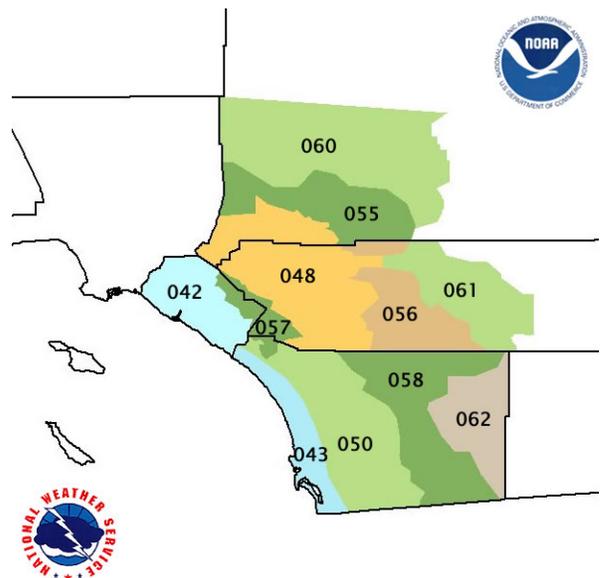


# The NWS in San Diego



The San Diego Forecast Office Costa Mesa prepares forecasts and any necessary warnings for a sizable area of Southern California, which is called a County Warning Forecast Area (CWFA or CWA). The San Diego CWA comprises all of Orange and San Diego Counties, western Riverside County, southwestern San Bernardino County and adjacent coastal waters off San Diego County. The CWA is divided into forecast zones, each containing roughly similar climates. A zone forecast is routinely made for each zone, the text of which is generated from a highly detailed graphical database. Forecast operations run continuously 24 hours a day, 365 days a year, providing its citizens a constant monitoring of the weather and protection of life and property in the form of timely warnings. In this way the NWS is the “weather police.” The San Diego Forecast Office meteorologists are the experts of local weather and climate. They keep informed of research developments and the latest discoveries and news that impact the weather, such as El Niño and climate prediction, but do not conduct the research themselves and therefore are not experts in those research fields.



## A History of the NWS in San Diego

*“A very great gale blew from the southwest; the port being good, we felt nothing,”* commented Juan Rodriguez Cabrillo in 1542, upon sailing into what is now San Diego Bay. It was probably the first documented weather observation in California.

Officially, weather observations were first taken in San Diego from 1849 to 1871 at the San Diego Mission de Alcalá and at Ft. Stockton, now part of Presidio Park, by the Medical Corps of the Army. When the Army’s Signal Service assumed the task in 1871, the weather observing station was moved downtown to Horton Square at present day Broadway between 3<sup>rd</sup> and 4<sup>th</sup> Avenues. In 1909 a city ordinance allowed the U.S. Weather Bureau to install a weather kiosk to be placed in the San Diego Plaza containing weather instruments, posted forecasts, and weather charts. It is not known when the kiosk was discontinued. The official station moved around the Horton Square area several times from 1871 until 1940, but always remained within a stone’s throw of present day Horton Plaza. In 1890 the first Weather Bureau Office was located on 5<sup>th</sup> Avenue between E and F streets. In 1930 the office and a second weather observing station were relocated to the Lindbergh Municipal Airport 1 ½ miles northwest of the city office, but observations were continued downtown. In 1940 observations became official at Lindbergh Field. This new site was considered close enough and sufficiently similar in climate to the downtown location that the climate record was continued uninterrupted rather than starting a new separate record for the new location. In 1969 the weather equipment was moved to its current location at the General Aviation Building at Lindbergh Field, now San Diego’s International Airport. A history of the early observations in San Diego has been published and can be found at: [www.wrh.noaa.gov/sgx/cpm/SanDiegoHistory.pdf](http://www.wrh.noaa.gov/sgx/cpm/SanDiegoHistory.pdf).

In 1970 the Lindbergh Field office became a National Weather Service Office with limited forecasting responsibility. The NWS office in Los Angeles provided the general forecasts for all of Southern California. The San Diego office adapted these forecasts for local use and issued warnings for San Diego County in addition to the regular duties of taking weather observations



at Lindbergh Field. In October 1995, the office at Lindbergh Field moved to Rancho Bernardo in the northern reaches of the city and discontinued taking the weather observations, but still maintained the climate record at Lindbergh with the help of automated equipment and contract observers installed in 1996. In 1997 the San Diego Office made a gradual transition to full forecast office capacity. Orange, western Riverside, and southwestern San Bernardino Counties were added to San Diego County. Since 1997 all forecasts and warnings for our area originate from the office in Rancho Bernardo. Marine forecast and warning responsibility for adjacent coastal waters were added in 1999. In late 2002, the Interactive Forecast Preparation System (IFPS) was implemented. This bold new forecasting system provides NWS forecasts in a graphical format and with a great amount of detail. In January 2003, the office assumed fire

weather forecast responsibility in an area with virtually a year-round fire season. In November 2004, the northern borders of the CWA were adjusted. The community of Yucca Valley joined Twentynine Palms and other Morongo Basin communities as part of the Las Vegas area of responsibility. In exchange, the San Diego Forecast Office added an area north of Victorville almost to Barstow, including the city of Helendale.

The function, purpose and importance of the NWS were stated eloquently by Ford A. Carpenter in *The Climate and Weather of San Diego* California, published in 1913. “A few years ago a member of the French Academy of Science visited the San Diego Weather Bureau office, and having being shown the meteorological apparatus and informed as to the application of the data to the everyday needs of commerce and agriculture, exclaimed, “You Americans are a wonderful people. You not only equal the French in the use of delicate instruments from which theories are evolved, but you excel us in making the results worth dollars and cents.”

Carpenter also observed, “An article in the *Century* magazine a few years ago stated that the Weather Bureau costs the United States a million and a half dollars a year, but that a conservative insurance company figured that on an average the people of the United States saved annually \$30,000,000 because of their weather service, and this in addition to thousands of lives.”

## **The People of the NWS in San Diego**

The current staff at the NWS in San Diego consists of 25 employees. Four managers and one assistant (three of which are degreed meteorologists) direct the work activities and administrative duties of the office. An Information Technology Officer maintains computer systems. 11 forecasters (all of whom are degreed meteorologists) prepare and disseminate forecasts and warnings, and attend to focal point duties and other projects. Three hydrometeorological technicians (HMTs) and two meteorologist interns collect and disseminate data, operate the NOAA Weather Radio, manage the climate observer program, and answer phone calls from the public and media. The interns (who are degreed meteorologists) also perform forecaster duties occasionally. Three electronic technicians maintain and repair observational equipment, the two Doppler Radars and NOAA All-Hazards Radio.

The Meteorologist-in-Charge (MIC) is Jim Purpura. He ultimately oversees all operations and work in the office and implements changes in policy or practices when needed. Questions about policy, funding, employment, technology, and the future are best directed to the MIC.

Ed Clark is the Warning Coordination Meteorologist (WCM). He maintains relationships with our partners in service, i.e., emergency management within cities and counties, agencies of flood control and law enforcement, fire departments, and the media. He keeps the staff current and proficient in correct warning practices, completes verification studies, and conducts a variety of outreach activities.

Ivory Small is the Science and Operations Officer (SOO). He ensures that good forecasting techniques and good science are used by meteorologists through training and development. He implements the latest technology and meteorological theory from the research community and produces some of the research himself. He can answer questions regarding student volunteer and

employment programs. He is the best resource for questions about the meteorology behind the weather.

The first line of phone communication is usually with a hydrometeorological technician (HMT). They answer general questions about the weather, climate, or forecast, or can point you in the right direction for the answer. Forecasters on duty can provide greater detail about the reasons behind the current weather or forecast. Many questions of this nature can be answered by consulting the latest Area Forecast Discussion, updated at least four times a day.

When not working basic operations directly, each member of the staff completes focal point duties. These include directing local programs, conducting special projects or overseeing other areas of responsibility. A list of the entire staff and the numerous duties they perform in addition to operational duties can be found on our staff web page: [weather.gov/sandiego/office/staff.php?wfo=sgx](http://weather.gov/sandiego/office/staff.php?wfo=sgx).

## **Communications and Product Dissemination**

Text products and information disseminated from the NWS are transmitted in a coded format. Each product name is identified, for Weather Wire and EMWIN (Emergency Manager's source) purposes, by its code containing nine letters. The code formula is cccNNNxxx, where ccc is the regional node, NNN is the product identifier, and xxx is normally the code of the originating forecast office. For example, LAXZFPSGX indicates Los Angeles (LAX) is the regional node, the Zone Forecast Product (ZFP) is the name of the product, and San Diego-Rancho Bernardo (SGX) is the originating office. When a product is sent from the office, it goes to Gateway, the communications center for the NWS. From there, the products are disseminated to the world. Subscribing news services and private weather information companies then pick up these products and send them to users. The NWS maintains the largest meteorological telecommunications switching center in the world, sending and receiving nearly half a million meteorological bulletins each day.

The NWS relies heavily on its partners in emergency management and the media to keep communities safe and well informed. Emergency managers and the media have timely access to severe weather information through a number of systems and services listed below. For information on how to set up a service to receive real-time weather information, contact our Warning Coordination Meteorologist, Ed Clark, at 858-675-8700 ext. 223.

The **Family of Services** includes the NOAA Weather Wire Service, NOAAPort and news agencies such as AP, UPI and City News Service. These systems provide paying subscribers consistent and timely weather information in real time. For more information, visit: [www.weatherwire.net](http://www.weatherwire.net) and [www.noaaport.com](http://www.noaaport.com).

**Private commercial information vendors** supply numerous paying customers with weather information packages tailored to their needs. These are easily found on the Internet by doing a search for weather software.

Emergency management and flood control agencies in California can receive timely information

through the **California Law Enforcement Telecom System (CLETS)**. This originates from the State Office of Emergency Services in Sacramento. The **Emergency Manager's Weather Information Network (EMWIN)** provides real time information for a one-time cost for equipment and installation. Email and pager notification can be easily set up. However, this information may not be as reliable or timely as that found with the Family of Services. You can always consult the NWS web page ([www.weather.gov](http://www.weather.gov)) for up to date information from a national perspective. However, it is subject to the availability and connection limitations inherent to the Internet.

Weather information can also be obtained from the National Weather Service anywhere and anytime using a wireless device. All you need is a wireless device that can surf the Internet along with a wireless Internet service provider. For more details, visit [www.srh.noaa.gov/cte.htm](http://www.srh.noaa.gov/cte.htm). RSS feeds and podcasts are also available, see [www.nws.noaa.gov/rss](http://www.nws.noaa.gov/rss).

Please note: The Internet is **not** the primary means of disseminating weather information from the NWS and **should not be solely relied on at any time**, especially during significant weather events. **The clickable map on the home page is not the official means of communicating current watches, warnings or advisories in effect.** A backup source of information is recommended, such as NOAA weather radio or other systems mentioned above.

## Special Programs

The **Aviation** program encompasses the preparation, transmission and verification of Terminal Aerodrome Forecasts (TAFs) and Transcribed Weather Broadcasts (TWEBs). TAFs are coded 24-hour forecasts updated at least every six hours. TAFs give detailed weather conditions expected at six area airports: San Diego-Lindbergh Field (SAN), McClellan-Palomar Airport (CRQ), Orange County-John Wayne (SNA), Ontario (ONT), Palm Springs (PSP), and Thermal (TRM). Soaring forecasts are also generated daily. Aircraft accident reports are issued for fatal accidents.



The **Cooperative Observer Program** is a vast network of thousands of weather stations across the nation. Local volunteers keep a daily climate record with data collected from equipment provided and maintained by the NWS. San Diego's Cooperative Program Manager directs this work at more than 90 official weather stations in our region. Data from some of the stations are used for hydrology and forecasting purposes. Climate data are forwarded to the National Climatic Data Center and become part of the official climate record.



The **San Diego Mesonet** is a network of public and private providers of weather data. Using existing weather stations, providers can transmit data from their own weather stations to the NWS in real-time. For more details, see [www.wrh.noaa.gov/sgx/cpm/sdm.php?wfo=sgx](http://www.wrh.noaa.gov/sgx/cpm/sdm.php?wfo=sgx).



**Fire Weather** forecasts are essential for fire fighting efforts by a number of agencies. Routine Fire Weather Forecasts are issued detailing sky condition, winds, relative humidity, and lightning potential. Specific spot forecasts are given by request for particular fire fighting or controlled burn situations, and also for hazardous material incidents. Fire Weather Watches and Red Flag Warnings are issued when dangerous fire potential exists.

The **Hydrology** program provides guidance and data for forecasting rainfall amounts and flooding. The hydrology focal point works closely with flood control agencies, NWS hydrologists and River Forecast Centers to ensure data that is correct, useful and timely gets into the hands of forecasters during possible flooding events. Networks of instrumentation such as rain gauges and stream gauges are maintained to monitor rapidly changing hydrological events. Computer models and software are developed and maintained to enable accurate and timely issuance of hydrological products such as flash flood warnings.



The **Marine** program oversees the quality preparation of marine forecasts. The Coastal Waters Forecast describes wind and sea conditions out to five days; the Surf Forecast provides details about the next day's surf. Relationships with the marine community are maintained, along with a network of coastal observation equipment for frequent observational data. Warning systems are ready to be used in the event of large surf, coastal flooding, tidal overflow, tsunamis, or severe weather of any kind over the coastal waters.

**NOAA All-Hazards Radio** continuously broadcasts a cycle of warnings, forecasts and current conditions on six separate frequencies on the VHF band, originating from the San Diego office. Specially designed receivers have the capability to alarm and play a warning at the moment it is issued. This is possible due to ever-improving computer-synthesized voice technology. A Spanish language transmitter was installed in June 2004 in the Coachella Valley and provides Spanish broadcast of all products. It is the first transmitter of its kind in the west.



The following table includes transmitter locations, names, and frequencies:

San Diego (east of Poway)	KEC-62	162.40 MHz
Santa Ana Mountains (south of Corona)	WWG-21	162.45 MHz
Coachella Valley (east of Indio)	KIG-78	162.40 MHz
Strawberry Peak (south of Lake Arrowhead)	WXM-66	162.50 MHz
Mt. Soledad Marine (La Jolla)	WNG-637	162.425 MHz
Coachella Valley Spanish (east of Indio)	WNG-712	162.525 MHz

The **Public Forecast Program** is a suite of forecasts and warnings designed for the entire public community. The traditional flagship product of the NWS has been the Zone Forecast, the routine forecast issued at least twice daily. The forecast is text generated from our digital forecast database. Forecasts of sky condition, temperatures, precipitation and significant winds are included in the forecast which extends to seven days. Area Forecast Discussions are issued at least four times a day. They give the current reasoning behind the forecast and explain any additional action taken. Quantitative Precipitation Forecasts are issued during the wet season and as needed during the dry season to indicate expected rainfall amounts. Hazardous Weather Outlooks are issued when any hazardous weather is expected for the upcoming week and contain flash flood potential indices during the monsoon season. Any necessary watches, warnings, advisories, and other statements are issued under the direction of the Public Forecaster on duty.

The **Weather Spotter Program** is a network of volunteers. A weather spotter is a person who observes significant weather and relays the information to the NWS. With this information, forecasters can issue warnings and update forecasts if necessary in a more accurate and timely manner. Around 1300 weather spotters are keeping an eye to the sky in our forecast area. Information about the program, including the quarterly newsletter can be found at:

**[www.wrh.noaa.gov/sgx/spotter/spotter.php](http://www.wrh.noaa.gov/sgx/spotter/spotter.php)**.

**Skywarn** is a more proactive spotter network involving ham radio communications to relay weather information during active weather events. When forecasters deem appropriate, Skywarn is “activated” and a Skywarn member operates radio communications from the San Diego office. Reports of significant weather or damage are actively solicited from the Skywarn community. The reports are then immediately forwarded to the forecasters on duty to aid in the forecast and warning process. For more information on the local Skywarn organization, visit **[www.skskywarn.org](http://www.skskywarn.org)**.

Spotter and Skywarn training presentations are held occasionally to recruit and train weather spotters.