THE HISTORY OF WEATHER OBSERVING IN PORTLAND, MAINE, 1722-2004 INCLUDING FORT PREBLE

From author's personal collection of post cards

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

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Executive Summary

Weather observations in Portland began as early as 1722 by Reverend Thomas Smith and Reverend Samuel Deane, Pastors of the First Church in Portland. Their observations continued until 1787. Some 30 years later, in 1816, Lemuel Moody, followed by his son Enoch, began recording the weather at their Portland Observatory. These observations continued until 1852. During the early 1850's Charles B. Merrill also recorded the weather in his diary. The first Smithsonian Observer in Portland was Henry Willis who began observing in 1855. John W. Adams followed in 1859, continuing his efforts until 1861. No records have been found for the civil war years.

In 1871 the United States Army Signal Service opened its weather observatory in downtown Portland. The location moved in 1873, in 1874, and again in 1885. The United States Weather Bureau assumed the duties in 1891 and they continued at the downtown location until December 1940. Meanwhile, the Weather Bureau opened an office at the new Portland airport in 1934, moved to the Administration Building in 1940, and moved to a new site on the airport grounds in 1988. The Automated Surface Observing System (ASOS) was commissioned at the airport in August 1994 and continues to be used to this day. The Weather Bureau did support a Cooperative Observer station located at the downtown Fire Station from 1946 until 1972.

The photograph on the cover page is of the wind vane that was mounted on the roof of the First Parish Church in 1800. From the book *Portland,* published by Greater Portland Landmarks, Inc, 1999.

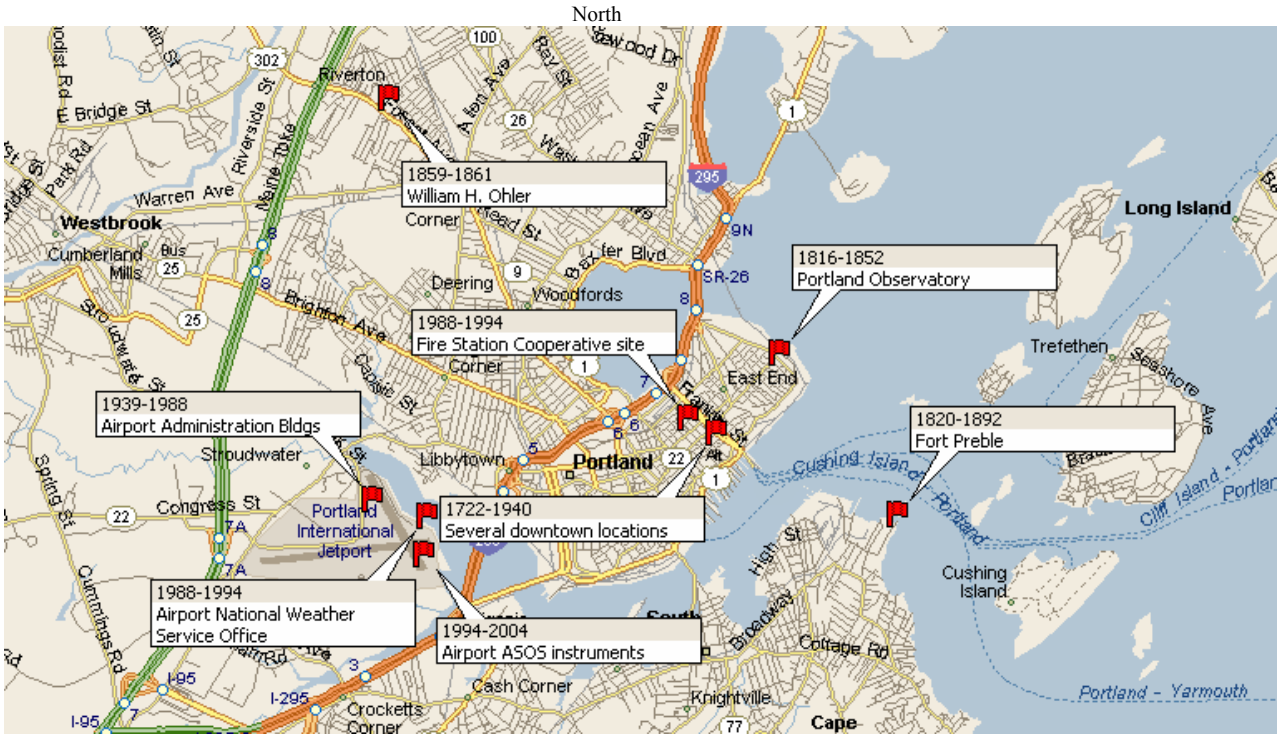
Goal of the Study

The goal of this study is to document the primary weather observational path at Portland, Maine, leading to the current and on-going National Weather Service observing program. The major challenge was to identify and define the roots of the path that began in the 1700s and continued through many times of significant transition. Extrinsic observations, i.e., those by Smithsonian and Voluntary (or Cooperative) observers, are considered in relation to the beginning of the central observational stream eventually established by the Army surgeons, Signal Service, and Weather Bureau. This does not minimize the importance of these collateral observations, but rather to focus on the original events that led to the routine, formal weather observing program of modern times.

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

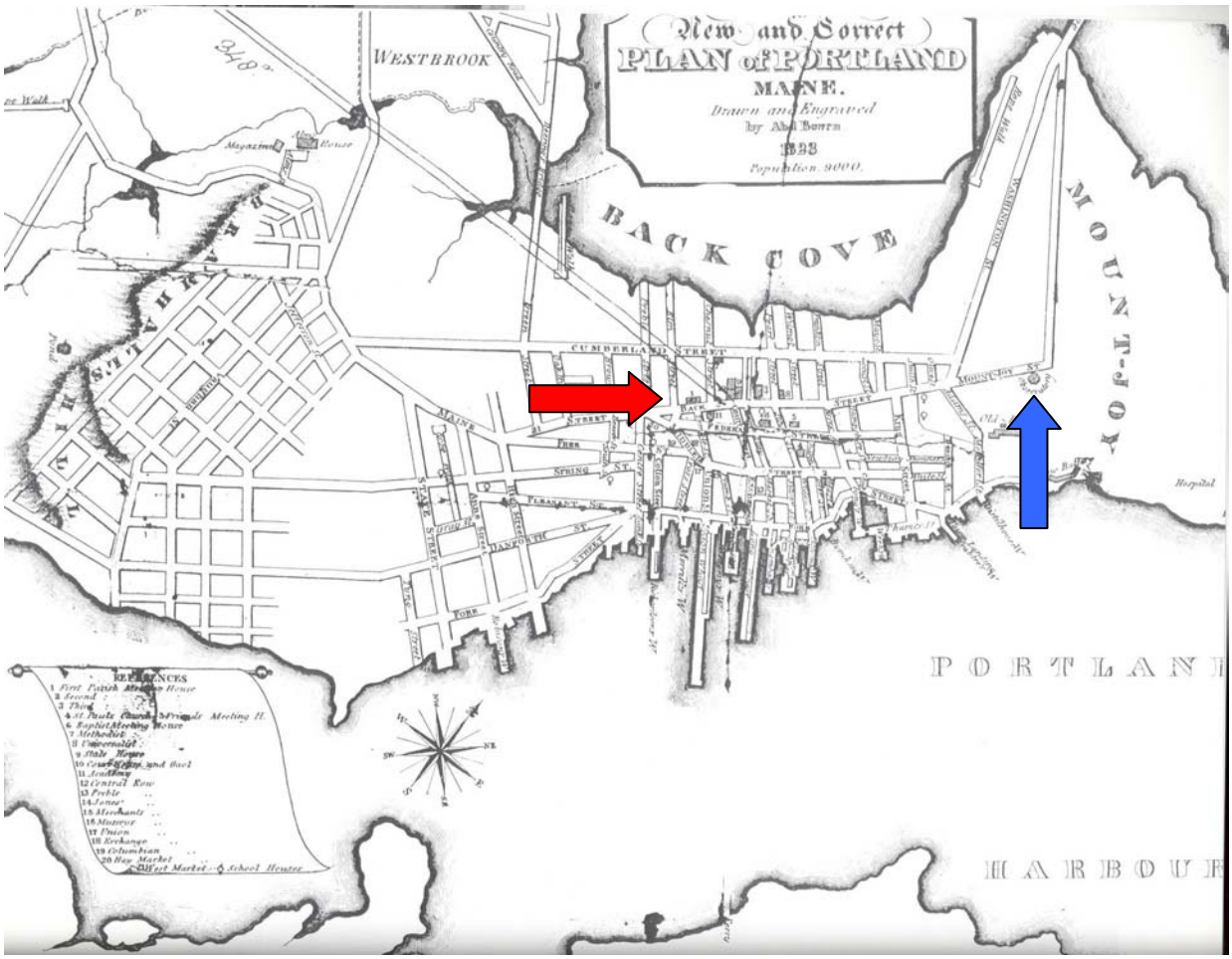
A series of maps follow which are intended to portray the location and surroundings for the many weather observing locations in Portland. Map 1 and 2, of course, are based on today's road system and thus are presented only to give an overall view of the various locations and the extent of the various moves.



Map 1. The location of weather observing sites at Portland, Maine, 1722-2004, including Fort Preble. See Map 2 for greater detail on the downtown sites, 1722-1940.

Map 2. Location of weather observing sites in downtown Portland, Maine, 1722- 1940.

The following three maps are included to show in a general way the growth of Portland from 1823 until 1876. As rural settings, Figures 1 and 2, gave way to urban locations, see Figures 7 and 8, the environment surrounding the weather instruments changed as well.



Map 3. Portland, Maine as it appeared in 1823. The population of the city was 9,000. The red arrow indicates the location of the First Parish Church and the blue arrow the location of the Portland Observatory. From the book *Portland,* published by Greater Portland Landmarks, Inc, 1999.

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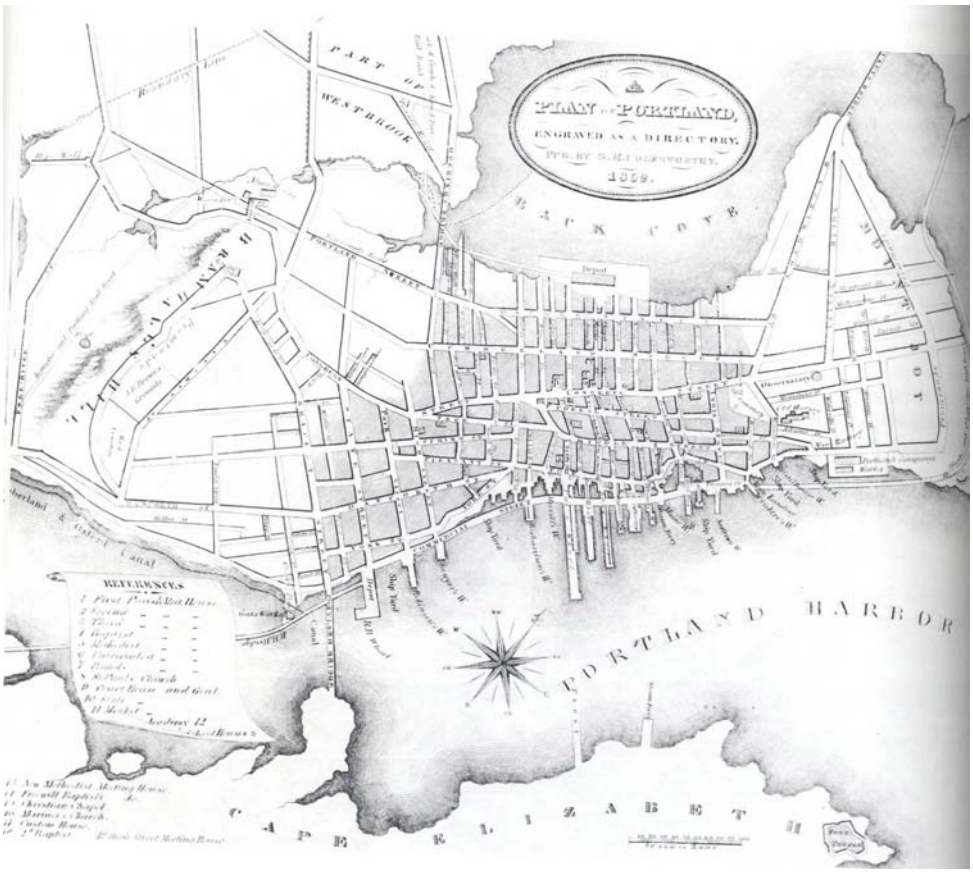

Map 4. Portland, Maine as it appeared in 1852. From the book *Portland,* published by Greater Portland Landmarks, Inc, 1999.

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Map 5. Portland, Maine as it appeared in 1876. From the book *Portland*, published by Greater Portland Landmarks, Inc, 1999.

The following lists the chronology of weather station locations in the Portland, Maine, area from 1722 until 1994:

February 1722 – December 1787 – Elevation – Not Available

- First Parish Church, at the head of Temple Street at Congress Street.

1816 – December 1852 – Elevation – Not Available

- Portland Observatory located at 138 Congress Street

August 1820 – February 1892 – U.S. Army Medical Service – Elevation 53 feet (ground)

- Fort Preble hospital (several locations within the fort grounds)

January 1851 – June 1852 – Elevation - Not Available

- Observations taken at either 101 Middle Street (Office location) or 31 Spring Street (Home location)

1855 – November 1859 – Smithsonian Observer - Elevation 87.5 feet

- Observations taken at either 105 Middle Street (Office location) or 45 Free

Street (Home location)

May 1859 – October 1881 – Smithsonian Observer - Elevation 180 feet (ground)

- Observations taken at a nursery and greenhouse in Westbrook on Forest Avenue, near the cemetery.

January 1871 – September 1873 – Signal Service - Elevation 30 feet (ground)

- 4 Exchange Place, address was 4 Exchange Street, offices in upper story.

September 1872 – December 1873 – Smithsonian Observer Elevation – Not available

- 158 Middle Street

September 1873 – November 1874 – Signal Service – Elevation 51 feet (ground)

- Boyd's Block, address was corner of Middle and Exchange Streets, 450 feet northwest of previous location

December 1874- July 1885 – Signal Service – Elevation 32 feet (ground)

- Custom House, address is 312 Fore Street, 450 feet east of previous location

July 1885 – December 1940 – Signal Service (1885 until June 1891), Weather Bureau – Elevation 47 feet (ground)

- First National Bank, address is 57 Exchange Street, Rooms 30-32, 350 feet west northwest of previous location and one-eighth of a mile from the waterfront.

August 1931 – December 1940 – Weather Bureau – Elevation 61 feet (ground)

- Airport terminal building. Location is 2.75 miles west of previous site.

December 1940 – October 1988 – Weather Bureau/National Weather Service – Elevation 61 feet (ground)

- Airport Administration Building, address is 1001 Westbrook Street, offices on second floor. Location 100 feet southwest of previous site.

November 1946 – June 1971 – Elevation – 65 feet (ground)

- On lawn of Fire Station at the corner of Market and Congress Streets.

October 1988 – August 1994 – National Weather Service - Elevation 38 feet

- General Aviation Terminal, address is 4 Al McKay Avenue. Location is approximately 2,100 feet east across runway 18-36 from previous site.

August 1994 – 2004 – National Weather Service – Elevation 38 feet

- Portland International Jetport runway, south end of runway 18-36. Location is 2,100 feet southwest of previous location.

Location and Instrument Descriptions

City of Portland

1722 – 1787: In February 1722, the Reverend Thomas Smith, Pastor of the First Parish Church in Portland, Maine, began recording the weather in his diary. He continued this practice, along with Reverend Samuel Deane, until December 1787. The church building was located at the top of Temple Street where it meets Congress Street. Figure 1 details what the area looked like in those early days.

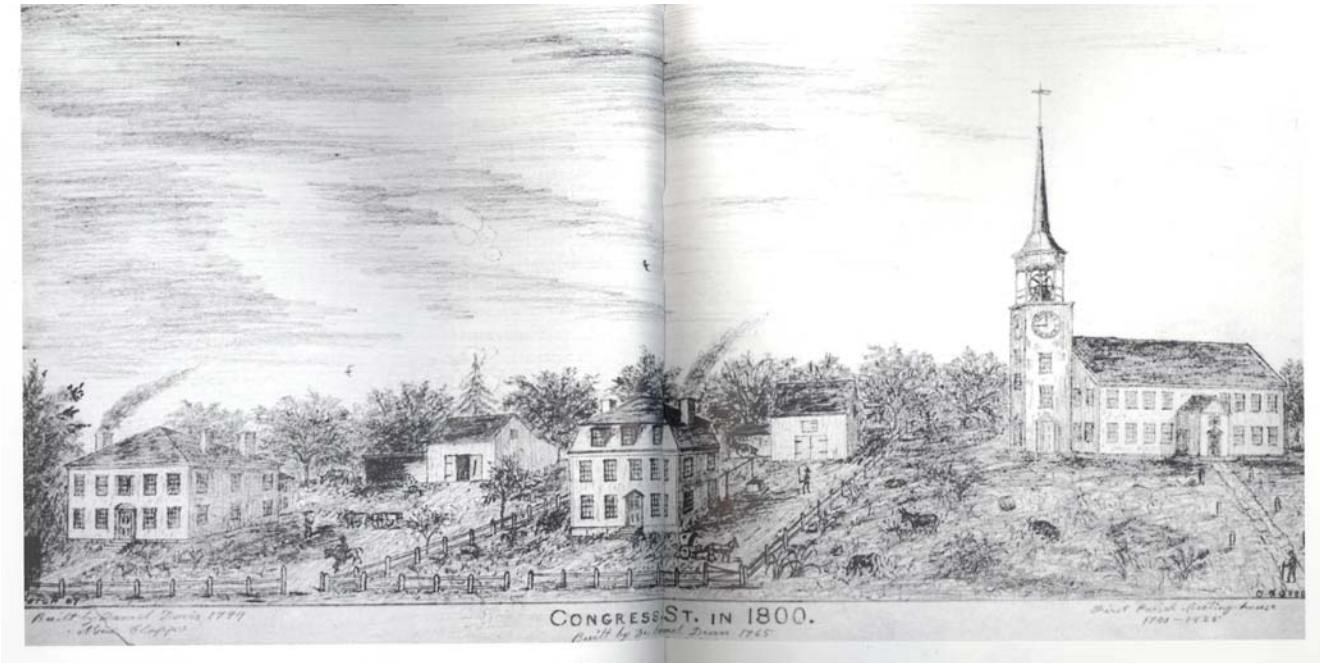

Figure 1. A sketch depicting Congress Street in Portland, Maine as it looked in 1800. The First Parish Church, site of the earliest weather observations in Portland, is on the right. View is looking towards the Northwest. Notice the wind vane on the steeple peak. From the book *Portland,* published by Greater Portland Landmarks, Inc, 1999.

Thermometer – No information available

Rain gage – No information available

1816-1852: In December 1816, Lemuel Moody commenced detailed weather observations from his "Portland Observatory" which had been built in 1807. He and his son, Enoch Moody, who assumed the observing duties in May 1845, continued until December 1852. The Observatory was built at the eastern end of the Portland peninsula

on Munjoy Hill, which was then a cow pasture, see Figure 2. The site is just a few yards from the highest point in Portland. [Since the Observatory's purpose was to signal the town's people as to the arrival of ships coming into the Portland harbor, it made perfect sense to build on the highest ground.] Today its address is 138 Congress Street. Indications are that the weather observations were taken at ground level near the Moody home, not at the top of the 86 foot building.

Figure 2. The Portland Observatory, circa 1820, located near the highest point in the city of Portland, Maine, at 138 Congress Street (current address). From the book *Captain Moody and His Observatory* by John K. Moulton.

Thermometer – No information available

Fort Preble

1820 -1892: On August 21, 1820, a thermometer was received at Fort Preble, Maine, for the purpose of recording the weather. United States Army surgeons were responsible for this duty, a duty that remained in force for Fort Preble's surgeons until February 1892.

The fort itself was located southeast across the harbor from downtown Portland. It is not clear whether the observations were taken at the hospital or at some other location on the grounds of the fort. The first hospital was located north of the main works. The second location, from the 1840's until the 1870's, was located in the southeast corner of the fort approximately 30 feet above the water level. See Figure 4. A plan of the fort from 1867 is shown in Figure 3. Sometime after 1869 the hospital was moved to a location behind the barracks and near the wharf. What is intriguing is that a photograph taken in the late 1890's shows what appears to be an anemometer on the roof of the commanding officers residence. This location is several feet higher than the hospital locations. See Figure 5.

Only two indications of a move show up in the observational record. First is an indication of a barometer moved from 50 feet elevation to 30.915 feet elevation sometime between August 1853 and October 1854 (the records are missing for this period?) Then in June 1889 the height changes again to 15 feet. Unfortunately, these "moves" do not match up with any of the documented hospital moves.

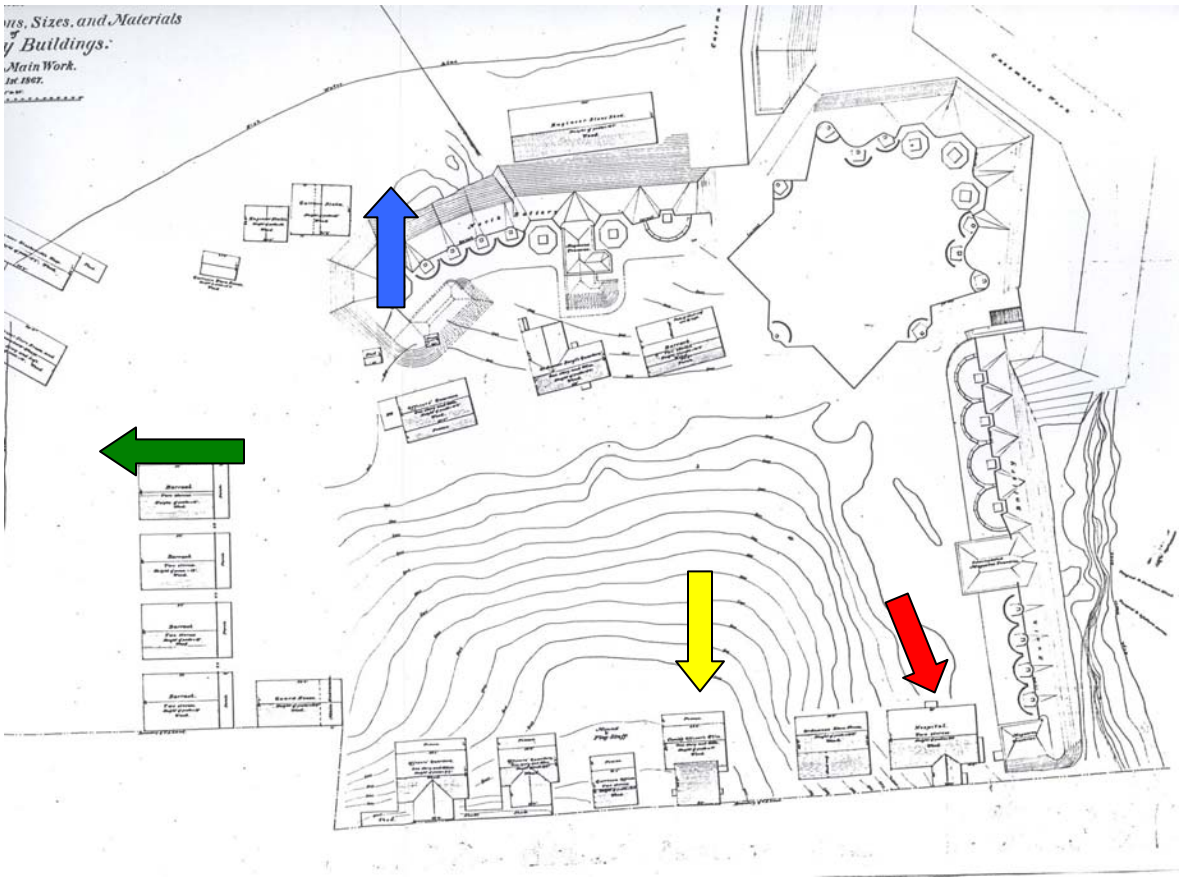

Figure 3. The layout of Fort Preble, Maine in November 1867. The general locations for the fort hospital are indicated by the arrows. The blue arrow shows the approximate location from 1820-1840's, the red arrow for 1840's-1870's, and the green arrow for 1870's-1892. The Commanding Officer Quarters is indicated by the yellow arrow. Map from the National Archives and Records Administration, Cartographic Department, Drawer 12, Sheet 39.

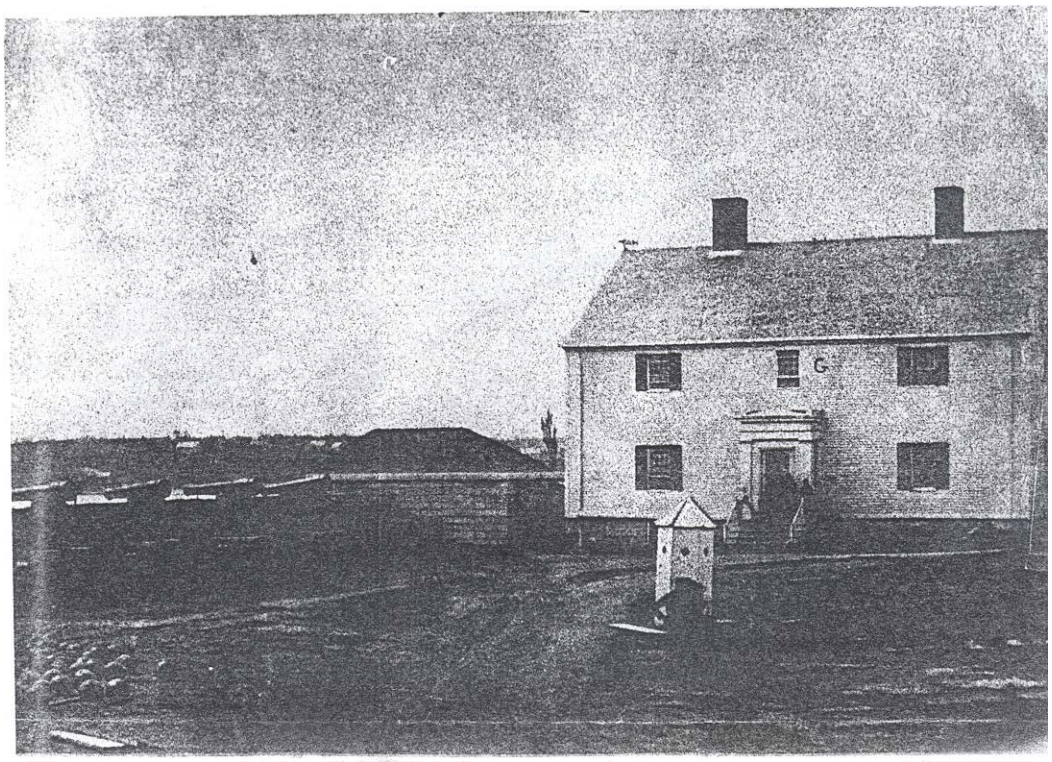

Figure 4. The hospital building at Fort Preble, Maine circa 1860. The South Battery Works can be seen just to the left of the hospital building. Photograph courtesy of the South Portland, Maine, Historical Society.

Figure 5. The commanding officers residence at Fort Preble, Maine in 1878. Notice what appears to be some type of wind instrument on the roof. From the National Archives and Records Administration, Still Picture Division, RG 92 F, Box 14.

Thermometer – No information is available. The observer wrote on the observational form of September 1888 that "No maximum/minimum thermometer at this post."

Barometer – Observations were made beginning in the early1840's but no information is available on instruments used.

Wind instruments – No information is available.

Rain gage – No information is available.

City of Portland

1851 – 1852: From January 1851 until June 1852, Charles Benjamin Merrill entered weather observations in his diary. It is unclear whether Mr. Merrill, an attorney, observed the weather from his home at 31 Spring Street or from his office at 101 Middle Street.

Thermometer – No information is available.

Barometer – No information is available.

1855 – 1859: Beginning in 1855, Mr. Henry Willis became a Smithsonian Institution observer. Mr. Willis, an attorney, had his office at 105 Middle Street and his home at 45 Free Street. He recorded his elevation as 87.5 feet. He recorded weather observations until November 1859.

Thermometer – No information is available.

Barometer – No information is available.

Wind instruments – No information is available.

Rain gage - No information is available.

1959 – 1861: Another Smithsonian observer, Mr. John W. Adams, began his observational program in May 1859, an effort he continued until October 1861. According to the Portland City Directory of 1858-59, Mr. Adams had a nursery and greenhouse in Westbrook on Forest Avenue, near the cemetery. This location would place him several miles west of downtown Portland. He listed his elevation as 180 feet giving some assurance that he was indeed "inland" of the city proper. Mr. Adams only recorded information on clouds, begin and end time of precipitation, and wind direction and force.

Wind Instrument – No information is available.

1871 – 1873: After a gap in the records of nearly a decade, the United States Army Signal Service established an office in the 4 Exchange Place Building on January 15, 1871. [There was a great fire in Portland in 1866 that destroyed most of the downtown district, could this be why no records exist?] The building was located in the center of the business portion of the city and the weather office was located in the upper story of the building. The address is now known as 4 Exchange Street. Sergeant William Lewin established the station but was relieved for drunkenness on duty April 5, 1871. He was succeeded by Sergeant R. E. McGrady who had an able assistant in Private William Ramsey assigned in June 1871. Sergeant Alex B. Williams assumed duties at the station in January 1872.

Figure 6. The building at 4 Exchange Street, Portland, Maine where weather observations were taken from January 1871 until September 1873. Photograph taken by author in October 2004.

Thermometer – Extreme thermometers were located in the instrument shelter on the flat roof of the building, 40 feet above ground.

Barometer – The barometer was located 52 feet above mean sea level.

Rain Gage – No information is available.

1873 – 1874: The Signal Service offices were moved to Boyd's Block at Middle and Exchange Streets in September 1873. This appears to be the same location that the Signal Service occupied some 10 years later after the First National Bank building was constructed in 1884. Sergeant Alfred R. Thornett assumed his duties at the station in September 1874.

Thermometer – Extreme thermometers were located 50 feet above ground in a north window.

Barometer – The barometer was located 95 feet above mean sea level.

Wind instruments – No information is available.

Rain gage – No information is available.

1872 – 1873: A third Smithsonian observer, Mr. William H. Ohler, recorded observations from his home at 158 Middle Street from September 1872 until December 1873.

Thermometer – No information available

Rain gage – No information available

Wind instruments – No information is available.

1874 – 1885: In December 1874, the Signal Service office moved once again, this time to the United States Customs House at 312 Fore Street. The office was on the north side of the building. A series of observers were assigned to the office including Will T. Boyd, Jno Lauresey (spelling unclear), P. J. Jenkins, and W. W. Eichelberger.

Figure 7. The United States Customs House in Portland, Maine circa 1920. The offices of the U.S. Army Signal Service weather observers were in the back of the building on Fore Street. The wind vane can be seen above the back tower. Building faces southeast. From the Collection of the Maine Historical Society and used with permission.

Thermometer – Extreme thermometers were located 28 feet above ground in a north facing window.

Barometer – The barometer was located 45 feet above mean sea level

Wind instruments – Elevation of the anemometer on December 1, 1874 was 82 feet above the ground

Rain gage – An eight-inch gage was mounted on the roof at 71 feet above ground.

1885 – 1940: The Signal Service moved for the last time on July 1, 1885, to rooms 30, 31, (and later 32) in the First National Bank building at 57 Exchange Street. See Figure 8. The Army personnel conducting the observing program were C. J. Luhnaus (spelling unclear), B. A. Kinnig, N. D. Lane, and Edward Pernell Jones. Mr. Jones was the last Signal Service observer and the first Weather Bureau observer. This transition from one

agency to another took place in June 1891. The downtown observations continued to be taken on Exchange Street until December 4, 1940.

Figure 8. The First National Bank building at 57 Exchange Street, Portland, Maine. circa 1890's. The Signal Service and later the Weather Bureau occupied offices in the building from 1885 until 1940. The wind instrument tower and the instrument shelter can be seen just to the left of the clock tower. From the Collection of the Maine Historical Society and used with permission.

Thermometer – Large instrument shelter containing extreme thermometers was located 82 feet above the ground on the building roof. See Figure 8.

Barometer – The barometer was located 103.4 feet above mean sea level.

Wind instruments – The anemometer was located on roof 81 feet above the ground on the building roof, see Figure 8. The height was 89 feet between May 22, 1890, and November 28, 1900. Height was raised to 117 feet after that date. The wind vane was a 4 foot wooden model in 1940.

Rain gage – A tipping bucket gage and an eight-inch gage were both mounted on the roof, 75 above the ground. Tipping bucket gage was at 74 feet from January 1, 1894 until May 5, 1897.

Other instruments – Barograph, Thermograph, Triple Register

1934 – 1940: The Portland weather observational program began at the Portland Airport in December 1934 a move of 2.75 miles west of downtown location. The location was on the northeast side of the airport. Initially called Stroudwater Field, the name changed to the Portland Municipal Airport in 1936 when the city purchased the property. On November 27, 1940, the full climatological observational program was moved from the downtown office to the airport. This change in location had an impact on the record as a comment was found that "temperatures are considerably lower at the airport than in the city on calm cold mornings." The Weather Bureau remained in this location until late 1940.

Figure 9. The Portland, Maine, airport as it appeared in the late 1930's. North is towards the upper left corner. Photograph by Mr. Leo Boyle, Portland, Maine.

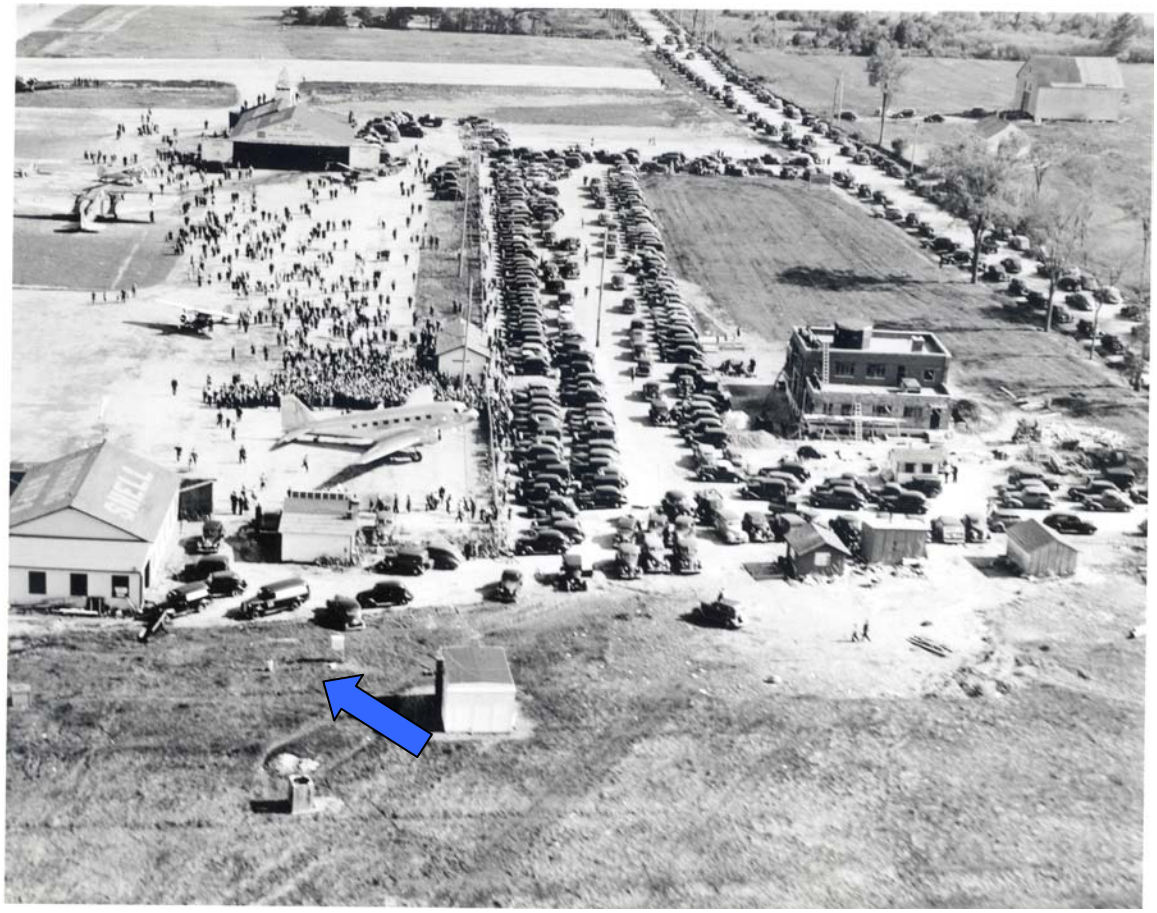

Figure 10. The Portland, Maine airport in the early 1940 looking south. The weather instruments are located in the grass just to the right of the building with "SHELL" on the roof and indicated with blue arrow. A new Administration building is under construction to the right of the picture. Photograph from the Portland International Jetport.

Thermometer – As of 1935 the airways shelter was located 5 feet above the ground over sod, twelve feet north of the Administration building. It opened to the north and was reported to be in good condition with a good exposure. Extreme thermometers were relocated to 7 feet above the ground on November 25, 1940. Exposure was over sod.

Barometer – The aneroid barometer was located 62.97 feet above mean sea level. This Tycos barometer was mounted on the east wall of the Administration building.

Wind instruments – Instruments were located 25 feet above the ground being mounted on beacon tower supports which are attached to a platform on roof of the hangar. The wind-vane was a 5 foot model. The anemometer was a three-cup design.

Rain gage – An eight-inch gage was located 3 feet above the ground.

1940 -1988: The weather offices were moved 100 feet southwest from the previous location on December 4, 1940. The offices were now located on the second floor of the Airport Administration Building. See Figures 10 and 11. The Weather Bureau remained at this location until late 1988.

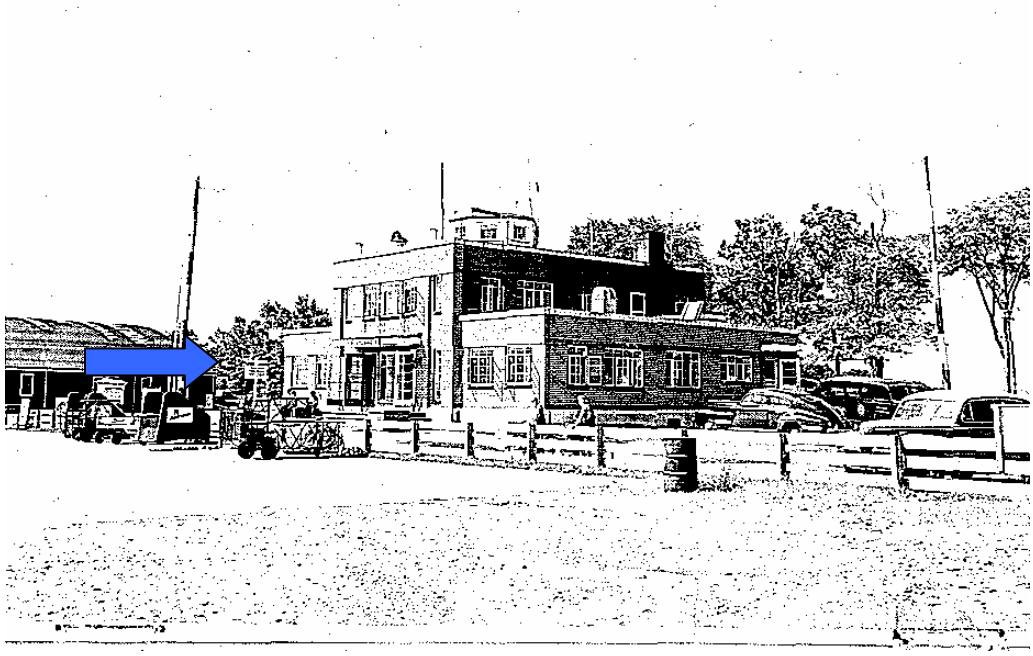

Figure 11. The Administration Building, Portland, Maine Municipal Airport in July 1946. Weather Bureau quarters were on second floor. The instrument shelter can just be made out just to the left of the pole rising above hanger roof (blue arrow). Picture taken looking southwest. From the station history files at the National Climatic Data Center.

Thermometer – The instrument shelter was located to the lawn south of the Administration Building in December 1940. The instruments remained at 7 feet. See Figure 11. In late 1947 the instrument shelter was moved from the south side of the Administration Building to the north side as the Administration Building was undergoing a major expansion. See Figure 14. On August 15, 1957, the height of the thermometers was changed to 5 feet. A hygrothemometer was installed at the runway complex, 1200 feet east of the Administration Building at a ground elevation of 4 feet on February 2, 1965. The hygrothemometer was relocated 750 feet southeast and ground elevation changed to 5 feet on December 10, 1969.

Barometer – The barometer was at 62.97 feet above mean sea level until May 21, 1941 when it was moved to 76.66 feet. On February 27, 1948, the height was changed to

67.59 feet, on August 24, 1948 to 78.4 feet, on September 4, 1955 to 78.5 feet, and on May 15, 1968 to 78.27 feet (a resurvey).

Wind instruments – Located at 36 feet, 13 feet above roof of Administration Building, however, the exposure above the roof proved to be unsatisfactory. On July 24, 1941, the height was increased to 61 feet as the instruments were moved to the top of the 50 foot tall beacon light tower. The exact location of this tower is unknown. On June 5, 1943, the instruments were relocated to the roof of the C.A.P. hanger at a height of 43 feet, 16 feet above the roof. This exposure was only rated fair, so on September 20, 1948, the anemometer was moved to the roof of the new control tower on the Administration Building, 7 feet above the tower, 55 feet above the ground. The wind equipment was relocated to a field site about 1200 feet east of control tower, on a 20 foot mast over ground on October 6, 1964. Instruments moved 750 feet SE on December 5, 1969, remaining at 20 feet above the ground.

Rain gages – The tipping bucket and an eight-inch gage were installed on the roof of the Administration Building, 4 feet above the roof and 24 feet above ground on December 4, 1940. See Figure 13. Exposure rated as fair. On August 24, 1948, the tipping bucket gage was moved to the ground north of the Administration Building where the exposure was excellent. A weighing rain gage was installed on the ground north of the Administration Building on August 24, 1948. On November 26, 1963, a windshield was installed around the weighing gage and the gage was raised to 6 feet above the ground. The standard 8-inch and the tipping bucket gages were 3 feet above the ground.

Other instruments – A full range of observing instruments were located at the station including a ceiling light, clinometer, 4-day barograph, triple register and a WSR 74S radar (commissioned May 10, 1985).

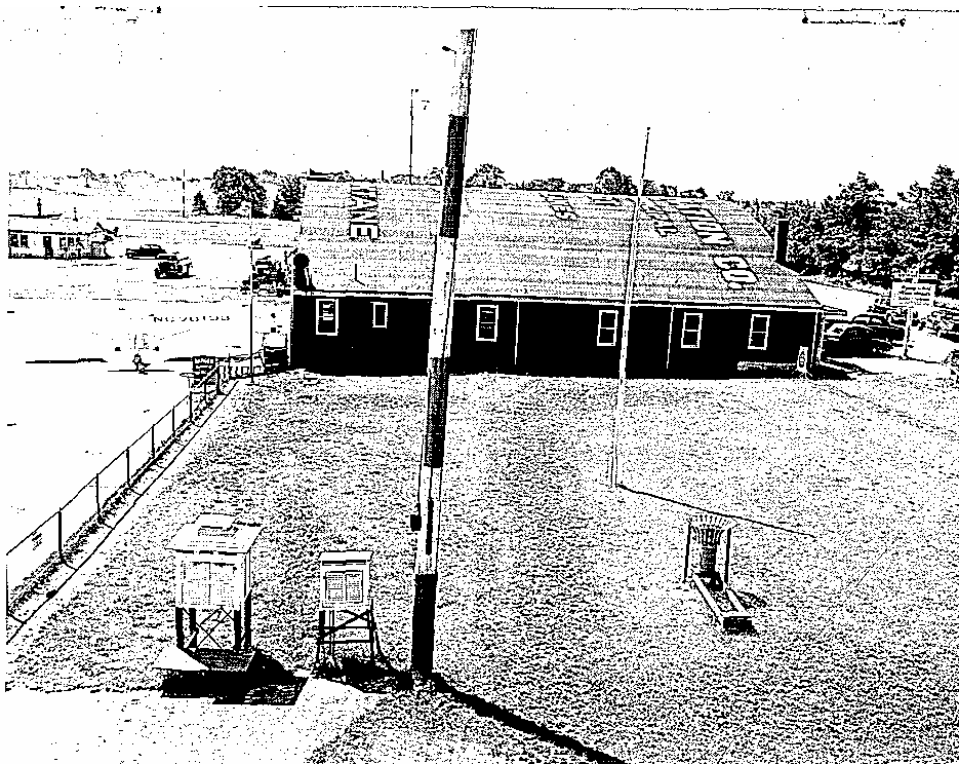

Figure 12. The instrument shelter, weighing precipitation gage, and wind instrument installation (on hanger roof) as seen from roof of Portland, Maine airport Administration Building and the Weather Bureau offices. This July 1946 picture was taken looking south. From the station history files of the National Climatic Data Center.

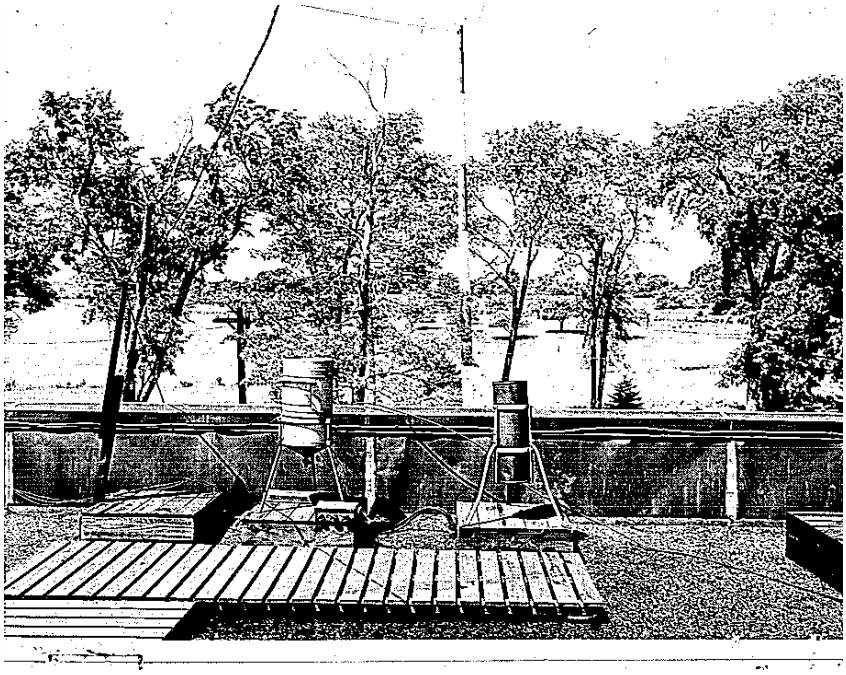

Figure 13. Exposure of rain gages on roof of Administration Building at the Portland, Maine airport in July 1946. From the station history files at the National Climatic Data Center.

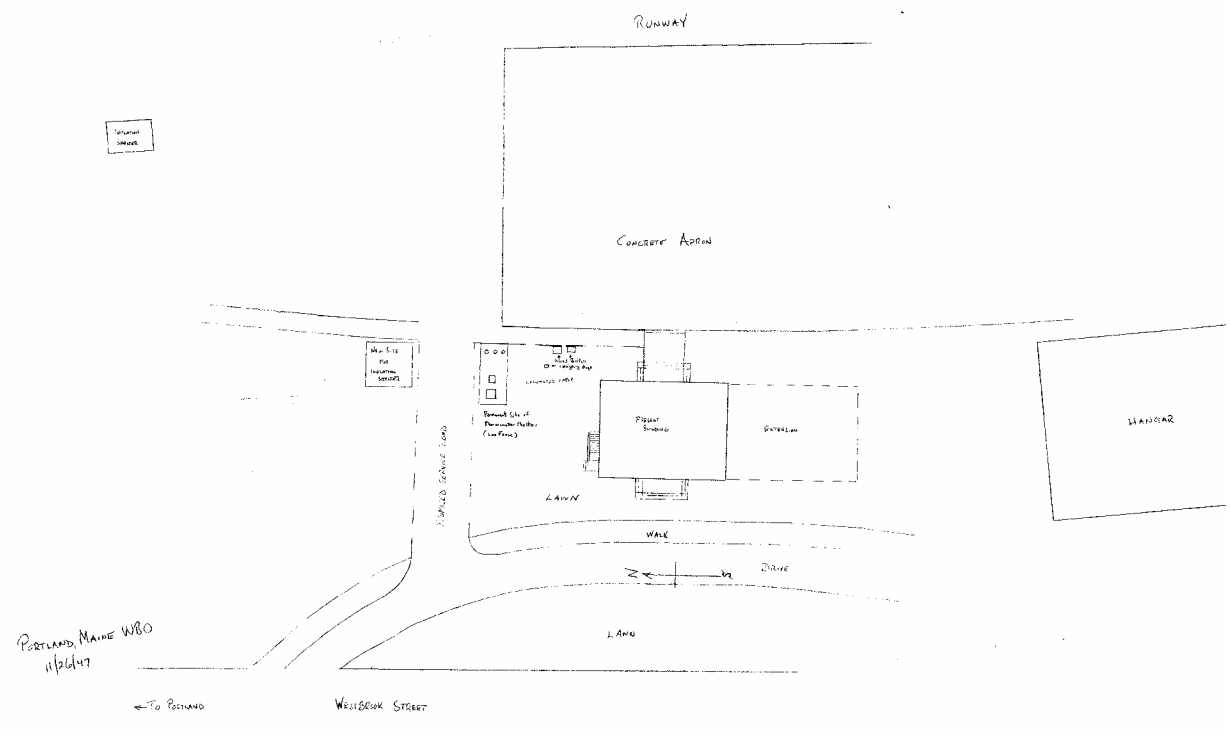

Figure 14. Diagram of weather offices and instruments at the Portland, Maine airport on November 26, 1947. The instruments were located on the north side of the building after a building expansion project was completed. From the station history files at the National Climatic Data Center.

Figure 15. The Portland, Maine airport Administration Building circa 1940's. The weather instruments are hidden behind the plane but this photograph is included to show the changes that have taken place at the airport since it's opening in December 1940. Compare to Figures 10 and 11. From the author's private collection of postcards.

Figure 16. The Portland, Maine airport Administration Building circa 1950's. The wind instruments are on the roof of the control tower but the instrument shelter is hidden behind the plane. From the author's private collection of postcards.

1946 – 1972: On November 1, 1946, the Weather Bureau opened a Cooperative Weather Observing station on the grounds of the downtown Fire Station. The station was established in order to compare downtown readings with those at the airport. The instruments were located in a grassy lawn at the corner of Congress and Market Streets. In the early years Weather Bureau personnel took the observations. By 1948 both the Weather Bureau employees and employees of the Portland Press-Herald were sharing the duties. In 1956 the Officer on Duty at the Central Fire Station assumed the observing duties. By 1960 the observer was simply listed as the "City of Portland." See Figure 17.

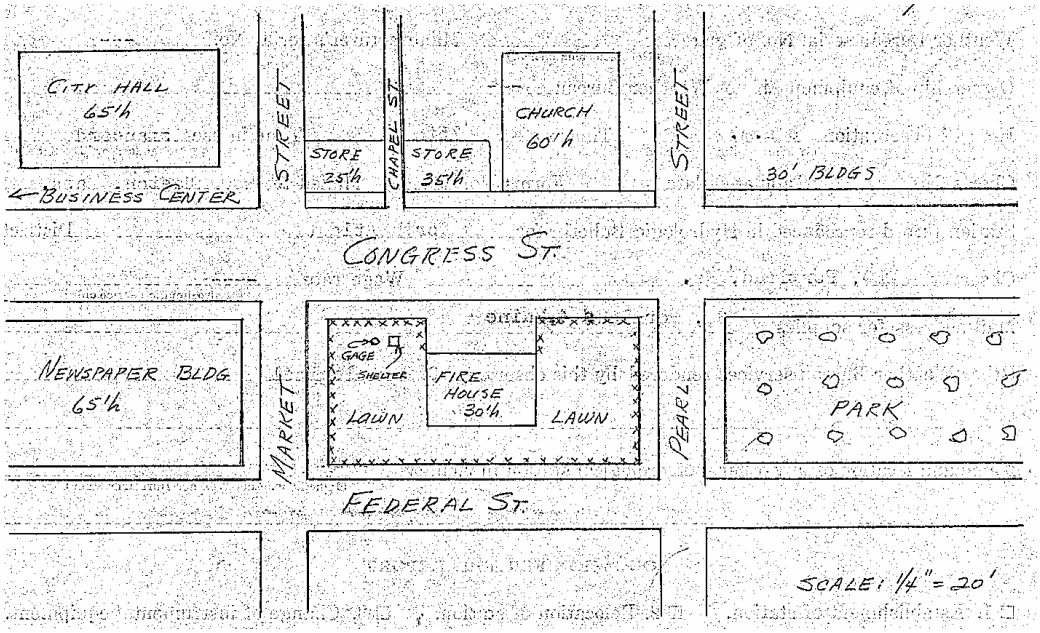

Figure 17. The location of the weather instruments for the Weather Bureau Cooperative Weather station located at the corner of Congress and Market Streets in downtown Portland, Maine. The station remained at this location from November 1946 until June 1972 when the site was paved. From the station history files of the National Climatic Data Center.

Thermometer – The Cotton Region shelter was located 4 feet over sod. Thermometers were located 5.5 feet above ground.

Rain gage – An eight-inch gage was located 3.5 feet above the ground.

1988 – 1994: On October 13, 1988, the observing program was moved across the airport to the General Aviation Terminal at 4 Al McKay Avenue. See Figure 18. Observations were made from this location until August 1, 1994, when the Automated Surface Observing System instruments were installed on the grounds of the airport, thus ending over 250 years of the human weather observers in Portland.

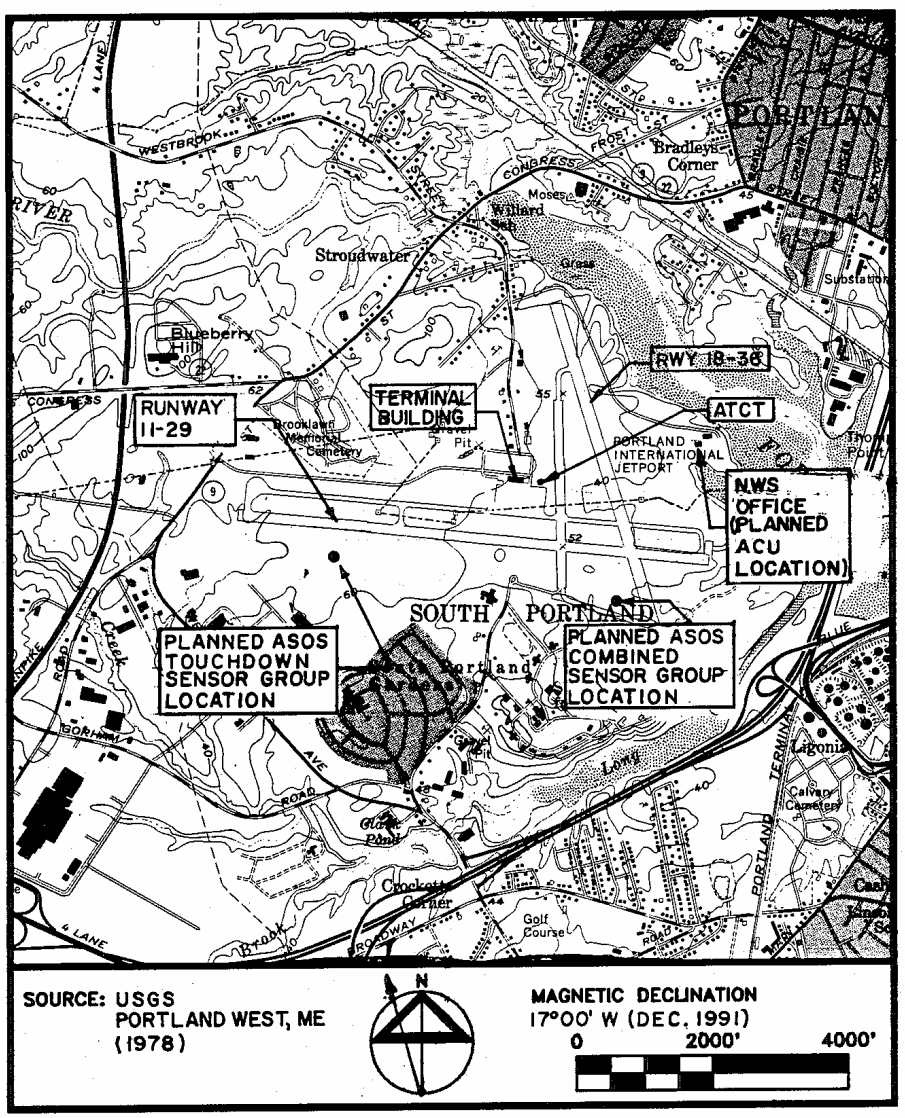

Figure 18. Map indicating the location of the National Weather Service office at the Portland International Jetport. The offices and instruments were moved eastward across the north-south runway in 1988. From the station history files of the National Climatic Data Center.

Thermometer – An HO83 Hygrothemometer was located 5 feet above grass being installed on December 10, 1985. An HO21 Psychrometer was located 5 feet above a pad being installed on October 13, 1988.

Barometer – A barometer at 52.7 feet was present effective November 29, 1988.

Wind instruments – The wind instruments were at 20 feet above the ground being commissioned on December 5, 1969.

Rain gage – An eight- inch gage and a weighing gage were located 3 above a pad. The tipping bucket rain gage was located over ground at a height of 3 feet. These gages were installed at this location on October 13, 1988.

Other instruments - The station had the following additional instruments, barograph, precision aneroid, sunshine switch, WSR 74S radar, a ceilometer, and a ceiling light.

1994 –2004: Beginning on August 1, 1994, the Automated Surface Observing System (ASOS) instruments were commissioned. These instruments were located near the south end of runway 18-36. See Figure 18, the text box located in the lower right of the map indicates the location of the primary ASOS instrument package. Figure 19 shows the instruments as they appeared in 2004.

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.

Figure 19. The ASOS instrument suite at the Portland International Jetport in 2004. From the Gray, Maine office of the National Weather Service.

Observer Stories

Portland Observatory and the Moody's

It's not a lighthouse! And it has nothing to do with astronomy. The Portland Observatory (1807) is the only extant maritime signal station in the United States and thus is a unique architectural icon of maritime shipping and the "Golden Age of Sail".

Lemuel Moody, a sea captain-turned-entrepreneur, ordered the construction of an octagonal, 86 foot high tower to serve as a communication station for Portland's bustling harbor. With his powerful telescope, Moody identified incoming vessels and then signaled merchants with coded signal flags. "Signalizing" allowed merchants ample time to reserve a berth on the wharves, and to hire a crew of stevedores before the vessel docked. Moody built his home and other buildings near the tower. The complex was replete with banquet and dance halls as well as a bowling alley. From the time it opened in 1807, it was a tourist attraction. The tower ceased its "signalizing" in 1923.

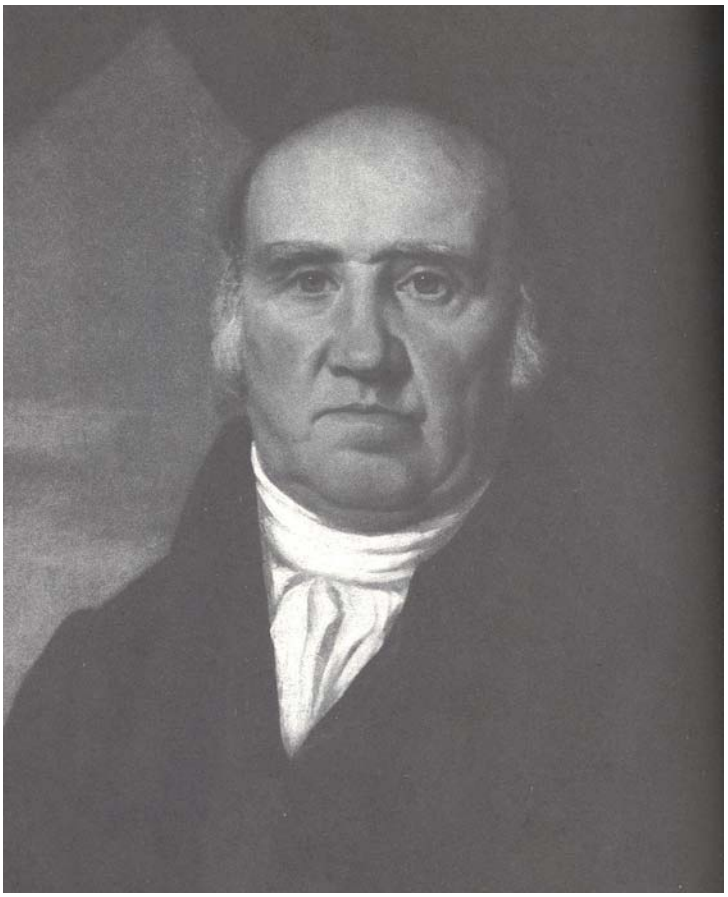

Figure 20. Captain Lemuel Moody, sea captain turned entrepreneur and builder of the Portland Observatory in Portland, Maine. From *Captain Moody and His Observatory* by John K. Moulton.

Above article extracted from
http://www.portlandlandmarks.org/portland_observatory/observatory.htm

The United States Army Signal Service in Portland

As in many American cities in the 1870's the U. S. Army's Signal Service established an official weather observing presence in Portland. The Chief Signal Officers report of 1871 certainly gives a wonderful insight into the effort required to turn plans into reality.

PORTLAND, MAINE, (No. 12.)

The office at this station is located in the upper story of No. 4 Exchange Place, a building in the center of the business portion of the city. The roof of the building is sloping, and the instruments are fixed upon a rough platform built on the highest part of it. The vane, anemometer, and rain-gauge are well exposed. The instrument-shelter is a small copy of the observatory on the central office, and is also upon the roof, and well adapted to the purpose, but difficult of access.

The station was established by Sergeant William Lewin, and reports commenced January 15, 1871. Sergeant Lewin was relieved for drunkenness on duty April 5, and succeeded by Sergeant R. E. McGrady, who still remains in charge and performs his duties in a satisfactory manner. Private William Ramsey was sent to this station as an assistant June 5, 1871. Full reports are received from all other stations, and seven bulletins are issued daily and three papers supplied with the press-reports.

Latitude of station	43° 40′
Longitude of station	70° 14′
Elevation of barometer above sea-level	69½ feet.

The station is supplied with a complete set of standard instruments, all of which are reported in good condition.

Rent paid for office is $18 per month.

Figure 21. The 1871 Annual Report of the U.S. Army Signal Service weather observer in Portland, Maine. From the *1871 Annual Report of the Chief Signal Officer*

Security and weather observing, 1990's version:

"When security became important and a new fence around the airport was installed the fence went between the building and the instruments. A hole had to be cut in the fence to install a gate that had to be unlocked and locked with each visit to the instruments."

Per Mr. Augie Sardinha, retired National Weather Service forecaster in Portland, Maine.

Acknowledgements

The staff at the Maine Historical Society, especially Bill Barry and Christine Albert, were a great help in locating material about the city of Portland. Greg Hughes at the Portland International Jetport was eager to help. Linda Eastman and Tim Carr from the South Portland Historical Society and Dr. Joel Eastman were of great assistance in my learning about Fort Preble's history.

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

Maine Historical Society, William D. Barry and Christine Albert

South Portland Historical Society, Linda Eastman and Tim Carr

Portland International Jetport, Gregory T. Hughes, Airport Marketing Manager

Portland, published by Greater Portland Landmarks, Inc, Second edition reprinted and corrected, 1999.

Captain Moody and His Observatory by John K. Moulton

Portland City Directories, 1850-51, 1852-53, 1856, 1858-59, and 1863-64.

1871 Annual Report of the Chief Signal Officer

Journals of the Rev. Thomas Smith and Rev. Samuel Deane, 1849

Dr. Joel Eastman, Portland, Maine

APPENDIX I - METHODOLOGY

The primary sources of information for this study were the Portland observers were the daily weather records themselves. Copies of their monthly reports were available through the National Climatic Data Center. These monthly reports can be considered primary sources because they were written by the observers and not altered by subsequent readers.

A variety of secondary sources held information about Portland, its history, and its people. The author visited and collected information from the holdings of the Maine Historical Society, the South Portland Historical Society, the Portland Harbor Museum, the Portland International Jetport, and the Portland Observatory. Interviews were conducted with several past and present National Weather Service employees. Dr. Joel Eastman, a local historian for Fort Preble, proved to be an invaluable source of information.

The tertiary sources were reference materials that are available on-line. Among those were the metadata summaries prepared by the Weather Bureau, National Weather Service, and the National Climatic Data Center. The book *Portland* proved to a great aid in determining the early history of the city.

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

The street maps were generated using Microsoft's Streets and Trips software.