Summary of HPC's Heritage and Leadership

January 9, 2013



Mar 1942 Established as the **Weather Bureau Analysis Center**

- created Mar 5, 1942, by Weather Bureau Circular Letter 39-42; operations began Mar 16, 1942. (This letter did not indicate the creation was a result of Executive Order 8991, "Coordinating Civil Meteorological Facilities and Services for War Purposes", signed by President Franklin D. Roosevelt on Dec 26, 1941.)
- located in Old Main Building, 24th & M, Northwest, Washington, DC; collocated with the Weather Bureau's Central Office.
- referred to as "the Analysis Center", although occasionally early on as the Master Analysis Center.
- At that time and since 1940 the Weather Bureau was a bureau of the Department of Commerce (DOC).
- Leadership:

1942-1947:	Joseph R. Fulks

Jun 1947 Consolidated into the **Weather Bureau-Air Force-Navy (WBAN) Analysis Center**

- The new organization was created from the Weather Bureau Analysis Center, Air Force Master Analysis Center, and Navy Weather Central.
- referred to as "the WBAN Analysis Center" and "the Analysis Center".
- WBAN was pronounced "WAY ban".
- Operations began June 16, 1947, at 2 p.m. EDT.
- technicality: the U.S. Air Force did not come into existence until Sep 18, 1947.
- Leadership:

1947-1950+	Joseph R. Fulks
1953-1955	Albert K. Showalter, Meteorologist in Charge

1955 Renamed the **National Weather Analysis Center** (NAWAC)

- moved to Federal Complex in Suitland, MD, at that time.
- NAWAC was pronounced "NAY wack".
- Leadership:

1955-1958:	Albert K. Showalter, Chief

Jan 1958 Incorporated with no name change into the National Meteorological Center (NMC) upon NMC's creation

- Leadership:
  - 1958-1961?: Albert K. Showalter, Chief

Jul 1961 Reorganized into the **Analysis and Forecast Branch** of NMC

- Leadership:
  - 1961?-<1963 Albert K. Showalter?, Chief

1964 Reorganized into the **Analysis and Forecast Division** of NMC

- In 1965, the Environmental Science Services Administration (ESSA) was created, incorporating the Coast and Geodetic Survey and the Weather Bureau.
- On Oct 3, 1970, the National Oceanic and Atmospheric Administration (NOAA) was created. At that time the Weather Bureau was renamed the National Weather Service and incorporated into NOAA.
- Leadership:
  - <1968 - 1972: Harlan K. Saylor, Chief

1972 Reorganized into the **Forecast Division** of NMC

- The division moved to the World Weather Building (WWB) on Wednesday, Feb 19, 1975. (According to employee Bill McReynolds the division moved two days after Presidents Day in 1975.)
- Leadership:
  - 1972 - ~1975: Harlan K. Saylor, Chief
  - ~1975 - 1978: Edwin B. Fawcett, Chief
  - Mar 1978 - Apr 1984: Edward M. Carlstead, Chief

1984 Reorganized into the **Meteorological Operations Division** (MOD) of NMC

- The reorganization was led by Edward M. Carlstead.
- Leadership:
  - 1984 - ??: Harlan K. Saylor, Chief (acting)
  - Jul 1987 - Oct 1988: Ronald D. McPherson, Chief
  - Sep 1989 - Apr 1994: Louis W. Uccellini, Chief
  - Nov 1994 – Jun 1995: Ralph A. Petersen, Chief (acting)
  - Jun 1995 - Sep 1995: James E. Hoke, Chief

Oct 1995 Reorganized into the **Hydrometeorological Prediction Center** (HPC)

- HPC was created on Oct 1, 1995, from part of MOD upon the reorganization of NMC into the National Centers for Environmental Prediction (NCEP), with the other components of MOD becoming all or part of the Marine Prediction Center (now the Ocean Prediction Center), the Aviation Weather Center, and NCEP Central Operations.
- HPC started continuous operations from the NOAA Center for Weather and Climate Prediction in College Park, MD, on Friday, Aug 17, 2012, at 12 UTC.
- HPC ceased continuous operations at the World Weather Building in Camp Springs, MD, on Sunday, Aug 19, 2012, at 19 UTC.
- Leadership:
  - Oct 1995 - present: James E. Hoke, Director

A Brief Narrative of NCEP and HPC History

January 9, 2013

The National Centers for Environmental Prediction (NCEP) is a recognized global leader providing a seamless suite of operational environmental analysis, diagnostics and forecasts for a domain that now ranges from the sun to the sea, including weather, ocean, climate, water and space weather prediction services. NCEP's success depends on addressing user needs and the requirements of our world-class employees to enable NCEP to best meet the evolving NOAA mission. Furthermore, NCEP is at the forefront to capitalize and implement emerging scientific and technological advances. In that regard, NCEP must serve as a catalyst to coordinate, cooperate and collaborate through applied research, training, technology transfer and implementation of a common modeling infrastructure for global to regional applications. Partnerships with the entire community, and related operational and developmental test beds, will build off collaborations with the NWS, NOAA, other federal agencies, academia and the public sector to accelerate improvements in all NCEP products and services.

The Hydrometeorological Prediction Center (HPC) is one of nine centers of NCEP. HPC is a leader in the collaborative weather forecast process delivering responsive, accurate, and reliable national forecasts and analyses. HPC serves as a center of excellence in quantitative precipitation forecasting, medium-range forecasting (three to eight days), the interpretation of numerical weather prediction models, and in surface analysis. HPC's vision is to be America's Go-To Center for high-impact precipitation events and forecast guidance out to 14 days for a Weather-Ready Nation.

From the earliest days of the government's involvement in weather services (the NWS may be traced to 1870), it was apparent that a centralized facility would be necessary to gather, organize and disseminate weather data on a national basis effectively. The center during the early years occupied a single room as part of the U. S. Army Signal Service in Washington, D. C. There, telegraphic reports of temperature, wind, and pressure from around the country were plotted and analyzed. From these analyses, rudimentary forecasts were made for the following day. Washington shared some of its forecast duties with the advent of a field office system in the 1890s, but the central office still had the final say in cases of professional dispute.

While HPC's roots lie deep in the past, the organization can be most directly traced to the formation of the Analysis Center by Circular Letter 39-42, signed by Weather Bureau Director Francis W. Reichelderfer on March 5, 1942. Operations began on March 16, 1942, with the unit collocated with the Weather Bureau Central Office at 24th and M Streets NW in Washington, D.C. Initially the unit was sometimes referred to as the Master Analysis Center.

In 1947, the Analysis Center was combined with the Air Force Master Analysis Center and the Navy Weather Central to create the Weather Bureau-Air Force-Navy (WBAN) Analysis Center. Operations commenced on June 16, 1947, at 24th and M Streets NW. The unit was established to coordinate and consolidate national efforts of the civilian and military weather services as they existed at the time. The center produced a wide array of diagnostic and forecast maps for national distribution. Initially, the charts were sent in coded form via teletype. Somewhat later, the installation of facsimile allowed for the direct transmission of graphics. Hundreds of maps were produced every day, including surface and upper air analyses, temperature and precipitation forecasts and prognostic surface charts.

By the early 1950s, computers powerful enough to solve the fundamental equations of atmospheric motion in real-time were at last becoming available. Thus, the theoretical work of English physicist L.F. Richardson, who during World War I first proposed the use of numerical techniques in weather prediction, could finally be tested. The Joint Numerical Weather Prediction Unit (JNWPU) was formed in July 1954 to do just that. More broadly, JNWPU's objective was to apply the expanding field of computer technology to operational weather forecasting.

The JNWPU was staffed and funded jointly by the Weather Bureau, Army, and Navy, and was responsible for many of the early advances in automated analysis and forecasting. The first JNWPU computer, an IBM 701, was installed in March 1955, and the first numerical experimental forecasts (using a barotropic model) appeared one month later. The unit co-located with the renamed National Weather Analysis Center (NAWAC, formerly the WBAN Center), in Suitland, Maryland, during the same year.

The National Meteorological Center (NMC), the direct precursor to NCEP, came into being with the merging of NAWAC (including the Extended Forecast Section) and JNWPU in Federal Office Building #4 (FOB 4) in Suitland in January 1958. NMC at once became the nerve center for weather data in the United States. NMC processed weather observations from around the globe and disseminated analyses and forecasts to customers throughout the U.S. and other countries. Research increased, with emphasis on developing faster and more accurate numerical techniques. It was the only such facility in the world at the time, and at least one publication described its creation as being "a milestone in the progress of meteorology."

Constantly pursuing greater speed and reliability, NMC upgraded its computer investment substantially in the ensuing years, with each new system about 6 times more powerful than the one before. An IBM 704 replaced the 701 in 1957, and an IBM 7090 was installed in 1960. By 1963, the first operational baroclinic model was running on a new IBM 7094. The arrival of a CDC 6600 enabled the first global primitive equation (PE) model run to be made in June 1966.

The accuracy of NMC's numerical guidance continued to increase into the 1970s, but especially significant gains were noted with the introduction of the high resolution PE model on an IBM 360/195 in 1978. By the late 1980s, a Cray Y-MP8 Class VII supercomputer served as NMC's mainframe system. It could produce a numerical forecast for all of North America out to 48 hours in less than 30 seconds, and was some 50,000 times more powerful than the IBM 701. While most NMC functions moved to the World Weather Building at Camp Springs, MD in 1974 and 1975, Suitland's FOB 4 continued to house the Center's main computers until 1999, when an IBM SP was installed at a new site in Bowie, Maryland. This site was changed again in 2002 when a more powerful IBM supercomputer was installed in Gaithersburg, Maryland.

On October 1, 1995, NMC was reorganized and was renamed NCEP. HPC is one of the nine NCEP centers, with the other six Service Centers being the Aviation Weather Center, Climate Prediction Center, National Hurricane Center, Ocean Prediction Center, Storm Prediction Center, and Space Weather Prediction Center. The two other centers, the Environmental Modeling Center and NCEP Central Operations, provide the numerical model development and Information Technology infrastructure that are foundational to the Weather Enterprise in the U.S. and around the world.

Five permanent directors have guided NMC and NCEP since its inception in 1958. George P. Cressman was the Center's first director, a post he held until leaving to become Director of the U. S. Weather Bureau in 1963. Frederick G. Shuman succeeded him and remained until retiring in 1981. William D. Bonner then served as NMC Director until Ronald D. McPherson arrived in 1990. McPherson served until he retired in July 1998, at which time James E. Hoke filled in as Acting NCEP Director. Louis W. Uccellini became NCEP Director in January 1999.

These are exciting times for NCEP. In August 2012 five of its centers moved into a state-of-the-art facility, the NOAA Center for Weather and Climate Prediction, collocated at the University of Maryland. This move will certainly provide a basis for accelerating product improvements and expanding prediction services envisioned for years to come.