A Century of Weather Service


Patrick Hughes
First Published in 1970, *A Century of Weather Service* provides a comprehensive history of the birth and growth of the National Weather Service from 1870 to 1970 in America. It discusses important themes such as coping with disaster; American weather pioneers; a military weather service; The United States Weather Bureau; the air commerce age; weather in war; growth of a global weather service; calculated weather risks; the air we breathe; and one world of weather. The book closes with a chronology of the meteorological milestones of the American weather services from 1644 to 1970.

This is an important historical work for students of environmental geography and general readers interested in the topic.
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OF WEATHER SERVICE

A History of the Birth and Growth of the National Weather Service

1870 - 1970

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FOREWORD

February 9, 1970 will mark the 100th anniversary of the founding of our national weather service. In 1870 much of the country was still wilderness, and the telegraph was the most advanced means of communication. Today, we have turned from taming the land to tackling the problems of our environment, and television brings us live pictures from the moon. The parallel growth and organizational diversification of our Nation's weather services to meet the challenges of this century of radical change have contributed importantly to our country's emergence as a world leader in scientific thought and application.

I salute the men and women of the Nation's weather services on their centennial. May their second century of service be as beneficial to the American people as has been the first!

MAURICE H. STANS
Secretary of Commerce
U.S. Department of Commerce
Washington, D.C.
INTRODUCTION

The Weather Bureau, through its forecasts and warnings, probably touches the daily lives of more Americans than all other Government agencies combined, with the single exception of the Post Office. Yet, the Weather Bureau is itself only one of many agencies which collectively comprise a national weather service whose roots reach back to colonial days.

Only a century ago weather warnings and forecasts were not available, whether for farmer or President, and the atmosphere was still largely a realm of mystery. In the application of science to free man from the limitations of his environment, the past 100 years have far exceeded the previous hundreds of thousands. And from the beginning of this century, American weather scientists have been among the first to apply the latest technological innovation to the needs of the Nation. More recently, they have turned their attention to the needs of the global community.
ACKNOWLEDGMENTS

In a work such as this the author is often more craftsman than creator, chipping and polishing pieces provided by others to produce an overall mosaic. That the picture is as complete and detailed as it is, is due in large measure to the contributions and efforts of many people. It would be impossible to credit all who have contributed, but some must be mentioned.

Material and cooperation were provided in abundance by Gail L. Bradshaw, public information officer for the Atomic Energy Commission, and David Slade, an Environmental Science Services Administration (ESSA) meteorologist working with the AEC; Robert McCormick, an ESSA meteorologist attached to the Department of Health, Education, and Welfare's National Air Pollution Control Administration; Gordon Webb, Dr. Arnaud J. Loustalot, William White, and Dr. Wayne D. Rasmussen of the Department of Agriculture; Robert McCormick, an ESSA meteorologist attached to
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The contributions of J. J. Keyser of the Naval Weather Service Command, Charles Dickens, Air Weather Service historian, and Carl Posey of ESSA's Public Information Office were particularly valuable. Mr. Keyser and Mr. Dickens provided the
bulk of the material on the military weather services in Part III, while Mr. Posey contributed substantially to portions of Part IV.

Although the early and recent history of the Nation's weather services is well documented, information for the years between is often sketchy, scattered and, in many instances, not available in print. Here the memories and knowledge of several eminent scientists filled the void. Dr. Francis W. Reichelderfer, an architect of the Navy's Meteorological Service and for many years Chief of the Weather Bureau, Dr. Helmut E. Landsberg, former Director of the Bureau's Office of Climatology, and Dr. Charles W. Abbot, Secretary Emeritus of the Smithsonian Institution, recalled the spirit as well as the accomplishments of years past. Unpublished papers and personal correspondence provided by Albert Showalter of the Weather Bureau also supplied background material for some of the notable events of this period.

Though the chronology at the back of the book is drawn from many sources, the lists of meteorological milestones prepared by Malcolm Rigby of ESSA were the principal references, as they were in the early structuring of the narrative. Mr. Rigby also provided notes on the history of the American Meteorological Society and an outline of developments in international meteorology. In addition, he served as a general reviewer and critic and, with the help of his wife Marian, prepared the index.

The tireless efforts of William West and Clyde Collier of ESSA, of Maurice Callahan, assistant archivist of the Smithsonian Institution, and of Commander Thomas Fredian and Lieutenant David Sokol of the Naval Weather Service Command, made it possible to assemble an outstanding collection of photographs. Thanks to their efforts, and the generous cooperation of the many agencies, organizations, and individuals who supplied pictures, only the final selection was left to the author.

James Osmun of ESSA, Executive Secretary of the Weather Services Centennial Steering Committee, provided the contacts, coordination, and initial material needed to begin the book. Mary Ellis Moore of ESSA's Public Information Office was a tireless girl Friday during the final hectic months, providing invaluable assistance to the author by coordinating the efforts and activities of all connected with the project.
The typing, retyping, and retyping was done with great patience and perseverance by Catherine Shaver and Lillian Hovermale of the Environmental Data Service, who also took it upon themselves to catch errors surviving the editorial process.

Carol Litman of the author's own office was the chief editorial critic and kept him within reasonable range of established English grammar and usage. Gertrude Fricke of the same office undertook much of the tedious checking of details and references so necessary to a work of this nature.

To these, and to the many others I have not mentioned, either through oversight or lack of space, my thanks; without their efforts and contributions there would have been no book.

PATRICK HUGHES
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PART I
AN AMERICAN ORIGINAL
An American Original

When Central Pacific’s “Jupiter” and Union Pacific’s Engine No. 119 touched cowcatchers at Promontory Point, Utah on May 10, 1869 large areas of the West were still uninhabited by white men. Twenty years later the great transcontinental railroads had peopled these vast open spaces, and the American Frontier had disappeared forever.

During these same years the telephone and incandescent light bulb were invented, and at their close in 1890, the world’s first skyscraper was erected in Chicago. In this period of territorial expansion and accelerating technological innovation the American weather service was born and passed its adolescence.

A Child of the Telegraph

Worrying about the weather is as old as man himself. He has always tried to understand and predict it, and the beginnings of his weather knowledge can be traced to the earliest civilizations. However, modern meteorology—the science of weather—was born only a few hundred years ago with the invention of the thermometer and barometer. Suddenly, for the first time, it was possible to accurately measure temperature and pressure, the basic elements of weather.

Heinrich W. Brandes of the University of Breslau drew the first known weather map in 1816, using observations made in 1783. He made the major discovery that storms are simply moving systems of low pressure easily identified and tracked on weather maps.

During the next few decades the weather map was adopted by more and more scientists, but there was no way to collect current observations from widely scattered stations quickly enough to make weather forecasts—until the invention of the telegraph.
Joseph Henry established the Nation's first telegraph storm warning network in 1849. —THE SMITHSONIAN INSTITUTION
The telegraph made meteorology a practical science. Weather observations from distant points could now be rapidly collected, plotted, and analyzed for pressure patterns; a series of such analyses or weather maps could be used to track the movement of storms and to predict their probable paths and speeds of advance. For the first time man had the tools he needed to observe, study, and forecast the weather. Now he had to learn to use them.

When the first commercial telegraph line opened on April 1, 1845, many people saw the possibility of "forecasting" storms by simply telegraphing ahead what was coming. The first person to do something about it was Joseph Henry, Secretary of the new Smithsonian Institution.

On December 8, 1847 Henry wrote to the Smithsonian's Regents:

... It is proposed to organize a system of observation which shall extend as far as possible over the North American continent. . . . The Citizens of the United States are now scattered over every part of the southern and western portions of North America, and the extended lines of the telegraph will furnish a ready means of warning the more northern and eastern observers [weather in the eastern United States usually moves from the west or southwest] to be on the watch from the first appearance of an advancing storm.

By the end of 1849, 150 widely scattered volunteers were reporting weather observations to the Smithsonian regularly.

The next logical step was to portray the weather occurring over various sections of the country on a daily map. In 1850 Henry mounted such a map in the hall of the Institution where it could easily be seen by the public. Corresponding weather signals were displayed on the high tower of the Smithsonian castle.

Henry's system of weather observers, telegraphic relay, and weather display maps was a direct ancestor of the national weather service established 20 years later. The only major element missing was the public weather forecast.

On February 1, 1868 Professor Cleveland Abbe became director of the Cincinnati Astronomical Observatory. Six months
Cincinnati, Ohio as Cleveland Abbe knew it.

—THE NATIONAL ARCHIVES
later he sent a letter to the local chamber of commerce detailing a plan to issue daily weather reports and storm warnings and asking financial support. The chamber agreed to underwrite Abbe’s weather service for a 3-month trial period.

The first *Weather Bulletin* was issued for the chamber on September 1, 1869; a little later, the bulletins were printed and distributed to the public. The first weather forecast was published in the Bulletin of September 22.

Less than 6 months after Abbe’s first bulletin, a national weather service was born. The man who started the immediate chain of events leading to its creation was Professor Increase A. Lapham of Milwaukee, a student of meteorology and a weather observer for both Henry and Abbe.

*To Cope with Disaster*

In 1868 storms sank or damaged 1,164 vessels on the Great Lakes, killing 321 sailors and passengers. In 1869 there were 1,914 casualties with 209 lives lost.

Once again, as he often had in the past, Professor Lapham sought support for a storm warning service for the Lakes, sending clippings of the maritime casualties to General Halbert E. Paine, Congressman for Milwaukee. In an accompanying letter he asked if it were not “... the duty of the Government to see whether anything can be done to prevent, at least, some portion of this sad loss in the future ...?”

Congressman Paine was aware of the importance and practicability of the service Lapham was advocating. On February 2, 1870 he introduced a Joint Congressional Resolution requiring the Secretary of War “to provide for taking meteorological observations at the military stations 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 was passed by Congress and signed into law on February 9, 1870 by President Ulysses S. Grant.

Paine named the Secretary of War to execute the law because “military discipline would probably secure the greatest promptness, regularity, and accuracy in the required observations.” The Secretary assigned the new service to the Chief Signal Of-