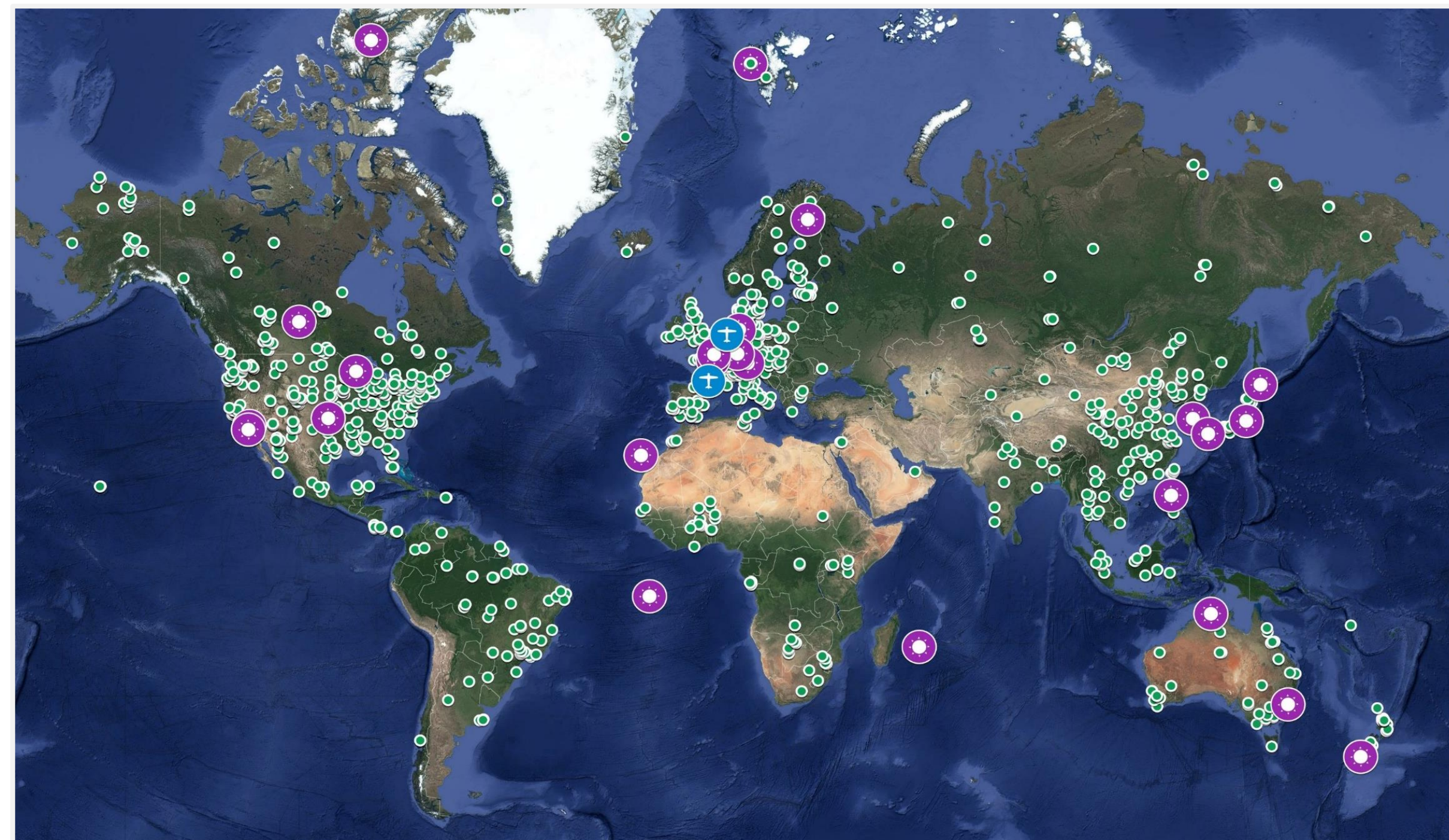


DIRECT FLUX MEASUREMENTS FOR IMMEDIATE SOCIETAL BENEFITS

CLEAR EXPLANATIONS, AUTOMATED INSTRUMENTS, PEER-TO-PEER DATA SHARING, AND WEATHER STATION-INSPIRED APPROACH

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LIMITED USE OF SUPERIOR TOOLS & DATA



Continental-scale research infrastructures and flux networks (e.g., AmeriFlux, AsiaFlux, ChinaFlux, ICOS, NEON, OzFlux), as well as numerous smaller GHG flux networks, and individual sites, measure CO₂, CH₄, and other GHG exchange, as well as water vapor fluxes (evapotranspiration, ET) between ecosystem and atmosphere.

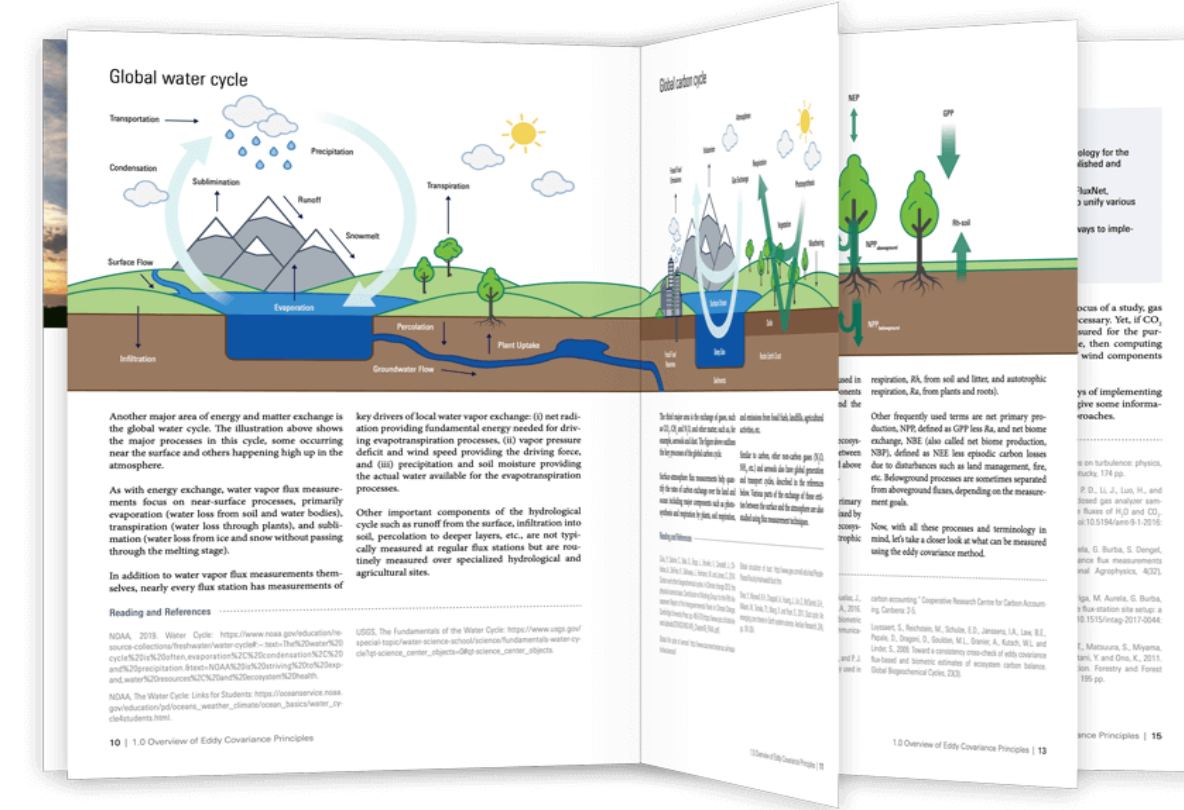
After four decades of academic use, the flux stations covered over 2100 stationary measurement locations, and numerous campaigns' locations. Most measurements were used for process-level ecological and hydrological studies and for long-term climate and ecosystem modeling.

Such measurements use ultra-high-resolution methodology and state-of-the-art hardware vastly superior to typical monitoring-grade methods and equipment deployed outside academia for a wide range of non-academic decision-making applications. However, despite providing exceptional ways to measure GHG emissions and ET, these are very rarely utilized outside academia.

The ultimate goal of this presentation is to ignite and provide a base for a discussion regarding the latest needs, ideas, and examples of the use of the flux measurements for practical 'everyday' decision-making applications benefiting society.

	Total	Active	Unknown	Inactive
Africa	80	32	9	39
Antarctica	1	1	0	0
Asia	353	157	142	54
Australia, New Zealand & Oceania	102	28	42	32
Europe	731	110	452	169
North America	720	187	221	312
South America	168	29	25	114
World	2155	544	891	720

EMERGING NEED FOR SIMPLE INSTRUCTIONS



Efforts of the flux networks have led to a major progress in the unification of the terminology, standardization and transparency of QC/QA, processing, and analysis.

Yet many non-EC researchers and nearly all non-academic stakeholders are not well-acquainted with the method, and as a result, cannot take full advantage of these high-quality, reliable, traceable, and defensible measurements.

With this in mind, detailed step-by-step instructions were created to introduce a novice to general principles, requirements, applications, processing and analysis of Eddy Covariance technique, and to assist an advanced reader in deeper understanding of the method.

EMERGING NEED FOR MUCH SIMPLER INSTRUMENTS

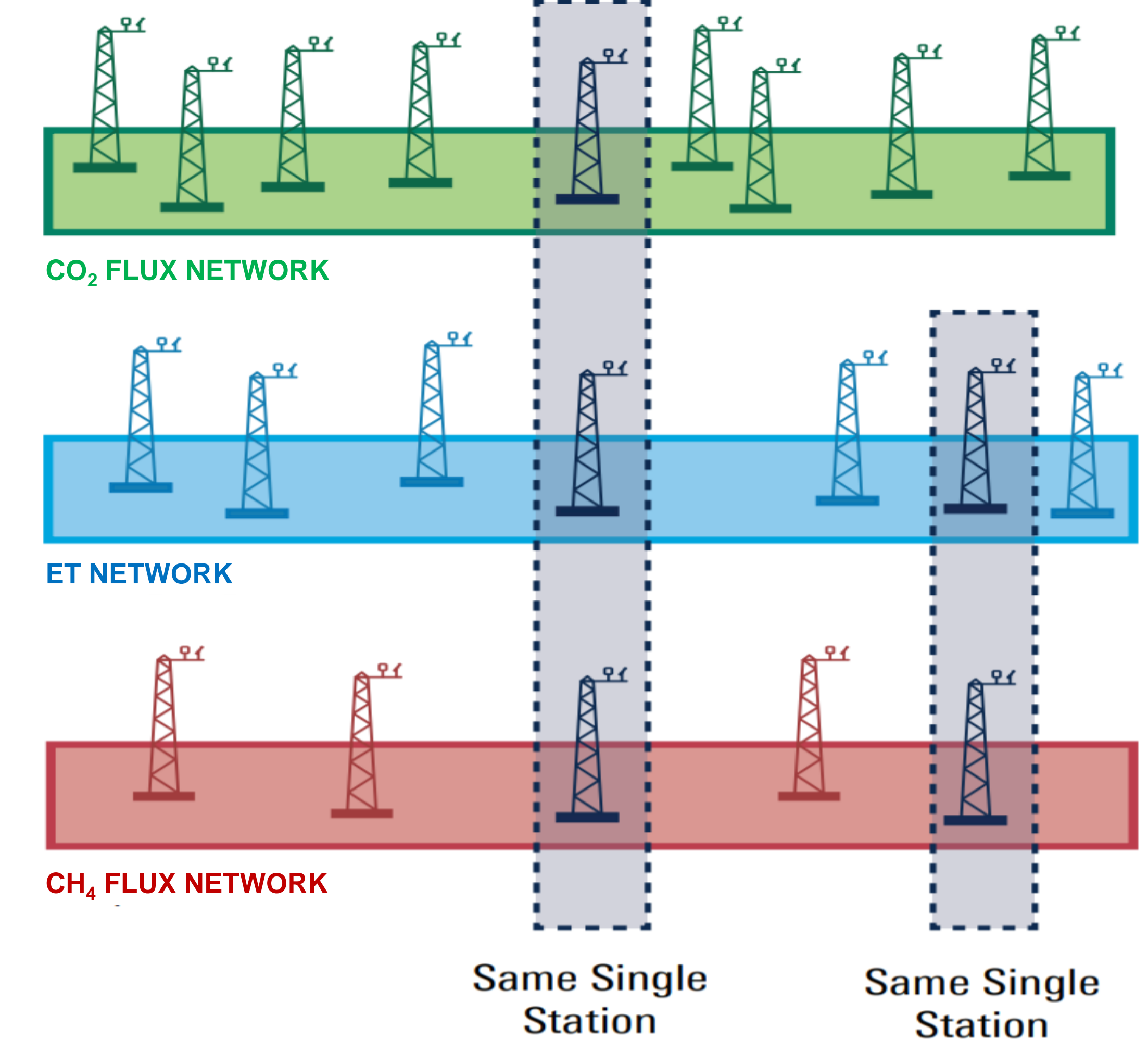


Past and present flux instruments are very complex and require an expert help to run them.

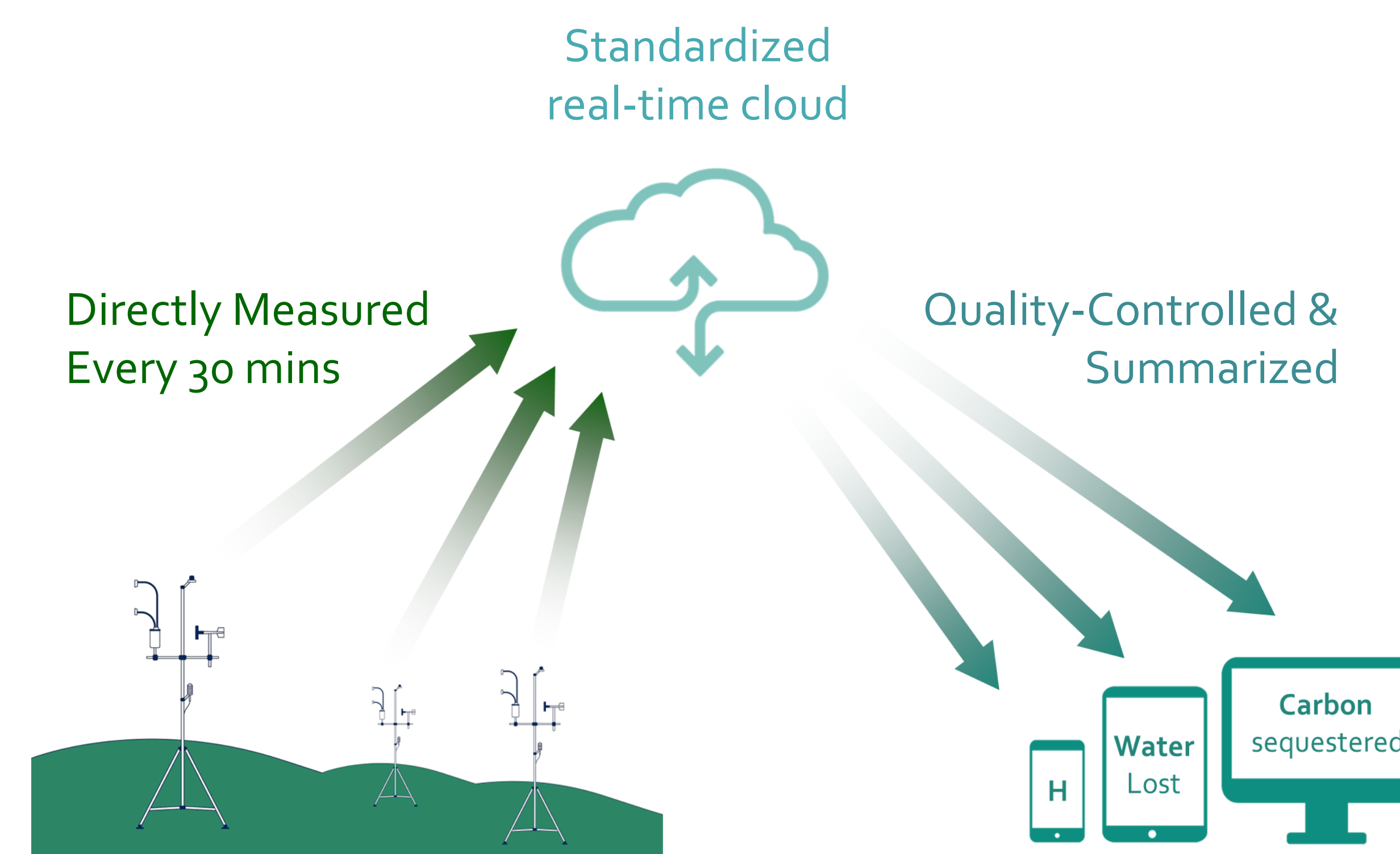
Efforts are on the way to make this instrumentation as simple-to-use as regular automated weather stations (AWS).

Pioneering example is fully automated low-power ET sensor, LI-710, outputting direct real-time ET and sensible heat fluxes.

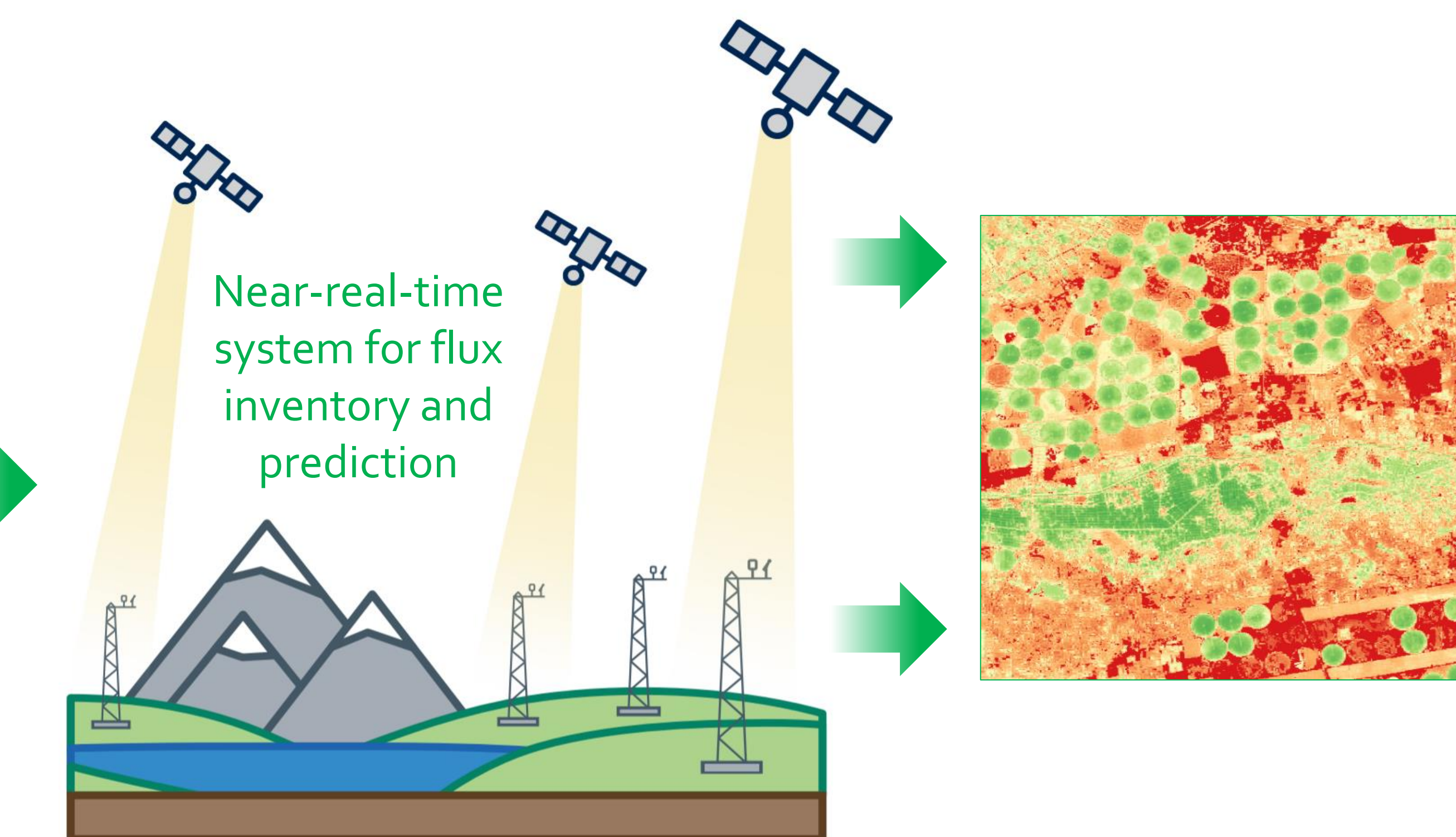
DECENTRALIZED PEER-TO-PEER CROSS-SHARING



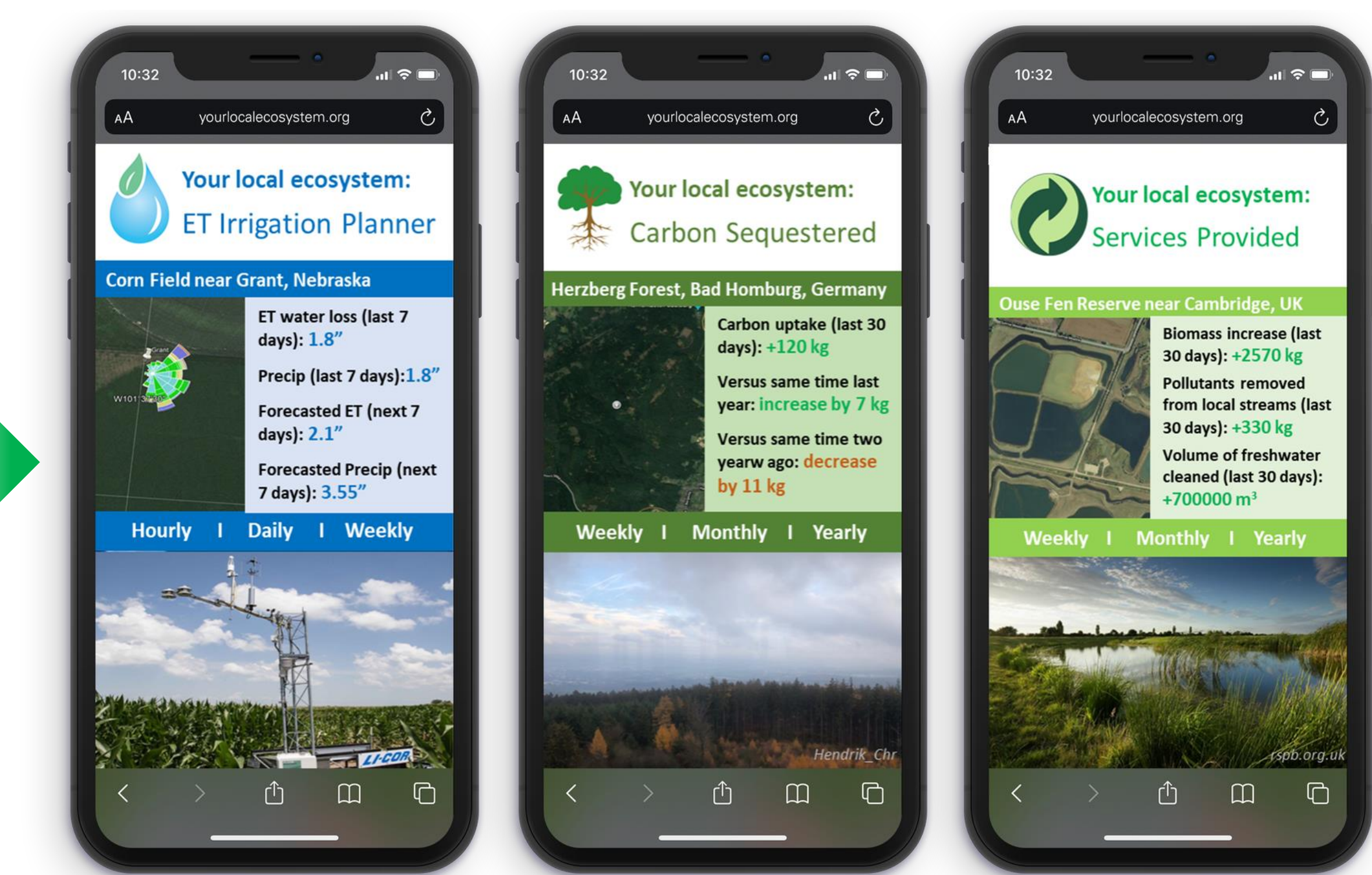
AWS-LIKE APPROACH APPLIED TO FLUX STATIONS & RESULTED IMMEDIATE SOCIETAL BENEFITS



A future network of automated real-time flux stations (AFS) designed similar to the existing networks of automated weather stations (AWS), measuring GHG fluxes in addition to weather



Remote sensing products and resulted models fine-tuned by the automated flux stations continuously and in near-real-time, again similar to AWS approach

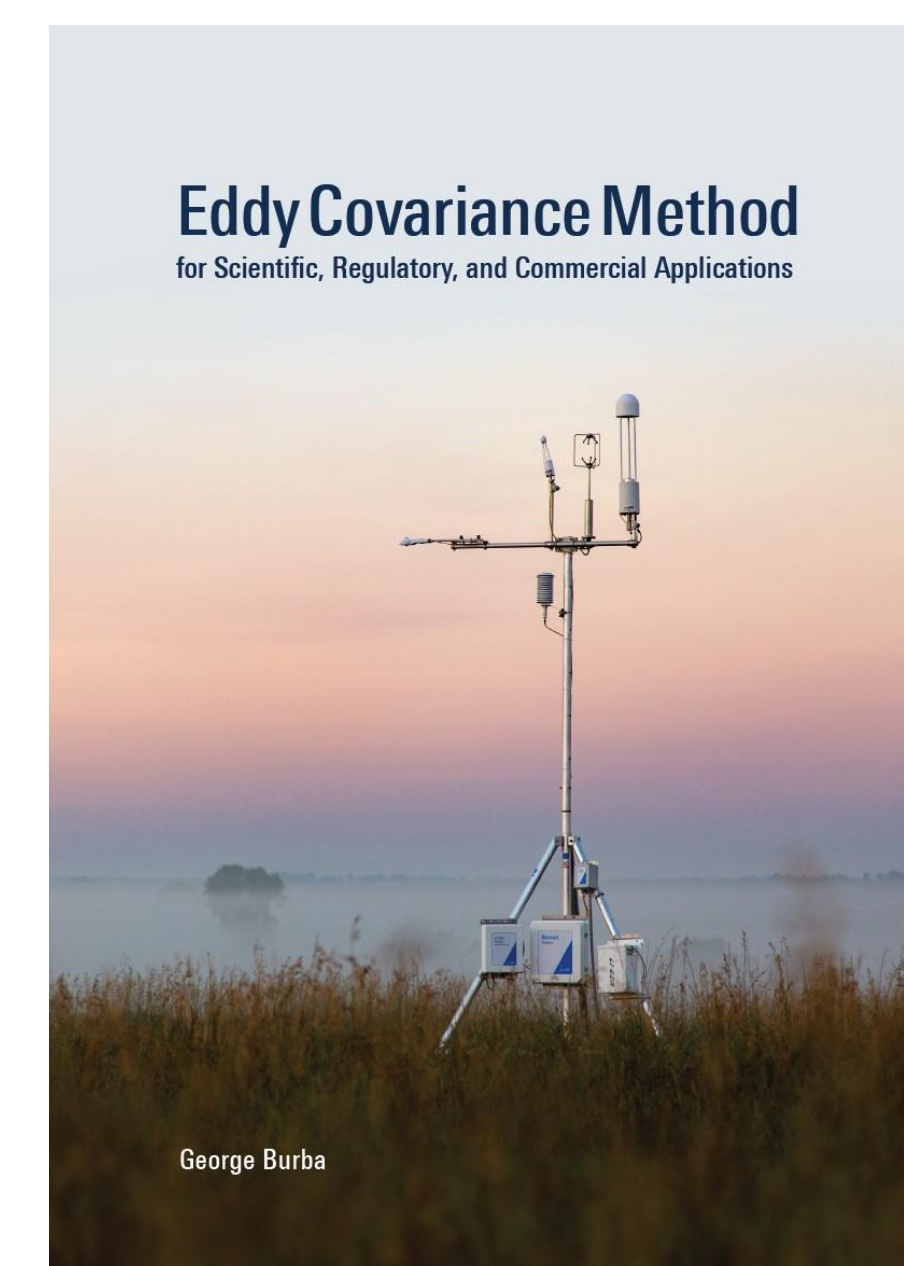


Public products and services, similar to weather apps: GHG emissions, carbon sequestration, irrigation guides, local ecosystem services tracker, growth forecasts, etc.

FURTHER RESOURCES & NEW AUDIENCE

New 700-page book:

- Simple to understand, with hundreds of clear illustrations, and numerous practical examples
- Free Electronic PDF book at www.licor.com/env/products/eddy_covariance/ec-book
- See printed textbook at LI-COR booth



New Community of Practice:

- Communicate with experts across academic and non-academic GHG domains: www.carbondew.org
- Free private or public membership for individuals and organizations: www.carbondew.org/join
- Collaborate to bring best available science to practical climate solutions



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