# Building Climate Resilience for Food System with Local Weather Networks

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**COOPERATIVE EXTENSION**
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## NEED/GOAL

The Clemson Extension Weather Network aims to address several critical needs in South Carolina using WeatherFlow technology. Primarily, it seeks to fill the gap in local and rural weather information, create a comprehensive historical database, and provide on-farm weather data. The network will also focus on enhancing climate resiliency by monitoring and addressing natural disasters, droughts, floods, frost and freeze events, and sea level rise. The collected data will serve multiple purposes, including historical comparisons, forecast modeling and predictions, and the implementation of weather alerts via text and email. Additionally, the network will develop decision-making tools to aid farmers and researchers in utilizing the gathered weather information effectively. By implementing this weather network, Clemson Extension aims to improve South Carolina's ability to respond to climate challenges and support agricultural decision-making with accurate, localized weather data.

## APPROACH

To date, one station has been installed in all 46 counites across South Carolina, with three counties having more than one. The website interface is "live" and provides real-time weather data for producers, researchers, and industry partners. In addition to real time data, WeatherFlow provides a custom point forecast based on hyperlocal weather data modeling. Priority for installation was assigned based on feedback from the South Carolina State Climate office regarding identifying rural geographic locations with minimal weather data reporting.

**Real-time weather data to impact food systems** → **Public and Private partnerships for locating and processing** → **Decision Tools to build resilience**

## RESULTS



**Figure 1.** WeatherFlow Tempest station sensor/functionality outline.

Light Sensor — ambient light, UV index, solar radiation
Haptic Rain Sensor — rain onset duration Intensity & accumulation
Sonic Wind Sensor — continuous wind speed and direction every 3 seconds
Pressure Sensor — station and sea level pressure
Temp / Humidity — integrated radiation shield
Lightning Sensor — strikes & distances up to 40 km
Solar Powered
Totally Wireless — Super long-range Wireless connection
Simple Mounting — 1" pole mount or flat base

SCAN ME



**Total Stations**
- Farm
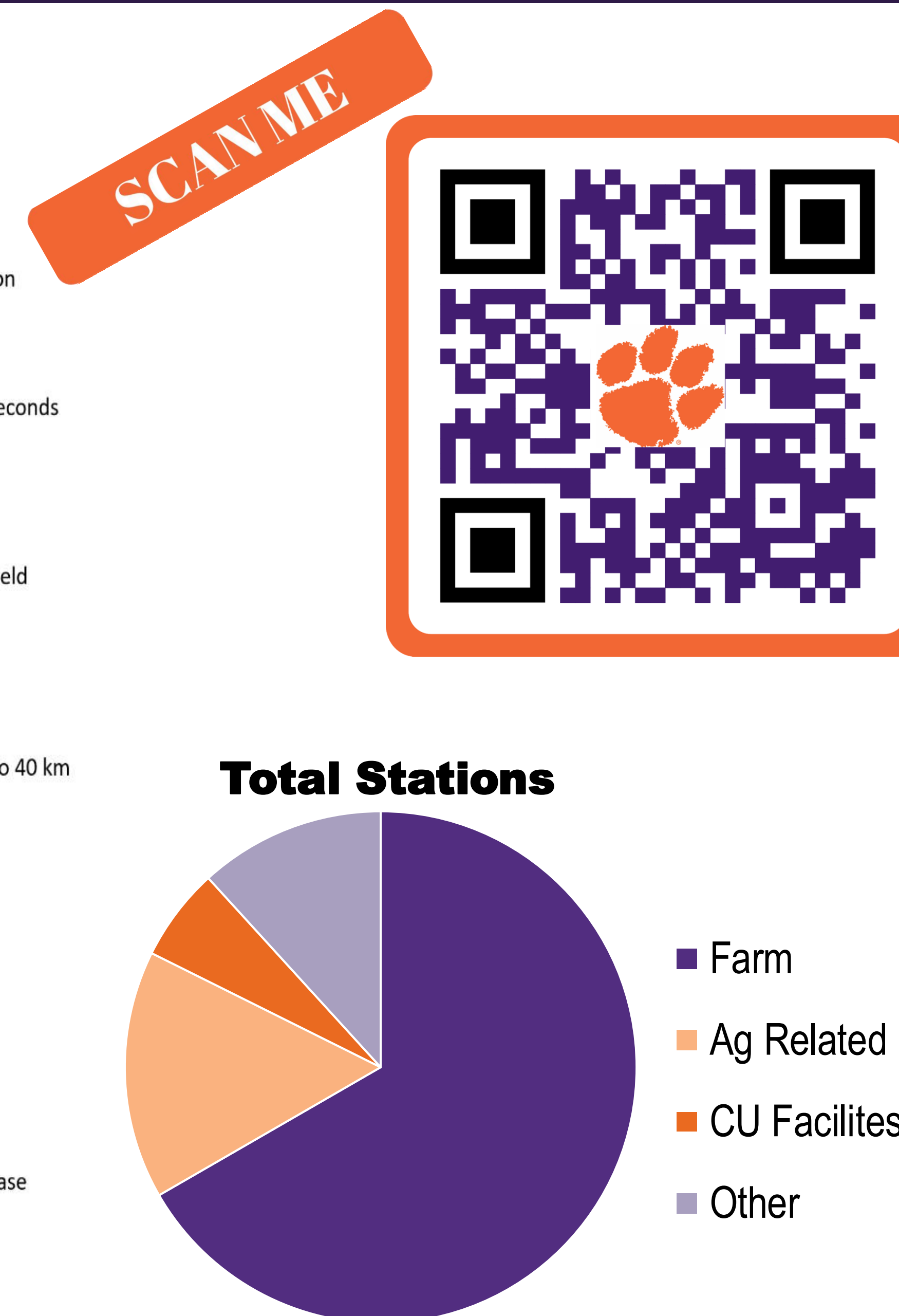- Ag Related
- CU Facilites
- Other

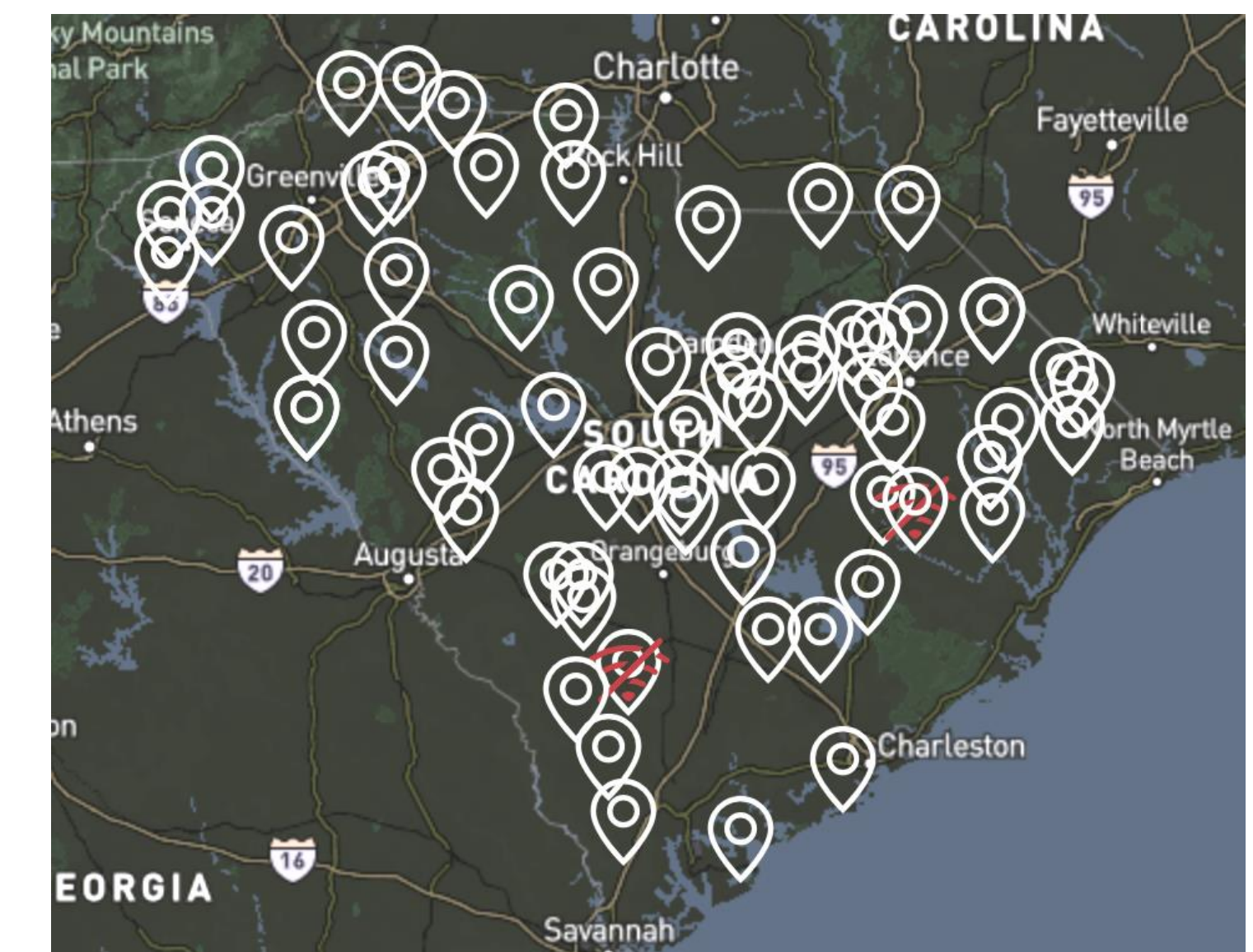**Figure 2.** Weather stations (n=51) site by type of location.



**Figure 3.** Weather station website map identifying each location of the sited weather stations.



**Figure 4.** Weather station install in proximity to food system production area.

## DISCUSSION & CONCLUSION

Of the 65 stations installed, 54 (82%) were close to a production area contributing to a food system. While the presence of weather data is critical for food production decisions, decision aids and tool kits will be the key to building climate resilience. According to the Center for Climate and Energy Solutions, climate resilience is the ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate. The Clemson Extension Weather Network (powered by WeatherFlow) provides real-time lightning alerts, custom point forecasts by location, realtime rainfall start/volume, and temperature. Forecasting and documenting drought, flood, frost/freeze, and other natural disaster events and effects on food system production will aid in building resilience to the food system. Once weather station infrastructure (stations and website) are completed, the aim is to build calculators and alerts that will help growers make management decisions based off of hyperlocal, real time and projected weather.