a new phase of his career. Shortly after his retirement, Purvis became the state climatologist, and in less than two years, the State Climate Office (SCO) was established and funded by the S.C. Legislature. The office was so productive and received so much recognition that when a Regional Climate Center was being considered for the Southeast in 1989, the only choice was to combine it with the SCO. Purvis was named director of the Southeast Regional Climate Center (SERCC) and worked in that capacity until he retired from the state in 1991. Upon retirement, Purvis received the Order of the Palmetto, the state’s highest award, from then-Gov. Carroll Campbell.

At 80 year old, Purvis continues to work twice a week as a consultant to the SERCC and SCO and teaches at the University of South Carolina. “I have never seen a person with the energy he has. Even at eighty he could probably outwork two people,” says Milt Brown, of the S.C. Climate Office.

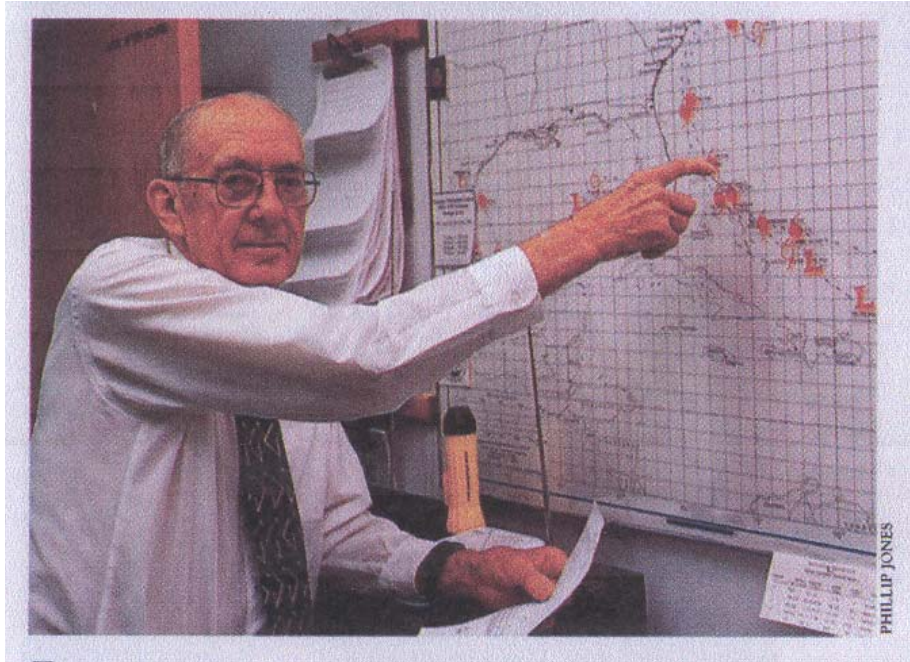


Figure 36. John C. Purvis at work at the State Climatologist Office, Columbia, South Carolina, circa 1990's.

Source: *South Carolina Wildlife*

But Purvis doesn't think of himself as a workaholic. He just enjoys what he does “As a child growing up on a farm, I remember some of the bad things that happened, like the drought in the 1920s,” Purvis said. “So I'm driven by the importance of weather in the life of the farmer, and that has guided me in my work.”

The family man is married to the former Johnsie Huneycutt, and they have three children – John Huneycutt Purvis, Danny Purvis and Jennie Purvis Band.”

Bernard L. Palmer

The following information was provided by Steve Naglic, National Weather Service, Columbia, South Carolina, in December 2005.

Bernard L. Palmer served with the National Weather Service (NWS) from 1968 until his retirement in 2005. For most of his career, “Bernie” served the people of South Carolina from the Weather Service office in Columbia.

From 1963 until 1968 he served in the U. S. Air Force as a weather forecaster. He returned to school in 1968 receiving his Masters of Science degree from Florida State University. Joining the NWS that same year he was first assigned to the Weather Service Office in Macon, GA. In 1969 he became a research meteorologist for Lockheed Missiles and Space Company but returned to the Weather Service in 1971 as a tropical weather analyst and forecaster at the National Hurricane Center. Then it was five years in New Orleans as a lead forecaster.



Figure 37. Bernard L. Palmer at the time of his retirement from the National Weather Service December 2005.

Source: National Weather Service, Columbia, South Carolina

In 1980 Bernie moved to Columbia where he would remain for the next 25 years. First as the Deputy Meteorologist-in-Charge and in 1982 he became the Meteorologist-in-Charge (MIC) and Area Manager for all of South Carolina. He supervised the modernization of the NWS in South Carolina, leading to the implementation of the 88-D Doppler radar and establishment of the Weather Forecast Offices in Columbia, Charleston, and Greenville-Spartanburg. He received two Department of Commerce Bronze Medals and numerous other awards. In 1994 he continued as the MIC in Columbia now serving central SC and east central Georgia. He supervised the implementation of AWIPS and the digital forecast database, and the use of graphical forecasts on the internet.

Throughout his career at Columbia, he led the NWS state liaison activities in support of five Governors of SC and many state agency heads. He gave numerous briefings to these officials, especially during hurricane emergencies. He was featured in

numerous workshops, seminars, and other presentations to the media, the public, and high level government officials. Under his leadership the NWS in SC received numerous group and individual accolades.

Appendix 2 - Methodology

The primary sources of information for this study were the Columbia observers' daily weather records themselves. Copies of these reports were available from the National Climatic Data Center's on-line system called WSSRD. These reports were considered the primary sources because they were written by the original observers and not altered by subsequent readers.

All these sources were gleaned to obtain a glimpse of the lives of the observers, the location of the observation site, and the historical environment that produced the climatic history of Columbia, South Carolina. Maps, drawings, and photographs were included when appropriate to illustrate the information.

The street maps were generated using Microsoft's Streets and Trips software. Elevations, latitude, and longitude were determined from the United States Geological Survey maps available on Topozone.com.

REFERENCES AND DATA SOURCES

Observational forms as found in the National Climatic Data Center archives

Station history forms as found in the National Climatic Data Center archives

South Carolina State Climate Office, Hope Mizzell, State Climatologist

Richland County Public Library

South Carolina Governor's Mansion, Ms Nancy Bunch, Curator

South Caroliniana Library, University of South Carolina

Dr. Cary Mock, Department of Geography, University of South Carolina

Mr. Jim Hamilton, Operator of Columbia Downtown-Owens Field

A Barhamville Miscellany, University of South Carolina Press, Columbia, 1956

South Carolina Wildlife

Columbia, Capital City of South Carolina, 1786-1936.