ORNL’s TES SFA Data Acquisition, Archiving, and Sharing to Support Publications, Synthesis, and Modeling Tasks

Les A. Hook1*, Jeffery S. Riggs2, Misha B. Krassovski1, W. Robert Nettles1, Ryan R. Heiderman3, and Paul J. Hanson1

1Environmental Sciences, Oak Ridge National Laboratory, Oak Ridge, TN
2Logistical Services Divisions, Oak Ridge National Laboratory, Oak Ridge, TN
3Michigan Technological University, Houghton, MI

Contact: hookla@ornl.gov

BER Program: TES
Project: ORNL Terrestrial Ecosystem Science SFA
Project Website: https://mnspruce.ornl.gov/ and https://tes-sfa.ornl.gov/

Data management, archiving, and sharing of data and model products are an integral part of the ORNL TES SFA. The open sharing of all data and results from SFA research and modeling tasks among investigators, the broader scientific community, and the public is critical to advancing the mission of DOE’s Program of Terrestrial Ecosystem Science. TES SFA researchers are developing and deploying the data systems, repositories, tools, and integration capabilities needed for the collection, QA, storage, processing, sharing, analysis, and archiving of data and model products. What’s new and improved for the ORNL TES SFA?

**FRED 2.0:** Version 2 of the Fine Root Ecology Database (FRED) has been released at https://roots.ornl.gov/. FRED 2.0 contains more than 105,000 observations of some 330 different types of root traits as well as associated data such as site soil temperature, moisture, and sunlight, from about 1,200 data sources. There are more than 1.5 x 10^6 reported values. This is a 50% increase in observations and sources above and beyond FRED 1.0.

**Phenocam Expansion at SPRUCE:** New closeup shrub-view cameras have been added in each SPRUCE experimental chamber to supplement the existing overhead-view. See https://phenocam.sr.unh.edu/webcam/gallery/.

**Gigabit Internet Connection at SPRUCE:** High-speed internet connectivity via fiber optics will reach the SPRUCE Site. This new connection will facilitate direct access to data loggers, automated minirhizotron cameras, soil flux chamber instruments, real-time Phenocam images, the eddy covariance (EC) flux system, and a new mobile integrated EC/SIF (solar-induced chlorophyll fluorescence) system.

**FAME at MOFLUX:** The Fluorescence Auto-Measurement Equipment (FAME) SIF measurement system, has been deployed at the Missouri Ozark AmeriFlux (MOFLUX) site. FAME provides stable measurements over a wide range of conditions. The developing field technology and measurement protocols facilitate coordinated observation of SIF and EC fluxes, that will lead to new advances in ecosystem and carbon-cycle science.

**DOIs via OSTI:** The TES-SFA can now register DOIs for data products using the OSTI (Office of Scientific and Technical Information) E-Link System. Comprehensive metadata can be entered that will facilitate the eventual transfer of data to the ESS-DIVE archive.

**New Data Products:** Check for new datasets and modeling products from ORNL SPRUCE and TES SFA Teams plus DOE, EPA, and Universities at our project web sites.