# 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 #Science

- Oak Ridge National Laboratory – Research Technician **(May 2016 – Present)**
- 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 #Science

Planetary Science, Oceanography, Extreme Environments, Climate Change Science, Ecosystem Science, Paleosciences.

## RESEARCH METHODOLOGY

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

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

Equipment: 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 equipment, [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: ArcGIS, SigmaPlot, C2, R Studio, MS Office, WinRHIZO, etc.
Experience: Cold Neutron Imaging (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, chlorophyll fluorescence, , wet chemistry techniques, ecophysiology technician at (SPRUCE) site, greenhouse/growth chamber ecophysiology technician, protocol development & refinement, develop and implement logistics, equipment, and measurements for intensive field campaigns, geologic mapping.

Oak Ridge National Laboratory – May 2016 to Present [40 hour/week – overtime during field ops] –

- 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) & support other projects within the group as needed, including the Next Generation Ecosystem Experiments (NGEE Arctic; NGEE Tropics) and The Impact of Extreme Weather Events on Plant Species, Competition, and Ecological Function.
- Lead technician 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.
- Lead ecophysiology 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.

- Lead physiology technician on 3 intensive field campaigns in 2018, implementing logistics, organizing and coordinating measurements with researchers and presenting initial findings at the American Geophysical Union.
- Lead ecophysiology technician during 2 intensive field campaigns in 2019, implementing logistics, measurements, equipment/instrumentation support and planning/coordination with researchers.
- Lead technician refining in-house non-structural carbohydrate assays, & in situ fluorescence protocols, working with 2 postdocs (E. Ward & A. Guha), an undergraduate intern, and staff researchers including J. Warren and J. Childs.
- Significant expertise & tech support of PI Warren, A. Guha, E. Ward, J Peters with protocols, logistics, & equipment.
- Experience with learning new equipment & instrumentation including troubleshooting problems. Recording observations and gathering data personally and in coordination with other personnel.
- Independent responsibility planning and applying established technology routinely. Responsible for organizing work, following methods, protocols, & guidelines, while recognizing conditions that may affect the findings.
- Voluntarily participation in ORNL and science endeavors such as AAAS Communicating Science Seminar, local building emergency squad leader, ORNL travelling science fair, and scientific presentations.
- Provide technical guidance and instructions to a variety of interns & less experienced personnel.

Oak Ridge National Laboratory - **FIELD OPERATIONS** *(additional field work listed on addendum)

- ***S**pruce and **P**eatland **R**esponses **U**nder **C**hanging **E**nvironments* [SPRUCE] (N. Minnesota)
  - **2016**: [August 15-19], [October 3-7] • **2017**: [May 11-14], [June 17 - July 2]; [July 16-22], [August 12-27]
  - **2018**: [July 9-13], [August 13-16], [September 4-21] • **2019**: [June 4–11; 26-27], [July 14–31], [August 18-23]
- ***N**ext-Generation **E**cosystem **E**xperiments Arctic* [NGEE Arctic] (Seward Peninsula, AK)
  - **2017**: July [22-31]

Indiana State University – (3 Jobs)

- **Research Assistant (Biogeochemistry):** [Aug.2013 – Dec.2015 @ ~20 hours/week] Highly involved in 7 research projects, leading 3 of my own, assisting 2 grad student projects, & assisting on multiple undergrad projects. Presented at 4 international and 1 national conference, & multiple state and local events regarding my research.
- **Office of Information Technology Student Admin:** [Aug.2013 – Dec.2015 @ 28 hours/week] 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:** [Aug.2015 – Dec.2015 @ 5 hours/week] Intimately familiar with the content and learning objectives. Conducted 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.

Pre-Science Summary of Experience 1997-2016 [40+ hours/week]

- **15** years of **restaurant industry** experience to include: {Extensive Front and Back of House experience listed in addendum} -- providing me with the knowledge of many restaurant design models, concepts, and functionalities. Experience with teamwork, training, team-building, and management. I am comfortable with a broad range of business models {Listed in addendum}.
- **Military:** 1999 – 2005 [**2003 – 2005** Active Duty 2A3x3 Tactical Fighter Aircraft Crew Chief]
  Responsible for maintaining tactical aircraft (A-10), support equipment, forms and records. Performs in collaboration with the flight chief, expediter, other crew chiefs, repair and reclamation, quality assurance, and other maintenance support personnel to ensure mission readiness. Performance of aircraft inspections, sortie generation, hot pit refueling, maintenance and repair of aircraft systems including engines, hydraulics, and structural components, conducts functional tests, towing operations, rigging and aircraft jacking operations, and other repairs in concordance with unit mission.

## PUBLICATIONS

[5] Ward EJ, Warren JM, McLennan D, Wullschleger SD., SPRUCE Photosynthesis and Respiration of Rhododendron groenlandicum and Chamaedaphne calyculata in SPRUCE Experimental Plots ,2016., (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 In Process Data Reports.

[4] Brown SR, Stone JR, Westover KS, McLennan, David A., Latimer JC, Linking Fossil Diatom Assemblage and Macroscopic Charcoal to Reconstruct Fire and Ecological Impacts, Island Lake, Wyoming. (Manuscript in Development)

[3] Han, Jimei., Gu, Lianhong., Warren, Jeffrey M., Guha, Anirban., McLennan, David A., Zang, Wengfeng., Zhang, Yali., (2019) The key role of the fraction of open reaction centers in photosystem II on the induction of photosynthetic CO2 assimilation, New Phytologist (Submitted)

[**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., (2019) Frontiers In Forests And Global Change, doi: 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.

## ABSTRACTS AND PRESENTATIONS

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

McLennan, David A., Guha, Anirban., Warren, Jeffrey M., Childs, Joanne., Brice, Deanne J., 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.

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***.

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.

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***.

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
Undergrad Researcher Honored
Indiana State Students Present Research

## Research Experience

Equipment: Hand-held Thermo Scientific Niton® XL3 Series XRF analyzer, Shimadzu UV-Vis Spectrophotometer, ThermoScientific Spectronic 20D+, Muffle Furnace, Standard equipment for sample analysis (centrifuge, analytical balances, convection ovens, pH meter, etc.), Millipore Milli-Q water purification system, Geno/Grinder, Fume and Laminar flow hoods, soil/sediment/water sampling equipment, Livingstone/Bolivia and Griffith sediment corers, HTH surface sediment corer, 5m$^2$ portable modular coring platform, YSI multiparameter instrument for analyzing (Salinity, DO, pH, ORP, Ammonium, Nitrate, Chloride, Temperature, etc.), Digital depth finder, Secchi disk, 2.2 liter vertical beta water sampler, 3-person inflatable Zodiak boat, Flowatch digital current/air velocity meters, Petrographic microscopes, Olympus transmitted light microscopes (100 - 1000x), Large diameter rock cutting saws, and Grinding wheels, Constant head & Falling head permeameters, Stream tables, LICOR-6400XT, Li-COR 6800, Greenhouse/headhouse, Costech Elemental Combustion System (pneumatic & zero blank), Conviron BDW80 Walk in Growth Chamber & BDW80 Extreme Temperature Growth Chamber, Conviron E15 Reach-in Growth Chambers, Conviron (CMP6050, CMP4060, CMP3244) Control Systems, Model 610 & 615D Pressure Chamber Instrument, LI-6252 $CO_2$ Analyzer, SpectraMax Plus 384 Microplate Reader, Biotek Synergy2 Microplate Reader, High Flux Isotope Reactor - Cold Neutron Imaging Beam Line CG-1D, CI-203 Handheld Laser Leaf Area Meter, Fluke TiR4 IR FlexCam Thermal Imager, Walz Gas-Exchange Chamber 3010-GWK1, Walz Multi-Channel Chlorophyl Fluometer (Monitoring-PAM), LI-3110 Area Meter, Cambell Scientific Data Loggers, Soil Moisture Sensors, Leaf Wetness Dielectric Sensors, Sap Flow Sensors, Delta V [EA-IRMS] Isotope Ratio MS

PC: ArcGIS, SigmaPlot, C2, R, MS Office, WinRHIZO, LI6400 Software, Google Earth, GFS Win,

Experience: Cold Neutron Imaging (HFIR), Basic Radiological Worker, Liquid Nitrogen Handling & Use, Soil & Sediment Sampling, Loss on Ignition (LOI), Sequential Phosphorus Extractions (SEDEX & Schenau), Total Phosphorus Digestion, Lake and Wetland Sample Collection, Potassium Chloride Extraction of Ion-Exchange Resins, Non Structural Carbohydrate Analysis, Leaf & Stem Water Potential, Fluorometric Measurement of Potential Soil Extracellular Enzyme Activities, Dimethyl-sulfoxide Chlorophyll and Carotenoids Extraction for Spectral Analysis, Leaf Relative Water Content, Plant Gas Exchange Field Sampling (SPRUCE), Greenhouse and Growth Chamber Ecophysical measurements, Leaf Disk Heat Sensitivity Assays, Chlorophyll A Fluorescence Induction (OJIP), Chlorophyll Fluorescence Field Protocol Development, Chlorophyll Fluorescence Light-Dark Measurements, 6800 RACiR Curves, Plant Tissue Sampling for Molecular Analysis(RNA), Solar Induced Fluorescence, Field Collection N Fixation, Root Nodule Biomass Collection, Point Center Quarter (PQD) Transects, Root Sample Voucher Collection, Stem Respiration Protocol Development, Plant Hydraulic Flow Meter & Conductivity measurements, Soil Water Release Curve w/ Neutron Imaging, Tree Allometry, Sap Flow Sensors Installations, Soil Moisture Sensor Installations, Develop and implement logistics, equipment, and measurements for intensive field campaigns.

### Office of Information Technology Student Admin (Indiana State)

- Provide training to faculty and students on the use of Blackboard, Tegrity, Turnitin, Collaborate, Respondus, 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 ISU Computer Programmers to implement testing and new features. Attend staff meetings when required

### Supplemental Instructor (ISU)

- 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.

### Pre-Science Summary of Experience 1997-2015

- 15 years of service industry experience to include: {dish-washing, line cook, serving, bartending, prep, barista, baker, busser, hosting, catering prep & delivery, carry-out, special events(in-store and festival), certified trainer (in-store, new store opening, & new manager), administrative assistant, quality control, shift lead, supervisor, hourly managing, acting manager roles(bar, service, and GM)} -- providing me with knowledge of the inner-workings (front and back of house) of many restaurant design models, concepts, and functionalities. Comfortable with a broad range of business models with experience in pub, family restaurant, specialty, cafe, breakfast, lunch, dinner casual dining, banquet and large function dining, family-owned, corporate owned, and name branding.
- Military : 1999 – 2005 (2003 – 2005 Active Duty 2A3x3 Tactical Fighter Aircraft Crew Chief)
  Responsible for maintaining tactical aircraft (A-10), support equipment, forms and records. Performs in collaboration with the flight chief, expediter, other crew chiefs, repair and reclamation, quality assurance, and other maintenance support personnel to ensure mission readiness. Performance of aircraft inspections, sortie generation, hot pit refueling, maintenance and repair of aircraft systems including engines, hydraulics, and structural components, conducts functional tests, towing operations, rigging and aircraft jacking operations, and other repairs in concordance with unit mission.

### Continuing Education

- ESRI Web Course – Building Models for GIS Analysis Using ArcGIS
- LI-COR Biogeosciences: LI-6400XT Training Course

- LI-COR Biogeosciences: LI-6800 Training Course
- GSA 2015 – Short Course 502: Sequence Stratigraphy for Graduate Students
- FERPA for Higher Education
- Workshop on Human Activity at Scale in Earth Systems Models (ORNL)
- Oak Ridge National Laboratory & Environmental Molecular Sciences Laboratory Joint Workshop
- Radiological Worker HFIR and SNS
- Basic Radiological Worker Training
- Scientific Laboratory Access Training for Neutron Sciences Users
- Heat Stress Training
- Local Building Emergency Squad Training
- Materials of Trade

## Community Service and Selected Synergistic Activities (Post Graduation)

- ORNL Travelling Science Fair (Science & Engineering Expo, D.C., April 2018)
- Outstanding Student Presentation Award Judge (2018 American Geophysical Union Fall Meeting)

## Honors (While Attending Indiana State University)

- Dean's List (4.0) [2013-2015] – All 5 Semesters @ Indiana State
- McBeth Talisman Award (Spring 2014)
- Summer Undergraduate Research Experience Full Time Scholarship (2014), $3,500
- On To the Future (OTF) Scholarship (GSA Meeting 2014), $275
- Center for Student Research and Creativity (2014 & 2015), Total: $1,000
- Department of Earth and Environmental Systems Travel Grants (2014 & 2015), Total: $1,200
- Center for Student Research and Creativity Travel Grants (2014 & 2015), Total: $1,525
- Indiana State University College of Arts and Sciences Travel Grants (2014 & 2015), Total: $600
- GSA North-Central Section Student Travel Grant (2015), $100
- Center for Student Research and Creativity Grant(2015)
  National Conference for Undergraduate Research (2015) & ISU at The Capitol (2015), Full Funding
  Posters on the Hill (D.C.) *Honorarium* (2016), $1000
- ISU Scholarships (2015), Total: $2,000
- Council on Undergraduate Research: GeoCUR Award for Excellence in Undergraduate Student Research (2015)
- ISU - Earth and Environmental Systems: Outstanding Undergraduate Research Award (2015)
- GSA/ExxonMobil Bighorn Basin Field Award (August 2015)

## FIELD EXCURSIONS (While Attending Indiana State)

- **GSA/ExxonMobil Bighorn Basin** (2–9 August 2015)
- **Geoscience Field Camp** (Penn State; May 28, 2015 – July 12, 2015)
- Allegheny County Soil Sampling (Spring 2016)
- Wabashiki Wetland Terrestrial Soil Sample Collection (Fall 2013 & 2015, Spring 2015)
- Vigo County / Terre Haute Soil Sample Collection (Summer & Fall 2013 & Spring 2015)
- Walnut Creek data collection for stream flow analysis (Spring 2014)
- Stream ecology assessment at East Fork Big Creek (Spring 2014)
- Ordovician to Silurian paleontological outcrop investigation of fossils near Madison, IN (Spring 2014)
- Geode extraction & Identification in shale & limestone outcrops near Bloomington, IN (Spring 2014)
- Quaternary glacial landform investigations in Illinois and Indiana (Spring 2014)
- Maple Pond, Goose Pond, & Green Valley Lake water & sediment core sampling (Summer 2014)
- Sedimentary Paleo Environment Investigation at Indiana Dunes, IN (Fall 2014)
- Sedimentary Paleo Environment Investigation at Shades State Park, IN (Fall 2014)
- Sedimentary Paleo Environment Investigation at Sulfur, IN (Fall 2014)
- Rock cutting, polishing, and petrographic slide creation (Fall 2014)
- Kentland, IN Meteor Crater Field Trip with AIPG Illinois-Indiana Chapter (Fall 2014)

- Wabash River & Maple Pond – Limnology Field Equipment Intro (Summer 2014 & Spring 2015)
- Dobbs Park Frozen Lake Limnology Sampling (Spring 2015)
- Core Logging – Cloverdale Core (Spring 2015)
- Theodolite Surveying Introduction (Spring 2015)
- Orienteering Field Exercise (Spring 2015)
- Gravity Coring and Limnological sampling at Maple Pond (Spring 2015)
- Geologic Mapping Field Experience – Paradox Valley Salt Anticline (Utah) (Spring 2015)
- Arches National Park Field Excursion (Utah) (Spring 2015)
- Mesalands College Dinosaur Museum and Natural Science Laboratory Visit (New Mexico) (Spring 2015)
- Petrogenetic evaluation of the St Francois Caldera Complex (Mo) (Spring 2015)
- Economic Geology - Gordonsville Zinc Mine (TN) (Spring 2015)
- Limnology Coring and Lake Sampling – Jimmerson Lake (Spring 2015)
- Proposed ISU Eco-Village Property Ground Assessment (Fall 2015)
- ISU Campus Sustainability Walking Tour (Fall 2015)
- Aquaponics Introduction (Greener Scenes Aquaponics) (Fall 2015)
- (ISU – RoseHulman Eco-Village) Collaborative Meeting (Fall 2015)

## Community Service and Selected Synergistic Activities (While Attending Indiana State)

- Geode Collection for Earth Day Give Away (Spring 2014)
- Institute of Community and Sustainability – Community Gardens: Site maintenance including pathway mulching, soil and compost addition to plots, creation of a community strawberry patch, and assisting gardeners with plot maintenance. (Spring 2014)
- Earth Day (Indiana State University): Communication regarding the Department of Earth and Environmental Systems, Geode giveaway, plaster fossil creation and fossil dig for kids, and coloring and painting of discovered fossils. (Spring 2014)
- Earth Day Vigo County Library: Set up of events and equipment, litter and recycling hands on kids table, and bubble station (Spring 2014)
- Lead(Pb) testing in Terre Haute yards: Community Outreach & Education. (Summer 2015 – Fall 2015)
- Earth Science Club Member (Spring 2014 – Fall 2015)
- Authorized Driver for Field Trips & Class Exercises (12 Passenger Van) (Spring 2015 – Fall 2015)
- TuBiShevat Gardening Resource Fair – Safe Urban Gardening and Pb Initiative Volunteer (Spring 2015)
- Mentor new student lab workers (Summer 2014 – Fall 2015)
- Wabashiki Wetland Assistant (Fall 2015)
- Geological Society of America Student Volunteer (15 hours), Baltimore MD (2015)
- American Geophysical Union Student Volunteer (8 Hours; Press Room), (Fall Meeting, 2015)
- Eco Village Soil Sampling Prep & Analysis (Fall 2015)
- Indiana State University Democracy Project –RIFRA- (Spring 2015)

## RELATED COURSEWORK

## Coursework – Indiana State University

Intro to Environmental Science
Physical Geology
General Astronomy
Historical Geology
Environmental Geology
Environmental Ethics
Sedimentary and Stratigraphy
Paleoecology
ISU Seminar Lecture Series (Observer-Multiple)
Seminar - Extreme Aquatic Environments
Remote Sensing / GIS: Comprehensive (G)
Structural Geology
Weather and Climate
Quaternary Environments
Intro to Hydrology
Conservation and Sustainability
Intro to Field Geology
Mineralogy
Sustainable Development (H)
Process Geomorphology
Lakes and Wetlands
Global Biogeochemical Cycles
Igneous and Metamorphic Petrology
Geoscience Field Camp (Penn State)
Groundwater Hydrology (G)
Seminar - Early Life (Observer)
Oceanography
Seminar – Paleoceanography

(G) = Graduate (H) = Honors