



# 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. The Texas Water Development Board (TWDB) developed TexMesonet to serve as the state’s earth observation data collection network capturing real-time data on soil conditions and mesoscale meteorological events from across Texas.

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, West Texas Mesonet, Lower Colorado River Authority, and others. Since its inception in 2016, the network has grown to include 119 TWDB stations and more than 3,000 partner stations. The TWDB continues to strategically add stations and partners to improve statewide coverage.

TexMesonet.org displays this 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 TWDB stations and partner stations support situational awareness, improved weather models and forecasts, and other data products that contribute to improved public safety, agricultural and economic productivity, and scientific research.

## How are sites selected for new TWDB stations?

Station locations are identified using a standardized approach that includes an analysis of gaps in existing weather data coverage, risk potential, and existing data reliability. Together with partners—such as groundwater conservation districts, local utilities, other state agencies, and landowners—the TWDB continually screens specific sites for station installation by considering the following:

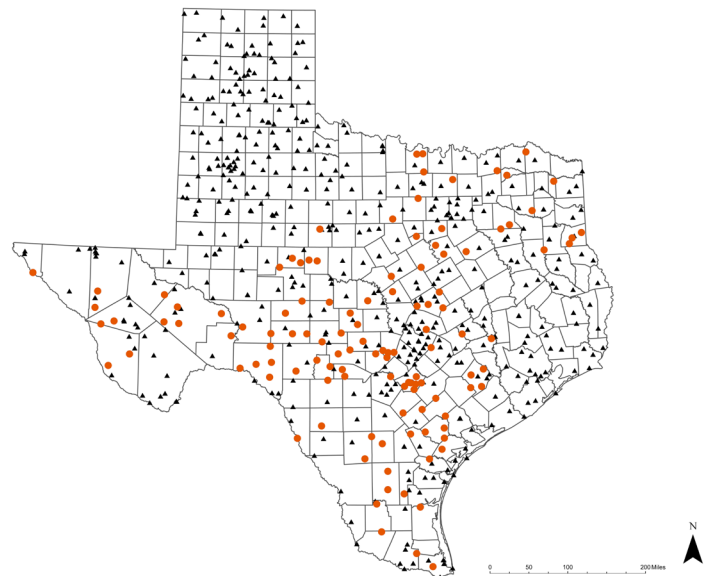
- What is the site’s location in relation to other existing stations?
- What are the communication capabilities, soil type, and potentially significant topographical features of the site?

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 precipitation and barometric pressure data as well as winds at 6.5 feet and 33 feet, temperature at 6.5 and 29.5 feet, and relative humidity and solar radiation at 6.5 feet.

Secondary stations operate on 10-foot towers and include sensors for temperature, relative humidity, precipitation, and winds measured at 6.5 feet. Both primary and secondary stations collect data on soil moisture and soil temperature at 2, 4, 8, and 20 inches underground. Stations operate on a combination of solar and battery power and transmit data every 5 minutes.



Map of TexMesonet (orange circles) and partner (black triangles) stations across Texas.

The following chart shows parameters that may be visible on [TexMesonet.org](http://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	“Feels like” temperature. Only shown if temperature is > 80°F
Humidity	Relative humidity as a percentage
Precipitation	Precipitation in inches
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 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	“Feels-like” temperature. Only 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. Near real-time data—as well as current radar, precipitation accumulations, and National Weather Service alerts—is displayed on a map viewer. A limited range of historical data is available through the application programming interface, the data download feature, or by reaching out to TexMesonet staff.

By aggregating numerous networks into one online location, the TWDB provides Texans with direct access to statewide earth observation data. Type [TexMesonet.org](http://TexMesonet.org) into your browser or use the QR code to open the map viewer and start exploring.

### Contact information

For more information about TexMesonet or becoming a network or station partner, please email [TexMesonet@twdb.texas.gov](mailto:TexMesonet@twdb.texas.gov).