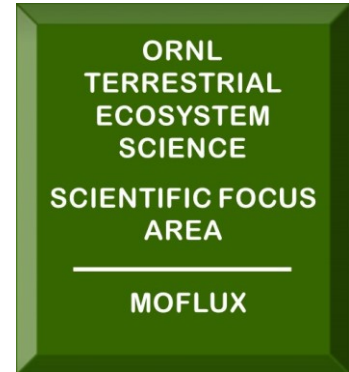


Leaf-area index of Oak-Hickory Forest at Missouri Ozark (MOFLUX) site: 2007–2022



Summary:

This data set contains measurements of leaf-area index (LAI) at the Missouri Ozark (MOFLUX) site during growing seasons from 2007-2022. The MOFLUX site is located in the University of Missouri Baskett Forest, a second growth oak-hickory forest situated in the Ozark Border Region of central Missouri, USA. MOFLUX is part of the AmeriFlux network (site ID: US-MOz) and an eddy covariance tower marks the middle of the site (Figure 1). During 2003, 24 circular vegetation plots (each 0.08 ha) were established within a ~250 m radius around the tower. The plots were situated 50 m apart along 5 linear transects radiating out from the flux tower base in SE, S, SW, W and NW directions. There were 5 plots per transect except for the NW one, which had only 4 due to the presence of a small pond at the terminus.

At weekly intervals during the growing season, leaf-area index measurements were taken within each vegetation plot on the 5 transects running from the central flux tower. A plant canopy analyzer (model LAI-2000 Li-Cor Inc., Lincoln NE) was used to make the LAI measurements. We collected samples to enable measurement of the mean LAI of each transect. Data are contained in one comma-separated (*.csv) file.

Relevant Publication:

These data have been reported in the following publication:

Wood, JD, BO Knapp, R-M Muzika, MC Stambaugh, L Gu. 2018. The importance of drought–pathogen interactions in driving oak mortality events in the Ozark Border Region. *Environmental Research Letters*, 13, 015004, <https://10.1088/1748-9326/aa94fa>.

Data Citation:

Cite this data set as follows:

Wood, JD, BW Widmer, D Anderson, SG Pallardy, L Gu, and KP Hosman. **Leaf-Area Index of Oak-Hickory Forest at Missouri Ozark (MOFLUX) Site: 2007–2022**. 2022. Oak Ridge National Laboratory, TES SFA, U.S. Department of Energy, Oak Ridge, Tennessee, U.S.A. <https://doi.org/10.25581/ornlsfa.028/1906782>.

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Ecosystem Science (TES) Science Focus Area (SFA). ORNL is managed by UT-Battelle, LLC, for the U.S. Department of Energy under contract DE-AC05-00OR22725.

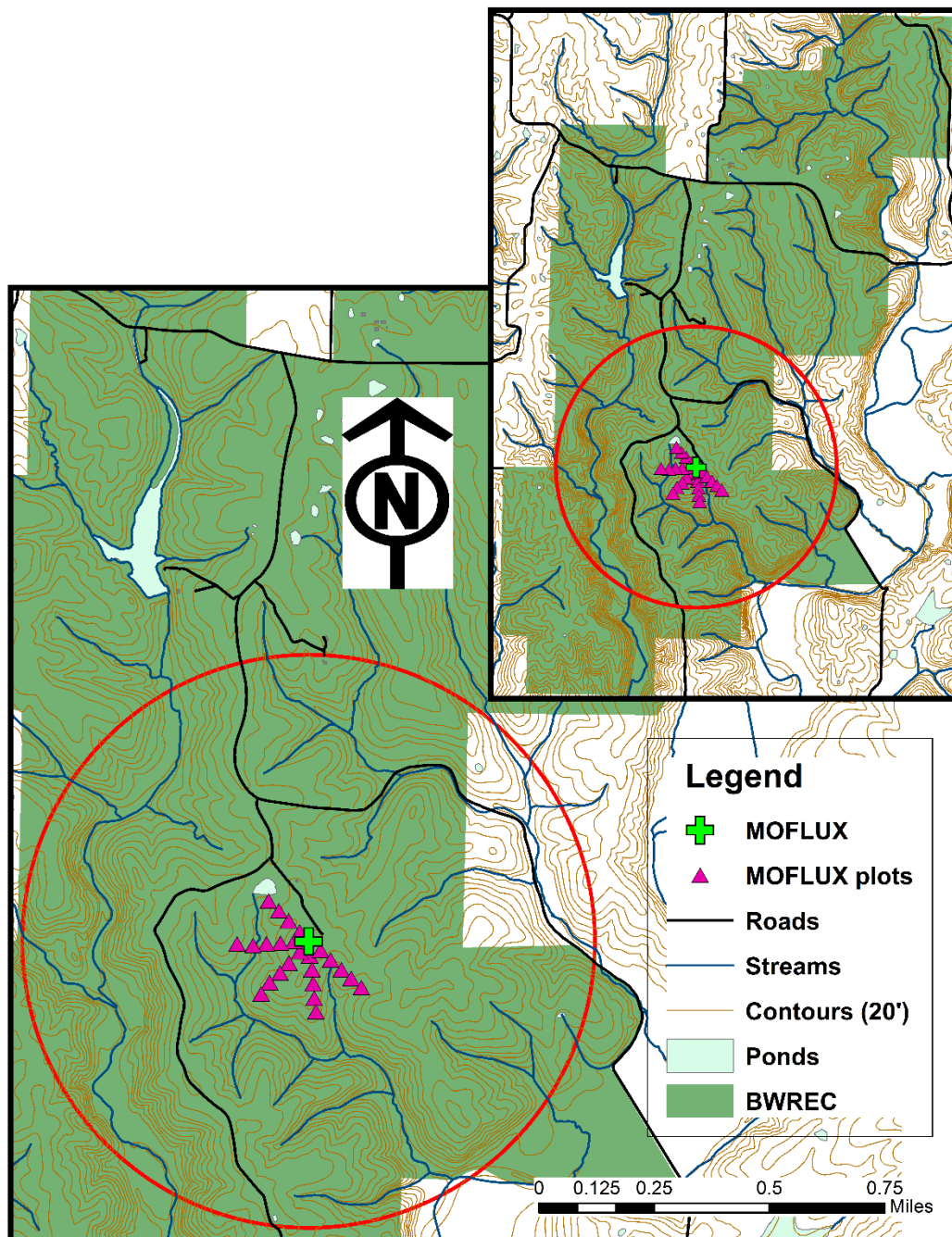


Figure 1. The spatial distribution of the 24 vegetation plots along 5 transects around the MOFLUX tower at the Baskett Forest (green shaded area) near Ashland MO. The brown lines represent 20' contours.

Related Data Sets

Wood, J.D., Pallardy, S.G., Gu, L., and Hosman, K.P. 2020. Litter Production of Oak-Hickory Forest at Missouri Ozark (MOFLUX) Site: 2003-2015. Oak Ridge National Laboratory, TES SFA, U.S. Department of Energy, Oak Ridge, Tennessee, U.S.A.

<https://doi.org/10.25581/ornlsfa.019/1619052>.

Pallardy, S.G., Gu, L., Wood, J.D., Hosman, K.P., and Hook, L.A. 2019. Vegetation Inventory of Oak-Hickory Forest at Missouri Ozark (MOFLUX) Site: 2004-2017. Oak Ridge National Laboratory, TES SFA, U.S. Department of Energy, Oak Ridge, Tennessee, U.S.A. Access on-line at:

<https://doi.org/10.25581/ornlsfa.016/1498529>.

Pallardy, S.G., Gu, L., Wood, J.D., Hosman, K.P., and Sun, Y. 2018. Predawn Leaf Water Potential of Oak-Hickory Forest at Missouri Ozark (MOFLUX) Site: 2004-2020. Oak Ridge National Laboratory, TES SFA, U.S. Department of Energy, Oak Ridge, Tennessee, U.S.A.

<https://doi.org/10.3334/CDIAC/ornlsfa.004>.

Data and Documentation Access

Get Data

For public access to data from the US Department of Energy Terrestrial Ecosystem Science Scientific Focus Area (TES-SFA) please visit: <https://tes-sfa.ornl.gov/node/80>

Table of Contents:

[1 Data Set Overview](#)

[2 Data Characteristics](#)

[3 Applications and Derivation](#)

[4 Quality Assessment](#)

[5 Acquisition Materials and Methods](#)

[6 References](#)

[7 Data Access](#)

1. Data Set Overview:

This data set contains weekly measurements of leaf-area index (LAI) at the Missouri Ozark (MOFLUX) site during growing seasons from 2007-2022. The MOFLUX site is located in the University of Missouri Baskett Forest, a second growth oak-hickory forest situated in the Ozark Border Region of central Missouri, USA. MOFLUX is part of the AmeriFlux network (site ID: US-MOz) and an eddy covariance tower marks the middle of the site (Figure 1). During 2003, 24 circular vegetation plots (each 0.08 ha) were established within a ~250 m radius around the tower. The plots were situated 50 m apart along 5 linear transects radiating out from the flux tower base in SE, S, SW, W and NW directions. There were 5 plots per transect except for the NW one, which had only 4 due to the presence of a small pond at the terminus.

At weekly to biweekly intervals during the growing season, leaf-area index measurements were taken within each vegetation plot on the 5 transects running from the central flux tower. A plant canopy analyzer (model LAI-2000 Li-Cor Inc., Lincoln NE) was used to make the LAI measurements. We collected samples to enable measurement of the mean LAI of each transect. Data are contained in one comma-separated (*.csv) file.

2. Data Characteristics:

This data set contains 1 comma-separated (*.csv) file:

- *LAI_MOFLUX_2007_2022.csv*

Spatial Coverage

Latitude and longitude given in decimal degrees.

Site	Latitude	Longitude	Elevation (meters amsl)	Geodetic Datum	UTM Zone
Missouri Ozark Site (US-MOz)	38.7441	-92.2000	212	WGS84	15S

Source: AmeriFlux: Missouri Ozark/US-MOz, <http://ameriflux.lbl.gov/sites/siteinfo/US-MOz>

Temporal Coverage

The data cover roughly the April to November period each year, from 2007-04-04 to 2022-08-12.

Data File Description

These data are considered at **Quality Level 1**. Level 1 indicates an internally consistent data product that has been subjected to quality checks and data management procedures.

This data set contains 1 file in (.csv) format:

- ***LAI_MOFLUX_2007_2022.csv***
 - The datafile reports a leaf-area index measurement for each transect (SE, S, SW, W, & NW) for every sampling event. The year and day of year for each sampling event are also included.

Missing data or data that have been screened out are indicated by -9999.

Data Dictionary for *LAI_MOFLUX_2007_2022.csv*

Column Name	Units	Description
Year		Year of sampling
DOY		Day of year of sampling
LAI_SE	m ² /m ²	Mean leaf-area index of the southeast transect
LAI_S	m ² /m ²	Mean leaf-area index of the south transect
LAI_SW	m ² /m ²	Mean leaf-area index of the southwest transect

LAI_W	m ² /m ²	Mean leaf-area index of the west transect
LAI_NW	m ² /m ²	Mean leaf-area index of the northwest transect

3 Applications and Derivation

LAI observations are useful for understanding vegetation phenology, and to aid in the interpretation of ecosystem gas exchange. Moreover, they are useful for the modeling community for validation purposes.

4. Quality Assessment:

These data are considered at **Quality Level 1**. Level 1 indicates an internally consistent data product that has been subjected to quality checks and data management procedures.

The random measurement uncertainty (1σ) of a single LAI-2000 measurement is $\sim 5\%$ (Richardson et al. 2011). The random uncertainty of the transect means are thus 1.1% and 1.3% for the transects with 5 plots and 4 plots, respectively. Systematic errors of an individual LAI-2000 measurement are on the order of 10–20% (Richardson et al. 2011). Early in the MOFLUX project, a comparison of the forest-level, seasonal peak LAI measured following the protocol described in this document were compared to LAI determined from leaf litter collection—the two methods agreed to within 9%.

5. Data Acquisition Materials and Methods:

Study Site

The Missouri Ozark Forest AmeriFlux (MOFLUX) site (AmeriFlux ID: US-MOz; latitude 38.7441, longitude -92.2000). The site is a second growth oak-hickory forest situated in the Ozark Border Region of central Missouri, USA.

Methods

LAI was measured each growing season at the MOFLUX site at weekly to biweekly intervals using a plant canopy analyzer (model LAI-2000 Li-Cor Inc., Lincoln NE). On each sampling day, measurements were made in the early morning in diffuse light conditions, and we measured the mean LAI of each transect.

Sampling involved the collection of an A-line sample (i.e., incident radiation) in an unobstructed clearing near the MOFLUX tower prior to collecting the B-line (i.e., subcanopy) samples for a

transect. We collected 4 subcanopy B-line samples on each vegetation plot of the transect being measured. This gave a total of 20 subcanopy samples for the transects with 5 plots, and 16 subcanopy samples for the NW transect that has only 4 plots.

6. Related References:

Richardson, A.D, Dail, D.B. and Hollinger, D.Y. 2011. Leaf area index uncertainty estimates for model–data fusion applications. *Agricultural and Forest Meteorology*, 151:1287-1292.

7. Data Access:

Get Data

For public access to data from the US Department of Energy Terrestrial Ecosystem Science Scientific Focus Area (TES-SFA) please visit: <https://tes-sfa.ornl.gov/node/80>