

# A BRIEF INTRO TO ECONET

## WHAT IS ECONET?

ECONet stands for **Environment and Climate Observing Network**.

ECONet is a network of 45 research-grade, real-time weather stations that are located across North Carolina. Dedicated staff at the State Climate Office of North Carolina work hard to maintain the **quality and reliability** of ECONet stations while also ensuring these data are accessible to the public.

For more information about **ECONet**, please visit our website: <https://econet.climate.ncsu.edu/>.

## WHAT DATA DO WE COLLECT AND SHARE?

Each ECONet weather station measures **15 variables every minute** and reports these data back to our office every 5 minutes. **All data are publicly available** through our Cardinal and Scout data portals:

<https://products.climate.ncsu.edu/cardinal/>. All ECONet stations are built and maintained **in collaboration with** local organizations. ECONet stations have evolved to respond to the monitoring needs of our local partners. This includes adding new sensors, communications infrastructure, and more.

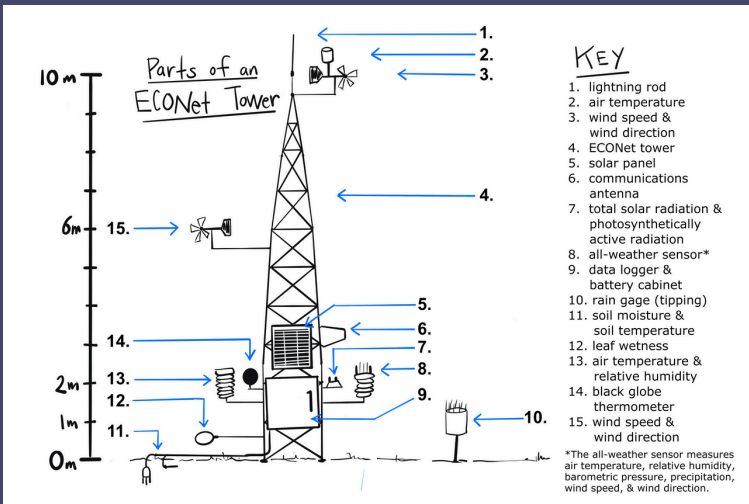


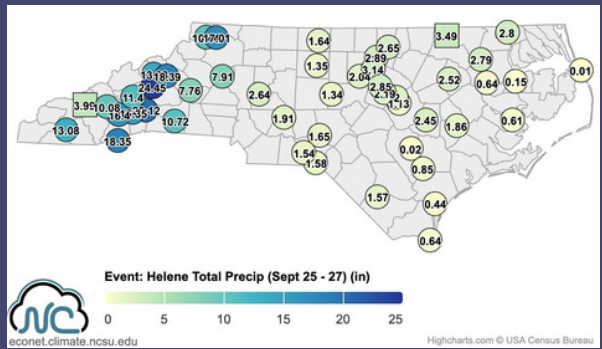
Diagram of a typical ECONet weather station, including power supplies, communications equipment, and environmental sensors.

# WHY IS ECONET IMPORTANT?

ECONet data **support a diverse range of communities, interests, and sectors** across North Carolina. These include planning, management, and response for fire, agriculture, and emergency management sectors as well as education and research opportunities. As one example, ECONet data are used in an **inversion monitoring tool** to help agricultural growers make decisions about pesticide spraying based on temperature and wind conditions. As another example, measurements from specialized temperature sensors are incorporated into a **heat stress tool** that allows North Carolinians to view their heat stress risk in real-time.

To see these and more examples of **ECONet-powered tools**, please visit our products website: <https://econet.climate.ncsu.edu/products/>.

Map of total rainfall from Hurricane Helene that passed through NC from September 25 - 27, 2024. This image was taken from the ECONet website.



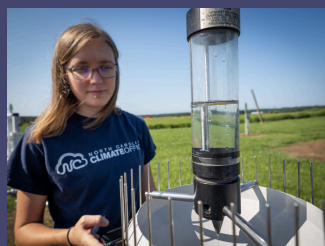
# WHAT DOES IT TAKE TO INSTALL A NEW ECONET STATION?

We consider **three important factors** when deciding whether, how, and where to install an ECONet weather station: **siting, funding, and community buy-in**. We welcome discussing partnerships with organizations, state agencies, and community groups to expand existing weather station infrastructure and build new ECONet weather stations.

**1. SITING.** Ideal station sites are free of trees, buildings, and other obstacles that may interfere with sensors or damage the weather station. Data quality is best when obstacles are 10 times the height of the obstacle away from the weather station. However, it can often be difficult to find ideal locations so we are happy to visit a site you have in mind to discuss this further. It is also important that the ECONet Team can access the site by vehicle for routine maintenance (3 times per year) and emergency maintenance. Finally, each ECONet station needs either cellular network access or a landline connection to enable data transmission.

## WHAT DOES IT TAKE TO INSTALL A NEW ECONET STATION? (CONTINUED)

**2. FUNDING.** Setting up an ECONet weather station requires a start up fee to cover installation (e.g., station structure, communications equipment, power supply equipment), weather and environmental sensors, staff labor for initial station installation, and the first year of routine maintenance. An ongoing annual fee is also required to cover routine and emergency maintenance, including, sensor recalibration and replacement, communications and utilities, data quality control, and data storage and sharing. We balance the cost of equipment and sensors while ensuring the quality of data. Initial start up costs range from \$15,000-\$20,000; however, the total can vary based on individual location needs such as additional tower stabilizing equipment. The ongoing annual station cost is \$5,000 per year.



Clockwise from the left:

Rebecca Ward explaining how the LAKE station works (photo: Sean Heuser, 2013), Cam Baillie repairing the solar radiation sensor at LAKE (photo: Mark Hall, 2021), Myleigh Neill running a rain gauge calibration test at LAKE (photo: Mark Hall, 2021).

**3. COMMUNITY BUY-IN.** Last but definitely not least, the short- and long-term success of each ECONet weather station requires sustained community support. Community buy-in ensures that ECONet data has an impact on and serves the needs of NC communities. In 2016, we established an ECONet station in collaboration with staff at UNC Asheville. This station, located on the UNC Asheville campus, collects important weather data for the region while providing educational and job training opportunities to students.

# ARE THERE ALTERNATIVES TO SETTING UP A NEW ECONET STATION?

**Yes!** We work with several groups across NC to connect and share weather station data with the public through our Cardinal and Scout data portals.

We call this subset of weather stations **ECONet Extended** (ECONet Ext) weather stations. While ECONet Ext weather stations may not have all the bells and whistles of the standard ECONet weather station, they **complement** ECONet and provide **publicly accessible data** to our partners and NC communities at-large. A good example of an ECONet Ext station is the **Grandfather Mountain** weather station (<https://econet.climate.ncsu.edu/stations/grandfather/>) in Linville, NC. We operate this weather station in partnership with Grandfather Mountain staff.

## CONTACT US!

If you have any questions or ideas for expanding an existing weather station or are interest in installing a new weather station, please email **Sean Heuser** at [spheuser@ncsu.edu](mailto:spheuser@ncsu.edu) to set up a meeting with the ECONet Team.



Bearallow Mountain ECONet Station in January 2021  
Photo: Evan Fisher (2021)