

THE HISTORY OF WEATHER OBSERVING IN CHEYENNE, WYOMING, 1870-2004



Downtown Cheyenne, Wyoming, circa 1890

From Wyoming State Archives, Department of State Parks and Cultural Resources

**Current as of
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Executive Summary

Weather observations in the Cheyenne, Wyoming, area have been taken at several sites in the city located within a few blocks of each other until the move to the airport in 1935. The U.S. Army Signal Service began observing in Cheyenne in 1870 located downtown at several sites including the observer's home. The Weather Bureau took over the observing duties in 1892, occupying three locations before relocating to the airport. Since moving to the airport in 1935 the Weather Bureau (now the National Weather Service) has located their instruments at four primary locations.

Goal of Study

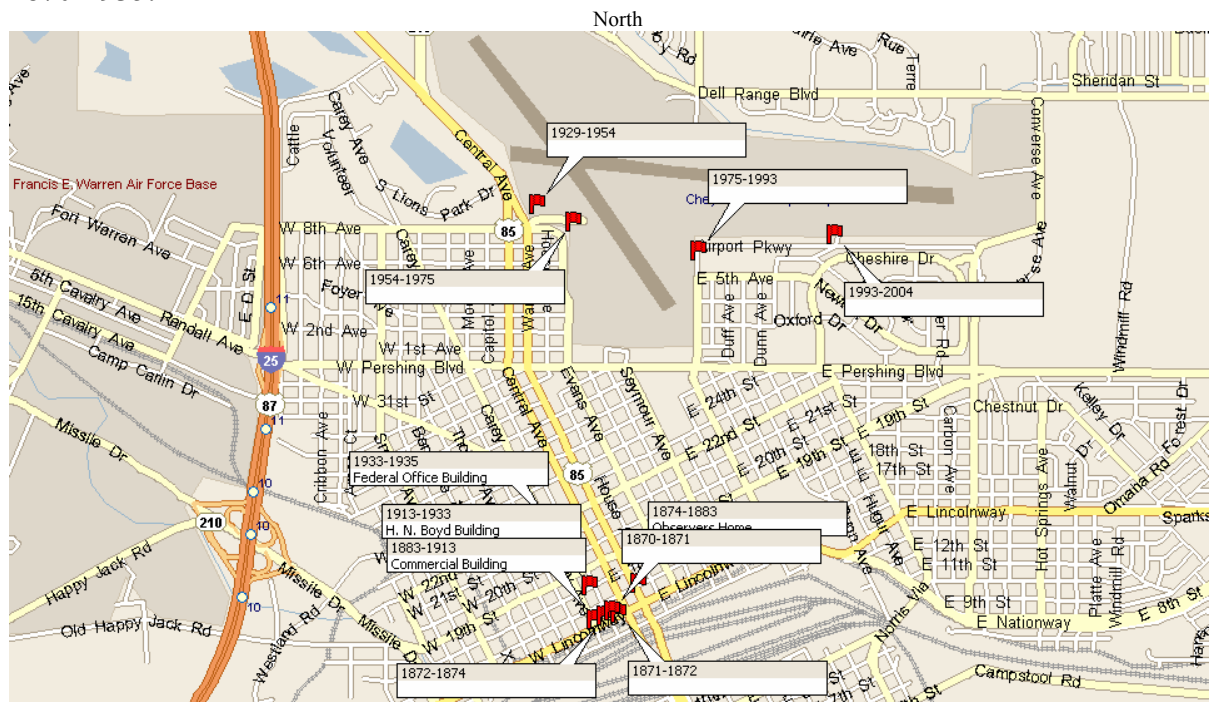
The goal of this study is to document the primary weather observational path at Cheyenne, Wyoming, leading to the current and on-going National Weather Service observing program. The challenge was to identify and define the roots of the path that began in the 1870s. Though other weather observers have been in the Cheyenne area those not considered part of the original path have been excluded from this study. This does not minimize the importance of these collateral observations, but does allow for the focusing on the formal weather observing program that continues to this day.

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

Location Maps



Map 1. The location of downtown weather observing sites at Cheyenne, Wyoming, 1870-1935.



Map 2. The location of weather observing sites at Cheyenne, Wyoming, 1870-2004.

The following lists the chronology of weather station locations in the Cheyenne, Wyoming, area from 1870 until 2004:

October 1870 – April 1871 – Signal Service - Elevation 6,067.1 feet - 41° 08' N, 104° 48' W

- 16th Street between Carey and Capitol Avenues (originally Ferguson and Hill Streets, respectively)

May 1871 – February 1872 – Signal Service - Elevation 6,067.1 feet - 41° 08' N, 104° 48' W

- Corner 16th and Capitol Avenues

February 1872 – June 1874 – Signal Service – Elevation 6,068.1 feet - 41° 08' N, 104° 48' W

- Corner 16th Street and Carey Avenue

June 1874 – November 1883 – Signal Service – Elevation 6,062.5 feet - 41° 08' N, 104° 48' W

- 17th Street between Central and Warren Avenues (originally Ransan and Dodge Streets, respectively) at the home of observer

December 1883 – September 1913 – Signal Service/Weather Bureau – Elevation 6,087.5 feet - 41° 08' N, 104° 48' W

- Commercial Building, 218 ½ West 16th Street

September 1913 – November 1933 – Weather Bureau – Elevation 6,121 feet - 41° 08' N, 104° 48' W

- H. N. Boyd Building, Corner 18th Street and Carey Avenue

December 1933 – August 1935 – Weather Bureau – Elevation 6,076 feet - 41° 08' N, 104° 48' W

- Federal Office Building, 21st Street and Carey Avenue

August 1929 – August 1954 – Weather Bureau – Elevation 6,139 feet - 41° 09' N, 104° 49' W

- Municipal airport, 112 East 8th Avenue

August 1954 – November 1975 – Weather Bureau – Elevation 6,126 feet - 41° 09' N, 104° 49' W

- Municipal airport, 4101 Evans Avenue, Control Tower Building

November 1975 – August 1993 – Weather Bureau/National Weather Service – Elevation 6,126 feet - 41° 09' N, 104° 49' W

- Municipal airport, 4000 Morrie Avenue

August 1993 – 2004 – National Weather Service – Elevation 6,120 feet - 41° 09' N, 104° 49' W

- Municipal airport, 1301 Airport Parkway
- ASOS instrument suite was commissioned on November 1, 1995.

Location and Instrument Descriptions

1870-1871: The first U.S. Army Signal Service weather observer arrived in Cheyenne on October 15, 1870. The observing program began in a second floor office on 16th Street, between Carey Avenue and Capitol Avenues (originally known as Ferguson and Hill Streets, respectively) on November 1, 1870. The observer was Sergeant Asa C. Dobbins. This location was in the center of the business portion of the town and in the immediate vicinity of the telegraph office. The roof of the building was flat and provided a good exposure for the wind vane, anemometer, and rain gage.

Thermometer – The thermometer was located outside a window facing north northwest on the second floor 17 feet above the ground. Sergeant Dobbins listed his shelter as being “of the authorized pattern, with louver-boarded sides and front, and project from a window of the office.”

Barometer – The barometer was located at a height of 6,075.1 feet above mean sea level.

Wind instruments - The instruments were located at 29 feet above the ground.

Rain gage – An eight-inch gage was located at 10 feet above the ground.

1871-1872: Sergeant Asa C. Dobbins moved the observing program to a second floor office on the west side of Capitol Avenue., south of 16th Street on May 1, 1871. The office was located on the second floor with two windows facing north northwest and west southwest. This was a move of 135 feet east.

Thermometer –The thermometer was located in an outside window facing NNW on the second floor 17 feet above the ground.

Barometer – The barometer was located at a height of 6,075.1 feet above mean sea level.

Wind instruments - The instruments were located at a height of 29 feet.

Rain gage – An eight-inch gage was located at a height of 30 feet.

1872-1874: Another move was made on February 20, 1872, to the corner of 16th and Carey Avenue. The building was south of 16th Street and east of Carey Avenue. The office was located on the second floor in the northwest corner of the building. This was a move of 270 feet west.

Thermometer – The thermometer was located in an outside window facing north northwest on the second floor 19 feet above the ground.

Barometer – The barometer was located at a height of 6,076.1 feet above mean sea level.

Wind instruments – The instruments were located at a height of 33 feet.

Rain gage – An eight-inch gage was located at a height of 26 feet.

1874-1883: On June 20, 1874, Sergeant Dobbins moved the observing program into his home on 17th Street between Central Avenue and Warren Avenue (originally known as Ranson and Dodge Streets, respectively.) The house was on the south side of 17th Street. This was a move of 800 feet east northeast. See Figure 1.



Figure 1. An view of Cheyenne, Wyoming, in 1882. The white arrow shows the site of weather observations as of 1882 on 17th Street between Ranson and Dodge Streets. The blue arrow shows the sites of weather observations prior to 1882 located along 16th Street. The red arrow shows the site of weather observations after 1882 at 218 West 16th Street. From the Library of Congress, Division of Maps, G4264 .C5A3 .57

Thermometer – The thermometer was located at a height of 15 feet above the ground.

Barometer – The barometer was located at a height of 6,070.5 feet above mean sea level.

Wind instruments - The instruments were located at a height of 33 feet.

Rain gage – An eight-inch gage was located at a height of 24 feet.

1883-1913: The next location was at the Commerce Building, 218 ½ West 16th Street, beginning in December 1883. The office was on the third floor in rooms 31-33. See Figure 2. This was a move of 600 feet southwest. The U.S. Department of Agriculture's Weather Bureau assumed responsibility for the observing program in January 1892 remaining in the Commerce Building until September 28, 1913.

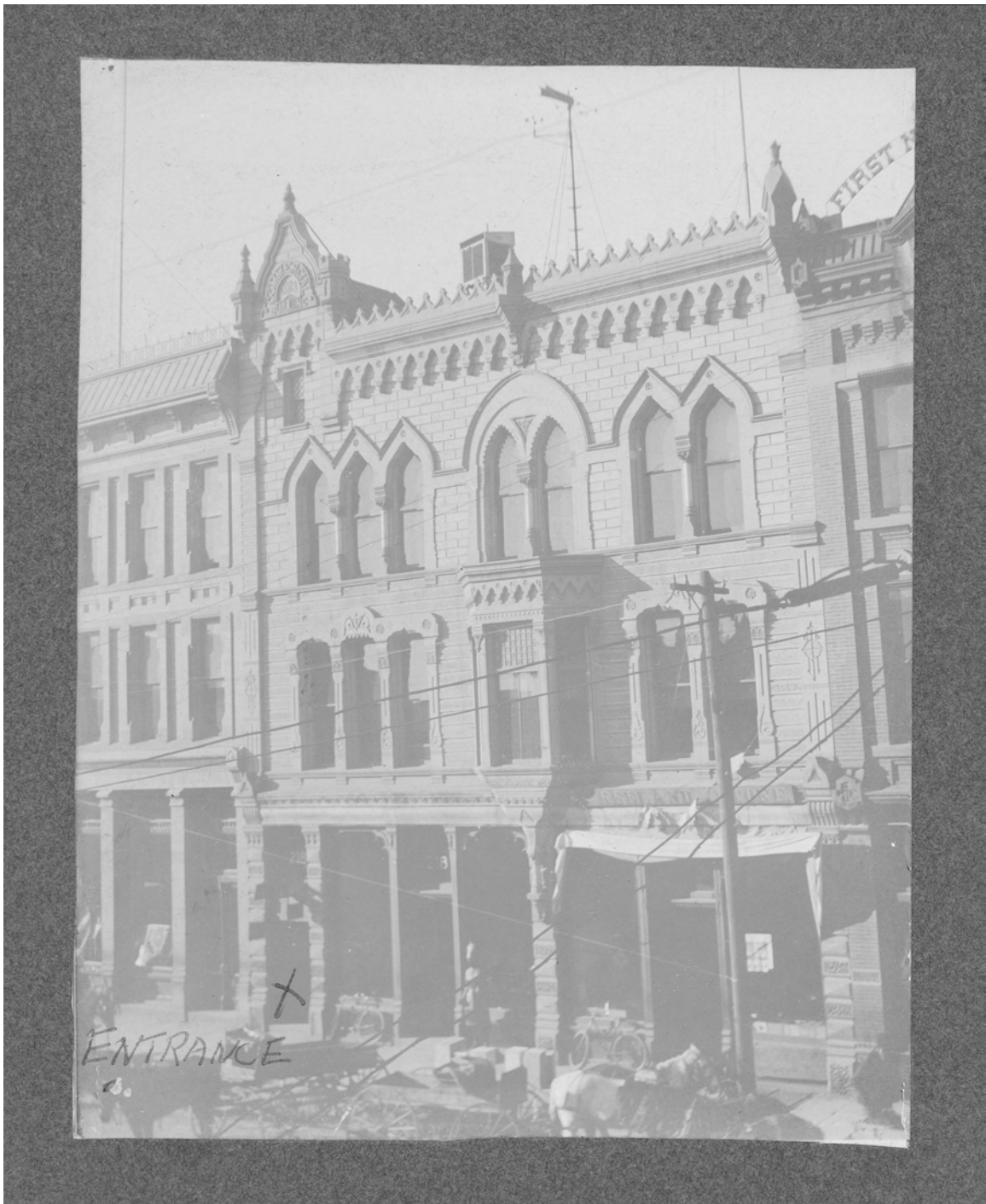


Figure 2. The Weather Bureau offices in the Commerce Building, Cheyenne, Wyoming circa 1900. The instrument shelter and wind instruments are clearly visible on the roof. From the Wyoming State Archives, Department of State Parks and Cultural Resources.

Thermometer – The thermometer was located outside an attic window on the north side until July 1, 1884, when supports were installed under the shelter and it was moved to a roof location. The instruments were located at a height of 56 feet.

Barometer – The barometer was located at an elevation of 6,094.2 feet above mean sea level.

Wind instruments - The instruments were located on the roof at a height of 64 feet.

Rain gage – A tipping bucket gage and an eight-inch gage was located on the roof at a height of 49 feet.

1913-1933: The office moved to the Citizen's National Bank Building on the southwest corner of 18th Street and Carey Avenue (also listed as 1720 Carey Avenue) on September 28, 1913. The offices were located on the sixth (top) floor in rooms 608, 610, 612, 614, and 616. This was a move of 600 feet northwest. The building was later known as the H. N. Boyd Building. See Figure 3.

Thermometer – The thermometer was located at a height of 84 feet.

Barometer – The barometer was located at an elevation of 6,127.3 feet above mean sea level.

Wind instruments - The instruments were located at a height of 101 feet.

Rain gage – A tipping bucket gage and an eight-inch gage were located at a height of 75 feet.



Figure 3. The H. N. Boyd Building in downtown Cheyenne, Wyoming circa 1920's. Notice the instrument shelter just visible on the roof. From the Wyoming State Archives, Department of State Parks and Cultural Resources.

1933-1935: The last downtown location was in the Federal Office Building located at 21st Street and Carey Avenue beginning in December 1933. The offices were located on the third floor in rooms 305, 305A, 307, and 307A. This was a move of 1,000 feet north northwest. See Figure 4.

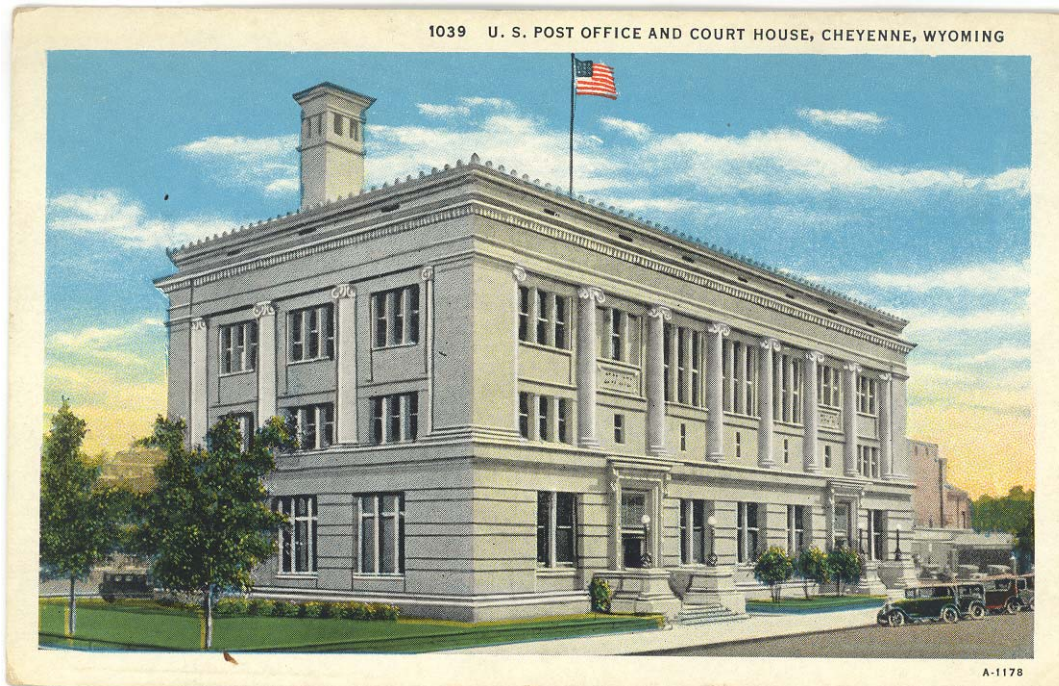


Figure 4. The U.S. Federal Building in Cheyenne, Wyoming, circa 1920. Unfortunately, the weather instruments are not visible in this picture. From author's personal collection of post cards.

Thermometer – The instrument shelter was located 11.5 feet above the roof and 50 feet above the ground. The instrument stand and rain gage were located on a wooden platform 24 x 16.2 feet. The platform was 1 to 1.5 feet above the roof sloping to the north.

Barometer – The barometer was located at a height of 6,106.80 feet above mean sea level.

Wind instruments - The anemometer cups were located 19.5 feet above the penthouse roof and 32 feet above the roof of the building or 71 feet above the ground. The wind vane was located 21.6 feet above the penthouse roof and 34.1 feet above the building roof or 73.1 feet above the ground.

Rain gage – A tipping bucket gage and an eight-inch gage were located at a height of 42 feet above the ground and the top of the gages was 4.3 feet above the platform.

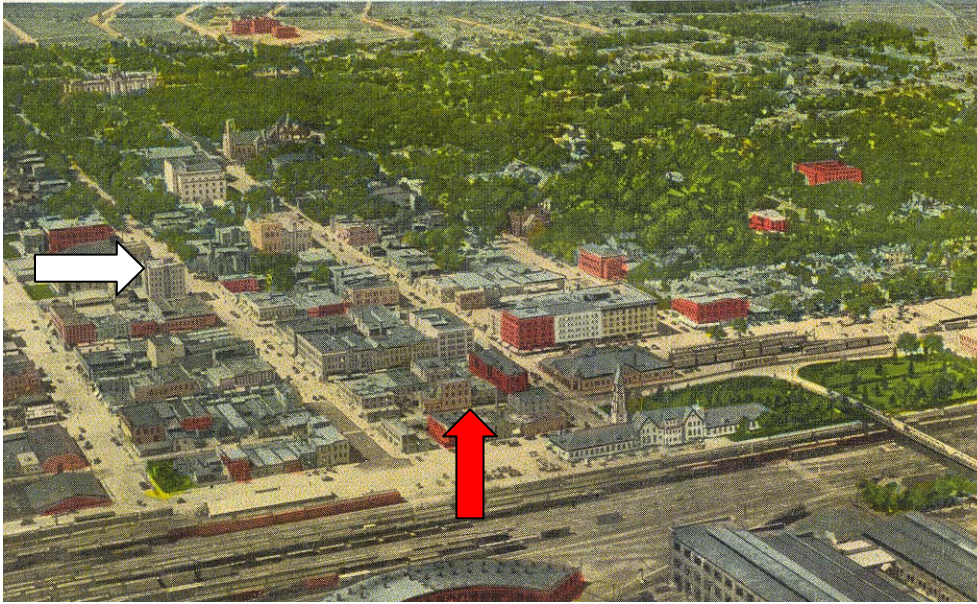


Figure 5. Aerial view of downtown Cheyenne, Wyoming, circa 1940. This photograph gives a good perspective of the various downtown weather observing locations. The red blue arrow indicates the location of the Weather Bureau office and the white arrow shows the H. N. Boyd Building. From the author's personal postcard collection.

1929-1954: On September 1, 1935, the official weather observing program moved to the municipal airport. Reference was found that the instruments were in place at the airport as early as August 10, 1929, but no observational records were found in the archives. The office was located at the corner of 8th Avenue and Central Avenue, 1 ¼ miles north of the business district. This was a move of 1.4 miles north. See Figures 6 and 7 for a view of the airport in the late 1930's. The downtown location was closed effective September 1, 1939, when the two stations were consolidated.



Figure 6. The Cheyenne, Wyoming airport, circa 1935. The location of the Weather Bureau office and instruments is indicated by the white arrow. From the author's personal postcard collection.

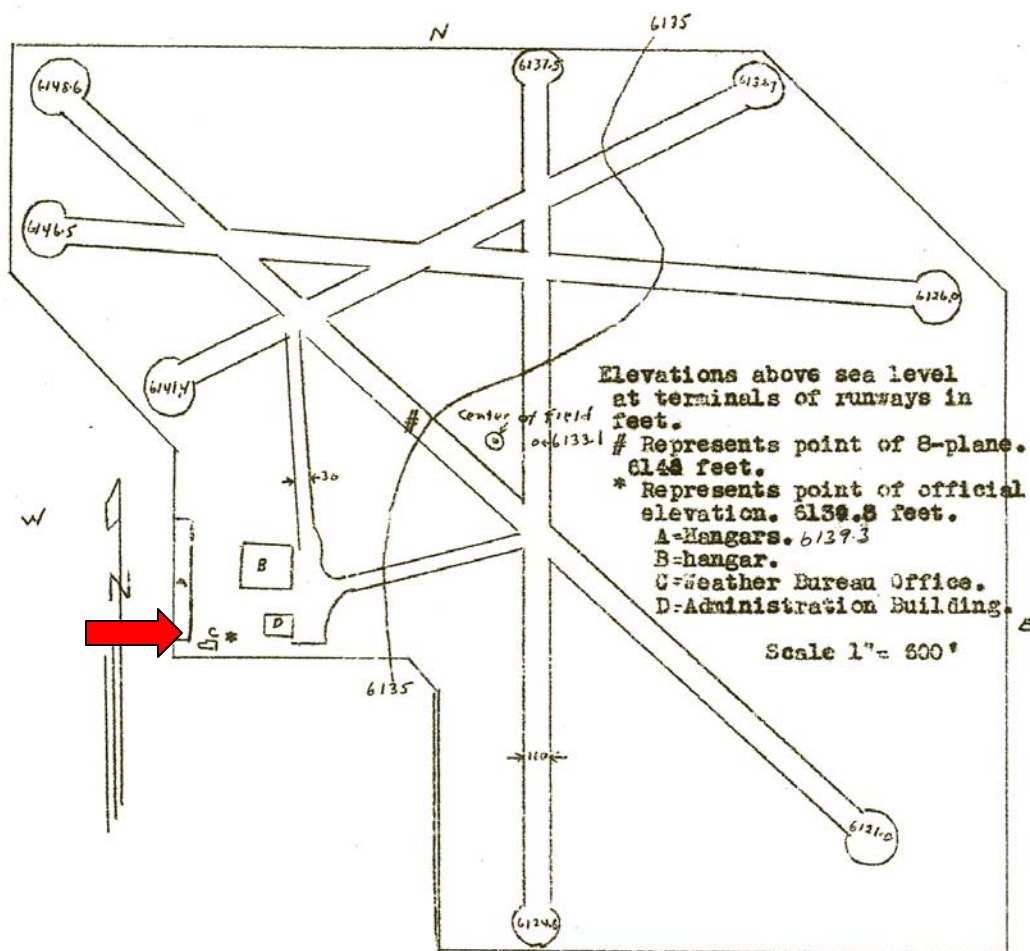


Figure 7. Drawing of the Municipal Airport in Cheyenne, Wyoming, circa 1937, showing the location (location C, red arrow) of Weather Bureau office. From official station history files, National Climatic Data Center.

Thermometer – The instrument shelter was located over sod at a height of 5 feet above the ground. Effective September 20, 1945, the shelter was moved to a roof location with the shelter now 5 feet above the roof and a height of 22 feet above the ground.

Barometer – Station barometer number 714 was located at an elevation of 6140.50 feet above mean sea level until January 1, 1946 when it was moved to the second floor office with a new elevation of 6,154.2 feet.

Wind instruments – The wind instruments included a 4 foot metal vane and a 3-cup anemometer. The instruments were located 18 feet above the roof at a height of 40 feet above the ground. These instruments were installed on September 6, 1929.

Rain gage – A tipping bucket gage and an eight-inch gage were located at a height of 15 feet until October 22, 1943 when the height changed to 4 feet. A weighing rain gage was installed on January 1, 1940 at a height of 4 feet.

Other instruments – The station had the following additional instruments, triple register, barograph, ceiling light, ceilometer, and a clinometer.

1954-1975: On August 12, 1954, the Weather Bureau offices were moved to 4101 Evans Avenue, Room 101 remaining on the airport grounds. This office was occupied until November 20, 1975. This was a move 0.2 miles east. Instruments were located in the center of the field.

Thermometer – The thermometers were located at a height of 5 feet. A hygrothermometer was installed at a location 1500 feet east of the office on September 1, 1959.

Barometer – The barometer was located at an elevation of 6,137.74 feet above mean sea level.

Wind instruments - The instruments were located at a height of 73 feet until October 2, 1957 when the height changed to 33 feet.

Rain gage –The weighing rain gage was at a height of 4 feet until it was moved 1,400 feet north west of office on July 27, 1959. The height at this location was 5 feet. The gage was moved 1,680 feet southeast on May 14, 1962, with the height returning to 4 feet. The eight-inch gage was at a height of 4 feet until May 14, 1962, when the height changed to 5 feet. The gage was inactivated in 1964. A tipping bucket rain gage was not installed at this location until December 1, 1974. The gage was at a height of 4 feet.

1975-1993: The Weather Service moved to new quarters on November 21, 1975 located at 4000 Morrie Avenue. This was a move of 2,000 feet east of the previous location. There was no change in the center field instrumentation. See Figure 8.



Figure 8. Cheyenne, Wyoming, National Weather Service instruments located at the municipal airport in August 1987. The Cotton Region shelter and the rain gages can be seen in this photograph taken 20 feet from the office building looking north. From the station history files at the National Climatic Data Center.

Thermometer – Thermometers were at a height of 5 feet, 25 feet west of office. The HO-61 hygrothermometer was not moved from the previous location and the height remained at 5 feet. This location was 750 feet west of office. On July 24, 1985, an HO83 hygrothermometer was installed at the same location.

Barometer – The barometer, serial number 502, was located at 6,123.211 feet above mean sea level. Note: In 1993 the barometer was listed as old, circa 1962, and the mercury was found to be contaminated.

Wind instruments - The instruments were not moved from previous location and height remained at 33 feet. This location was 750 feet west of NWS building and 1,500 feet east of Control Tower.

Rain gage – The tipping bucket, weighing (shielded) and eight-inch gages were at a height of 4 feet located 25 feet west of NWS building on a concrete pad. The building was 14 feet tall. No other obstructions were listed.

Other instruments – The station had the following instruments: barograph, ceilometer, ceiling light, RVR recorder, and a WSR-74C radar.

1993-1995: On August 17, 1993, the office moved to 1301 Airport Parkway, a location change of some 1,000 feet southeast of the previous location. Instruments were relocated at this time.

Thermometer – The instruments were relocated on August 17, 1993, but remained at 5 feet above the ground. The hygrothermometer was not moved from the previous location and the height remained at 5 feet.

Barometer – A new barometer, number 22-82, was installed at the office on August 5, 1993. The elevation of the instrument was not indicated.

Wind instruments - The wind instruments not moved from previous location and height remained at 33 feet.

Rain gage – The tipping bucket, weighing (shielded) and eight-inch gages were at a height of 4 feet. The location was changed on August 17, 1993, but the height remained the same.

Other instruments – The station had the following instruments: barograph, ceilometer, ceiling light, RVR recorder, and a WSR-74C radar.

1995- 2004: An Automated Surface Observing System (ASOS) suite of instruments was commissioned on November 1, 1995. Documentation as to the exact location on the airport grounds has not been found. The National Weather Service office remained at 1301 Airport Parkway.

Thermometer – The standard ASOS hygrothermometer is the HO83.

Barometer – The standard ASOS pressure sensor consists of three measuring systems.

Wind instruments – The standard ASOS wind instruments are at a height of 33 feet.

Rain gage – The standard ASOS gage is a heated tipping bucket.

Other instruments - The standard ASOS instrument suite includes a laser beam ceilometer, present weather indicator, freezing rain sensor, thunderstorm sensor, and a visibility sensor.

Observer Stories

One note of interest was found on the January 1887 form. It stated “No observations during the month owing to the illness of the observer Corp’l S. R. Riley, who died at the station on March 5, 1887.”

Observer portraits



Figure 9. Asa C. Dobbins was the first weather observer in Cheyenne, Wyoming. He established the U.S. Signal Service weather office in downtown Cheyenne in 1870, serving until 1878. From the Wyoming State Archives, Department of Parks and Cultural Resources.



Figure 10. Walter Sherman Palmer the Weather Bureau Secretary Director in Cheyenne, Wyoming, 1898-1910. From the Wyoming State Archives, Department of State Parks and Cultural Resources.

References and Data Sources

Observational forms as found in the National Climatic Data Center archives

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

Report of the Chief Signal Officer – 1871

Wyoming State Archives, Department of State Parks and Cultural Resources, Cheyenne,
Ms Peg Ostlund and Ms Cindy Brown

APPENDIX I - METHODOLOGY

The primary sources of information for this study were the Cheyenne observers' daily weather records themselves. Copies of their monthly reports were available from the National Climatic Data Center's on-line system called WSSRD. The monthly reports can be considered primary sources because they were written by the observers and not altered by subsequent readers. Station history files at the Data Center also provided details as to station and instrument history.

Ms Peg Ostlund, Reference Archivist, at the Wyoming State Archives in Cheyenne, provided valuable historical photographs and insight into Cheyenne's early days.

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

Street maps were generated using Microsoft's Streets and Trips software. Additional photographs were used from the author's personal collection of postcards.