

Elizabeth A. Agee, Ph.D.
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EDUCATION

University of Michigan

Department of Civil and Environmental Engineering
Ph.D. Environmental Engineering
Thesis: *Below-ground Root Structure and Ecophysiological Controls of Plant Water Flux During Drought: from Individual to Ecosystem*

Ann Arbor, MI
December, 2019

University of Michigan

Department of Civil and Environmental Engineering
M.S.E. Environmental Engineering, Ecohydrology focus
Certificate in Graduate Teaching, Center for Research on Learning & Teaching

Ann Arbor, MI
April, 2017

Indiana University – Purdue University Indianapolis

Department of Physics, Purdue School of Science
B.S. Physics, Minor Mathematics

Indianapolis, IN
December, 2012

APPOINTMENTS

Postdoctoral Research Associate, Environmental Sciences Division, Oak Ridge National Laboratory, 09/2019 – present

Supervisor: Anthony Walker
○ NGEE-Tropics Project Team

Graduate Research Assistant, Department of Civil and Environmental Engineering, Univ. of Michigan, 09/2013-08/2019.

Advisor: Valeriy Ivanov, Associate Professor
○ NASA Earth Science Fellow, NASA
○ Blue Waters Graduate Fellow, National Center for Supercomputing Applications/NSF

Undergraduate Research Assistant, Department of Earth Sciences, IUPUI, 10/2010-12/2012.

Ronald E. McNair Summer Scholar, Department of Physics, IUPUI, 06/2012-08/2012.

PEER-REVIEWED PUBLICATIONS

1. Atkins J.W., **Agee, E.**, Barry, A., Dahlin, K.M., Dorheim, K., Haber, L.T., Hickey, L.J., Grigri, M.S., Mathes, K., McQuigan, C., Paris, E., Pennington, S.C., Rodriguez, C., Shafer, A., Shiklomanov, A., Tallant, J., Gough, C.M., and Bond-Lamberty, B. The fortedata R package: open-science datasets from a manipulative experiment testing forest resilience. 2020. Earth System Science Data.
2. Gough, C.M., Atkins, J.W., Bond-Lamberty, B., **Agee, E.**, Dorheim, K., Fahey, R., Grigri, M., Haber, L., Mathes, K., Pennington, S., Shiklomanov, A., Tallant, J. Diversity, structure and complexity as predictors of carbon cycling resistance to disturbance. 2020. Ecosystems.
3. Tague, C.L., Papugua, S.A., Gerlein-Safdi, C., Dynmond, S., Morrison, R.R., Boyer, E.W., Riveros-Iregui, D., **Agee, E.**, Arora, B., Dialynas, Y.G., Hansen, A., Krause, S., Loheide II, S.P., Schymanski, S.J., Zipper, S.C. Adding our leaves: A community-wide perspective on research directions in ecohydrology. 2020. Hydrological Processes, 34(7), 1665-1673, doi: 10.1002/hyp.13693

4. Atkins, J.W., and **Agee, E.** Phenological and Structural Linkages to Seasonality Inform Productivity Relationships in the Amazon Rainforest*. 2019. *New Phytologist*; 222(3), 1165–66, doi:10.1111/nph.15783. *Commentary
5. Xu, D., **Agee, E.**, Wang, J., and Ivanov, V.Y. Estimation of Evapotranspiration of Amazon rainforest with Maximum Entropy Production Theory. 2019. *Geophysical Research Letters*. doi: 10.1029/2018GL080907 *Top 10% Downloaded
6. **Agee, E.**, and Li, Y. Fighting the Leaky Pipeline: Developing Peer Support for Women in the Earth and Environmental Sciences. 2018. *Michigan Journal of Sustainability*. 6(1). doi: 10.3998/mjs.12333712.0006.107

CONFERENCE PROCEEDINGS

1. **Agee, E.**, Knox, R., Koven, C., Fisher, R., Davies, S., Walker, A. 2020. Identifying plant resource acquisition and allocation strategies for nutrient-enabled ELM-FATES. Ecological Society of America. Salt Lake City, UT.
2. **Agee, E.**, Atkins, J.W., Gough, C.M., Bond-Lamberty, B.P., Mathes, K.C., Matheny, A.M., and Ivanov, V.Y. 2019. Below-ground structural and ecohydrological feedbacks across disturbance severity gradients. American Geophysical Union Fall Meeting. San Francisco, CA.
3. Restrepo Acevedo, A.M., **Agee, E.**, and Matheny, A.M. 2019 Influence of tree water content in the zero-flow maximum temperature difference: A theoretical and experimental approach. American Geophysical Union Fall Meeting. San Francisco, CA.
4. **Agee, E.**, Ivanov, V.Y., Xu, D., Oliveira, R.S., Brum, M., Saleska, S.R., Bisht, G., Prohaska, N., Taylor, T., Albert, L., Oliveira, R.C., Christoffersen, B., and Restrepo-Coupe, N. 2018. Exploring linkages between below-ground plant hydraulic processes and multi-scale evapotranspiration during the 2015-2016 Amazon dry season. American Geophysical Union Fall Meeting. Washington, D.C.
5. Matheny, A.M., Bohrer, G., **Agee, E.**, Rechner, A. F., Restrepo Acevedo, A.M., and Mursinna, A. R. 2018. Dynamics of Ecosystem-Scale Water Use Efficiency as a Product of Plant Hydraulic Strategy. American Geophysical Union Fall Meeting. Washington, D.C.
6. Mursinna, A.R., Matheny, A.M., and **Agee, E.** 2018. Beyond isohydricity: a whole-plant approach to understanding hydraulic strategy. American Geophysical Union Fall Meeting. Washington, D.C.
7. **Agee, E.**, Ivanov, V.Y., Oliveira, R.S., Brum, M., Saleska, S.R., Bisht, G., Albert, L., Prohaska, N., Taylor, T., Oliveira, R.C., and Restrepo-Coupe, N. 2018. Quantifying the contributions of root systems to individual and community drought resilience in the Amazon rainforest. XXII International Conference Computational Methods in Water Resources. Saint-Malo, France.
8. **Agee, E.**, Ivanov, V.Y., Oliveira, R.S., Brum, M., Saleska, S.R., Bisht, G., Prohaska, N., Taylor, T., Oliveira, R.C., and Restrepo-Coupe, N. 2017. Quantifying the contribution of root systems to community and individual drought resilience in the Amazon rainforest. American Geophysical Union Fall Meeting. New Orleans, LA.
9. Xu, D., **Agee, E.**, Wang, J., and Ivanov, V.Y. 2017. Evapotranspiration estimation using a parameter-parsimonious energy partition model over Amazon basin. American Geophysical Union Fall Meeting. New Orleans, LA.
10. **Agee, E.**, He, L., Bisht, G., Gough, C.M., Couvreur, V., Fatichi, S., Matheny, A., Bohrer, G., and Ivanov, V.Y. 2016. Root water uptake and lateral interactions among root systems in a temperate forest. American Geophysical Union Fall Meeting. San Francisco, CA.
11. Ivanov, V.Y., Oliveira, R.S., Brum, M., Prohaska, N., Albert, L., Taylor, T., Fatichi, S., **Agee, E.**, Saleska, S., Oliveira, R.C., Dye, D.G., and Wiedemann, K.T. 2016. Hydraulic Strategies and Response to El Niño Drought in Amazon Rainforest. American Geophysical Union Fall Meeting. San Francisco, CA.

12. **Agee, E.**, Ivanov, V.Y., He, L., Bisht, G., and Couvreur, V. 2016. Evaluating the impact of root hydraulic traits at the forest scale. XXI International Conference Computational Methods in Water Resources. Toronto, Canada.
13. **Agee, E.**, Ivanov, V.Y., He, L., Bisht, G., Shahbaz, P.J., Fatichi, S., Gough, C.M., Couvreur, V., Matheny, A., and Bohrer, G. 2015. Compensatory root water uptake of overlapping root systems. American Geophysical Union Fall Meeting. San Francisco, CA.

SELECTED PRESENTATIONS

- Agee, E.** 2019. Tree roots: the hidden half of forest drought response. Earth, Coffee, and Climate Seminar. Climate and Space Sciences Department, University of Michigan. Ann Arbor, MI. *(invited)*
- Agee, E.** 2018. Individual and landscape water fluxes using sap flow technology. Seminar. Universidade Federal do Amazonas (UFAM). Manaus, Brazil. *(invited)*
- Agee, E.** 2018. The root of the matter: quantifying the role of tree roots in forest drought response. Environmental and Water Resources Seminar. Ann Arbor, MI. *(invited)*
- Agee, E.**, 2016. Green Infrastructure: Blurring the lines between urban and natural landscapes. Water Sciences Pop-up Talk. American Geophysical Union Fall Meeting. San Francisco, CA.
- Agee, E.**, He., L., Couvreur, V., Bisht, G., Ivanov, V.Y. 2016. Modeling the impacts of competition and meteorological conditions on root water uptake in a northern temperate forest stand. University of Michigan Engineering Graduate Symposium. Ann Arbor, MI.
- Agee, E.** 2015. Modeling root water uptake partitioning at the plot scale. Plant Functional Response to Drought Workshop. State University of Campinas (UNICAMP). Campinas, Brazil.
- Agee, E.**, and Joglekar, Y. 2012. Examination of the Boussinesq approximation as applied to a 2-D hydrodynamic model. IUPUI Summer Research Program Poster Symposium. Indianapolis, IN.
- Agee, E.**, and Babbar-Sebens, M. 2012. The use of a multi-objective genetic algorithm for calibration of water quality numerical model of Eagle Creek Reservoir, IN. IUPUI Research Day. Indianapolis, IN.
- Agee, E.**, and Babbar-Sebens, M. 2011. Spatial risk assessment of nitrate loads in the Eagle Creek Watershed. Indiana University Undergraduate Research Conference. Kokomo, IN.

GRANTS AND FELLOWSHIPS

- 2018 Rackham Research Grant, UM (\$3,000)
- 2017-2019 NASA Earth and Space Sciences Fellowship, NASA (\$90,000 cumulative)
- 2017-2018 J.B. and Marilyn McKenzie Graduate Fellowship, UM Biological Station (\$2,000 cumulative)
- 2017 Rackham Predoctoral Fellowship, UM – *declined for NASA fellowship*
- 2016 Rackham Interdisciplinary Workshop Grant with Y.Li, A. Steiner, and R.Cory, UM (\$5,000)
- 2016 Google Earth Engine Research Award with V.Y. Ivanov (PI), Google (\$45,000)
- 2016 Blue Waters Graduate Fellowship, NCSA/NSF (\$50,000 and computation time)
- 2016 Rackham International Research Award, UM (\$8,200)
- 2015-2018 Rackham Conference Travel Grants, UM (\$3,200 cumulative)
- 2015 Tinker Foundation Field Research Grant, Tinker Foundation/UM-LACS (\$1,400)
- 2015 International Institute Individual Fellowship, UM (\$4,800)
- 2015 Lewis & Clark Field Exploration Grant, American Philosophical Society (\$2,000)
- 2013 Victor L. Streeter Fellowship, Departmental Fellowship, UM
- 2012 Ronald E. McNair Scholar, IUPUI (\$2,500)
- 2010 Undergraduate Research Opportunities Program Grant, IUPUI (\$2,000)

AWARDS

- 2016 First Place Poster, University of Michigan Engineering Graduate Symposium

2016 Chi Epsilon Engineering Honor Society Inductee
2016 ASCE Graduate Student Instructor of the Year
2016 Willie Hobbs Moore Award Nominee
2015 NSF Graduate Research Fellowship Honorable Mention

TEACHING EXPERIENCE

Graduate Student Instructor, Department of Civil and Environmental Engineering, Univ. of Michigan 09/2015-05/2016.

Course: CEE421 Hydrology and Floodplain Hydraulics

Grader, Department of Civil and Environmental Engineering, Univ. of Michigan, 09/2016-12/2018.

Courses: CEE521 Open Channel Flow, CEE520 Physical Processes of Land-Surface Hydrology, CEE428 Groundwater Hydrology

Teaching Assistant, Joint Workshop, Univ. of Michigan Biological Station, 08/2015.

Workshop: Modeling plant functional response to drought

WORKSHOPS/PROFESSIONAL DEVELOPMENT

2019 Sensing Forest Water Dynamics from Space, Keck Institute for Space Studies
2019 Emerging Frameworks for Understanding Memory in Ecological Systems, ORNL
2017 Methods in Plant Water Relations and Transport Workshop, University of Idaho
2016 Preparing Future Faculty Workshop, CRLT, University of Michigan
2015 Google Earth Engine Summit, Google, Mountain View, CA
2015 Plant Hydraulics Workshop, UNICAMP, Campinas, Brazil

PROFESSIONAL SERVICE

Conference Session Chair, AGU Fall Meeting

- H54C. Forest Water Dynamics, Plant Hydraulics, and Drought Responses in the Earth System. 2019
- B074 - Linking Aboveground–Belowground Processes in a Changing Environment. 2020

Committee Member, AGU Hydrology Section, Ecohydrology Technical Committee 01/2017-present.

Peer reviewer, Multiple Journals 2017-present.

- Oecologia, Ecology, Journal of Geophysical Research Biogeosciences, Agricultural and Forest Meteorology, Water Resources Research, Plant & Soil, Geophysical Research Letters, Biogeosciences

Founder/Graduate Coordinator, Michigan Earth Science Women's Network 09/2016-09/2017.

Editor, Chi Epsilon Civil Engineering Honor Society, 05/2016-09/2017.

Other Relevant Activities

- Engineering Graduate Symposium Volunteer, 2016
- Lunch and Lab Mentor for Undergraduate Students, 2016, 2017, 2018
- UROP Symposium Poster Judge, 2016, 2017, 2018
- CEE Department Visit Committee, 2016
- CEE Department Visit Panel Speaker, 2015

COMMUNITY SERVICE

Event Coach, Washtenaw Elementary Science Olympiad, A2STEAM School, 09/2013-05/2017.

Events: Water Rockets, Back to Nature

Assistant Coordinator & Event Coach, Michigan Science Olympiad, A2STEAM School, 09/2016-2017.

Events: Ecology, Invasive Species, Meteorology

K-12 Ecohydrology Outreach, Various Schools, Washtenaw County, MI.

Workshop Instructor, Indiana Science Olympiad, Indiana Univ.-Purdue Univ. Indpls, 07/2012.

Events: Awesome Aquifers! (groundwater hydrology), Meteorology

PROFESSIONAL SOCIETIES

- American Geophysical Union
- Ecological Society of America

SOFTWARE RELEASES

Agee, E., He., L., Bisht, G., Couvreur, V. and V.Y. Ivanov. PFLOTTRAN-Root: a three-dimensional model of soil water physics and root water uptake. 2019. laagee/pflotran-dev-root-system: PFLOTTRAN-Root v0.0 (Version v0.0). Zenodo. <http://doi.org/10.5281/zenodo.3540881>

PRESS

“Solve for Life.” *Re-engineering Radio* and *Michigan Engineering*. Story: Gabriel Cherry. Photos: Joseph Xu. 2019. <https://shows.pippa.io/re-engineering-radio/episodes/solve-for-life> (podcast); <https://news.engin.umich.edu/features/solve-for-life/> (article).

“Hands-on in the Amazon.” *Michigan Engineering*. Story: Gabriel Cherry. Photos: Joseph Xu. July 2019. <https://news.engin.umich.edu/2019/07/hands-on-in-the-amazon/>

“Stories of #HerEngineering.” *Michigan Engineering*. Story and photos: Somya Bhagwager. March 2019. <https://news.engin.umich.edu/2019/03/stories-of-herengineering/>