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WEATHER DATA AND AVIATION LITIGATION

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There are four points which I would like to cover today. First, I will tell you what data is available on a routine basis to aid in aviation litigation; secondly, how to get the data and information; thirdly, whom to contact when an aircraft accident or incident occurs in an area where few weather observations are made and professional assistance is needed to reconstruct a three- or four-dimensional picture of the weather from available information; and finally, what forecasts and weather advisories are issued and how to obtain copies of the data.

The Environmental Data Service (EDS) and the National Weather Service, two sister agencies of the National Oceanic and Atmospheric Administration (NOAA), provide weather services to the aviation industry. The National Weather Service operates about 300 weather stations at various locations throughout the United States. In addition, weather observations are taken by the Federal Aviation Administration and the Department of Defense. These surface observations consist of hourly measurements of temperature, humidity, pressure, wind velocity, visibility, and the weather (rain, snow, fog, etc.) at the time of observation, as well as cloud information. The data is then plotted on maps and analyzed. These analyses are filed at EDS' National Climatic Center (NCC) in Asheville, North Carolina. These maps present an overall picture of the weather at standard times on a given day.

Upper air observations generate another source of weather information. Observations are obtained by sending a balloon aloft containing miniature weather observing equipment and radio gear (rawinsonde). What information does this instrument provide and how does it function? It is controlled by a pressure element de-

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signed so that as the pressure decreases (when the balloon rises), a commutator arm sweeps across a contact, successively giving measurements of temperature, humidity, pressure and wind. Since the instrument has first been calibrated on the ground, one can readily deduce the temperature and humidity as the balloon ascends. The balloons normally reach heights up to 100,000 feet, measuring the vertical structure in the earth's atmosphere. Weather stations normally take these upper air observations a minimum of twice a day at 0000 GMT and 1200 GMT.

Radar adds another dimension to weather observation and forecasting. It is especially effective in detecting thunderstorms and tornadoes. For example, the tornado that practically desroyed Xenia, Ohio was tracked by weather radar. Weather radar also shows precipitation and the areas where precipitation is occurring. With radar, you can tell whether a climatic condition is a shower or a thunderstorm or, by measuring the intensity of the echo of precipitation returns, you can determine the amount of rain that is falling in a particular storm cloud. Weather Service radars are normally activated in various locations throughout the United States whenever a weather condition exists or is likely to develop which would show up on the radarscope. This information is periodically relayed throughout the country over the facsimile network.

The NOAA operates two types of satellites. One is a polar orbiting satellite that continuously orbits from pole to pole. In a 12-hour period the satellite will pass over Dallas twice producing a daylight picture and also a nighttime image. The picture at night is infrared; the daylight picture is visible. The other satellite operated by the NOAA is called geostationary. A geostationary satellite is one which is so stationed that it stays in the same position relative to the surface of the earth. It, therefore, continuously scans the same location. This satellite is currently located over the Equator and scans the United States to an area just west of the Rocky Mountains, while simultaneously scanning South America. Once every 25 minutes, the satellite photographs the ground with a resolution of one-half to two miles.

With such resolution, much detail is available, but the quantity of data generated is so immense that selectivity in archiving is the only answer. For example, there is so much data received from satellites that more than one-half million reels of magnetic tape would

accumulate at the end of a year's operation. The NOAA is now exploring techniques to compact the data. Under normal circumstances, a satellite picture every 30 minutes is unnecessary. It is needed, however, to learn more about how tornadoes build and cloud activity during tornado formation or thunderstorms.

How can you get these data? All of the hourly observations that are taken by the weather stations are kept at the NCC in Asheville, North Carolina. Some of the data which are used frequently are published.

The NCC publishes a total of 19 different publications containing various types of meteorological information which will be helpful to you. For instance, precipitation data for Texas is published monthly. Also published monthly are local climatological data for each of the 300 weather stations. The climatological data sheet contains three-hourly observations for a specific area giving maximum and minimum temperatures, precipitation, and other variables measured during the observation period.

You may be interested to know that more than 10,000 Cooperative Observers in the United States measure and report temperature and precipitation data on a daily basis. At the end of each month, the observers—the majority of whom are not paid—forward the weather information to the NCC, where it is assembled and published.

In many instances, courts will require authentication of certified documents. Authenticated certified weather documents embossed with the Department of Commerce seal are available for about three dollars from the NCC where the records are stored to anyone who requires them for litigation purposes. The certified documents cover any weather observations which the National Weather Service records within the conterminous United States.

The NCC also archives foreign meteorological information. Every three hours, and as often as hourly at some locations, weather data are received routinely on a global basis through the World Meteorological Organization (WMO) exchange procedures. Furthermore, satellite photographs from the polar orbiting satellite cover the entire globe and are received twice a day. Therefore, if any litigation involves overseas flights, the NOAA has the basic information or has access to it through overseas contacts made by

Dr. Robert M. White, NOAA Administrator and WMO Permanent Representative.

If you need weather information from a site where no weather observations were made, what can you do? This is a job for the professional meteorologist who can use available information to reconstruct weather conditions for a particular area. Take, for example, Hurricane Camille which caused extensive damage along the Gulf Coast. A 500 millibar chart showing the wind structure during the storm up to an altitude of 18,000 to 19,000 feet is available. There are also radar pictures and a satellite picture which show the circular swirl as the hurricane moved toward Louisiana. Another picture of the same storm was taken during one of the Apollo Missions. Armed with this information, a professional meteorologist can reconstruct the distribution of the various parameters for any particular area. The American Meteorological Society (AMS) has certified consultants to help solve meteorological problems which require more information than mere observations and can provide you with a list of such consultants.

A final word about forecast advisories issued during the course of an aircraft accident or incident. These may be obtained from any of the six Regional Weather Service Offices listed below.[1] All such advisories are retained from three to five years.

I would like to add that the Environmental Data Service is a service organization and the service is there. Generally speaking, 99 percent of the information you require is readily available at a minimal cost which mainly covers the retrieval services.

National Weather Service Eastern Region
585 Stewart Avenue
Garden City, N.Y. 11530

National Weather Service Souhern Region
819 Taylor Street
Fort Worth, Tex. 76102

National Weather Service Central Region
601 E. 12th Street
Kansas City, Mo. 64106

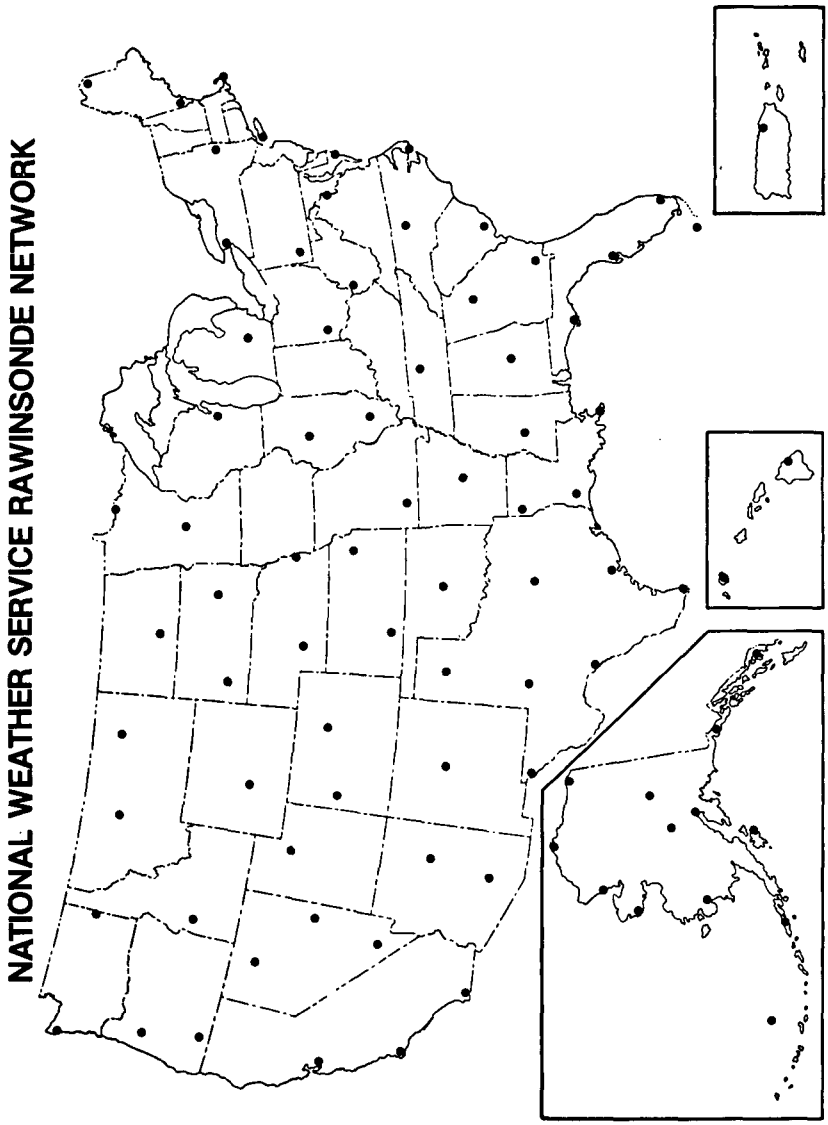
National Weather Service Western Region
Box 11188
Federal Building
125 South State Street
Salt Lake City, Utah 84111

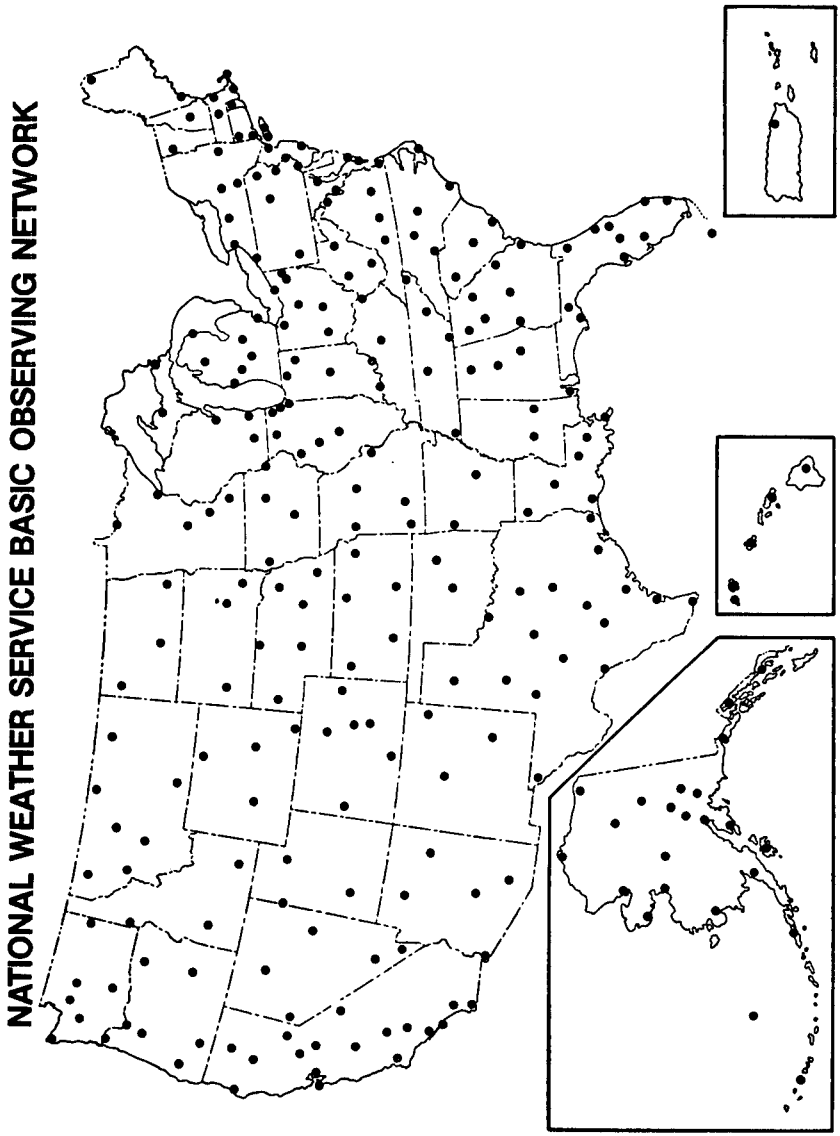
National Weather Service Alaska Region
632 6th Avenue
Anchorage, Alaska 99501

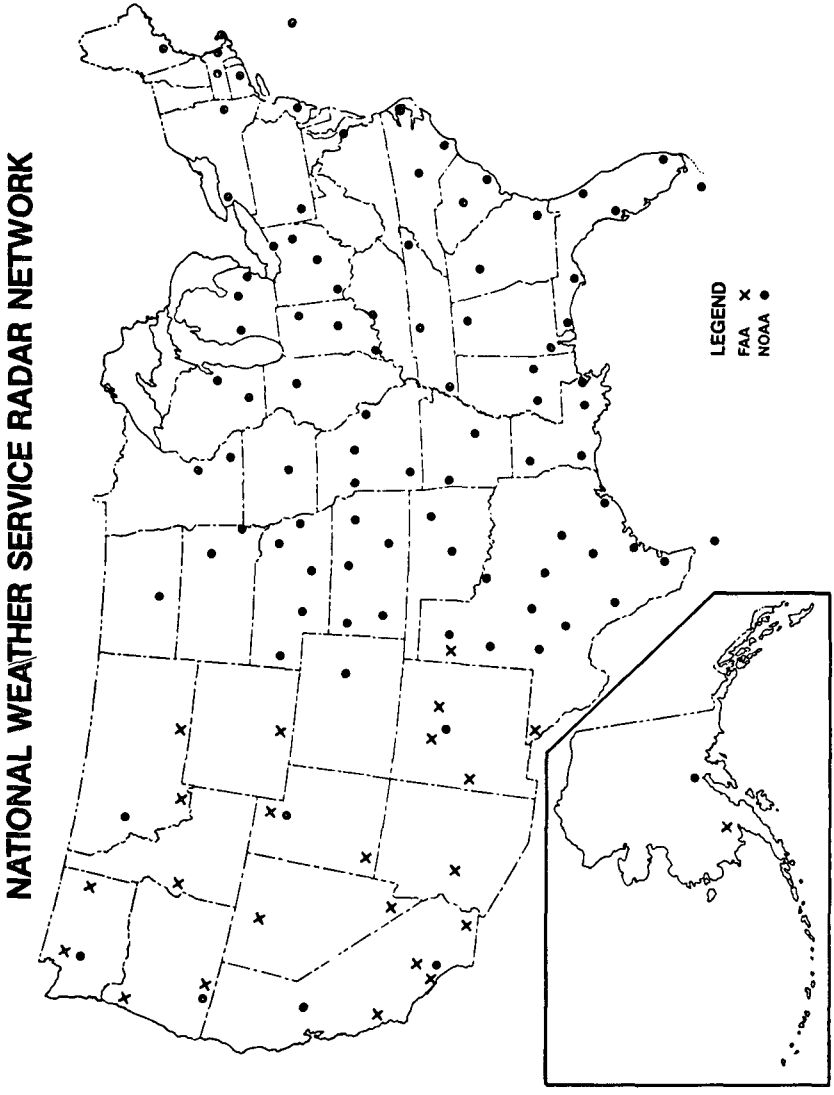
National Weather Service Pacific Region
Bethel-Pauahi Building
1149 Bethel Street
Honolulu, Hawaii 96813

Executive Director
American Meteorological Society
45 Beacon Street
Boston, Mass. 02108
Tel: 617-227-2425

National Climatic Center
Federal Building
Asheville, N.C. 28801
Tel: 704-258-2850 Ext. 683


NATIONAL WEATHER SERVICE RAWINSONDE NETWORK


NATIONAL WEATHER SERVICE BASIC OBSERVING NETWORK


NATIONAL WEATHER SERVICE RADAR NETWORK
LEGEND
FAA ×
NOAA ●