HISTORY OF WEATHER OBSERVATIONS
LOUISVILLE, KENTUCKY
1851-2004

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CONTENTS

List of Illustrations iii

Introduction
The Location 1
Goal of the Study 2

Location of Observations 3
Louisville
Louisville 1851-1852 6
Louisville 1858-1859 7
Louisville 1861-1862 8
Louisville 1869-1870 8
Louisville 1871-1889 10
Louisville 1890-1948 18
Bowman Field 22
Standiford Field 24
Louisville WFO 28
Louisville Upper Gage 29
Louisville Lower Gage 29

Jefferson County
Anchorage 30
Cherokee Park 31
Fairdale 31
Harrod's Creek 32
Lyndon 32
Pleasure Ridge Park 33
Springdale 33
Taylor Barracks 36

Bibliography 37

Appendices
Appendix 1, Louisville Elevations 39
Appendix 2, Methodology 42

ILLUSTRATIONS

Figures

1.	Downtown Louisville Observer Sites	3
2.	Jefferson County Observer Sites	4
3.	Louisville Map 1873	5
4.	Louisville Weather Record October 1851	6
5.	Dr. Samuel D. Manly Comments	9
6.	Post Office and Customs House	11
7.	Window Instrument Shelter	12
8.	Anemometer	13
9.	Courier Journal Building	15
10.	Topics for Promotion Examination	16
11.	Lincoln Building	20
12.	Index to Weather Bureau Scrapbook	21
13.	Airport Station in Louisville	22
14.	Bowman Field Administration Building	23
15.	Lee Terminal	24
16.	Instrument Shelter, Lee Terminal Roof	25
17.	Damaged Instrument Shelter Lee Terminal Roof	26
18.	View from Observation Deck	26
19.	Layout of Weather Station	27
20.	Weather Forecast Office, Standiford Lane	27
21.	Instrument Shelter, Standiford Lane	28
22.	Weather Service Forecast Office, Theiler Lane	29
23.	Anchorage in 1879	30
24.	Harrod's Creek in 1879	32
25.	Lyndon in 1879	33
26.	Springdale in 1879	34
27.	Annual Precipitation Springdale—Louisville	35
28.	Annual Mean Temperature Springdale—Louisville	35

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INTRODUCTION

The Location

In 1818, Joseph Lovell as Surgeon General of the United States Army ordered each Army Post's Surgeon to keep a diary of the weather and to note everything of importance relating to the medical topography of his station, the climate, and diseases prevalent in the vicinity. As part of that effort, the Post Surgeon at Newport Barracks, Kentucky began the first weather observations in Kentucky on 1 July 1825.

About twenty-five years later, the first observations were made in Louisville. During that intervening time, Louisville had grown from a population of less than 5,000 people to a robust 43,194 people by 1850. By then, the city ranked as the fourteenth largest city in the United States.

Another important change had occurred during that growth period. An Act of Congress on August 10, 1846 created the Smithsonian Institute under terms of the will of James Smithson of London. Those terms were for it to increase and diffuse knowledge among men. It was and is a research organization. Within a year after their creation, they developed a climate network. On 1 October 1851, William F. Beach began recording weather observations three times per day in Louisville as part of the Smithsonian Institute network. Seven years later, the network had additional observers reporting from Kentucky and from each of the other thirty states. By 1860, it had over 600 observer stations and the Smithsonian Institute had supplanted the Army's network as the primary climatic data collection agency for the United States.

Since those first observations from 1851 to 1852, Jefferson County had a variety of weather reporting stations and organizations involved in producing the climate record. Those locations include Anchorage, Cherokee Park, Harrod's Creek, Fairdale, Lyndon, Pleasure Ridge Park, Springdale, Taylor Barracks, Bowman Field, Standiford Field, and several locations in downtown Louisville. There are some overlapping periods of observation from these locations and they provide a mostly unbroken record of weather data from the Louisville area since 1858.

With a metro government, Louisville now includes all the area within Jefferson County. Therefore, this history of weather observations in Louisville traces that record and identifies the observers, their instrumentation, and their locations within Jefferson County.

Goal of the Study

The goal of this study is to document the primary weather observational history in the Louisville Kentucky area that was part of the path to the current National Weather Service's observing program. Climatic data from stations in the Louisville area that made weather observations throughout the period of record are readily available from the National Climatic Data Center, the Midwestern Regional Climate Center, and the State Climatologist of Kentucky. The station's history since 1947 is well documented and also available through easily obtainable climatic records. The challenge of this study was to identify Louisville's role in the development of the formal weather observational program and where it fit in the route from the Army surgeons, through the Smithsonian Observers, the Signal Service Observer Sergeants, the Weather Bureau meteorologists, to the National Weather Service observational network of today. Therefore, the focus of this study is on the period before 1947, the generally accepted start of the modern era of the documentation of weather observations.

LOCATIONS OF OBSERVATIONS

A map of the location of the downtown observations during the past one hundred fifty years or more shows the rather frequent moves (Figure 1).

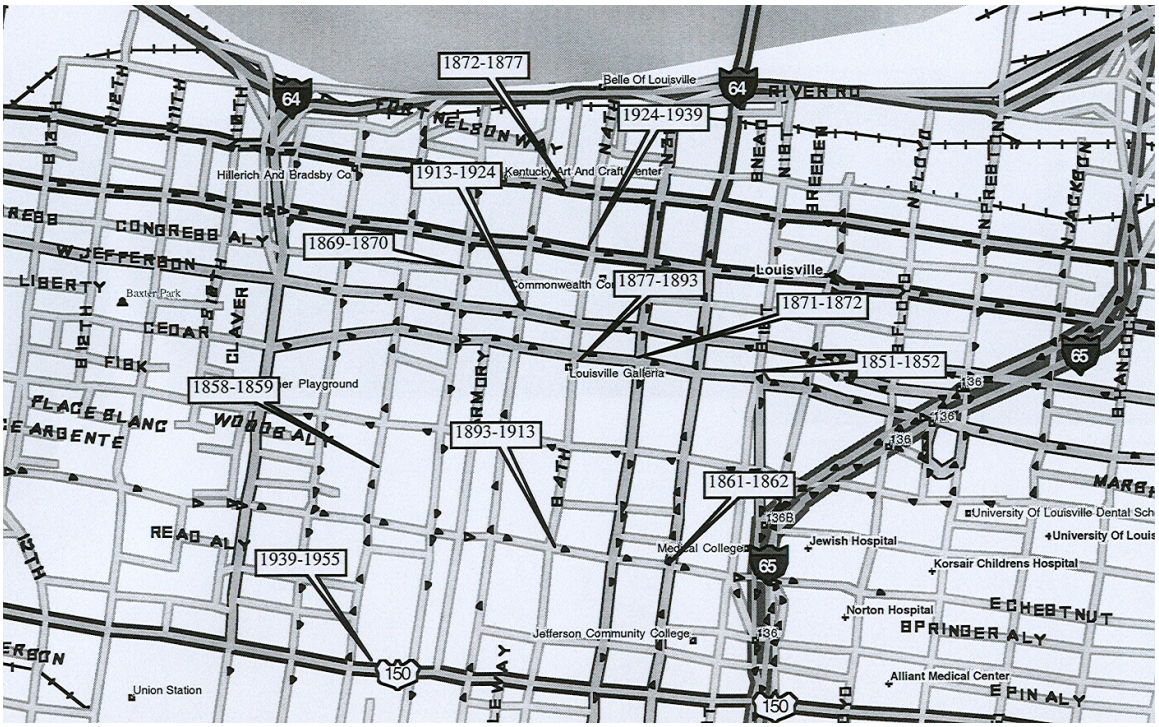


Figure 1. Observer locations in downtown Louisville with dates when they were active. Source: Author

Some of the locations were the result of moves that were necessitated by a change in the observer. Some of those were only a few blocks and a few slightly farther. Others were the result of decisions on the observation site itself, for example to collocate with the Board of Health or to use the roof of the tallest building. After the advent of aviation and its demands for readily available weather information, observations at airports came to be preferred. The relocations to Bowman Field and later to Standiford Field are examples of such moves from downtown locations to nearby airfields that were made all across the country. The downtown locations were usually sites with long periods of records, important to climatology. The immediate daily operational needs of aviation outweighed the long term needs of climatology.

Over the years, other observation stations were established within Jefferson County most in the early years as the need for and interest in climatic data expanded. Many of those were in small communities that were, during that time, small country villages and towns. Figure 2 shows the observation locations other than those in the downtown Louisville area. The locations and the dates of the records produced there are shown in the call-out boxes.

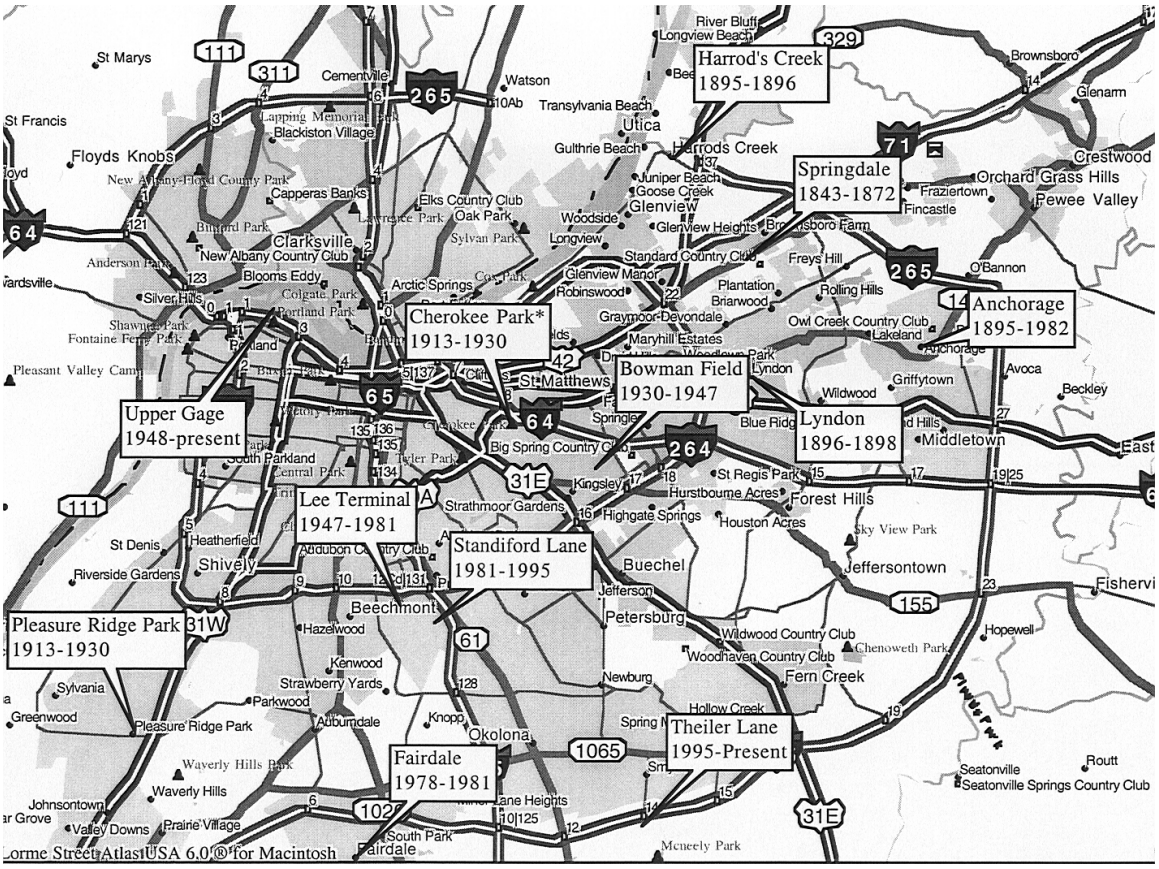


Figure 2. Jefferson County observer locations other than downtown Louisville.
Source: Author

In the following sections, the chronology of observations will be described for stations bearing the Louisville name and those other Jefferson County sites now included within the city.

LOUISVILLE

This section contains the weather observation locations within what was the city of Louisville before the advent of metro government. The map in Figure 3 is included because some of the streets and their names have changed over the years.

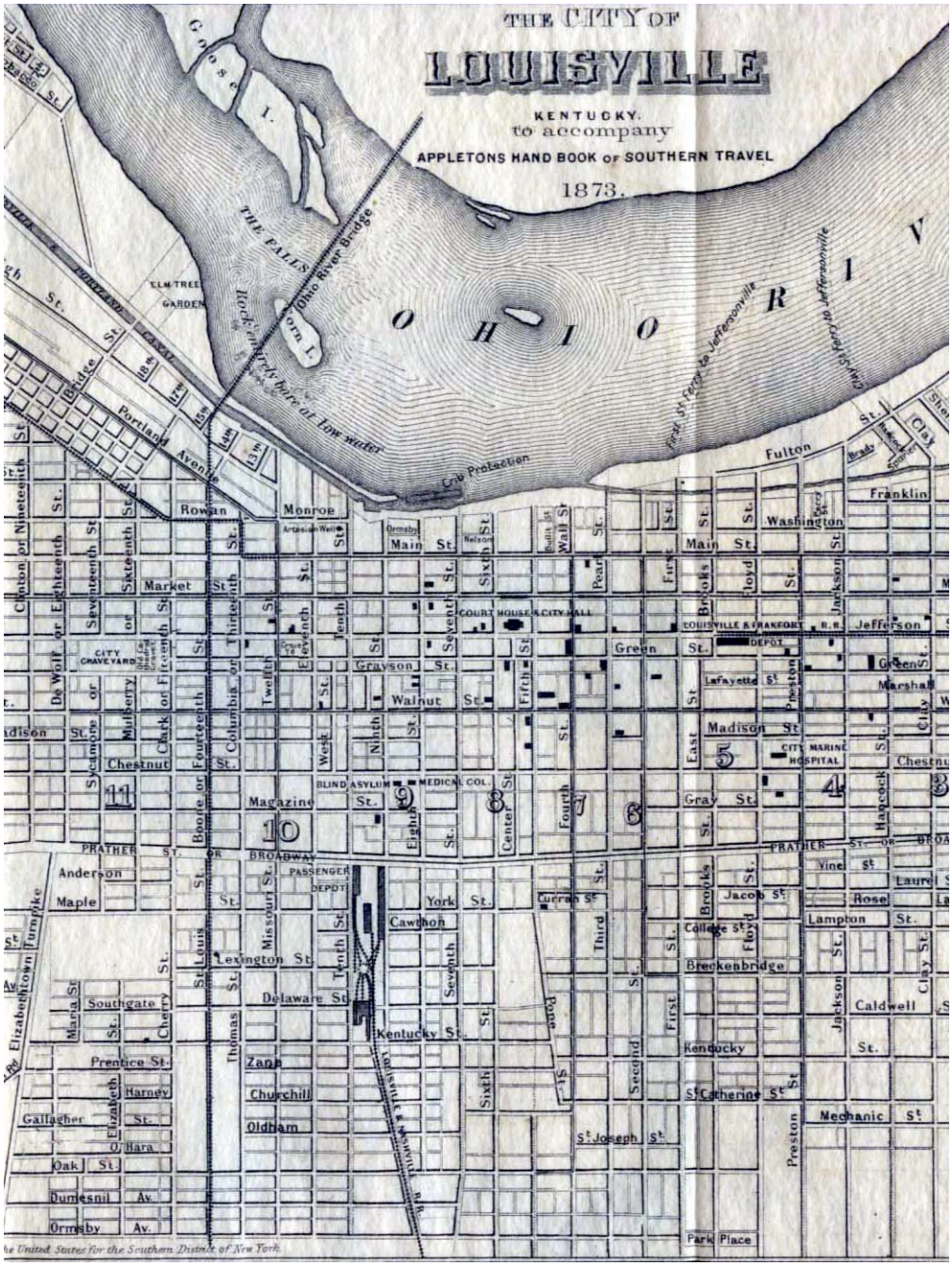


Figure 3. Downtown Louisville 1873.
Source: Appletons Handbook of Southern Travel, 1873.

LOUISVILLE

1851-1852

William F. Beach made the earliest meteorological observations in Jefferson County beginning on 1 October 1851. The precise location of site of his observations is unknown but he reported to be at 38˚ 10’ north latitude and 85˚ 30’ west longitude. That would indicate that it was near First and Green Streets. (See Figure 3 for Green Street that is now known as Liberty Street.)

Mr. Beach entered “Louisville” in the Station Name box of the form that he used. On the forms that contain his observations, someone in a different handwriting lined through “Louisville” and wrote “S.I.,” “(Springdale, Kent.),” and “(Beach) above it (Figure 4). During Mr. Beach’s time of observation, Ms. Lawrence L. Young was observing and reporting from Springdale about eight and a half miles northeast of Mr. Beach. The editorial change should be ignored.

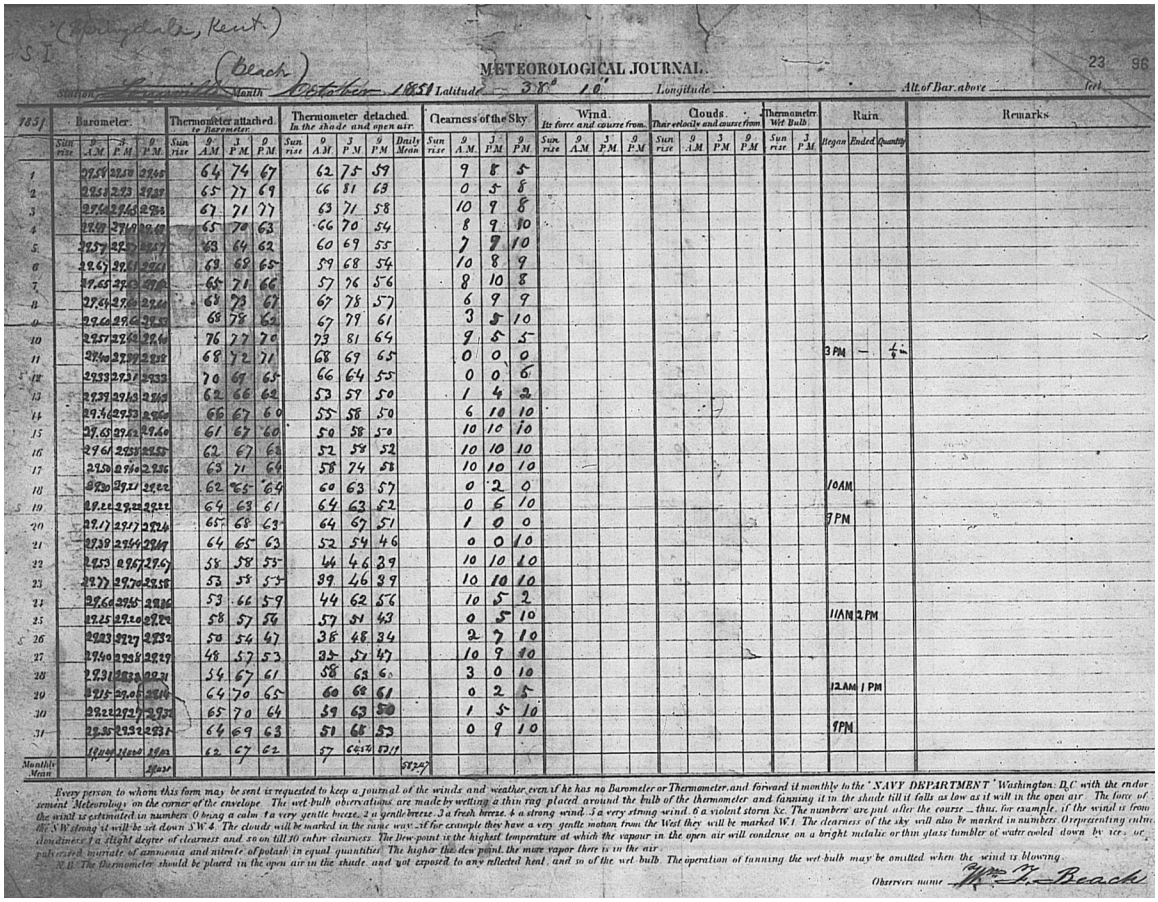


Figure 4. Earliest Weather Record from Louisville, Kentucky dated October 1851
Source: Original Record, National Climatic Data Center

The first forms used to record the observations made by Mr. Beach were titled "Meteorological Journal." At the bottom of those forms were printed instructions that required the forms to be forwarded monthly to the Navy Department in Washington D.C. in an envelope with "Meteorology" written on its corner. Why he used this form, where he obtained it, and where he submitted it is unclear. The editorial comment about Springdale and the entry "S.I." may indicate that a Smithsonian Institute reviewer received Mr. Beach's forms.

Louisville's first observer made entries on the forms three times each day: at 9 a.m., 3 p.m., and 9 p.m. At each of those times, he recorded the barometer in inches, the temperature of the thermometer that was attached to it, the temperature from a thermometer located in the shade and open air, the clearness of the sky in tenths, the beginning and ending time of precipitation, the precipitation amount in inches and fractions, and remarks (e.g. rain or snow).

Mr. Beach made an interesting comment at the bottom of his form for March 1852, "Many many thanks for Espy's report." This is without doubt a reference to James Pollard Espy who in 1842 was appointed meteorologist to the U.S. government and assigned to work in the office of the Surgeon-General of the U. S. Army. There, he prepared daily weather maps that were published in four successive reports. The reference to Espy's report was probably one of those, perhaps the one containing a collection of weather maps that he had prepared. Of interest is that James Pollard Espy graduated from Transylvania College in Lexington, Kentucky in 1808 and taught in the Franklin Institute in Philadelphia beginning in 1817.

The last month of Mr. Beach's record was May 1852. In it, the barometer entries and the accompanying attached thermometer readings stopped after the 20th. The explanation was at the bottom of the form. It stated that "In consequence of an injury to the barometer the observation of this office will be discontinued for the present time." There followed an almost six year gap in the Louisville record.

1858-1859

The meteorological record continued on 1 April 1858 with Samuel R. Williams as the observer. According to the 1859 Louisville City Directory, Mr. Williams was a teacher who lived on Seventh Street between Walnut and Chestnut. That site is at about 38˚ 15' north latitude and 85˚ 46' west longitude.

The first form used by S. R. Williams in April 1858 was a form titled "Meteorological Journal for ____ 18 ___ kept at _____ County, Pennsylvania for the Committee on Meteorology of the Franklin Institute." Like his predecessor, he was using a substitute form to record his observations. Note that the Franklin Institute was located in Philadelphia and was the work place of James Pollard Espy. The word "Pennsylvania" on the form was lined out and "Kentucky" was written above it. The phrase "Committee on Meteorology of the Franklin" was lined out and "Smithsonian" was written above it. These substitutions were in the same handwriting as the other writing on the form so they belong to Mr. Williams. To the left of his signature at the bottom was written "Observer 3." If that is true, then there must have been another observer between Mr. Beach and Mr. Williams, one whose records were lost.

The original time of observation printed on the form was 7 a.m., 2 p.m., and 9 p.m. The afternoon time was lined through and replaced by a handwritten 3 p.m. At each time, he entered the detached thermometer, the register (lowest and mean), attached thermometer, barometer and sky, wind (force and direction) and clouds, wet bulb at 3 p.m. (also changed from 2 p.m.), dew point at 3 p.m., beginning and ending times of precipitation, precipitation amount in inches, and remarks.

The second and subsequent months of Mr. William's observations used the Smithsonian Institution form. This form has forty-eight columns and he made entries in all but the "Barometer Height Reduced to Freezing Point" and "Kind of Clouds" columns. There were three times per day entries of the detached thermometer, the attached thermometer, thermometer in the open air, psychrometer or hygrometer, beginning and ending time of precipitation, amount of rain or melted snow, snow depth, amount of sky cover, course of higher clouds, wind direction, wind force, force or pressure of vapor in inches, and relative humidity or fractions of saturation. In addition on the back of the form he included remarks on most days.

On the May 1858 report, he entered his location as at 38˚ 03' north latitude and 85˚ 30' west longitude at an elevation of 452 feet. It seems, from his street address, that the latitude is in error. However, it remained unchanged throughout his observations the last of which was in May 1859.

1861-1862

After a gap in the record, Edward N. Woodruff began observing for the Smithsonian Institute on 1 March 1861. On the first form that he submitted, he entered his location as 38˚ 22' north latitude and 8˚ 37' west of Washington D.C. He also gave his address as the "Corner Second and Chestnut." That observation location must have been his Drug Store because the 1859 Louisville City Directory listed his home address as Broadway between Brook and Floyd Streets. According to the 1860 census, he was an unmarried 21 years old who was a Druggist by profession. The Smithsonian forms that he used contained the same information as that used by Mr. Williams except that Mr. Woodruff made entries in all of the columns as well as making remarks on the back of the form.

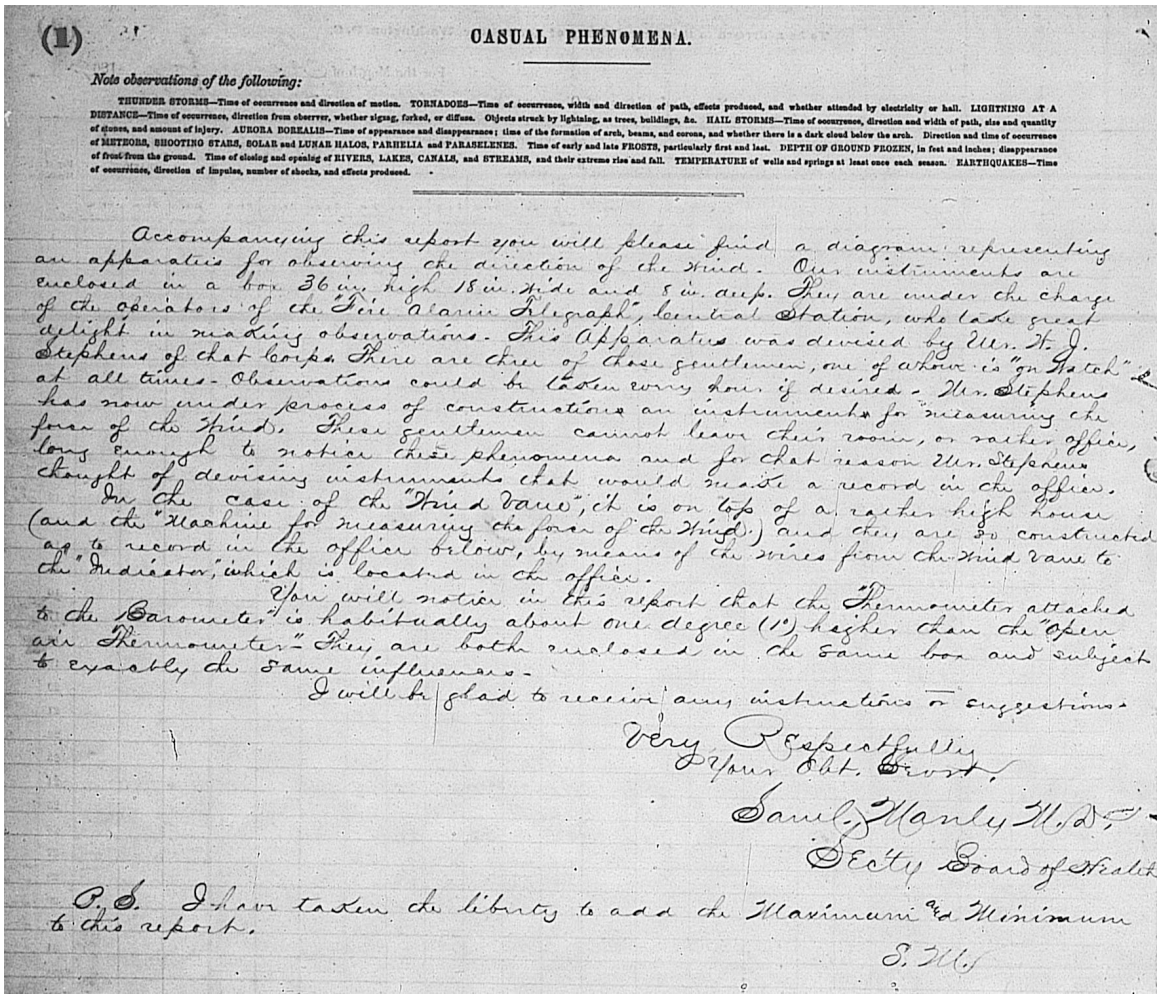
On the November 1861 record, he changed his latitude to 38˚ 20' north latitude and his longitude to 85˚ 38' west longitude. There was no change in his observation site and no explanation for altering the latitude by two minutes. The longitude change conformed to the custom of using Greenwich England's as the prime meridian rather that that of our Nation's Capitol.

Mr. Woodruff's last record was December 1862. Thereafter, another gap in the record exists until 1869.

1869-1870

The subsequent observers continued observations in the same general area of downtown Louisville. The next was Samuel D. Manly, M.D. who was the Secretary for the Board of Health

for Louisville and later a Health Officer. According to the Louisville City Directory of 1867-78, the Board of Health was located on 6th Street between Market and Jefferson Streets. He reported for September 1869 using the same Smithsonian form except that he added two hand drawn columns for the maximum and minimum temperature taken at 7 a.m. Those data were in his view valuable. Early observers were encouraged to add information that they believed could contribute to the understanding of weather and climate. On the reverse side of the form were comments (Figure 5).



(1)

CASUAL PHENOMENA.

Note observations of the following:

THUNDER STORMS—Time of occurrence and direction of motion. TORNADOES—Time of occurrence, width and direction of path, effects produced, and whether attended by electricity or hail. LIGHTNING AT A DISTANCE—Time of occurrence, direction from observer, whether zigzag, forked, or diffuse. Objects struck by lightning, as trees, buildings, &c. HAIL STORMS—Time of occurrence, direction and width of path, size and quantity of stones, and amount of injury. AURORA BOREALIS—Time of appearance and disappearance; time of the formation of arch, beams, and corona, and whether there is a dark cloud below the arch. Direction and time of occurrence of METEORS, SHOOTING STARS, SOLAR and LUNAR HALOS, PARHELIA and PARASELENES. Time of early and late FROSTS, particularly first and last. DEPTH OF GROUND FROZEN, in feet and inches; disappearance of frost from the ground. Time of closing and opening of RIVERS, LAKES, CANALS, and STREAMS, and their extreme rise and fall. TEMPERATURE of wells and springs at least once each season. EARTHQUAKES—Time of occurrence, direction of impulse, number of shocks, and effects produced.

Accompanying this report you will please find a diagram representing an apparatus for observing the direction of the Wind. Our instruments are enclosed in a box 36 in high 18 in. wide and 8 in. deep. They are under the charge of the operators of the "Fire Alarm Telegraph", Central Station, who take great delight in making observations. This Apparatus was devised by Mr. W. J. Stephens of that corps. There are three of those gentlemen, one of whom is "on Watch" at all times. Observations could be taken every hour if desired. Mr. Stephens has now under process of construction an instrument for "measuring the force of the Wind". These gentlemen cannot leave their room, or rather office, long enough to notice these phenomena and for that reason Mr. Stephens thought of devising instruments that would make a record in the office.

In the case of the "Wind Vane", it is on top of a rather high house (and the "Machine for measuring the force of the Wind".) and they are so constructed as to record in the office below, by means of the wires from the Wind Vane to the "Indicator" which is located in the office.

You will notice in this report that the Thermometer attached to the Barometer is habitually about one degree (1°) higher than the "Open air Thermometer". They are both enclosed in the same box and subject to exactly the same influences.

I will be glad to receive any instructions or suggestions

Very Respectfully
Your Obt. Servt.
Saml. D. Manly M.D.
Secty Board of Health

P.S. I have taken the liberty to add the Maximum and Minimum to this report.

S. M.

Figure 5. Comments of Samuel D. Manly M.D. September 1869, Louisville Kentucky
Source: Original Observer Form

Dr. Manly described an apparatus for observing the direction of the wind. He stated that his weather instruments were enclosed in a box 36 in. high, 18 in. wide, and 8 in. deep. The observations were actually taken by the operators of the "Fire Alarm Telegraph," Central Station. The wind vane was devised by W. H. J. Stephen. It was mounted on top of a rather high house (and the machine for measuring the force of the wind) but they recorded in the office below, by means of the wires from the wind vane to the "Indicator" which was located in the office below.

He also expressed concern about the accuracy of the thermometer that was attached to the barometer. The attached thermometer was about one degree (1˚) higher than the thermometer in the open air. He said that both were enclosed in the same box and subject to exactly the same influences.

On the next month's form, he discussed a temperature measurement inconsistency between the thermometer attached to the barometer and the open air thermometer. The former read about a lower than the latter, as much as seven degrees. He said that he was at a loss to explain the difference because they both are kept in the same box. He said that the difference varied and was not by any means uniform.

For January and February 1870, Dr. C. B. Blackburn, M.D. was the replacement as Secretary of the Board of Health.

The location of the Board of Heath has been ascertained. The remarks about the wind vane at the "Fire Alarm Telegraph" and a member of that "Corps" being on watch at all times may refer to the Signal Service that took over observations from the Board of Health almost two years later. The Weather Bureau Form 500-1 prepared in 1955 retained the same latitude and longitude when the Signal Service assumed the observation role. However, their actual locations were not the same street address.

1871-1889

In 1870, the census recorded Louisville's population as just over 100,000. It had seen an increase of over 30,000 in the previous ten years. The responsibility for weather observations changed too. In that same year, a joint resolution of Congress authorized the Secretary of War to establish a weather service within the Army. The idea was to develop synchronous weather observations and telegraph them to Washington. There, professionals employed by the Signal Corps would develop what would come to be known as forecasts. This beginning evolved into the Weather Bureau.

Beginning on 1 November 1871, observations in Louisville were performed by members of the U.S. Army's Signal Service, Division of Telegrams and Reports. These Signal Service Sergeants were trained observers and eventually there was a career path opened for advancement to 2nd Lieutenant.

Those first U.S. Army observations were made by Thomas. J. Brown, a Signal Service Observer Sergeant. He used a War Department Form 22 called the Monthly Means Report that reported mean daily barometer, mean daily temperature, rainfall amounts in inches, and the total miles run of the wind during the month. There is a gloss at the bottom: "From the opening of station to Dec. 31 1884 the reduced bar is too low 0.020 inch. L. S. Jun 6 85." The Weather Bureau Form 500-1 prepared of 3 February 1954 explains that on 11 Jun 1885 a new determination of altitude occurred. The barometer elevation changed from 530 feet to 551 feet. That change of 21 feet required that previous barometer readings be increased.

Figure 6. The Post Office and Customs House in Louisville, Kentucky, 1920's
Source: http://www.oldlouisville.com/Ruins/PO/PO1920.htm

The first location of the Signal Service observations was on the third floor of the Customs House at the corner of 3rd and Green Streets. (Figure 6). The thermometers were in a window shelter on the 3rd floor about 35 feet above ground level (AGL). The wind instruments were on the roof about 75 feet AGL. The use of the roof was a matter of contention by the Collector of Customs. The top of the eight inch rain gage was about 4 feet AGL. The barometer was stated as 476 feet in a letter he sent to the Acting Signal Officer on 14 September 1871. The other elevations were estimated by the Weather Bureau from the original station records. The observations were sent by telegram from the Telegraph Office that was located 2nd and Main Streets. The junior observers at the site were trained using Loomis' textbook.

The midnight tabular weather report data from the previous day were widely distributed. They were published in the local newspapers. Sgt Brown reported that the Louisville Courier Journal, the Louisville Daily Commercial, and the Louisville Daily Ledger (until its suspension as a morning paper on 26 February 1872 and conversion to the Daily Evening Ledger) carried the daily data. Two German daily papers "The Auzeiger" and "Volksblatt" began using the data in April. Thus the daily data were appearing in five daily newspapers in Louisville. In addition to newspapers, the data were placed on seven bulletin boards located in the Galt House, the Western Union Telegraphy Office, the Board of Trades Room, the Post Office, and at street corners in the downtown area.

On 29 February 1872, the Signal Service Office moved to the corner of Main and Bullitt Streets. This move seems to have been to be near the river gage station although no direct statement to that effect was found. Mr. H. D. Newcomb owned the building that they occupied. There they used a window instrument shelter (Figure 7). The height of this shelter was estimated to be about 59 feet above ground level. The maximum and minimum thermometers were mounted inside.

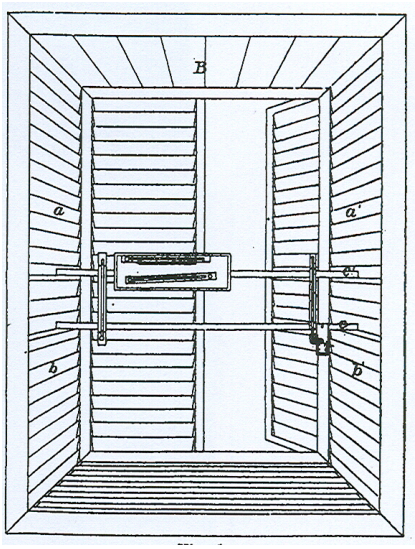


Figure 7. Window Instrument Shelter circa 1880
Source: Instructions to Observers of the Signal Service, 1881.

There was other equipment on the roof of the building, for example, the weather vane and the anemometer. The anemometer recorded the mile run of the wind, that is to say the miles of air that passed the station (Figure 8).

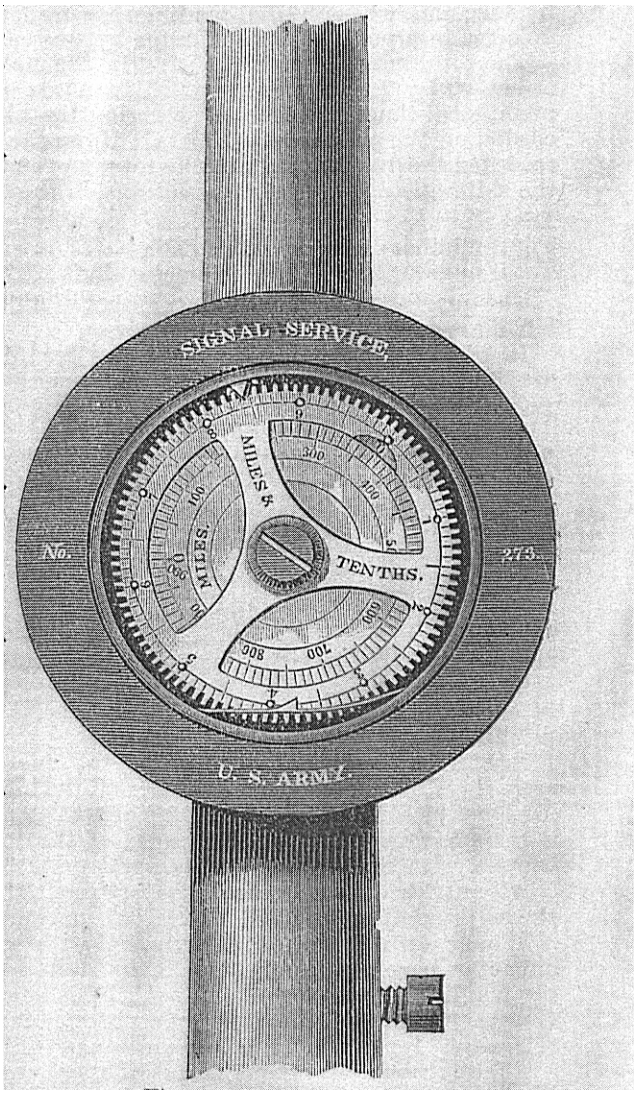


Figure 8. Anemometer circa 1880
Source: Instructions to Observers of the Signal Service, 1881.

The anemometer recorded the hundreds and tens of miles were read on the inner scale and units and tenths of miles were read on the outer scale.

The barometer was at 518 feet MSL. Pvt. H. M. Ludwig of the Signal Service was the acting Observer who submitted the report for July and August 1872. Sgt. Brown returned from furlough in mid-August. Observer Sergeant Robert E. McGrady, also an observer of the Signal Service, followed and he began observations in late August 1872.

There was concern about the instruments. On 11 April 1873, Sgt. McGrady wrote that he "invariably found the wet bulb thermometer to read from one half to one degree higher when the muslin or wicking remained upon the bulb at temperatures from thirty-one (31˚) degrees down to ten (10˚) than when the bulb was wet with a brush and allowed to freeze a film of ice upon it. I

have had no means of ascertaining the result of temperatures below ten degrees." On 26 December 1873, he expressed concerned that when vane on the roof pointed south, the arrow in the office pointed very nearly southeast. Comments of that type gave evidence of the care with which they made their weather observations.

Beginning on 5 August 1872, maximum and minimum thermometers were installed as was a lightning rod to protect the building and the instruments. In March 1873, the reporting form and its contents were changed to a Form 22B. The barometer and thermometer were read at 7 a.m., 4 p.m., and at 10 p.m. The latter time was used instead of midnight was dictated by the form. Rainfall was not reported. The old form was replaced by a Form 22-1 during April 1872. Four columns were added, Mean Daily Barometer, Mean Daily temperature, Mean Daily Humidity, and Rainfall amounts. There was also a monthly summary of the Highest and Lowest Barometer, Highest and Lowest Thermometer, Total Rainfall, Prevailing Wind, Total number of Miles traveled, Maximum Velocity of Wind, Number of Cloudy Days, and Number of Rainy Days.

Observer Sergeant J. W. Craig became the new Signal Service observer on 24 September 1873. In a letter to the Chief Signal Officer dated 12 January 1874, he described the instrument shelter as having "no solid sides nor front but is constructed of lattice work double, the outside slats incline or point upward and the inside slats vice-versa." Sgt. Craig was replaced by Observer Sergeant Herrmann Frey for April 1874 who in turn was replaced by Assistant Observer Cpl. James H. Marsh the following month. Sgt. Craig resumed observations for June 1874 but was relieved for misconduct and was replaced permanently by Marsh in July 1874. In September 1874, Marsh promoted to Sergeant and observed through July 1875. His instrumentation included two standard barometers, two standard thermometers, one standard maximum thermometer, one standard minimum thermometer, one standard hygrometer, one standard anemometer, one self-register for anemometer, one standard rain gauge, and one standard wind vane.

Sergeant E. E. Clements made the observations from August 1875 through February 1877. On 16 February 1877, Sgt. Clements described two of the organizations in Louisville that had an interest in weather services. One was the Merchants and Mechanics Exchange located at Number 118 Main Street. The Secretary of that organization, a Mr. Dumince, recommended a Mr. Belknap from that organization to become a member of the Meteorological Committee. He thought that he would be well informed and would show great interest in weather services. The other organization was the Polytechnic Society that was organized in Louisville in December 1876. Sgt. Clements reported Thomas E. Jenkins was its Secretary. The Society was composed of some of the principal commercial and agricultural citizens of the area. It maintained a library of 40,000 volumes. Members were allowed to check out the volumes. J. Lawrence Smith who was the President of the Meteorological Committee was the General Council of the Society. This Society would later influence the activities of the post-Signal Service observers.

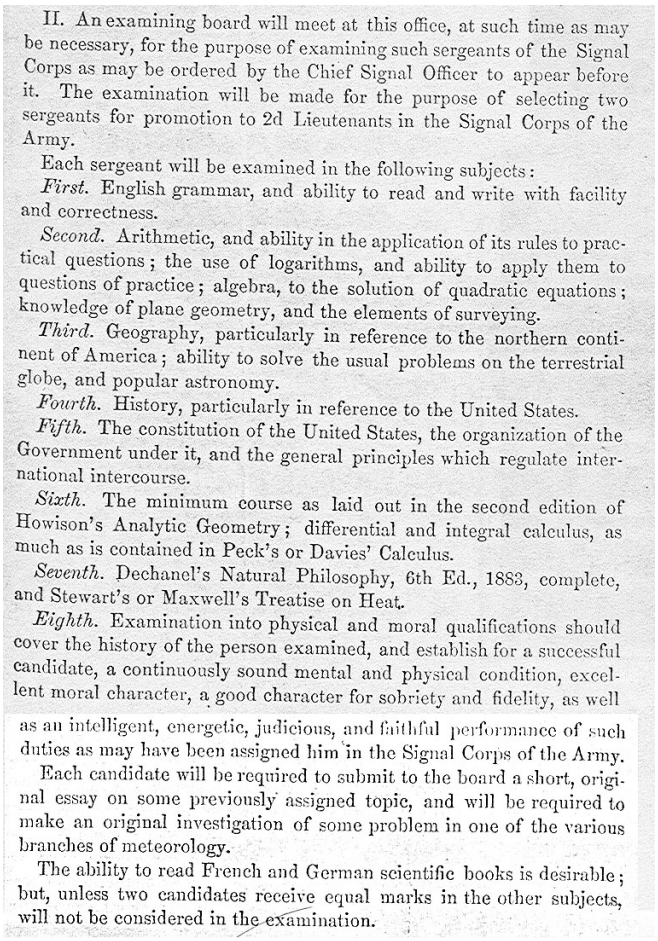
Sgt. Clements wrote in a 22 February 1877 letter to the Chief Signal Officer that he had received a claim for roof repairs from the owner of the building at Main and Bullitt Streets, Mr. Newcomb. The estimated cost of repairing the holes left in the roof when the anemometer was removed was $10.00.

Figure 9. Courier Journal Building in Louisville, Kentucky ca. 1887.
Source: Louisville Board of Trade, 1887.

Observer Sergeant Leroy E. Sebree assumed the duties in March 1877. On 3 March 1877, the Signal Service Office moved to the Courier Journal Building on the southeast corner of 4th and Green Streets (Figure 9). The move was prompted by at least two factors. One was the small stairway leading from the floor beneath the office to the office rooms. "The stairway was a cast iron spiral about six feet in diameter which makes the passageway a little less than three feet wide" according to a letter sent by Sgt. Clements on 21 February 1877. The second factor was the need to reduce costs. In a letter to the Chief Signal Officer on 29 July 1876, Sgt. Clements had reported that the cost of rooms in the Courier Journal Building would be $200 per annum plus $20 gas per annum, and that there would be no additional expenses. The rooms were heated by steam thus obviating the need for coal and stoves. The new Office occupied the sixth floor with the thermometers at 90 feet AGL with the other instruments mounted on the roof. The anemometer was 116 feet AGL, and the eight-inch rain gage was 102 feet AGL, with a tipping bucket at 101 feet AGL. The thermometers were moved to the roof on 1 February 1886. The barometer was at 551 feet MSL.

In April 1877, a new Form 22 was first used. This form kept the three columns for barometer and three for temperature. It expanded the precipitation to three columns with observations three times each day. It also added columns for maximum and minimum thermometer, prevailing daily wind direction, highest hourly wind velocity each day, and the

number of times wind was from each of the eight cardinal directions. The climatological summary was expanded to include the monthly, greatest, and least daily range of temperature; depth of snow, number of foggy days, number of cloudy days on which rain fell and didn't fall, and total number of precipitation days.



II. An examining board will meet at this office, at such time as may be necessary, for the purpose of examining such sergeants of the Signal Corps as may be ordered by the Chief Signal Officer to appear before it. The examination will be made for the purpose of selecting two sergeants for promotion to 2d Lieutenants in the Signal Corps of the Army.

Each sergeant will be examined in the following subjects:

First. English grammar, and ability to read and write with facility and correctness.

Second. Arithmetic, and ability in the application of its rules to practical questions; the use of logarithms, and ability to apply them to questions of practice; algebra, to the solution of quadratic equations; knowledge of plane geometry, and the elements of surveying.

Third. Geography, particularly in reference to the northern continent of America; ability to solve the usual problems on the terrestrial globe, and popular astronomy.

Fourth. History, particularly in reference to the United States.

Fifth. The constitution of the United States, the organization of the Government under it, and the general principles which regulate international intercourse.

Sixth. The minimum course as laid out in the second edition of Howison's Analytic Geometry; differential and integral calculus, as much as is contained in Peck's or Davies' Calculus.

Seventh. Dechanel's Natural Philosophy, 6th Ed., 1883, complete, and Stewart's or Maxwell's Treatise on Heat.

Eighth. Examination into physical and moral qualifications should cover the history of the person examined, and establish for a successful candidate, a continuously sound mental and physical condition, excellent moral character, a good character for sobriety and fidelity, as well as an intelligent, energetic, judicious, and faithful performance of such duties as may have been assigned him in the Signal Corps of the Army.

Each candidate will be required to submit to the board a short, original essay on some previously assigned topic, and will be required to make an original investigation of some problem in one of the various branches of meteorology.

The ability to read French and German scientific books is desirable; but, unless two candidates receive equal marks in the other subjects, will not be considered in the examination.

Figure 10. Examination topics for promotion from Sergeant to 2nd Lieutenant. 1885
Source: Signal Corps General Order Number 25

Sgt. Sebree was appointed a 2nd Lieutenant in the Signal Corps on 1 November 1878. The examination for promotion was demanding according to General Order No. 25 prepared by the Signal Office of the War Department on 25 June 1885 (Figure 10). As a result of the promotion, 2nd Lt. Sebree was replaced on 9 November 1878 by Observer Sergeant William R. Stansbury. Sgt. Stansbury was provided one assistant, Pvt. T. A. Colné. Their pay receipts for February1879 indicate that Sgt. Stansbury earned $33.87 proper pay, $21 for rations, and $18 for Quarters. Pvt. Colné received the same rations and quarters amounts but earned only $16.87 proper pay. Sgt. Stansbury would continue the observations through December 1879. In January 1879, he

received instructions to begin observations at sunset beginning on 15 February 1879 and to submit them by telegraph.

On 25 October 1879, Sgt. Stansbury reported that the Meteorological Committee of the Louisville Board of Trade consisted of W. R. Belnap, J. W. Holland M.D., and J. B. Speed. He noted that the Committee visited his office on 16 April 1879 and on 2 December 1879. It was clear that the information developed by the Signal Service was considered valuable by the Board of Trade. That information included river observations that continued to be taken at the Government Lock at the foot of 10th Street and the Portland Canal. The Board of Trade had 700 members by 1887 — valuable support when the conversion from the Signal Service to the Weather Bureau occurred a few years later.

Public service was one of Sgt. Stansbury's primary interests. In his Semi-annual Report dated 31 December 1878, he summarized his this aspect of his job.

> "The Press have given a large amount of space to the reports furnished by this office and taken much interest in the Service expressing the greatest confidence in the reports furnished. I am confident that there is no other station where more space is allowed our reports than here. Whether the Press create the public interest or simply supply what the public demands, it is evident that the people here take a great deal of interest in the weather reports and the Service which furnish them. The Office is visited daily by those desiring information about the weather for one purpose or another, all going away perfectly satisfied that the information given them can be relied upon.
>
> The branches of industry more particularly benefited by the reports and forecasts are the Porkpackers, Produce Dealers, Shippers, and River Men.
>
> During the hog killing season in the latter part of the fall and early winter when the weather was desired by those interested in Pork, this office was visited daily by prominent porkpackers in quest of indication of coming cold and would kill or delay killing as the indications were favorable or otherwise."

In January 1880, a different Form 22 was used through June 1881. In July 1881, the older Form 22 was back in use. Then War Department Form 113a came into use in October 1881.

Sergeant Hill C. Smyth did the observations from January 1882 through September 1882. He was replaced by Sgt. L. W. Dey who reported through February 1884. Sergeant E. B. Garriott began observing in March 1884.

In January 1885, Sgt. Garriott noted that "All observations taken on 90th meridian time." There were other notes that pressure was "reduced to sea level & standard gravity" and that

"monthly mean pressure reduced to sea level and standard gravity 30.184." There is a second non duplicative form for January 1885 that have data with the note that "All observations taken on 75th meridian time." These two meridians are the center longitudes for Central and for Eastern Standard Time zones as we now know them. Prior to this date, Louisville and other U.S. locations determined observation times using local time — i.e., solar time. There was controversy over the establishment of these standardized zones. The existence of observation forms for both Eastern and Central Standard Time zones may reflect that controversy and indicate indecision over which or neither to use. They are in different handwriting and may reflect personal differences in preferences.

The railways adopted "Standard Railway Time" on 18 November 1883. Most cities in the United States adopted that time system. Kentucky adopted the railway's Central Standard Time in 1883. (The north-central Kentucky area that includes Louisville and Lexington were moved into the Eastern Standard Time in 1961.)

In 1884, the United States agreed to the establishment of the Greenwich, England meridian as the single prime meridian for a geographic grid and for time keeping. With a twenty-four hour day and 360 degrees of longitude, the time zones that naturally result are centered over each fifteen degrees from that point. (However, the United States did not officially enact the time zones until 1918.)

Sgt. Garriott continued to report using both Eastern and Central Standard Times through June 1885. In July 1885, a new form was introduced. It had seven pages for each month. Each page had columns for observations at 7 a.m., 3 p.m., 11 p.m. and their mean. It also had columns for 3 a.m., 11 a.m., and 7 p.m. and their mean. The pages were barometer, barometer reduced to sea level, thermometers exposed and wet bulb, dew point and relative humidity, wind, clouds, and cloud coverage. The time zone used the 75th meridian, Eastern Standard Time. By August, the report contained fifteen pages including river stage. Sgt. Garriott's last submission was in April 1886. He filled in the form to indicate that 7 a.m. 75th meridian time corresponded to 6:17 a.m. local.

On 1 May 1886, Sgt. Frank Burke assumed the observer role for the Signal Service in Louisville. His was the longest tenure of the succession of observers.

1890-1948

On 1 October 1890, Congress passed an act that transferred the weather service from the Signal Service to the Department of Agriculture. According to NOAA history, the new law prescribed that:

> ..the enlisted force of the Signal Service, excepting those hereinafter provided for shall be honorably discharged from the Army on June 30, 1891, and such portion of this entire force, including civilian employees of the Weather Bureau shall, if they so elect be transferred to the Department of Agriculture...

Frank Burke was the first employee of the new Weather Bureau in Louisville. Climatology in Kentucky began formally in January 1889 when the United States Weather Bureau created the Kentucky Weather Service with Frank Burke as its director.

On 1 May 1893, the Weather Bureau Office was moved to the northeast corner of 4th and Chestnut Streets. The office was on the fourth floor with the equipment on the roof. The heights were 132 feet AGL for the anemometer, 111 feet for the thermometers, 127 feet for the sunshine recorder, and 103 feet for the tipping bucket and eight inch rain gages. The barometer was at 525 feet MSL.

Frank Burke's title changed to Director, Climatological Services, Kentucky Section in February 1896. His Kentucky data are contained in the Climatological Data for Kentucky published by the National Climatic Data Center. He continued to provide services until the end of 1897. The succession continued with H. B. Hersey from January 1898 to January 1905 who was replaced by F. J. Walz in February 1905.

On 21 January 1913, the observation location was moved to the northeast corner of 5th and Jefferson Streets. The office was on the 18th floor but equipment was on the roof with the shelter at the base of a 40 foot tower on which the anemometer was mounted. The barometer was at 654 feet MSL.

James L. Kendall continued the succession in June 1920. The Weather Bureau Office was moved to the northwest corner of 4th and Market Streets (Figure 9) on 29 June 1924. The Office was on the 10th floor for four months before moving to the 15th floor. The barometer was always on the 15th floor with the other equipment located on the roof about 234 feet above the ground level. The barometer was at 635 feet MSL.

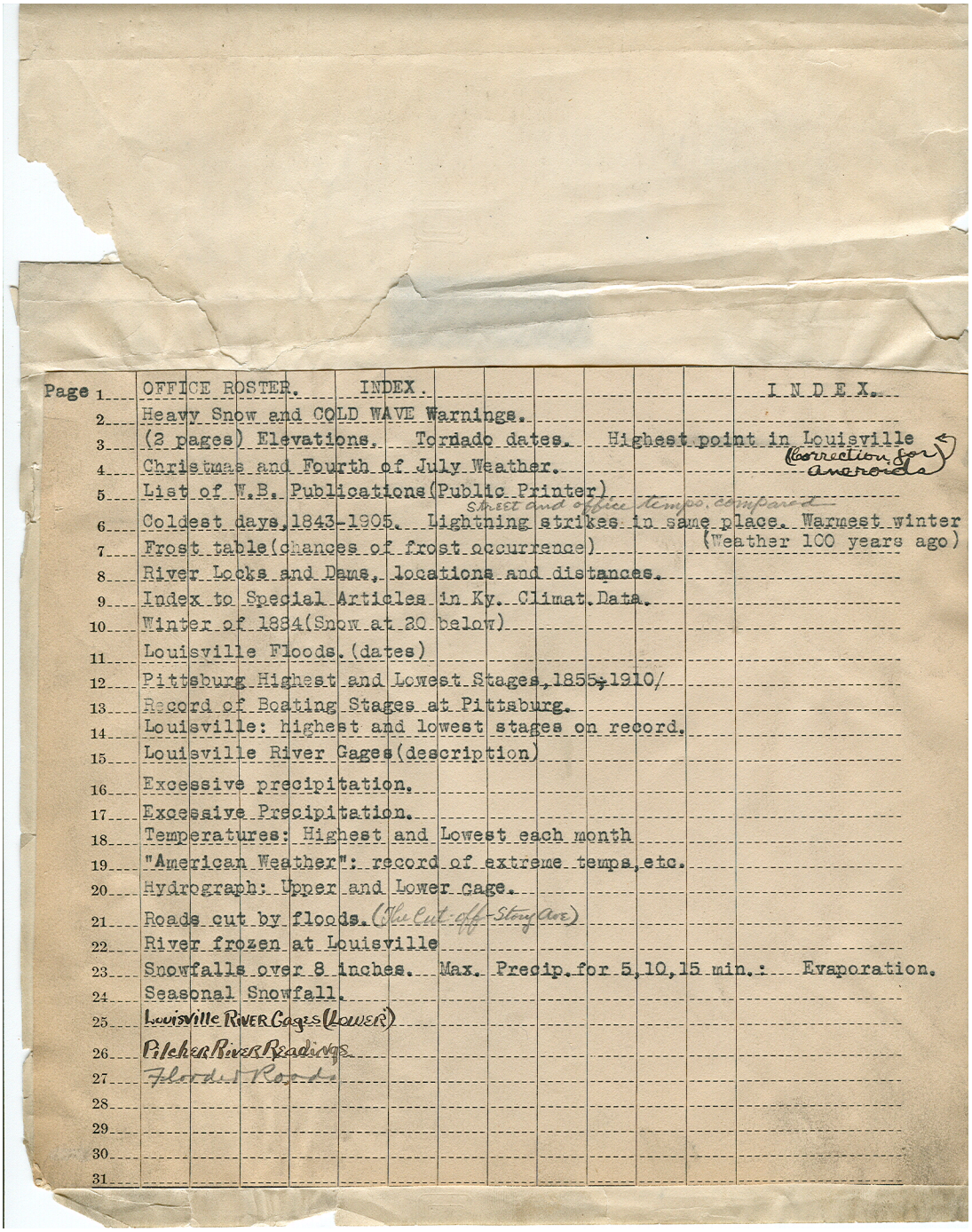
Figure 11. Lincoln Building, 1907, corner of 4th and Market Streets, Louisville
Source: http://www.oldlouisville.com/Ruins/Washington/Washington1907.htm

On 29 April 1939, the Weather Bureau Office moved to the Federal Building and Post Office between 6th and 7th Streets on Broadway. It remained there until 18 January 1955. The Office was on the sixth floor with the anemometer as 120 feet AGL, the thermometers at 106 feet, the sunshine recorder at 118 feet, and the tipping bucket and eight-inch rain gages at 6.4 feet. The barometer was at 531 feet MSL.

Ellwood E. Unger headed the Office from November 1943 to January 1949. The Office and the triple register, sunshine recorder, and tipping bucket rain gage were moved to Bowman Field on 30 June 1945. The Weather Bureau Office downtown continued to observe the weather. Its digital data record was as station number 154956. It was eventually discontinued and its functions were consolidated with the station at Standiford Field on 19 January 1955.

In a scrapbook kept by the Weather Bureau in Louisville, there are a variety of materials. They are contained in a reused, loose leaf book with "SPECIAL WARNINGS, SUNDAYS AND HOLIDAYS ONLY on its cover. Inside is a page that generally describes the contents (Figure

12). Among other things, the scrapbook contains elevations of the barometer over a number of years. See Appendix 1 for those pages.



Page 1 OFFICE ROSTER. INDEX. I N D E X.
2 Heavy Snow and COLD WAVE Warnings.
3 (2 pages) Elevations. Tornado dates. Highest point in Louisville
4 Christmas and Fourth of July Weather.
5 List of W.B. Publications (Public Printer)
6 Coldest days, 1843-1905. Lightning strikes in same place. Warmest winter
7 Frost table (chances of frost occurrence) (Weather 100 years ago)
8 River Locks and Dams, locations and distances.
9 Index to Special Articles in Ky. Climat. Data.
10 Winter of 1884 (Snow at 20 below)
11 Louisville Floods. (dates)
12 Pittsburg Highest and Lowest Stages, 1855-1910/
13 Record of Boating Stages at Pittsburg.
14 Louisville: highest and lowest stages on record.
15 Louisville River Gages (description)
16 Excessive precipitation.
17 Excessive Precipitation.
18 Temperatures: Highest and Lowest each month
19 "American Weather": record of extreme temps, etc.
20 Hydrograph: Upper and Lower Gage.
21 Roads cut by floods.
22 River frozen at Louisville
23 Snowfalls over 8 inches. Max. Precip. for 5, 10, 15 min.: Evaporation.
24 Seasonal Snowfall.
25 Louisville River Gages (Lower)
26 Pitcher River Readings
27 Flood Records
28
29
30
31

Figure 12. Index of Weather Bureau Scrapbook.
Source: Kentucky Climate Center

Bowman Field

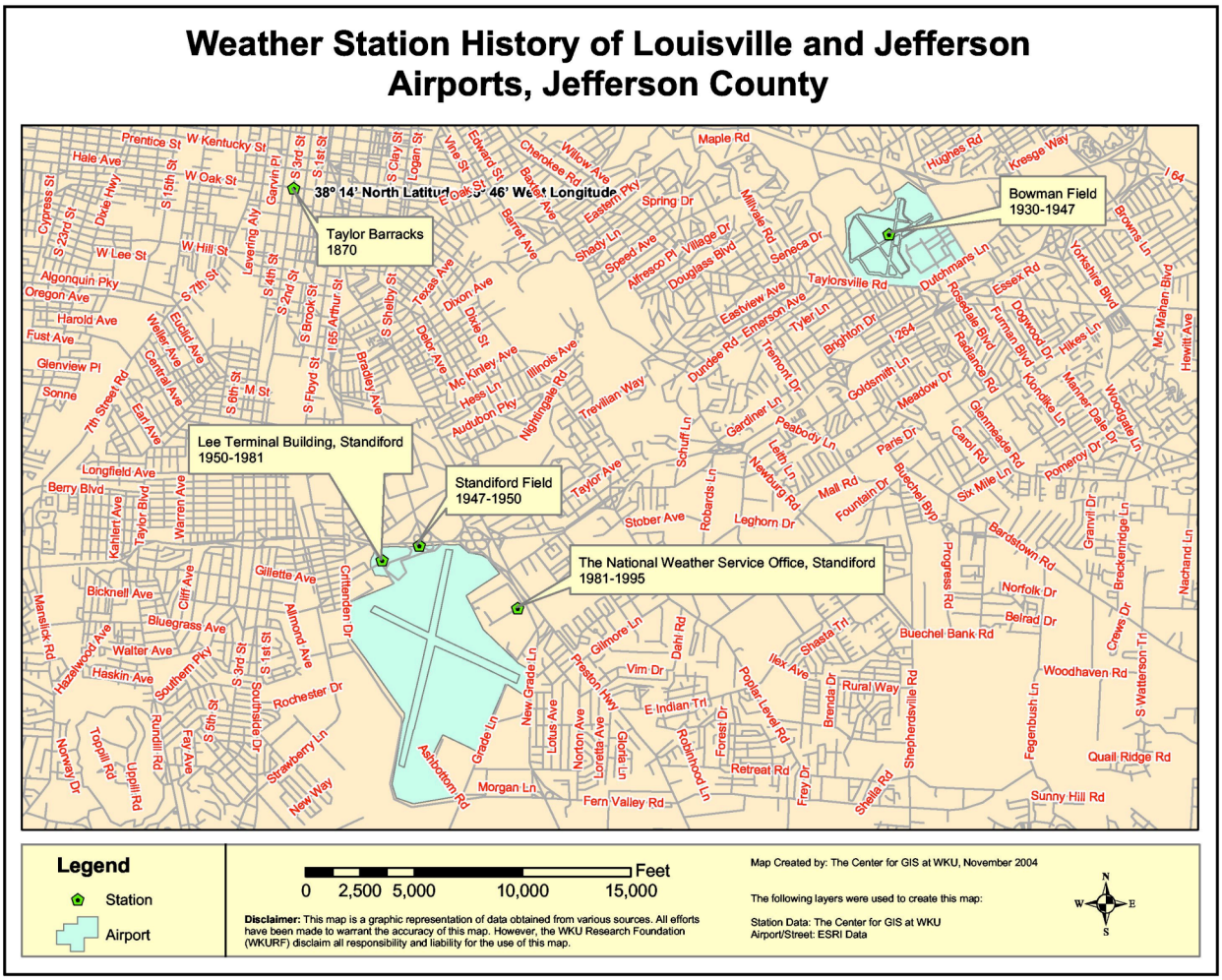


Figure 13. Airport Stations in Louisville
Source: Author and Center for GIS, Western Kentucky University

The Weather Bureau Form 500-1 dated 30 September 1951 provides the station history of Bowman Field. The CAA observed weather from 7 May 1930 to 16 January 1939. They were located in the Administration Building (Figure 14).

Temperature readings were taken over sod. The anemometer was at 44 feet AGL.

The barometer was at 556 feet MSL. On 20 November 1933 the office moved to the second floor. The temperature was measured 19 feet AGL over a gravel and blacktop roof at the second

level. The anemometer was at 48 feet AGL. An eight inch rain gage was used on the roof also. The barometer was at 545 feet MSL.

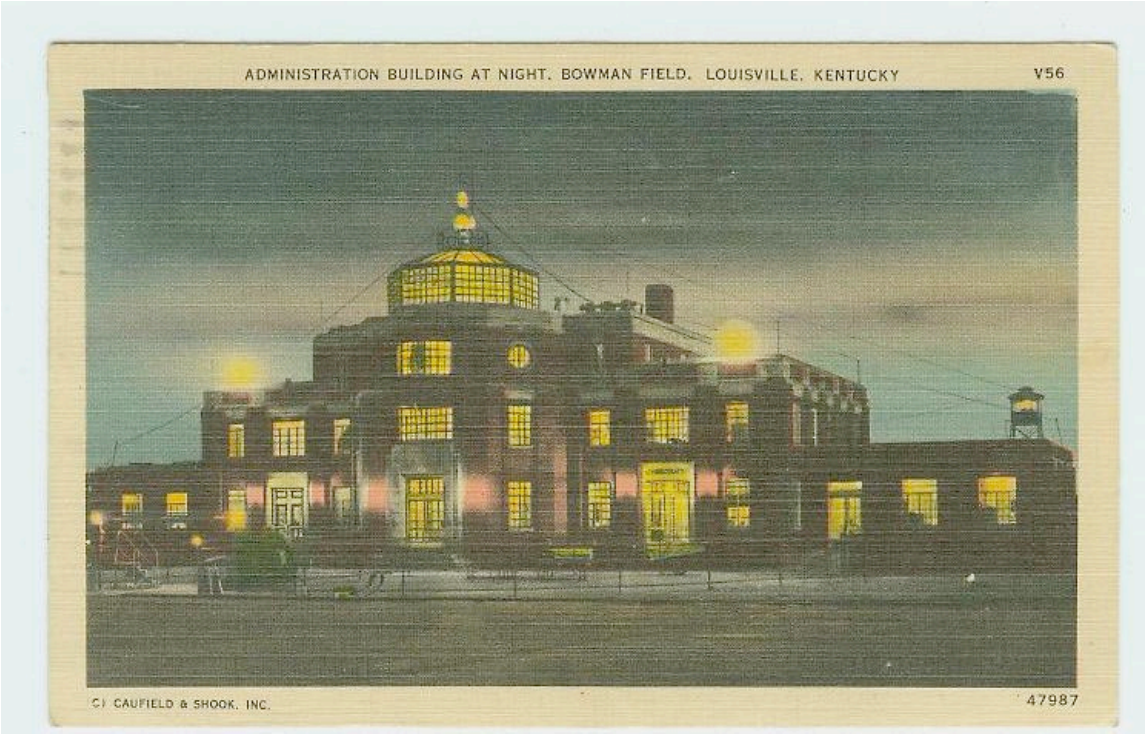


Figure 14. The Administration Building at Bowman Field.
Source: EBay Advertisement.

On 16 January 1939, the office moved back to the first floor and temperature was again measured over sod. The anemometer was 56 feet AGL. On 1 July 1945 a tipping bucket rain and a weighing gage was added to the eight inch gage at ground level. The barometer was at 503 feet MSL. The wind instruments were exposed near the center of a large flat roof and both direction and velocity readings were affected.

The WW II Flight Nurses Association Inc placed a historical marker at Bowman Field. It records that the east side of Bowman Field airport was expanded in 1940 to become the Bowman Field Air Base. It was a training facility with 124 buildings used by the U.S. Army Air Force throughout World War II. One hangar survives. Bowman Field was first used to train bomber crews and later was assigned to the first troop carrier command. Troop carrier units were organized and combat glider pilots trained at Bowman Field. The only school of Air Evacuation in Air Force was located there from 1942 to 1944. It taught surgeons, flight nurses, and medical technicians the procedures for the care of patients in the air.

Pilot balloon observations were taken by Army Weather Observers from 16 April 1942 to 12 December 1944.

On 15 November 1947, the observations were moved to Standiford Field about 4.5 miles away to follow the move of the airline operations. The Weather Bureau operations at Bowman ended when the FAA assumed observational responsibility on 1 December 1947.

Digital data are available for Bowman Field from July 1937 through September 1951 as station number 154951. The FAA Flight Service Station provided weather service at Bowman Field since then.

Standiford Field

An aerial survey during the great Ohio River flood of 1937, showed a large, dry area of land. That dry land eventually became Standiford Field. The new airport was named for Dr. Elisha David Standiford, who owned part of that land. In 1941, the U.S. Army Corp of Engineers cleared and built one north-south runway of 4,000 feet. The runway was needed for building and modifying World War II aircraft.

The Federal Government turned the airport over to the Air Board in 1947. That prompted the move of all commercial flights from Bowman Field to Standiford Field. The Weather Bureau operations made a similar move and began observations on 15 November 1947, the same day that the new field opened for passenger travel.

Figure 15. Lee Terminal at Standiford Field, Louisville, Kentucky ca. 1958.
Source: EBay Advertisement.

Those first observations at Standiford Field were on the blacktop roof of a wooden hanger. The barometer was at 503 feet MSL, the thermometers were at 44 feet AGL, the tipping bucket, weighing, and eight inch rain gage were at 42 feet AGL, and the anemometer was at 59 feet AGL.

There was a move to the Lee Terminal Building (Figures 15 and 16) at Standiford Field on 19 September 1950. There the temperature observations were taken over a black gravel roof at 18 feet AGL, the three rain gages were there too, all about 60 feet west of the office. The anemometer was at 71 feet AGL. The barometer was at 488 feet MSL. On 26 April 1956, the instrument shelter was moved from the roof to a ground exposure 600 feet WSW of the former location.

On 7 May 1960, elevation of the wind equipment changed when it was moved from the top of the tower on the terminal building to a 20 foot tower in the center of the field's runway complex. On 1 June 1960, the hygrothermometer was moved to the center of the runway complex. Psychrometric and extreme temperature readings were also taken at the new location.

A weather radar WSR-3 was commissioned on 20 February 1962. The antenna was mounted on a 12 inch pipe support on the roof of the Lee Terminal. The center of the antenna was 62 feet AGL. The radar console was on the second floor of the terminal.

A change from 2.40" recorder to a shielded 12" dual transverse weighing rain gage was made on 2 Sept 1969. A standard non-recording (stick) gage was installed on 20 November 1969 and an Esterline Angus gust recorder, was installed 12 December 1969.

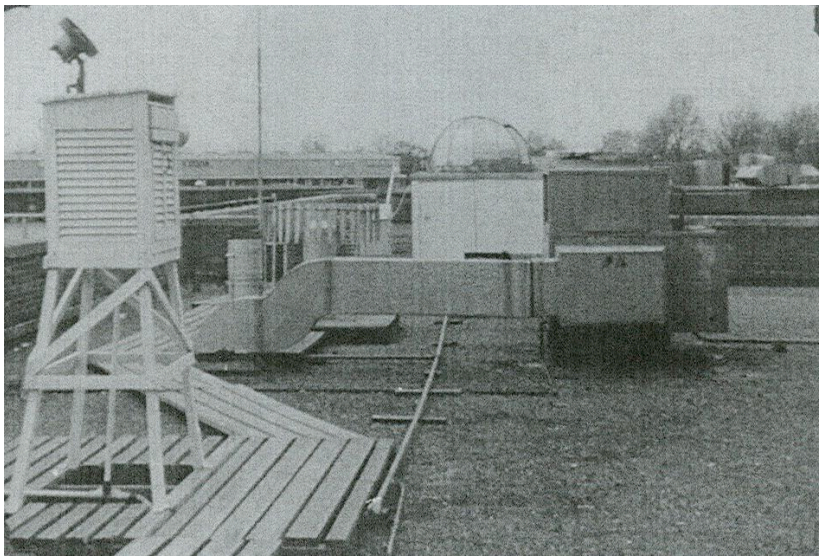


Figure 16. Roof observation site Lee Terminal Building, Standiford Field, 1973. Source: Sturm, 1993.

The observation site in 1973 (Figure 16) was still on the roof of the Terminal Building. The instrument shelter, rain gages, and pibal shelter are visible in the photograph. The picture was taken from the back door of the Weather Office.

In 1974, a tornado with wind gusts of 73 knots knocked over the instrument shelter (Figure 17) and ripped off a portion of the terminal roof depositing it onto the parking lot.

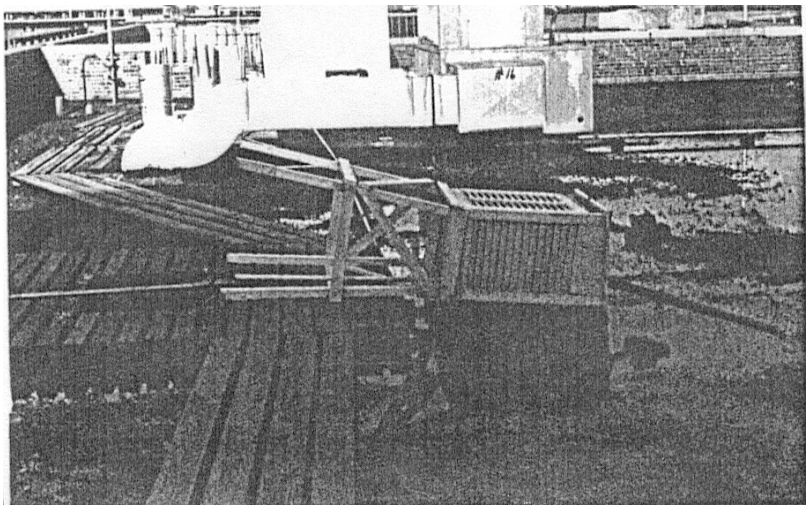


Figure 17. Instrument shelter at Lee Terminal, Standiford Field after a 1974 tornado. Source: Sturm, 1993.

Figure 18. View from observation deck of Lee Terminal, Standiford Field, 1981. Source: Sturm, 1993.

The view from the observation deck of the Lee Terminal was mostly of asphalt and brick (Figure 18).

The Forecast Office was located on the second floor directly above the Eastern Airlines ticket counter and directly below the Air Traffic Control Tower and airport radar. The layout of the Office is shown in Figure 19.

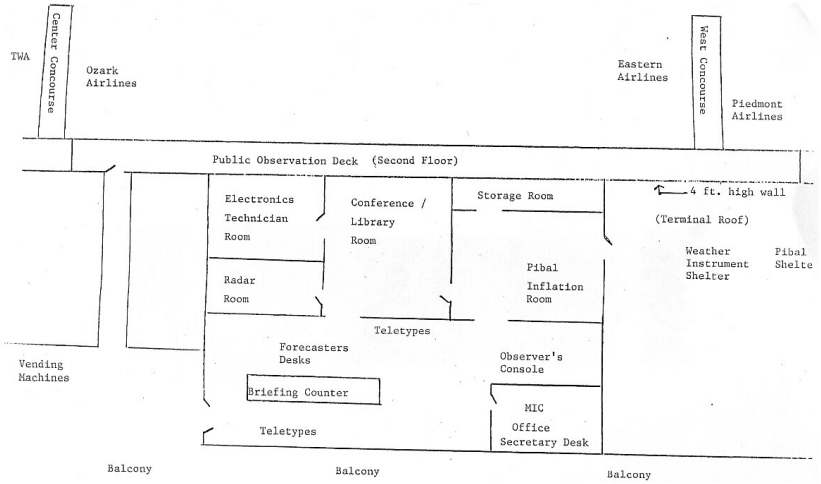


Figure 19. Weather Office layout at Lee Terminal, Standiford Field 1981. Source: Sturm, 1993.

Figure 20. The Weather Forecast Office on Standiford Lane, 28 July 1981. Source: NWS Forecast Office, Louisville.

On 28-29 July 1981, the National Weather Service office moved into a building with the FAA at a location on Standiford Lane on the northeast side of the airfield (Figure 20).

The location of the instrument shelter (Figure 21) was between the FAA building on the runway complex side. Construction of a new terminal began in May 1983 and it opened in 1985.

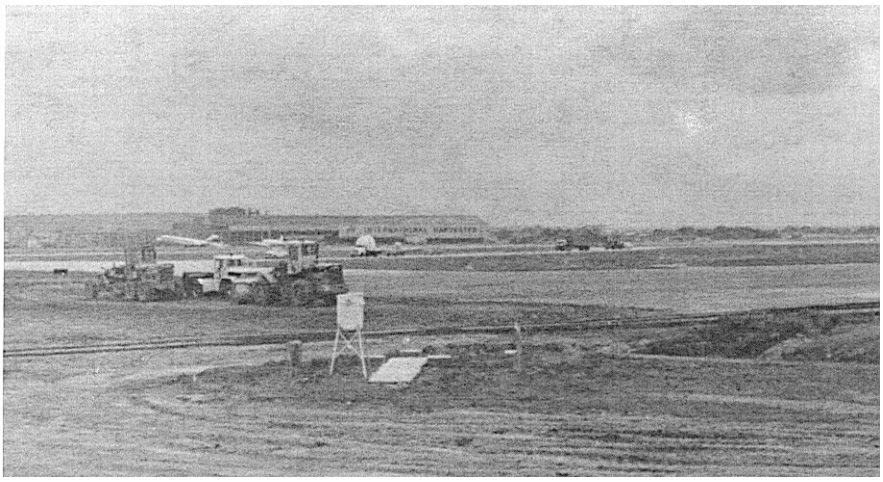


Figure 21. The instrument shelter at the Standiford Lane site, 28 July 1981.
Source: NWS Forecast Office, Louisville.

The new Automated Surface Observation System that was commissioned on 1 August 1994 was left to make the observations at Standiford Field. Beginning July 1, 1945 airport records were made the official records for the city of Louisville. In November 1995, the official records location was moved to the WFO office on Theiler Lane.

Continual digital data are available from 1948 to the present as station number 154949 with the name Louisville – Standiford Field.

Louisville WFO

After the move of the Weather Forecast Office to Theiler Lane in 1995, an observation function developed at the new location (Figure 22). That station's record began on 1 November 1995. Temperature is observed using the MMTS and rainfall is measured with an eight inch rain gage. The observation record is maintained by the staff of the National Weather Service Weather Forecast Office. The digital data from this site are available as station number 154958 with the name Louisville WFO.

Figure 22. Weather Service Forecast Office, Theiler Lane, Louisville.
Source: NWS Forecast Office, Louisville.

Louisville Upper Gage

The U.S. Corps of Engineers observed precipitation from their station at Lock 41 on the Ohio River. The location was recorded as 38˚ 17' north latitude and 85˚48/ west longitude. The precipitation record began on 1 June 1948 with both a recording rain gage and a standard eight inch rain gage. There are river stages available in prior years.

The station continues to report and its digital data are available as station number 154955 with the name Louisville Upper Gage.

Louisville Lower Gage

The U.S. Corps of Engineers has a river stage site located at mile 606.8 on the Ohio River at McAlpine Dam. There is a station number assigned (154953) with the name Louisville Lower Gage. No weather data are available in the digital record.

JEFFERSON COUNTY

This section contains the weather observation locations with Jefferson County whose names did not contain the word Louisville. Since the merger of the governments of Louisville and Jefferson County, all these locations are within the Louisville metropolitan area. They are discussed in alphabetical order.

Anchorage

On 1 February 1895, Emmett. G. Logan began making weather observations at his residence in Anchorage. The station was located at 38˚ 15' north latitude and 85˚ 33' west longitude according to the Weather Bureau Form 530-1 prepared in 1951. The observations included a standard rain gage and maximum-minimum thermometers. Mr. Logan's last observations were in August 1896. Figure 23 shows Anchorage as it appeared in 1879.

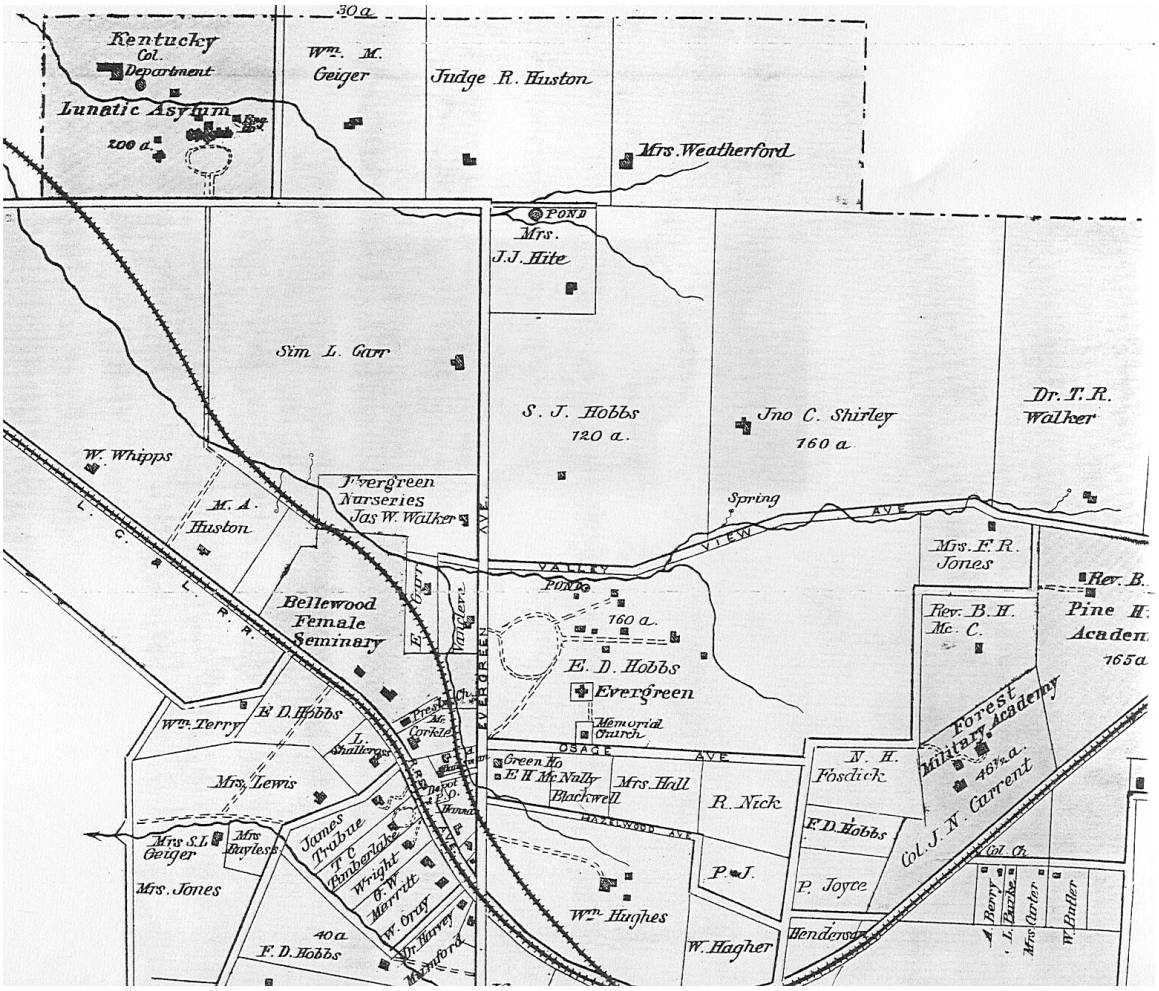


Figure 23. Anchorage, Kentucky in 1879.
Source: Atlas of Jefferson and Oldham Counties Kentucky, 1879

In November 1900, J. J. Barret became the observer. His residence was 0.2 mile southwest of the Post Office at about 38˚ 16' north latitude and 85˚ 33' west longitude at an elevation of about 700 feet MSL. It was described as a good exposure in a wooded and rolling countryside. He had a Cotton Region Shelter with maximum/minimum thermometers and a standard rain gage.

The observation station remained at the same location for the next sixty-four years and the observers were from the same family. J. R. Barret became the observer in October 1902. On 25 March 1960 the site was moved 60 feet south for better exposure. He was replaced by Charles E. Barret in September 1903 who observed the weather until his death on 14 November 1964. According to the 1930 U.S. Census he was an electrical engineer. His wife continued the observations for the next eight days until a replacement was found. The replacement was Lee S. Hamersley. He lived one mile south of the Post Office and the shelter and other instruments were moved from Mr. Barret's residence to his location. On 26 September 1969, George H. Potts became the observer and the equipment moved 0.3 mile to his residence. On 7 October 1970, he was replaced by George W. Warwick and the equipment moved one mile to his residence.

After eighty-eight years of record, the station was discontinued in 1982

Digital data are available for Anchorage using the station number 150155.

Cherokee Park

The Cherokee Park station was located 3.5 miles east-southeast of the Post Office. That was the Louisville Post Office downtown. The station was at 38˚ 15'north latitude and 85˚ 45' west longitude at an elevation of about 530 feet. According to the Weather Bureau form 530 prepared on 26 February 1952, the observer was W. I. Hunt. He observed the temperature and precipitation and his data were published in the Climatological Data for Kentucky. The exposure was described as being on open ground in a partially wooded area.

The station number 151531 was assigned by the National Climatic Data Center. Digital data are available from 1913 to 1930.

Fairdale

The station at Fairdale was located at Horine but the nearest Post Office was 2.1 miles north at Fairdale in southern Jefferson County near the Jefferson County Memorial Forest. It began on 1 November 1978 and was discontinued on 1 July 1981. The location was 38˚ 07' north latitude and 85˚ 47' west longitude. The station was not part of the cooperative observation network. Rather, it was an associate station located on the Hornine Boy Scout Reservation on Holsclaw Hill Road. It was used as part of the Boy Scout Training Program. Its temperature and precipitation observations were seasonal and were neither preserved nor published. The observer was Steve Goodwin of Brooks, Kentucky.

Harrod's Creek

Little is known about the Harrod's Creek observations. The station is listed in the Smithsonian Kentucky Precipitation Means Book Volume 1, page 188 with the observer being Dr. V. H. Hobson. Based on that record, the station number 153648 was assigned by the National Climatic Data Center. The period for which monthly means are recorded is from March 1895 through September 1896. The location of the station was about 38˚ 18' north latitude and 85˚ 37' west longitude. The elevation is estimated to be about 610 feet MSL. The Atlas of Jefferson and Oldham Counties show Harrod's Creek as it was in 1879. The location of the residence where Dr. Hobson presumably made his observations is shown in Figure 24.

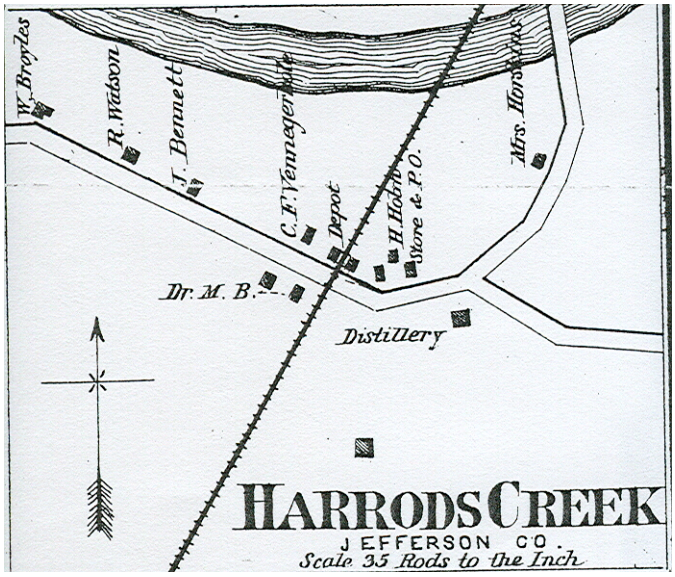


Figure 24. Harrod's Creek, Kentucky in 1879.
Source: Atlas of Jefferson and Oldham Counties Kentucky, 1879

Lyndon

There was a precipitation observation station in Lyndon (Figure 25) in Jefferson County that was located at 38˚ 16' north latitude and 85˚ 37' west longitude. The elevation is estimated to be about 580 feet. According to the Kentucky Precipitation Volume I page 26H of the Smithsonian Means Book, the period of observation was from 1 October 1896 through 31 December 1898. The observer was M. H. Crump. He appears in the 1880 census in Jefferson County but in the Warren County census in 1920. The M. H. Crump in Warren County was also an observer. Therefore it seems likely that they are the same person who moved.

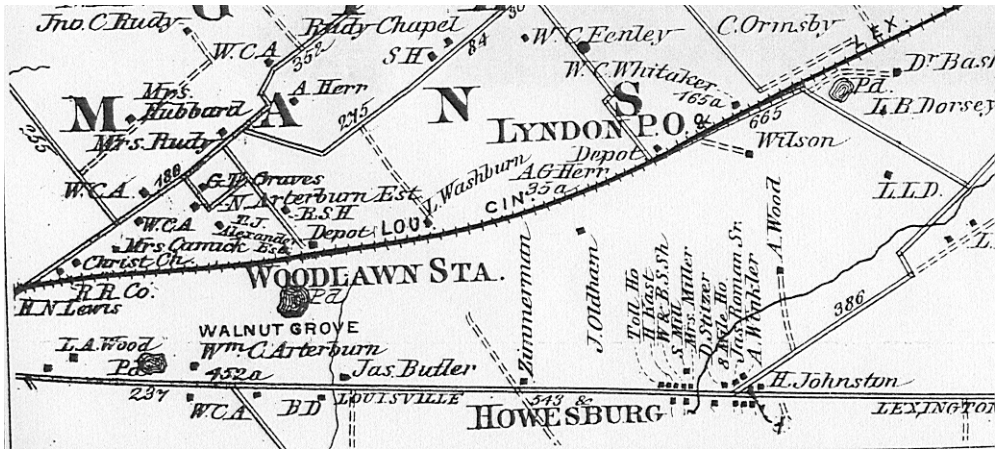


Figure 25. Lyndon, Kentucky in 1879.
Source: Atlas of Jefferson and Oldham Counties Kentucky, 1879

The National Climatic Data Center assigned the number 155053 to the Lyndon station. Location of the original observation records is unknown.

Pleasure Ridge Park

Weather observations were made in Pleasure Ridge Park in southwestern Jefferson County for a short period according to the Weather Bureau Form 530-1 prepared on 16 March 1953. The station was located at 38˚ 09' north latitude and 85˚50' west longitude. The elevation was 447 feet. The observer for the entire period of record was Frank. G. Erskine, Jr. According to the 1900 U.S. Census, he was a merchant who was born in Pennsylvania. He began the record on 16 October 1894 and continued them through 31 January 1898. He recorded rainfall using a standard eight inch rain gage and maximum/minimum temperature.

The National Climatic Data Center assigned station number 156432 to the Pleasure Ridge Park site.

Springdale

One of the most complete and earliest observational records came from Springdale. The earliest of the weather records from Springdale is from April 1843. It had the location listed as Louisville on the Form No. 3, Meteorological Register. The following month, the location was listed as Springdale. The handwriting was the same as was the subsequent records for December 1843 that had the initials "LY" at the bottom. The May 1849 form was signed by the observer Lawrence Young who was a farmer near Springdale (Figure 26). According to the Weather Bureau Form 530 dated 16 March 1853, showed that the location was 38˚ 18' north latitude and 85˚ 37' west longitude at an elevation of 570 feet. His record continued through 31 December

1843. His wife continued the observations beginning on 1 May 1849. She always entered her name in the then proper form of Mrs. Lawrence L. Young. The 1880 Census had here name as Eliza and she was 77 years old in that year. Using that age, she was 43 years old when her first weather records were made in May 1849 as her distinctive handwriting indicates. Her records continued for twenty-two years through 31 May 1871 with only 1850 and 1860 not extant.

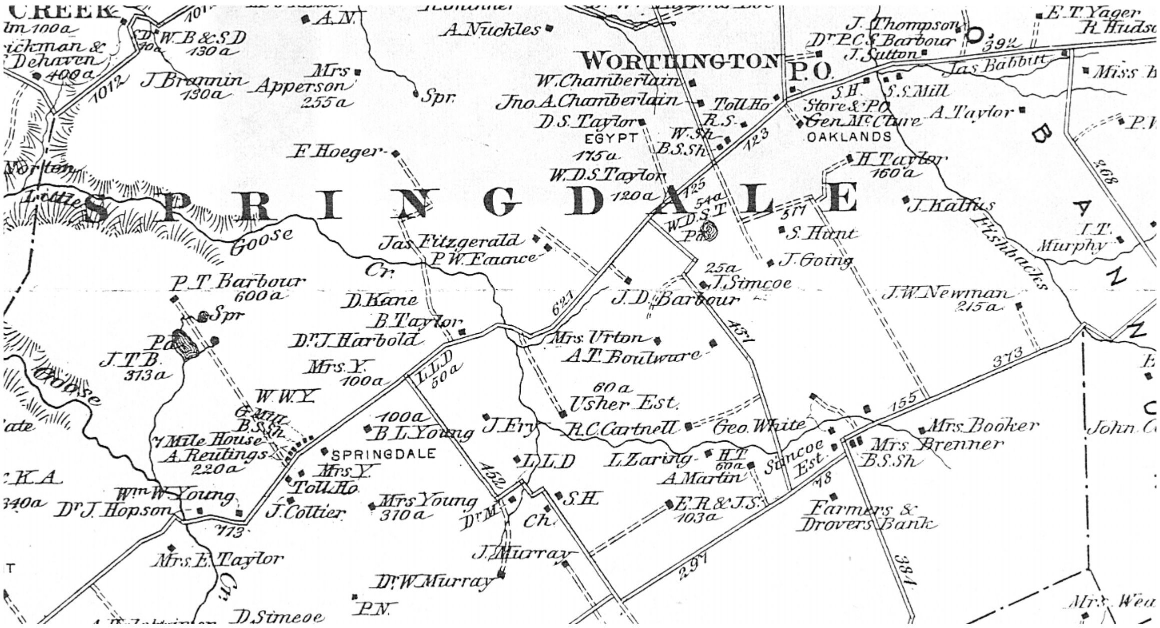


Figure 26. The Springdale community in 1879.
Source: Atlas of Jefferson and Oldham Counties Kentucky, 1879

On the October 1849 record, the location was listed as 38˚ 06' 55" north latitude and 85˚ 24' 13" west longitude at an elevation of 570 feet. This location appears to be in error in both the latitude and the longitude but it was repeated till the end of her period of record. In October 1853, Mrs. Young became an observer for the Smithsonian Institute using their observer form. Before that time, she and her husband before her had used the Navy Department form Meteorological Register that contained instruction that it be mailed to them in Washington D.C.

Note that for the period 1 Oct 1851 through 31 May 1852, William F. Beach was an observer who entered "Louisville" in the Station Name box on all his reports. On each report, that was lined through by a different handwriting and "Springdale" written in parentheses above it. One must conclude that the author of the edit considered that the two stations were compatible for climate studies and that prompted the edit rather than it being a correction to Mr. Beach' location.

The compatibility of the Louisville and Springdale data was examined. The Louisville record began the month after the Springdale record ended (December, 1872). When combined and studied, the record extended from 1841 through 1997 missing only 20 temperature and 23 precipitation months of the 1,884 months during the period. Although the stations are technically incompatible, it is instructive to view them together on a single graph.

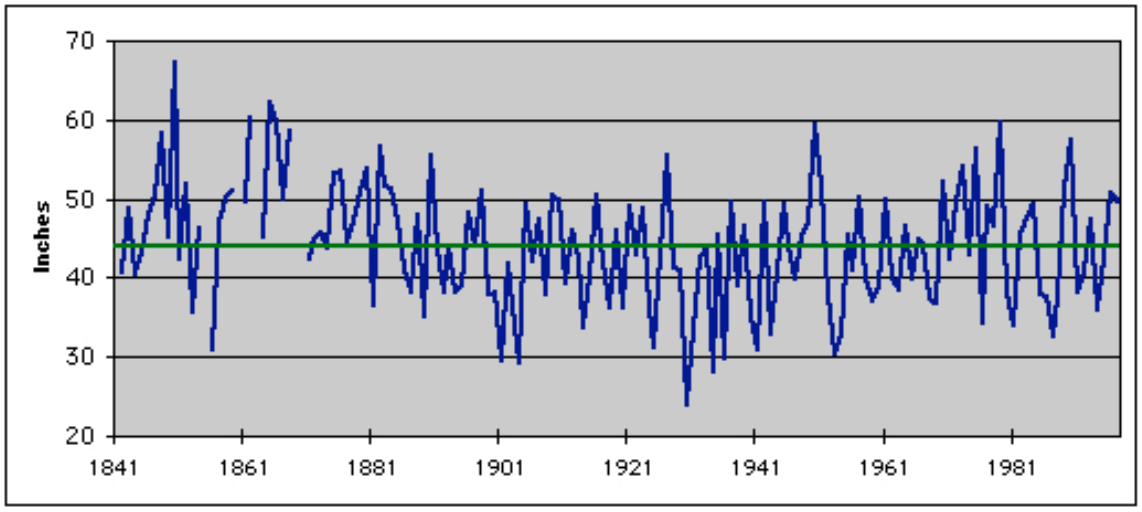


Figure 27. Annual precipitation from the combined Springdale-Louisville stations. Source: Kentucky Climate Center, http://kyclim.wku.edu/factsheets/157_year_clim/

Figure 27 above shows the annual precipitation of the combined Louisville-Springdale stations. It resembles the national graph with the drought years of 1856, 1901, and 1930 clearly visible. The long-term mean of 44.05 inches is shown as a horizontal referent. The standard deviation was 7.78 inches. The wettest year was 1850 with 67.10 inches and the driest was 1930 with 23.88 inches.

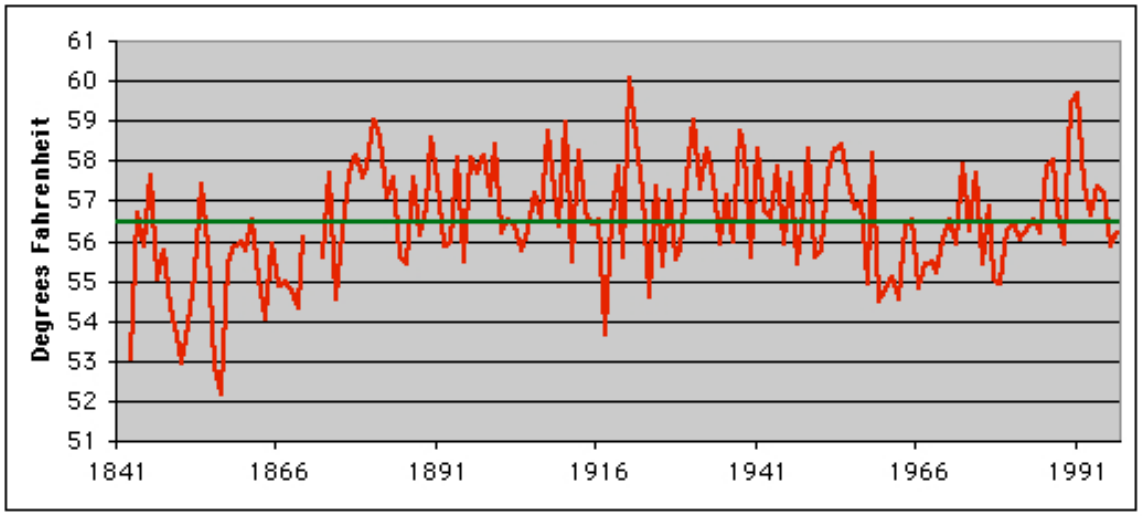


Figure 28. Mean annual temperature from combined Springdale-Louisville stations. Source: Kentucky Climate Center http://kyclim.wku.edu/factsheets/157_year_clim/

Figure 28 depicts the mean annual temperature of the combined Louisville-Springdale stations. The hottest years of 1881, 1921, 1990, and 1991 are visible. The long term mean of 56.43˚F is shown as the horizontal referent line. The standard deviation was 1.44˚F. The hottest year was 1921 with 60.07˚F and the coldest was 1857 with 52.18˚F.

Springdale was assigned the station number of 157596 by the National Climatic Data Center.

Taylor Barracks

The U. S. Army's Taylor Barracks in Louisville was located at Third and Oak Street in Louisville. It served as an induction center for African-Americans during the Civil War. The precise location is not indicated on the surviving observation form. The position is estimated to be 38˚ 14' north latitude and 85˚ 46' west longitude.

The earliest extant form is the Army's Meteorological Register for October 1870. The observer was Curtis E. Price who was the Acting Assistant Surgeon at the Post. Temperature was recorded at 7 a.m., 2 p.m. and 9 p.m. as were the wind direction and force, the amount of cloudiness, the rain or melted snow quantity, and remarks. Also included was a form containing the dry and wet bulb temperature for each of those times. For March 1871, the observer was John J. Milhan, Surgeon. That was the last surviving record.

The National Climatic Data Center assigned station number 157940 to the Taylor Barracks station in the digital record.

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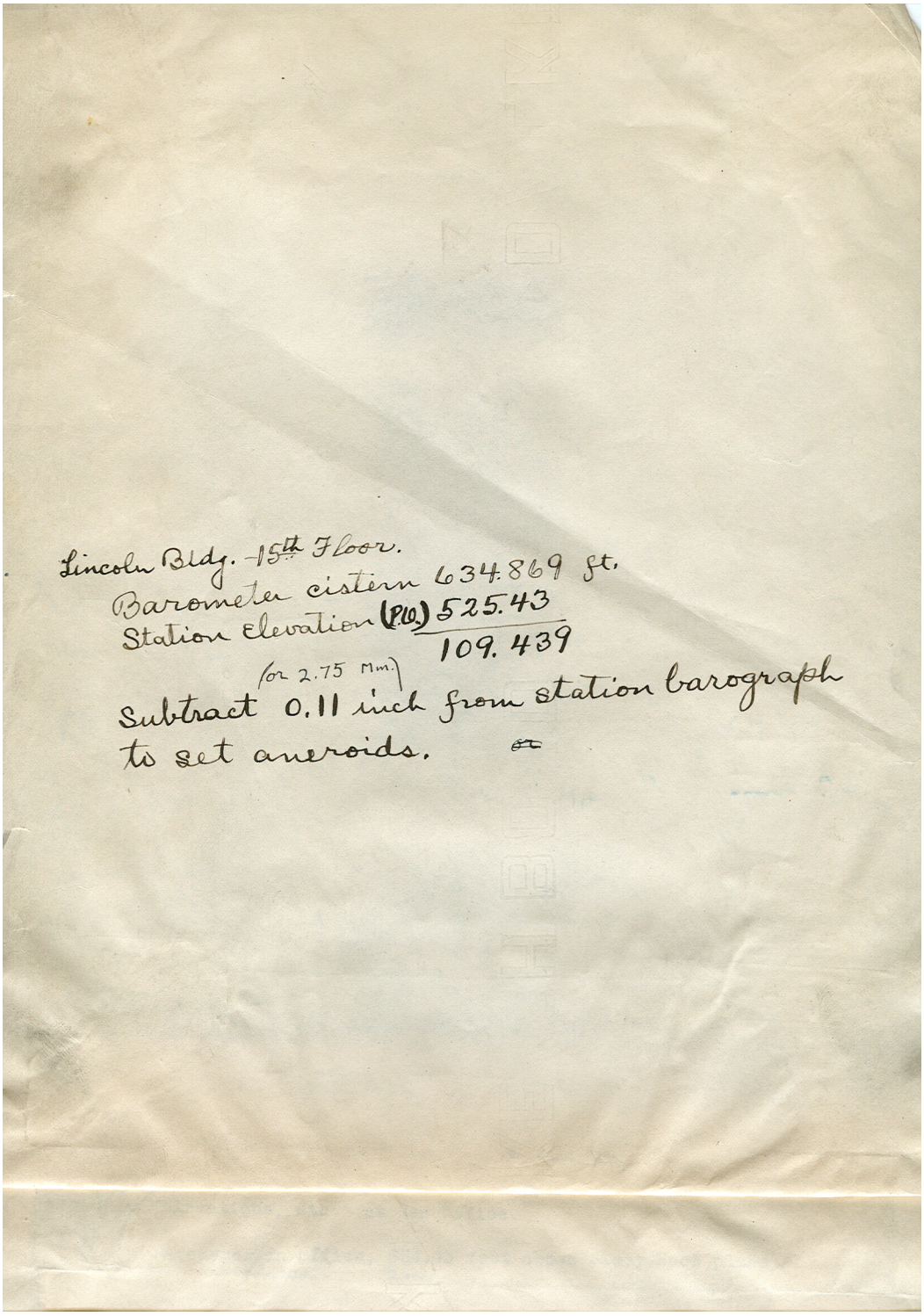
Appendix 1

LOUISVILLE ELEVATIONS

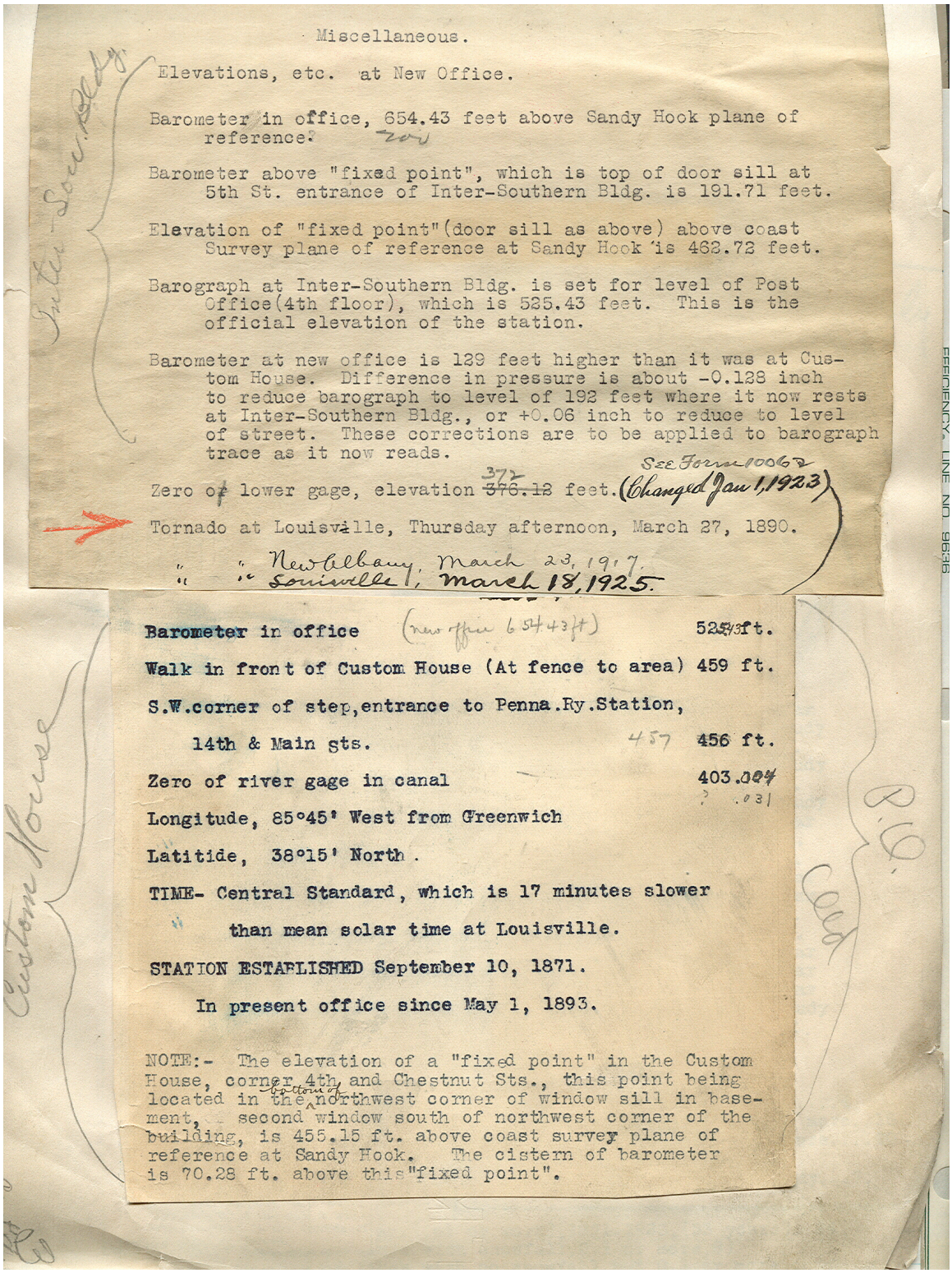


E L E V A T I O N S.

UNITED STATES DEPARTMENT OF AGRICULTURE
WEATHER BUREAU
LOUISVILLE, KY.

(SE Corner of Colored Stone, middle of doorway) July, 1924.

BM.	Fixed point, doorsill Lincoln Bldg.	466.419
	15th. Floor, Barometer cistern above sidewalk	168.450
	" " Barometer cistern above sea-level	634.869
	Roof. Fixed points.	
	Top of lowest girt of tower (NE corner)	646.89
	Top of NE skylight (edge of glass)	649.28
	Top of Rain gage	182.6
	Roof under shelter	178.4
	Bulb of Dry thermometer	187.9
	Center of Anemometer cups	233.6
	Lower edge of Wind Vane	234.9



Miscellaneous.

Elevations, etc. at New Office.

Barometer in office, 654.43 feet above Sandy Hook plane of reference.

Barometer above "fixed point", which is top of door sill at 5th St. entrance of Inter-Southern Bldg. is 191.71 feet.

Elevation of "fixed point"(door sill as above) above coast Survey plane of reference at Sandy Hook is 462.72 feet.

Barograph at Inter-Southern Bldg. is set for level of Post Office(4th floor), which is 525.43 feet. This is the official elevation of the station.

Barometer at new office is 129 feet higher than it was at Custom House. Difference in pressure is about -0.128 inch to reduce barograph to level of 192 feet where it now rests at Inter-Southern Bldg., or +0.06 inch to reduce to level of street. These corrections are to be applied to barograph trace as it now reads.

Zero of lower gage, elevation ~~376.12~~ 372 feet. See Form 1006 (Changed Jan 1, 1923)

Tornado at Louisville, Thursday afternoon, March 27, 1890.

" " New Albany, March 23, 1917.

" " Louisville, March 18, 1925.

Barometer in office (new office 654.43 ft) 525 ft.

Walk in front of Custom House (At fence to area) 459 ft.

S.W.corner of step, entrance to Penna.Ry.Station, 14th & Main sts. 457 456 ft.

Zero of river gage in canal 403.00 ? .031

Longitude, 85°45' West from Greenwich

Latitide, 38°15' North.

TIME- Central Standard, which is 17 minutes slower than mean solar time at Louisville.

STATION ESTABLISHED September 10, 1871.

In present office since May 1, 1893.

NOTE:- The elevation of a "fixed point" in the Custom House, corner 4th and Chestnut Sts., this point being located in the bottom of northwest corner of window sill in basement, second window south of northwest corner of the building, is 455.15 ft. above coast survey plane of reference at Sandy Hook. The cistern of barometer is 70.28 ft. above this "fixed point".

Source: Scrapbook of notes, data compilations, extreme events, newspaper clippings of Weather Bureau quotes, collected by the Weather Bureau in Louisville, mostly 1920's, 1930's, and 1940's.
Source: Kentucky Climate Center, Bowling Green, Kentucky.

APPENDIX 2

METHODOLOGY

The primary sources of information for this study were the Louisville and Jefferson County observers' daily weather records themselves. Copies of their monthly reports were available in the Kentucky Climate Center at Western Kentucky University and the data digitized from those reports were available from the Midwestern Regional Climate Center in Champaign, Illinois, or the National Climatic Data Center in Asheville, North Carolina. The monthly reports can be considered original sources because they were written by the observers and not altered by subsequent readers.

There were a variety of secondary sources that held information about Louisville, its history, and its people. The author visited and collected information from the holdings of the Kentucky Climate Center and the Kentucky Library at Western Kentucky University in Bowling Green, Kentucky; the National Climatic Data Center at Asheville, North Carolina; the Louisville Public Library and the National Weather Service Office in Louisville, Kentucky; the Kentucky State Archives and the Kentucky History Center in Frankfort, Kentucky; the Filson Historical Society in Louisville, Kentucky; the Cincinnati Public Library in Cincinnati, Ohio; and the LDS Family History Library in Salt Lake City, Utah.

The tertiary sources were reference materials that are available on-line. Among those were the metadata summaries prepared by the Kentucky Climate Center, Midwestern Regional Climate Center, the National Climatic Data Center substation histories, and the Office of Medical History in the Office of the Surgeon General, U.S. Army. Two genealogical research sources, Ancestry.com and Genealogy.com were used to provide some of the personal information about the observers. For location analysis, the interactive maps available from TopoZone.com were used.

There was an attempt to glean information from all these sources that would allow a glimpse into the lives of the observers, the location of the observation site, and the historical environment that produced the climatic history of Louisville, Kentucky. Maps, drawings, and photographs were included when appropriate to illustrate the information.

Throughout the research for and preparation of this study, the objective was to produce a document that future studies can use to evaluate the validity of the data that were collected here, judge the trustworthiness of the observers who collected them, and determine the climatological significance of the whatever variability may be discerned.