

Why Mesonets?

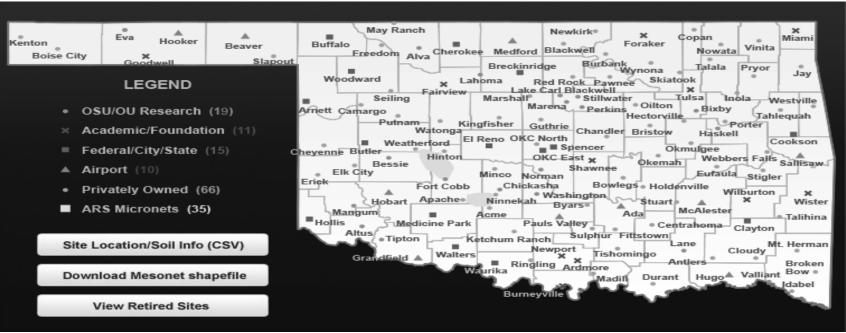
- Observe weather features
 - Thunderstorms
 - **Dry-lines**

- Squall lines
- Sea breezes
- Improve weather & flood forecasts
- Drought monitoring
- Assist crop productivity
 - Irrigation scheduling
 - Prescribe burn advisories
 - Planting and harvesting
- Near real-time data for school
- Recreation

Under-sampling of urban, coastal, and mountainous regions leaves large populations at risk in areas where there is wide variability in local weather. Texas Water

Development Board

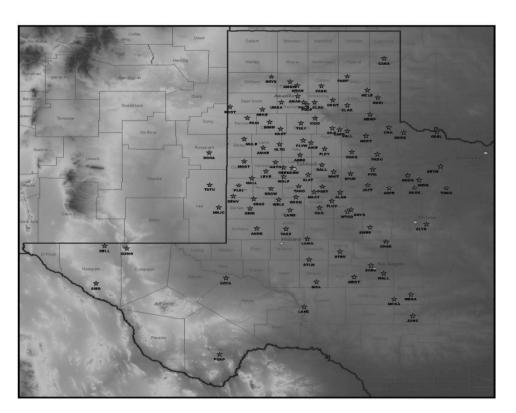
Oklahoma Mesonet



- □ Standard bearer: Oklahoma
 - □ 121 stations at least one station per 77 counties
 - 10m towers with 5 mins obs
 - Standard measurements include: temp, RH, winds, press, rainfall, solar radiation & soil temp (cover/bare)

West Texas Mesonet -**Texas Tech University**

- ☐ Established in 1999
- ☐ Concentrated in the Texas Panhandle
- \square ~96 sites in 61 counties
- \square 5 min obs





- ☐ Population growth: more lives at risk
 - "Flash Flood Alley" in Central Texas
 - ☐ Memorial Day Floods Houston 2015 & 2016
 - ☐ Hurricane Harvey 2017
- ☐ Extreme Weather Events
 - ☐ Shift in weather events
 - ☐ Increase frequency/intensity of events
 - ☐ Increase socio-economic impact to daily lives





- ☐ TWDB does surface & groundwater monitoring
 - □ Close the cycle to include atmospheric monitoring
- □ Build on existing networks
 - □ (LCRA, EAA, TCEQ, GCDs, Parks & Wildlife)
- □ Integrate local and regional networks
 - □ NWS, MesoWest
- ☐ Develop a statewide mesonet
 - ☐ Provide real-time, quality data
 - □ Forecasters
 - Modelers
 - ☐ General public





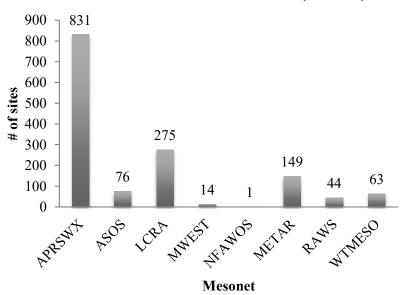
THE ISSUE

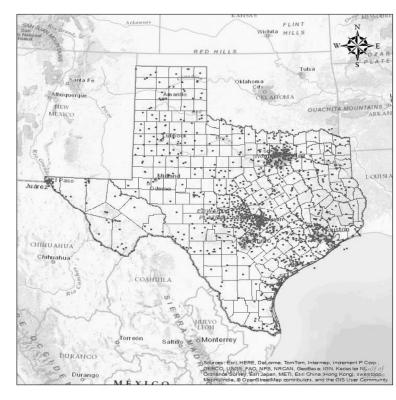




Observational Points in Texas

Network distribution in Texas (n=1453)

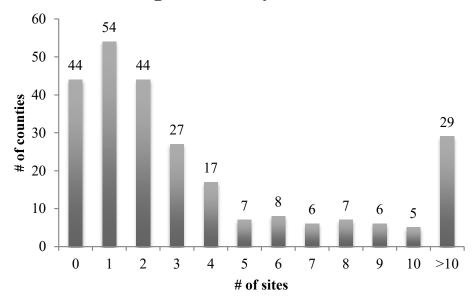




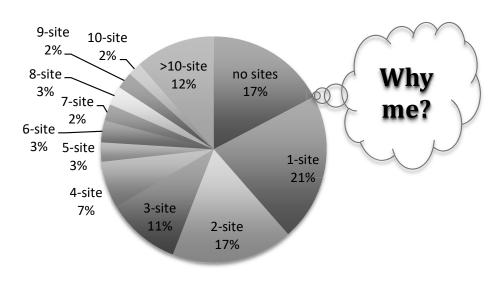
- □ Federal system (ASOS/METAR) comprise 15% of the network
- □ University run network (WTMESO/MWEST) comprise 6% of the network
- ☐ Largest network comprise of local citizens
 - □ Data reliability and usability to forecasters and modelers



Distribution of the number of sites per county in Texas



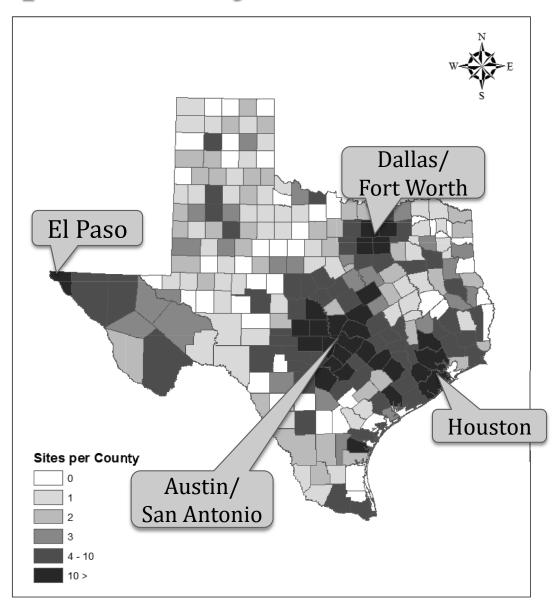
Percent distribution of the number of sites per county in Texas



- □ 44 counties or 17% of the state have no observational site
- 49% of the state has at least 3 obs. sites within a county
- ☐ Sites are concentrated within 29 counties or 12% of the state
- ☐ Counties with >10-sites are:
 - ☐ Metro areas (Austin, San Antonio, Dallas/Fort Worth, Houston)
 - □ Large flood monitoring networks (LCRA & HCFCD)

Site Distribution per County in Texas

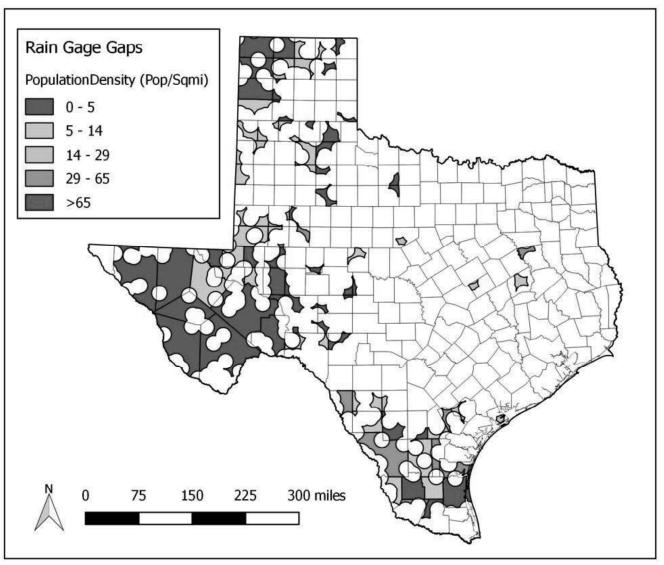
- ☐ Is their significance for counties with no sites?
- \square Is it due to population density?
- ☐ Are these counties now significant to the evolving weather pattern?



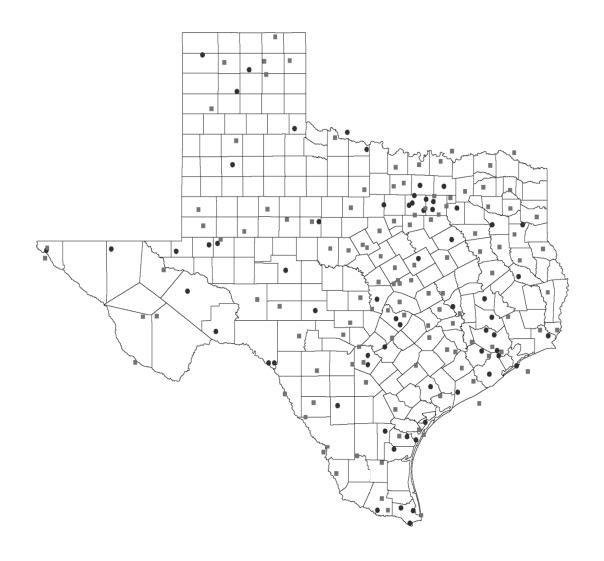


Lack of Rainfall Coverage

Source: 1600012027 aguaStrategies report



Location of Federal Sites within Texas



- ASOS





<u>TexMesonet</u>

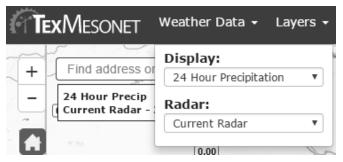
- □ 13 stations installed across 7 counties
- □ 10 counties with sites approved
- □ 5 counties pending
 - □ Objective
 - □ 1 primary station per County
 - \square (est. 20 mile separation between sites)
 - □ Several secondary (rain gage) stations per County to get denser rainfall measurement
 - \square (est. 11 mile separation between sites)
- □ Full time staff
 - ☐ Three field staff and two IT staff

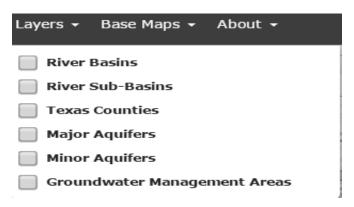


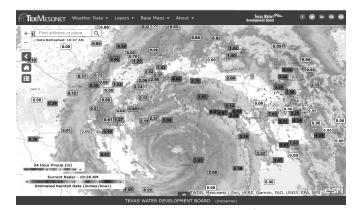


Network-of-Network

- ☐ Web viewer utilizing ArcGIS serving surface and weather layers
- □ Over 2200 existing stations from 12 mesonets
- □ Data ingestion via Mesowest







TexMesonet Sites

Colorado County



Primary Site

- □ 40 x 40 foot hog panel fenced area
- □ 30 foot tower
- ☐ Monitoring at 30 feet and 5 feet

Blanco County



Secondary Site

- □ 24 x 24 foot fenced area
- □ 10 foot tower
- Monitoring at 5 feet

Monitoring: Temperature, winds, rainfall, and soil temperature/moisture



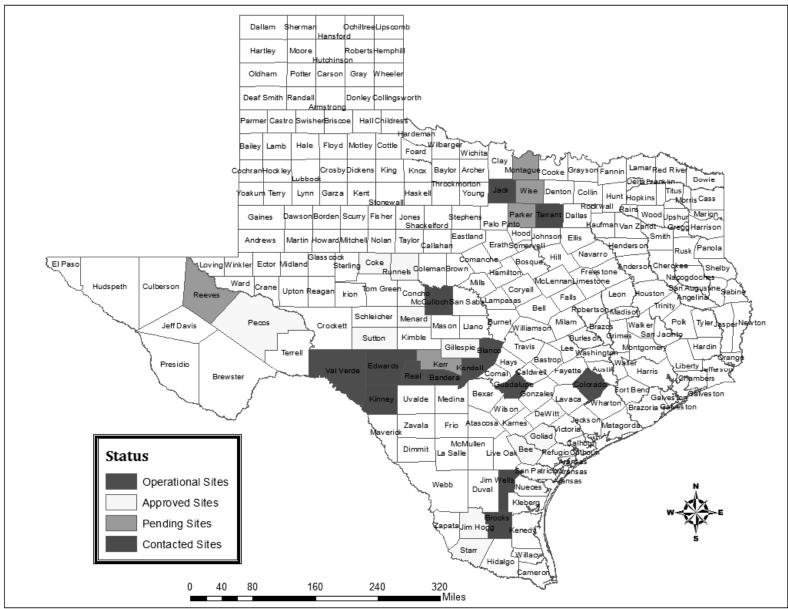
- ☐ Clearinghouse for statewide weather data
- ☐ Repository for: Reliable, Accurate, Trustworthy data
- ☐ Automate the collection, storage & dissemination of near, real-time rainfall data
- ☐ Reduce man hours collecting rainfall and in some cases well data
- ☐ Provide district wide, customizable, and downloadable maps and data



WHERE CAN **COLLABORATE???**

- ☐ Find landowners willing to have a site on their property
- ☐ Identify locations that will capture rainfall distributions in the county or district
- ☐ Improve and or expand existing networks

TexMesonet Status Map - Aug 2017



County Stats Operational: 7 Approved: 10

Pending: 5

Contact: 7





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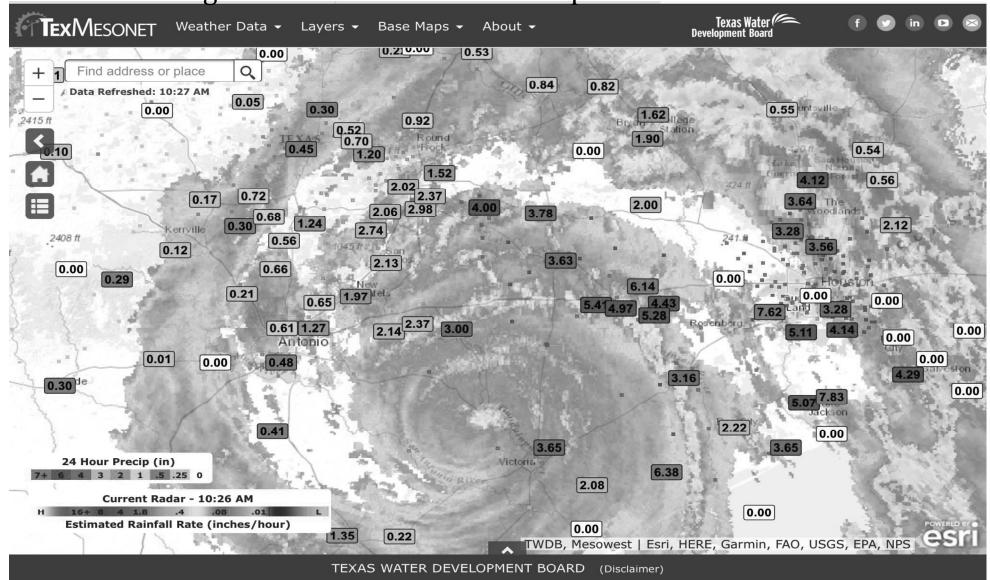
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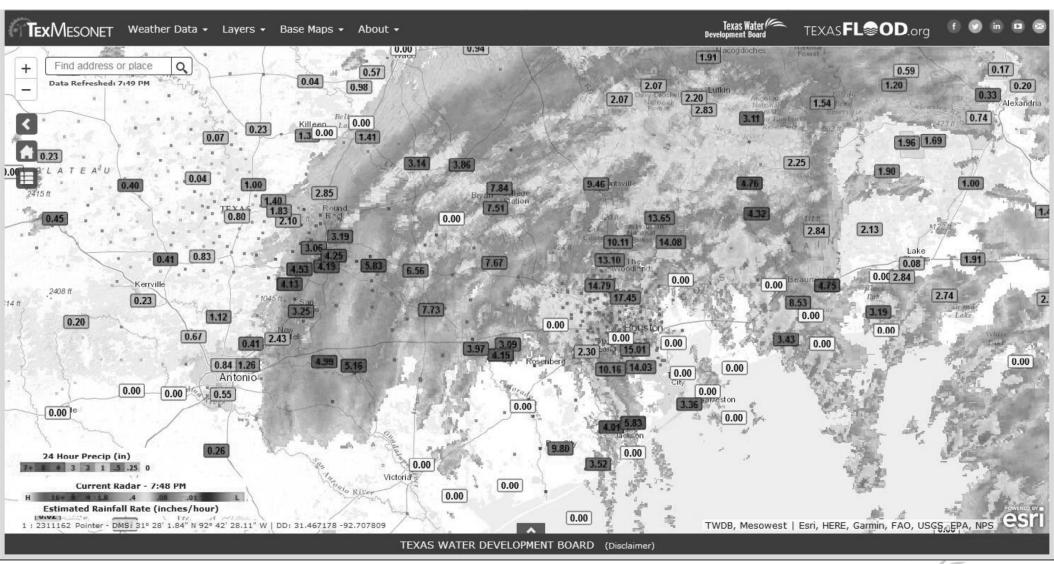
Hurricane Harvey at 10:26am CDT on August 26th 2017.

Locate 115 MI SE of Corpus Christie. Max winds 110 MPH Moving NW at 10 MPH with central pressure 947 millibars



Tropical Storm Harvey at 7:00pm CDT August 27th 2017.

Located 10 miles NE of Victoria, TX. Max winds 40 MPH Moving SE at 3 MPH with Central pressure 1000 millibars



The End



