

HISTORY OF WEATHER OBSERVATIONS
Natchez, Mississippi
1795 - 1955

January 2006

Prepared by:
Gary K. Grice
Information Manufacturing Corporation
Rocket Center, West Virginia

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

TABLE OF CONTENTS

ACKNOWLEDGMENTS	ii
LIST OF ILLUSTRATIONS	iii
INTRODUCTION	
Historical Overview	1
Goal of the Study	3
LOCATION OF OBSERVATIONS	
Colonial Diaries	5
Smithsonian Observers	8
Weather Observations by Army Surgeons	10
Cotton Region Observers	11
Voluntary/Cooperative Observers	13
SAWRS	17
INSTRUMENTATION	
Colonial Diaries	19
Smithsonian Observers	24
Weather Observations by Army Surgeons	32
Cotton Region Observers	35
Voluntary/Cooperative Observers	38
SAWRS	45
THE OBSERVERS	48
OTHER OBSERVATIONS	54
BIBLIOGRAPHY	61
APPENDIX	63

ACKNOWLEDGMENTS

Mimi and Ron Miller of the Historic Natchez Foundation were extremely helpful in locating the weather observers at Natchez. In particular, Mimi was able to provide important information regarding the observers in the mid and late 1800s. Mimi also recommended other Natchez historic experts that helped fill in critical blanks of the timeline. The generosity and hospitality of Ron and Mimi are greatly appreciated.

Clinton Pomeroy, Director of Aviation at the Natchez-Adams County Airport, provided crucial information regarding weather observing at the airport during the early and mid 1950s. Billy Simmons, former Airport Director, also provided a first-hand description of weather observing at the airport during the 1950s. Billy's and Clint's insight was important.

LIST OF ILLUSTRATIONS

Figures

1. Current map of Natchez, western Mississippi, and eastern Louisiana	1
2. Topographical map of area around Natchez	4
3. Topographical map of city of Natchez	5
4. Location of William Dunbar's home	6
5. Enlarged map showing William Dunbar's home	7
6. Location of Smithsonian observers 1849 through 1870	8
7. Location of Fort McPherson hospital	11
8. Cotton region, voluntary, and cooperative observers, 1884-1911	12
9. Cooperative observers 1911 to 1953	15
10. Cooperative observer 1953 through 1955	17
11. Location of SAWRS at Natchez-Adams County Airport	18
12. Weather observations by William Dunbar, March 1799	19
13. Weather observations at William Dunbar's plantation, March 1814	21
14. Columns of William Dunbar's house	22
15. North view from William Dunbar's house	23
16. East view from William Dunbar's house	23
17. South view from William Dunbar's house	24
18A. Smithsonian weather observations, April 1849	25
18B. Smithsonian weather observations, April 1849	25
19. George L.C. Davis home	27
20A. Smithsonian weather observations, July 1858	29
20B. Smithsonian weather observations, July 1858	30
21. Smithsonian weather observation remarks, August 1859	31
22A. Army surgeon weather observations, June 1869	32
22B. Army surgeon weather observations, June 1869	33
23. Location of Fort McPherson hospital	34
24. Cotton region observations, April 1884	35
25. Home of Charles Stietenroth	38
26. View of 520 B Street	39
27. Location of weather observations at 412 South Union Street	40
28. View of 302 Monroe Street	41
29. View of 156 Saint Catherine Street	42
30. View of 144 Saint Catherine Street	43
31. Schematic of instruments at Market and South Pearl Streets	44
32. Photograph of intersection of Market and South Pearl Streets	45
33. Schematic of SAWRS location at Natchez-Adams County Airport	46
34. Photograph of Airport Administration Building	47
35. Highway marker for William Dunbar's historic site	49
36. Locations of observations in the vicinity of Natchez	54

HISTORY OF WEATHER OBSERVATIONS

Natchez, Mississippi

1795 – 1955

Gary Grice

INTRODUCTION

Historical Overview

Natchez is located in southwest Mississippi on the east bank and over 100 feet above the Mississippi River (Figure 1). Natchez is the oldest civilized settlement on the river, being two years older than New Orleans. It also is the county seat of Adams County.

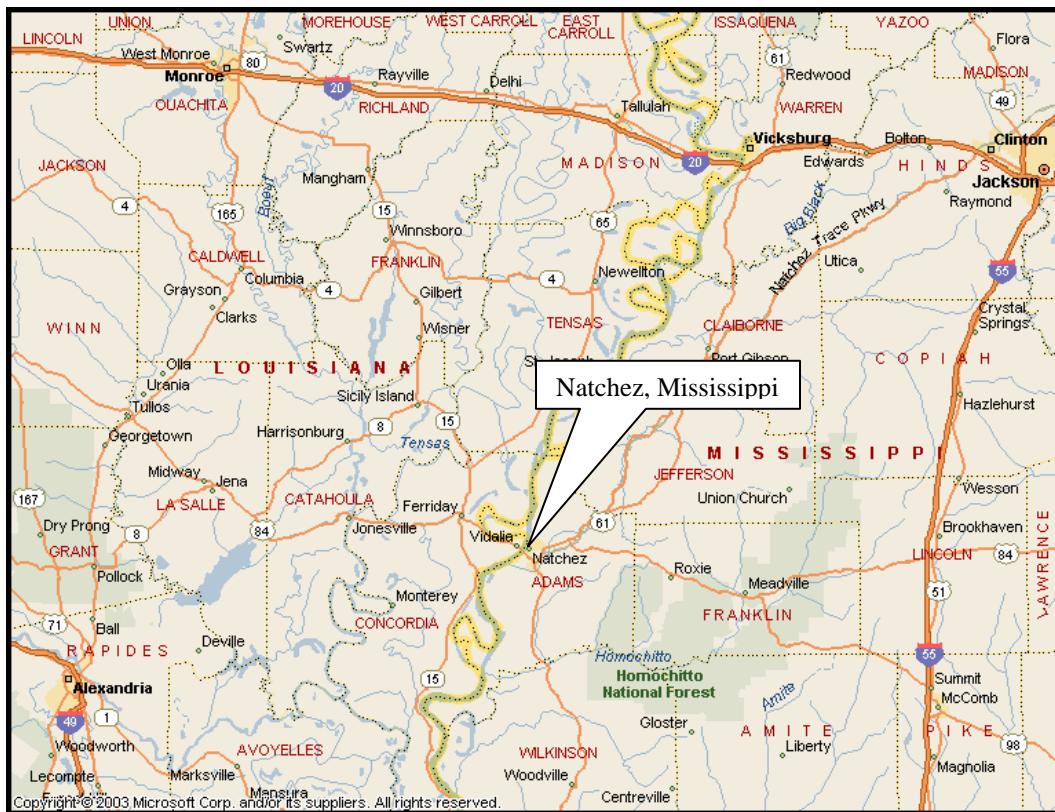


Figure 1. Location of Natchez, Mississippi, plotted on a current map of western Mississippi and eastern Louisiana.

Natchez and southwestern Mississippi were initially inhabited for centuries by prehistoric Indians and later by the Natchez Indians. The first Indians arrived in Mississippi at the end of the last Ice Age, around 9,500 B.C. The climate in Mississippi at

that time was cool and the region covered with forests and grasslands. The population of Native Americans increased through the years with small, settled communities developing, especially in the river valleys, as more attention turned to agriculture. One of the settlements was the first town and monumental earthworks in North America located near present-day Epps, LA, approximately 70 miles northwest of Natchez.

The Natchez Indians were among the last Native Americans to inhabit Natchez and southwest Mississippi. Their culture began around 700 A.D. and lasted until the mid 18th Century when the tribe was dispersed in a war with the French. The Natchez Indians were especially successful growing crops, in particular, corn, beans, and squash.

Building mounds was an expression of the complex tribal religion by the Natchez Indians, with the mounds serving as bases for sacred buildings. One of the mounds remains today, located on the Natchez Trace Parkway just northeast of Natchez.

The French settled in the Natchez area in 1716 when they built a fort (Fort Rosalie) on the east bank of the Mississippi River. The French chose Natchez because of its rich soil and location on a high bluff overlooking the Mississippi River. The fort was easily reached by water, easily defended, and was centered on an agriculturally rich area. The site was also more comfortable and healthier than the swamps and flatlands of the river.

In 1763, the British settled in the Natchez area, the Spanish arrived in 1779, and the Americans in 1798. In 1798, Natchez became the first capital of the Mississippi Territory, and in 1817, became the first capital of the new state of Mississippi (later to be moved to Jackson).

In 1811, steamboat service was inaugurated on the Mississippi River, assuring Natchez its future prosperous position. During the early and mid 19th Century, Natchez flourished by growing and serving as the center for the exportation of cotton. Fortunes were made from the land and the river. Cotton was king and money plentiful. Plantation mansions were built and filled with the finest furnishings. In 1860, the population of Natchez was 6,600 people, but there were more millionaires in Natchez than in any other American city, with the exception of New York, Philadelphia, and Boston. Also before the Civil War, Natchez had a more complete and concentrated group of mansions than anywhere else in the world.

Natchez was spared the ravages of the Civil War. Since the city was not a strategic location, like Vicksburg to the north, Natchez did not suffer directly from the fighting. A Union fleet under David G. Farragut captured New Orleans on 24 April 1862, and captured Baton Rouge on 8 May 1862. Four days later, on 12 May 1862, Natchez surrendered without a shot being fired, over 10 months before Vicksburg fell on 4 July 1863.

Following the capture of Natchez, Fort McPherson was built approximately one mile northeast of the center of town. The fort primarily was a line of earthworks and batteries constructed to defend the city. The fort was closed after the war.

The Civil War destroyed the old culture of the South, including Mississippi and Natchez, although Natchez escaped the destruction. At the end of the war the old order was gone and no one knew what would be the replacement. The South was devastated and the prosperity of Natchez was greatly diminished. However, the impact of cotton and the Mississippi River served as a foundation to build Natchez through the late 19th Century and early 1900s. The rich historical tradition at Natchez, that began many years earlier, continued into the 20th Century and to the present.

The record of weather observing in the Natchez area began in 1795 (abbreviated observations in French). Continuous and systematic observing started in 1799 by William Dunbar and was continued by him and his son (William) into 1818. Smithsonian observations began in 1849 and continued by various individuals into 1870. U.S. Army surgeons briefly took weather observations in 1869 and 1870 at Fort McPherson. Voluntary and Cooperative observations comprised the Natchez weather record during the late 1800s until aviation observations began at the Natchez-Adams County Airport in 1951. Natchez did not have a Signal Service or Weather Bureau office during the period of this study.

Goal of the Study

The goal of this study is to document the primary weather observational path at Natchez, MS leading to the Weather Bureau observing program in the mid 20th Century. Descriptions of Natchez weather observations since the late 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 late 1700s and continued through times of significant transition in the early 1900s. Extrinsic observations, i.e., those by Voluntary (or Cooperative) observers, are considered in relation to the beginning of the central observational stream eventually established by the Weather Bureau. This does not minimize the importance of these collateral observations, but rather focuses on the original events that led to the routine, formal weather observing program of modern times.

LOCATION OF OBSERVATIONS

Figure 2 shows a topographic map of the area around Natchez, MS and Figure 3 is a topographic map of the city of Natchez. Natchez is approximately 200 feet above sea level and over 100 feet above the Mississippi River. Vidalia, LA located just to the west of the river is 50 to 60 feet above sea level, and just above the Mississippi River.

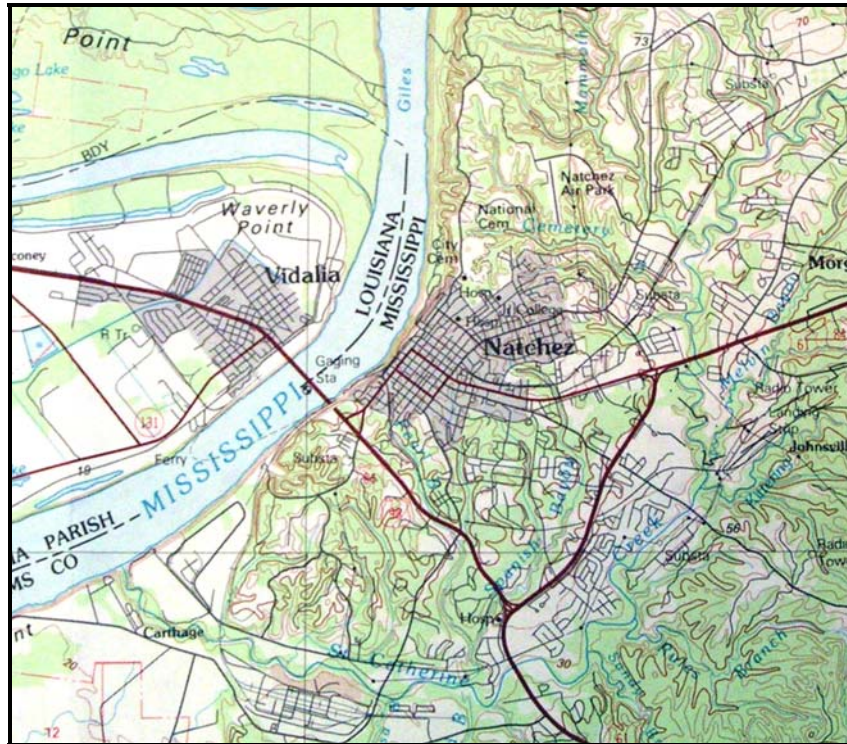


Figure 2. Topographical map (USGS) of area around Natchez, MS and Vidalia, LA.

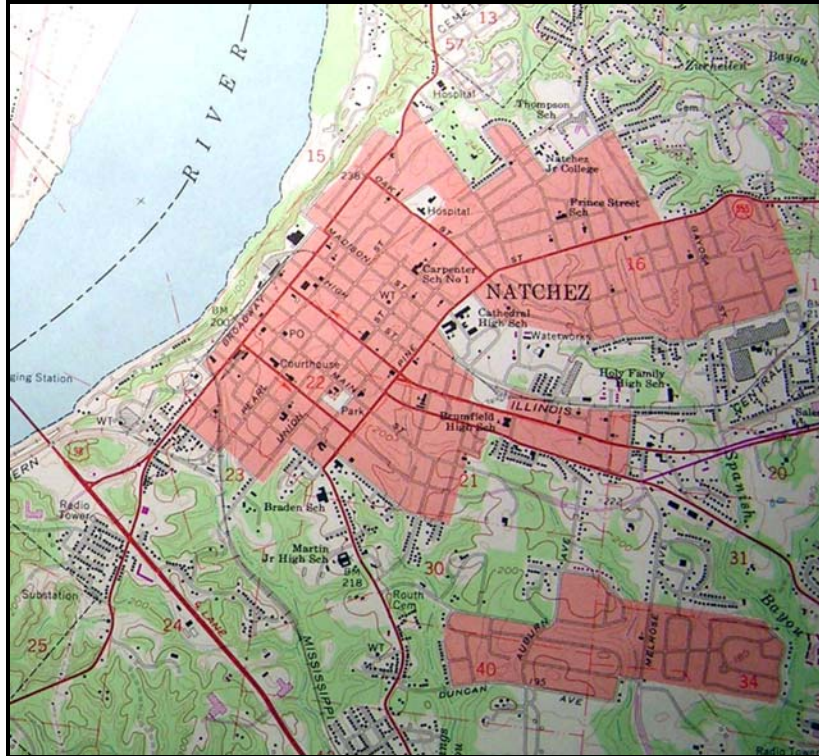


Figure 3. Topographical map (USGS) of city of Natchez, MS.

Colonial Diaries

The first weather observations listed for Natchez in the National Climatic Data Center (NCDC) data were 1-21 March 1795. Those observations were recorded in French with no indication of the exact location of the station. The observations are filed with the William Dunbar collection. Parameters recorded appeared to be temperature, winds, state of the weather, and general remarks. Original documents of the Dunbar observations are located in the Mississippi Department of Archives and History in Jackson, MS.

William and Robert Dunbar (February 1799-December 1818)

The first continuous record of weather observations in the NCDC database began 1 February 1799 and was taken at the plantation of William Dunbar. Figures 4 and 5 show the location of Mr. Dunbar's plantation, called "The Forest." The Forest was located approximately seven miles south southeast of downtown Natchez with the general location depicted by a marker on U.S. Highway 61 (see Figure 35).

Observations continued at the plantation from 1 February 1799 until 31 March 1810 with a gap until 1 March 1814. Observations continued from 1814 with the last observation 31 December 1818. The observations from 1799 into 1810 likely were taken by William Dunbar, or his son Robert Dunbar, or by other individuals supervised by the

Dunbars. Observations taken from 1814 into 1818 were taken by other individuals since both William and Robert Dunbar both died in 1810.



Figure 4. Location of William Dunbar’s home with respect to downtown Natchez plotted on a current map of the area. The Dunbar home was approximately 7 miles south southeast of downtown Natchez. North is at the top of the figure.

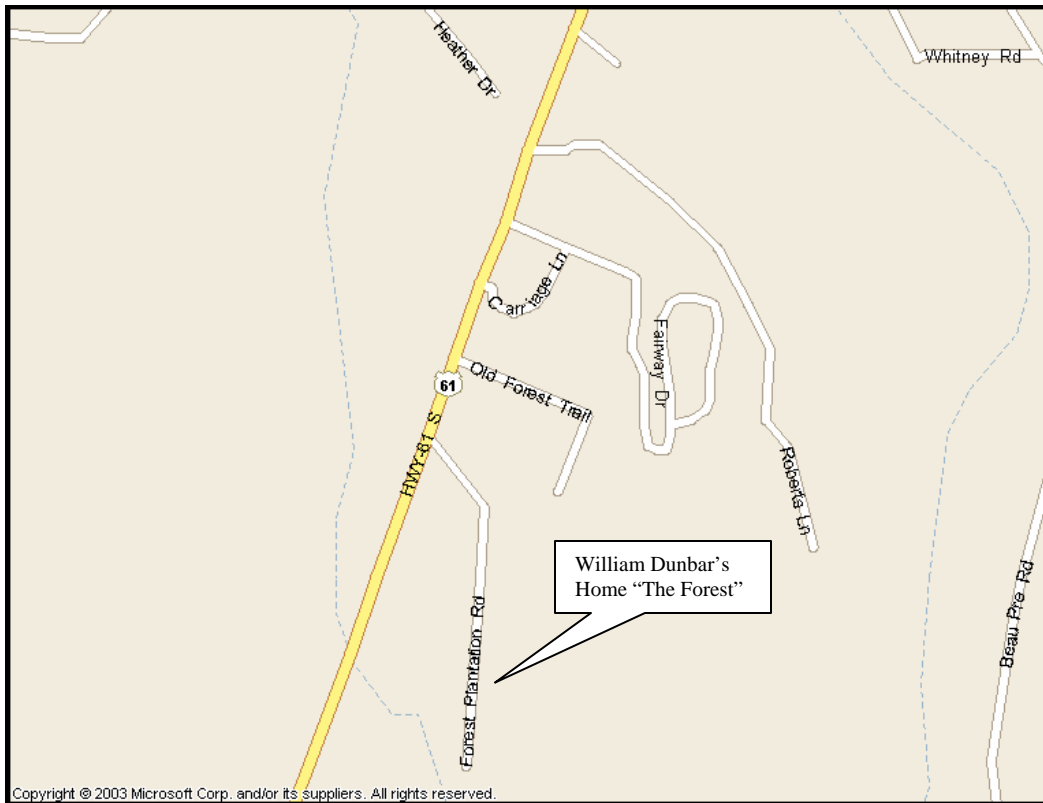


Figure 5. Enlargement of map showing William Dunbar’s home, plotted on a current map of the area. North is at the top of the figure. East-west distance across the map is approximately one and one-third miles.

Several sources indicated that William Dunbar constructed a “well-equipped” astronomical observatory at The Forest. Although no supporting information could be found, the weather observations likely were taken at, or near this observatory (since during the late 1700s and 1800s the sciences of astronomy and meteorology were considered closely related).

No coordinates or elevation were listed on the weather observing forms. However, columns of the plantation home still remain (see Figure 14), allowing for a reasonable location of the weather observations, assuming the observations were taken near the home. GPS coordinates for the Dunbar home are 31°27’47’’N 91°22’29’’W and the elevation 216 feet above sea level.

Smithsonian Observers

Figure 6 shows the locations of weather observations taken by Smithsonian observers in Natchez from 1849 through 1870.



Figure 6. Locations of Smithsonian weather observers in Natchez, MS from 1849 through 1870. Locations are plotted on a current map of the Natchez area. North is at the top of the page and the east-west distance across the map is approximately one and one-quarter miles.

No observations could be found in the Natchez area after 31 December 1818 (last observation listed on the William Dunbar plantation) until the first Smithsonian observation on 1 April 1849. According to Smithsonian Institution records, as well as the NCDC database, the following individuals were Smithsonian observers in the Natchez area: George L.C. Davis (1849-1851), J. Edward Smith (1856), Robert McCary (1858-1861, 1864-1866), and William McCary (1866-1870).

George L.C. Davis (April 1849-June 1851)

The first Smithsonian observation at Natchez (based on the NCDC database) was on 1 April 1849 by George L.C. Davis. Observations at this site were continuous for the remainder of 1849 but were missing for 1850. Observations resumed in the NCDC database 1 January 1851 and continued until 30 June 1851. Smithsonian records indicated that Mr. Davis took observations during 1850.

On the observation forms, Mr. Davis listed the coordinates for his station as 31°33'48''N 91°24'42''W. The same coordinates were listed on all of Mr. Davis' observation forms. Unfortunately, the listed latitude and longitude would have placed the station in the middle of the Mississippi River. He listed the elevation of the barometer as 275 feet above the Gulf of Mexico or 175 feet above the high water of the Mississippi River.

George L.C. Davis was a physician that lived at 305 North Rankin Street. His house still stands and is recognized as a historic landmark on the National Register. Most likely, observations were taken at this location. GPS coordinates for the site are 31°33'38''N 91°23'54''W, elevation 232 feet.

J. Edward Smith (September 1856-December 1856)

Following the last observation by G.L.C. Davis (30 June 1851), a gap existed until the first observation of J. Edward Smith on 1 September 1856. Smithsonian records indicated only that Mr. Smith took observations during the year 1856 and observations in the NCDC database were from 1 September 1856 until 31 December 1856.

On the observation forms, Mr. Smith listed the coordinates for his station as 31°34'N 91°24'42''W, which was in the middle of the Mississippi River. Mr. Smith listed his address as Box 31 at the Natchez Post Office. Smithsonian records, as well as the Substation History, listed Mr. Smith's station in Kingston, MS, approximately 12 miles southeast of Natchez. The Director of Preservation and Education at the Historic Natchez Foundation stated the exact residence of J. Edward Smith was unknown but that it was somewhere near downtown Natchez. He was an attorney and architect who worked somewhere on Main Street.

Robert McCary (July 1858-January 1863, October 1864-July 1866)

No observations could be found from 1 January 1857 (last observation by J. Edward Smith was 31 December 1856) until 1 July 1858 by Robert McCary (NCDC records suggest Mr. McCary may have taken observations as early as April 1858, but a number of forms were faded and illegible). Mr. McCary took observations until 31 January 1863, although observations during 1860 appeared to have been taken by another individual (observations for December 1862 were missing in the NCDC database).

A gap in observations occurred from 1 February 1863 until 1 October 1864. After October 1864, Mr. McCary took observations until just before his death. The last observation by Robert McCary was 23 July 1866 (he died 25 July 1866). On 1 August 1866, William McCary began taking weather observations.

On the observation forms, Mr. McCary listed the coordinates for the station as 31°34'N 91°25'W. These coordinates were similar to those of the previous Smithsonian observers, placing the station in the Mississippi River. Elevation was listed as 264 feet above sea level.

The exact location of the observations by Robert McCary could not be determined. The 1858 Natchez City Directory listed Mr. McCary's business address (he operated a barbershop) as the corner of Main and Commerce. No information was listed for his residence, but the Director of Preservation and Education of the Historic Natchez Foundation stated he lived in the downtown area. This location is supported by a diary kept by William Johnson (see Bibliography) that mentioned numerous visits from Robert McCary for dinner and breakfast, as well as strolls through downtown Natchez. William Johnson hints that Robert McCary lived nearby and Johnson's house was located on State Street between South Canal and South Wall Streets (the Johnson house is a historical site maintained by the National Park Service; see the section of this report on "The Observers").

William McCary (August 1866-May 1870)

On 1 August 1866, William McCary began taking weather observations. He measured/observed the same parameters as Robert McCary, making almost continuous recordings until his last observation on 30 May 1870 (his last observation in the NCDC database was confirmed by Smithsonian records).

No change was listed on the observation forms (as compared to Robert McCary) for latitude, longitude, or elevation.

The exact location of the weather observations by William McCary could not be determined. The only address found for William McCary was in the 1877 Natchez City Directory. This directory listed his residence as 145 Franklin Street. The directory also indicated that he sold groceries at this location. If William McCary did not live at this address from 1866 through 1870, he most likely lived in the downtown area, especially since he was sheriff of Adams County during Reconstruction following the Civil War (see the section of this report on "The Observers").

Weather Observations by Army Surgeons (May 1869–June 1870)

The first observation in the NCDC database by Army surgeons was 1 May 1869, and the last observation 30 June 1870. Best estimate is that the surgeon observations were made at the Fort McPherson hospital (see Figure 7) which was approximately one mile northeast of downtown Natchez. No specific location for the

observations was indicated on the observing forms; however, first mention of coordinates was on the June 1869 form and listed as 31°34'N 91°24'42"W, i.e., the same coordinates listed on the forms of the Smithsonian observers. Elevation was listed as 264 feet above sea level. GPS coordinates for the site are 31°34'22"N 91°23'46"W, elevation 275 feet.



Figure 7. Location of the Fort McPherson hospital plotted on a current map of Natchez, MS. The hospital was approximately one mile northeast of downtown Natchez. North is at the top of the figure and east-west distance across the map is approximately two and one-half miles.

No weather observations could be found for Natchez from 30 June 1870 (last observation by Army surgeons) until 1 April 1884 (first observation taken by a cotton region observer).

Cotton Region Observers (1884-1902)

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 (observations for Natchez were telegraphed to New Orleans, LA). These reports were published in newspapers and in bulletins at cotton exchanges. Cotton region observations continued into the early Weather Bureau years.

Based on the NCDC database and Signal Service Annual Reports, cotton region observations began at Natchez 1 April 1884 and continued until 31 October 1902. Beginning 1 January 1894, weather observations were taken all year at Natchez under the Cotton Region Program (April-October), with remaining observations under the Voluntary/Cooperative Program. Two individuals took Cotton Region observations at Natchez (according to the NCDC database) – C.W. Montgomery (1884-1888) and Charles Stietenroth (1889-1902).

Figure 8 shows the locations of cotton region, voluntary, and cooperative observers from April 1884 through March 1911.

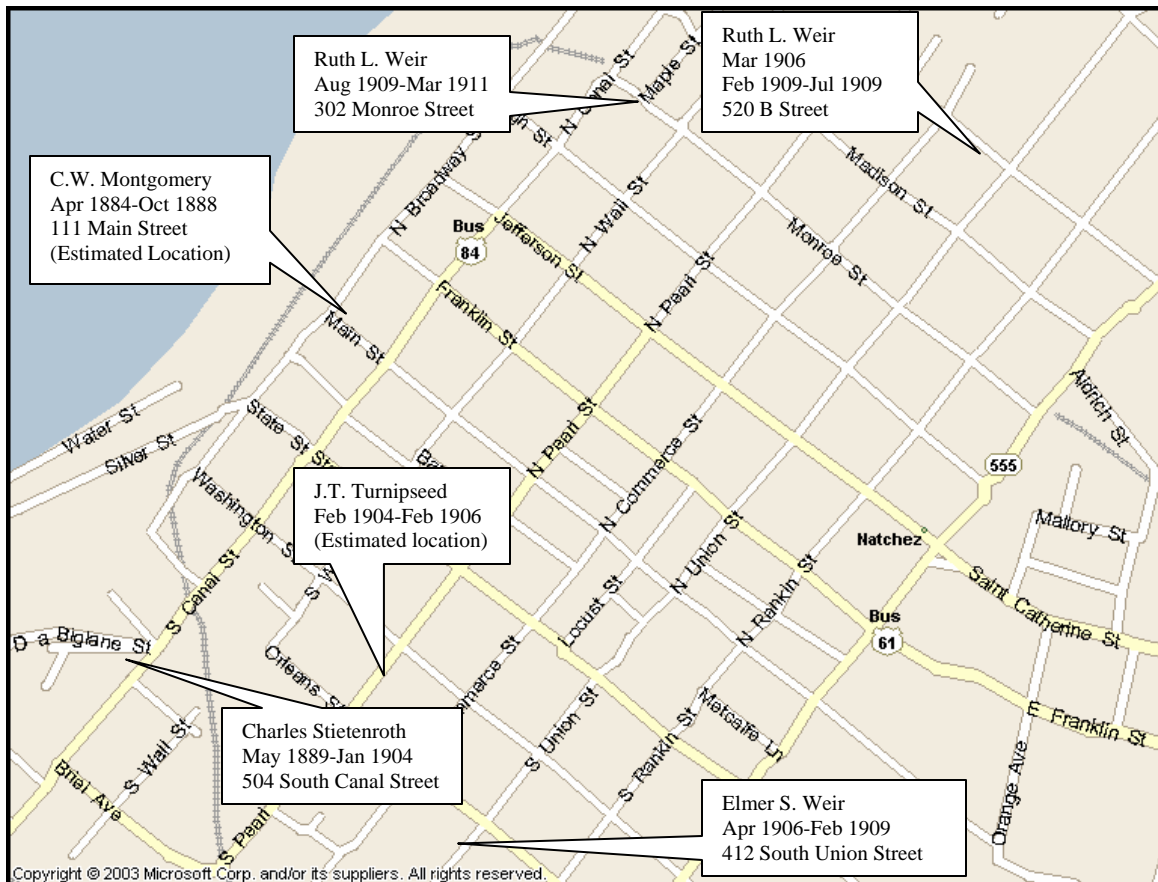


Figure 8. Cotton region, voluntary, and cooperative weather observers in Natchez, MS from April 1884 through March 1911, plotted on a current map. North is at the top of the page and east-west distance across the map is approximately one mile.

C.W. Montgomery (April 1884-October 1888)

C.W. Montgomery's first observation was 1 April 1884, and his last observation 31 October 1888. According to the 1892 Natchez City Directory (only directory available near the period of the observations), C.W. Montgomery worked for Western Union Telegraph. The observing forms only stated the observations were taken at

Natchez with no coordinates or elevation listed. Signal Service instructions stated that the Operator in Charge of the telegraph office was usually selected to take the cotton region weather observations. The 1877 city directory listed the address of the Western Union office as 111 Main Street, and the 1892 directory (next available directory) listed the address of the office as 527 Main Street. An 1886 Sanborn map did not show the existence of a Western Union office in Natchez, whereas an 1892 map listed the location of the office at 527 Main Street. Since the office with the address of 111 Main Street would have been close to the railroad depot, it is most likely that the weather observations were taken at this site through most, if not all of the period that C.W. Montgomery was the observer. The city directory stated that C.W. Montgomery lived on Orange Avenue (exact location not specified).

Charles Stietenroth (May 1889-October 1902; Voluntary Observer January 1902-January 1904)

Charles Stietenroth's first observation was 1 May 1889, and his last cotton region observation 31 October 1902, although he served as a voluntary observer until January 1904. No information was listed on the observation forms regarding the exact location of this observer other than somewhere in Natchez. The observing forms only stated the observations were taken at Natchez with no coordinates or elevation listed. However, Weather Bureau/National Weather Service Substation History records (1956 and 1982; see Bibliography) stated that Mr. Stietenroth took weather observations near Canal and Compress Streets, and the elevation listed was 206 feet above sea level.

The Natchez City Directory for 1892 listed the address for Mr. Stietenroth as 504 South Canal Street which agrees closely with Weather Bureau Substation document. The house remains standing with GPS coordinates for the site 31°33'29"N 91°24'32"W, elevation 219 feet. See the section in this report on "The Observers" for a more detailed description on the life of Charles Stietenroth.

Voluntary/Cooperative Observers (1903-1955)

J.T. Turnipseed (February 1904-February 1906)

On 10 February 1904, J.T. Turnipseed assumed voluntary/cooperative observing responsibilities at Natchez. The Substation History stated the exact location was unknown but was approximately four-tenths of a mile northeast of the previous location (i.e., 540 South Canal Street) which disagrees with the position with respect to the Post Office). Elevation was listed as 206 feet. Best estimate is the station was located on South Pearl Street, perhaps between Washington and Orleans Streets. A short obituary was found that stated he lived from 14 January 1886 until 9 January 1937, but no record of his residence or work could be found. The last observation by this observer was on 7 March 1906.

Ruth L. Weir (March 1906)

Ruth L. Weir began taking cooperative observations at Natchez on 8 March 1906. In Weather Bureau climatological publications (e.g., Mississippi Section of the Climatological Service of the Weather Bureau), this station was listed under the name “J.C. Weir, Jr”. The station was located at 520 B Street or approximately six-tenths of a mile northeast from observation station of J.T. Turnipseed. Elevation was listed at 206 feet. GPS coordinates for this site are 31°33’51”N 91°23’52”W, elevation 223 feet. The last observation by this observer was on 31 March 1906.

Elmer S. Weir (April 1906-February 1909)

Elmer S. Weir began taking cooperative observations at Natchez on 1 April 1906. The station was located at 412 South Union Street or approximately seven-tenths of a mile southwest from the previous observer--Ruth L. Weir. Elevation was listed as 206 feet. GPS coordinates for the site are 31°33’19”N 91°24’17”W, elevation 193 feet. The last observation by this observer was on 18 February 1909.

Ruth L. Weir (February 1909-July 1909)

Ruth L. Weir began taking cooperative observations on 19 February 1909. In Weather Bureau climatological publications (e.g., Mississippi Section of the Climatological Service of the Weather Bureau), this station was listed under the name “J.C. Weir, Jr”. The station was located at 520 B Street or approximately seven-tenths of a mile northeast from observation station of Elmer S. Weir. GPS coordinates for this site are 31°33’51”N 91°23’52”W, elevation 223 feet. The last observation at this location was on 31 July 1909.

Ruth L. Weir (August 1909-March 1911)

Based on the Substation History, Ruth Weir moved the observing station from 520 B Street to 302 Monroe Street on 1 August 1909, approximately one-quarter mile west. Elevation was listed at 206 feet. GPS coordinates for this site are 31°33’50”N 91°24’4”W, elevation 226 feet. The last observation at this location and by this observer was on 31 March 1911.

*Cooperative Observations at 156 and 144 Saint Catherine Street
(April 1911- January 1953) (Garrity and Butchart families)*

Beginning 1 April 1911, and continuing until 4 January 1953, the cooperative observing station was located at one general location in Natchez, 156 East Catherine Street from 1 April 1911 to 30 April 1934, and 144 St. Catherine Street from 1 May 1934 until 4 January 1953 (Figure 9). These sites were approximately one mile southeast from the previous location at 302 Monroe Street. Elevation was listed as 206 feet. GPS coordinates for the sites are 31°33’26”N 91°23’23”W, elevation 219 feet.

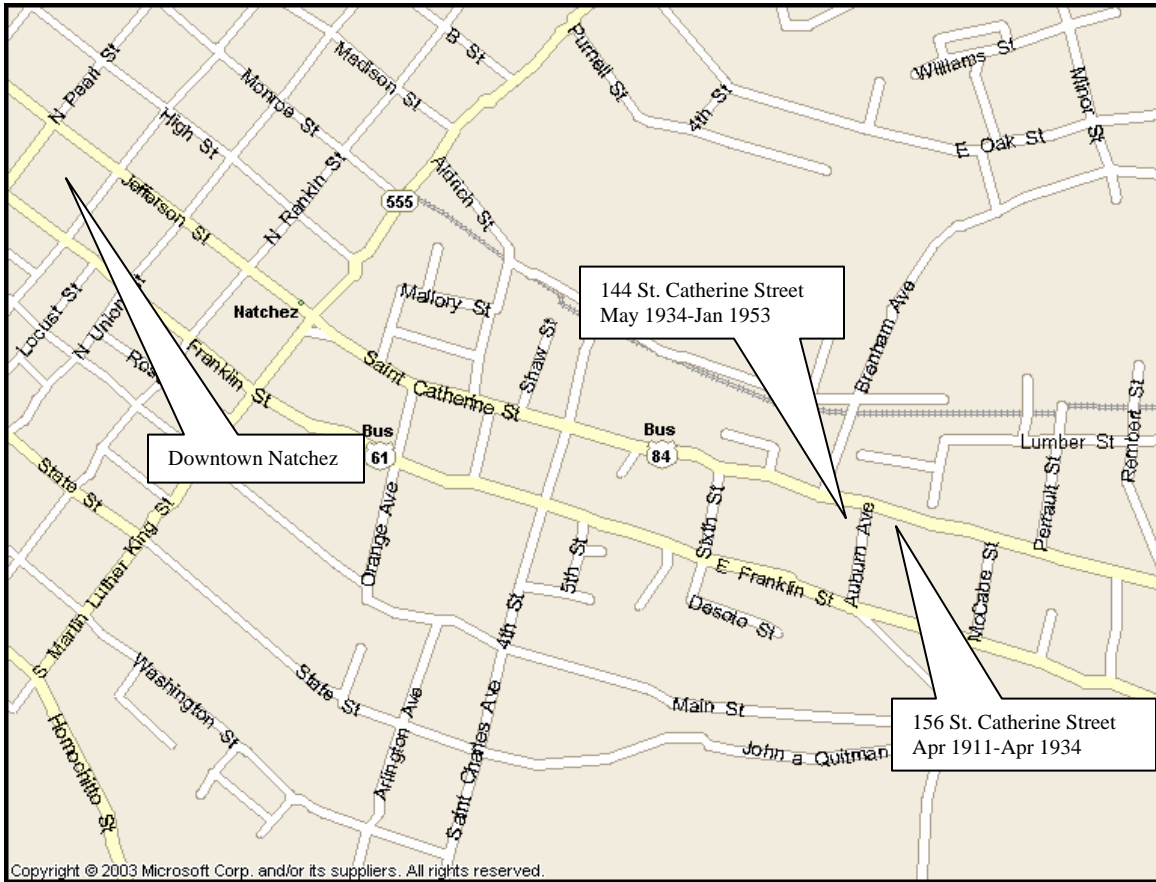


Figure 9. Locations of cooperative weather observations in Natchez, MS from 1 April 1911 through 4 January 1953 (see text for names of families who took the observations). Locations are plotted on a current map of the Natchez area. North is at the top of the page and the east-west distance across the map is approximately one mile.

Weather observations during the 42 years from 1911 to 1953 were taken by the Garrity and Butchart families. The families were related, with various members taking the observations until 5 January 1953 when William A. Robertson assumed observing responsibility in downtown Natchez. Below are the individuals and dates of the Garrity and Burchart families that took cooperative weather observations at 156 East Catherine Street from 1 April 1911 until 30 April 1934:

- Francis L. Garrity (1 April 1911- 28 February 1913)
- Catherine L. Garrity (1 March 1913-14 April 1917)
- Thomas A. Butchart (15 April 1917-30 September 1918)
- *Byron B. Butchart (or Bernard Butchart) (1 October 1918-30 June 1919)
- Francis L. Garrity (1 July 1919-30 April 1934)

* - No record could be found of Byron B. Butchart in the Natchez City Directories. A Bernard Butchart was listed that lived at 142 Saint Catherine Street.

On 1 May 1934, Francis L. Garrity moved the cooperative weather station approximately 100 feet west of the previous location to 144 Saint Catherine Street for better exposure. Elevation of this location was listed as 206 feet. On 1 October 1947, the instruments were moved 11 feet southeast (no reason given).

A documented Weather Bureau inspection on 24 October 1950 (Report on Substation) listed the location of the station as 142 East Saint Catherine Street (observer Francis L. Garrity and substitute observer William Garrity), which was just west of 144 St. Catherine Street. It could not be determined as to whether the station was actually moved from 144 East Saint Catherine Street or the conflict resulted from the numbering system along the street. According to the city directories, Francis L. Garrity lived at 142 Saint Catherine Street as early as 1925 through 1953.

William A. Robertson (January 1953 through 1955)

This Cooperative station was located approximately 20 feet northeast of the Municipal Building on the corner of Market and South Pearl Streets (Figure 10). This location was seven-tenths mile west of the location on Saint Catherine Street. Elevation was listed as 218 feet. GPS coordinates for this site are 31°33'34"N 91°24'14"W, elevation 236 feet.

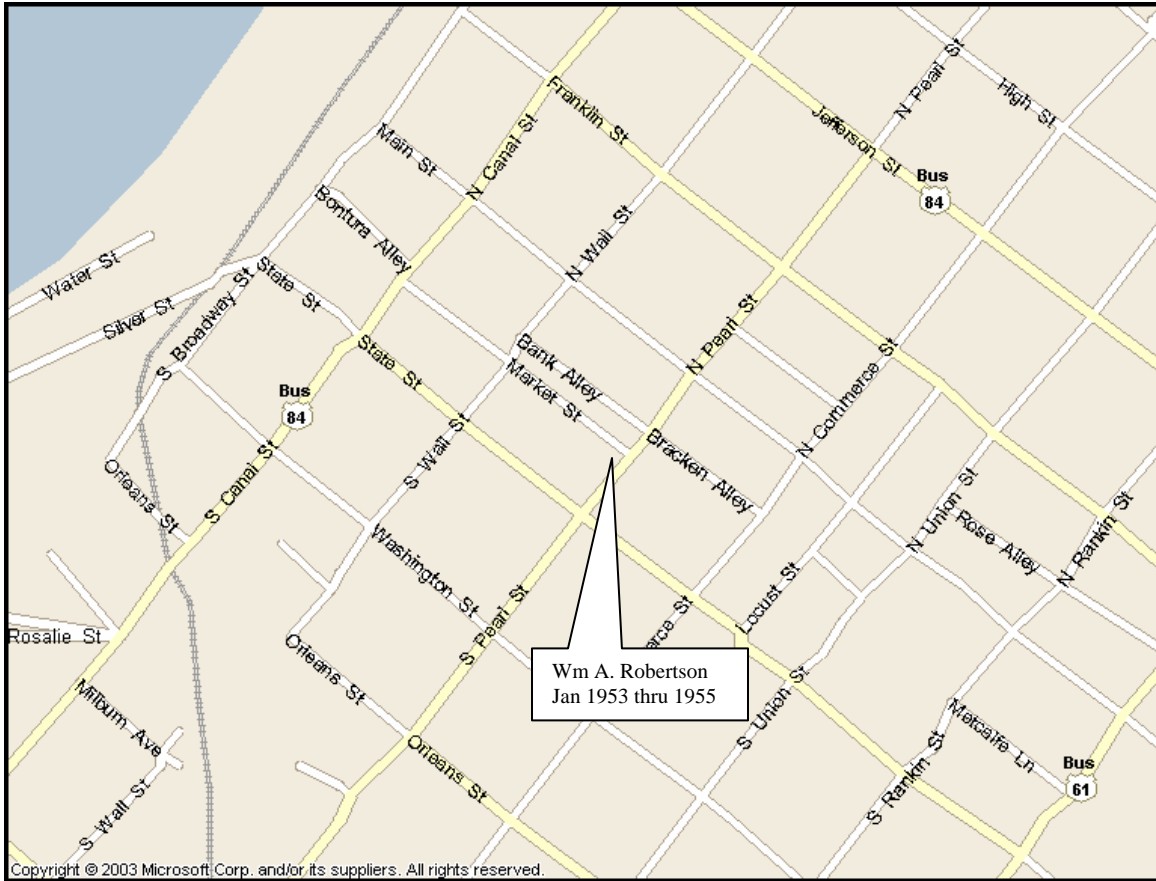


Figure 10. Location of cooperative weather observing station in Natchez, MS from 5 Jan 1953 through 1955 plotted on a current map of the city. North is at the top of the page and the east-west distance across the map is approximately six-tenths of a mile.

Observations at Natchez-Adams County Airport (SAWRS by Southern Airways; 7 January 1951 through 1955)

On 7 January 1951, a Supplementary Aeronautical Weather Reporting Station (SAWRS) was established by Southern Airways at the Natchez-Adams County Airport (now called Hardy-Anders Field, Natchez-Adams County Airport), located approximately seven and one-half miles northeast of Natchez (Figure 11). The weather instruments were at the Airport Administration Building. Coordinates were 31°36'49"N, 91°17'50"W. Elevation was 271 feet.

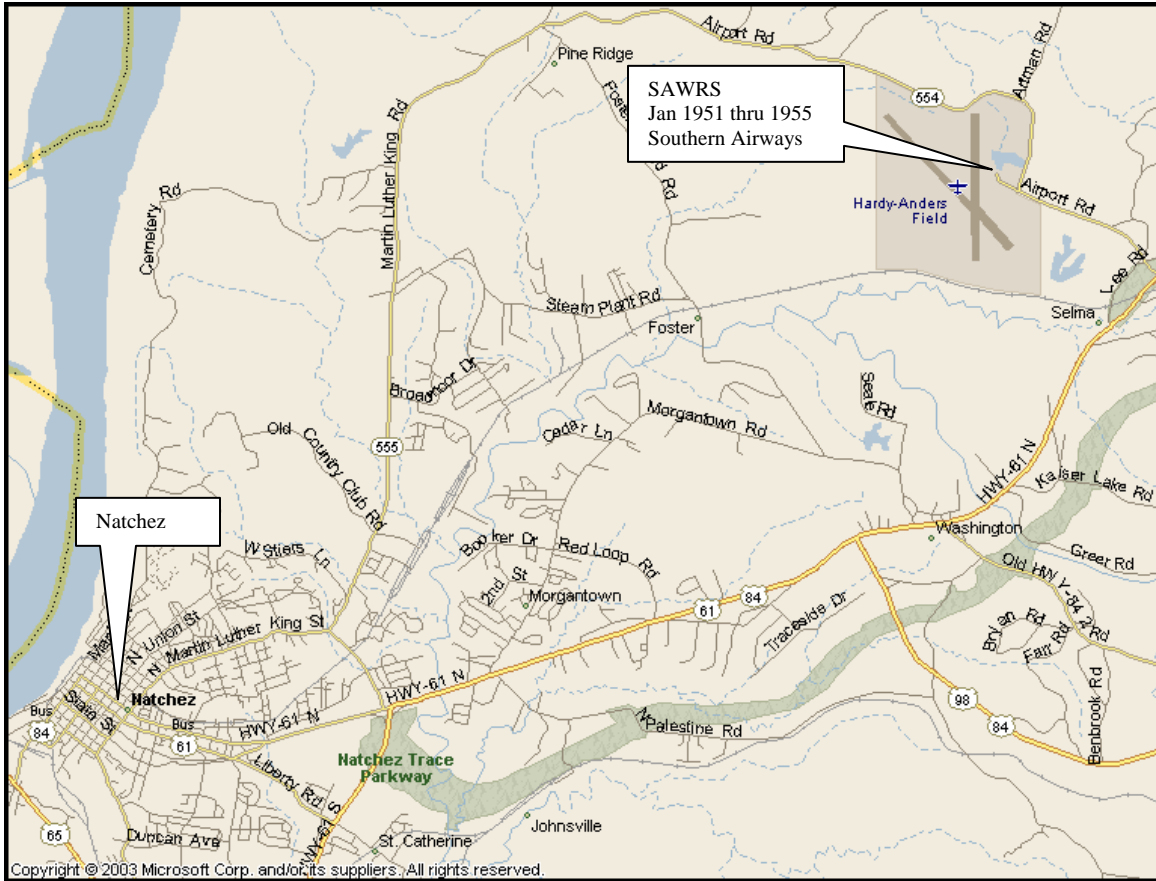


Figure 11. Approximate location of SAWRS with respect to Natchez-Adams County Airport (plotted on a current map). North is at the top of the page. East-west distance across the map is approximately 8 miles.

INSTRUMENTATION

Colonial Diaries

William and Robert Dunbar (February 1799-December 1818)

Observations listed in the NCDC database under William Dunbar were meticulous. The observations were almost continuous from 1 February 1799 until 31 March 1810. A gap in observations existed in the NCDC database from 1 April 1810 until 1 March 1814 (William Dunbar died in October 1810) and resumed from 1 March 1814 into June 1814 then became sporadic until 9 October 1814. Another data gap existed from 9 October 1814 until 4 July 1815. Observations were almost continuous from 4 July 1815 until 25 February 1818, with essentially no observations until 25 July 1818. Almost continuous observations were taken from 25 July 1818 through October 1818, with sporadic observations in November and December 1818. The last observation in the NCDC database for this station was 31 December 1818.

Although the observers were listed as William Dunbar or later, Robert Dunbar, the observations were likely taken by a number of individuals based on the difference in handwriting on the observation forms. The observations most likely were taken on the Dunbar Plantation called “The Forest.” For a more complete description of William Dunbar, refer to the section of the report entitled “The Observers.”

Figure 12 shows one of the first observations listed under William Dunbar.

March 1799.												
Day	Hour	Wind	Rain	Barom	Remarks	Day	Hour	Wind	Remarks			
1	6 1/2	41	29.83	NW 1	Clear	17	5 1/2	50	29.83	N 1	Clear	
	3	51	29.97	NW 1	Clear		3	75	29.90	N 1	Clear	
	9	42	30.03		Cloudy		9	44	29.90	N	Clear	
2	6 1/2	41	30.05	N	Clear	18	5 1/2	29	29.90	N 1	Clear, very clear	
	3	59	30.12	N	Clear		3	57	29.86	SE	very clear	
	9	41	30.09	N	Clear		9	50	29.80	SE	cloudy	
3	5 1/2	35	30.12	N	Very Clear	19	5 1/2	50	29.68		Cloudy	
	3	60	30.19	N 1	Very Clear		3	66	29.57	SE	rain	
	9	51	30.14				9	66	29.53	0.11	E 1	rain
4	6	36	30.14	W	Light clouds at horizon	20	5 1/2	64	29.59	E 1	rain	
	3	60	30.14	N 1	Grey Clouds		3	48	29.68	NW 1	Cloudy	
	9	52	30.14	NE			9	48	29.80	2.91	N 1	Cloudy
5	6 1/2	41	30.19	NE 1	Clear	21	5 1/2	41 1/2	29.92	0.51	NW 1	Cloudy
	3	60	30.19		Cloudy		3	51	29.92	NW	Clear	
	9	53	30.24		Clear		9	39	29.94		very clear	

Figure 12. Weather observations by William Dunbar for March 1799. The March 1799 observations reflected the format followed subsequently. Only the top of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

Observations were taken three times daily, around 6 a.m., 3 p.m., and around 9 p.m. Although the afternoon observation remained consistent, i.e., at 3 p.m., the morning and evening observations varied during the year. Morning observations varied from 5 a.m. to 6:30 a.m. (expressed as “6 ½”) with the earlier observations taken during the spring and summer months. Evening observations varied between 8 p.m. and 9 p.m. with the earlier observations taken during the spring and summer months.

The following measurements/observations were generally taken three times daily beginning February 1799:

Temperature – Degrees Fahrenheit.

Pressure – Inches of mercury.

Rainfall – Inches.

Winds – Direction and force. Force expressed as some type of scale.

Remarks on the Weather – General state of the weather.

In addition, notes frequently were included at the bottom of each monthly observing form describing agricultural activities, impact of the weather on plants and animals, state of crops in the area, and results of simple experiments undertaken by the observer. Below are representative notes included on the weather observing forms:

“Trees beginning to turn”

“Cows are calving”

“Heavy frost this morning”

“Black Mulberry ripe”

“Gathered ripe turnips and cabbages”

“Peaches just beginning to ripen”

“Shearing of sheep started”

“When the thermometer was placed in the snow it immediately rose from 26° to 28°”

“Temperature in the grass is lower than in the air”

“Temperature of spring well water 78 feet deep 64°”

“Thermometer placed in the sun at 3 p.m. rose to 120°”

No information could be found on the number of thermometers at this location. Numerous comments were indicated on the weather observation forms mentioning the movement of the thermometer, e.g., into the woods, into the snow, into the grass, into the sun, etc. It could not be determined whether two thermometers were used with one in the

shade to measure air temperature, with the second thermometer moved to various locations to determine the impact on the temperature, or if one thermometer was used for the temperatures recorded on the forms and also moved to different locations as part of exposure experiments.

Beginning 1 June 1803, two values of temperature were recorded and labeled “thermometer within” and “thermometer without.” No information could be found regarding the meaning of these observations. On 1 July 1803, a column labeled “Moon’s Age” was listed on the forms. This appeared to be the number of days past a certain moon phase, e.g., new moon, full moon, etc. The column on the moon’s age was dropped on 31 December 1803. It was added again later but no data recorded. The following note was included on the November 1807 observation form: “30th, finding the barometer had lost mercury, got it repaired.” No significant changes occurred with the weather observations through 31 March 1810, the last observation of the first group (1799-1810).

The weather observing format for the second group of observations (1814-1818) was similar to the first group taken between 1799 and 1810 (Figure 13). Main exception was that wind force was not routinely recorded initially and eventually dropped completely.

Hours of observation 39.						Hours of observation 6, 3, 9.					
Day	Therm		Wind		Rain	Days	Therm		Wind		Rain
	in	out	Dir.	St. or			in	out	Dir.	St. or	
<i>March 1814</i>											
Tuesd	42	25	30.03	N.W.	1						
	58	50	29.94	N.W.							
1	64	44	29.80			16					
Wed	53	40	29.86	N.	1.00	Thurs					
	60	43	29.97	N	2						
2	60	34	30.02	N.W.	1	17					
Thurs	40	26	30.07	N.W.		Frid					
	58	45	30.04	N.							
3	50	39	29.98	N		18					
	61	58	29.92	N		Sat					
4	46	38	29.93	E		19	69	62	29.88	S.W.	Cloudy
Sat	52	37	29.98	E	.70	Sund	66	56	29.78	N.W.	Rain
	60	44	29.99	N							Rain
5	56	37	30.00	N.	1	20	70	64	29.57	S.W.	Cloudy
Mon	40	29	30.10	N.	2	Mon	60	43	29.66	N.W.	Cloudy
	60	56	30.05	N			72	55	29.72	N.W.	Cloudy
6	63	40	30.04	S.W.		21	63	40	29.78	N.W.	Clear
Tues	50	38	29.97								

Figure 13. Weather observations at William Dunbar plantation for March 1814. Only the top of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

The parameters shown in the above figure continued until all observations ceased at this location on 31 December 1818.

The Mississippi Department of Archives and History contains numerous documents and letters by William Dunbar regarding his plantation, The Forest, including

frequent mention of the weather and its impact. However, no information could be found with regard to weather instruments used or the exposure of the instruments. The original observation forms are located in the Mississippi Department of Archives and History.

Columns of the old Dunbar home still remain, pinpointing the location of the plantation house (Figure 14). Although this house was constructed immediately following William Dunbar's death, according to the Director of Preservation and Education at the Historic Natchez Foundation, the previous house was just east of this location.



Figure 14. Columns of the Dunbar house. View is toward the west. Photograph made by the author.

Figure 15 is the north view from the columns of the Dunbar house, Figure 16 the view towards the east, and Figure 17 the view towards the south..



Figure 15. View to the north from the columns of the Dunbar house. Photograph made by the author.



Figure 16. View to the east from the columns of the Dunbar house. The previous Dunbar house was located in this direction. Trees in the distance are along a stream. Photograph made by the author.



Figure 17. View to the south from the columns of the Dunbar house. Photograph made by the author.

William Dunbar’s notes and letters contain references to his astronomical observatory that was established at The Forest. The observatory contained microscopes, chronometers, and a six-foot reflecting telescope. Although no confirmation could be made regarding where the weather observations were taken, they most likely were taken near the astronomical observatory, and the observatory likely was near the house. Refer to the section in this report on “The Observers” for more information on William Dunbar.

Smithsonian Observations

George L.C. Davis (April 1849-June 1851)

First Smithsonian observation in the Natchez area (according to the NCDC database) was on 1 April 1849 (Figures 18A and 18B).

METEOROLOGICAL																				
Station <i>Natchez Miss</i> Month <i>April</i> Latitude <i>31° 23' 48"</i>																				
1849	Barometer.				Thermometer attached.				Thermometer detached. In the shade and open air.					Clearness of the Sky.				Wind. Its force and course		
	Sun rise	9 A.M.	3 P.M.	9 P.M.	Sun rise	9 A.M.	3 P.M.	9 P.M.	Sun rise	9 A.M.	3 P.M.	9 P.M.	Daily Mean	Sun rise	9 A.M.	3 P.M.	9 P.M.	Sun rise	9 A.M.	3 P.M.
1	50.300	50.340	50.090	50.170	69.0	68.0	72.0	77.0	57.0	62.0	73.0	60.0	63.0	9	10	10	10	W 2	W 2	W 2
2	50.220	50.100	50.100	50.120	69.5	63.5	70.5	68.5	54.5	64.5	73.5	64.2	62.2	8	10	8	7	E. 2	SE 3	SW 2
3	50.090	50.090	50.090	50.090	63.5	66.5	75.0	71.5	59.0	65.0	75.0	61.5	68.9	9	10	7	0	S. 2	S. 2	SE 3
4	50.010	50.010	50.010	50.010	65.5	65.0	75.0	73.0	58.5	64.2	75.0	67.5	67.7	8	5	8	8	W 2	W 2	W 1
5	50.600	50.090	50.090	50.090	67.0	68.5	75.8	73.5	65.0	67.5	75.0	71.0	70.9	1	0	5	8	N. 1	W 1	SW 1
6	50.040	50.040	50.040	50.040	71.2	72.5	74.0	72.0	64.5	72.0	80.5	72.5	73.6	6	5	0	7	SSE 2	SSE 2	SSE 3
7	50.040	50.200	50.000	50.100	72.5	73.0	80.5	76.0	67.5	72.5	81.0	72.0	73.2	7	6	7	10	E. 2	SE 3	SE 2
8	50.040	50.100	50.100	50.100	71.7	72.5	75.8	76.0	66.7	72.5	80.2	71.5	72.6	5	6	7	9	SSE 2	SSE 2	SSE 3
9	50.120	50.120	50.120	50.120	69.2	69.0	77.3	75.0	64.1	69.0	79.3	64.3	69.2	5	4	0	0	SSE 2	S. 3	S. 3
10	50.080	50.120	50.120	50.120	63.6	70.1	74.8	71.5	64.6	68.3	74.3	65.1	65.1	6	5	4	9	SSE 1	SE 1	S. 1
11	50.180	50.220	50.100	50.120	63.5	64.5	74.0	70.8	67.4	72.7	67.3	67.3	67.3	8	8	7	1	W 2	W 2	W 2

Figure 18A. Smithsonian weather observations (left side of the observing form) for the Natchez, MS area by George L.C. Davis for April 1849. Only the top of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

METEOROLOGICAL JOURNAL.														
Latitude <i>31° 23' 48" N</i> Longitude <i>91° 24' 42" W</i> All of Bar. above Gulf of Mexico Sea <i>27.5</i>														
Wind. and course from.			Clouds. Their velocity and course from.				Thermometer. Wet Bulb.		Rain.			Remarks.		
9 A.M.	3 P.M.	9 P.M.	Sun rise	9 A.M.	3 P.M.	9 P.M.	Sun rise	3 P.M.	Began	Ended	Quantity			
W 2	W 2	W 1	0	—	—	—	52.0	57.5						
SE 3	SW 2	W 1	W 1	—	W 1	W 1	45.0	61.0				Sunny		
S. 2	SE 3	—	—	—	SW 2	W 2	56.5	66.5	7.45	11.30	1.56	Rain from N. 1/2 W.		
SW 2	W 1	E. 1	W 2	W 2	W 2	W 2	55.0	72.0						
W 1	SW 1	SE 1	S. 2	S. 2	SW 1	—	63.5	72.0				Light from 9 to 10. m. Haze around the moon at night		
SE 2	SSE 3	SE 2	SW 1	SW 2	SW 1	SW 1	67.0	72.5						
E. 8	SE 2	SE 2	SW 1	SE 2	S. 2	—	66.0	72.0						
SE 2	SSE 3	S. 1	SE 1	SSE 2	SE 1	—	65.7	70.0						
S. 3	S. 3	W 1	SW 2	SW 2	S. 3	SW 1	62.2	71.4	9.0	9.30	0.05	Light fog, cleared soon over and all S.		
E. 1	S. 1	W 1	SW 1	SW 1	SW 1	SW 1	63.5	67.1						
SE 2	SW 1	SE 1	SW 1	SW 1	SW 1	SW 1	63.2	64.6						
SE 2	SW 1	SE 1	SW 1	SW 1	S. 1	—	65.5	68.5						

Figure 18B. Smithsonian weather observations (right side of the observing form) for the Natchez, MS area by George L.C. Davis for April 1849. Only the top of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

The following parameters were measured/observed by Mr. Davis:

Pressure – Measured four times daily (Sunrise, 9 a.m., 3 p.m., and 9 p.m.) and recorded in inches of mercury. Smithsonian records indicated another barometer was sent to Mr. Davis in 1851.

Temperature - Measured four times daily (Sunrise, 9 a.m., 3 p.m., and 9 p.m.) and recorded in degrees Fahrenheit. Recorded from the attached thermometer and detached thermometer.

Clearness of the Sky - Observed four times daily (Sunrise, 9 a.m., 3 p.m., and 9 p.m.) and recorded on a scale from 0 to 10, with 0 representing completely cloudy and 10 representing entire clear.

Wind – Direction (from which the wind was blowing) and force were measured four times daily (Sunrise, 9 a.m., 3 p.m., and 9 p.m.). Direction was expressed on an eight-point compass and force expressed from 0 to 6 with 0 calm conditions, 1 a very gentle breeze, 2 a gentle breeze, 3 a fresh breeze, 4 a strong wind, 5 a very strong wind, and 6 a violent storm. Force of the wind was estimated by the observer.

Clouds – Direction (from which the clouds were moving) and speed of movement of the clouds were measured four times daily (Sunrise, 9 a.m., 3 p.m., and 9 p.m.). The same scale used for wind force (0 to 6) was used to express cloud movement.

Humidity - Measured twice daily (Sunrise and 3 p.m.) and expressed as the wet-bulb temperature. The wet-bulb observations were made by “wetting a thin rag placed around the bulb of the thermometer and fanning it in the shade until it fell as low as it would in the open air.

Rainfall – Beginning, ending, and daily amount expressed in inches of water.

Smithsonian instructions in 1849 stated: “The thermometer should be placed in the open air in the shade, and not exposed to any reflected heat, and so of the wet-bulb. The option of fanning the wet-bulb may be omitted when the wind is blowing.”

The observations for George L.C. Davis were continuous from his first observation (1 April 1849) through 31 December 1849. No observations were present in the NCDC database for 1850 although Smithsonian records indicated he took observations during this period. Observations resumed in the database on 1 January 1851, and continued to the last observation on 30 June 1851. Observations were missing 1-2 February 1851. On the March 1851 observation form, the observer is listed as “Mrs. Davis.”

No specific information was found regarding the type or exposure of weather instruments used by Mr. Davis. Figure 19 shows the location where he most likely took

the observations, i.e. his house. The terrain around his house sloped down from northwest to southeast with the backyard of the site lower than the front yard. No information could be found as to the exact location at the site that the observations were made.



Figure 19. George L.C. Davis home at 305 North Rankin. View is east. Photograph by the author.

J. Edward Smith (September 1856-December 1856)

Although sporadic, Mr. Smith took the following observations during the period 1 September 1856 through 31 December 1856:

Pressure – Measured three times daily (7 a.m., 2 p.m., and 9 p.m.) and recorded in inches of mercury. A note was attached to the September 1856 form stating that Mr. Smith’s barometer (name of barometer not legible) “agreed exactly with an instrument made by Green (No. 131) of the pattern adopted by the Smithsonian Institution.” On the October 1856 observation form the following was written across the top of the barometer column, “Green (New York) No. 131.”

Temperature - Measured three times daily (7 a.m., 2 p.m., and 9 p.m.) and recorded in degrees Fahrenheit. Measured from the attached and detached thermometers.

Humidity - Measured three times daily (7 a.m., 2 p.m., and 9 p.m.) and expressed as wet-bulb temperature. Also, vapor pressure and relative humidity were listed three times daily. Observations for this parameter were erratic.

Rainfall – Recorded the beginning and ending of rain and occasionally recorded daily rainfall amounts.

Clouds - Three times daily (7 a.m., 2 p.m., and 9 p.m.), indicating amount of clouds (10 completely cloudy, 5 sky half covered by clouds, and 0 for clear skies), type of clouds and movement of the clouds.

Winds - Three times daily (7 a.m., 2 p.m., and 9 p.m.), indicating the direction from which the wind was blowing (on an eight-point compass) and force of the wind (scale of 1 to 10 with 1 a very light breeze of 2 miles per hour and 10 a most violent hurricane with wind speeds 100 miles per hour). It was not apparent whether wind force was measured or estimated.

No information was found regarding the type or exposure of the weather instruments used by Mr. Smith. He worked somewhere on Main Street and no information was found depicting his residence. Most likely, he lived within a few blocks of downtown Natchez, as was customary during the 1850s.

Robert McCary (July 1858-January 1863, October 1864-July 1866)

Smithsonian records indicated Robert McCary had a barometer, thermometer, and rain gage. However, no specific information on the instruments was included. The 1854 Annual Report of the Smithsonian Institution described the instruments which should have been used by the observers. The relevant instructions for the instruments used by Mr. McCary were the following:

“The barometer is made by James Green, No. 422 Broadway, New York, under the direction of the Institution. It has a glass cistern with an adjustable bottom enclosed in a brass cylinder. The barometer tube is also in a brass cylinder, which carries the vernier. The whole is suspended freely, from a ring at the top, so as to adjust itself to the vertical position. The bulb of the attached thermometer is enclosed in a brass envelope communicating with the interior of the brass tube, so as to be in the same condition with the mercury, and to indicate truly its temperature. Each instrument made according to this pattern is numbered and accurately compared with a standard. In the comparisons made by Professor Guyot, a standard Fortin barometer, by Ernst, of Paris, was employed; also, a standard English barometer, by Newman, of London, belonging to this Institution. These instruments, for greater certainty, have been compared with the standard of the Cambridge Observatory, and of Columbia College, both by Newman; also with the standard of the Observatory of Toronto, Upper Canada. The results of these examinations prove the barometers made by Mr. Green, according to the plan adopted by the Smithsonian Institution, to be trustworthy instruments.”

“The thermometers are by the same maker.”

“The rain and snow gauges are made under the direction of the Institution by Messrs. Pike & Son, 166 Broadway, New York. The rain gauge is an inverted cone of sheet zinc, of which the area of the base is exactly one hundred square inches. This cone, or funnel, terminates in a tube which carries the water into a receiving vessel. The water which has fallen is measured by pouring it from the gauge into a cylinder, so graduated as to indicate hundredths of inches. A smaller cylinder is also provided, which gives thousandths of inches, and may serve, in case of accident, as a substitute for the gauge cylinder. The rain gauge is placed in a cask sunk in the earth, with its mouth near the level of the ground.”

“To accompany the instruments, and for the use of those who take part in the Smithsonian system of meteorological observations, a series of minute directions, prepared by Professor Guyot, has been printed by the Institution.”

A copy of the instructions was included in the 1856 Annual Report of the Smithsonian Institution.

Figures 20A and 20B are the first observations depicted in the NCDC database for Robert McCary.

REGISTER OF METEOROLOGICAL OBSERVATIONS UNDER THE DIRECTION OF THE SMITHSONIAN INSTITUTION, ADC

Place of Observation *Natchez* County of *Adams* State of *Mississippi*
 Latitude *31° 34'* Longitude *91° 44'* Height above the sea *204 feet*

Day of Month	BAROMETER.				THERMOMETER IN THE OPEN AIR.				PSYCHROMETER, OR HYGROMETER.			RAIN AND SNOW.			7 A. M.						
	UNCORRECTED READING.			THERMOMETER ATTACHED TO BAROMETER.			BAROMETER READING REDUCED TO FREEZING POINT.			WET GLOBE.		DRY GLOBE.		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 higher clouds.	Velocity.		
	T. m.	S. p. m.	P. m.	T. a. m.	S. p. m.	P. m.	T. a. m.	S. p. m.	P. m.	T. a. m.	S. p. m.	P. m.	T. a. m.							S. p. m.	P. m.
1							29.40	29.5	29.5	29.40	50	51	50.2						8	3.0	0
2							29.45	29.5	29.5	29.45	50	50	50.1						22	3	1
3							29.50	29.5	29.5	29.50	50	50	50.1						2	3.0	1
4							29.50	29.5	29.5	29.50	50	50	50.1						1	3.0	1
5							29.50	29.5	29.5	29.50	50	50	50.1						1	3.0	1
6							29.50	29.5	29.5	29.50	50	50	50.1						1	3.0	1
7							29.50	29.5	29.5	29.50	50	50	50.1						1	3.0	1
8							29.50	29.5	29.5	29.50	50	50	50.1						1	3.0	1
9							29.50	29.5	29.5	29.50	50	50	50.1						1	3.0	1
10							29.50	29.5	29.5	29.50	50	50	50.1						1	3.0	1
11							29.50	29.5	29.5	29.50	50	50	50.1						1	3.0	1
12							29.50	29.5	29.5	29.50	50	50	50.1						1	3.0	1
13							29.50	29.5	29.5	29.50	50	50	50.1						1	3.0	1

Figure 20A. Smithsonian weather observations (left side of the observing form) for the Natchez, MS area by Robert McCary for July 1858. Only the top of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

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

NO 126

Recd. Aug 18. 1858

For the Month of July 1858

Name and address of Observer Robert McCary, Natchez, Miss.

No.	CLOUDS.												WINDS.						FORCE OR PRESSURE OF VAPOUR IN INCHES.			RELATIVE HUMIDITY, OR FRACTION OF SATURATION.		
	7 A. M.				9 P. M.				D P. M.				7 A. M.		9 P. M.		D P. M.		7 A. M.	9 P. M.	D P. M.			
	Amount of clouds.	Course of higher clouds.	Velocity.	Kind of clouds.	Amount of clouds.	Course of higher clouds.	Velocity.	Kind of clouds.	Amount of clouds.	Course of higher clouds.	Velocity.	Kind of clouds.	Direction.	Force.	Direction.	Force.	Direction.	Force.	Direction.	Force.				
1	0	0	0	0	1	0	0	1	0	0	0	S.	1	S.W.	2	S.W.	1							
2	1	0	0	0	2	0	0	2	0	0	0	S.	1	S.	3	S.W.	1							
3	2	0	0	0	2	0	0	2	0	0	0	S.	2	S.	2	S.	2							
4	3	0	0	0	3	0	0	3	0	0	0	S.	3	S.W.	1	S.W.	2							
5	4	0	0	0	4	0	0	4	0	0	0	S.W.	1	S.W.	2	S.W.	2							
6	5	0	0	0	5	0	0	5	0	0	0	S.W.	2	S.W.	2	S.W.	2							
7	6	0	0	0	6	0	0	6	0	0	0	S.W.	2	S.W.	2	S.W.	2							
8	7	0	0	0	7	0	0	7	0	0	0	S.W.	2	S.W.	2	S.W.	2							
9	8	0	0	0	8	0	0	8	0	0	0	S.W.	2	S.W.	2	S.W.	2							
10	9	0	0	0	9	0	0	9	0	0	0	S.W.	2	S.W.	2	S.W.	2							
11	10	0	0	0	10	0	0	10	0	0	0	S.W.	2	S.W.	2	S.W.	2							

Figure 20B. Smithsonian weather observations (right side of the observing form) for the Natchez, MS area by Robert McCary for July 1858. Only the top of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

Robert McCary took the following weather observations beginning 1 July 1858:

Pressure – Measured three times daily (7 a.m., 2 p.m., and 9 p.m.) and recorded in inches of mercury. On the June 1858 form was attached the following note, “The Barometer that I use is the Metallic (sic) Barometer, a most excellent one.”

Temperature - Measured three times daily (7 a.m., 2 p.m., and 9 p.m.) and recorded in degrees Fahrenheit.

Rainfall – Recorded the beginning and ending of rain and daily rainfall amounts.

Clouds - Three times daily (7 a.m., 2 p.m., and 9 p.m.), indicated amount of clouds (10 completely cloudy, 5 sky half covered by clouds, and 0 for clear skies), type of clouds, and direction from which the clouds are moving. Although the column was labeled “Course of Higher Clouds,” according to Smithsonian instructions, movement of any clouds visible was the requirement.

Winds - Three times daily (7 a.m., 2 p.m., and 9 p.m.), indicated the direction from which direction the wind was blowing (on an eight-point compass) and force of the wind (scale of 1 to 10 with 1 a very light breeze of 2 miles per hour and 10 a most violent hurricane with wind speeds 100 miles per hour). No information could be found as to whether the wind force was measured or estimated.

In addition to Robert McCary's regular observations, he also included detailed descriptions of the daily weather (Figure 21).

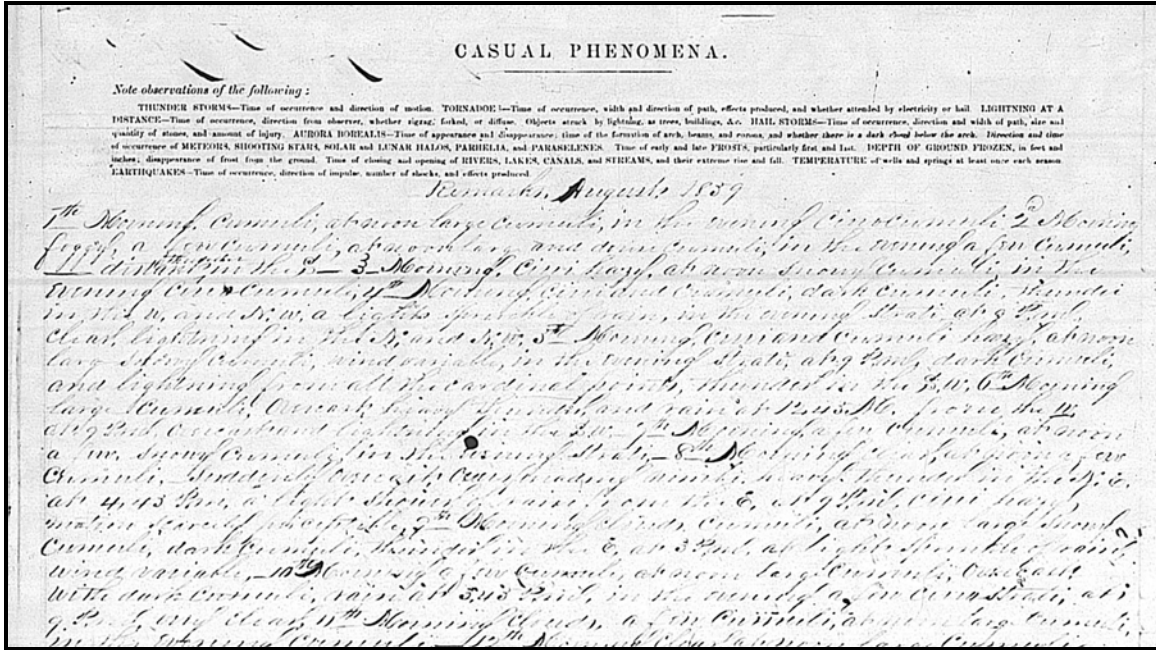


Figure 21. Remarks on the weather made almost daily by Robert McCary (August 1859). The form, entitled Casual Phenomena, appeared to be part of the Smithsonian observing form. Only the top of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

Beginning 1 January 1860, the observer ceased recording clouds and rainfall but resumed 1 January 1861. Also during this period, various parts of the heading of the observation form were left blank, e.g., latitude, longitude, elevation, and name of observer. Based on the handwriting, it is likely all the observations in 1860 were taken by someone other than Robert McCary.

Almost continuous observations were recorded from 1 July 1858 until 31 January 1863 (weather observations for the month of December 1862 were missing in the NCDC database). Smithsonian records indicated that Mr. McCary ceased taking observations in 1862, but NCDC records clearly show that he took weather observations through 31 January 1863.

A gap in observations by Mr. McCary existed in the NCDC database from 1 February 1863 until 1 October 1864. The start date basically agreed with Smithsonian records that indicated Mr. McCary did not resume observations until 1864. The last observation by Robert McCary was 23 July 1866. A note was written on the observing form stating that Robert McCary died on 25 July 1866. See the section of this report on “The Observers” for more information on Robert McCary.

William McCary (August 1866-May 1870)

On 1 August 1866, William McCary began taking weather observations. Initial recordings were for pressure, temperature, and precipitation with wind observations included beginning 22 August 1866. Cloud observations commenced 1 September 1866. He also included very detailed descriptions of the weather on the Casual Phenomena forms, following the precedent of Robert McCary. Mr. McCary took almost continuous weather observations from 1 August 1866 until his last observation on 30 May 1870 (confirmed by NCDC database and Smithsonian records). For more information on William McCary see the section of this report on “The Observers.”

Weather Observations by Army Surgeons (May 1869–June 1870)

First observation by Army surgeons in the Natchez area (in the NCDC database) was 1 May 1869. Figures 22A and 22B are examples of the recorded observations.

		METEOROLOGICAL REGISTER																			
		Station <i>Natchez, Mississippi</i>				Lat. <i>31 deg. 34 min.</i>				Long. <i>91 deg. 24 min. 4</i>											
1869 Month	Year	THERMOMETER.				SELF-REGISTERING THERMOMETER.			MOVEMENTS OF ATMOSPHERE.						AMOUNT OF CLOUDINESS.			RAIN Inches.			
		7 A. M.	3 P. M.	9 P. M.	Daily mean.	Max.	Min.	Mean.	7 A. M.		3 P. M.		9 A. M.		7 A. M.	3 P. M.	9 P. M.				
									WINDS.	Motion of Clouds.	WINDS.	Motion of Clouds.	WINDS.	Motion of Clouds.							
D.	F.	D.	F.	D.	F.	D.	F.	D.	F.	D.	F.	D.	F.	D.	F.	D.	F.				
<i>June</i>	<i>1</i>	<i>75</i>	<i>85</i>	<i>75</i>	<i>78.33</i>				<i>W</i>	<i>1</i>	<i>W</i>	<i>2</i>	<i>0</i>	<i>W</i>	<i>2</i>	<i>W</i>	<i>4</i>	<i>5</i>	<i>6</i>		
	<i>2</i>	<i>75</i>	<i>75</i>	<i>74</i>	<i>74.66</i>				<i>W</i>	<i>1</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>2</i>	<i>W</i>	<i>8</i>	<i>10</i>	<i>10</i>	<i>11.0 AM</i>
	<i>3</i>	<i>74</i>	<i>75</i>	<i>71</i>	<i>73.33</i>				<i>W</i>	<i>1</i>	<i>W</i>	<i>2</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>10</i>	<i>5</i>	<i>2</i>	
	<i>4</i>	<i>85</i>	<i>84</i>	<i>85</i>	<i>84.75</i>				<i>W</i>	<i>1</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>3</i>	<i>1</i>	<i>2</i>	
	<i>5</i>	<i>73</i>	<i>81</i>	<i>76</i>	<i>76.66</i>				<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>2</i>	<i>0</i>	<i>W</i>	<i>2</i>	<i>0</i>	<i>2</i>	<i>1</i>	<i>1</i>	
	<i>6</i>	<i>74</i>	<i>84</i>	<i>85</i>	<i>77.66</i>				<i>W</i>	<i>2</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>0</i>	
	<i>7</i>	<i>73</i>	<i>85</i>	<i>74</i>	<i>77.33</i>				<i>W</i>	<i>2</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>0</i>	
	<i>8</i>	<i>76</i>	<i>89</i>	<i>86</i>	<i>83.66</i>				<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>2</i>	
	<i>9</i>	<i>80</i>	<i>90</i>	<i>84</i>	<i>84.66</i>				<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>2</i>	<i>0</i>	<i>5</i>	
	<i>10</i>	<i>81</i>	<i>91</i>	<i>86</i>	<i>86</i>				<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	
	<i>11</i>	<i>76</i>	<i>85</i>	<i>73</i>	<i>78.66</i>				<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>3</i>	<i>1</i>	<i>0</i>	
	<i>12</i>	<i>80</i>	<i>85</i>	<i>77</i>	<i>80.66</i>				<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>2</i>	<i>5</i>	<i>5</i>	<i>6.30 AM</i>	
	<i>13</i>	<i>74</i>	<i>80</i>	<i>74</i>	<i>76</i>				<i>W</i>	<i>2</i>	<i>W</i>	<i>2</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>10</i>	<i>6</i>	<i>4</i>	<i>5.0 AM</i>
	<i>14</i>	<i>73</i>	<i>88</i>	<i>74</i>	<i>75</i>				<i>W</i>	<i>1</i>	<i>W</i>	<i>4</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>10</i>	<i>5</i>	<i>3</i>	<i>6.0 AM</i>
	<i>15</i>	<i>72</i>	<i>80</i>	<i>76</i>	<i>76</i>				<i>W</i>	<i>2</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>W</i>	<i>1</i>	<i>1</i>	<i>4</i>	

Figure 22A. Army surgeon weather observations for the Natchez, MS area for June 1869 (left side of the form). Only the top of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

METEOROLOGICAL REGISTER.											
Lat. <i>34 1/2</i> <i>North</i>			Long. <i>91 deg 24 7/8 min 42 3/4</i>			Alt. of Bar. above Sea. <i>264</i>			feet.		
STATE OF ATMOSPHERE.				AMOUNT OF CLOUDINESS.			RAIN AND MELTED SNOW.			REMARKS.	
7 P. M.		9 A. M.		7 A. M.	2 P. M.	9 P. M.	Began.	Ended.	Quantity.		
Dir.	Force.	Dir.	Force.								
<i>W</i>	<i>2</i>	<i>0</i>	<i>W</i>	<i>2</i>	<i>10</i>	<i>4</i>	<i>5</i>	<i>6</i>			
<i>0</i>	<i>1</i>	<i>10</i>	<i>S</i>	<i>2</i>	<i>8</i>	<i>8</i>	<i>10</i>	<i>10</i>	<i>11 P.M.</i>		
<i>0</i>	<i>2</i>	<i>10</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>10</i>	<i>3</i>	<i>2</i>	<i>11 A.M. 4.05</i>	<i>Light shower at 3 P.M.</i>	
<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>3</i>	<i>1</i>	<i>2</i>			
<i>W</i>	<i>2</i>	<i>0</i>	<i>W</i>	<i>2</i>	<i>0</i>	<i>2</i>	<i>1</i>	<i>1</i>			
<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>0</i>			
<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>0</i>			
<i>W</i>	<i>1</i>	<i>0</i>	<i>S</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>2</i>			
<i>W</i>	<i>1</i>	<i>0</i>	<i>E</i>	<i>1</i>	<i>0</i>	<i>2</i>	<i>0</i>	<i>5</i>			
<i>W</i>	<i>1</i>	<i>0</i>	<i>S</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>			
<i>W</i>	<i>1</i>	<i>0</i>	<i>S</i>	<i>1</i>	<i>0</i>	<i>3</i>	<i>1</i>	<i>0</i>			
<i>W</i>	<i>1</i>	<i>8</i>	<i>S</i>	<i>1</i>	<i>8</i>	<i>2</i>	<i>5</i>	<i>5</i>	<i>6.30m 6.50m .05</i>		
<i>W</i>	<i>2</i>	<i>8</i>	<i>S</i>	<i>1</i>	<i>8</i>	<i>10</i>	<i>6</i>	<i>4</i>	<i>5.0m 10.0m .20</i>		
<i>W</i>	<i>4</i>	<i>10</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>10</i>	<i>5</i>	<i>3</i>	<i>6.0m 7.50am .07</i>		
<i>W</i>	<i>1</i>	<i>0</i>	<i>W</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>1</i>	<i>4</i>			
<i>W</i>	<i>1</i>	<i>0</i>	<i>S</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>1</i>			

Figure 22B. Army surgeon weather observations for the Natchez, MS area for June 1869 (right side of the form). Only the top of the form is shown to improve readability. From the official station history files at the National Climatic Data Center.

Army surgeons at Natchez took the following weather observations beginning 1 May 1869:

Temperature - Measured three times daily (7 a.m., 2 p.m., and 9 p.m.) and recorded in degrees Fahrenheit. Maximum/minimum thermometers were not at this station even though space was provided on the observation forms under “Self-Registering Thermometers.”

Winds – Recorded three times daily (7 a.m., 2 p.m., and 9 p.m.). Indicated the direction from which the wind was blowing (on an eight-point compass) and force of the wind (scale of 0 to 10 with 0 calm conditions and 10 “winds of greater velocity than seventy miles an hour.”) No information could be found as to whether this station had wind instruments. A wind vane likely was issued to this station or constructed on site. Anemometers were not distributed to all field hospitals; however, alternate instructions were issued by the Army Surgeon General’s office in 1868 as to how to estimate wind speeds. Those instructions can be found in the Fort Snelling, MN, Fort Union, NM, or Fort Gibson, OK reports under this contract (see Bibliography).

Amount of Cloudiness – Estimated three times daily (7 a.m., 2 p.m., and 9 p.m.) and recorded as tenths of the sky covered, e.g., the number “1” represented one tenth coverage, 5 was five tenths coverage, etc.

Rainfall – Recorded the beginning and ending of rain and daily rainfall amounts.

Dry Bulb and Wet Bulb Temperatures – Measured three times daily (7 a.m., 2 p.m., and 9 p.m.) and expressed in degrees Fahrenheit.

General information concerning weather instruments used by Army field surgeons and observing instructions issued by the Surgeon General during the late 1860s and early 1870s are included in the reports for Fort Union, NM, Fort Gibson, OK, and Fort Snelling, MN under this contract (see Bibliography). Last observation by Army surgeons at Natchez in the NCDC database was on 30 June 1870.

No information could be found as to the exact location the Army surgeons took weather observations in 1869 and 1870. However, consistent with observations by the Army Medical Department at other forts, the observations likely were taken near the Fort McPherson hospital (see Figure 7). Figure 23 shows the location of this hospital based on information from the Director of Preservation and Education at the Historic Natchez Foundation. The hospital set on a small plateau with lower elevations (around 20 feet lower) immediately on all sides except to the west.



Figure 23. Location of the Fort McPherson hospital. View is northeast. Photograph taken by the author.

Cotton Region Observers (1884-1902)

C.W. Montgomery (April 1884-October 1888)

The first observation by C.W. Montgomery was on 1 April 1884, and the last observation 31 October 1888. Observations by this observer were almost continuous during the cotton growing season.

Figure 24 shows the first cotton region observations taken at Natchez.

(FORM No. 144 A.)

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

Signal Service, U. S. A., 7 83

Station: NATCHEZ, MISS.

Month of April, 1884

DATE.	MAXIMUM TEMPERATURE.	MINIMUM TEMPERATURE.	RAIN-FALL.	TIME OBSERVATION WAS TAKEN.	TIME REPORT WAS FILED AT TELEGRAPH OFFICE.	EXPLANATIONS AND REMARKS.
1	85°	65°	.00	5 pm	5:10 pm	
2	85°	59°	.14	"	5:15 "	
3	85°	47°	.02	"	"	
4	70°	45°	.00	"	5:20 "	
5	70°	46°	.12	"	5:15 "	
6	85°	65°	.00	"	"	
7	78°	47°	.00	"	"	
8	73°	50°	.00	"	"	
9	79°	46°	.00	"	"	
10	75°	43°	.00	"	"	
11	73°	47°	.00	"	"	
12	75°	50°	.64	"	"	
13	85°	64°	.00	"	"	
	82°	65°	.96			

Figure 24. First cotton region observations taken at Natchez (April 1884). 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 the observers to record the maximum temperature, minimum temperature, 24 hour rainfall, and the occurrence of light or killing frost, thunderstorms, or tornadoes. Observations at Natchez were transmitted once daily at 5 PM (Natchez time) to New Orleans, LA.

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

The observers were instructed to place the instrument shelter on the north side of a building, free from the jar of passing trains (most observations were taken at telegraph stations). The instructions stated the shelter should never be placed on a building where heavy freight was hauled to avoid vibrations to the minimum thermometer. The shelter was to be secured to the side of the building.

Signal Service instructions contained the following with respect to location of the rain gage:

“Place the rain-gauge, whenever practical, in an open space, free from all obstructions to within 10 degrees of the horizon, and protected from the interference of animals and unauthorized persons; secure it in a vertical position, with the top of the funnel-shaped collector 12 inches above the surface of the ground. When a position at the level of the ground, with a sufficiently clear exposure, cannot be found, place the gauge on the roof of the building.’

‘To determine the rainfall, examine the gauge at the time of making each observation, measure the amount of water it contains, including precipitation from fog or dew, by means of the measuring stick, then empty and replace the gauge.’

‘The proportion between the sectional areas of the cylinder and funnel is as one to ten. The measuring stick is graduated in inches and tenths of inches. Ten inches of water in the cylinder is equal to one inch of actual rainfall; one inch, to one-tenth of an inch of rain; and one-tenth of an inch to one-hundredth of an inch of rain.’

‘Stations in localities subject to heavy rainfall will be supplied with an attachment to the gauge of sufficient capacity to guard against overflow; but at stations where such rains are exceptional, care must be taken by the observer to prevent overflow during heavy rains. This overflow attachment is a larger, outer cylinder, into which the rainwater flows from the inner cylinder after the latter has been filled. After having measured the water in the inner cylinder, empty it; pour the water

from the outer into the inner cylinder; measure it, and the sum of the measurements gives the rainfall since last observation.”

The only comment found on the observing forms by C.W. Montgomery was on the April 1888 form which stated, “Instrument shelter moved from against a wall to an open space on April 12th.” No information could be found regarding the type or exposure of weather instruments used by C.W. Montgomery. According to the Weather Bureau Substation History, this site had a maximum thermometer, minimum thermometer, and standard rain gage. Best estimate is that the observing site was on main street (111 Main Street) near the railroad depot.

Charles Stietenroth (May 1889-October 1902; Voluntary Observer January 1902-January 1904)

The first observation by Charles Stietenroth was 1 May 1889, and the last cotton region observation 31 October 1902. Cotton region observations alone were taken by Mr. Stietenroth from 1 May 1889 until 31 October 1893. Beginning 1 January 1894, he took observations essentially all year with the months of January-March and November-December as part of the Signal Service Voluntary Observing Program, and the months April-October as cotton region observations. Atmospheric parameters measured/observed remained unchanged between cotton region and voluntary observations until 1 November 1895 when he began including prevailing wind direction and sky condition. These parameters continued to be included (although intermittent at times) until the last observation in the NCDC database on 31 December 1902.

Based on the Substation History, Mr. Stietenroth used a maximum thermometer and minimum thermometer in a cotton region shelter. The station also had a standard rain gage. The document indicated that observations were taken on the roof of the building until May 1890, then moved to a vacant lot (exact location not specified). Figure 25 shows the residence of Mr. Stietenroth, where the weather observations were taken. The back (west side) of the house has a flat roof which could have been used for the instruments. Additional information is provided on Mr. Stietenroth in the section on “The Observers.”



Figure 25. Residence of Charles Stietenroth at 504 South Canal Street. View is west-northwest. Photograph taken by the author.

Although weather observations ceased for Mr. Stietenroth in the NCDC database on 31 December 1902, Weather Bureau documents (Climate and Crop Service, Report for Mississippi Section) state that Charles Stietenroth took weather observations at Natchez through 31 January 1903.

According to Substation History, Mr. Stietenroth also used a “non-recording river gage” but no supporting information could be found in other sources. The Substation History document stated that a staff gage was in place at Natchez as early as December 1871 and observations were published by the Mississippi River Commission in the late 1800s. The Substation History indicated all voluntary/cooperative observers after 1889 had non-recording river gages and that river stages were published by the Weather Bureau subsequent to 6 July 1903. The gage was on the Natchez-Vidalia Bridge. A wire-weight gage was installed 1 January 1944. On 5 January 1953, river observations were transferred from Natchez to Vidalia, LA (station name Vidalia 2), located approximately three miles west of Natchez.

Voluntary/Cooperative Observers (1904-1955)

J. T. Turnipseed (February 1904-February 1906)

The first observation by J. T. Turnipseed was on 10 February 1904, and the last observation on 7 March 1906. Atmospheric parameters measured/observed included maximum and minimum temperatures, daily rainfall, sky conditions, and prevailing wind direction. According to the Substation History documents, this station had a cotton region instrument shelter, maximum thermometer, minimum thermometer, standard rain gage, and a non-recording river gage. However, Weather Bureau publications from 1904 through 1906 did not show river observations at Natchez. No information could be found on the location of this station or exposure of the instruments.

Ruth L. Weir (March 1906)

The first observation by Ruth L. Weir was on 8 March 1906 and the last observation on 31 March 1906. In Weather Bureau climatological publications (e.g., Mississippi Section of the Climatological Service of the Weather Bureau), this station was listed under the name “J.C. Weir, Jr.” Atmospheric parameters measured/observed included maximum and minimum temperatures, daily rainfall, sky conditions, and prevailing wind direction. According to Substation History documents, this station had a cotton region instrument shelter, maximum thermometer, minimum thermometer, standard rain gage, and a non-recording river gage. Exposure of the instruments was evaluated by the Weather Bureau as “good.”

The Weather Bureau Substation History lists the location of this station as 520 B Street and Figure 26 shows the terrain exposure for the general area. Exact location of the station could not be determined but was situated in the general area shown in Figure 26.



Figure 26. View of general area for the address 520 B Street showing terrain exposure. View is southeast along B Street. Weather observations were taken on the right side of the street. Photograph by the author.

Elmer S. Weir (April 1906-February 1909)

The first observation by Elmer S. Weir was on 1 April 1906 and the last observation on 18 February 1909. Atmospheric parameters measured/observed included maximum and minimum temperatures, daily rainfall, sky conditions, and prevailing wind direction. According to the Substation History documents, this station had a cotton

region instrument shelter, maximum thermometer, minimum thermometer, standard rain gage, and a non-recording river gage. Exposure of the instruments was evaluated by the Weather Bureau as “good.”

Weather observations by Elmer Weir were taken at 412 South Union Street, and Figure 27 is a photograph of the location.



Figure 27. Location of weather observations taken by Elmer Weir at 412 South Union Street. View is north. Could not determine if the house existed during the observing period of 1906-1909. Terrain sloped upward slightly from the street (foreground) to the back of the lot. Photograph taken by the author.

Ruth L. Weir (February 1909-July 1909)

Ruth L. Weir began taking cooperative observations (for the second time) on 19 February 1909. On Weather Bureau climatological publications (e.g., Mississippi Section of the Climatological Service of the Weather Bureau), this station was listed under the name “J.C. Weir, Jr”. The last observation at this location was on 31 July 1909. Atmospheric parameters measured/observed included maximum and minimum temperatures, daily rainfall, sky conditions, and prevailing wind direction. According to the Substation History documents, this station had a cotton region instrument shelter, maximum thermometer, minimum thermometer, standard rain gage, and a non-recording river gage. Exposure of the instruments was evaluated by the Weather Bureau as “good.” The station was located at 520 B Street during this observing period (see Figure 26).

Ruth L. Weir (August 1909-March 1911)

Based on the Substation History, Ruth Weir moved the observing station from 520 B Street to 302 Monroe Street on 1 August 1909, approximately one-quarter mile

west. Instruments and observations remained the same. The last observation at this location and by this observer was on 31 March 1911. Figure 28 shows the terrain along Monroe Street where the observations were taken.



Figure 28. Approximate location of weather observing site at 302 Monroe Street. View is southeast. Exact location of the station is unknown but was on the right side of street (Monroe Street) in the photograph. Terrain sloped slightly upward to the southeast. Terrain also sloped upward significantly to the right of the picture (southwest direction). Photograph by the author.

*Cooperative Observations at 156 East Saint Catherine Street (April 1911-April 1934)
(Garrity and Butchart families)*

Francis L. Garrity (April 1911-February 1913)
Catherine L. Garrity (1 March 1913-14 April 1917)
Thomas A. Butchart (15 April 1917-30 September 1918)
Byron B. Butchart (or Bernard Butchart) (1 October 1918-30 June 1919)
Francis L. Garrity (1 July 1919-30 April 1934)

For more information on the Garritys and Butcharts, see the section of this report on “The Observers.”

Atmospheric parameters measured/observed included maximum and minimum temperatures, daily rainfall, sky conditions, and prevailing wind direction. According to the Substation History documents, this station had a cotton region instrument shelter,

maximum thermometer, minimum thermometer, standard rain gage, and a non-recording river gage. Some influence on rainfall by tall pecan trees was noted on the Substation History document; however, the Weather Bureau inspector indicated any impact was slight. On 1 May 1934, the station was moved to a different location approximately 100 feet to the west. Figure 29 shows the general terrain for the location listed as 156 Saint Catherine Street.



Figure 29. General location of weather observations taken at 156 Saint Catherine Street. Saint Catherine Street is shown in the foreground and view of photograph is southeast. Building for the address no longer stands. Terrain slopes sharply downward to the right of the photograph (see Figure 30). Picture taken by the author.

Cooperative Observations at 144 Saint Catherine Street (May 1934-January 1953)
(Francis L. Garrity)

The first observation at this site was on 1 May 1934 with the last observation on 4 January 1953. According to the Substation History document this station had a cotton region instrument shelter, maximum thermometer, minimum thermometer, standard rain gage, non-recording river gage, and a recording rain gage. Nearby trees were cut down to improve exposure of the instruments, which was rated as “good” by the Weather Bureau. The instruments were moved 11 feet southeast on 1 October 1947 (no reason given for the move).

A Weather Bureau inspection report on 24 October 1950 (Report on Substation) listed the equipment at this station as:

1. Cotton region shelter
2. Maximum thermometer
3. Minimum thermometer
4. Standard eight inch rain gage
5. Recording 12 inch rain gage (moved from Washington, MS, located 5.8 miles east of Natchez, on 2 August 1845)

According to the report, the nearest obstructions were a group of trees located approximately 45 feet south and southeast of the instruments with several buildings located approximately 20 feet to the north. The rain gages were located just north of the instrument shelter.

On 5 January 1953, the recording 12 inch rain gage and river observing responsibilities were transferred from Natchez to Vidalia, LA (station Vidalia 2), located approximately three miles west of Natchez. Figure 30 shows the general terrain at 144 Saint Catherine Street.



Figure 30. General location of weather observations taken at 144 Saint Catherine Street. Saint Catherine Street is shown in the foreground and view of photograph is southeast. Building for the address no longer stands. Terrain slopes sharply downward to the right of the photograph. Picture taken by the author.

William A. Robertson (January 1953 through 1955)

Weather Bureau inspection reports on 5 January 1953 and 3 April 1956 listed the equipment at this station as:

1. Cotton region shelter
2. Maximum thermometer
3. Minimum thermometer
4. Standard eight inch gage

This station reported temperature and rainfall. Although listed under William A. Robertson, inspection forms stated the observations were taken by the City Police Desk Sergeant.

Figure 31 is a diagram showing the location of the instrument shelter and Figure 32 is a photograph of the site as it looks in 2006. The instrument shelter was approximately 20 feet north of the Municipal Building and the rain gage approximately 20 feet east-northeast of the building.

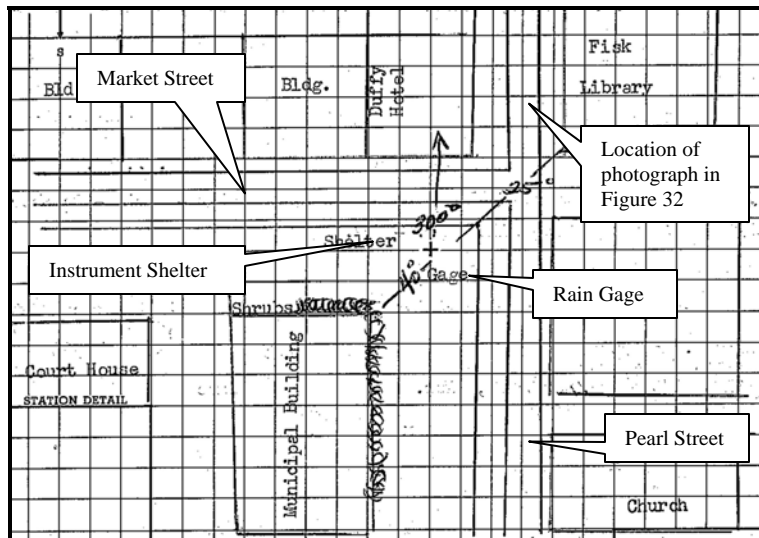


Figure 31. Drawing showing the location of the instrument shelter and rain gage on 5 January 1953. North is at the top of the page. From the official station history files at the National Climatic Data Center.

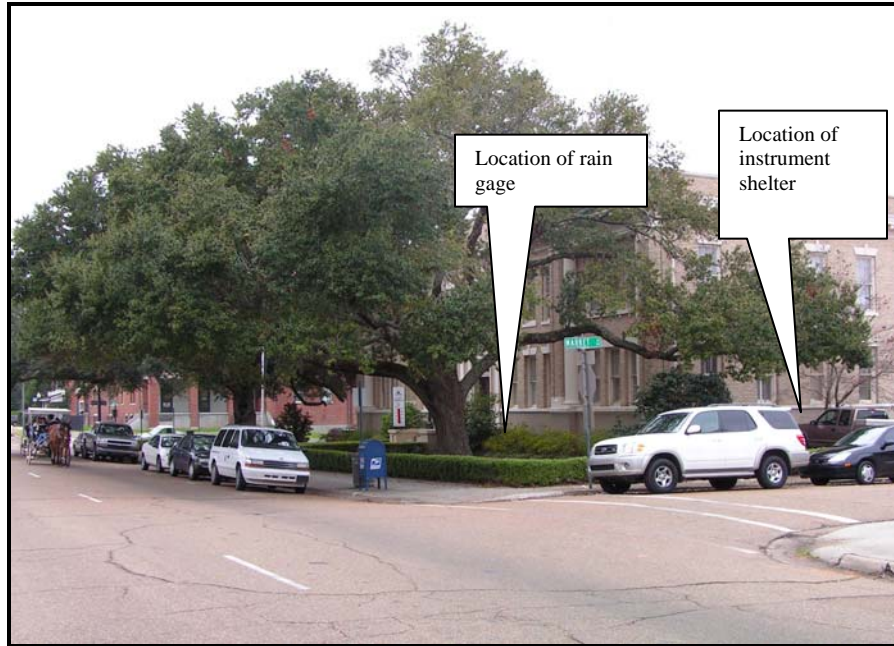


Figure 32. Municipal Building and surrounding area as it appears in 2006. View is southwest. Photograph taken by the author.

Observations at Natchez-Adams County Airport (SAWRS by Southern Airways; 7 January 1951 through 1955)

Figure 33 shows the location of the weather instruments at the SAWRS at the Natchez-Adams County Airport (Hardy-Anders Field) with respect to nearby buildings and the airport ramp. The old Administration Building was approximately 50 feet west of the current Administration Building at the airport.

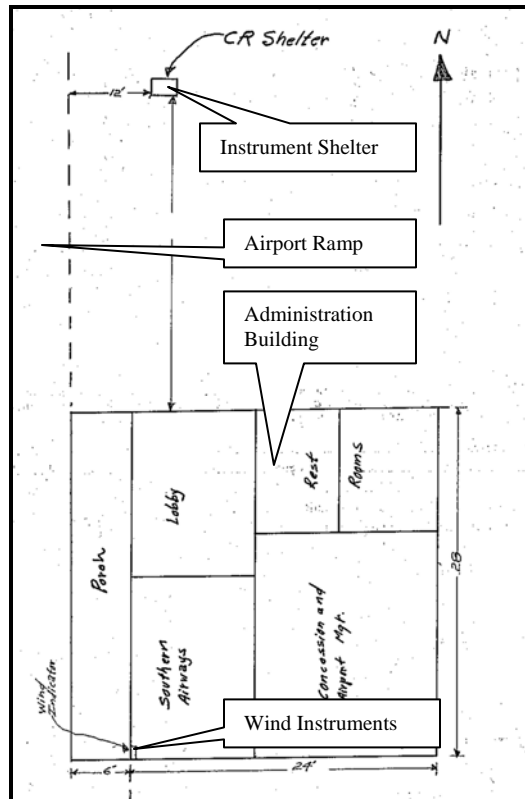


Figure 33. Location of SAWRS instruments at the Natchez-Adams County Airport (1 January 1951). North is at the top of the figure. From the official station history files at the National Climatic Data Center.

The cotton region type instrument shelter was located over sod, 25 feet east of the paved apron of the airport and 30 feet north of the Airport Administration Building. The dry bulb thermometer was four feet above ground and the psychrometer (standard fan) five above ground. Exposure was rated as “good” by the Weather Bureau. Figure 34 is a picture of the area around the Airport Administration Building in 1953 including the instrument shelter.

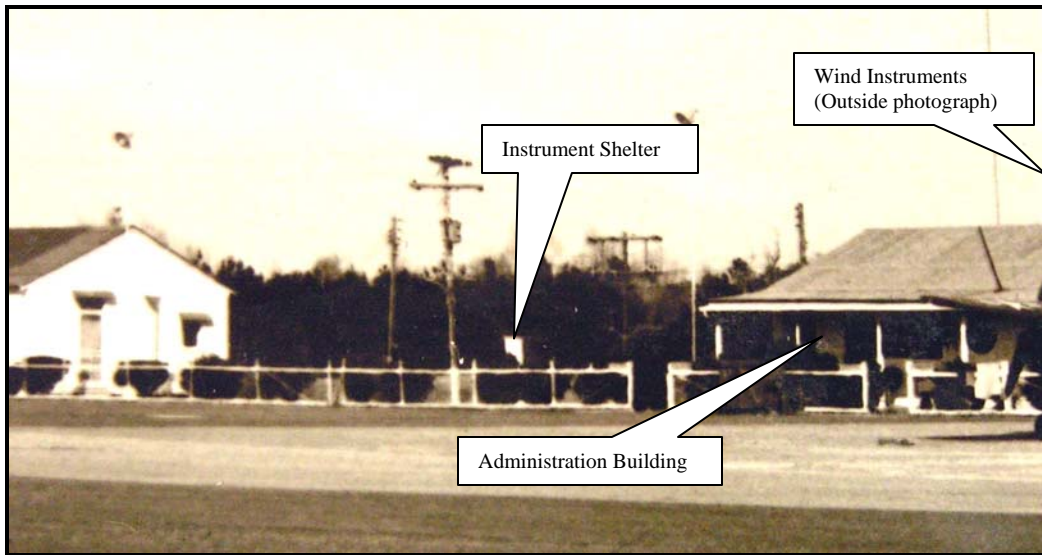


Figure 34. Airport Administration Building and surrounding area at Natchez-Adams County Airport in 1953. View is northeast. Provided by the Natchez-Adams County Airport Director of Aviation.

The wind instruments were owned and operated by Southern Airways. The instruments were made by Aircraft Components. The anemometer was a three-cup type. The wind instruments were on the southwest corner of the roof of the building (6 feet above the roof) and were 20 feet above ground. Weather Bureau inspections stated there were no obstructions to the wind instruments.

An altimeter setting indicator (made by Kollsman) was at this station and was owned by Southern Airways.

The station did not have a rain gage but did have a snow measuring stick. During routine observations, sky/ceiling and weather/obstruction to vision were recorded.

THE OBSERVERS

William Dunbar (1799-1810)

William Dunbar took meticulous weather observations at The Forest plantation, located seven miles south-southeast of Natchez, MS, from February 1799 until around his death in 1810. It appears his son, Robert Dunbar, also took some of the observations, but many of the observations may have been taken by other individuals, most likely under the supervision of the Dunbars. Weather observations also were taken at the plantation from 1814 through 1818.

During his life, William Dunbar contributed greatly to the field of meteorology through his dedicated weather observations. His observations were recognized as some of the earliest recordings along the Mississippi River. He also was recognized as a leader of the community and a pioneer explorer for the fledging United States. In the latter function he was a personal friend of President Thomas Jefferson. The Mississippi Department of Archives and History in Jackson, MS contains numerous letters between William Dunbar and President Thomas Jefferson.

Sir William Dunbar was born in Morayshire, Scotland, around 1749. He was educated at Glasgow and London where his love for mathematics and astronomy gained the friendship of Sir William Herschel. He moved to Philadelphia around 1771 for his health and moved to Pittsburgh in 1773. In 1773, he formed a partnership with John Ross, a Scottish merchant, establishing a plantation in the vicinity of Baton Rouge. In 1792, Dunbar moved to Natchez, MS and built The Forest approximately 7 miles south-southeast of the town (Figure 35).

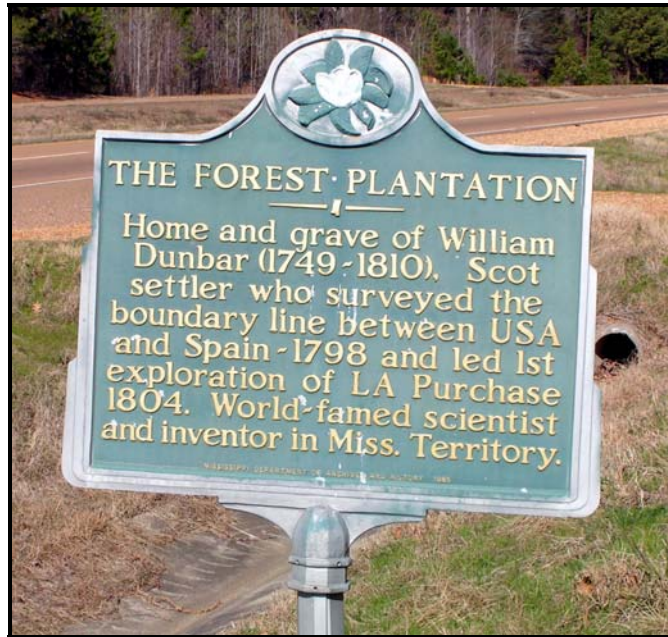


Figure 35. Marker located on U.S. Highway 61 at the intersection of Forest Plantation Road (approximately seven miles south-southeast of Natchez). Photograph by the author.

While in Louisiana, William Dunbar took maximum advantage of his scientific insights. Following a hurricane that made landfall near New Orleans on 18 August 1779, he correctly observed the nature of the storm's winds revolving around a vortex, with the entire system moving forward. He expressed his keen meteorological insight in an 1801 letter to Jefferson when he stated, "It is possible that if similar observations are made upon all hurricanes, tornadoes, and whirlwinds they will be found universally to consist of a vortex with a central spot in a state of profound calm."

Following another hurricane in 1780, he noted that tornadoes formed around tropical cyclones and seldom lasted more than 5 or 10 minutes. Some of the reports made by Dunbar on hurricanes in Louisiana were included in David M. Ludlum's book entitled, *Early American Hurricanes*.

While at Natchez, William Dunbar was able to follow his interests in scientific research and exploration. His weather observations were meticulous and detailed, containing comments and observations on the impact of the weather on the agriculture of the area. His agricultural activities were progressive for the time, involving innovations in developing plows, harrows, the cotton gin, and other aspects of cotton production.

William Dunbar built and equipped an astronomical observatory at The Forest which was considered one of the best observatories in the United States at the time. The observatory had microscopes, chronometers, and a six-foot' Gregorian reflecting telescope. He also conducted investigations into the natural history of the area, Indian

languages, and paleontology. He studied the Indian sign language; uncovered, measured, and sketched fossils; analyzed soil formations in the area; and sought curious plants, rocks and animals. After being elected to the American Philosophical Society in 1800, Dunbar contributed a dozen published articles.

Following the Louisiana Purchase in 1803, President Thomas Jefferson envisioned two expeditions to the new territory – the Lewis and Clark Expedition and a second mission to explore the southwestern boundaries of the Purchase. William Dunbar was selected by the President to lead the southwestern exploration, and in 1804-1805, Dunbar led an expedition to explore parts of Arkansas and northern Louisiana. Under Dunbar's leadership, the group provided some of the earliest records of the fauna and flora for the area. He also investigated the hot springs in Arkansas.

In addition to his meteorological observations, William Dunbar is known for the following:

1. He helped locate and survey part of the present boundary between Mississippi and Louisiana.
2. He directed the attention of the world to the manufacture of cotton-seed oil.
3. He invented the screw press for packing cotton and helped to perfect the process of packing cotton into square bales.
4. He made a critical scientific study of the Mississippi River and its Delta.
5. He determined latitude and longitude for many places around the Mississippi River.
6. He was the first to give a scientific account of the hot springs in Arkansas and an analysis of its water.

William Dunbar was Surveyor General for the Natchez area in 1798 and later Chief Justice of the Mississippi Court of Quarter Sessions and a member of the Mississippi Territorial Legislature.

William Dunbar died 16 October 1810 at The Forest.

Robert and William McCary (1858-1870)

(Much of the following information came from two books—*The Barber of Natchez* and *William Johnson's Natchez*; see the Bibliography)

Robert McCary, and his son William, took weather observations in Natchez for the Smithsonian Institution for almost 12 years. Robert was the observer from 1858 until 1866 and William the observer from 1866 until 1870. Robert and William were free African Americans before and during the Civil War. Robert McCary was a good friend of William Johnson, another free African American, and is mentioned numerous times in Johnson's diary (see Bibliography).

Robert McCary was born a slave around 1810 with his father white and mother black. His father, James McCary, was a Natchez cabinet-maker, and when he died in 1815, he willed that Robert and his sister Kitty be freed. In addition, James left most of his property to his two children.

The executor of James McCary's estate followed his wishes in rearing Robert and Kitty. He took them to Ohio to be emancipated, managed their property and perfected titles to the property. He secured five white tutors for their education and ensured they were clothed and lodged in various homes. One of the homes where Robert lived in the mid 1820s was maintained by William Johnson's mother and sister. Robert and William probably learned the barber trade during this time in the shop of William's brother-in-law, James Miller. This also was the beginning of a lifelong friendship between William and Robert.

Mr. McCary was a successful barber who also was involved in the arts. He was sufficiently educated that during the 1840s, he taught free Negro children. He and his good friend William Johnson, also a barber, supported each other in business deals by endorsing notes. They also hunted and fished together extensively and were involved in card games, Sunday walks along the river, long talks in their shops, and in memorable sessions at the dinner table. In his diary, William Johnson frequently referred to the occasions spent with Robert McCary, referring to him as "Mc" or "Old Mc."

William Johnson owned the largest barbershop in Natchez, primarily because it was downtown. Robert McCary owned a two-chair barbershop, but was located on the edge of the business district (corner of Main and Commerce). The business competition did not appear to lessen the friendship between these two individuals.

Based on Johnson's diary, the free Negro population in Natchez and Adams County existed in widely economic circumstances and maintained distinct social levels within the group. The group had its own aristocracy with families like the McCarys, and Johnsons at the top. These upper-class families had received land or town property from white men who openly acknowledged their relations. They were at a much different level, both socially and culturally. They had records of events, e.g., marriages, deaths, etc., recorded and even owned slaves. They would never have attended functions (which were numerous) that involved the intermingling of slave servants and lower class free Negroes. However, the free blacks walked a fine line between "freedom" and slavery, even at the higher social level of the McCarys. In his diary, William Johnson mentions several times his concern of how events could transform him from free to slave. Those same pressures applied to Robert McCary.

William Johnson's diary substantiates that Robert McCary was a leader in his community and his church. He frequently was consulted for his guidance and wisdom.

Information on William McCary is less abundant. William Johnson mentions Robert's son infrequently and briefly in his diary. Johnson expressed reservations over the younger McCary—referring to him as a "gum sucker"—although he provided

financial assistance when William McCary was married. However, William exhibited similar leadership qualities as his father. During Reconstruction following the Civil War, William became the first black sheriff of Adams County with a record of service superior to other Reconstruction officeholders.

Charles Stietenroth (1889-1904)

Charles Stietenroth took weather observations as a cotton region and voluntary observer for almost 15 years. He was a highly respected member of Natchez who gave generously to the community through civic and church activities. According to the *Natchez Democrat* (local newspaper), few people were better informed on the history and traditions of Natchez and its commercial development during the late 1800s and early 1900s than Charles Stietenroth.

Mr. Stietenroth was born in Natchez on 30 January 1853. Through most of his life he was involved in the printing and publishing business, being recognized as a master craftsman printer. He was associated with the printing business for 61 years. Later during his career, he was promoted to business manager for the *Natchez Democrat*, as well as manager for the paper's commercial printing department. Later, when the commercial printing department was organized as a separate business under the name of the Natchez Printing and Stationary Company, he was made president of the company, a position held until his death on 16 November 1933.

He was especially interested in the history of the Episcopal Church in Natchez, writing a number of historic documents. One article—*One Hundred Years with Old Trinity*—was regarded as an outstanding contribution to the church. Mr. Stietenroth was an organizer of the *Church News*, an Episcopal publication, and he designed the Diocesan Seal. Within the local church, he served as a vestryman, chorister, superintendent of the church school, and usher.

Charles Stietenroth lived at 504 South Canal Street his entire life. When he died, the *Natchez Democrat* included a large article on his life and his many contributions to the church and local community.

Garrity and Butchart Families (1911-1953)

Only pieces of information were found on the Garrity and Butchart families that were cooperative observers from 1911 until 1953. The names were not familiar to the Director of Preservation and Education at the Historic Natchez Foundation, with the primary source of information the Natchez City Directories. Both families (members of the families that took the weather observations) lived at 156, 142, or 144 Saint Catherine Street, just east of the intersection with Brenham Avenue. Weather Bureau records stated that the Garrity and Butchart families were friends.

According to the city directories, Francis Leroy Garrity was a bookkeeper in 1912, living at 156 Saint Catherine Street with his wife Elodie (no mention of other

family members). In 1925 and 1928, he was listed as an accountant, living at 142 Saint Catherine Street (same wife), during the 1930s he was listed as a clerk for Royal Route, and in 1941 he was listed as working for the Natchez and Vidalia Bridge, same residence. In 1947 he was listed as a clerk at the Main Street News Stand with his residence listed as 142 Saint Catherine, with the same information in the 1950 and 1953 directories except the address changed to 152 Saint Catherine. All the locations are close, i.e., within approximately one block. Several directories during the 1940s indicated he had six children. No information was found on Catherine L. Garrity.

Thomas A. Butchart was a tinner for Butchart and Phelan, a company that made metal cisterns and other tin products. The company was located at 601-605 Main Street, and Mr. Butchart's residence was listed as 142 Saint Catherine Street.

No information was listed in the Natchez city directories regarding Byron B. Butchart. A Bernard Butchart was listed with a residence of 142 Saint Catherine. Bernard worked for Butchart and Phelan also.

OTHER OBSERVATIONS

According to the Director of Preservation and Education of the Historic Natchez Foundation, a number of plantations took weather observations (or recorded weather conditions) across western Mississippi and eastern Louisiana during the early and mid 1800s. The observations are contained in collections at Louisiana State University, University of Texas, University of North Carolina and the Mississippi Department of Archives and History. The observations primarily are contained in diaries, e.g., the Charles Whitmore diary (University of North Carolina), Joseph Buck Strotton diary (LSU), John C. Jenkins diary (LSU), John B. Nevitt diary (LSU), and William Johnson diary (LSU).

Figure 36 shows the general locations of other observations taken within the vicinity of Natchez during the late 1800s and early 1900s.

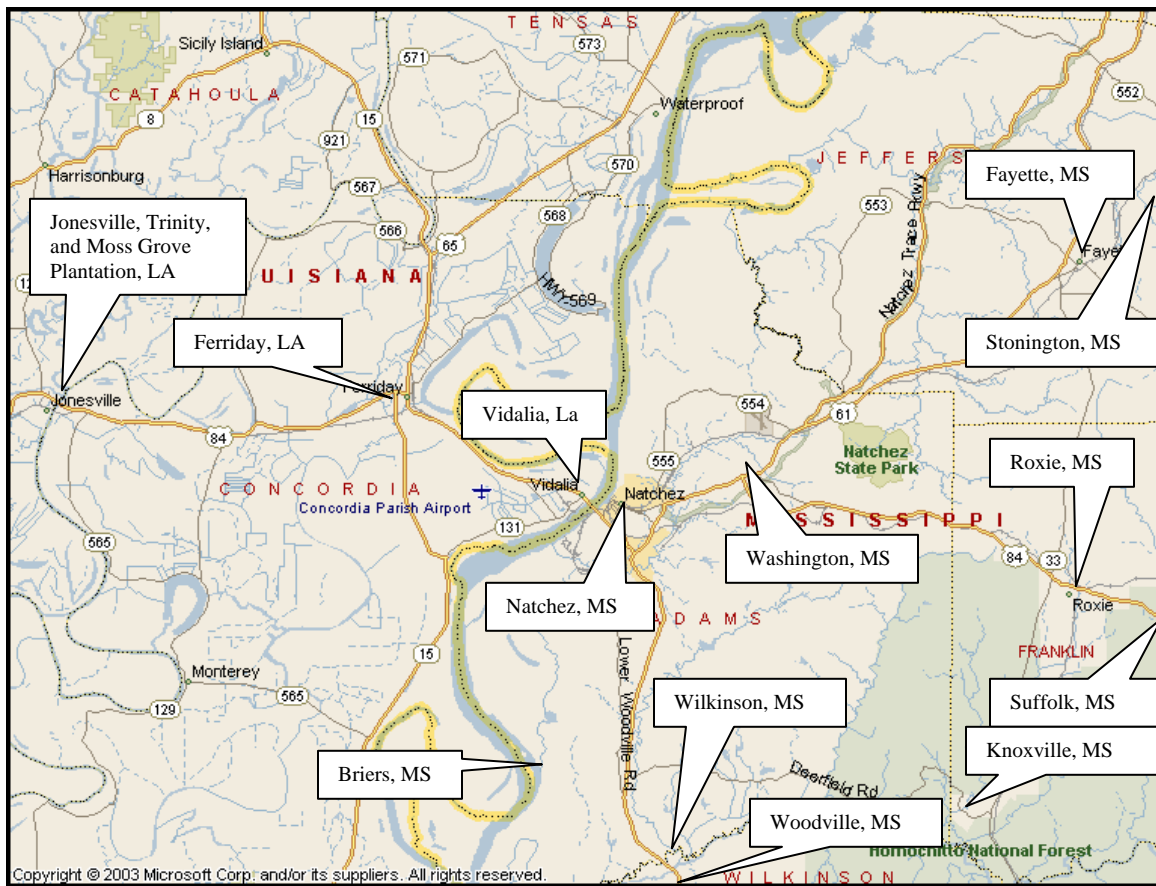


Figure 36. General locations of other observations taken in the vicinity of Natchez during the late 1800s and early 1900s. The sites are plotted on a current map of Mississippi and Louisiana. East-west distance across the map is approximately 48 miles.

Jonesville, LA/Trinity/Moss Grove Plantation (December 1856-October 1860; June 1895-June 1896)

Intermittent observations were taken in the vicinity of Jonesville, LA at Moss Grove Plantation and Trinity (approximately 25 miles west of Natchez) in the mid and late 1800s. The Substation History stated intermittent observations were taken at Moss Grove Plantation from December 1856 through October 1860. NCDC database contains broken observations for Trinity from 1856 through 1860. Coordinates were listed as 31°37'30"N and 14°46' west of Washington D.C. Elevation was listed as 68 feet. Precipitation and temperature observations were taken at the plantation and were published in the Louisiana Weather Journal (no specific edition or date indicated). Observation forms from 1856 through 1860 contained records for temperature, precipitation (beginning, ending, and daily amount), clouds (7 a.m., 2 p.m., and 9 p.m.), and wind direction/force (7 a.m., 2 p.m., and 9 p.m.).

The Substation History also stated that Hugh Watson took broken rain and temperature observations at Trinity from June 1895 through June 1896. Instruments at this site were a cotton region instrument shelter, maximum thermometer, minimum thermometer, and a standard rain gage. Coordinates for Trinity were listed as 31°38'N, 91°49'W with an elevation of 50 feet. Smithsonian records indicated that observations were taken at Trinity in the mid 1800s as part of its program. According to Smithsonian records, Dr. A.R. Kilpatrick took observations from 1856 through 1859 and Dr. Edward Merrill took observations in the same area from 1856 through 1858 and also in 1860. Smithsonian records indicated that Dr. Kilpatrick and Dr. Merrill had a thermometer and rain gage. It was not clear as to whether Drs. Kilpatrick and Merrill took observations at the same, or separate locations around Trinity. Observation forms in the NCDC database were signed only by Dr. Merrill.

Vidalia, LA (March 1861-June 1890; October 1952 through 1955)

The Weather Bureau Substation History indicated that weather observations were taken at Vidalia Plantation Louisiana (approximately 2 miles west of Natchez; listed as Vidalia 2 in the document) from 5 March 1861, through June 1890. According to the document, the observations were published in the Louisiana Weather Journal. The substation record indicated that L.P. Ault was the observer, but Smithsonian records stated that Reverend A.K. Teele took observations in 1867 for that program. The substation report stated that in June 1890, the observer moved away from Vidalia and observations ceased at the plantation. The substation record stated that L.P. Ault used maximum/minimum thermometers and a standard rain gage. Smithsonian records indicated that Reverend Teele had only a thermometer.

The NCDC database contains observations for the Vidalia Plantation for March 1867 through May 1867. Observations in the database contained the following:

1. Temperature ((7 a.m., 2 p.m., and 9 p.m.)
2. Precipitation (beginning, ending, and daily amount)
3. Clouds (7 a.m., 2 p.m., and 9 p.m.)
4. Wind direction and force (7 a.m., 2 p.m., and 9 p.m.)

The observations were signed by Reverend A.K. Teele. No information could be found in Natchez or Vidalia with regard to the location or existence of the Vidalia Plantation.

On 30 October 1952, a recording rain gage was moved from the Natchez cooperative observer to the U.S. Corps of Engineers office in Vidalia that continued through 1955. Elevations for the plantation and Corps office were approximately 62 feet.

Fayette, MS (November 1866-December 1908)

A number of individuals made weather observations within the immediate vicinity of Fayette, MS (approximately 23 miles northeast of Natchez) between November 1866 and December 1908 (according to Substation History). The observing period was broken, primarily between December 1873, and June 1889; between January 1868 and February 1873; between December 1893, and April 1894; and between August 1897 and December 1897. According to Smithsonian records, Reverend T.H. Cleland took observations in 1866 and early 1867. Reverend Cleland used only a thermometer. Coordinates for this station were listed as 31°43'N, 91°4'W with an elevation of 282 feet. Observations in the NCDC database by Reverend Cleland began in November 1866 and ended in December 1867. Parameters measured/observed included the following:

- 1 Temperature ((7 a.m., 2 p.m., and 9 p.m.)
- 2 Precipitation (beginning, ending, and daily amount)
- 3 Clouds (7 a.m., 2 p.m., and 9 p.m.)
- 4 Wind direction and force (7 a.m., 2 p.m., and 9 p.m.)

Observers between early 1867 and 1873 were unknown (no observations were in the NCDC database from 1868 through 1872) with Reverend George C. Armstrong observations listed by the Smithsonian as beginning in 1873. Information in the NCDC database indicated that Reverend Armstrong began taking weather observations at Fayette in May 1873 with the last observations in March 1883.

Substation records indicated that Reverend Armstrong used a thermometer and standard rain gage. The duration that Reverend Armstrong served as observer was not indicated. The following were observers at Fayette beginning June 1889 (from Substation History):

1. J.N. Bedford (June 1889-December 1893)
2. W.L. Faulk (April 1894-August 1897)
3. George V.D. Schober (December 1897-December 1908)

These observers used maximum/minimum thermometers and a standard rain gage. A cotton region instrument shelter was listed beginning December 1897. No change in coordinates or elevation was listed from the previous observers.

Fayette, MS (Fayette 8 SE; January 1874-March 1883)

The Substation History stated that weather observations were taken at a site eight miles southeast of Fayette from January 1874 through March 1883. Coordinates were listed as 31°38'N, 90°57'W with elevation estimated at 420 feet. This station had a thermometer and standard rain gage.

Washington, MS (January 1890-January 1894; September 1940-August 1945)

First weather observations at Washington, MS (approximately six miles northeast of Natchez) were taken 1 January 1890 (from Substation History) and continued until 31 January 1894. Location of this site was within one-half mile of the Washington Post Office with coordinates 31°35'N, 91°18'W and elevation of 280 feet. According to the Substation report, this station had maximum/minimum thermometers and a standard rain gage.

The Substation History also indicated weather observations were taken approximately two-tenths mile northeast of the Post Office beginning 8 September 1940 and continuing until 2 August 1945. Observations were taken by the staff of the Jefferson Military Academy, in particular by Major Reed D. Waiser (8 September 1940-7 October 1943) and Professor Benson W. Russell (8 October 1943-2 August 1945). This site had only a recording rain gage. Coordinates and elevation for this station were the same as for the observations in the early to mid 1890s.

Observations in the NCDC database were for the years of 1890 through 1892. Records were broken during the period, especially during 1891 and 1892. The observation forms in the database listed no coordinates or elevations. The forms were

signed by Jackson Reeves. The following were measured/recorded at Washington, MS on the forms in the NCDC database:

1. Exposed temperature
2. Maximum/minimum temperatures
3. Beginning, ending, and daily amount of precipitation
4. State of weather in the remarks section

The forms in the NCDC database indicated the Washington, MS voluntary station had a Signal Service rain gage, exposed thermometer (made by Green), and maximum/minimum thermometers (made by Green).

Briers, MS (near Briar Landing; 1893-August 1899)

W.H. Swan began taking weather observations in 1893 near the Mississippi River approximately 12 miles southwest of Natchez. The last observation for this observer was on 28 February 1899, and F.M. Swan assumed responsibility from 1 March 1899 to 31 August 1899. Coordinates for this site were 31°23'N, 91°32'W with an elevation of 60 feet. This station had a maximum thermometer, minimum thermometer, and standard rain gage.

Woodville, MS (March 1893 through 1955)

Beginning 1 March 1893, a string of observers took almost unbroken weather observations around Woodville, MS, located approximately 33 miles southeast of Natchez. Most significant breaks in the observations were in the 1940s. The stations had a cotton region instrument shelter, maximum thermometer, minimum thermometer, and a standard rain gage. On 15 February 1952, the standard rain gage was replaced by a recording rain gage.

Stonington, MS (April 1897-January 1908)

I.W. Burch took weather observations from 14 April 1897 until 31 January 1908, at Stonington, MS (approximately 26 miles northeast of Natchez). Coordinates for the station were listed as 31°46'N, 91°01'W with elevation of 185 feet. The instruments were at a railroad depot. This station had a cotton region instrument shelter (after 1 March 1901), maximum thermometer, minimum thermometer, and standard rain gage. Remarks in the Substation History stated, "Thermometers in gallery prior to March 1, 1901.

Fayette, MS (Fayette 3S; April 1899-July 1932)

T.L. Daidin began taking weather observations on 1 April 1899, and continued until 30 May 1928. Coordinates were listed as 31°41'N, 91°03'W with an elevation of 270 feet. This station had a cotton region instrument shelter, maximum/minimum

thermometers, and a standard rain gage. M.W. Corban began taking observations 1 June 1928 and continued until 31 July 1932. Same instruments were used.

Suffolk, MS (February 1901-October 1917)

George H. Kent took weather observations from 1 February 1901, until 31 October 1917, near Suffolk, MS. Coordinates for the station were 31°28'N, 90°58'W or approximately 25 miles east southeast of Natchez. No elevation was listed for the station. His station contained a cotton region instrument shelter, maximum thermometer, minimum thermometer, and a standard rain gage. Remarks stated, "Forest 200 yards from shelter; on top of hill at Post Office."

Ferriday, LA (April 1907-March 1913)

Employees of the American Nut and Fruit Company at Ferriday, LA took intermittent weather observations from 1 April 1907 through 26 March 1913. Exact location of station was unknown but likely near the company. Estimated coordinates listed for the site were 31°37'N, 91°33'W. Elevation was around 70 feet. The station had a cotton region shelter, maximum thermometer, minimum thermometer, and standard rain gage.

Observations Vicinity of Wilkinson, MS (September 1940-August 1951)

A number of individuals took Cooperative weather observations in the vicinity of Wilkinson, MS (approximately 24 miles southeast of Natchez) from 1940 to 1951. Only instrument listed in the Substation History was a recording rain gage. Elevation was listed as 206 feet.

Corps of Engineers (Natchez, MS; September 1940-July 1945)

The Corps of Engineers made rainfall observations in southwest Natchez approximately one mile southwest of the center of town from 17 September 1940 until 31 July 1945. The observation site was located on the river with coordinates 31°33'N, 91°25'W and an elevation of 67 feet. The station was listed in the Substation History as "Fleet, MS." The station had a standard rain gage.

Knoxville, MS (December 1942-February 1948)

Roy Shell took weather observations near Knoxville, MS (3.8 miles east northeast of Knoxville; called Knoxville Tower) from 2 December 1942 to 15 April 1948. Coordinates were listed as 31°24'N, 91°03'W, elevation 155 feet. Knoxville is approximately 21 miles southeast of Natchez. Only instrument indicated for this station was a recording rain gage.

Roxie, MS (April 1948-January 1952)

From 15 April 1948, through 21 March 1952, a recording rain gage was located at two sites in the immediate vicinity of Roxie, MS (approximately 20 miles east of Natchez). Coordinates were listed as 31°30'N, 91°04'W, elevation 240 feet. The gage was moved from the first site on 5 September 1952.

BIBLIOGRAPHY

- Army Surgeon General, 1868. *General Meteorological Instructions*. U.S. Army Surgeon General's Office. War Department, Government Printing Office, Washington.
- Calhoun, Robert Dabney, 1933. *A History of Concordia Parish*. The Louisiana Historical Quarterly, Baton Rouge, LA.
- Davis, Edwin Adams and William Ransom Hogan, *The Barber of Natchez*, 1954. Louisiana State University Press, Baton Rouge, LA.
- Johnson, William, *William Johnson's Natchez, The Ante-Bellum Diary of a Free Negro*, (written 1835 through 1851; edited 1951 by William Ransom Hogan and Edwin Adams Davis). Louisiana State University Press, Baton Rouge, LA.
- Ludlum, D. 1963. *Early American Hurricanes: 1492-1870*. American Meteorological Society, Boston, MA.
- McMillan, Lucy Mae, 1938. *Natchez, 1763-1779* (Master of Arts Thesis). University of Virginia, Charlottesville, VA.
- Midwestern Regional Climate Center (Gary Grice), 2005. *History of Weather Observations at Fort Gibson, Oklahoma 1824-1890*. National Climatic Data Center, Asheville, NC.
- Midwestern Region Climate Center (Gary Grice and Peter Boulay), 2005, *History of Weather Observations at Fort Snelling, Minnesota 1819-1892*. National Climatic Data Center, Asheville, NC.
- Midwestern Regional Climate Center (Gary Grice), 2005. *History of Weather Observations at Fort Union, New Mexico 1851-1891*. National Climatic Data Center, Asheville, NC.
- Natchez Democrat*, 17 November 1933. "Greatly Loved Citizen Answers Call of Death" (page 1 and page 4). Natchez Democrat Printing and Publishing Company, Natchez, MS.
- National Weather Service, 1982. *Substation History (Louisiana)*. Department of Commerce, Government Printing Office, Washington D.C.
- National Weather Service, 1982. *Substation History (Mississippi)*. Department of Commerce, Government Printing Office, Washington D.C.

Riley, Franklin L., Ph.D., 1895. "Sir William Dunbar—The Pioneer of Scientists of Mississippi" contained in the book entitled: *The Mississippi Historical Society, Vol. I*, edited by Franklin L. Riley, Oxford, MS.

Rowland, Ms. Dunbar, 1930. *Life, Letters, and Papers of William Dunbar*. Press of the Mississippi Historical Society, Jackson, MS.

Smithsonian Institution, 1850 through 1873. *Annual Reports*. A.O.P. Nicholson, Public Printer, Washington DC.

Weather Bureau, 1956. *Substation History (Louisiana)*. Department of Commerce, Government Printing Office, Washington D.C.

Weather Bureau, 1956. *Substation History (Mississippi)*. Department of Commerce, Government Printing Office, Washington D.C.

APPENDIX

Methodology

The timeline for weather observing at Natchez 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, with the U.S. Signal Service and Weather Bureau assuming responsibility in the late 1800s. The Natchez observing timeline essentially was the result of individual observers, beginning with observations during colonial times and continuing with Smithsonian, cotton region, voluntary, and cooperative observers. These individual observers were responsible for the Natchez observing history from 1799 into 1951, when a SAWRS was established at the airport. Consequently, the methodology followed for this report differed significantly from previous approaches.

Station history files at the National Climatic Data Center (NCDC) provided critical information beginning in 1799, continuing into the early part of the 20th Century. Especially important were substation files and observation forms for Smithsonian, cotton region, voluntary, and cooperative observers.

Entries from Substation History documents and monthly observations in the NCDC database provided the backbone for locations and general exposures for observing instruments. Weather Bureau officials routinely documented station history and instrument status through forms entitled, Description of Topography and Exposure of Instruments, Report of Elevation and Position of Instruments, and Surface Weather Observations. Information on these forms provided significant detail with respect to the SAWRS that was established at the airport in 1951.

Weather observations for William and Robert Dunbar were found in the NCDC database. Information on the many accomplishments of William Dunbar was found on a number of web sites on the Internet, in particular from the William Dunbar Journals (1796-1809) listed on the American Philosophical Society's web site. An instructive description of William Dunbar's exploration of the southern part of the Louisiana Purchase was available on the National Park Service Hot Springs, Arkansas web site. The Mississippi Department of Archives and History (Jackson, MS) contained numerous records on The Forest and letters to/from William Dunbar.

The Director of Preservation and Education at the Historic Natchez Foundation was very helpful in finding addresses for the weather observers from the mid 1800s through the early 20th Century. In addition, Natchez city directories and Sanborn Maps were important in piecing together residence and work sites for many of the observers, especially in the late 1800s and early 1900s.

Other information and data sources checked (by person, telephone, or through the Internet) during this study were the Natchez Public Library, Vidalia, LA Public Library, Ferriday, LA Public Library, Historic Jefferson College Library/Museum, Natchez in Historic Photographs, National Park Service, Natchez Historical Society, Natchez Museum of African American History and Culture, and NOAA Library. Also, relevant information regarding the Army Medical Department was obtained from the Dallas, TX Public Library, Oklahoma State University Library, and the National Library of Medicine at Bethesda, MD.