David A. McLennan
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EDUCATION

2015 B.S. Earth & Environmental Science – Indiana State University (ISU)
 Concentrations: [1] Geoscience [2] Atmosphere and Surface Processes (Sustainability Minor)

PROFESSIONAL EMPLOYMENT

● [Oak Ridge National Laboratory](https://www.ornl.gov/)

* Experimental Technologist and Automation Engineer (APPL) **(December 2021 – Present)**
* Research Technician **(October 2019 – 2021)**
* Research TechnicianIntern **(May 2016 – October 2019)**

● Paleoceanography & Biogeochemistry Laboratory (ISU) – Research Assistant (**Fall 2013 – Fall 2015**)
● Office of Information & Technology (ISU) - Technical Support Analyst (**Fall 2013 – Fall 2015**)
● Summer Undergraduate Research Experience (**Summer 2014**)
● Supplemental Instructor [Physics/Envi 360: Intro to Astronomy] – (**Fall 2015**)

INTERESTS
Planetary, Ecosystem, Climate Change, Biology & Paleo Sciences, Oceanography, Extreme Environments.

RESEARCH METHODOLOGY
Passionately curious. Think beyond the job description. Never stop exploring, learning, and innovating.

INTRODUCTION
Prior to returning to university in 2013, I had a successful career in the restaurant industry, gaining experience with teamwork, training, team building, and management. My adventure into the scientific community began after completing my B.S. Earth & Environmental Systems when I accepted a research technician internship at Oak Ridge National Laboratory (ORNL) followed by a staff technician position. Since joining ORNL I have supported research for [1] DOE’s flagship manipulation experiment known as SPRUCE (Spruce and Peatland Responses Under Changing Environments), [2] the Next Generation Ecosystem Experiments (NGEE Arctic; NGEE Tropics), [3] Bio-Scales, [4] Center for Bioenergy Innovation (CBI), [5] Plant Microbe Interfaces (PMI), [6] Bio-Security (SEED), [7] DoD funded research, as well as two initiatives that included neutron imaging at the High Flux Isotope Reactor (HFIR): [8] The Impact of Extreme Weather Events on Plant Species, Competition, and Ecological Function, [9] The Impact of plant roots and mycorrhizal fungal hyphae on soil hydraulic properties. I am now the technician responsible for operating and managing the Advanced Plant Phenotyping Laboratory (APPL). which inestigates LDRD investments in { [10a] Linking Nutrients/Elements & [10b] Linking Physiological Traits } projects from CBI & PMI. Throughout my life I have been extremely innovative and collaborative in achieving mission goals in fast paced environments and the ability to implement logistics, measurements, equipment/instrumentation support and planning/coordination with researchers.

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| • Innovative Problem Solving  | • Project Coordination  | • Assay Protocol Development  |
| • Mechanical / Technical Aptitude  | • Workflow Management  | • Space Management  |
| • Developing Vendor Relationships  | • ES&H Protocol Development  | • Inventory Control  |
| • Process Improvement  | • Facility Commissioning  | • Experimental Design  |
| • IT Solutions & Implementation  | • Logistics  | • Corporate Trainer  |
| • Instrument Maintenance & Repair  | • Electrical Worker Training (QEW3) | • Commercial Applicator License  |
| • Collaborative Development | • Hazard Assessment & Mitigation | • Laboratory Space Manager |
| • Confined Space Supervisor | • Respirator Supervisor | • Rad Worker |
| • LTV | • Mentoring | • Bio Safety & Security |

***Core Competencies***

RESEARCH EXPERIENCE (Aug 2013 to Present) \*For full list – see addendum

Equipment: Advanced Plant Phenotyping Laboratory (CFL Fluorescence, Multi-Spectral CFL Fluorescence, Thermal Imaging, RGB Imaging, 3D Imaging, Multispectral, VNIR, & SWIR), PBSL-2 Conviron Growth Chambers, LiCOR instrumentation, Hyperspectral Camera Systems, XRF analyzers, UV-Vis Spectrophotometers, Standard equipment for sample analysis (centrifuge, analytical balances, convection ovens, furnaces, pH meter, grinders, etc.), soil/sediment/water sampling & coring equipment, terrestrial lake & river monitoring equipment, microscopes, plant physiology equipment, ecology equipment, combustion elemental analyzers, wet chemistry techniques, EA-IRMS Isotope Ratio MS, greenhouse and growth chambers, inferred gas analyzers, microplate readers, High Flux Isotope Reactor - Cold Neutron Imaging Beam Line CG-1D, etc.
PC: PSI Phenotyping Software, ArcGIS, SigmaPlot, C2, R Studio, MS Office, WinRHIZO, etc.
Experience: Automated Plant Phenotyping ([APPL](https://www.ornl.gov/content/advanced-plant-phenotyping-laboratory-appl)) Cold Neutron Imaging ([HFIR](http://neutrons.ornl.gov/hfir)), plant, soil & sediment sampling, terrestrial water sampling, hydrology & limnology, variety of C,N,P assay & analysis, non-structural carbohydrate assays & analysis, plant physiology measurements, field experiment ecophysiology technician at ([SPRUCE](http://mnspruce.ornl.gov/)), greenhouse/growth chamber ecophysiology technician, protocol development & refinement, develop and implement logistics, equipment, and measurements for intensive field campaigns, geologic mapping, Integrated Greenhouse Pest Management, Commercial Applicators License, plant propagation, harvest and transplantation, Project Development, Experimental Design, operational and ESHQ policy development, Hazard Analysis, Confined Space Attendant & Supervisor, QEW & LTV.

Oak Ridge National Laboratory – May 2016 to Present –

* Collaborative System Safety Analysis of the Advanced Plant Phenotyping Laboratory.
* Mentor and LSM to technical staff during greenhouse management transition.
* Lead on the Advanced Plant Phenotyping Laboratory commissioning and review. (Multi-Year effort & Ongoing)
* Assistant technician of APPL during conditional operation working with PSI to operate, provide maintenance & repairs, make physical changes, create novel solutions, and troubleshoot system stoppages.
* Assist in planning, maintaining, and the running of large scale multi discipline greenhouse experiments within the Bioscience Division and provide technical assistance to greenhouse, growth chamber and instrumentation users to advance current research and inform logistics, safety and implementation of proper procedures and protocols on a variety of projects within the group, division, & directorate.
* Provide ecophysiology field and laboratory support focused on the response of terrestrial ecosystems, making direct measurements of mechanistic plant responses including foliar and woody gas exchange, phenology, chemistry, anatomy and water relations. Travel to N. Minnesota intensive measurement campaigns at our flagship experiment [‘Spruce and Peatland Responses Under Climatic and Environmental Change’ (SPRUCE)](http://mnspruce.ornl.gov/) & support other projects within the group as needed, including the Next Generation Ecosystem Experiments ([NGEE Arctic](http://ngee-arctic.ornl.gov/); [NGEE Tropics](http://esd1.lbl.gov/research/projects/ngee_tropics/)) and The Impact of Extreme Weather Events on Plant Species, Competition, and Ecological Function.
* Lead physiology technician during 2 multi-week intensive field campaigns in 2017, developing and implementing logistics, measurements, and maintaining continuity as over a dozen personnel were shifted in and out. And 3 intensive field campaigns in 2018, implementing logistics, organizing, and coordinating measurements with researchers and presenting initial findings at the American Geophysical Union.
* Lead technician developing in house non-structural carbohydrate assays, and field fluorescence measurements, while working with 2 postdocs (E. Ward & A. Guha), an undergraduate intern, and multiple researchers including J. Warren and J. Childs. Also working with postdoc A. Guha on multiple intensive experiments that propagated, screened and measured 25 co-occurring East TN tree species to extreme drought and/or heat wave techniques.
* Provide technical guidance and instructions to a variety of interns & less experienced personnel.

FIELD OPERATIONS (Oak Ridge National Laboratory) \*additional field work listed on addendum
● Spruce and Peatland Responses Under Climatic and Environmental Change [[SPRUCE](http://mnspruce.ornl.gov/)] (N. Minnesota)
 ● 2016: [Aug 15-19], [Oct 3-7] ● 2017: [May 11-14], [June 17 - July 2]; [July 16-22], [Aug 12-27]
 ● 2018: [Jul 9-13], [Aug 13-16], [Sept 4-21] ● 2019: [June 4–11; 26-27], [July 14–31], [Aug 18-23], [Sept 29 – Oct 5]
 ● 2021 [Aug 9 – Sept 3]
● Next-Generation Ecosystem Experiments Arctic [[NGEE Arctic](http://ngee-arctic.ornl.gov/)] (Seward Peninsula, AK)
 ● 2017: July [22-31]
● Oak Ridge National Laboratory Onsite poplar experiment [[SEED](https://seed-sfa.ornl.gov/)] (Oak Ridge, TN)

Continuing Education (Oak Ridge National Laboratory)

● 2020: Smokey Mountain Pest Management Conference, Disease Management In Enclosed Spaces, PEST Management
● 2021: ITV CA Certification Core Plus C03, Plant Biosafety for Lab workers, greenhouse safety, and Support Personnel
● 2022: Green & Growing Pesticide Continuing Education Courses, Biosafety and Biosecurity Training Course (BBTC)
● 2023: Scheduled - Cultivate Pesticide Continuing Education Course, Laboratory Operations Supervisor Academy (LOSA)

PUBLICATIONS

[9] Mirindi Eric Dusenge, Jeffrey M. Warren, Peter B. Reich, Eric J. Ward, Bridget K. Murphy, Artur Stefanski, Raimundo Villanueva, Marisol Cruz, David A. McLennan, Anthony W. King, Rebecca A. Montgomery, Paul J. Hanson, Danielle A. Way, Leaf-level carbon uptake is not negatively affected by future air temperatures in key North American boreal conifers. Submitted.

[8] Udaya Kalluri, Mac McLennan, Sara Jawdy, Samuel Sparks, Mindy Clark, Stanton Martin, Root image collection from a genotype by environment (GxE) root architecture study of the bioenergy species, Populus trichocarpa, (2022), Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tennessee, U.S.A.
https://doi.org/10.25983/1841375

[7] JM Warren, JMR Peters, J Childs, A Jensen, DA McLennan, EJ Ward. SPRUCE Diurnal and Seasonal Patterns of Water Potential in S1 Bog and SPRUCE Experimental Plot Vegetation beginning in 2010 (2021), Oak Ridge National Laboratory, TES SFA, U.S. Department of Energy, Oak Ridge, Tennessee, U.S.A.
https://doi.org/10.25581/spruce.080/1615776

[6] Han, Jimei., Gu, Lianhong., Warren, Jeffrey M., Guha, Anirban., McLennan, David A., Zang, Wengfeng., Zhang, Yali., The roles of photochemical and non-photochemical quenching in regulating photosynthesis depend on the phases of fluctuating light conditions, Tree Physiology, Volume 42, Issue 4, April 2022, Pages 848–861, (2022), https://doi.org/10.1093/treephys/tpab133

[5] Brown, Sabrina R., Stone, Jeffery R., McLennan, David A., Latimer, Jennifer C., Westover, Karlyn S., (2020) Landscape–lake interactions in the Beartooth Mountains, Wyoming: a 350-year fire history reconstruction, Journal of Paleolimnology, https://doi.org/10.1007/s10933-020-00126-0

[4] Mirindi Eric Dusenge, EJ Ward, JM Warren, DA McLennan, JR Stinziano, BK Murphy, AW King, J Childs, DJ Brice, JR Phillips, A Stefanski, R Villanueva, SD Wullschleger, M Cruz, PB Reich, DA Way, SPRUCE Photosynthesis and Respiration of Picea mariana and Larix laricina in SPRUCE Experimental Plots, 2016-2017, (2020), Oak Ridge National Laboratory, TES SFA, U.S. Department of Energy, Oak Ridge, Tennessee, U.S.A. https://doi.org/10.25581/spruce.056/1455138

[3] Ward EJ, Warren JM, McLennan D, Wullschleger SD., SPRUCE Photosynthesis and Respiration of Rhododendron groenlandicum and Chamaedaphne calyculata in SPRUCE Experimental Plots, 2016-2017, (2019), Oak Ridge National Laboratory, TES SFA, U.S. Department of Energy, Oak Ridge, Tennessee, U.S.A. https://doi.org/10.25581/spruce.061/1493603

[2] Ward, Eric J., Warren, Jeffrey M., McLennan, David A., Dusenge, Mirindi E., Way, Danielle A., Wullschleger, Stan D., Hanson, Paul J., Photosynthetic and respiratory responses of two bog shrub species to whole ecosystem warming and elevated CO2 at the boreal-temperate ecotone, (12 Sept. 2019) Frontiers In Forests And Global Change, Volume 2 pg.54, https://doi.org/10.3389/ffgc.2019.00054

[1] Guha, Anirban., Han, Jimei., Cummings, Cadan., McLennan, David A., Warren, Jeffrey M., (2018) Differential ecophysiological responses and resilience to heat wave events in four co-occurring temperate tree species, Environmental Research Letters, Volume 13 Number 6 5008.

INVITED

McLennan, D., William T.M., Latimer J.C., Stone, J.R., Brake, S.S., (2015), Monitoring Heavy Metals and Phosphorus in Green Valley State Fishing Area, American Democracy Project – Greening the Capitol: ISU Day at the State House, Indianapolis, Indiana. ***INVITED***.

McLennan, D., Latimer, J.C., 2014, 31 Ma record of phosphorus burial and diagenesis from metalliferous sediments recovered from the South Pacific Ocean, Geological Society of America Annual Meeting, Vancouver, British Columbia, ***INVITED***.

ABSTRACTS AND PRESENTATIONS

Alyssa A. Carrell, Brandon Kristy, David McLennan, Miranda Clark, and Melissa A. Cregger, (2022), Understanding the Effects of Populus—Mycorrhizal Associations on Plant Productivity and Resistance to Abiotic Stress, DOE Genomic Sciences Meeting, D.C. USA (Awaiting Publication)

Eric J Ward, Mirindi Eric Dusenge, Jeff Warren, Anthony W King, Daniel M Ricciuto, Danielle Way, David McLennan, Bridget K Murphy, Artur Stefanski, M Cruz Aguilar, R Bermudez Villanueva, Rebecca Montgomery, Peter B Reich, Stan Wullschleger, Paul J Hanson, (2020) Photosynthetic acclimation to whole ecosystem warming and elevated CO2 in two peatland shrub species: implications for ecosystem modeling, [B087-05], American Geophysical Union Fall Meeting, (Virtual)

Peters JMR., Warren, Jeffrey M., Guha, Anirban., Ward, Eric J., Childs, J., McLennan, David A., Brice, DJ., Hanson, Paul J., (2019) Whole ecosystem warming induces divergent hydraulic and physiological stress in a black spruce – tamarack – shrub bog ecosystem, [B33D-05], Ecological Society of America Annual Meeting, COS 107, Louisville KY.

McLennan, David A., Guha, Anirban., Warren, Jeffrey M., Childs, Joanne., Brice J., Deanne., Ward, Eric J., Hanson, Paul J., (2018) Glimpsing the Future: Boreal Peatland Ecophysiology under Whole-Ecosystem Warming and Elevated CO2, [B43I-2962], American Geophysical Union Fall Meeting, Washington D.C. (Poster Presentation)

Ward, Eric J., Warren, Jeffrey M., Dusenge, Mirindi E., Way, Danielle A., McLennan, David A., King, Anthony W., Wullschleger, Stan D., Hanson, Paul J., (2018) Impacts of Elevated CO2 and Whole Ecosystem Warming on Photosynthesis and Respiration of Two Ericaceous Shrubs in a Northern Peatland, [B33D-05], American Geophysical Union Fall Meeting, Washington D.C.

Guha, Anirban., McLennan, David A., Warren, Jeffrey M., (2018) Tune to thrive: photosynthetic and hydraulic adjustments in Populus deltoides to warming, Multiscale Plant Vascular Biology: Gordon Research Conference, West Dover, VT. (Poster Presentation)

Bluhm, Kyrstin, McLennan, David A., Warren, Jeffrey M., (2018) Carbohydrate Retention in Four Plant Species Exposed to Elevated Temperatures and CO2 Concentrations, ORISE SULI/HERE Poster Session, Oak Ridge National Laboratory, April 26, 2018, Poster Presentation.

Guha, Anirban., Warren, Jeffrey M., McLennan, David A., Gu, Lianhong., Riccuito, Daniel M., (2018), Growth temperature effects on poplar ecophysiology and thermotolerance., Ecological Society of America Annual Meeting OOS 7-10, New Orleans, LA.

Ward, Eric J., Warren, Jeffrey M., Dusenge, Mirindi E., Way, Danielle A., Aguilar, Marisol Cruz., King, Anthony W., McLennan, David A., Montgomery, Rebecca A., Reich, Peter B., Stefanski, Artur., Murphy, Bridget K, Riccuito, Daniel M., Villanueva, Raimundo Bermudez., Wullschleger, Stan D., Hanson, Paul J., (2018), Impacts of Elevated CO2 and Whole Ecosystem Warming on Photosynthesis and Respiration of two Ericaceous Shrubs in a Northern Peatland, Ecological Society of America Annual Meeting OOS 7-8, New Orleans, LA.

Ward, Eric J., Dusenge, Mirindi E., Warren, Jeffrey M., Way, Danielle A., King, Anthony W., McLennan, David A., Murphy, Bridget K., Stefanski, Artur., Montgomery, Rebecca A., Reich, Peter B., Aguilar, Marisol Cruz., Wullschleger, Stan D., Villanueva, Raimundo Bermudez .,Hanson, Paul J., (2017), Ecophysiology at SPRUCE: Impacts of whole ecosystem warming and elevated CO2 on leaf-level photosynthesis and respiration of two ericaceous shrubs in a boreal peatland [B32B-04], American Geophysical Union Fall Meeting, New Orleans, LA.

Smith, Erika L., McLennan, David A., Stone, Jeffery R., Latimer, Jennifer C., (2016), Reconstructed Impacts of Acid Mine Drainage On An Indiana Lake Using Diatom And Geochemical Sediment Records, Geological Society of America Annual Meeting, Denver, Colorado. (Poster)

McLennan, D., Smith, E, Latimer, J.C., Stone, J.R., (2016), Monitoring Increased Nutrient Loads on a Lake Acting as a Heavy Metal Reservoir, Posters on the Hill (CUR), Capitol Hill, Washington D.C.

Smith, E., Stone, J.R., McLennan, D., Latimer, J.C., (2016), Reconstructing the Impacts of Acid Mine Drainage on Nutrient Cycling in a Lake Using Diatom and Geochemical Analyses, Geological Society of America (North-Central Section Meeting), Champaign, Illinois.

McLennan, D., Smith, E, Latimer, J.C., Stone, J.R., (2015), The Potential Impact of Increased Phosphorus Loads in Lakes Acting as Heavy Metal Reservoirs: A case study from west-central Indiana, American Geophysical Union Fall Meeting, San Francisco.

McLennan, D., Smith, E, Latimer, J.C., Stone, J.R., (2015), Monitoring Biogeochemical Cycles In A Lake Impacted By Increasing Phosphorus And Heavy Metals, Geological Society of America Annual Meeting, Baltimore, Maryland. Oral Presentation.

Smith, E., McLennan, D., Stone, J.R., Latimer, J.C., (2015), Paleolimnology: Diatom Analysis of Reclaimed Scott Lake-Green Valley, Center for Student Research and Creativity Exposium: A Celebration of Student Research & Creativity, Indiana State University, Terre Haute, Indiana.

Smith, E., McLennan, D., Stone, J.R., Latimer, J.C., (2015), Diatom Analysis of Reclaimed Scott Lake-Green Valley, Symposium, 10th Annual SURE Symposium, Poster Presentation.

McLennan, D., Williams, T.M., Latimer, Jennifer C., Stone, J.R., Brake, S.S., (2015), Investigating The Effects Of Ongoing Acid Mine Drainage On Lake Nutrient And Metal Cycling In The Green Valley Public Fishing Area, National Conference on Undergraduate Research, Spokane, Washington.

McLennan, D., William T.M., Latimer J.C., Stone, J.R., (2015), Highlighting Undergraduate Student Research, Center for Student Research and Creativity Exposium: A Celebration of Student Research & Creativity, Indiana State University, Terre Haute, Indiana.

Latimer, J.C., McLennan, D., Stone, J.R., Memmer, E., Foster, J., Hardin, K.J., Nickerson, Z., Portwood, C.A., \*\*Williams, T., (2014), Short sediment cores as archives of urban pollution, American Geophysical Union Fall Meeting, San Francisco.

McLennan, D., Latimer, J.C., Williams, T., Brown, S.R., Stone, J.R., McCune, A., (2014), Phosphorus fluxes in the Beartooth Mountains: A record of P geochemistry from Island Lake, American Geophysical Fall Meeting, San Francisco.

Brown, S., Stone, J.R., McLennan, D., Williams, T., Latimer, J.C., (2014), Holocene climate and stratification of Island Lake, Wyoming, Geological Society of America Annual Meeting, Vancouver, British Columbia.

Williams TM, McLennan, DA, Latimer, J.C., Stone J.R. (2014), Anthropogenic Impacts Recorded in Lacustrine Environments: Examples from Green Valley Lake and Goose Pond Mid-America Prosperity and Security Conference, Terre Haute, IN. Poster Presentation.

McLennan, D., Williams, T.M., Latimer, J.C., 2014, 31 Ma record of phosphorus burial and diagenesis from metalliferous sediments recovered from the South Pacific Ocean, 9th Annual SURE Symposium, Poster Presentation.

Williams T.M., McLennan, DA, Latimer, J.C., Stone J.R. (2014), Anthropogenic Impacts Recorded in Lacustrine Environments: Examples from Green Valley Lake and Goose Pond, Symposium, 9th Annual SURE Symposium, Poster Presentation.

Popular Press
[Plants—Surviving the heat](https://www.ornl.gov/news/plants-surviving-heat)
[Undergrad Researcher Honored](http://www2.indstate.edu/news/news.php?newsid=4364)
[Indiana State Students Present Research](http://www2.indstate.edu/news/news.php?newsid=4163)

Indiana State University – (3)

* **Research Assistant (Biogeochemistry):** Highly involved in 7 research projects, leading 3 of my own, assisting 2 graduate student projects, and assisting on multiple undergraduate projects. Presented at 4 international conferences, one national conference, and multiple state and local events regarding my research.
* **Office of Information Technology Student Admin:** Provide training to faculty & students on the use of computer integrated technologies and other instructional software. Implement thorough testing of instructional software in preparation for yearly upgrades. Test, research, and troubleshoot problems with software and other technology. Train and mentor new technicians in problem solving and office procedures including customer service, phone etiquette, procedures, etc. Collaborate with the computer programmers to implement testing and new features. Attend staff meetings when required.
* **Supplemental Instructor:** Intimately familiar with the content and learning objectives. Conduct study sessions/seminars in which students compare notes, discuss readings, develop organizational tools and predict test items. Employ interactive study techniques and a variety of learning strategies in sessions.