History of the NOAA National Weather Service in Southeast Michigan

The Early History of Weather Services in Southeast Michigan

As one of the oldest cities in North America, Detroit has a rich history of weather observations and significant weather events. The earliest recorded weather observations for the area go back to the late 18th century by the ships HMS Welcome and HMS Hope, which the British wintered (1779-80) near the old Fort Sinclair and the St Clair River. After that, sporadic observational records exist for Detroit through the first half of the 1800's. The most reliable were those ordered by the Army Surgeon's General following the War of 1812. These observations were routinely taken by Army Assistant Surgeons stationed at Fort Shelby from 1820 to 1826 after which Fort Shelby was demolished.

The Surgeons General resumed taking observations at the Dearbornville Arsenal in 1836, and these continued until 1848. Another set of observations were taken simultaneously at the Detroit Barracks at Russell and Gratiot from 1839 – 1851. Records also started at the completion of Fort Wayne in 1862. These were of frequent and good quality through the Civil War years, but then became less reliable and fragmented until their discontinuance in 1892.

The first attempt at a national, real-time weather observing network followed the invention of the telegraph in 1844. In 1848, a network of 150 volunteers nationwide was recruited at the behest of the Smithsonian Institution. In March of 1849, the Detroit observer, Dr. George Duffield, began transmitting his observation from Woodward and Larned to Washington D.C. In 1858, the Smithsonian observations moved to the Marine Hospital at Jefferson and Mt Elliot and continued there until the start of the Civil War in 1862. The Army Corp of Engineers Lake Survey Unit also began taking observations in late 1858 and continued until 1870.

The Beginnings of the National Weather Service

By the mid 1800's, marine traffic on the Great Lakes was reaching a peak and represented a significant segment of commercial transportation in the United States. Unfortunately, the Great Lakes marine fleet was extremely vulnerable to the intense storms that traverse the lakes in summer and fall. In the years 1868 and 1869 over 3,000 ships were damaged or sunk by storms on the Great Lakes and 530 lives were lost in these disasters.

Following these tragedies, Professor Increase Lapham of Milwaukee, a student of early meteorology and an avid weather observer, sought support for a national storm warning service to cope with the weather. Sending clippings of the maritime casualties to Congressman and General Halpert Paine of Milwaukee, Laphan asked if it were not the duty of the government to see whether anything can be done to prevent this loss in the future. In response to Professor Lapham's petition, Congressman Paine, on February 2, 1870, introduced a Joint Congressional Resolution requiring the Secretary of War to provide for taking meteorological observations at the military station in the interior of the continent and at other points in the states and territories and for giving notice on the northern Great Lakes and on the seacoast by magnetic telegraph and marine signals of the approach and force of storms. The Resolution passed and was signed into law by President Ulysses S. Grant on February 9, 1870.

Thus was ordered the beginning of today's NOAA National Weather Service. In 1870, this duty was initially assigned to the U.S. Army Signal Service, and its meteorological division (formally known as the Division of Telegrams and reports for the Benefit of Commerce) quickly became popularly known as the Weather Bureau. On November 1, 1870, at 735 AM, observations from 24 locations, including Detroit, were sent by telegraph to Washington and other cities.

In Detroit, the Signal Service Sergeant Allen Buel was in charge of the weather unit and its initial location was in Room 186 in the top floor of the Michigan Exchange Hotel at the corner of Jefferson and Wayne. This location is now occupied by the circular ramp to the roof of Cobo Center. Six months later, on May 15, the Signal Service was moved to more permanent residence on the Buhl Block at the corner of



Prof Increase Lapham

Congress and Griswold. Another ten years later, in 1881, the Weather Bureau moved to Room 225 of the Board of Trade Building at 154 Jefferson, where it remained until 1890.

All of the original weather records of the U.S. Signal Service currently reside at the NOAA National Weather Service office in White Lake MI. The records are startling in their penmanship and hand-written clarity, and include documentation of two major events for the region. The first was a written account describing the first recorded tornado to hit Detroit (June 18, 1874). The second describes Detroit's all-time 24-hour record snowfall (April 7, 1886).

The Beginning of the US Weather Bureau

In 1890, the Congress and President Benjamin Harrison signed into law a resolution to establish the United States Weather Bureau as an agency of the Department of Agriculture. In Detroit, the new agency occupied Rooms 1008-1010 of the Hammond Building at 122 Griswold



Majestic Building Circa 1910

and all employees of the old Signal Service were transferred to civilian service in the Weather Bureau. The Weather Bureau's role in forecasting and disseminating weather information was increasing at this time, and in 1895 Norman Conger became the first qualified meteorologist to take charge of the station. In 1896, the office moved from the Hammond Building to rooms 1105-1107 of the Union Trust Building at 102 Griswold, and then was relocated in 1907 to rooms 1314-1319 of the Majestic Building at 1101 Woodward. Instruments exposed on the roof of the Majestic were as high as 258 feet above street level.

Even though the use of telegraph and telephone were increasingly in use as methods of

disseminating weather warnings and

forecasts in the early part of the century, from 1909-1919 one of the more popular and visible ways for people to access the Weather Bureau forecasts was via a kiosk. The Detroit kiosk was located in a central location on the front lawn of the old City Hall, near the current location of Campus Martius at Woodward and Michigan. The kiosk was 10 feet high and four feet square and each of the four sides held a plate glass window. One side held several selfrecording weather instruments, while the other sides contained weather maps and bulletins.



Detroit Weather Kiosk Circa 1915



A Forecast Office Near the Turn of the 20th Century

Aviation Services Come to the Weather Bureau in Southeast Michigan

Detroit's first airplane took off from the State Fairgrounds on July 14, 1910, and two airports were built in the area during Word War 1, one at the current Selfridge Army Field and one at Ford Field between Oakwood Boulevard and the Rouge River. Following the war, Weather Bureau employees became increasingly involved in providing weather advice for aviation activities at the airports. Pilot Balloon observations were started at Ford Field on January 17, 1919, and the Air Commerce Act of 1926 gave the Weather Bureau specific responsibilities in the field aviation weather services. The first scheduled passenger flight in the United States occurred on November 2, 1927 from Ford Airport to Cleveland. By 1928, a fulltime Weather Bureau Airport Station (WBAS) was established at Ford Field. The WBAS was moved to the new Wayne County Airport (current Detroit Metro DTW) in 1930, then to the Detroit City Airport in 1933 (DET). In the early 1930s a new Federal Building was built downtown Detroit and the Weather Bureau moved from the Majestic to room 1013 of the new building. On January 1, 1934, all weather observations were transferred to the Weather Bureau Airport Station at Detroit City Airport, while administrative and forecast functions remained at the Federal Building. At this time, Detroit City Airport was the first airport in the United State to be the official weather observation site for their city. By the late 1930s, the forecast functions of the Weather Bureau were gradually transferred to the City Airport office until, by 1940, only the administrative functions of the agency and the Meteorologist in Charge remained at the Federal Building location.

Weather Bureau Functions Expand Across Detroit

By the 1940s, forecasting, map preparation, public service and aviation briefings were being handled by the weather bureau office at Detroit City Airport. Aviation support grew tremendously during World War II. During the war, a large factory was constructed for Ford to build the B-24 Liberators, known as the Willow Run Bomber Plant. An airport was constructed to fly the bombers away. It was the largest airport in the world at the time; 1,986 acres. A Weather Bureau Airport Station was created for this airport, in addition to one at the Wayne County Airport (now DTW). A nationwide RAOB network was established in 1940, which would allow upper air charts to become feasible. In 1941, RAOBs began at Selfridge ANG. Improvements in communications during the 1940s also allowed easier means to disseminate the forecasts. A multiline automatic weather answering service was established and by the middle of the decade was handling over a million calls a month. In addition, direct broadcasts of weather forecasts over the radio began in 1946 on WJR during the early morning farm program.

Continued improvements in communications took place in the early 1950s, including the teletypewriter circuit which enabled news media to easily receive forecasts. Also during the 1950s, the United States was divided up into "Areas of County Responsibility" for the purpose of Tornado and Severe Thunderstorm Warnings, which is still the case today. The Detroit City office was originally allotted eleven counties. This was then reduced to eight when the Flint Weather Bureau Office was opened in 1956 at Bishop Airport. The upper air observations (RAOBS) were also transferred from Selfridge ANG to Flint.

A major expansion program in the mid 1950s enlarged the Wayne County Airports area to over six square miles. Pan American World Airways operated the first scheduled passenger flight from the field in April 1954. In 1957, the name was changed to Detroit Wayne County Metropolitan Airport (DTW). As it became apparent that DTW was going to be a major airport, the Weather Bureau began installing new electronic equipment and transferring staff to the DTW Weather Bureau Airport Station. The office was located in an annex to the Old Administration Building (renamed the Executive Terminal in 1963). A WSR3 radar was commissioned here on May 15, 1957. On November 1, 1957, the downtown Weather Bureau Office in the Federal Building was closed and the meteorologist in charge moved to city airport which had then become the headquarters of the Weather Bureau in the Detroit Area (soon after this position moved to DTW). During 1958, half the staff at City Airport, along with most forecasting responsibility was transferred to the Detroit Metro Weather Bureau Office. Through the 1960s, facilities at DTW continued to be enlarged, while staff was reduced at City Airport and the Willow Run office. In 1961, the WSR 57 radar replaced the old WSR3 radar at DTW and 5 professional radar observers were added to the staff. On April 1, 1966 responsibility for synoptic observations was transferred from Detroit City (DET) to the Detroit Metro Office (DTW). Since that date, DTW has been the "official weather station" for

Detroit. On July 1, 1966 the Weather Bureau Airport Station at Detroit City



1957 Weather Radar Debuts

Airport was closed. All staff plus marine warning responsibility were transferred to Detroit Metro. The Willow Run office then closed on October 1, 1968. By November 1, 1968 Detroit Metro became the forecast office for the entire state and received additional forecaster positions. By 1969, the Detroit Metro Forecast Office and the Flint WBAS were the two sole Weather Bureau Offices in Southeast Michigan (although several WBAS existed in other parts of the state).



Typical Weather Bureau Office in the 1960s

The Weather Bureau Becomes the National Weather Service

In 1970, the Environmental Science Services Administration (ESSA) became the National Oceanic and Atmospheric Administration (NOAA), under the US Department of Commerce. The Weather Bureau was placed under NOAA and renamed the National Weather Service (so the Detroit metro station became a National Weather Service Forecast Office and the Flint station became a National Weather Service Office). In 1979, the forecast staff at the Detroit Metro office was transferred to the federal building in Ann Arbor. This forecast office in Ann Arbor was responsible for issuing public, marine and aviation forecasts for the entire state of Michigan. Like the Flint office, the office at Detroit Metro then became a Weather Service Office (WSO), responsible for taking observations, monitoring radar and issuing local warnings, operating NOAA weather radio, providing short term forecasts, and giving pilot weather briefings. The other WSOs across the state at this time included; Lansing, Grand Rapids, Muskegon, Houghton Lake, Alpena, Sault Ste Marie, and Marquette. The technological advances during the 70s and 80s, especially those made in computer models and satellite technology, was tremendous, which led to a steady improving trend in forecast accuracy. On March 9, 1984 the WSR-74S radar was commissioned at Detroit Metro Airport. These radars were installed to provide better radar coverage across the country (to fill in the gaps so to speak) and were transistor based.



A Typical National Weather Service Forecast Office in the 1970s

Modernization to Present

During the 1990s the National Weather Service underwent a program of modernization. The installation of Automated Surface Observing Systems (ASOS) at all of the major airports would no longer require a human observer to report and record weather observations at the airports. Pilot weather briefings were also transferred from the Weather Service Offices to FAA Flight Service stations. Modernization was implemented to consolidate the Weather Service Forecast Offices (WSFO) and the Weather Service Offices (WSO) into one large Forecast Office covering a specific geographic region. Four forecast offices were created in the state of



WSR-88D RADAR in White Lake

Michigan. For Southeast Michigan, a new office was constructed in Oakland County's White Lake Township in 1992. This office essentially merged the forecast office in Ann Arbor with the offices at Detroit Metro and Flint. The Ann Arbor staff, who had been forecasting for the entire state of Michigan, would now only have to forecast for Southeast Michigan (17 counties). Similar forecast offices were created in Grand Rapids, Gaylord, and Marquette to cover the rest of the state. In 1993, the WSR – 88D was being built at White Lake and was commissioned in 1995, providing radar coverage for the entire 17 county area. The upper air observation station (RAOB) that had been located in

Flint since the 1950s was moved to the White Lake facility in late 1994. Advances in radar and computer technology over the last 20 years have greatly improved the accuracy of warnings

and forecasts, while the advances in communications have now made it possible to receive these products within seconds of their issuance. Despite the departure of the National Weather Service from Detroit Metro Airport, climate data for DTW is still received and archived at the NWS White Lake office, maintaining the continuous weather data for Detroit that goes back to the late 19th century.



National Weather Service White Lake in 2010