

# WEATHER INSTRUMENT HISTORY

Weather is described as the state of the atmosphere and more generally that part in which life can exist. The most common variables, which present a reference to the state of the atmosphere, are temperature, moisture, wind, and barometric pressure. Around the year 340 BC, Aristotle offered in his book, "Meteorologica", detailed writings on what we now observe as weather. Outside of the unwritten wisdom of early farmers and hunters, the wind vane direction indicator atop the Tower of the Winds in Athens, constructed in the second century BC, is likely the first atmospheric variable measured.

During the middle of the 15th century the German mathematician Cardinal Nicholas deCusa invented the hygrometer for measuring humidity by calculating the weight of wool's absorption of water vapor against a balance beam. Late in the 16th century the thermometer was invented to establish a value reference for hot and cold degrees. Galileo, Santorio, Drebel and Fludd all share in the development of today's most widely used weather tool. The thermometer was followed by the invention of the mercury barometer around 1640 by Evangelista Torricelli. In 1670, Robert Hooke improved the hygrometer by using the hair strand's ability to respond to humidity by stretch and contraction. Psychrometers measure the lowering of temperature caused by



National Weather Service field instruments at Columbia Airport include present weather sensors for temperature, dewpoint, rain, freezing rain, snow and fog, wind speed and direction, visibility and ceiling.

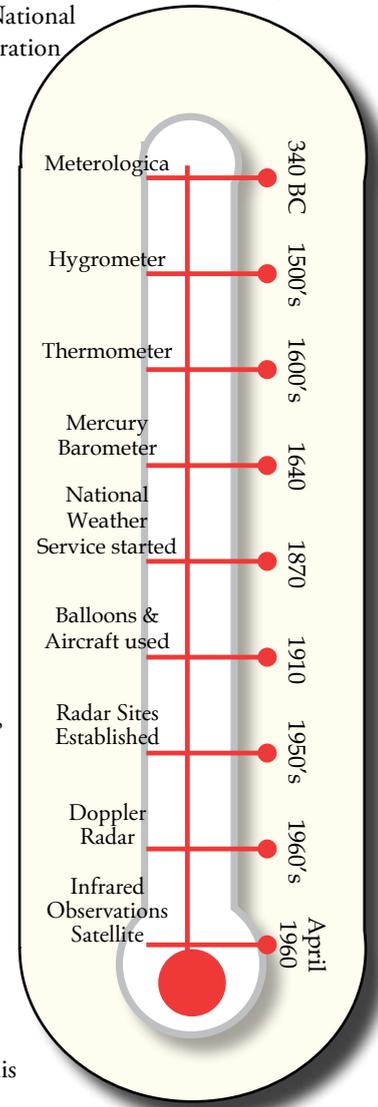
evaporation, thus giving the wet bulb temperature. This instrument was attributed to the Scot, William Cullen, in the 1750's. Joseph Henry established the first weather reporting system on behalf of the Smithsonian Institution with 150 volunteers in locations across America. President Ulysses Grant created the U.S. Signal Service on November 1, 1870, which was the beginning of what is now known as the National Weather Service. Between 1910 and 1930, the science of using soundings provided by balloons and aircraft revealed properties of the atmosphere with height. This three dimensional analysis became a valuable aid to forecasters and subsequently to computer generated applications of predicting the weather. Radar, used in aircraft positioning, was discovered just before the Second World War

to additionally display weather phenomena. A network of radar sites was established throughout the United States in the 1950's to provide timely observations and public weather warnings. The more complex Doppler weather radar in use today was developed in the 1960's before being perfected by electrical circuit advancements in the 1970's.



Probably the most significant achievement in monitoring weather by instrumentation is satellite imagery. Thanks to the efforts of scientists and the willing cooperation of President John Kennedy's administration request for funding, the newly formed National Aeronautics and Space Administration (NASA) helped launch the Television and Infrared Observations Satellite (TIROS) in April 1960. This technology continues to improve with visible and infrared coverage blanketing the globe. The ability to process complex amounts of numerical weather data by today's super computers allows mankind to benefit and plan unlike any time in recorded history.

Current remote sensing techniques now enable meteorologists to address cloud formation, precipitation types, lightning threats, visibility, soil conditions, and evaporation. The library of information from the atmosphere provides a resource for aviation, agriculture, engineering, marine, public safety, transportation, tourism, business, education, and research. Perhaps today's descendants of the earliest weather instruments will be helpful to your vacation plans this weekend.



NWS staff forecaster monitors the Automated Weather Information Processing System (AWIPS)