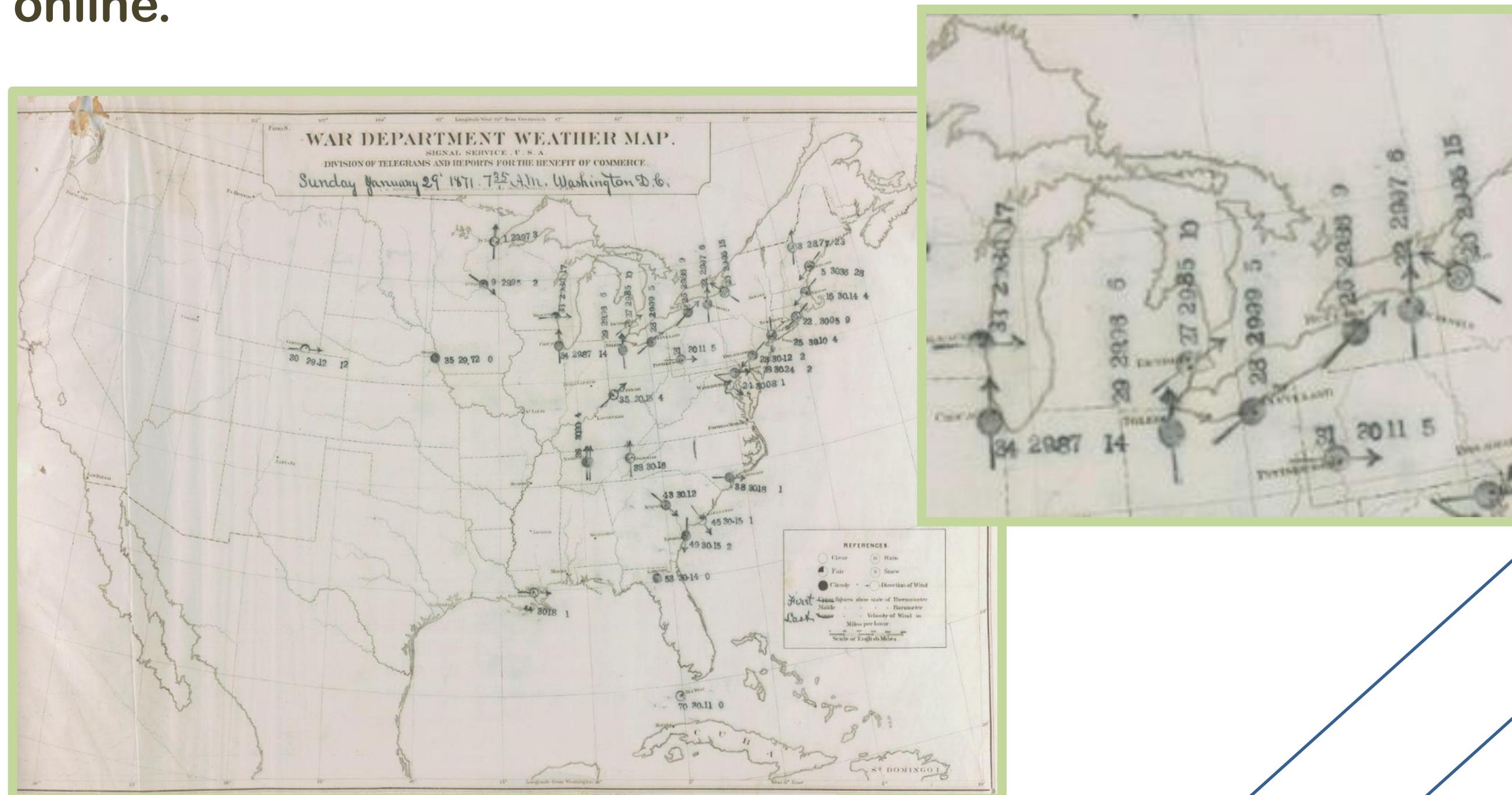


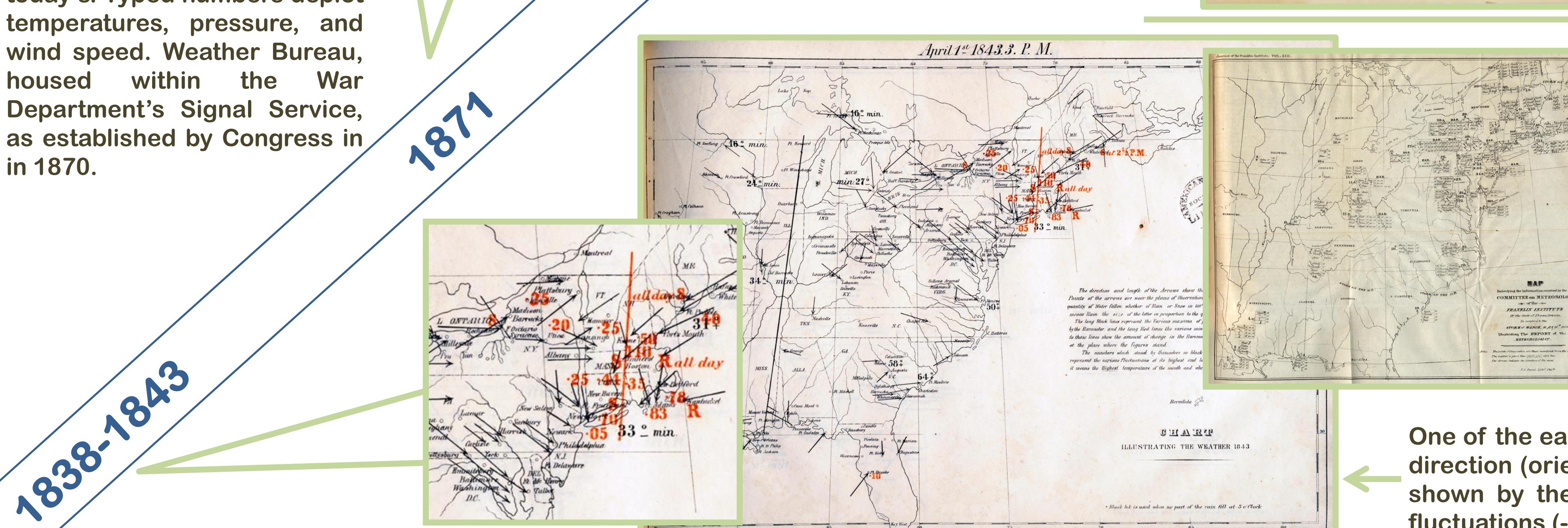
The Daily Weather Map: A Cartographic History of Meteorology

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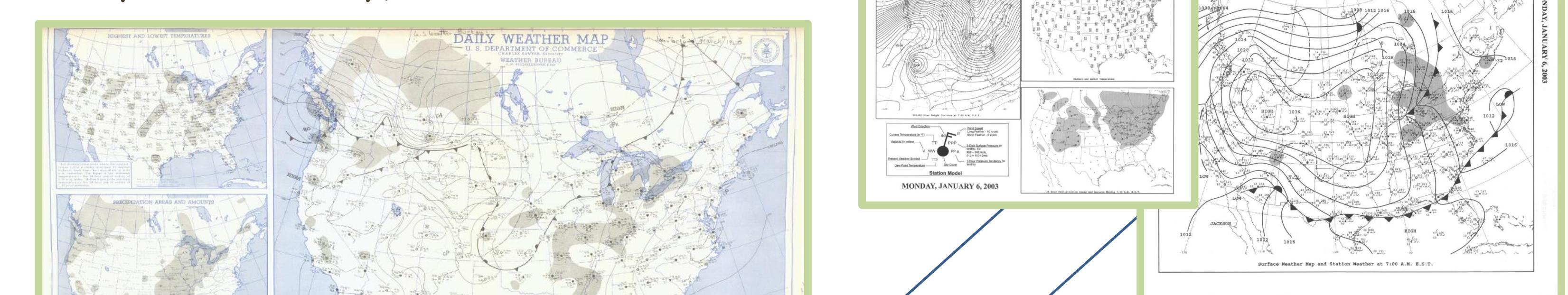
The U.S. Daily Weather Map has been continuously published for over 140 years. Prior to the Daily Weather Map, James Pollard Espy (1785–1860) produced one of the first U.S. weather maps, noting that “A well-arranged system of observations spread over the course of the country, would accomplish more in one year, than observations at a few isolated posts, however accurate and complete, to the end of time”. An examination of these early maps, and specifically the Daily Weather Map, reveals the evolution of meteorological science in this country. The relevance of the maps evolved – initially they were outdated before distribution, evolved to serve as a timely source of information, and later were relegated as an archival record. The early maps were confined by a limited number of observing stations, later isotherms and isobars could be drawn as the observing network became denser and expanded westward. The maps reveal the early struggle with the visualization of weather data which eventually led to the development of the ‘station model’. The display of air masses eventually found their way on the maps, while the depiction of air mass boundaries, as depicted by fronts (Norwegian Cyclone Model), came late to the Daily Weather Map, as it did to this country. The expansion from one to multiple maps followed in subsequent years, leading to the eventual publication online.



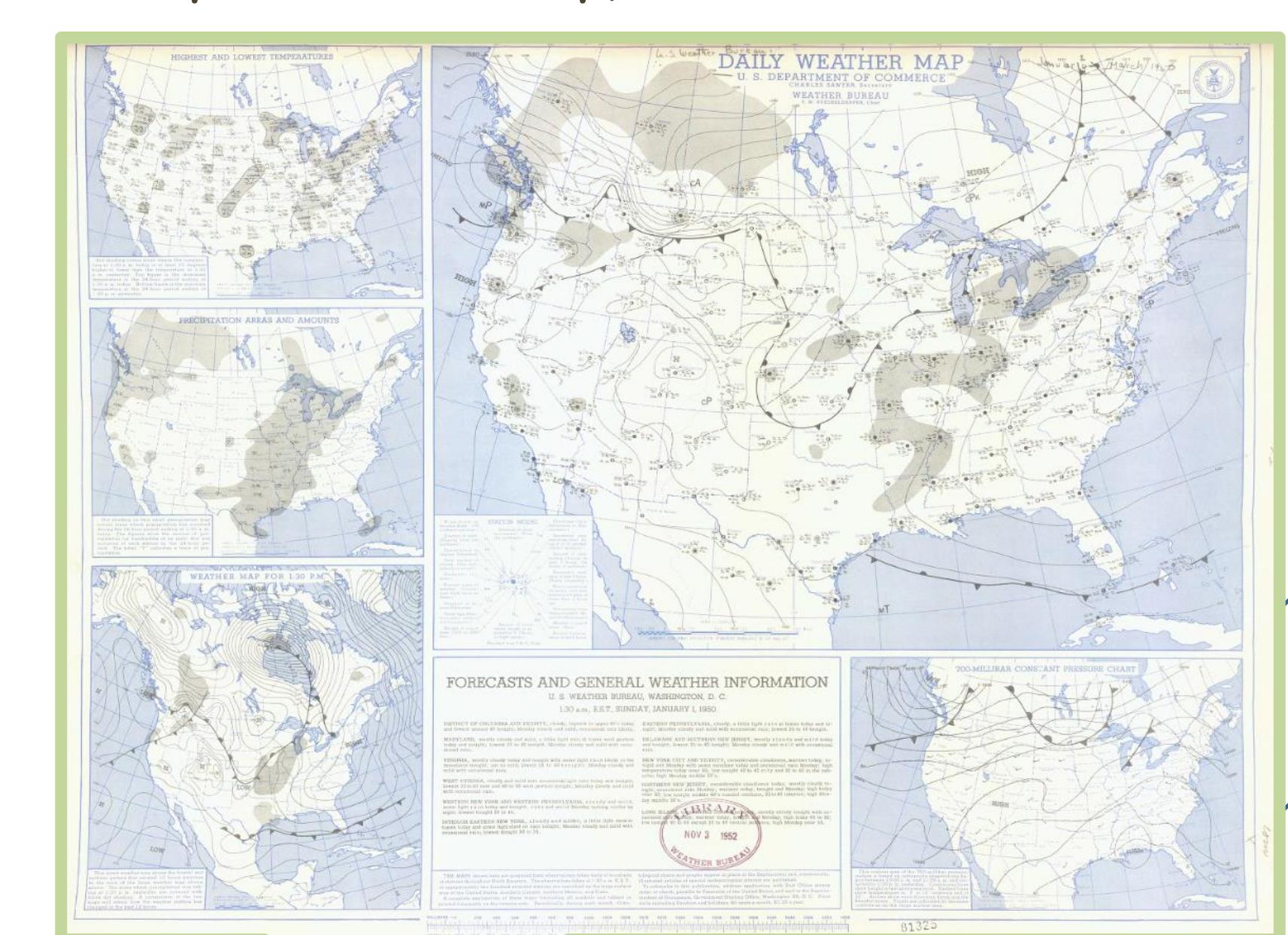
Early ‘Daily Weather Map’ – yes, published daily. Most stations located along Atlantic seaboard and Great Lake shores, with few western stations. Cloud cover symbols debut – somewhat similar to today’s. Typed numbers depict temperatures, pressure, and wind speed. Weather Bureau, housed within the War Department’s Signal Service, as established by Congress in 1870.



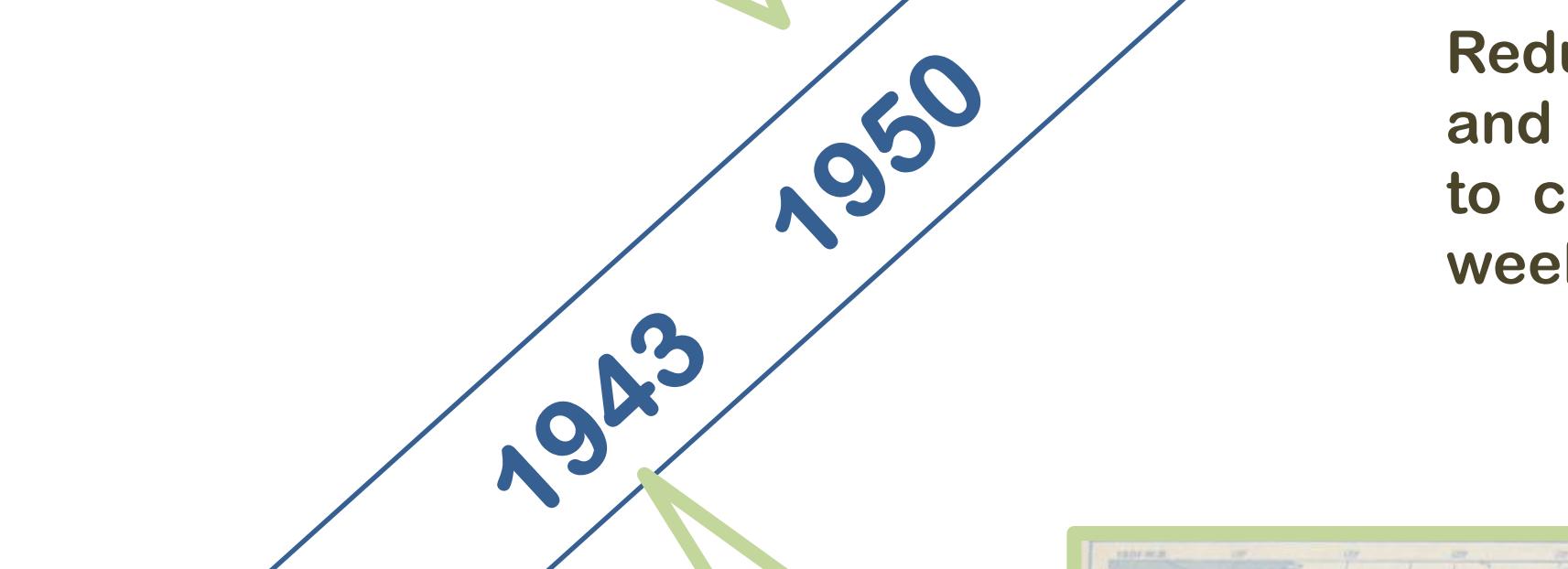
U.S. Daily Weather Map remains a sheet of paper but additional maps added: High and Low Temperatures; Precipitation Areas and Amounts; 1:30 p.m. Weather Map; and 700 mb Chart.



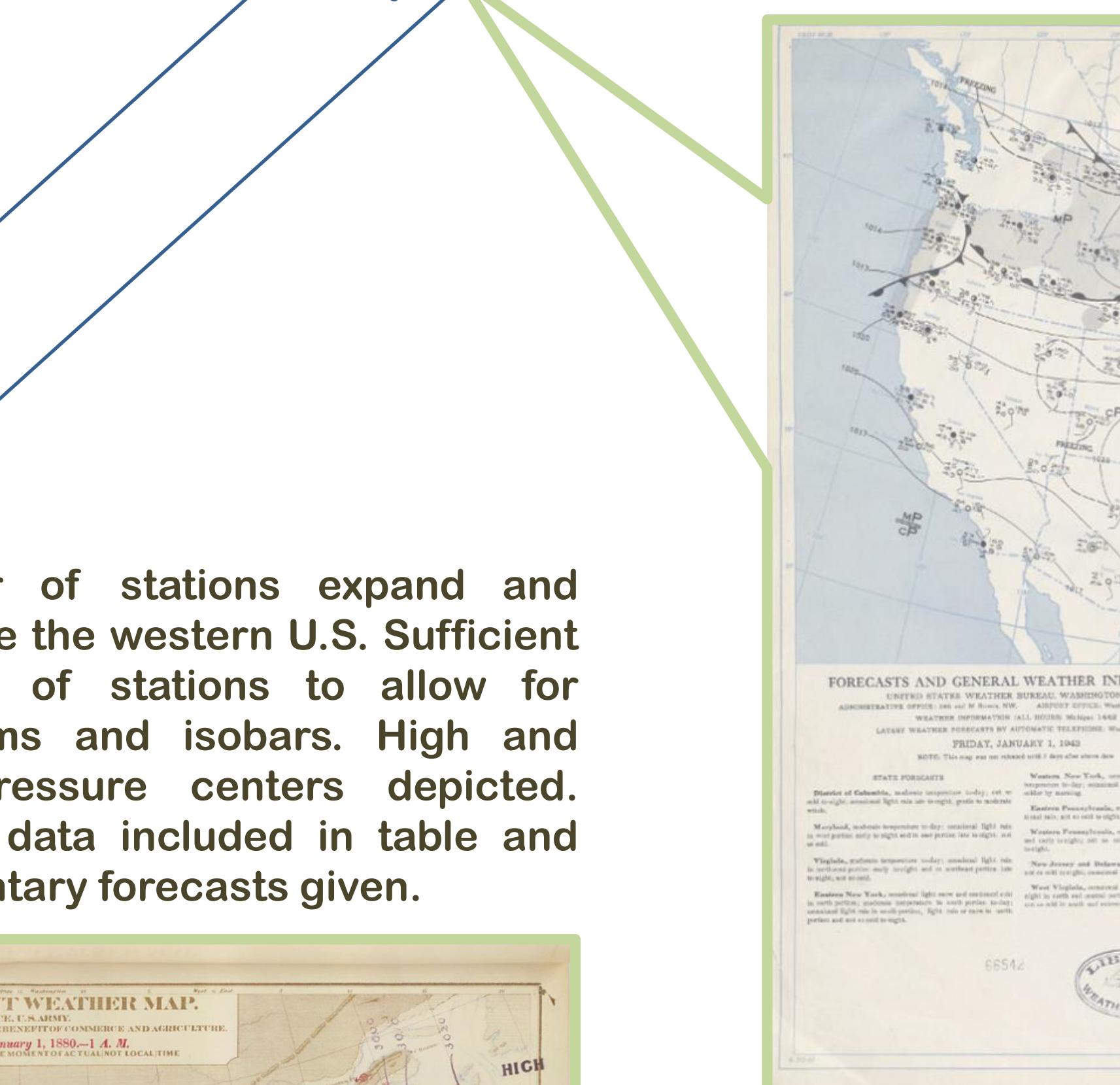
First available on Internet for viewing and downloading.



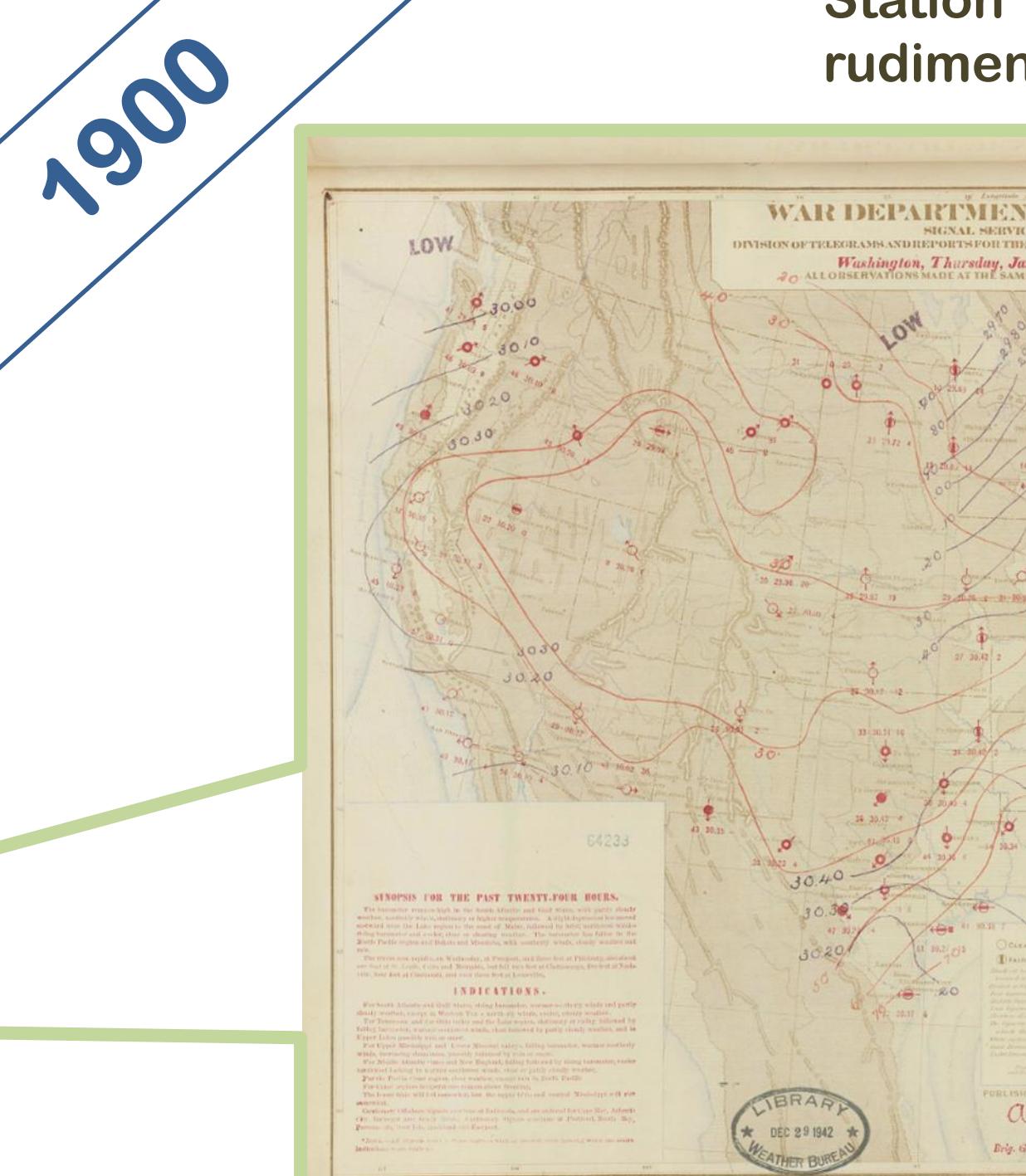
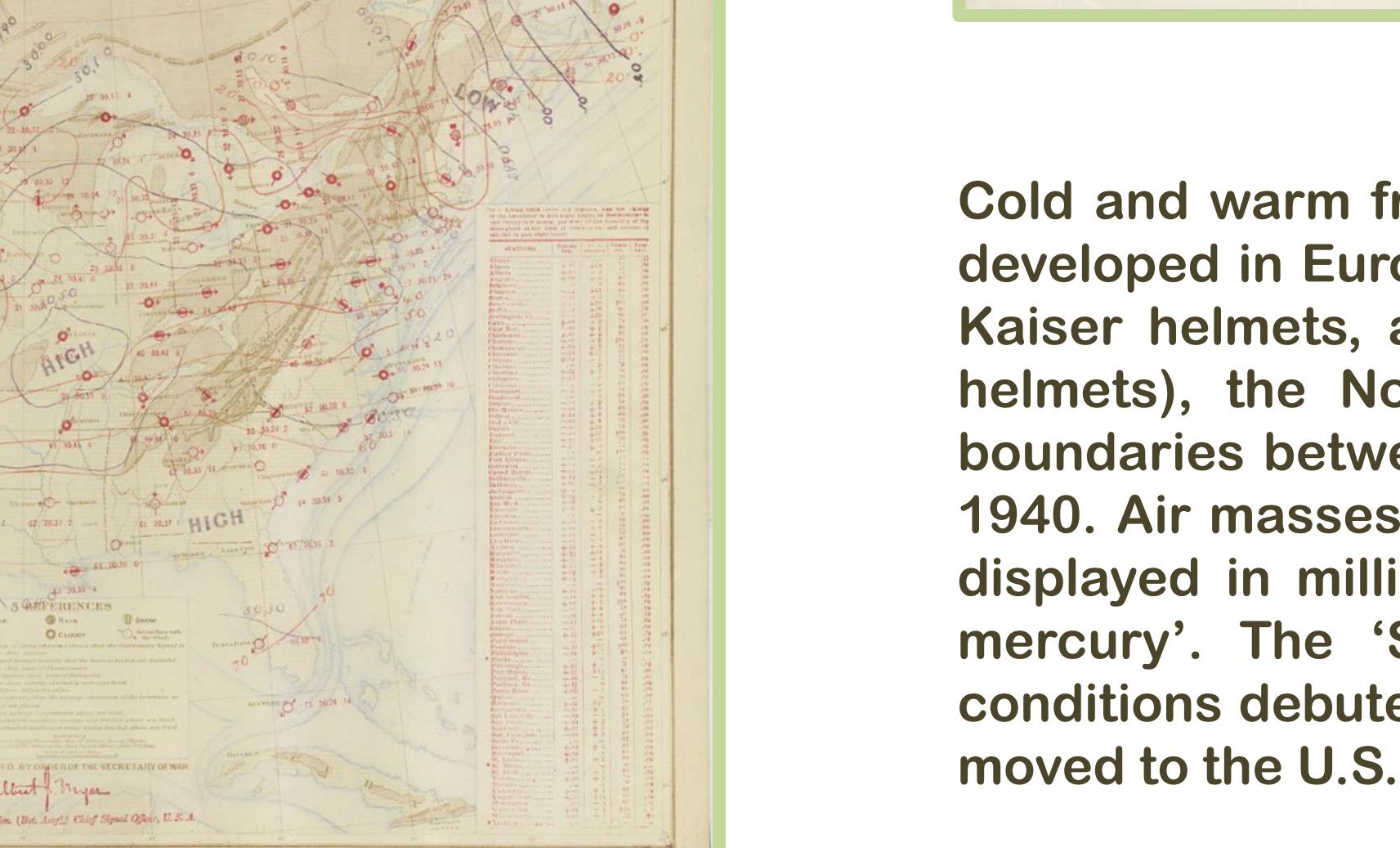
Reduced in size and expanded to cover a one week period.



Precipitation areas Last 24 hours) are shaded. Low pressure storm tracks are shown. Along with isotherms, dashed red isolines indicate changes in temperature over the past 24 hours. Tabular station data expanded, river gauge stations added, and weather forecasts expanded. The Weather Bureau moves from the War Department to the U.S. Department of Agriculture.

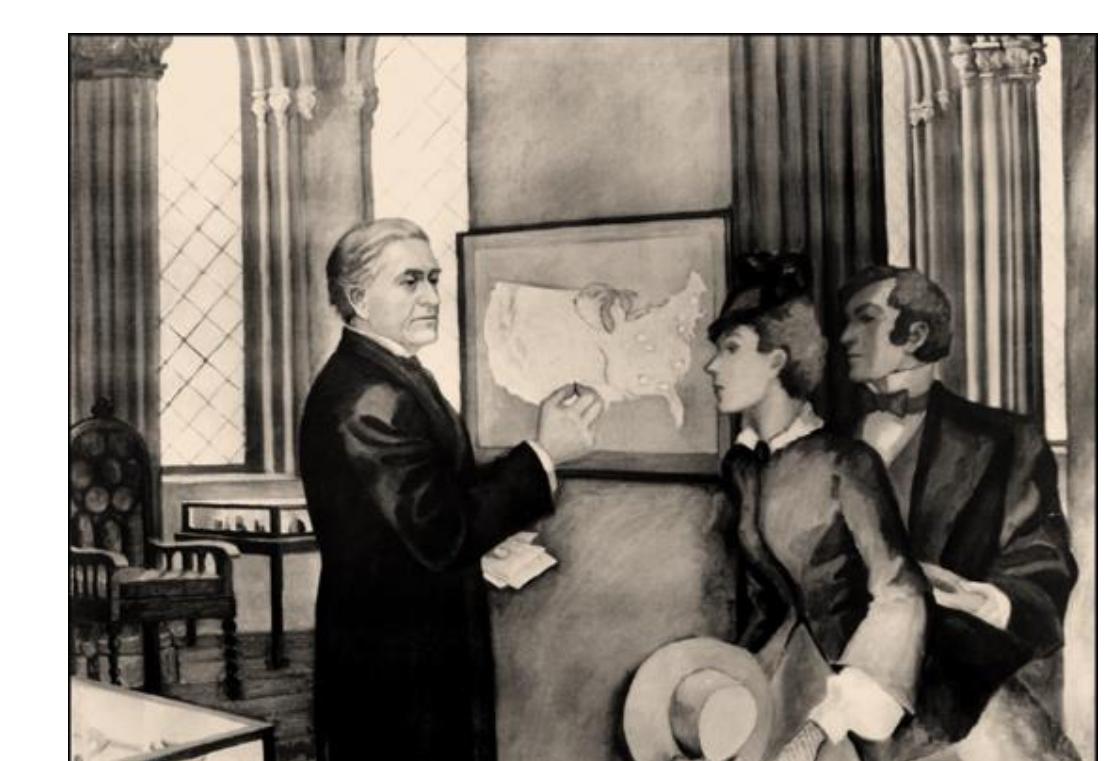


Number of stations expand and populate the western U.S. Sufficient number of stations to allow for isotherms and isobars. High and Low pressure centers depicted. Station data included in table and rudimentary forecasts given.



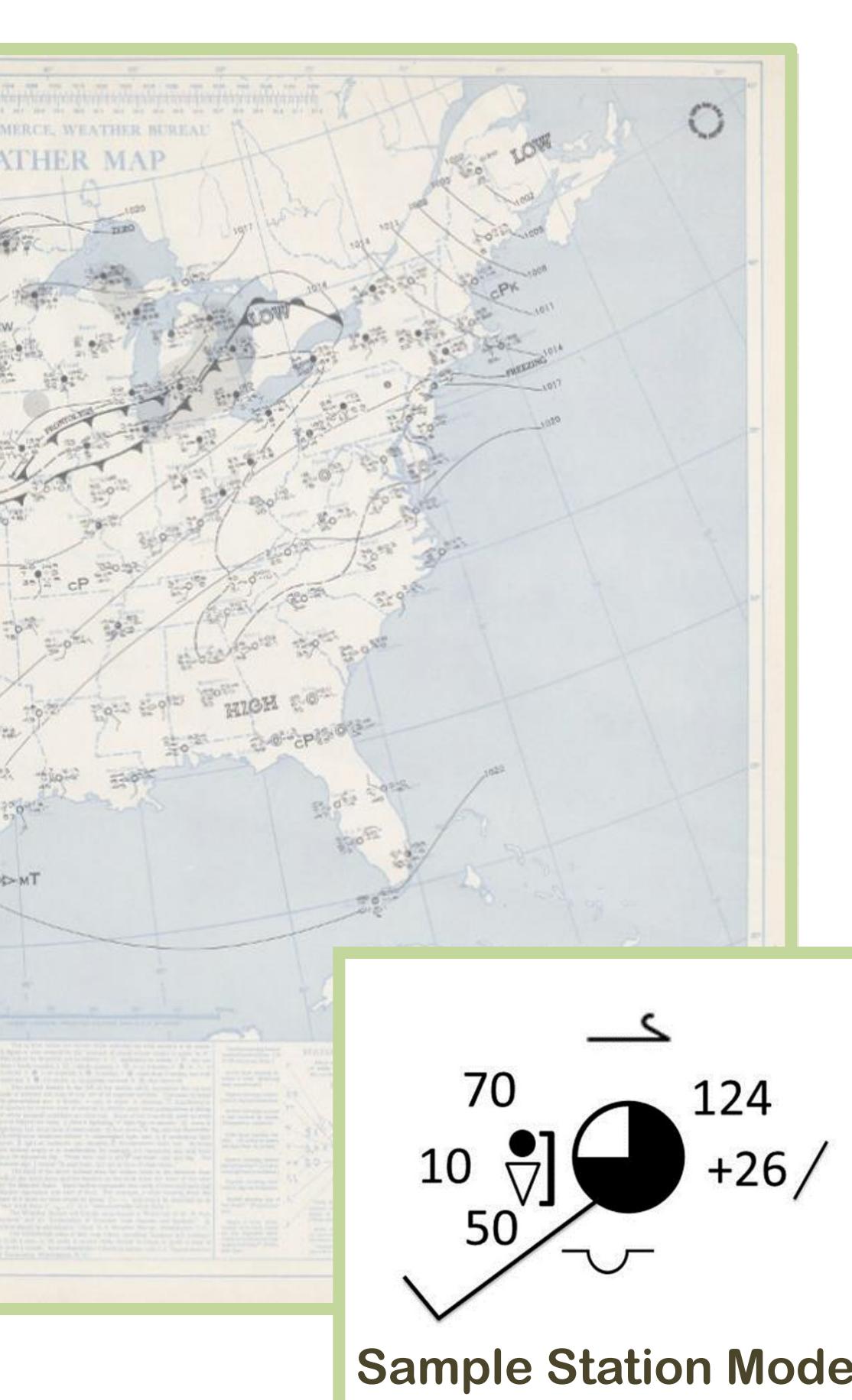
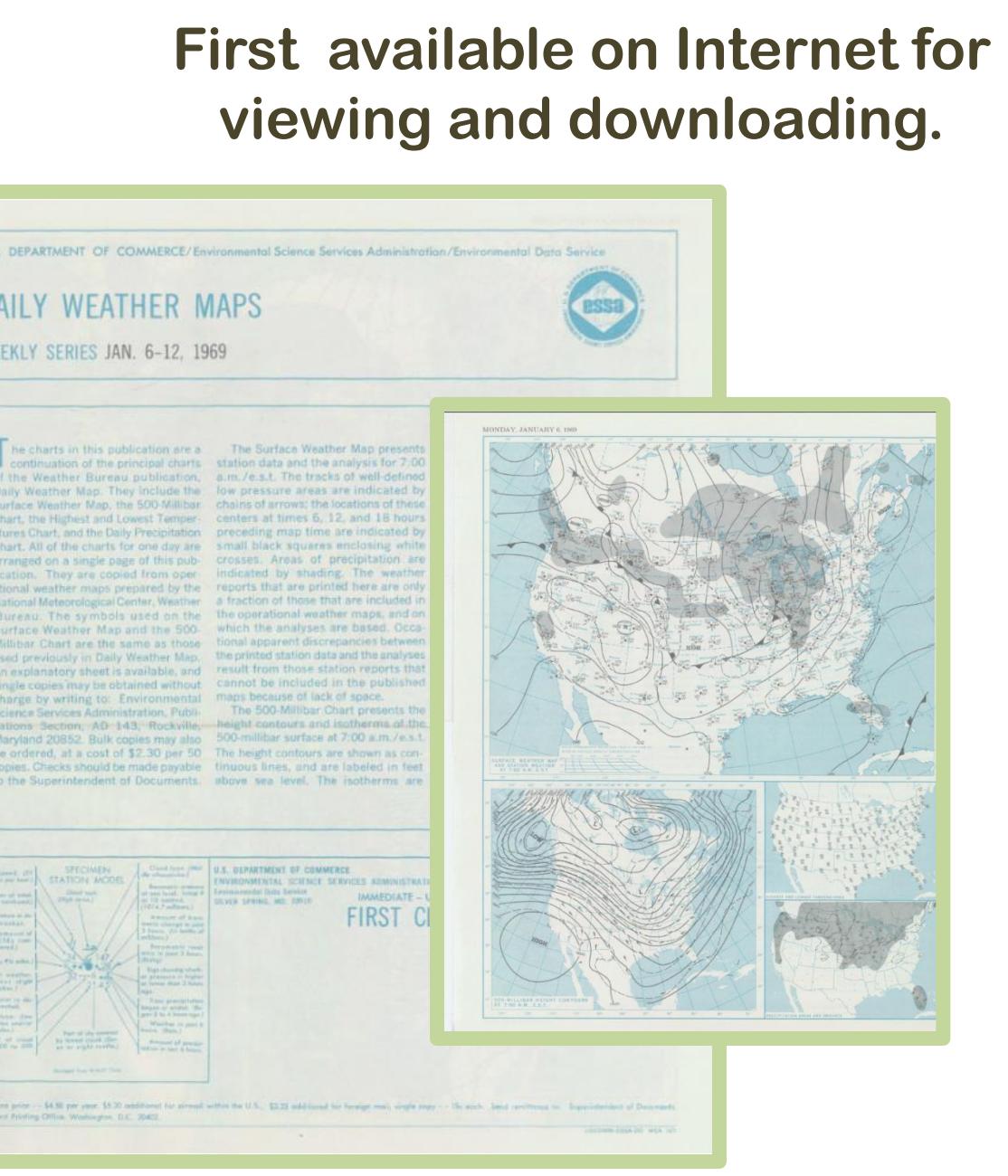
The first maps were used to track storms. In an earlier map (1838) data appears on the map in tabular form (barometer and sky conditions: fair, or cloudy). Large circles are used to show the progress of a storm.

One of the earliest U.S. weather maps – a precursor to the ‘Daily Weather Map’. Depicts early weather symbols. Wind direction (orientation) and speed (length) are indicated by arrows (points indicate points of observation). Pressure is shown by the length of two long lines ('High' in black and 'Low' in red). Temperatures are reported as diurnal fluctuations (- or +), or monthly max or min. Red values/symbols relate to precipitation. Easy to follow a storm.



Louise Hoover's painting, "Secretary Henry Posts Daily Weather Map in Smithsonian Building, 1858."

Using the telegraph, Joseph Henry (Smithsonian Institute's first Secretary) demonstrated the value of a real-time weather map (1856). As telegraph reports were received, various colored discs were placed on a map to show current weather conditions (blue discs for snow, black discs for rain, and brown discs for clouds). Henry called for the federal government to establish a national weather service.



Sample Station Model

Cold and warm fronts first appear on the ‘Daily Weather Map’. First developed in Europe around WW I (cold front spikes associated with Kaiser helmets, and warm front semicircles associated with Allied helmets), the Norwegian Cyclone Model which depicts fronts as boundaries between air masses, was resisted in the U.S. until about 1940. Air masses are labeled (e.g. cP and mT). Air pressure isobars displayed in millibars, as opposed to the earlier use of ‘inches of mercury’. The ‘Station Model’ used to describe station weather conditions debuted, replacing tabular weather data. Weather Bureau moved to the U.S. Department of Commerce.