

Louisiana State Mesonet: Project Summary

Environmental monitoring is critical for human survival and proper resource management. Weather and climate disasters, such as tropical cyclones, severe weather episodes, major floods, droughts, and winter weather can significantly impact both the social and economic welfare across the United States. In the past 20 years, Louisiana has experienced *46 individual billion-dollar weather and climate disasters*, with these events severely impacting sectors such as energy, agriculture, and transportation, in addition to public life and property. In the past, environmental monitoring was primarily used to provide information about current and forecast weather conditions. However, given the increasing importance of environmental information, its use has been incorporated into many diverse sectors to decrease social and economic losses from weather and climate disasters.

One of the best weather and environmental monitoring tools available today are mesonets. Mesonets are interconnected networks of multiple instrumented weather and environmental monitoring stations across an entire state, or a small footprint of a state/region. The University of Louisiana Monroe (ULM), working with our congressional leaders, has secured funding to support the installation and operations of 50 initial mesonet stations across Louisiana, establishing the Louisiana State Mesonet (LSM). The LSM data will be available to NOAA and other interested parties, and will provide critical information that will impact sectors such as severe and hazardous weather forecasting, homeland security and emergency management, aviation, energy and renewables, agriculture, transportation, and education.

Each LSM site will provide measurements of: wind speed, wind direction, air temperature, relative humidity, incoming solar radiation, air pressure, precipitation (rate and total amount), and soil temperature and moisture at various soil depths. In addition, each site will be equipped with a camera to view field and sky conditions. These data are measured continuously, provided at regular intervals, and archived in a central repository at ULM where it can be accessed for current and future use. Real-time data will be made available via various data visualizations on the LSM website (in development). Example data visualizations the LSM will employ can be found on other state mesonet websites (e.g., Kentucky Mesonet <https://www.kymesonet.org/>; New York State Mesonet <http://www.nysmesonet.org/>).

A data access policy is being developed which will include a fee structure for access to a live data stream or for purchasing archived data. Parishes, cities, townships, or other landowners that agree to host a LSM site will receive their local site data (live or archived) at no cost. Real-time LSM data will always be publicly available for free via data visualizations from our website.

The LSM will be managed by ULM through the ULM School of Science and the Atmospheric Science program. Project contacts:

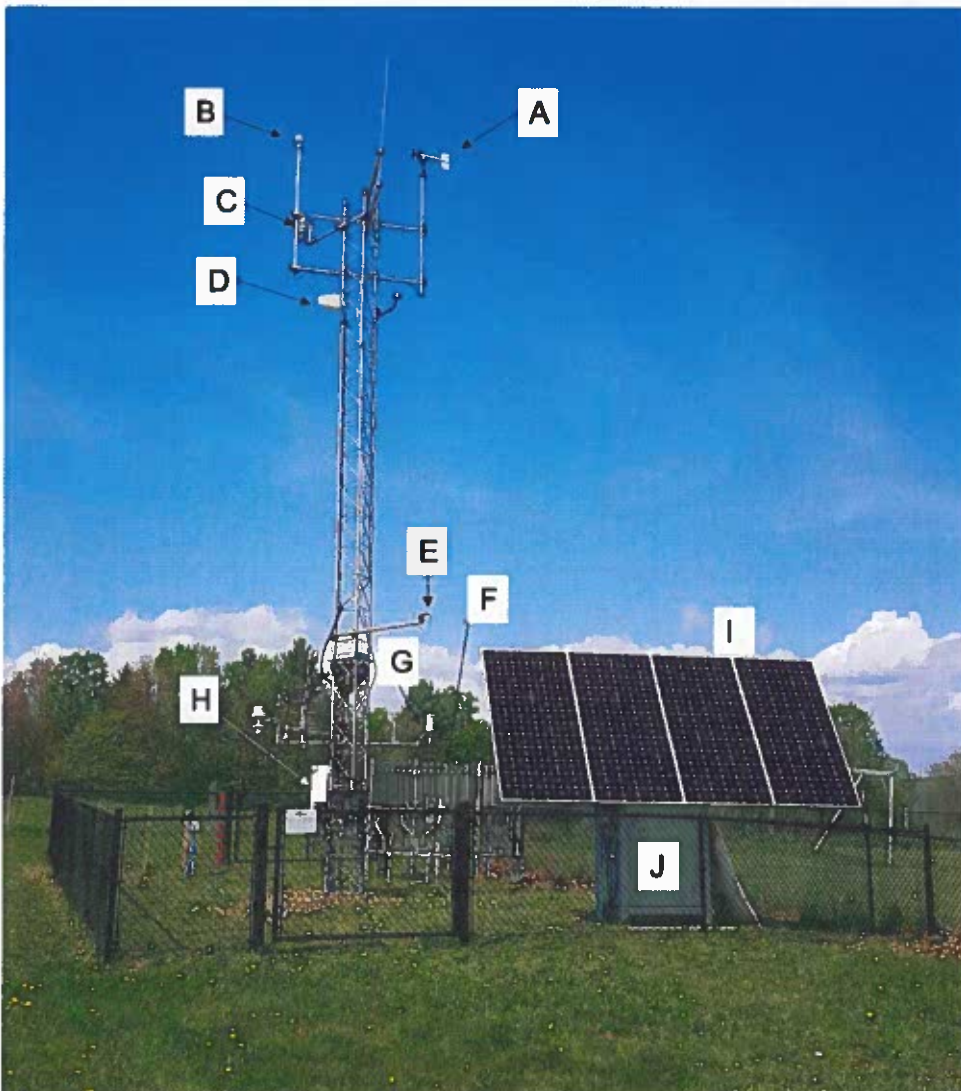
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3. Institutional Contact: Dr. John Sutherlin, sutherlin@ulm.edu, 318.342.1413

Louisiana State Mesonet: Site Specifications

Site considerations for each mesonet location include:

1. Acceptable for 10-m (30-ft) tower installation, including 36"x36"x48" cement pad to anchor tower and guy wire anchors (if needed).
2. Site must be accessible by truck for installation and maintenance visits.
3. Acceptable to install security fence (if needed) around site perimeter.
4. Site must be in an open area, at least 30-ft from heat sources or bodies of water; ground cover should be natural vegetation; no nearby obstructions (e.g., buildings, vegetation, etc.) that blocks wind or shades the site.
5. 30-ft x 30-ft site footprint is preferred; smaller footprints are possible depending on availability, guy wire anchor requirement, and if conditions listed in #4 is met.
6. Local power or communications not required; each site will be solar powered and use cell network for communications.

An example mesonet site (from the New York State Mesonet), with instruments labeled, is seen in the photo below.



A – wind speed & direction; propeller anemometer

B – wind speed & direction; sonic anemometer

C – temperature @ 9-m

D – cell communication antenna

E – solar radiation; pyranometer

F – precipitation; tipping bucket rain gauge

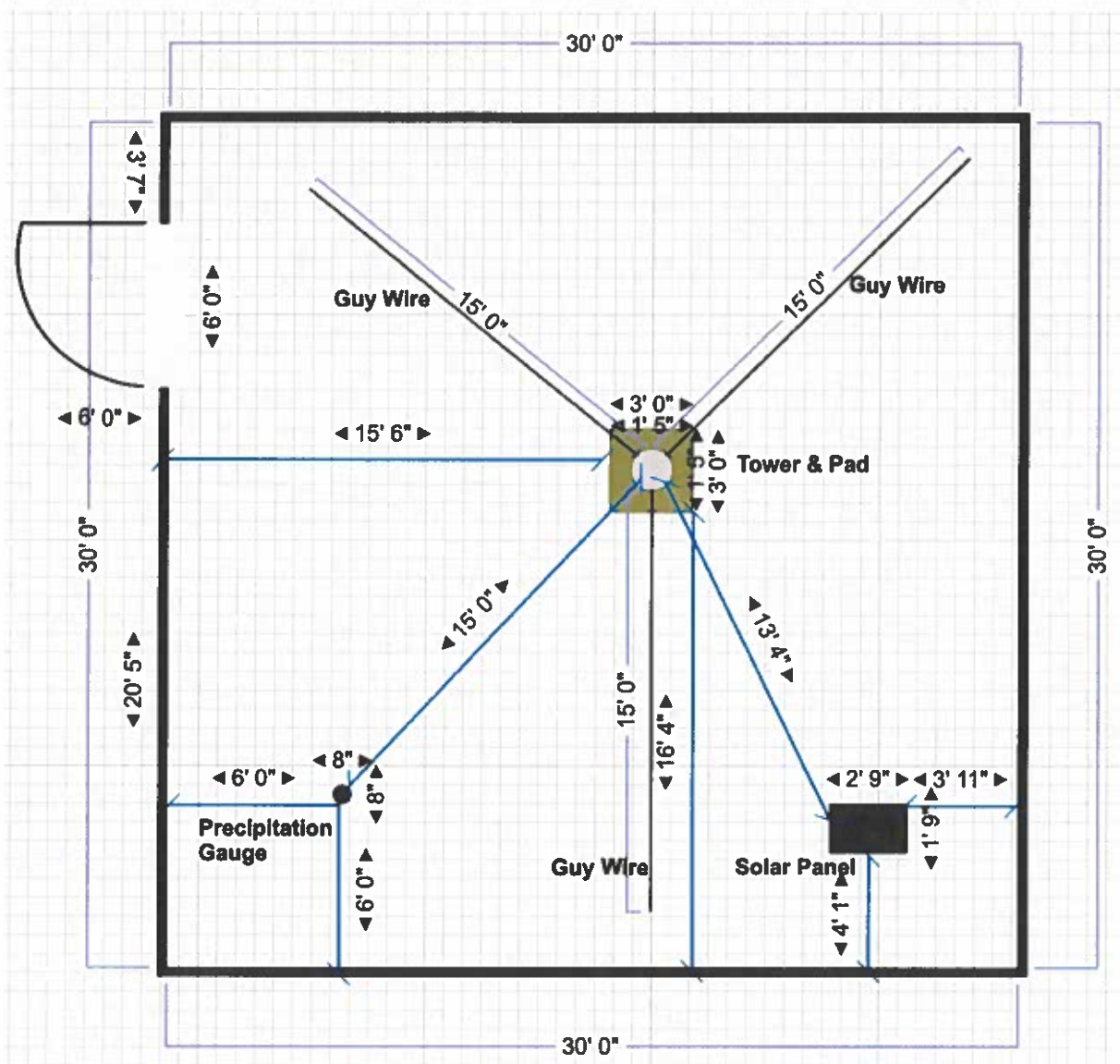
G – temperature & relative humidity @ 2-m

H – data logger enclosure; pressure sensor

I – solar panels

J – battery enclosure

Below is an approximate site layout, assuming a 30'x30' site with guy wire support.



Note: guy wires are not necessary if the concrete anchor pad for 10-m tower is 36"x36"x48" in solid soil. Sites without guy wires can cover a smaller area footprint (< 30'x30' site). Sites near the coast that may experience ≥ 110 mph winds due to hurricanes will need additional guy wire support and thus will require the 30'x30' footprint.