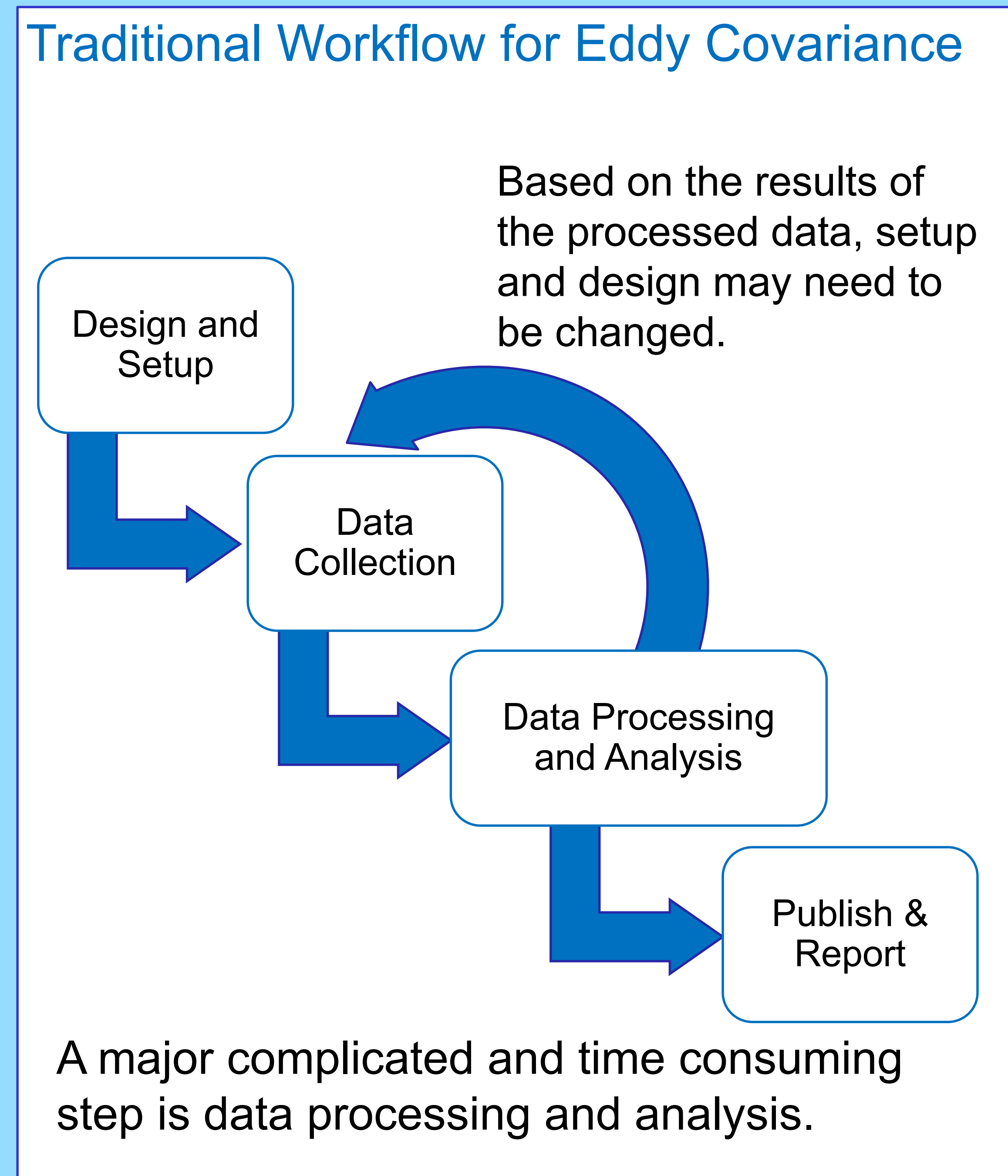



A New Tool for Automated Data Collection and Complete On-Site Flux Data Processing for Eddy Covariance Measurements

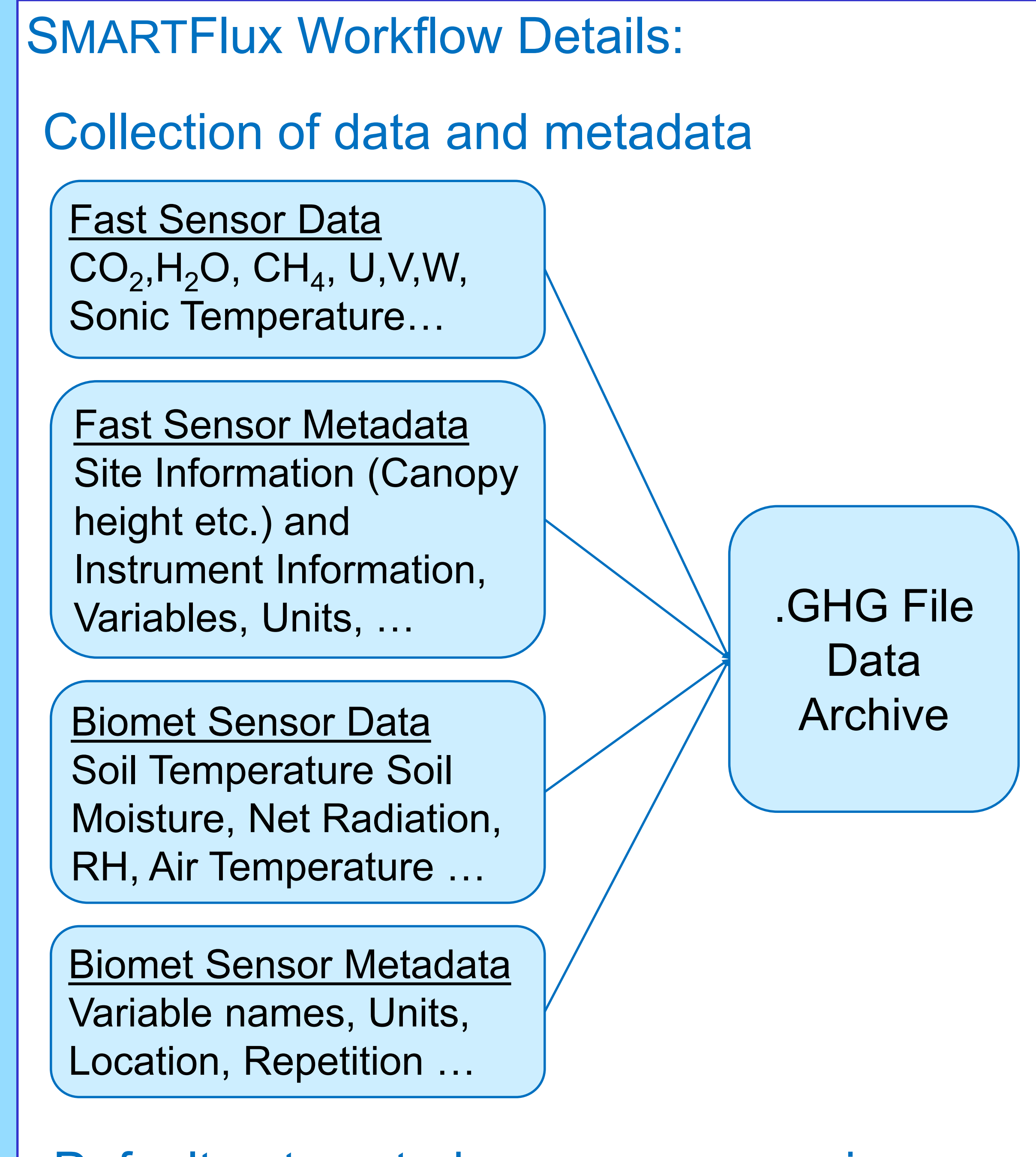
Israel Begashaw, James Kathilankal, Jiahong Li, Kevin Beaty, Kevin Ediger, Antonio Forgione, Gerardo Fratini, David Johnson, Michael Velgersdyk, Liukang Xu, George Burba
LI-COR Biosciences, Lincoln, NE, USA



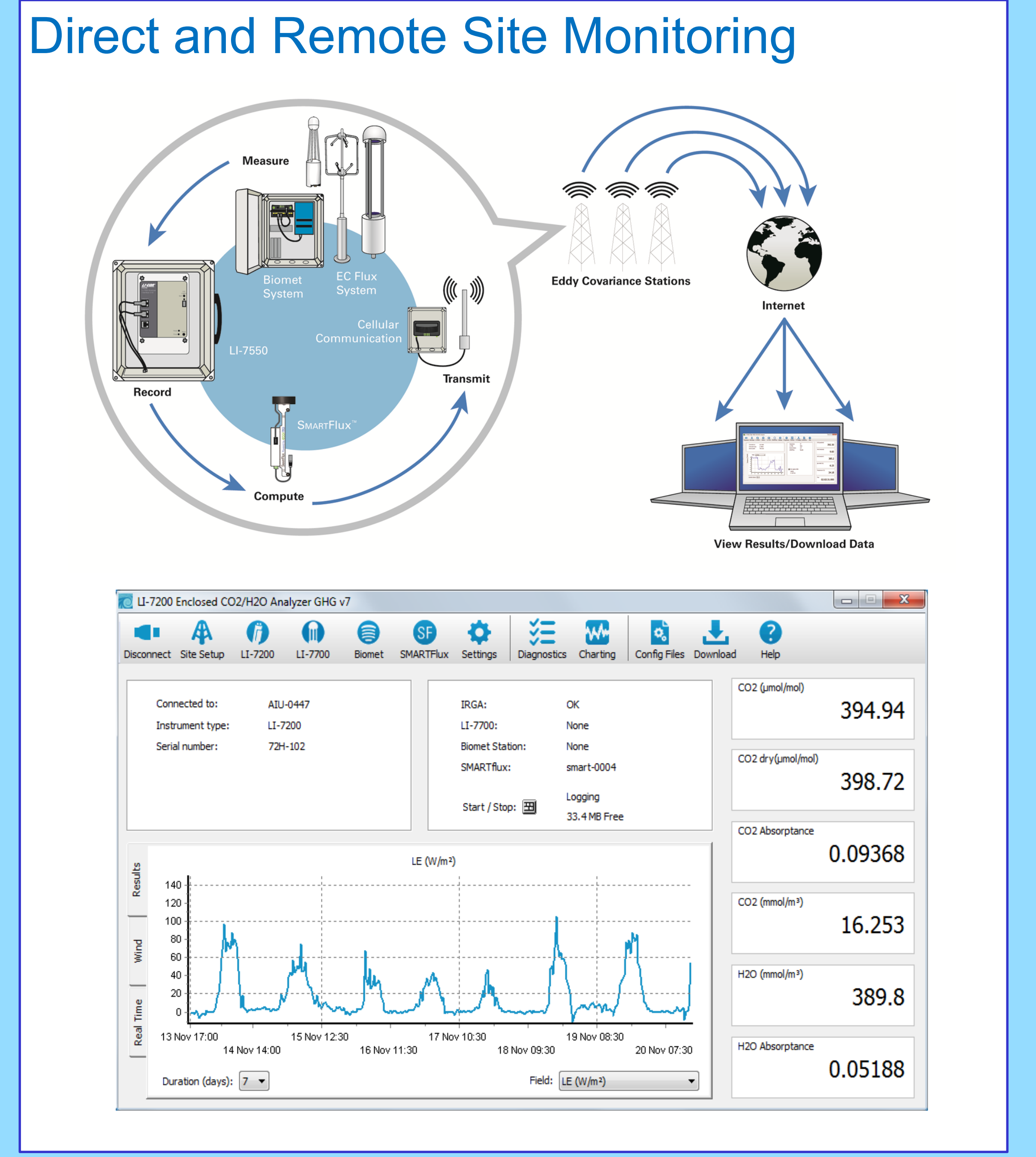
- ### Challenges of Traditional Workflow
- Significant delay between data collection and data processing, leading to inconsistencies in analysis and processing as the information gets lost over time due to separation of data and information about the data (metadata)
 - Inability to quickly recognize problems and troubleshoot since data collected is not processed and analyzed until a later time
 - Inability to perform advanced and site specific data processing due to limitation in data collection devices and/or complexity of implementation



- ### Standardized Processing Across Sites
- Mauder et. al 2006, Papale et. al 2006 and others show the need for standardized EC data processing to minimize errors and uncertainties.
 - EddyPro® is used by more than 3,800 researchers from large networks such as Ameriflux (US), ICOS (Europe), and CERN (China), as well as numerous institutions (NASA, USGS, EPA, etc.)
 - SmartFlux uses EddyPro processing engine and allows standardization across sites.
 - Workflow allows both default and advanced processing, configurable and automated
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- ### Default automated express processing
- Statistical screening
 - Coordinate rotation for tilt correction
 - Detrending of raw time series
 - Time lag compensation
 - WPL (density correction)
 - Frequency response correction
 - Micrometeorological quality control flags
- ### Flexible automated advanced processing
- Spectral Correction
 - Massman
 - Moncrieff
 - Horst
 - Ibrom
 - Planar Fit Rotations
 - (Non)linear detrending
 - Automatic Time lag Detection
 - Footprint Estimation



- ### Key Benefits
- Efficient Site Monitoring
 - Faster Data Processing and Analysis
 - Faster Troubleshooting
 - Standardized Complete Processing
 - Automated Quality Control
 - Ability to use FluxSuite™ software for monitoring network of multiple flux towers
- ### References
- Mauder M., Foken T., Impact of post-field data processing on eddy covariance flux estimates and energy balance closure, Meteorologische Zeitschrift, Vol. 15, No. 6, 597-609 (December 2006)
 - Papale D., et al.: Towards a standardized processing of Net Ecosystem Exchange measured with eddy covariance technique: algorithms and uncertainty estimation, Biogeosciences, 3, 571-583, 2006
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