

Darren L. Ficklin

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Department of Geography
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Education

- Ph.D. in Hydrologic Sciences December 2010
University of California at Davis, Davis, CA, USA
- M.S. in Geologic Sciences (Hydrogeology emphasis) May 2007
Southern Illinois University at Carbondale, Carbondale, IL, USA
- B.S. in Geologic Sciences (Hydrology emphasis)/Minor in Chemistry May 2004
Indiana University at Bloomington, Bloomington, IN, USA

Professional Experience

- Assistant Professor, Department of Geography August 2013 – Present
Indiana University, Bloomington, IN, USA
- Principal Researcher April 2013 – Present
Indiana Geological Survey, Bloomington, IN, USA
- Visiting Assistant Professor, Department of Geography January 2013 – July 2013
Indiana University, Bloomington, IN, USA
- Postdoc. Research Assoc./Research Faculty March 2010 – Dec. 2012
Department of Environmental Studies and Sciences
Santa Clara University, Santa Clara, CA, USA

Publications

Refereed Publications

Published or in press

22. **Ficklin, Darren L.**, Bradley L. Barnhart, Jason Knouft, Iris T. Stewart, Edwin P. Maurer, Sally L. Letsinger, Gerald W. Whittaker. 2014. Climate change and stream temperature predictions in the Columbia River basin: biological implications of spatial variation in hydrologic drivers. *Hydrology and Earth System Sciences*. *In press*
21. **Ficklin, Darren L.** and Bradley L. Barnhart. 2014. SWAT hydrologic model parameter uncertainty and its implications for hydroclimatic projections in snowmelt-dependent watersheds. *Journal of Hydrology*. 519, 2081-2090.
20. Mou Leong, Tan, **Darren L. Ficklin**, Ab Latif Ibrahim, Zulkifli Yushop. 2014. Impacts and uncertainties of climate change on streamflow of the Johor River Basin, Malaysia using a CMIP5 GCM ensemble. *Journal of Water and Climate Change*. *In press*

19. **Ficklin, Darren L.**, Yuzhou Luo, Minghua Zhang. 2014. The use of soil taxonomy as a soil type identifier on the Shasta Lake watershed using SWAT. *Transactions of the American Society of Agricultural and Biological Engineers* 57(3), 717-728.
18. Barnhart, Bradley L., Gerald W. Whittaker, **Darren L. Ficklin**. 2014. Improved stream temperature simulations within SWAT using NSGA-II for automatic, multi-site calibration. *Transactions of the American Society of Agricultural and Biological Engineers* 57(2), 517-530.
17. **Ficklin, Darren L.**, Iris T. Stewart, Edwin P. Maurer. 2013. Climate change impacts on streamflow and subbasin-scale hydrology in the Colorado River Basin. *PLOS ONE* 8(8), e71297. DOI: 10.1371/journal.pone.0071297
16. **Ficklin, Darren L.**, Yuzhou Luo, Minghua Zhang. 2013. Climate change sensitivity assessment of streamflow and agricultural pollutant transport in California's Central Valley using Latin hypercube sampling. *Hydrological Processes* 27(18), 2666-2675. DOI: 10.1002/hyp.9386
15. **Ficklin, Darren L.**, Iris T. Stewart, Edwin P. Maurer. 2013. Effects of climate change on stream temperature, dissolved oxygen, and sediment concentration in the Sierra Nevada mountain range in California. *Water Resources Research* 49(5), 2765-2782. DOI: 10.1002/wrcr.20248
14. Luo, Yuzhou, **Darren L. Ficklin**, Xiaomang Liu, Minghua Zhang. 2013. Assessment of climate change impacts on hydrology and water quality with a watershed modeling approach. *Science of the Total Environment* 450-451, 72-82.
13. **Ficklin, Darren L.**, Minghua Zhang. 2013. A comparison of the Curve Number and Green-Ampt Models in an Agricultural Watershed. *Transactions of the American Society of Agricultural and Biological Engineers* 56 (1), 61-69.
12. **Ficklin, Darren L.**, Yuzhou Luo, Minghua Zhang. 2013. Watershed modeling of hydrology and water quality in the Sacramento River Watershed, California. *Hydrological Processes*. 27, 236-250. DOI: 10.1002/hyp.9222
11. **Ficklin, Darren L.**, Iris T. Stewart, Edwin P. Maurer. 2013. Effects of projected climate change on the hydrology in the Mono Lake Basin, California. *Climatic Change*. 116, 111-131. DOI: 10.1007/s10584-012-0566-6
10. Luo, Yuzhou, **Darren L. Ficklin**, Minghua Zhang. 2012. Approaches of soil data aggregation for hydrologic simulations. *Journal of Hydrology* 464-465, 467-476.
9. **Ficklin, Darren L.**, Iris T. Stewart, Edwin P. Maurer. 2012. Projections of 21st century Sierra Nevada local hydrology using an ensemble of General Circulation Models. *Journal of the American Water Resources Association*. 48, 1104-1125. DOI: 10.1111/j.1752-1688.2012.00675.x
8. Wang, Zhonggen, **Darren L. Ficklin**, Yongyong Zhang, Minghua Zhang. 2012. Impact of climate change on the hydrologic cycle in the arid Shiyang River Basin. *Hydrological Processes* 26(18), 2733-2744. DOI: 10.1002/hyp.8378
7. **Ficklin, Darren L.**, Yuzhou Luo, Iris T. Stewart, Edwin P. Maurer. 2012. Development and application of a hydroclimatological stream temperature model within the Soil and Water Assessment Tool. *Water Resources Research* 48, W01511.
6. Gatzke, Sarah E., Dylan E. Beaudette, **Darren L. Ficklin**, Yuzhou Luo, Anthony T. O'Geen, Minghua Zhang. 2011. Refining the method of soil type identification in SSURGO using soil taxonomy: an application in hydrologic modeling. *Soil Science Society of America Journal* 75, 1908-1921.
5. **Ficklin, Darren L.**, Eike Luedeling, Minghua Zhang. 2010. Sensitivity of groundwater recharge to changes in climate, CO₂ concentrations and canopy structure. *Agricultural Water Management* 97, 1039-1050.

4. **Ficklin, Darren L.**, Yuzhou Luo, Eike Luedeling, Sarah E. Gatzke, Minghua Zhang. 2010. Sensitivity of agricultural runoff to rising levels of CO₂ and climate change in the San Joaquin Valley watershed of California. *Environmental Pollution* 158, 223-234.
3. Liu, Xingmei, Weiwen Zhang, Minghua Zhang, **Darren L. Ficklin**, Fan Wang. 2009. Spatio-temporal variations of soil nutrients influenced by an altered land tenure system in China. *Geoderma* 152, 23-34.
2. **Ficklin, Darren L.**, Yuzhou Luo, Eike Luedeling, Minghua Zhang. 2009. Climate change sensitivity assessment of a highly agricultural watershed using SWAT. *Journal of Hydrology* 347, 16-29.
1. Luo, Yuzhou, Xuyang Zhang, Xingmei Liu, **Darren L. Ficklin**, Minghua Zhang. 2008. Dynamic Modeling of Organophosphate Pesticide Loads in Surface Water in the Northern San Joaquin Valley Watershed of California. *Environmental Pollution* 156, 1171-1181.

Submitted/In review

- Maxwell, Justin T., **Darren L. Ficklin**, Grant Harley, Gregory Jones. 2014. Projecting future wine grape yields using a combination of *Vitis vinifera* growth rings and soil moisture simulations. (*In review at the Australian Journal of Grape and Wine Research*).
- Ficklin, Darren L.**, Sally L. Letsinger, Edwin P. Maurer, Iris T. Stewart. 2014. Differences in western United States hydrologic projections using CMIP3 and CMIP5 climate forcing data (*In review at the Journal of Hydrology*)
- Mou Leong, Tan and **Darren L. Ficklin**. 2014. Climate change impacts on streamflow in a palm oil region of the Johor River Basin, Malaysia (*In review at Regional Environmental Change*)
- Shawn Naylor, Sally L. Letsinger, **Darren L. Ficklin**, Kevin Ellett, and Greg A. Olyphant. 2014. A hydrogeological approach to quantifying groundwater recharge in various glacial settings of the mid-continental U.S.A. (*In review at Hydrological Processes*)
- Ficklin, Darren L.**, Sally L. Letsinger, Hamed Gholizadeh, Justin T. Maxwell. 2014. Incorporation of the Penman-Monteith potential evapotranspiration method into a Palmer Drought Severity Index tool. (*In review at Computers & Geosciences*)
- Wilmott, Cort J., Scott M. Robeson, Kenji Matsuura, **Darren L. Ficklin**. 2014. Comparisons of Three Dimensionless Model-performance Measures with Illustrative Assessments of Competing Parameterizations of a Stream-flow Model (*In review at the Journal of Hydrology*)
- Stewart, I.T., **Darren L. Ficklin**, C.A. Carillo, R. McIntosh. 2014. 21st century increases in the likelihood of extreme hydrologic conditions for the mountainous basins of the Southwestern U.S. (*In review at the Journal of Hydrology*)
- Mou Leong, Tan, **Darren L. Ficklin**, Barnali Dixon, Ab Latif Ibrahim, Zulkifli Yusop. Digital Elevation Model Uncertainty Assessment (DEM-UA): an evaluation of DEM resolution, source and resampling technique uncertainties in hydrological modeling. (*In review at the Journal of Hydrology*)
- Ficklin, Darren L.**, Justin T. Maxwell, Sally L. Letsinger, Hamed Gholizadeh. 2014. A climatic deconstruction of recent drought trends in the United States. (*In review at Environmental Research Letters*).

Other Publications

- Ficklin, Darren L.**, Eike Luedeling, Minghua Zhang. Comparison of groundwater recharge rates under irrigated agriculture from changes in climate, CO₂

concentrations and canopy structure. "What's Up?" The Newsletter of the International Canopy Network. Fall 2010.

Lower Feather River watershed – Organophosphate and Pyrethroid Stone Fruit Pesticide Use Report. Written for Community Alliance with Family Farmers. December 2007.

Theses

Ficklin, Darren. Modeling the impacts of climate change on hydrology and agricultural pollutant runoff in California's Central Valley. Ph.D. Dissertation, University of California at Davis, 2010.

Ficklin, Darren. Hydrogeologic Setting, Water Budget, and Analysis of Groundwater Exchange at Crystal Lake, a Glacial Lake in McHenry County, Illinois. M.S. Thesis, Southern Illinois University at Carbondale, 2007.

Book Chapters

Ficklin, Darren L., 2006. Isotopes *in* Environmental Geology: Esling, S. (Eds.), McGraw Hill, Chicago.

Ficklin, Darren L., 2006. Meteorite Impacts *in* Environmental Geology: Esling, S. (Eds.), McGraw Hill, Chicago.

Presentations

Invited presentations

Ficklin, Darren L. General Circulation Models: downscaling and incorporation into watershed models. American Society of Agronomy, Crop Science Society of America, and the Soil Science Society of America Joint Annual Meeting. 2014. Long Beach, California.

Ficklin, Darren L. Implications of a changing climate on water resources in the western United States. 2014 Clean Water Matters: Challenges and Research Perspectives Workshop. Beijing, China.

Ficklin, Darren L, Iris T. Stewart, Edwin P. Maurer. Effects of climate change on hydrology and stream temperature in the Merced and Tuolumne River watersheds. 2012 Yosemite Hydroclimate Meeting. Yosemite, California.

Ficklin, Darren L., Iris T. Stewart, Edwin P. Maurer. Effects of projected climate change on the hydrology in the Mono Lake Basin, California. 2011 UC Davis Hydrologic Sciences Seminar Series. Davis, CA

Other presentations -- * indicates graduate student

Burke, William* and **Darren L. Ficklin.** Assessing the impact of projected climate changes on coastal watershed hydrology in Western North America. 2015 Association of American Geographers Annual Meeting. Chicago, IL.

Darren L. Ficklin. The use of General Circulation Model output for projections of watershed hydrology. 2015 Association of American Geographers Annual Meeting. Chicago, IL.

Roy, Samapriya, **Darren L. Ficklin,** Rinku Roy Chowdhury, James B. Heffernan, Meredith K. Steele, Peter M. Groffman. Urban Watersheds and urbanizing hydrology: Assessment through dynamic modeling. 2015 Association of American Geographers

Annual Meeting. Chicago, IL.

Samapriya Roy, **Darren L. Ficklin**, Rinku Roy Chowdhury. Dynamic assessment of urban hydrologic components using SWAT. ILTER 2014 All-Scientists Meeting of the Americas. Valdivia, Chile.

Anthony, Melissa, M., **Darren L. Ficklin**, Iris T. Stewart, Jason H. Knouft. Assessing the impacts of climate change on the distribution of trout species in the Sierra Nevada region of California using output from a landscape scale hydrological model. 2014 AGU Fall Meeting. San Francisco, California.

Carrillo, Carlos, Iris T. Stewart, **Darren L. Ficklin**, Russell McIntosh. Anticipating Changes in Extreme Streamflow Events and Stream Temperature for the Sierra Nevada and Colorado River Basin. 2014 AGU Fall Meeting. San Francisco, California.

Ficklin, Darren L, Sally L. Letsinger, Hamed Gholizadeh, Justin T. Maxwell. A Tool to Estimate the Palmer Drought Severity Index Using Penman-Monteith Potential Evapotranspiration at Any Spatial Scale. 2014 AGU Fall Meeting. San Francisco, California.

Stewart, Iris, T., **Darren L. Ficklin**, Edwin P. Maurer, Russell McIntosh, Carlos Carrillo. Projected changes in seasonal drought and flood conditions in the Sierra Nevada and Colorado River basins (USA). 2014 European Geophysical Union. Vienna, Austria.

Ficklin, Darren L, Sally L. Letsinger, Iris T. Stewart, Edwin P. Maurer. How do hydrologic projections change with the new CMIP5 models? 2013 AGU Fall Meeting. San Francisco, California.

Stewart, Iris, T., **Darren L. Ficklin**, Edwin P. Maurer, Russell McIntosh, Carlos Carrillo. Changing likelihoods of extremely low flows, high flows, and high stream temperatures in the Sierra Nevada (CA). PACLIM 2013.

Naylor, Shawn, Kevin M. Ellett, **Darren L. Ficklin**, Greg A. Olyphant. Modeling water flux at the base of the rooting zone for soils with varying glacial parent materials. 2013 AGU Fall Meeting. San Francisco, California.

LaRiviere, Jonathon, P. A. Christina Ravelo, Heather Ford, Max Aung, **Darren L. Ficklin**. A Comparison of Sea Surface Temperature Patterns in the Late Miocene, Pliocene and Pleistocene. 2nd Workshop on Pliocene Climate, Bristol, UK, 2013.

Stewart, Iris, T., **Darren L. Ficklin**, Edwin P. Maurer. Impact of climatic changes on water resources in the North American Southwest. American Geophysical Union: Meeting of the Americas 2013

Stewart, Iris, T., **Darren L. Ficklin**, Edwin P. Maurer. Declining water quality in Sierra Nevada mountain streams under projected climatic changes. MTNCLIM 2012: Mountain Climate Research Conference.

LaRiviere, Jonathan P., A.C. Ravelo, M. Aung, **Darren L. Ficklin**, Heather L. Ford, 2012. Basin-wide sea surface temperature distributions of the Pleistocene, Pliocene, and late Miocene. 2012 AGU Fall Meeting. San Francisco, California.

Luo, Yuzhou, **Darren L. Ficklin**, Iris T. Stewart, Dan J. Issak, Charlie H. Luce. Stream temperature modeling and its integration with watershed hydrologic simulation. 2012 AGU Fall Meeting. San Francisco, California.

Ficklin, Darren L., Iris T. Stewart, Edwin P. Maurer. Projecting the impacts of climate change on stream temperature and dissolved oxygen in a snowmelt-dominated mountainous watershed. 2012 AGU Fall Meeting. San Francisco, California.

Stewart, Iris, T., **Darren L. Ficklin**, Edwin P. Maurer. How much water will be available in the upper Colorado River Basin under projected climatic changes? 2012 AGU Fall Meeting. San Francisco, California.

Stewart, Iris, T., **Ficklin, Darren L.**, Yuzhou Luo, Iris T. Stewart, Edwin P. Maurer. Can a new model better capture the stream temperature changes resulting from climate warming? 2011 AGU Fall Meeting. San Francisco, California.

Ficklin, Darren L., Yuzhou Luo, Iris T. Stewart, Edwin P. Maurer. Development and application of a hydroclimatological stream temperature model within SWAT. 2011 International SWAT Conference. Toledo, Spain.

Ficklin, Darren L., Iris T. Stewart, Edwin P. Maurer. Changes in components of the hydrologic cycle under a warming climate in California. 2011 AGU Fall Meeting. San Francisco, California.

Stewart, Iris T., **Darren L. Ficklin**, Edwin P. Maurer. How will projected climate change impact stream temperature and water quality in the Sierra Nevada (CA)? EGU General Assembly 2011. Vienna, Austria.

Luo, Yuzhou, **Darren L. Ficklin**, Eike Luedeling, Sarah E. Gatzke, Minghua Zhang. Evaluating agrochemical aquatic exposure modeling in relation to risk evaluator needs. 2011 American Chemical Society National Meeting, Denver, CO.

Ficklin, Darren L., Iris T. Stewart, Edwin P. Maurer. Effects of projected climate change on the hydrology in the Mono Lake Basin, California. California Water and Environmental Modeling Forum. 2011 Annual Meeting. Asilomar, CA.

Ficklin, Darren L., Iris T. Stewart, Edwin P. Maurer. How will a warmer climate affect water quality in the Sierra Nevada, California? 2010 AGU Fall Meeting. San Francisco, California.

Ficklin, Darren L., Yuzhou Luo, Eike Luedeling, Sarah E. Gatzke, Minghua Zhang. Sensitivity of agricultural runoff to rising levels of CO₂ and climate change in the San Joaquin Valley watershed of California. July 2010. Organic Pelagic Decline Contaminant Team Meeting, Sacramento, California.

Williams, W. Martin, Gerco Hoogeweg, Rich Breuer, Debra Denton, Minghua Zhang, Scott Hecht, **Darren Ficklin**, J. Mark Cheplick, Surj Dasgupta. Spatial and Temporal Quantification of Pesticide Loadings to the Sacramento River, San Joaquin River, and Bay-Delta to Guide Risk Assessment for Sensitive Species. 2009 SETAC North America Annual Meeting. Tampa, Florida.

Ficklin, Darren L., Yuzhou Luo, Eike Luedeling, Sarah E. Gatzke, Minghua Zhang. Sensitivity of agricultural runoff to rising levels of CO₂ and climate change in the San Joaquin Valley watershed of California. 2008 AGU Fall Meeting. San Francisco, California.

Luo, Yuzhou, Xuyang Zhang, Xingmei Liu, **Darren Ficklin**, Minghua Zhang. Dynamic Modeling of Organophosphate Pesticide Loads in Surface Water in the Northern San Joaquin Valley Watershed of California. 2008 AGU Fall Meeting. San Francisco, California.

Luo, Yuzhou, Xuyang Zhang, Xingmei Liu, **Darren Ficklin**, Minghua Zhang. Dynamic Modeling of Organophosphate Pesticide Loads in Surface Water in the Northern San Joaquin Valley Watershed of California. International Workshop on Sustainable Watershed Research and Management. March 2008. Hangzhou, China.

Ficklin, Darren. Hydrogeologic Setting, Water Budget, and Analysis of Groundwater Exchange at Crystal Lake, a Glacial Lake in McHenry County, Illinois. International Workshop on Sustainable Watershed Research and Management. March 2008. Hangzhou, China.

Grants / Fellowships

- **Indiana University Faculty Research Support Program: Seed Funding --** Vulnerability and resilience in the face of climate change: Mapping spatial differentiation in the socio-physical determinants of water security in Pakistan – Role: Co-PI; Total amount: \$36,699 (*Submitted*)
- **NSF Geography and Spatial Sciences Program –** Grape Yields in a Changing Climate: Reconstructing Past and Projecting Future California Grape Product Yields – Role: Co-PI; Total amount: \$199,131; IU portion: \$168,075 (*Submitted*)
- **NSF Geography and Spatial Sciences Program and NSF Hydrological Sciences Program 2014 –** A high-resolution reconstruction of Sierra Nevada paleo-hydrology with implications for ecology and water supply – Dual submission to both programs – Role: PI; Total amount: \$1,033,792; IU portion: \$486,018 (*Submitted*)
- **SESYNC: Data-Intensive Analysis and/or Modeling for Socio-Environmental Synthesis 2014 –** Analyzing the Socio-Environmental Effects of Citizen Science: Development of a Crowd-sourced Modeling System for Aquatic Ecosystems and A Case Study of Community Engagement– Role: PI; Budget: TBD if accepted (*Submitted*)
- **NSF Advances in Biological Informatics --** Collaborative Research: ABI Development: HydroClim: Empowering aquatic research in North America with data from high-resolution streamflow and water temperature GIS modeling – Role: Co-PI; Total amount: \$1,184,724; IU portion: \$544,724 (*Submitted*)
- **Indiana University Sustainability Course Development Fellowship --** Water security and sustainability: A socio-ecological perspective – with Dr. Majed Akhter -- \$6,000
- **2009-2011 Kearney Mission on Spatial and Temporal Scaling --** University of California, Davis -- *Development of soil property aggregation techniques for spatially distributed watershed models. University of California, Davis* – Role: Co-PI -- \$88,000

Teaching Experience

*denotes course developed at Indiana University

Water Resources (GEOG-G 451/551) * Department of Geography, Indiana University	Jan., 2014 – <i>present</i>
Geographic Information Science (GEOG-G 338/538)* Department of Geography, Indiana University	Jan., 2013 – <i>present</i>
Environmental Change: Nature & Impact (GEOG-G 305/540) * Department of Geography, Indiana University	Jan., 2013 – <i>present</i>
Topical Seminar in Spatial Analysis and Geographic Information Science (GEOG-G 439/639)*	Jan. 2015 – <i>present</i>

Readings Courses/Internships Supervised

GEOG-G 400: Internship in Geographical Analysis. Approx. 1 per year.

GEOG-G 830: Graduate Readings in Geography/GEOG-G 840: Graduate Research in Geography. Approx. 2 per year.

Synergistic Activities

University activities

Indiana University

- Wells Scholar Program student application reviewer (2014 – *Present*)
- IU Research and Teaching Preserve Executive Committee - (2013 – *Present*)
- Sustainable Community of Practice – 3 day workshop - (May 12-14, 2014)
- IU professional development course - (August 2014 – *Present*)
- IU Residential Programs and Services Academic Initiatives - Pizza with a Professor - (August 2013 – *Present*)
- Indiana University Science Fest (2014)

Department of Geography

- Department of Geography Electronic Market Committee - (2013 – *Present*)
- Department of Geography Equipment and Computing Committee - (2013 – *Present*)
- Department of Geography Landscape Ecologist Faculty Search Committee - (2013-2014)
- Department of Geography Visitant Assistant Professor Environmental Change Search Committee - (2013)

Other service activities

Conference session convener

- AGU Fall 2014: Local vs. Global Approaches in Coupled Natural-Human Systems Research
- AGU Fall 2014: Hydrologic, Water Quality, and Ecological Responses to Climatic Variability and Change at the Watershed Scale
- AGU Fall 2013: Water, Climate Variability, and the Anthropocene

Manuscript reviewer

Journal of Hydrology, Journal of Environmental Quality, Hydrological Processes, *Eos*, Trans. of ASABE, International Journal of Climatology, Ecological Applications, Soil Science Society of America Journal, Theoretical and Applied Climatology, Climatic Change, Environmental Research Letters,

Environmental Earth Sciences, Regional Environmental Change, Proceedings of the National Academy of Sciences of the United States of America, Journal of Earth System Sciences, Agricultural Water Management, Water Resources Research, Hydrological Sciences Journal, Journal of Water and Climate Change, Int. Journal of Agricultural and Biological Engineering, Environmental Research Letters, River Research and Applications, Water, Hydrology and Earth System Sciences, Agricultural and Forest Meteorology, Land Use Policy, Journal of Hydrology: Regional Studies, Journal of Earth Science

Proposal reviewer

- 2013 Mid-Atlantic Sea Grant Program

Graduate Student Committees

Chair

William Burke	M.S., Geography, Indiana University	<i>In progress</i>
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Member

Trevis Matheus	M.S., Geography, Indiana University	<i>In progress</i>
Sara Johnson	M.S., Geography, Indiana University	<i>In progress</i>
Hamed Gholizadeh	Ph.D., Geography, Indiana University	<i>In progress</i>
Paul McCord	Ph.D., Geography, Indiana University	<i>In progress</i>

Undergraduates Mentored

Meredith Strunk	B.S., Environmental Management	<i>2013-2014</i>
Jessica Ayers	B.S., Environmental Science	<i>In progress</i>