



TexMesonet

What is TexMesonet?

A mesonet (mesoscale network) is composed of a set of weather stations designed to detect and monitor mesoscale weather phenomena. Mesoscale weather events, such as thunderstorms, flooding, drought, and fronts, range in size from several miles to hundreds of miles. Therefore, TexMesonet is a statewide earth observation data collection network capturing real-time data on soil conditions and mesoscale meteorological events.. TexMesonet operates as a “network of networks” by establishing a unifying architecture for mesonets across Texas and aggregating data into a central online location. Data is collected from national, regional, and specialized networks, such as those operated by the National Weather Service, U.S. Forest Service, Lower Colorado River Authority, Texas Soil Observation Network, and others. TexMesonet.org displays the data freely online in English and Spanish and acts as a one-stop shop for Texans to find National Weather Service forecasts, current weather conditions, and historical weather data.

Why is TexMesonet important?

The goal of TexMesonet is to help Texans use meteorological, hydrological, and soil data to monitor, understand, and respond to ever-changing weather patterns and extreme weather events. On-the-ground weather data provided by Texas Water Development Board (TWDB) stations and partner stations support improved weather models and forecasts, which contribute to improved public safety, agricultural productivity, and scientific research. Since its inception in 2016, the network has grown to include 91 TWDB stations and more than 3,000 partner stations. The TWDB continues to strategically add its own managed stations to improve statewide coverage.

How are sites selected for new TWDB stations?

Initial station locations were identified by using a standardized approach that included an analysis of gaps in existing weather data coverage, population, risk potential, and existing data reliability. Together with statewide partners, such as groundwater conservation districts, local utilities, other state agencies, and landowners, TWDB staff continue screening specific sites for station installation by considering the following:

- What is the site’s location in relation to other high-quality observation stations and other TWDB-managed stations?

- What are the communication requirements, soil type, and potentially significant topographical features of the site?
- What are the partnership opportunities and needs of the site?

In considering the surrounding topographical features of a site, the TWDB uses the World Meteorological Organization’s siting classifications as a guideline. These classifications generally dictate the distance a tall obstacle (like a tree or building) or reflective object (like a road or metal structure) should be from the various sensors used on the station and help determine if the site is representative of the region.

What equipment is used on a TWDB earth observation station?

The TWDB installs and maintains two types of stations. Primary stations require a 33-foot tower and include sensors to collect data on winds at 6.5 feet and 33 feet, temperature at 6.5 and 29.5 feet, relative humidity at 6.5 feet, solar radiation at 6.5 feet, precipitation, and barometric pressure. Secondary stations operate on 10-foot towers and include temperature, relative humidity, and winds measured at 6.5 feet, as well as precipitation. Both primary and secondary stations collect data on soil moisture and soil temperature at 2 inches, 4 inches, 8 inches, and 20 inches underground. Stations operate on a combination of solar and battery power and transmit data every 5 minutes.

The chart below shows parameters that may be visible on Texmesonet.org. Available data varies by station and is displayed in customary units by default.

Dew Point	Average dew point in degrees Fahrenheit
Heat Index	Shown if temperature is > 80°F
Humidity	Relative humidity as a percent of 100
Precipitation	Precipitation in inches from rain gage
Sea Level Pressure	Barometric pressure in millibars (mb)
Solar Radiation	Average incident solar radiation in watts per square meter
Soil Moisture	Percentage volume of water to volume of soil (i.e., volumetric soil moisture)
Soil Temperature	Soil temperature in Fahrenheit
Temperature	Air temperature in degrees Fahrenheit
Water Level	Water level in feet below ground. (for well sites)

Water Temperature	Water temperature of water below ground (for well sites)
Wind Chill	Shown if temperature is < 50°F
Wind Direction	Wind direction in compass degrees
Wind Gust	Wind gust speed in miles per hour
Wind Speed	Wind speed in miles per hour

Where can I find TexMesonet data?

TexMesonet.org assimilates and displays data from TWDB stations and partner networks on the homepage's map viewer. The map viewer displays near real-time data, as well as current radar, precipitation accumulations, and streamflow. Additionally, under the Data Products tab, users can download historical data. By aggregating numerous networks into one online location, the TWDB provides Texans with direct access to statewide earth observation data. Type [TexMesonet.org](https://www.texmesonet.org) into your browser or use the QR code to open the map viewer and start exploring.

Contact information

For assistance or to learn more about becoming a network or station partner, please send an email to TexMesonet@twdb.texas.gov or contact the TexMesonet Program Manager, Nathan Leber, at 512-475-0466 or Nathan.Leber@twdb.texas.gov.