

History of Weather Observing at Fort Jesup, Louisiana 1827 - 1845

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Executive Summary

Fort Jesup was built in 1822 to protect the western border of the United States. Soldiers at the fort helped open the frontier, primarily into Texas, by building roads, surveying uncharted areas, and by clearing streams and rivers. Many settlers moved through Fort Jesup on their way to Texas, and in 1845, approximately one-half of the U.S. Army traveled through the post en route to war with Mexico. Following the war with Mexico, Fort Jesup was no longer needed and the fort was abandoned by Federal forces in 1846.

Weather observations at Fort Jesup were taken by Army surgeons, most likely in the vicinity of the hospital. First recorded weather observations in the National Climate Data Center database are for Oct 1827, although indications are the surgeons may have been taking observations earlier.

Archives and research at the Northwestern State University of Louisiana both indicate the post hospital was constructed during the winter of 1828-1829. Weather observations prior to this date likely were taken approximately 70 yards to the north or northeast from the hospital, i.e., in the vicinity of the initially constructed buildings. A plaque currently exists at the Fort Jesup Historic Site that pinpoints the location of the hospital.

No significant information was found regarding weather instruments used at Fort Jesup. However, publications of the Army Surgeon General's Office in 1844 provided general documentation of the observation process at forts for the period.

The National Climate Data Center database contains almost unbroken records of weather observations at Fort Jesup from Oct 1, 1827 through Dec 1845. Primary exceptions were Oct 1843 through Mar 1844 and Aug 1845 when observations were missing.

Fort Jesup Historical Overview

Fort Jesup was built in western Louisiana in 1822, located in Sabine Parish approximately 20 miles southwest of Natchitoches. The boundary between Texas and Louisiana had been in dispute with Spain following the Louisiana Purchase Treaty of 1803, but after the boundary was finally fixed at the Sabine River by the Florida Purchase Treaty of 1819, the United States recognized the need for a fort to protect the western border of U.S. interests.

The fort was built and initially commanded by Lieutenant Colonel Zachary Taylor and was named after Taylor's good friend Brigadier General Thomas Sidney Jesup. The fort was built on one of the highest locations within Louisiana with the foundations of the principal buildings constructed of stone. However, many of the buildings were made from available pine wood which quickly rotted.

Soldiers at Fort Jesup helped open the frontier west to American settlers by building roads, surveying the frontier, and by clearing streams and rivers. In addition, the garrison

was called upon to control slave insurrections in the area. Many settlers moved through Fort Jesup into Texas, and in 1845, approximately one-half of the U.S. Army traveled through Fort Jesup en route to war with Mexico, including Ulysses S. Grant. Also, Surgeon Thomas Lawson, who was to become the Army Surgeon General, was the surgeon at Fort Jesup early in his career. Following the war with Mexico, Fort Jesup was no longer needed and it was abandoned in 1846.

Weather observations at Fort Jesup were taken by U.S. Army surgeons. The first observation recorded was on Oct 1, 1827 (based on the National Climate Data Center database) with the last weather observation recorded on Dec 31, 1845.

Location Description

The remains of Fort Jesup are located just to the southeast of State Highway 6 which runs between Many and Natchitoches Louisiana (Figures 1 and 2).



Figure 1. Location of Fort Jesup, shown on a current map of Louisiana.

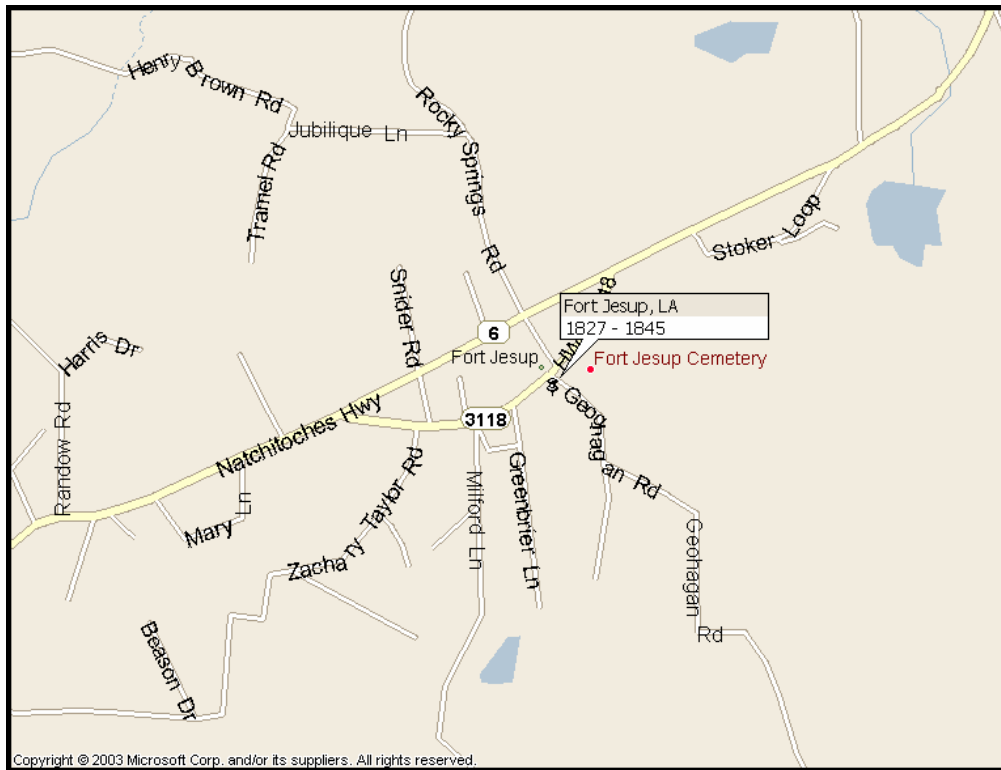


Figure 2. Expanded view of Fort Jesup location shown on a current map of Louisiana.

Research conducted at the Northwestern State University of Louisiana in Natchitoches (Jarrell, 2001) indicates some uncertainty exists with regards to the number of hospitals that existed over the life of Fort Jesup. The conclusion from the research was that the hospital (or medical facilities) in existence when the fort was built in 1822 was at an unknown location. The location of the hospital described in this report (and the only hospital known for certain to exist) was built during the winter of 1828-1829 based on the research, as well as indicated in a letter from the Fort Jesup Quartermaster on Oct 12, 1835. Available archives and the research at Northwestern State University indicate the second fort continued until the post was abandoned in 1846. Exact location of the second hospital at the current historic site is indicated by an embedded plaque.

Since weather reporting before construction of the hospital, the observations prior to the winter of 1828-1829 were taken at an unknown location at the fort. Based on available information from other forts, for example Fort Gibson, OK, initial construction at a post frequently involved a central stockade or set of core buildings with additional construction around the periphery. Early medical facilities were usually in the stockade or central buildings. Consequently, weather observations at Fort Jesup from late 1827 into the winter of 1828-1829 most likely were taken approximately 70 yards north or northeast of the hospital indicated in this report (see Figure 8 for location of the second hospital in relation to the remainder of the fort).

Figure 3 shows the topographical relief surrounding the Fort Jesup Hospital. GPS elevation for the hospital area is 364 feet and latitude/longitude 31°36'41" N 93°24'9" W.

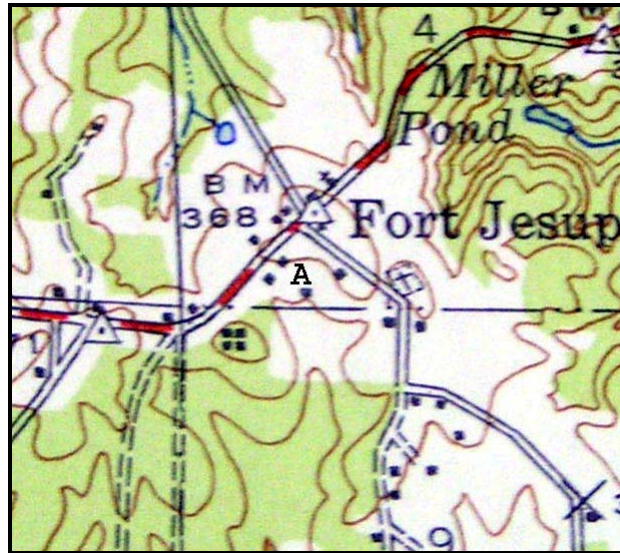


Figure 3. Location of the Fort Jesup Hospital plotted on a USGS topographical map.

The Jun 1844 observation form contained the first mention of the elevation of the weather observations. Following Jun 1844, Fort Jesup observational forms contained the following statement regarding elevation of the barometer: “Alt of Bar above Red River, Natchitoches LA 150 feet.” GPS elevation of the hospital location is 364 feet above sea level which is approximately 20 feet below the top of the hill located to the north.

The exact location of the 1828-1829 hospital was indicated by a plaque at the Fort Jesup Historic Site. Figure 4 shows the location of the tablet indicating the hospital location.



Figure 4. Location of Fort Jesup Hospital. Plaque indicating location of the hospital is immediately below point “A” in the photograph. The plaque indicates the hospital was 41 feet wide and 87 feet long. View is toward the north. Building in background is the visitors’ center.

Figures 5, 6, and 7 show the topographical relief around the hospital. The hospital was located near the top of the hill with the land sloping primarily to the east and south. Greatest slope was towards the east. Figure 8 shows the location of the hospital with respect to other buildings at Fort Jesup.



Figure 5. East view from hospital grounds.



Figure 6. West view from hospital grounds.



Figure 7. Location of the hospital from near the top of the hill, i.e., looking south. The hospital was located in the area within the clump of trees just to the right of center in the photograph.

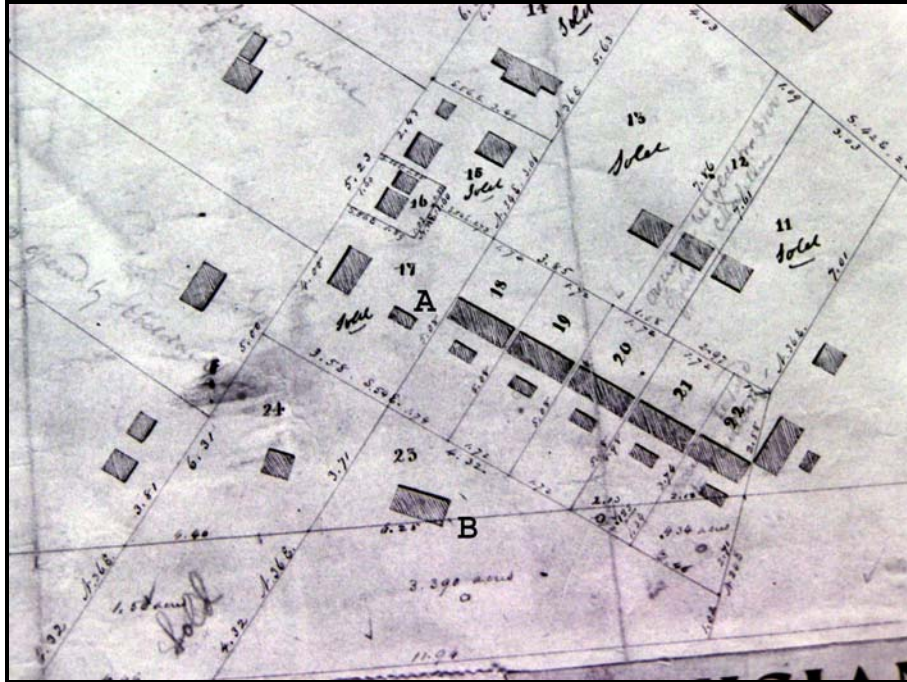


Figure 8. Survey map of Fort Jesup made in 1855 showing the location of post buildings (survey was made for the purpose of selling the grounds of the abandoned fort). The hospital was located at point “B.” Photograph in Figure 7 was taken from point “A” to point “B.”

Instrumentation Descriptions

Specific information regarding number, type, location, and exposure of weather instruments at Fort Jesup for the Army (surgeon observations) was not available. However, general inferences can be made from the monthly weather summaries, as well as from documented instructions from the U.S. Army Surgeon General’s Office.

Instructions from the Surgeon General’s Office to field surgeons are highlighted in the Fort Gibson, OK report through 1844. Although these instructions do not highlight, or pinpoint weather instruments at specific forts, information is presented for field surgeons to follow in establishing post weather observing stations. The Army surgeons at Fort Jesup likely followed these medical military instructions closely.

The first observation at Fort Jesup listed in the National Climate Data Center (NCDC) database is for Oct 1, 1827 (Figure 9) and the observations continued almost unbroken through Dec 1845. Primary exceptions were Oct 1843 through Mar 1844 and Aug 1845 when observations were missing. Some indication exists that weather observations at Fort Jesup may have started as early as May 1822, but no weather observations earlier than Oct 1827 were found during this study.

DIARY OF THE WEATHER at *Fort Jesup (Louisiana)*
for the quarter ending the *31st* day of *December* 1827.

MONTH.	THERMOMETER.			WINDS.	WEATHER.	REMARKS.
	VII. A. M.	II. P. M.	IX. P. M.			
<i>October</i>						
1st	<i>66</i>	<i>84</i>	<i>70</i>	<i>N^oE</i>	<i>Fair</i>	
2d	<i>66</i>	<i>84</i>	<i>74</i>	<i>N^oW</i>	<i>Fair</i>	
3d	<i>66</i>	<i>87</i>	<i>75</i>	<i>N^oW</i>	<i>Fair</i>	
4th	<i>70</i>	<i>88</i>	<i>76</i>	<i>S^oW</i>	<i>Fair</i>	
5th	<i>78</i>	<i>90</i>	<i>78</i>	<i>S</i>	<i>Fair</i>	
6th	<i>78</i>	<i>88</i>	<i>82</i>	<i>N^oE</i>	<i>Fair</i>	
7th	<i>75</i>	<i>87</i>	<i>78</i>	<i>S^oW</i>	<i>Fair</i>	
8th	<i>76</i>	<i>76</i>	<i>76</i>	<i>S^oW</i>	<i>Cloudy</i>	
9th	<i>68</i>	<i>76</i>	<i>68</i>	<i>N^oW</i>	<i>Fair</i>	
10th	<i>48</i>	<i>63</i>	<i>57</i>	<i>N^oE</i>	<i>Fair</i>	
11th	<i>47</i>	<i>66</i>	<i>66</i>	<i>N^oE</i>	<i>Fair</i>	

Figure 9. First “Diary of the Weather” recorded at Fort Jesup, LA in Oct 1827. From the official station history files at NCDC.

In the initial observations, only temperature was measured (observations taken at 7 AM, 2 PM, and 9 PM daily) with wind direction (eight points on the compass), sky condition (recorded as “cloudy” or “fair”), and weather observed (as recorded in the “Remarks” column). Only one wind direction and sky condition was recorded daily. It was not apparent whether the one wind direction and sky condition represented an observation at a particular time.

During the years 1827 through early 1831, observed weather was listed in general terms, e.g., “rain at night” or “rain in the afternoon.” During the summer of 1831, the surgeons began to provide additional details on the timing of the weather, indicating when possible, to the nearest hour. These more detailed observations of weather continued until observations stopped in Dec 1845.

On Jul 23, 1833 the surgeons began measuring 24 hour rainfall (accuracy to one hundredth of an inch). The rainfall observations stopped in Jan 1834 and started again in Oct 1835, continuing until the end of observations in Dec 1845. According to the *Meteorological Register*, published by the Army Surgeon General in 1851, the rain gage was a “conical rain gage of De Witt; and observations are ordered to be made immediately after every shower or fall of rain or snow.” However, only one daily precipitation value was logged on the observation forms. The Oct 1835 observational form stated; “The Rain-gage used in ascertaining the fall of rain is constructed after the

plan of De Witt as described in Silliman's Journal*. It was made by a mechanic at the post. I believe it to be correct."

* - The note refers to Silliman's American Journal of Science and Arts for Apr, May, and Jun, 1832.

Prior to Oct 1835, Army surgeons at Fort Jesup provided weather information in the "Remarks" section of the forms approximately one-third to one-half of the time, i.e., when significant weather occurred. On Oct 1, 1835, the surgeons began logging weather descriptions daily. This continued until Apr 1840 when the surgeons returned to logging comments in the "Remarks" section one-third to one-half of the time.

Also on Oct 1, 1835, temperature measurements were listed only as "AM," "PM," and "Evening." It was not apparent whether temperature observations continued to be taken at 7 AM, 2 PM and 9 PM and logged as "AM," "PM," and "Evening," or whether Army surgeons were given latitude for timing of the observations. Wind direction and sky conditions were listed only as "AM" and "PM."

Beginning Jan 1, 1841, the temperature was measured at "Sunrise," "2 PM," "Sunset," and at "9 PM." Wind direction and sky condition were observed at "AM" and "PM" and rainfall logged once daily.

On Jan 1, 1843, changes occurred in the Army weather observation program that continued into the 1850s. These changes were reflected at Fort Jesup and continued until weather observations stopped in 1845 (Figures 10a and 10b).

FORM N.
METEOROLOGICAL

Station of Fort Jesup La. for the month of January 1843. Lat. 31° West.

1843	Barometer.				Thermometer attached.				Thermometer detached.					Clearness of the Sky.				Wind.			
	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.	
<i>January</i>																					
1									32	46	62	60	50	0.	0.	0.	0.	W	SW	W	
2									50	56	64	56	56 1/2	0.	0.	0.	0.	S	S	SW	
3									38.	42	50	38.	42	10.	10.	10.	10.	SE	N	SW	
4									30	50	52	50	45 1/2	10.	0.	0.	0.	S	N	SW	
5									52.	60	70	72	63 1/2	0.	0	10	10	S	S.	S.	
6									62	74	78	72	71 1/2	0	0	0	0	S	S	S	
7									40	46	50	44	45	0	10	10	10	S.	N	SW	
8									24	22	36	32	31 1/2	10	0	0	0	S	S	SW	
9									42	42	52	42	44 1/2	0	0	0	0	SW	SW	N	
10									28	36	52	40	39	10	10	10	10	SW	N	SW	
11									34	50	54	54.	48					SE.	SE	N	

Figure 10A. Observation form (left part of form) for Fort Jesup for Jan 1843. From the official station history files at NCDC.

24 43

FORM No. 3.
METEOROLOGICAL REGISTER.

1843. Lat. *31° West* Long. *110° from Washington.* Alt. of Bar. above *9* feet. *8*

Clearness of the Sky.				Wind.				Clouds.				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.	9 A. M.	3 P. M.	9 P. M.	Sun rise.	3 P. M.	Began.	Ended.	Quantity.		
0	0	0	7	SW	W	W	Cloudy	Cloudy	Cloudy	Cloudy							
0	0	0	7	SW	W	W	"	"	"	"							
10	10	10	SE	N	SW	SW	Fair	Fair	Fair	Fair							
0	0	0	7	N	SW	SW	Cloudy	Cloudy	Cloudy	Cloudy							
0	10	10	7	S	S	W	Cloudy	Cloudy	Fair	Fair							
0	0	0	7	S	S	W	"	"	Cloudy	Cloudy			8 1/2	10 p.m.	1/10 in.		
10	10	10	7	S	S	W	"	"	Fair	Fair	Fair						
0	0	0	7	S	S	W	Fair	Cloudy	Cloudy	Cloudy			9 1/2	10 p.m.	4/10 in.		
0	0	0	7	SW	SW	NE	Cloudy	"	"	"			5 a.m.	10 p.m.	3/10 in.		
10	10	10	7	SW	S	W	Fair	Fair	Fair	Fair							

Figure 10B. Observation form (right part of form) for Fort Jesup for Jan 1843. From the official station history files at NCDC.

Temperature measurements were made four times daily at: “Sunrise,” “9 AM,” “3 PM,” and “9 PM.” According to the Annual Report of the Surgeon General, these times were selected to correspond with the observational times adopted by the Royal Society of London, with the exception that Army surgeons took the observations a “little before sunrise” versus the 3 AM observation recommended by the society.

Also clearness of the sky, wind direction, and clouds were observed the same time as the temperatures. This represented a significant step for the Army Medical Department toward taking synchronized weather observations/measurements. Rainfall measurements were expanded on Jan 1, 1843 to include time the rain began (to the nearest one-half hour), ended, and total daily rainfall (to the nearest one-tenth inch).

The following indicates the parameters measured/observed at Fort Jesup beginning Jan 1843:

1. Temperature measurement – Four times daily (degrees Fahrenheit)
2. Clearness of the sky – Four times daily (the amount of clear sky at the hour of observation expressed from “0” to “10,” with “0” indicating no clear sky and “10” indicating no clouds)
3. Wind direction – Four times daily (direction expressed on an eight-point compass)
4. Clouds – Four times daily (cloudy or fair)
5. Daily rainfall – Beginning, ending, and amount
6. Significant weather in Remarks section

On Feb 1, 1843, Fort Jesup Army surgeons began including a value for wind force (expressed on a scale from “0” for calm conditions, to “10” for a “violent hurricane”; e.g., SW4). Wind force values were subjectively determined. Also on May 14, 1843, barometric measurements (in centimeters of mercury and changed to inches of mercury in

Apr 1844) were included for each of the four observations daily. With the inclusion of barometric readings, temperature measurements were made on both the “Thermometer attached” and “Thermometer detached.” On Sep 20 1843, the surgeons apparently began indicating cloud movement for each of the four observational times. These observations were placed under the “Clouds” column (previously listed as cloudy or fair), indicating a direction and value, e.g., E2 or SE2. Cloud movement was expressed on the same scale used for the force of the surface wind, i.e., “0” for no movement to “10” for movement corresponding to a “violent hurricane.” Cloud movement was a subjective estimate. Apr 1, 1844 represents the first day wet bulb temperatures were measured at Fort Jesup, continuing through all available observations (Dec 31, 1845).

Dec 31 1845 was the last observation available for Fort Jesup from the NCDC database. Observation times were sunrise, 9 AM, 3 PM, and 9 PM and the following were measured/observed:

1. Barometric pressure (inches of mercury) – Measured four times daily.
2. Temperature (Fahrenheit) – Measure four times daily (attached and detached).
3. Clearness of sky (in tenths) – Observed four times daily.
4. Wind direction and force (eight point compass and a force estimate) – Observed four times daily.
5. Clouds (direction and movement estimate) – Observed four times daily.
6. Wet bulb (Fahrenheit) – Measured two times daily (sunrise and 3 PM)
7. Rainfall (hundredths of an inch) – Beginning and ending time and one daily amount.
8. Significant weather in the “Remarks” section.

Acknowledgments

Linda Freeman, Interpretative Ranger at the Fort Jesup Historic Site, provided key pieces of information regarding the timeline of the fort. Her help is greatly appreciated.

Mary Linn Wernet and Madeline Meziere of the Watson Memorial Library (Northwestern State University of Louisiana), spent considerable time locating library and archive materials for this study. Their generosity and patience are appreciated.

References and Data Sources

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Data Sources

Data regarding weather instrument location and exposure at Fort Jesup during observations by Army surgeons is sparse to non-existent. The NCDC database was the primary source of weather observations by the surgeons at Fort Jesup from 1827 through 1845, but no information was available on instrument location, exposure, or type (with the exception of the rain gage). In addition, the surgeons themselves appeared to take meticulous weather observations, but did not include any information on the forms with respect to the instruments.

Primary information regarding weather instruments used by the Army surgeons and procedures used to take the observations came from publications by the Army Surgeon General's Office (1844 and 1851) which provided instructions to be used by field surgeons.

Annual reports by the U.S. Army Surgeon General were reviewed for the years 1825 through 1845 with only bits and pieces of revealed information. The primary exception was the annual report for 1844 which contained a summary of instructions for taking weather observations; however, a more detailed document was obtained from the National Library of Medicine in Bethesda, MD.

Staff of the Fort Jesup Historic Site helped clarify the location of various buildings and the timeline of activities at the post. The Watson Memorial Library, located at the Northwestern State University of Louisiana, provided the best source of reference materials and archives. In particular, research documented on the fort hospital helped answer the issue regarding whether more than one hospital existed. The microfilm collection at the Watson Library also contained a number of revealing letters written by Fort Jesup soldiers during the period. Other sources of information checked included the Sabine Parish Library in Many, LA, Natchitoches Parish Library, LSU Libraries Special

Collections, State Library of Louisiana, Louisiana Tech University Library, Louisiana Office of State Climatology, and the National Weather Service Forecast Office in Shreveport, LA.