

Eddy Covariance Systems

Fully processed flux results at your site



LI-COR

Fully Processed Results

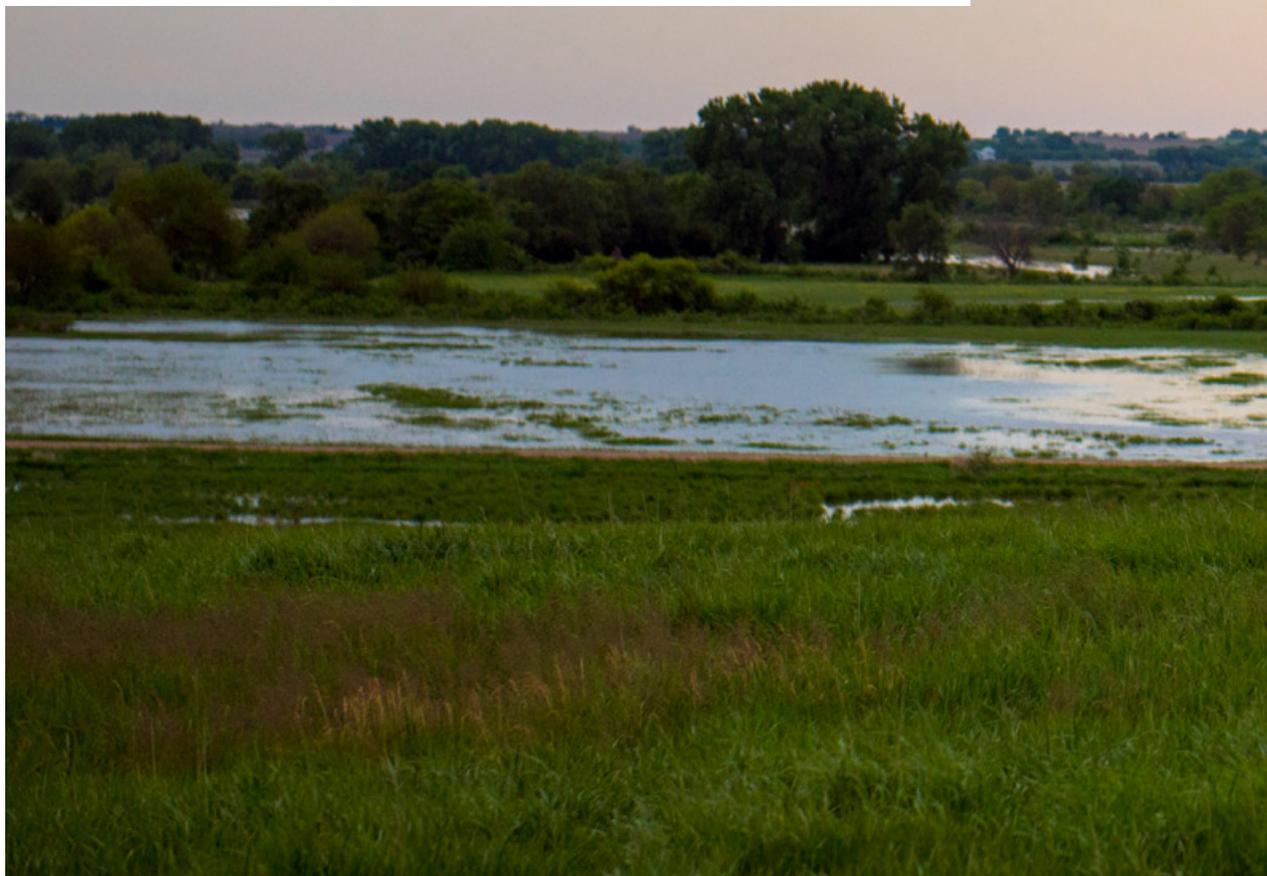
Get fully processed eddy covariance results in real time at your site using the SmartFlux® System. No other flux system provides this capability.

Preferred by Major Networks

Based on rigorous testing and trials by independent researchers, flux networks around the world have chosen our gas analyzers and EddyPro® Software as their standard. 100% of eddy covariance systems at the Integrated Carbon Observation System (ICOS), Cold and Arid Regions Network (CARN), Chinese Ecosystem Research Network (CERN), and National Ecological Observatory Network (NEON) include LI-COR analyzers.

Simplified Systems

Fewer parts and lower power requirements simplify measurements with the new EddyFlux System, all at a lower price. LI-COR eddy covariance systems are now easier to install and maintain.





What is Eddy Covariance?

The eddy covariance (EC) method is a micrometeorological technique for high-speed measurements of gases, water vapor, and energy transfer and emission rates. Fluxes between the surface and the atmosphere can be carefully characterized from single-point *in situ* measurements from an eddy covariance station.

Use the eddy covariance method to compute fluxes from the covariance between the directly measured vertical wind speed and the gas concentration. The basic instruments you'll need are a CO₂/H₂O analyzer and a sonic anemometer. With these, you can measure evapotranspiration, CO₂ flux, sensible heat flux, latent heat flux, and many other variables.

Why Use Eddy Covariance?

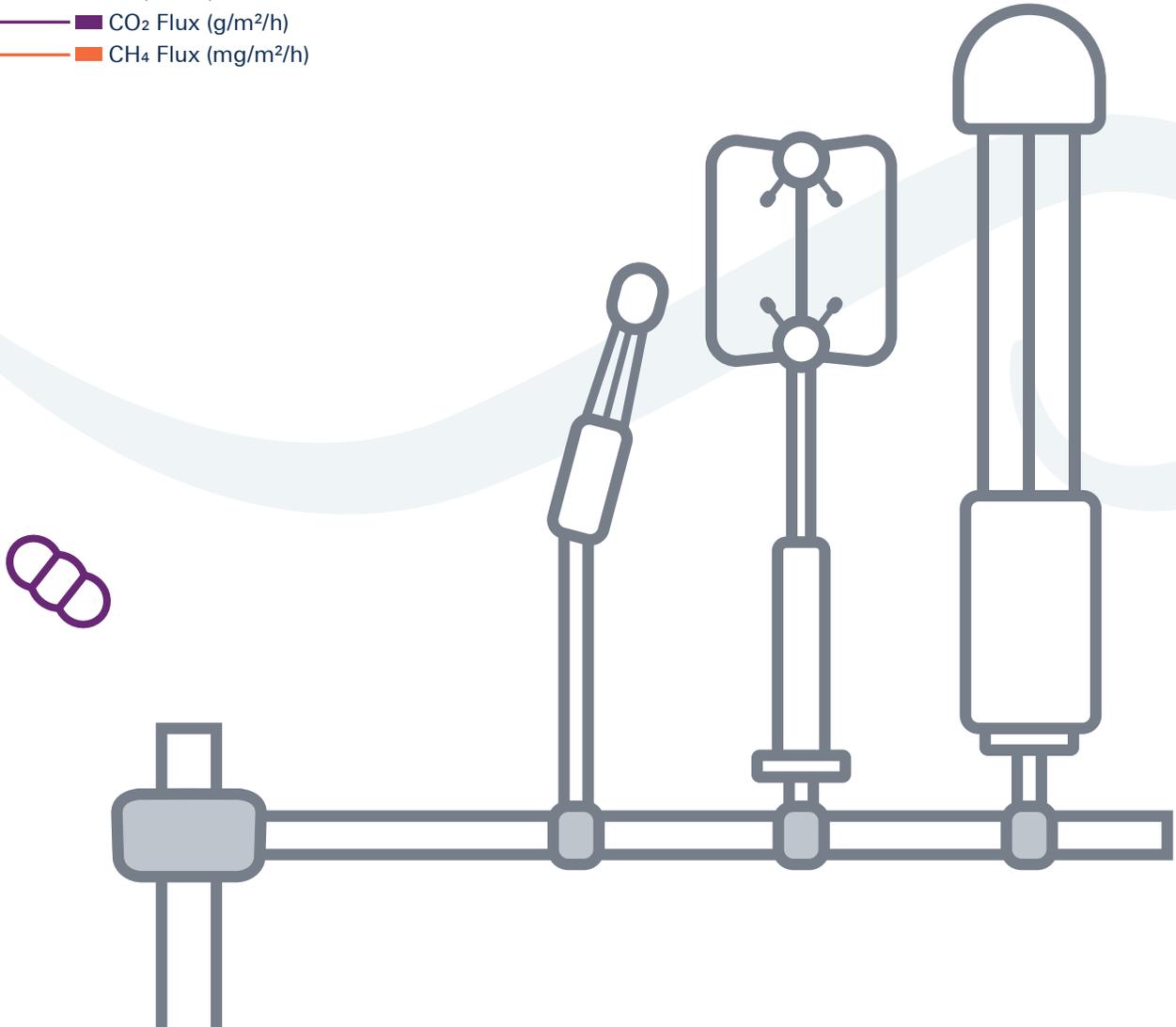
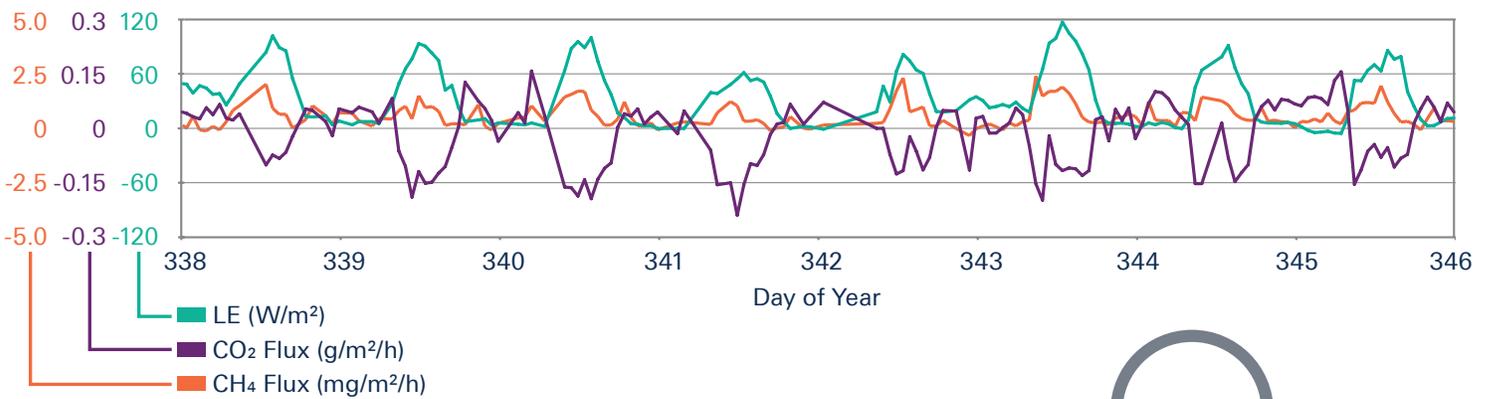
The eddy covariance technique is the most widely used, accurate, and direct way to measure ecosystem fluxes, emissions, and exchange rates of gas and energy between the surface of the earth and the atmosphere.

- Measures ecosystem exchange over a large area
- Won't disturb the environment
- Very flexible to fit a wide range of applications
- Methodology and data shared via worldwide networks



Eddy Covariance in Action

The figure below shows methane, carbon dioxide, and latent heat (LE) fluxes measured with the eddy covariance technique. These data are a subset of a 6-week dataset collected in the Florida Everglades, at 3.15 m above the canopy, using an LI-7500 Open Path CO₂/H₂O Analyzer and an LI-7700 Open Path CH₄ Analyzer. The data show a net negative flux of CO₂, but positive CH₄ and LE fluxes for the measurement period, indicating that this ecosystem was taking up (or, a sink of) carbon dioxide and releasing (a source of) methane and water vapor.





Introducing the EddyFlux System

The EddyFlux System includes everything you need for eddy covariance measurements: the new LI-7500DS Open Path CO₂/H₂O Analyzer for measuring CO₂ and H₂O, a sonic anemometer for measuring wind speed, and the SmartFlux[®] System for automated flux calculations. Through innovative design, the flux station achieves high performance at a lower price.

The EddyFlux system features miniaturized electronics and lower power requirements. The LI-7500DS brings the dependability and precision that researchers expect, in a lower-cost, easier-to-use instrument. This system is effectively omnidirectional, meaning it can get wind measurements from nearly all directions.

Fully Processed Fluxes

Get fully processed eddy covariance fluxes—sensible heat, latent heat, evapotranspiration, CO₂, and H₂O—at your site with SmartFlux, included in every EddyFlux System. SmartFlux is the on-site processing and GPS synchronization component of each LI-COR eddy covariance system. It keeps universal GPS time within sites and across sites to keep the system time accurate and prevent drift. You can also customize raw data processing for your specific site, including *in situ* spectral corrections, customizable planar fit approaches, and footprint calculations.

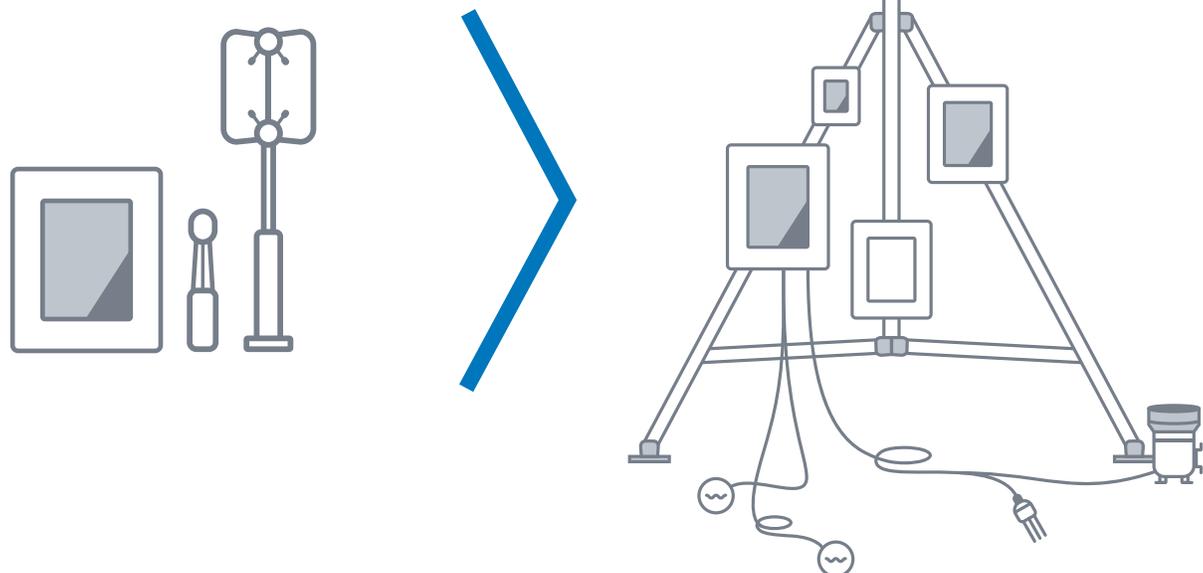


Flexibility to Customize Your Site

LI-COR eddy covariance systems are scalable—from basic systems that measure carbon dioxide exchange, evapotranspiration, and energy flux, to advanced systems that measure methane flux and additional biological and meteorological variables.

Each station has unique goals and requirements to get the highest data quality. Here are additional options so you can customize the eddy covariance system for your research needs:

- Compatible with almost any sonic anemometer brand and model
- Biological and meteorological (Biomet) sensors for gap filling and interpreting results
- Solar power supplies to provide power in remote areas
- Mounting with a heavy duty tripod
- Remote communications to keep track of your system, or multiple stations, from anywhere



LI-7500DS Open Path CO₂/H₂O Analyzer

Designed for high-speed CO₂ and water vapor measurements in ambient air, improved optics and temperature controls reduce sensitivity to dust and other contamination. The open path design means you'll have lower power requirements. This analyzer is ideal for effective omnidirectional flux measurements.

LI-7200RS Enclosed CO₂/H₂O Analyzer

An enclosed system can make measurements even in challenging outdoor environments. Choose the LI-7200RS if your site has frequent rain, fog, or snow.

LI-7700 Open Path CH₄ Analyzer

Only LI-COR EC systems make it easy to add methane flux measurements. Simply connect the LI-7700 with a single Ethernet cable and get methane fluxes in real time, while adding as few as 8 watts to the power demands of your EC system.



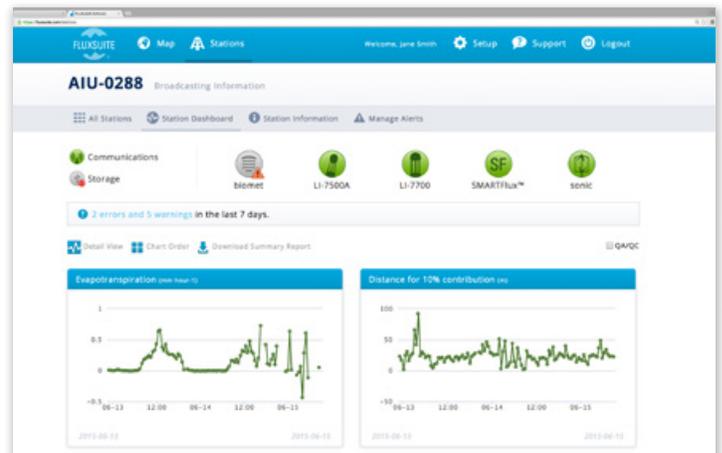
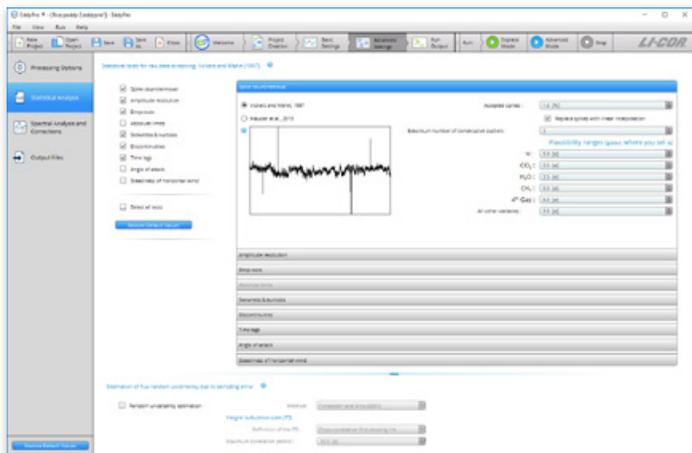
Advanced Software

No other eddy covariance system comes close to providing as many automated processing steps. These steps—based on published research in peer-reviewed journals—avoid potential errors in flux calculations. Chosen by networks worldwide, EddyPro® Software runs automatically in the SmartFlux System. EddyPro offers raw data QA/QC and data output in database-compliant formats (FLUXNET, ICOS, and Ameriflux). SmartFlux can also push your raw and processed data to a network server or a private repository, such as Dropbox.

All steps are designed so that data output is standardized, repeatable, and traceable—making it easy to reproduce your results. This is the only EC software package to offer all of these features.

Access Your Site from Anywhere

With FluxSuite™ Software, you can view real-time final fluxes on your smartphone, tablet, or computer. Remote access makes it easy to monitor your station and see how instruments are performing without traveling to your site. FluxSuite also notifies you of any issues via email alerts. Secure access to your station can be shared with collaborators across the globe.





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The LI-COR board of directors would like to take this opportunity to return thanks to God for His merciful providence in allowing LI-COR to develop and commercialize products, through the collective effort of dedicated employees, that enable the examination of the wonders of His works.

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"Trust in the LORD with all your heart and do not lean on your own understanding. In all your ways acknowledge Him, and He will make your paths straight."

— Proverbs 3:5,6