

# Riley J. Balikian

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Illinois State Geological Survey  
Prairie Research Institute  
University of Illinois

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## **SUMMARY**

I study geology, hydrogeology, and resilience through the lens of near-surface geophysics. My work and research involve near-surface geophysical and hydrogeological investigations, water resources management and resilience planning, and analysis of other geophysical and remote sensing data. I have experience collecting, processing, and/or interpreting electrical resistivity tomography (ERT), ground penetrating radar (GPR), multichannel analysis of surface waves (MASW), and other electrical and seismic geophysical methods. I work to apply these methods towards engineering and environmental problems in Illinois and around the world.

## **EDUCATION**

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**University of Illinois Urbana-Champaign, Illinois**  
Ph.D. Geology (In Progress)

**University of Wisconsin-Madison** Madison, Wisconsin  
M.S. Environment and Resources  
M.S. Urban and Regional Planning

**Wheaton College** Wheaton, Illinois  
B.S. Physics: Geophysics  
Minor: Spanish Language  
Certificate: Human Needs and Global Resources

## **WORK AND RESEARCH**

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| <b>2017 – Present</b> | <b>Illinois State Geological Survey</b> Champaign-Urbana, Illinois<br>2018 – Present: Visiting Senior Scientific Specialist: Geophysicist & Hydrogeologist<br>2017 – 2018: Geophysics Field Scientist         |
| <b>2014 – 2016</b>    | <b>University of Wisconsin Ethiopia Twinning Partnership</b> Madison, Wisconsin<br>2015-2016: Associate Outreach Specialist<br>2014-2015: Research Assistant  |
| <b>2014</b>           | <b>University of Wisconsin-Madison Urban &amp; Regional Planning Department</b> Madison, Wisconsin<br>2014-2015: Research Assistant<br>2014: Project Manager, Oneida Community Integrated Food System Project |
| <b>2013 – 2014</b>    | <b>University of Wisconsin-Madison Urban &amp; Regional Planning Department</b> Madison, Wisconsin<br>Graduate Research Assistant   |
| <b>2013 – 2014</b>    | <b>Wisconsin Department of Natural Resources</b> Madison, Wisconsin<br>Water Permit Intake Specialist   |
| <b>2011</b>           | <b>Lifewater International</b> Southern Nations, Nationalities and Peoples Region (SNNPR), Ethiopia<br>Field Intern (in partial fulfillment of Human Needs and Global Resources certificate)                  |

## **ABSTRACTS AND PRESENTATIONS (PEER-REVIEWED)**

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- McKnight, G., Barklage, M., Lucas, M., & **Balikian, R.** 2020. *Using Electrical Resistivity Tomography (ERT) to Image Cave Passages at Mammoth Cave National Park, Kentucky, USA*. Proceedings of the Symposium on the Application of Geophysics to Engineering and Environmental Problems. [Accepted]
- Kelly, W.R., Zhang, Z., Abrams, D.B., Hadley, D.R., Mannix, D.H., Getahun, E., Knapp, H.V., Roadcap, G.S., Meyer, S.C., Dziegielewski, B., **Balikian, R.**, Thomason, J.F., 2019. Water Supply Planning: Kankakee Watershed Assessment of Water Resources for Water Supply (ISWS Contract Report No. 2019– 07), IL Water Supply Planning. Illinois State Water Survey, Champaign, IL.
- Balikian, R.** 2019. *Creeping Hazards: A Forgotten Framework for Transformability and Resilience*. Proceedings of the Symposium on the Application of Geophysics to Engineering and Environmental Problems, Portland, OR.
- Balikian, R.**, Larson, T.H., Thomason, J. 2019. *Electrical Tomography and 3D Geophysical Models Towards Informed Land-Use Planning in Glacial Fluvial Outwash Plain*. Proceedings of the Symposium on the Application of Geophysics to Engineering and Environmental Problems, Portland, OR.
- Grimley, D., Szocinski, P., Larson, T.H., **Balikian, R.** 2018. *Surficial Geology of Pleasant Mount Quadrangle: Bond and Fayette Counties*, Illinois State Geological Survey, Illinois County Geologic Map. Bond-Fayette County, 1:24,000.
- Balikian, R.**, & Larson, T. H. 2018. *Pseudo Three-Dimensional Imaging of Creep Failure in a Highway Embankment Using Two-Dimensional Electric Earth Resistivity*. Oral presentation accepted at the Symposium on the Application of Geophysics to Engineering and Environmental Problems, Nashville, TN.
- Larson, T. H., & **Balikian, R.** 2018. *In-Situ Cassava Root Size Measurement Using Ground Penetrating Radar (GPR)*. Oral presentation accepted at the Symposium on the Application of Geophysics to Engineering and Environmental Problems, Nashville, TN.
- Ruiz-Vera, U., Larson, T.H., Mwakanyamale, K., Grennan, A., Souza, A., Ort, D., **Balikian, R.** 2017. *Non-invasive monitoring of below ground cassava storage root bulking by ground penetrating radar technology*. Poster at the 2017 American Geophysical Union Fall Meeting, New Orleans, LA.
- Van Engen, K., Mutebi, J., Daring, K., & **Balikian, R.** 2015. *Depoliticizing Climate Change Through Film, Story, and Conversation*. Panel at the Christian Community Development Association National Conference, Memphis, TN.
- King, R. S., & **Balikian, R.** 2015. *Food Insecurity: Local Solutions to a National Need*. Oral presentation at the Christian Community Development Association National Conference, Memphis, TN.
- Law, C., & **Balikian, R.** 2015. *Business Improvement Districts in the Maintenance of Downtown Infrastructure*. Oral presentation at the 20th Conference on the Small City and Regional Community, Wausau, WI.
- Fofanah, M., **Balikian, R.**, Engen, N., Asfaw, F., Busse, H., & Jogo, W. 2015. *Nutrition Sensitive Value Chains: Analysis of Local Production and Marketing Systems of Sweet potatoes in Ethiopia*. Poster presented at the 2nd International Conference on Global Food Security, Ithaca, NY.

## **TECHNICAL REPORTS (NOT PEER-REVIEWED)**

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- Larson, T.H., **Balikian, R.J.**, Lohman, S., 2020. A Geophysics Study near Winchester, IL to Image Mass Wasting Along IL-106 (Geophysics Technical Report No.2020-01E). Illinois State Geological Survey, Urbana, IL.

- Barklage, M., **Balikian, R.**, Larson, T.H., Sargent, S., 2020. *Multi-Channel Analysis of Surface Waves - Sheffield, IL*. Technical Report Presentation. Urbana, IL: Illinois State Geological Survey.
- Balikian, R.**, Sargent, S., & Larson, T. H. 2019. *Shear-Wave Measurements Using Multi-Channel Analysis of Surface Wave (MASW) Method near Lincoln Ave. and University Ave. in Urbana, IL*. Technical Report. Urbana, IL: Illinois State Geological Survey.
- Larson, T. H., & **Balikian, R.** 2019. *An Electrical Earth Resistivity Survey in the Beaver Creek Quadrangle near Greenville, IL*. Technical Report. Greenville, IL: Illinois State Geological Survey.
- Balikian, Riley**, Larson, Timothy H., and Ruiz-Vera, Ursula. 2019. *Report on an In Situ Study of Cassava Roots Using Ground Penetrating Radar*. Champaign, IL: Illinois State Geological Survey.
- Larson, Timothy H. and **Balikian, Riley**. 2019. *An Electrical Earth Resistivity Survey along Illinois Route 127 in Alto Pass, IL*. Technical Report. Champaign, IL: Illinois State Geological Survey.
- Larson, Timothy H. and **Balikian, Riley**. 2018. *Preliminary Report of an Electrical Earth Resistivity Survey near Tinley Park, IL*. Technical Report. Champaign, IL: Illinois State Geological Survey.
- Larson, Timothy H. and **Balikian, Riley**. 2018. *Preliminary Report of an Electrical Earth Resistivity Survey near Greenville, IL*. Technical Report. Champaign, IL: Illinois State Geological Survey.
- Larson, Timothy H. and **Balikian, Riley**. 2018. *Shear-Wave Measurements Using Multi-Channel Analysis of Surface Wave (MASW) Method at Carle Foundation Hospital, Urbana, IL*. Technical Report. Champaign, IL: Illinois State Geological Survey.
- Larson, Timothy H., **Balikian, Riley**, and Deng, Siqi. 2017. *Preliminary Report of an Electrical Earth Resistivity Survey near Joliet, IL*. Technical Report. Champaign, IL: Illinois State Geological Survey.
- Larson, Timothy H., **Balikian, Riley**, and Deng, Siqi. 2017. *Preliminary Report of an Electrical Earth Resistivity Survey near St. Francisville, IL*. Technical Report. Champaign, IL: Illinois State Geological Survey.
- Larson, Timothy H., **Balikian, Riley**, and Deng, Siqi. 2017. *An Electrical Earth Resistivity Survey along Northbound Illinois Route 251 in Peru, IL*. Technical Report. Champaign, IL: Illinois State Geological Survey.
- Larson, Timothy H., **Balikian, Riley**, and Thomason, Jason. 2017. *Electrical Earth Resistivity Surveys in McHenry Co., IL*. Technical Report. Champaign, IL: Illinois State Geological Survey.

## **NON-ACADEMIC WRITING & OUTREACH**

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- Balikian, R.**, 2021. Illinois State Geological Survey Geophysics Data Viewer. FastTIMES 25. <http://fasttimesonline.co/2021/02/17/government-geophysics-news-2/>
- Balikian, R.** 2021. *Earth Sciences on the Divide: Earth Sciences in Illinois*. Virtual Presentation at Pleasantdale Middle School. Burr Ridge, IL. <https://rileybalikian.blog/2021/03/11/earth-sciences-on-the-divide/>
- Balikian, R.**, 2021. *2020: A Year for the Books*. Riley J. Balikian. <https://rileybalikian.blog/2021/01/29/2020-a-year-for-the-books/>
- Balikian, R.** 2019. *The World is at Your Feet: A Career in the Earth Sciences*. Oral Presentation at Monticello Middle School. Monticello, IL. <https://rileybalikian.blog/2020/01/08/earth-sciences-world-at-your-feet/>
- Balikian, R.** 2019. *Aguacate: Water Resources and Systems Resilience among Avocado Growers in San Diego County, CA*. Oral Presentation at the Illinois State Geological Survey Brownbag Series, Urbana, IL.
- Balikian, R.** 2018. *The Value of Volunteering*. GeoGradGuide.com. [[Link](#)]
- Balikian, R.** 2018. Writing in Rock Blog.

*Some Great Falls and a Very Rivery River* [[Link](#)]  
*In the Middle: Kansas, Cowboys, Crossroads, & an American Mediterranean Sea* [[Link](#)]  
*The Precambrian: 20,000 Feet Under the Trees (Part III)* [[Link](#)]  
*The Precambrian: Mystery and Myth (Part II)* [[Link](#)]  
*Groundwar: Geologists in the Trenches* [[Link](#)]  
*The Precambrian: An Origin Story (Part I)* [[Link](#)]  
*The Quiet of the Aging (A Sonnet of Illinois Geology)* [[Link](#)]  
*The Earth is Electric: Resistivity Geophysics* [[Link](#)]  
*Southern Proceedings: The Three Tennessees* [[Link](#)]  
*A Wrinkle in Time (Lapse)* [[Link](#)]  
*From Time Immemorial: The Prevanance of Unremembered Eons* [[Link](#)]  
*The Lakes and the Law of the Sea* [[Link](#)]  
*Geology of Illinois (No, it's not an Oxymoron)* [[Link](#)]  
*How to Build a Moraine (Part II)* [[Link](#)]  
*How to Build a Moraine (Part I)* [[Link](#)]  
*Writing in Rock: An Introduction (Parts I & II)* [[Link 1](#)] [[Link 2](#)]

Hailu, Z.G., Sanders, R., **Balikian, R.** 2013. *Water & Irrigation for Small-Scale Farmers*. Panel Presentation at the Human Needs and Global Resources Symposium. Wheaton, IL.

## **AWARDS AND HONORS**

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- 2015** Wisconsin Without Borders: Excellence in Community-Based Research (from the Morgridge Center)
- 2015** Student Project Award (Awarded by the Wisconsin Chapter of the American Planning Association)
- 2013** Student speaker (Selected by Wheaton College administration to speak at undergraduate baccalaureate)
- 2013** 1st Place: P.J. Hill Essay Contest (Awarded by the Wheaton College Department of Economics)
- 2013** 1st Place: Wheaton Reflects Senior Essay Contest (Sponsored by the Wheaton College Union)
- 2011** Recipient: Hendrickson Human Needs and Global Resources Scholarship (Wheaton College)

## **FORMAL COURSE INSTRUCTION AND FACILITATION**

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### **Higher Education**

- 2016** **PL PATH 375: Social-Ecological Systems and Development** University of Wisconsin  
**Instructor:** Prepared course materials, facilitated class sessions, and led and organized field trips
- 2013** **GEOL 437: Hydrogeology** Wheaton College, IL  
**Lab Assistant:** Assisted students in lab and during field trip
- 2012 – 2013** **HNGR 117: Third World Issues** Wheaton College, IL  
**Teacher's Assistant:** Facilitated sessions, coordinated guest lectures, prepared class materials
- 2012 – 2013** **CFM 131: Introduction to Spiritual Formation** Wheaton College, IL  
**Freshman Passage Leader:** Developed and facilitated freshman passage program for incoming college students in partnership with faculty mentor

### **K-12 Education**

- 2016 – 2017** **Champaign Unit 4 School District (Licensed Substitute Teacher)**  
**Substitute Teacher:** Medium-term substitute for High School Spanish I course  
 Also taught and/or aided classes from kindergarten to 12th grade, including special education

## ***SERVICE AND VOLUNTEERING***

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- 2019 – 2021**      **United State Coast Guard Auxiliary** Flotilla 84 (Central Illinois)  
Member (BQII)
- 2014 – 2019**      **Young Evangelicals for Climate Action (YECA)** United States (Nationwide)  
2016 – 2019: Secretary  
2015 – 2016: Treasurer  
2014 – Present: Steering Committee Member
- 2013 – 2015**      **Nehemiah Center for Urban Leadership Development** Madison, Wisconsin  
LIGHT Program Site Coordinator - Madison East High School
- 2014**              **Community Groundworks at Troy Community Farm** Madison, Wisconsin  
Intern
- 2012 – 2013**      **A Rocha Conservation Organization, Wheaton College Chapter** Wheaton, Illinois  
Student member
- 2012**              **Wheaton College Deye Mon Haiti (Formerly Haiti-Wheaton Partnership)** Wheaton, Illinois  
Student member
- 2010 – 2011**      **World Relief** West Chicago, Illinois  
English as a Second Language (ESL) Tutor
- 2009 – 2011**      **Honduras Project** Wheaton, Illinois and Tegucigalpa, Honduras  
2010 – 2011: Cabinet Member (Team Educator)  
2009 – 2010: Student Team Member
- 2010**              **World Relief** Wheaton, Illinois  
After School Tutor, Lowell Elementary School
- 2006 – 2008**      **Salvation Army Downtown Shelter** San Diego, California  
Volunteer and Youth Organizer

## ***PRESS & ACKNOWLEDGEMENTS***

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[Acknowledgment] Lucas, M., Barklage, M., McKnight, G., 2019. Locating Previously Unmapped Water-Filled Cave Passages Feeding the Echo River Accessory Spring Using Electrical Resistivity Tomography at Mammoth Cave National Park, KY.

Kroeker, A. 2017. "Nurturing a Holy Curiosity," byFaith Magazine, 23-Aug-2017.  
<https://byfaithonline.com/nurturing-a-holy-curiosity/>

University of Wisconsin Global Health Institute. 2015. "GHI Programs Associate Among Those Honored for Engagement Beyond Campus Borders." <https://ghi.wisc.edu/ghi-programs-associate-among-those-honored-for-engagement-beyond-campus-borders/>.

[Acknowledgement] J. Dawson and A. Morales, Eds., "Chicago Marketplaces: Advancing Access to Healthy Food," in *Cities of Farmers: Urban Agricultural Practices and Processes*, University of Iowa Press, 2016, pp. 191–210. <https://www.jstor.org/stable/j.ctt20q23dv>

[Acknowledgement] A. Morales, "Food Systems for Healthy Places," *Built Environment and Public Health Clearinghouse*, 14-Dec-2015. [Online]. Available: *Food Systems for Healthy Places*.

[Acknowledgement] C. Law, "Directory of Contacts for Wisconsin Business Improvement Districts (BIDs)," University of Wisconsin-Extension, Madison, WI, Sep. 2015.

- Erickson, D. 2015. "As Young Evangelical, He Finds God's Call in Focus on Climate 'Crisis,'" Wisconsin State Journal. Madison, Wisconsin. [https://madison.com/wsj/as-young-evangelical-he-finds-gods-call-in-focus-on-climate-crisis/article\\_33e7c838-a207-5e5f-b3a1-9d833c80a265.html](https://madison.com/wsj/as-young-evangelical-he-finds-gods-call-in-focus-on-climate-crisis/article_33e7c838-a207-5e5f-b3a1-9d833c80a265.html)
- Collins, M.B. 2014. "A Partnership: Oneida and the Commons," University of Wisconsin School of Human Ecology. <https://sohe.wisc.edu/partnership-oneida-commns/>
- Schneider, P. 2014. "Madison's tiny houses for homeless an example of 'housing co-production,' says planning journal," The Cap Times. Madison, Wisconsin. [https://madison.com/ct/news/local/writers/pat\\_schneider/madison-s-tiny-houses-for-homeless-an-example-of-housing/article\\_434e5a00-be7f-11e3-91fd-0019bb2963f4.html](https://madison.com/ct/news/local/writers/pat_schneider/madison-s-tiny-houses-for-homeless-an-example-of-housing/article_434e5a00-be7f-11e3-91fd-0019bb2963f4.html)

### ***SKILLS AND TRAINING:***

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- FEMA Training: National Incident Management (NIMS) Introduction (IS-700 – Completed)
- FEMA Training: Introduction to Incident Command System (ICS-100 – Completed)
- United States Coast Guard Auxiliary Basic Training (BQII)
- Proficient in ESRI Arc suite and QGIS
- Proficient: MATLAB, Python
  - Experience: Javascript, SQL, Visual Basic, C++, Arduino (esp. Uno)
- Proficient in Microsoft Office Suite
- Proficient in various geophysical software, including Res2dInv, GPR-Slice, GeoScene3D and others
- Conversational in Spanish; Competent in Amharic (Ethiopia) and Koine Greek (r/w)
- Experience with various community facilitation methods