

Walter Lee Ellenburg II, PhD

Associate Professor, Alabama State Climatologist

Department of Atmospheric and Earth Sciences | Earth System Science Center | University of Alabama in Huntsville | 320 Sparkman Drive, National Space Science and Technology Center 3046, Huntsville, AL 35899
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Research Interest and Specialties

Integrated water-resources and hydroclimate science that advances climate services, drought preparedness, water-resource management, and agricultural resilience. Specialties include land-surface hydrology; land-atmosphere interactions; ET and surface-energy processes; streamflow and subsurface hydrology; nutrient and water transport; agricultural water use and irrigation modeling; land-surface and crop modeling; and remote-sensing analysis.

Professional Preparation

University of Alabama, Huntsville, Civil and Environmental Engineering | B.A. 2009
University of Alabama, Huntsville, Civil and Environmental Engineering | M.S.E. 2011
University of Alabama, Huntsville, Civil and Environmental Engineering | Ph.D. Dec. 2015
Dissertation: An analysis of Evapotranspiration in the Southeastern United States: Its role in the climatology and hydrology of the region

Current Experience/Appointment

Alabama State Climatologist
Office of the State Climatologist,
Earth System Science Center, Univ. AL Huntsville

Appointed by Alabama Governor Kay Ivey, Jan 2026

Associate Professor
Atmospheric and Earth Science
University of Alabama in Huntsville

Aug 2026 - Present

Past Experience/Appointment

Principle Research Engineer
Earth System Science Center, Univ. AL Huntsville

Dec 2025 – July 2026

Associate State Climatologist,
Office of the State Climatologist,
Earth System Science Center, Univ. AL Huntsville

Mar 2021-Jan 2025

Research Engineer
Earth System Science Center, Univ. AL Huntsville

Jan 2017 – Dec 2025

Research Scientist, Agriculture and Water Resources Lead,
NASA-SERVIR, Huntsville, AL

Jan 2017-Mar 2021

Postdoctoral Researcher,
Earth System Science Center, Univ. AL Huntsville

Jan 2016- Dec 2016

Hydrologic/Hydraulic Consultant,
Boshma Research Inc., Brownsboro, AL

Jan 2014- Feb 2016

Professional Accreditation and Memberships

American Association of State Climatologist
American Meteorological Society
American Institute of Hydrology, Professional Hydrologist (PH) – *pending*
American Water Resources Association
American Geophysical Union
American Society of Civil Engineering

Academic and Community Service

Alabama State Climatologist - Appointed by Alabama Governor Kay Ivey, Jan 2026- Present
Board of Directors – Incoming President - Alabama Section of American Water Resources Association
Board of Directors – Alabama Sustainable Agriculture Network Term: Jan 2022 – July 2025
UAH Affiliate Member of the Graduate Faculty Term: Jun 2023 – May 2026
Advisory Board – Huntsville City Air Quality Control Board Term: Jun 2023 – May 2029
Planning Committee - American Water Resources Association Spring 2024 Conference
North Alabama Zoological Society Research Advisory Committee
NASA Develop Mentor: Summer 2018, Summer 2019, Spring 2020, Spring 2023, Summer 2025
Guest Editor: Frontiers in Climate Services
NASA, USGS Panel Reviewer
Ad Hoc Journal Reviewer: Journal Geophysical Research, Remote Sensing, Frontiers, Journal of Climate, Water Policy

Teaching Experience

Adjunct Faculty, UAH Dept of Atmospheric and Earth System Science Spring 2020 – present
Courses taught:

Undergraduate Hydrology (AES 305)
Spring 2020-2026

Graduate Hydrology (AES 690)
Fall 2021, Fall 2022, Fall 2024

Mentoring/Advising Experience

UAH Department of Atmospheric and Earth System Science Fall 2017 – Present
UAH Department of Civil and Environmental Engineering Fall 2020– 2024

Undergraduate Students:

Actively supervising 1–3 undergraduate AES students per semester through the Office of the State Climatologist and research grants, engaging them in data analysis, field observations, and applied hydroclimate research that supports workforce development in water resources.

Graduate Students:

Current:

Brianne Minton – UAH, M.S. Earth System Science 2026- Present | Thesis Advisor
Alexandria Cox – UAH, M.S. Earth System Science 2025- Present | Thesis Advisor

Graduated:

Lisa Lugo-Kuzy – UAH, PhD Civil and Environmental Engineering | Dissertation Advisor

Ronan Lucy – M.S. Earth System Science 2017- 2019 | Thesis Advisor
Caily Schwartz– M.S. Earth System Science 2019- 2021 | Thesis Advisor
Sarah Miller – M.S. Earth System Science 2020- 2021 | Thesis Advisor
Gelayol Mohammadnazar – M.S.E Civil and Environmental Engineering 2021-2023 | Thesis Advisor
Corey Walker – M.S. Earth System Science 2022- 2024 | Thesis Advisor
Shaelyn Deal – M.S. Earth System Science 2023- 2025 | Thesis Advisor

Leah Parker - M.S. Earth System Science 2017-2019 | Thesis Committee
Rebecca Russell - M.S. Earth System Science 2019- 2021 | Thesis Committee

Research Grants

Cooperative Agreements

March 2026 – February 2031 *Cooperative Ecosystem Studies Unit (CESU), National Park Service*
Project Director, Principal Investigator: W. Lee Ellenburg
Master Cooperative Agreement with U.S. Department of the Interior / National Park Service and the University of Alabama in Huntsville

Current Funded Research Grants

July 2026 – June 2028 *Quantifying Effective Precipitation and its Non-stationarity to Improve Drought Assessments in the Southeastern United States*
Principal Investigator: W. Lee Ellenburg
NOAA NIDIS (Awarded)
\$496,422

April 2026 – March 2028 Open-ET Hydrological and Agricultural Assessment and Integration in the Southeastern United States
Principal Investigator: W. Lee Ellenburg
USGS
495,962

Jan 2026 – Dec 2027 *Building Thriving and Resilient Alabama Agri-Food Systems by Transforming Regional Food Value Chains and Agricultural Technology Innovation*
Principal Investigator: Nick Magliocca (UA)
Co-PI: W. Lee Ellenburg
ADECA
\$166,564.

Mar 2024 – Feb 2027 *Supporting the Alabama Universities Irrigation Initiative (AUII) Through Integrated Hydrologic - Agricultural Modeling*
Principal Investigator: W. Lee Ellenburg
Auburn University

\$300,000 (annual contact of 100k)

Oct 2023 – Oct 2026

A Unified Mesonet Data for Climate Monitoring and Decision Support

Principal Investigator: W. Lee Ellenburg

CIROH - NOAA A24-0502-S001-A01

\$299,370

Sept 2023 – Aug 2028

Environmental Evaluation and Watershed Assessment for Irrigation Expansion and Resource Conservation in Alabama

Principal Investigator: Eve Brantley (Auburn University)

Co-PI: W. Lee Ellenburg

USDA NRCS PL 566: NR234101XXXXC003

\$ 1,639,696.45

Oct 2023 – Oct 2028

Scaling-Up Transformative Adaptation in the Southeastern United States through Socio-Agroclimatology

Principal Investigator: W. Lee Ellenburg

NSF Growing Convergence Research 2317821

\$3,600,000

Past Funded Research Grants

Oct 2024 – Sept 2025

Southeastern Flash Drought Assessment

Principal Investigator: W. Lee Ellenburg

CIROH - NOAA/NIDIS A24-0351-S001

\$198,072

Oct 2024 – Sept 2025

Southeastern Flash Drought Assessment

Principal Investigator: W. Lee Ellenburg

CIROH - NOAA/NIDIS A24-0351-S001

\$198,072

Oct 2023 – Sept 2024

A Southeastern US Regional Flash Drought Review and Agriculture Impact Assessment

Principal Investigator: W. Lee Ellenburg

NOAA-WPO NA23OAR4590590

\$100,000

Oct 2020 – Oct 2022

Developing New Soil Moisture Technologies and Applications for Improving Assessments and Forecasts of Water Issues in the Southeast Such as Flash Droughts, Floods and Ecosystem Health

Principal Investigator: W. Lee Ellenburg

NOAA-NFA-NFAPO-2018-2005418

\$598,233

Oct 2020 – Oct 2022

Rural Employment and the need for an Alabama Irrigated Acreage Survey, Demand Estimate & Forecast

Principal Investigator: W. Lee Ellenburg

Alabama Department of Economic and Community Affairs: 1ARDEF21 02

\$172,073

Oct 2020 – Oct 2022

Developing New Capabilities and Research Applications for the National Water Model Over the Southeastern US

Principal Investigator: Jamie Dyer (MSU)

Co-I: W. Lee Ellenburg

NOAA #NA19OAR4590411

\$ 1,477,676.00

Dec 2016 – Dec 2021 *Developing a Dynamic SPARROW Water Quality Decision Support System Using NASA Remotely-Sensed Products*
Principal Investigator: Richard Smith (USGS)
Co-I: W. Lee Ellenburg
NASA NNH16ZDA001N-WATER
\$ 1,417,883.00

Pending Research Grants

July 2026 – May 2030 *TREES: Linking Two Millennia of Land Use to Environmental Perception and Process-Form Relationships in Complex Forest Systems*
Principal Investigator: Rob Griffin
Co-I: W. Lee Ellenburg
NSF-HEGS
\$966,277

Jun 2026 – Mar 2027 *Toward a Water-Use Module for NextGen: Quantifying Low-Flow Skill with Explicit Water-Use Effects*
Principal Investigator: W. Lee Ellenburg
CIROH - NOAA
\$297,000

May 2026 – Apr 2029 *AI-Driven Flash Drought Monitoring and Forecasting to Support Drought Management Decision-Making*
Principal Investigator: Di Tian (AU)
Co-PI: W. Lee Ellenburg
NASA Water Resources
\$89,000

Mar 2026 – Sept 2027 *AgriShift-SE: A GeoAI-Enabled Crop Suitability and Climate Adaptation Platform for the Southeastern United States*
Principal Investigator: Vikalp Mishra
Co-I: W. Lee Ellenburg
Taylor Geospatial Institute
\$300,000

Publications (selected, h-index 18, * notates student papers)

- 2026 **Ellenburg, W. Lee** and Shaelyn Deal (2025). Flash Drought Risk and Agricultural Exposure in the Southeast U.S., *Journal of Applied Meteorology and Climatology* 65 (6), 861-879
- 2026* Walker, Corey, **Ellenburg, W. Lee**, Mishra, V, Mecikalski, John, Hain, Christopher, and Martha Anderson, and (2026). Evaporative Stress Index as a Flash Drought Tool in the Southeastern U.S. *Journal of Hydrology: Regional Studies*, 64, 103245.
- 2025 Minton, B., **Ellenburg, L.**, Junod, R., Wickham, E., & Muth, M. (2025). *Facing future droughts: Lessons from the Southeast's 2023 fall flash drought* (NOAA Technical Memorandum OAR-NIDIS-005). U.S. Department of Commerce, National Oceanic and Atmospheric Administration.
- 2025 **Ellenburg, L.**, & Knox, P. (2025, April 22). *When it comes to climate services, we need data, not debate*. The Atlanta Journal-Constitution, Opinion Editorial

- 2025 Magliocca, N., Burchfield, E. K., Busby, E. C., Brantley, E., Cleveland, O., **Ellenburg, W.**, ... & Worosz, M. (2025). Leverage points to pathways for transformation of agri-food systems. *Env. Research: Food Systems*.
- 2025* Perlaky, N., **Ellenburg, W. L.**, Nair, U., Klein, N., & Solomon, M. B. (2025). Soil Temperature, Environment, and Moisture Monitoring Network-A low-cost sensing network for Alabama. *Journal of Environmental Monitoring and Assessment*
- 2025 **Ellenburg, W. Lee**, et al. "The Impact of Irrigation on Surface Nitrate Export from Agricultural Fields in the Southeastern United States." (2025) *Land* 14.2 (2025)
- 2024 Rathore, L. S., Kumar, M., McNider, R. T., Magliocca, N., & **Ellenburg, W.** (2024). Contrasting Corn Acreage Trends in the Midwest and Southeast: The Role of Yield, Climate, Economics, and Irrigation. *Journal of Agriculture and Food Research*, 101373.
- 2024 **Ellenburg, W. Lee**, et al. "Evaluation of a regional crop model implementation for sub-national yield assessments in Kenya." *Agricultural Systems* 214 (2024): 103819.
- 2022 MG Estes Jr, J Cruise, **WL Ellenburg**, R Suhs, A Cox, M Runge, A Newby. Evaluating Ecosystem Services for the Expansion of Irrigation on Agricultural Land. *Land* 11 (12), 2316
- 2022* Caily Schwartz, **Walter Lee Ellenburg**, Vikalp Mishra, Timothy Mayer, Robert Griffin, Faisal Qamer, Mir Matin, Tsegaye Tadesse (2021). A statistical evaluation of Earth-observation-based composite drought indices for a localized assessment of agricultural drought in Pakistan. *International Journal of Applied Earth Observation and Geoinformation*, 106, 102646.
- 2021* S Miller, V Mishra, **WL Ellenburg**, E Adams, J Roberts, A Limaye, R Griffin (2021). Analysis of a Short-Term and a Seasonal Precipitation Forecast Over Kenya. *Atmosphere*, 12 (11) 1371.
- 2021 Abhishek, A., Das, N. N., Ines, A. V., Andreadis, K. M., Jayasinghe, S., Granger, S., **Ellenburg, W.L** ... & Phanikumar, M. S. (2021). Evaluating the impacts of drought on rice productivity over Cambodia in the Lower Mekong Basin. *Journal of Hydrology*, 599, 126291.
- 2021 **Ellenburg, W. L.**, Mishra, V., Roberts, J. B., Limaye, A. S., Case, J. L., Blankenship, C. B., & Cressman, K. (2021). Detecting Desert Locust Breeding Grounds: A Satellite-Assisted Modeling Approach. *Remote Sensing*, 13(7), 1276.
- 2020* Tiwari V, Kumar V, Matin MA, Thapa A, **Ellenburg WL**, Gupta N, et al. (2020) Flood inundation mapping-Kerala 2018; Harnessing the power of SAR, automatic threshold detection method and Google Earth Engine. *PLoS ONE* 15(8): e0237324. <https://doi.org/10.1371/journal.pone.0237324>
- 2020* Tiwari, Varun, Mir A. Matin, Faisal M. Qamer, **Walter Lee Ellenburg**, Birendra Bajracharya, Krishna Vadrevu, Begum Rabeya Rushi, and Waheedullah Yusafi. "Wheat area mapping in Afghanistan based on optical and SAR time-series images in Google Earth Engine cloud environment." *Frontiers in Environmental Science* 8 (2020): 77.
- 2020 Vikalp Mishra, **W. Lee Ellenburg**, Kel N. Markert & Ashutosh S. Limaye. Performance evaluation of soil moisture profile estimation through entropy-based and exponential filter models, *Hydrological Sciences Journal*, 65:6, 1036-1048, DOI: 10.1080/02626667.2020.1730846
- 2020* Miller, S. E., Adams, E. C., Markert, K. N., Ndungu, L., Ellenburg, W. L., Anderson, E. R., ... & Irwin, D. (2020). Assessment of a spatially and temporally consistent MODIS derived NDVI product for application in index-based drought insurance. *Remote Sensing*, 12(18), 3031.
- 2020 David Saah, Karis Tenneson, Ate Poortinga, ... **Walter L. Ellenburg**, et al.: Primitives as building blocks for constructing land cover maps, *International Journal of Applied Earth Observation and Geoinformation*, Vol85
- 2019 Poortinga Ate, Nguyen Quyen, Tenneson Karis, ... **Ellenburg Walter L.**, et al.: Linking Earth Observations for Assessing the Food Security Situation in Vietnam: A Landscape Approach, *Frontiers in Environmental Science* (7). DOI=10.3389/fenvs.2019.00186
- 2019 Nelson E. James, Pulla Sarva T., Matin, **Ellenburg W. Lee**, et al: Enabling Stakeholder Decision-Making With Earth Observation and Modeling Data Using Tethys Platform, *Frontiers in Environmental Science*. DOI=10.3389/fenvs.2019.00148
- 2019 Saah, David;Tenneson, Karis;Matin, Mir; **Ellenburg, Walter L.** et al.: Land Cover Mapping in Data Scarce Environments: Challenges and Opportunities, *Frontiers in Environmental Science* (7) DOI=10.3389/fenvs.2019.00150
- 2019 Uddin, K., Matin, M.A., Dhanju, H.K., Bajracharya, B., Flores, A., Anderson, E. and **Ellenburg, L.** Remote Sensing Based Deforestation Monitoring at the Change Hotspot Area in Hindu Kush Himalayan Region. *Journal of Forest and Livelihood*, 18 (1): 26-38.
- 2019 Faisal M Qamer, Tsegaye Tadesse, Mir Matin, **Walter L Ellenburg**, Benjamin Zaitchik. Earth Observation and Climate Services for Food Security and Agricultural Decision Making in South and Southeast Asia. *Bulletin of the American Meteorological Society*

- 2019 David Saah, Gary Johnson, Billy Ashmall... , **Water L Ellenburg**, et al.: Collect Earth: An online tool for systematic reference data collection in land cover and use applications, Environmental Modelling & Software
- 2018 **Ellenburg WL**, J.F. Cruise, and V.P. Singh. The Role of Evapotranspiration in Streamflow Modeling-an Analysis Using Entropy Theory. Journal of Hydrology 2018.
- 2017 Mishra V, **Ellenburg WL**, Griffin RE. An Initial Assessment of SMAP Soil Moisture Disaggregation using Fine Resolution TIR Surface Evaporation Data over the Continental United States. International Journal of Applied Earth Observation and Geoinformation <https://doi.org/10.1016/j.jag.2018.02.005>
- 2016 Griffin, R.E., J.F. Cruise, **W.L. Ellenburg**, M.Z. Al-Hamdan, C. Handyside.2015 Geographic Information Systems, in Chow's Handbook of Applied Hydrology, Second Edition. Ed V.J. Singh (McGraw Hill)
- 2016 **Ellenburg, W.L.**, R.T. McNider, J.F. Cruise, and J.R. Christy, 2014. Towards an Understanding of the Twentieth-Century Cooling Trend in the Southeastern United States: Biogeophysical Impacts of Land-Use Change. Earth Interactions, 20, 1–31, doi: 10.1175/EI-D-15-0038.1.
- 2015 McNider, R.T., C. Handyside, K. Doty, **W.L. Ellenburg**, J.F. Cruise, J.R. Christy, D. Moss, V. Sharda and G. Hoogenboom. An Integrated Crop and Hydrologic Modeling System to Estimate Hydrologic Impacts of Crop Irrigation Demands. Environmental Modeling and Software, In Press, available online November 1, 2014. ISSN 1364-8152, DOI:10.1016/j.envsoft.2014.10.009
- 2015 Mishra, V., **W.L. Ellenburg**, O.Z. Al-Hamdan, Josh Bruce and J.F. Cruise. Modeling Soil Moisture Profile in Irrigated Fields by the Principle of Maximum Entropy. Entropy 2015, 17(6), 4454-4484; doi:10.3390/e17064454