

DIRECT ET MEASUREMENTS FOR THE IMMEDIATE SOCIETAL BENEFITS

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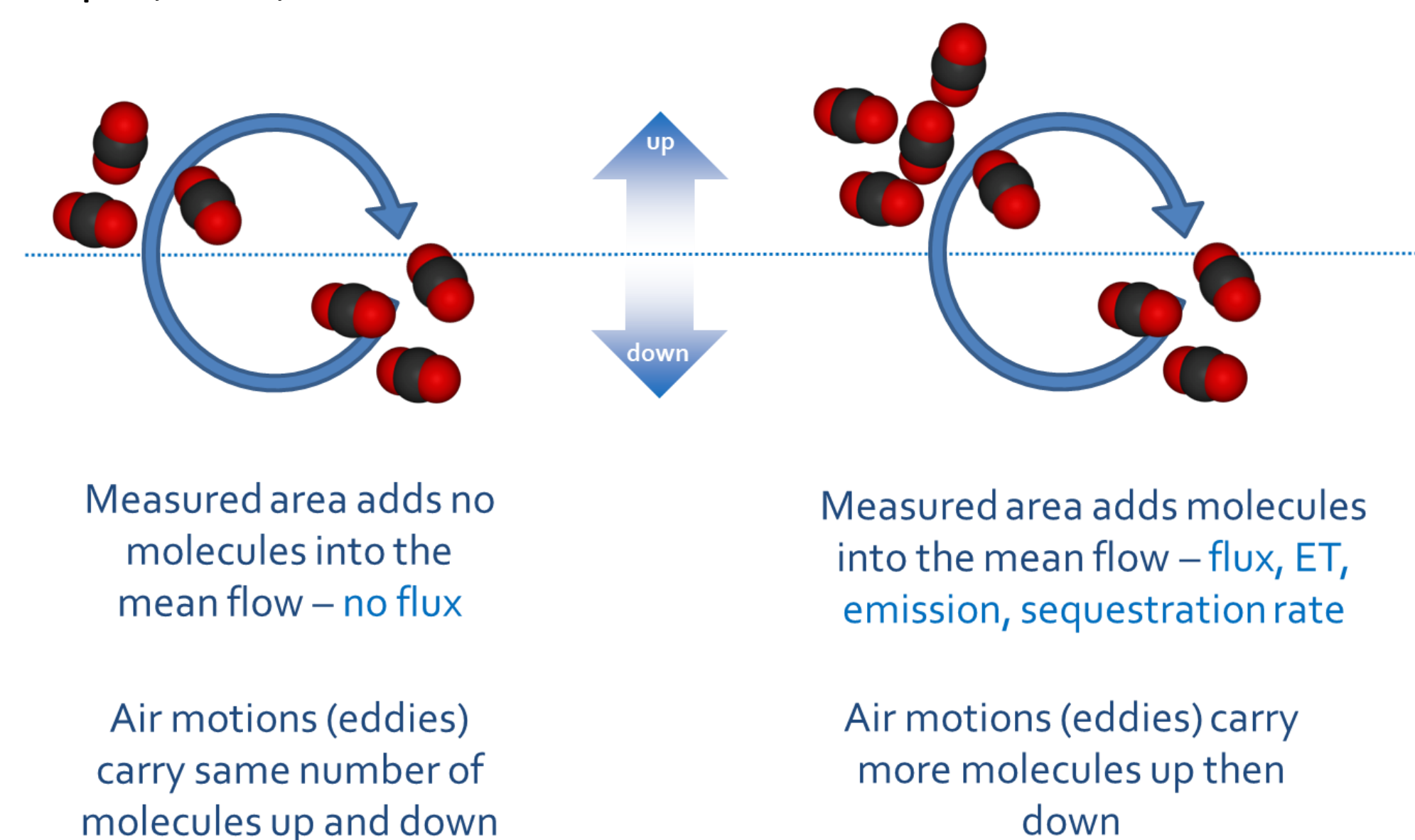
Direct ET Measurements

Declining water availability in combination with growing water demand is one of key global concerns in the modern society.

These two opposing trends manifest uniquely at different scales, from the farm field to the global water distribution, and require innovative management based upon a number of crucial regulatory, social and technical means, including water inventories, water loss and water use measurements, as well as development of the techniques for water use reduction, optimization and prediction.

These, in turn, require direct measurements of water transport in real time, with high temporal resolution. Direct flux measurements using eddy covariance method can provide such resolution at the field and larger scales.

The method has been widely used in academia since the 1980s and works by directly measuring vertical transport of water vapor, heat, and GHGs:



Limitations of Current Technology

Current eddy covariance technology is very high-performing, providing a random error of about 5-10% at 30-min time scale.

However, the academic equipment is quite expensive, ranging \$25-50K, and consuming about 5 to over 50 Watts of power.

Complexity of setting up and running the station and processing the data often requires hiring and expert.

As a result, such high-performing approach cannot be readily used outside academia to provide immediate societal benefits in practical water management applications.

The new cost-optimized solution for direct automate ET measurements has been developed to resolve this problem.

New LI-710: Cost-Optimized Automated & Very Simple to Use

Cost reduced 5-10 times below current EC technology

Power consumption reduced 3-15 times for solar/wind operation

Fully automated real-time calculations of all parameters

Extremely simple and fast installation: poll or stick

Designed for use by a novice and not an expert

Evapotranspiration
Water vapor flux
Latent heat flux

Sensible heat Flux:
the heat going from surface into the air

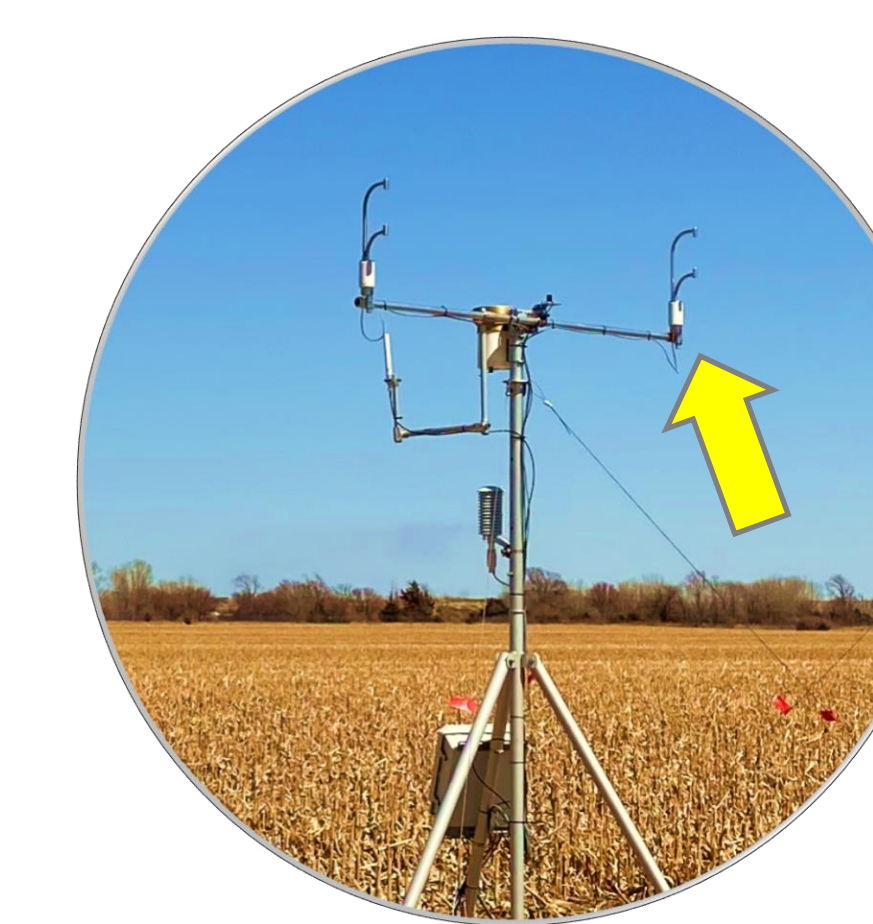
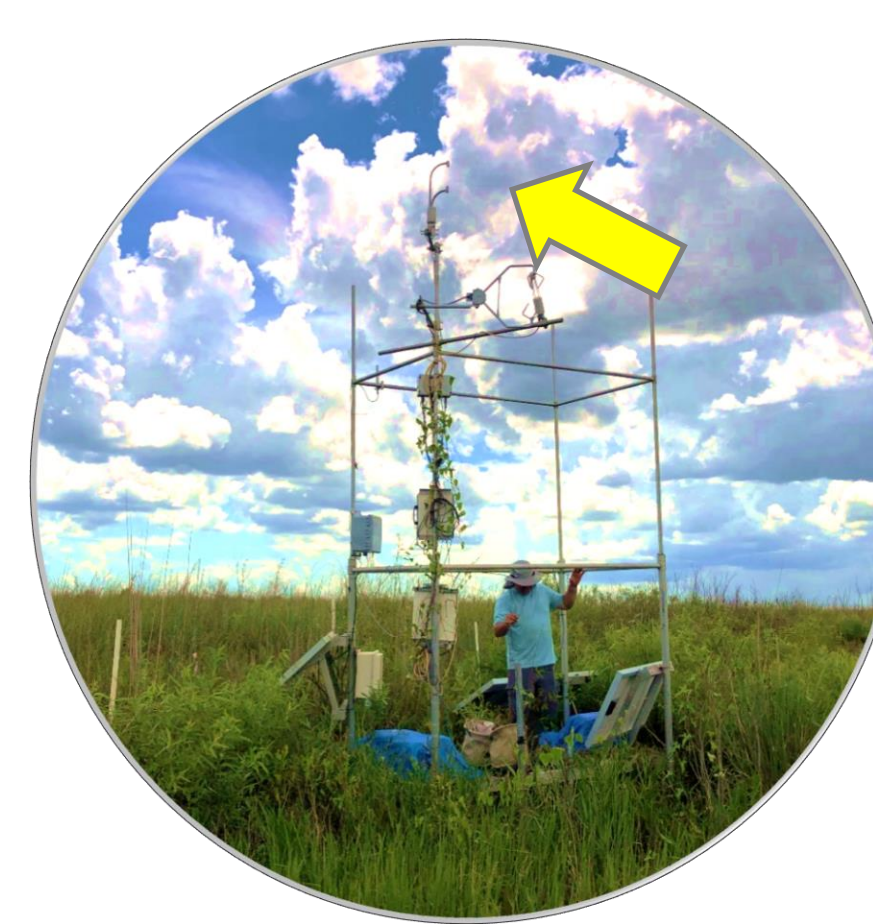
Temperature:
Ambient Air

Humidity:
Absolute
Relative

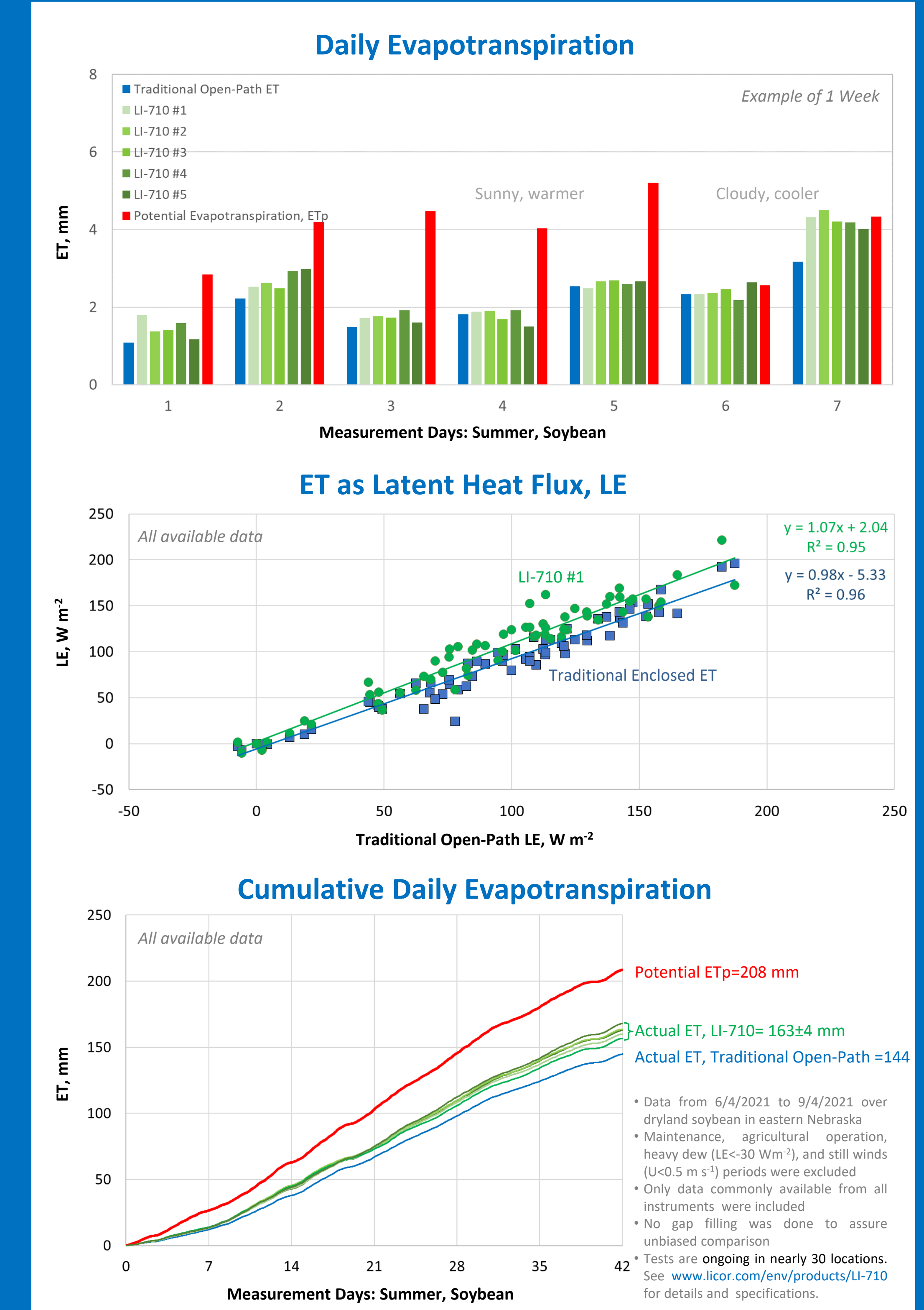
Ambient
Atmospheric Pressure

Dewpoint, VPD,
Saturated Vapor Pressure

SDI-12 compatible
with most weather stations and loggers



Preliminary Field Test Results



Conclusions

New LI-710 device is fully automated and has significantly reduced cost, and power of about 1.5 W.

This enables the best available academic method for direct ET measurements to be used in practical applications such as agricultural water management, irrigation scheduling, watershed management, water regulation and water use verification, etc.

