

# Samuel C. Zipper

Web: [samzipper.com](http://samzipper.com)

Email: [samzipper@ku.edu](mailto:samzipper@ku.edu)

Twitter: [@ZipperSam](https://twitter.com/ZipperSam)

University of Victoria

Department of Civil Engineering

PO Box 1700, Stn CSC, Victoria BC

+1-206-909-1277

## Education

2015 **Ph.D.**, Freshwater & Marine Science, University of Wisconsin-Madison, Madison WI

2009 **B.A.**, *cum laude*, Geology, Pomona College, Claremont CA

## Professional Appointments

Beginning **Assistant Scientist - Groundwater Hydrology**  
08/2019 Kansas Geological Survey, University of Kansas, Lawrence KS

2016–2019 **Postdoctoral Fellow** (PIs: Tom Gleeson, Jeff McKenzie)  
Dep't of Civil Engineering, University of Victoria, Victoria BC  
Dep't of Earth & Planetary Sciences, McGill University, Montreal QC

2011–2016 **Graduate Research Assistant & Postdoctoral Research Associate** (PI: Steve Loheide)  
Dep't of Civil & Environmental Engineering, University of Wisconsin-Madison, WI

2009–2010 **Summer Student Fellow & Research Assistant I** (PIs: Liviu Giosan, Jeff Donnelly)  
Dep't of Geology & Geophysics, Woods Hole Oceanographic Institution, Woods Hole MA

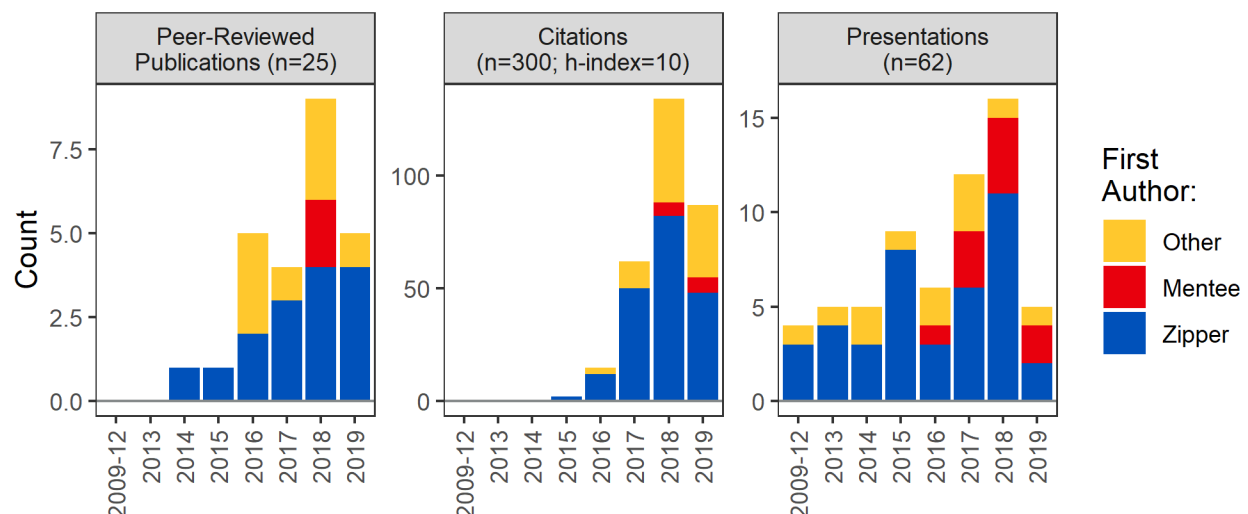
## Visiting Positions

03-04/2019 **Visiting Researcher** (Host: Line Gordon, Lan Wang-Erlandsson)  
Stockholm Resilience Centre, Stockholm, Sweden

09-10/2016 **Green Talents Fellow** (Host: Stefan Kollet)  
Centre for High-Performance Scientific Computing in Terrestrial Systems  
Universität Bonn, Bonn, Germany

01-03/2015 **Visiting Scientist** (Host: Esteban Jobbágy)  
Universidad Nacional de San Luis, San Luis, Argentina

## Scientific Output



Citation data from [Google Scholar](https://scholar.google.com), 7/23/2019. Preprints, in review, and in press not included.

## Peer-Reviewed Publications

Underlined = student mentee

### Published/In Press

- 27 Motew MM, Chen X, SR Carpenter, EG Booth, J Seifert, J Qiu, SP Loheide, MG Turner, **SC Zipper**, CJ Kucharik (*in press*). Comparing the effects of climate and land use on surface water quality using future watershed scenarios. *Science of the Total Environment*.
- 26 Chen X, MM Motew, EG Booth, **SC Zipper**, SP Loheide II, CJ Kucharik (*in press*). Management of minimum lake levels and impacts on flood mitigation: A case study of the Yahara Watershed, Wisconsin, USA. *Journal of Hydrology*. DOI: [10.1016/j.jhydrol.2019.123920](https://doi.org/10.1016/j.jhydrol.2019.123920)
- 25 **Zipper SC**, T Gleeson, B Kerr, JK Howard, MM Rohde, J Carah, J Zimmerman (2019). Rapid and accurate estimates of streamflow depletion caused by groundwater pumping using analytical depletion functions. *Water Resources Research*. DOI: [10.1029/2018WR024403](https://doi.org/10.1029/2018WR024403)
- 24 **Zipper SC**, K Stack Whitney, JM Deines, KM Befus, U Bhatia, SJ Albers, J Beecher, C Brelsford, M Garcia, T Gleeson, F O'Donnell, D Resnik, E Schlager (2019). Balancing open science and data privacy in the water sciences. *Water Resources Research*. DOI: [10.1029/2019WR025080](https://doi.org/10.1029/2019WR025080)
- 23 \*Qiu J, \***SC Zipper**, MM Motew, EG Booth, CJ Kucharik, SP Loheide II (2019). Nonlinear groundwater influence on biophysical indicators of ecosystem services. *Nature Sustainability*. DOI: [10.1038/s41893-019-0278-2](https://doi.org/10.1038/s41893-019-0278-2)  
\*Equal contributions; **SCZ** and **JQ** share first authorship.
  - Highlighted in *Nature Sustainability* News & Views, 'Including the subsurface in ecosystem services' ([link](#))
- 22 **Zipper SC**, J Keune, S Kollet (2019). Land use change impacts on European heat and drought: Remote land-atmosphere feedbacks mitigated locally by shallow groundwater. *Environmental Research Letters*. DOI: [10.1088/1748-9326/ab0db3](https://doi.org/10.1088/1748-9326/ab0db3)
- 21 Wallen K, K Filbee-Dexter, J Pittman, S Posner, C Romulo, [11 equally-contributing authors including **SC Zipper**] (2019). Integrating team science into interdisciplinary graduate education: an exploration of the SESYNC Graduate Pursuit. *Journal of Environmental Studies and Sciences*. DOI: [10.1007/s13412-019-00543-2](https://doi.org/10.1007/s13412-019-00543-2)
- 20 **Zipper SC**, P Lamontagne-Halle, JM McKenzie, AV Rocha (2018). Groundwater controls on post-fire permafrost thaw: Water and energy balance effects. *Journal of Geophysical Research: Earth Surface*. DOI: [10.1029/2018JF004611](https://doi.org/10.1029/2018JF004611)
- 19 **Zipper SC**, MM Motew, EG Booth, X Chen, J Qiu, CJ Kucharik, SR Carpenter, SP Loheide II (2018). Continuous separation of land use and climate effects on the past and future water balance. *Journal of Hydrology*. DOI: [10.1016/j.jhydrol.2018.08.022](https://doi.org/10.1016/j.jhydrol.2018.08.022)

- 18 Lamontagne-Halle PLH, BL Kurylyk, **SC Zipper**, JM McKenzie (2018). Changing groundwater discharge dynamics in permafrost regions. *Environmental Research Letters*. DOI: [10.1088/1748-9326/aad404](https://doi.org/10.1088/1748-9326/aad404)
- 17 **Zipper SC**, T Dallemagne, T Gleeson, T Boerman, A Hartmann (2018). Groundwater pumping impacts on real stream networks: testing the performance of simple management tools. *Water Resources Research*. DOI: [10.1029/2018WR022707](https://doi.org/10.1029/2018WR022707)
- 16 Breyer B, **SC Zipper**, J Qiu (2018). Sociohydrological impacts of water conservation under anthropogenic drought in Austin, Texas. *Water Resources Research*. DOI: [10.1002/2017WR021155](https://doi.org/10.1002/2017WR021155)
- 15 Qiu J, SR Carpenter, EG Booth, M Motew, **SC Zipper**, CJ Kucharik, SP Loheide, MG Turner (2018). Understanding relationships among ecosystem services across spatial scales and over time. *Environmental Research Letters*. DOI: [10.1088/1748-9326/aabb87](https://doi.org/10.1088/1748-9326/aabb87)
- 14 Somers, LD, JM McKenzie, **SC Zipper**, B Mark, P Lagos, and M Baraer (2018). Does hillslope trenching enhance groundwater recharge and baseflow in the Peruvian Andes? *Hydrological Processes*. DOI: [10.1002/hyp.11423](https://doi.org/10.1002/hyp.11423)
- 13 **Zipper SC** (2018). Agricultural research using social media data. *Agronomy Journal*,. DOI: [10.2134/agronj2017.08.0495](https://doi.org/10.2134/agronj2017.08.0495)
- 12 Qiu J, SC Carpenter, EG Booth, MM Motew, **SC Zipper**, CJ Kucharik, X Chen, SP Loheide II, J Seifert, MG Turner (2018). Scenarios reveal pathways to sustain future ecosystem services in an agricultural landscape. *Ecological Applications*. DOI: [10.1002/eap.1633](https://doi.org/10.1002/eap.1633)
- 11 **Zipper SC**, KH Smith, B Breyer, J Qiu, A Kung, DL Herrmann (2017). Socio-environmental drought response in a mixed urban-agricultural watershed: Synthesizing biophysical and governance responses. *Ecology and Society*. DOI: [10.5751/ES-09549-220439](https://doi.org/10.5751/ES-09549-220439)
- 10 **Zipper SC**, ME Soylu, CJ Kucharik, SP Loheide II (2017). Indirect groundwater-mediated effects of urbanization on agroecosystem productivity: Introducing MODFLOW-AgroIBIS (MAGI), a complete critical zone model. *Ecological Modelling*. DOI: [10.1016/j.ecolmodel.2017.06.002](https://doi.org/10.1016/j.ecolmodel.2017.06.002)
- 9 Motew MM, X Chen, EG Booth, SR Carpenter, P Pinkas, **SC Zipper**, SP Loheide II, S.D. Donner, K Tsuruta, P Vadas, CJ Kucharik (2017). The influence of legacy P on lake water quality in a Midwestern agricultural watershed. *Ecosystems*. DOI: [10.1007/s10021-017-0125-0](https://doi.org/10.1007/s10021-017-0125-0)
- 8 **Zipper SC**, J Schatz, CJ Kucharik, SP Loheide II (2017). Urban heat island-induced increases in evapotranspirative demand. *Geophysical Research Letters*. DOI: [10.1002/2016GL072190](https://doi.org/10.1002/2016GL072190)
  - [GRL Editor Highlight](#)

- 7 **Zipper SC\***, J Qiu\*, CJ Kucharik (2016). Drought effects on US maize and soybean production: Spatiotemporal patterns and historical changes. *Environmental Research Letters*. DOI: [10.1088/1748-9326/11/9/094021](https://doi.org/10.1088/1748-9326/11/9/094021)  
 \*Equal contributions; **SCZ** and **JQ** share first authorship.
- 6 Booth EG, **SC Zipper**, CJ Kucharik, SP Loheide II (2016). Is groundwater recharge always serving us well? Water supply provisioning, crop production, and flood attenuation in conflict in the Yahara River Watershed, Wisconsin, USA. *Ecosystem Services*. DOI: [10.1016/j.ecoser.2016.08.007](https://doi.org/10.1016/j.ecoser.2016.08.007)
- 5 Vonk JE, AF Dickens, L Giosan, ZA Hussain, B Kim, **SC Zipper**, RM Holmes, DB Montlucon, V Galy, TI Eglinton (2016). Arctic deltaic lake sediments as recorders of fluvial organic matter deposition. *Frontiers in Earth Science*. DOI: [10.3389/feart.2016.00077](https://doi.org/10.3389/feart.2016.00077)
- 4 Kang Y, M Ozdogan, **SC Zipper**, M Roman, J Walker, SY Hong, M Marshall, V Magliulo, J Moreno, L Alonso, A Miyata, B Kimball, SP Loheide II (2016). How universal is the relationship between remotely sensed vegetation indices and crop leaf area index? A global assessment. *Remote Sensing*. DOI: [10.3390/rs8070597](https://doi.org/10.3390/rs8070597)
- 3 **Zipper SC**, J Schatz, A Singh, P Townsend, CJ Kucharik, SP Loheide II (2016). Urban heat island impacts on plant phenology: Intra-urban variability and response to land cover. *Environmental Research Letters*. DOI: [10.1088/1748-9326/11/5/054023](https://doi.org/10.1088/1748-9326/11/5/054023)
- 2 **Zipper SC**, ME Soylu, EG Booth, SP Loheide II (2015). Untangling the effects of shallow groundwater and soil texture as drivers of subfield-scale yield variability. *Water Resources Research*. DOI: [10.1002/2015WR017522](https://doi.org/10.1002/2015WR017522).
  - [WRR Editor Highlight](#)
- 1 **Zipper SC**, SP Loheide II (2014). Using evapotranspiration to assess drought sensitivity on a subfield scale with HRMET, a high resolution energy balance model. *Agricultural & Forest Meteorology*. DOI: [10.1016/j.agrformet.2014.06.009](https://doi.org/10.1016/j.agrformet.2014.06.009).

## Grants & Fellowships

*Foreign currencies converted to USD based on exchange rate at time of submission*

- |           |  |
|-----------|--|
| 2019-2021 | <b>Evaluating playas in Western Kansas: Recharge to the High Plains Aquifer and economics of cropping.</b><br><i>Total Award:</i> \$372,913 USD<br><i>Program:</i> EPA Wetland Program Development Grant (through Kansas Water Office).<br><i>PIs:</i> R Stotler (lead), AE Brookfield, J Kastens, SC Zipper |
| 2019-2021 | <b>Visualizing the Invisible: Causes, Consequences, Changes, and Management of Streamflow Depletion across the U.S.</b><br><i>Total Award:</i> \$163,530 USD.<br><i>Program:</i> USGS Powell Center Working Group.<br><i>PIs:</i> AE Brookfield (lead), LM Hays, MC Hill, SC Zipper.                         |

- 2019-2020 **Harnessing the power of the crowd to monitor urban street flooding.**  
*Total Award:* \$25,000 USD  
*Zipper Share:* \$0 (0%)  
*Program:* Colorado Water Center Research Team Grant.  
*PIs:* A Bhaskar, S Kampf, G Newman  
*Zipper Role:* Co-Investigator.
- 2018-2019 **Ripples of Resilience: Navigating cross-scale SDG interactions of water, land, and climate within planetary boundaries.**  
*Total Award:* 1,999,537 SEK (~\$220,00 USD)  
*Zipper Share:* \$50,000 USD (22.5%)  
*Program:* FORMAS- Swedish Research Council for Sustainable Development  
*PIs:* L Gordon (lead), L Wang-Erlandsson, F Jaramillo  
*Zipper Role:* Co-wrote as postdoc under PI Tom Gleeson.
- 2019 **Using unmanned aerial vehicles (UAVs) for variable rate soil and water management in the Wisconsin Central Sands**  
*Total Award:* \$15,000 USD.  
*Zipper Share:* \$0 USD (0%)  
*Program:* Wisconsin Potato and Vegetable Growers Association.  
*PIs:* M Nocco (lead), J Prater, SC Zipper.
- 2018-2019 **Analytical models and lag times for groundwater pumping impacts on Environmental Flow Needs: Identifying the best approaches across BC**  
*Total Award:* \$42,000 CAN (~\$32,000 USD)  
*Zipper Share:* \$32,000 USD (100%)  
*Program:* BC Ministry of Environment Groundwater Science Program  
*PI:* T Gleeson (Zipper was Lead Author and Project Lead as postdoc under T Gleeson)
- 2015-2016 **Green Talents – International Forum for High Potentials in Sustainable Development**  
*Total Award:* €5250 (~\$6000 USD) + travel funds  
*Zipper Share:* \$6000 USD (100%)  
*Program:* German Federal Ministry of Education and Research (BMBF)  
*Zipper Role:* Fellow
- 2015-2016 **Learning for and adapting to surprises: Resilience to water-related hazards in Germany and the USA**  
*Total Award:* \$2000 USD + travel funds  
*Zipper Share:* \$2000 USD (100%)  
*Program:* NSF National Socio-Environmental Synthesis Center graduate pursuits  
*Zipper Role:* Student Fellow
- 2015 **Shallow groundwater, soil texture, and corn yield in the Argentine Pampas**  
*Total Award:* \$2000 USD  
*Zipper Share:* \$2000 USD (100%)  
*Program:* University of Wisconsin Anna Grant Birge Memorial Fund  
*Zipper Role:* Recipient as Ph.D. student
- 2012 **High-resolution imaging of the Yahara River Watershed**  
*Total Award:* \$675 USD

*Zipper Share:* \$675 USD (100%)

*Program:* University of Wisconsin Anna Grant Birge Memorial Fund

*Zipper Role:* Recipient as Ph.D. student

2009 **Summer Student Fellowship**

*Total Award:* \$6000 USD + travel funds

*Zipper Share:* \$6000 USD (100%)

*Program:* Woods Hole Oceanographic Institution

*Zipper Role:* Student Fellow

Travel **Becker Student Travel Grant** (\$300 USD), 2015. University of Wisconsin-Madison.

Grants **Becker Student Travel Grant** (\$250 USD), 2014. University of Wisconsin-Madison.

**Becker Student Travel Grant** (\$420 USD), 2014. University of Wisconsin-Madison.

## Awards & Recognition

2017 **IOP Outstanding Reviewer.** Environmental Research Letters.

2016 **James R. Villemonte Excellence in Research Award.** University of Wisconsin-Madison  
Department of Civil & Environmental Engineering.

2014 **First Prize, Scholarly Poster Competition.** Water for Food Global Conference.

2013 **Best Student Oral Presentation.** American Water Resources Association WI Section.

2009 **Mason L. Hill Memorial Award in Geology.** Pomona College.

## Invited Seminars

Of Corn, Cities, and Cannabis: Hydrogeology for landscape-scale water and ecosystem sustainability. Kansas Geological Survey, University of Kansas. 2018.

Hydrogeology for landscape-scale water and ecosystem sustainability. University of Wisconsin-Stevens Point, Center for Watershed Science and Education. 2018.

Oops... Did I do that? Separating climate and land use impacts on the past and future water balance of the Yahara Watershed. University of Wisconsin-Madison Climate, People, and Environment Program. 2018.

Of Corn, Cities, and Cannabis: Groundwater connections between local land use and distant ecosystems. Pomona College, Department of Geology. 2018.

Data Sandbox (panelist). Santa Fe Institute Workshop on Socio-Hydrological Dynamics. 2018.

Eco-hydrogeologic feedbacks following land cover change. University of Alaska-Anchorage, Department of Geological Sciences. 2018.

Hydrogeologic controls on ecosystem services. University of Iowa, Department of Earth & Environmental Sciences. 2018.

Ecohydrology for the Anthropocene. University of Birmingham (UK), Geography Department. 2017.

Groundwater, agroecosystems, and urbanization: Land use as an ecohydrological lever. Appalachian State University, Department of Geology. 2017.

Groundwater, crop yield, and urbanization. Forschungszentrum Jülich (Germany), TR32 General Meeting. 2016.

The ecohydrology of agroecosystems: Implications for food, water, and watersheds. Montana State University, Department of Land Resources and Environmental Sciences. 2016.

## Presentations

### Zipper Presenting

Cannabis California: Testing Analytical Streamflow Depletion Models for Conjunctive Water Management in Data-Limited Settings. The Nature Conservancy (California) water science team webinar, 2019.

Cannabis California: Testing analytical streamflow depletion models for conjunctive water management in data-limited settings. American Geophysical Union Fall Meeting, 2018.

Balancing open science and individual data privacy in the Earth Sciences. American Geophysical Union Fall Meeting, 2018.

Decision Support Tools for Sustainable Water Management. California State Water Resources Control Board groundwater-surface water workshop, December 2018.

Keep It Simple, Stupid? An analytical decision-support tool for quantifying depletions of interconnected surface water due to groundwater pumping. Western Groundwater Congress. 2018.

Simple, transferable approaches for estimating streamflow depletion from wells. Canadian Water Resources Association National Meeting. 2018.

Groundwater controls on post-fire permafrost thaw. American Geophysical Union Fall Meeting. 2017.

Groundwater-permafrost interactions following fire: Water and energy balance effects. Geological Society of America Annual Meeting. 2017.

Land use change in four dimensions: Groundwater as a vector for the lateral transmission of ecohydrological impacts. NSF Critical Zone Science meeting. 2017.

Permafrost response to fire-induced changes in the energy and water balance. Canadian Geophysical Union Annual Meeting, 2017.

AgroIBIS-MODFLOW (AIM): A new coupled groundwater-vadose zone-agroecosystem model. American Water Resources Association WI Section, 2016.

Impacts of shallow groundwater and soil texture on agricultural drought resistance. American Geophysical Union Fall Meeting, 2015.

Soil + Water = Food?. American Geophysical Union Fall Meeting (Future Directions in Hydrology pop-up talks), 2015.

Untangling the influences of shallow groundwater and soil texture on corn yield variability. Soil Science Society of America (Tri-Societies) Annual Meeting, 2015.

Untangling the influences of shallow groundwater and soil texture on corn yield variability. Long Term Ecological Research Network All Scientist Meeting, 2015.



Critical zone interactions between groundwater, soil, and agricultural production. Geological Society of America North-Central Meeting, 2015.

Mapping subfield-scale evapotranspiration to assess agricultural drought sensitivity. Wisconsin Ecology Symposium, 2015.

Urban heat island impacts on evapotranspirative demand. North Temperate Lakes LTER Young Scientist Meeting, 2015.

Shallow groundwater and soil texture drive subfield-scale yield patterns. American Water Resources Association WI Section, 2015.

Mapping subfield-scale evapotranspiration to assess agricultural drought sensitivity. American Geophysical Union Fall Meeting, 2014.

Soil texture and groundwater availability as drivers of subfield-scale yield variability. American Water Resources Association WI Section, 2014.

Spatially variable impacts of shallow groundwater and soil texture on yield. Water for Food 2014 Global Conference, 2014. **First Prize, Scholarly Poster Competition.**

Groundwater subsidies and penalties to corn yield. American Geophysical Union Fall Meeting, 2013.

Persistent patterning of plant water use during drought, Yahara Watershed WI. North Temperate Lakes LTER Young Scientist Meeting, 2013. **Invited speaker.**

Mapping persistent patterns of evapotranspiration to assess ecosystem sensitivity. Wisconsin Ecology Symposium, 2013.

Shallow groundwater impacts on corn biophysics and yield during a drought. American Water Resources Association WI Section, 2013. **Best Student Presentation Award.**

Water resources and crop production in the Yahara Watershed, Wisconsin. Long Term Ecological Research Network All Scientist Meeting, 2012. **Invited speaker.**

Changes in crop productivity as a result of shallow groundwater, Yahara Watershed, Wisconsin. Long Term Ecological Research Network All Scientist Meeting, 2012.

Linking shallow groundwater to crop yield using remotely sensed data, Yahara Watershed, WI. American Water Resources Association WI Section, 2012.

Lacustrine records of historical hydrology: Mackenzie River Delta, N.W.T., Canada. American Geophysical Union Fall Meeting, 2009.

### [Mentee Presenting, Zipper Co-Author](#)

Lamontagne-Hallé, P. Cold regions groundwater modelling: Are surface boundary conditions important? International Union of Geodesy and Geophysics General Assembly, 2019.

Boerman, T. Innovative water planning and management tool: Estimating streamflow depletion caused by groundwater pumping using neural networks. American Geophysical Union Fall Meeting, 2018.

Lamontagne-Hallé, P. How will permafrost thaw affect the groundwater contribution to streams and lakes? American Geophysical Union Fall Meeting, 2018.



Boerman, T. Estimating streamflow depletion by groundwater pumping under transient conditions using neural networks. Canadian Water Resources Association National Meeting, 2018.

Somers, L.D. Climate change and enhanced recharge in a non-glacierized mountain catchment, Shullcas River, Peru. Canadian Geophysical Union Annual Meeting, 2017. ***Best Student Presentation Award.***

Lamontagne-Hallé, P. Groundwater models for cold regions: How do surface-layer boundary conditions affect hydrology simulation outcomes? Canadian Geophysical Union Annual Meeting, 2017.

Nocco, M. High resolution mapping of evapotranspiration and apparent electrical conductivity in the Wisconsin Central Sands: Could precision irrigation conserve groundwater? American Water Resources Association-Wisconsin Section Meeting, 2017.

Nocco, M. Using high-resolution remote sensing, lysimetry, and big leaf modeling to infer crop water use in the Wisconsin Central Sands. American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America Annual Meeting, 2016.

## Teaching & Mentoring

### Advising

#### **Postdoctoral Scholars** supervised:

- Li, Qiang (John). Civil Engineering, University of Victoria. 10/2018 - present.

#### **Graduate students** mentored:

- Boerman, Thomas. Ph.D., Civil Engineering, University of Victoria. 05/2017 - present.
- Lamontagne-Halle, Pierrick. Ph.D., Earth and Planetary Sciences, McGill. 11/2016 - present.
- Nocco, Mallika. Ph.D., Environment and Resources, UW-Madison. 06/2014 - 09/2017.
- Hatzel, Jeffrey. GIS Certificate, UW-Madison. 06/2014 - 05/2015.
- Somers, Lauren. Ph.D., Earth and Planetary Sciences, McGill. 11/2016 - 12/2017.

#### **Undergraduate students** (majors) mentored:

- Friedrich, Hannah. Geography, UW-Madison. 05/2014 - 05/2015.
- Bergquist, Galen. Botany, UW-Madison. 05/2014 - 09/2014.
- LoBue, Allison. Biological & Biosystems Engineering, UW-Madison. 11/2013 - 12/2014.
- Pomije, Taylor. Biological Aspects of Conservation, UW-Madison. 05/2012 - 08/2013.
- Gross, Erin. Geological Engineering, UW-Madison. 08/2011-12/2012.

### Classroom Instruction

- 2018 **Sessional Instructor.** Sustainable Water Resources (CIVE340), University of Victoria. Instructor for core undergraduate water resource engineering course. Leading all lectures, in-class activities, homework assignments, and exams.
- 2016 **Teaching Assistant.** Ecohydrology (CEE 619), University of Wisconsin-Madison.

Developed new module on rainfall-runoff partitioning including student modeling exercise in MATLAB simulating formation and migration of banded vegetation. Lectured on various topics in class and assisted with curriculum design.

- 2015 **Teaching Assistant.** Ecohidrologia (Ecohydrology), Uni. Nacional de San Luis (Argentina).  
Led student development of ecohydrological ‘bucket model’ in programming language R and implementation of site-specific modifications for research applications.
- 2011 **Staff Science Tutor.** Harlem Village Academies High School (New York NY)  
Resident tutor for high school-level chemistry, biology, and earth sciences curriculum. Public charter school serving primarily students from underrepresented communities.
- 2007– **Teaching Assistant.** Pomona College Geology Department.  
2008 Worked one-on-one and in small groups with students on during labs, field trips, and peer writing evaluations. Led in-class discussions. Graded homework, labs, and exams.  
*Courses:* Introductory Geology; Oceanography; Earth History; and Space: To Boldly Go? (Scientific critical writing seminar for freshman).

### Guest Lectures

- 2017 Groundwater, ecosystems, and humans. Hydrogeology (EOS 491). University of Victoria.  
Unsaturated flow. Hydrogeology (EPSC 549). McGill University.  
Ecohydrology. Hydrogeology (EPSC 549), McGill University.  
Hydraulic Properties and Aquifer Testing. Hydrogeology (EPSC 549). McGill University.
- 2016 Groundwater and crop yield. Groundwater and Water Resources (EPSC 550), McGill University.  
Food security and environmental sustainability. Resources & Sustainability (CHE 390), University of Wisconsin-Baraboo
- 2015 Ecohydrology: Earth science at the intersection of water and life. Introduction to Environmental Geology (GLG 135), University of Wisconsin-Baraboo.

### Professional Development

- 2019 Make sense of the mess: How to keep your research project on track. European Geophysical Union.  
Social science methods for natural scientists. European Geophysical Union.  
Data To Motivate Synthesis Workshop. National Socio-Environmental Synthesis Center (SESYNC).
- 2018 Effective Climate Conversations: Exploring Communications Solutions. ICLEI Canada.
- 2017 No Means No: How to Step Up and Stop Harassment. Geological Society of America.  
Science Communication 101. Canadian Society for Ecology and Evolution.
- 2016 Increasing Research Self-Efficacy of your Trainees. University of Wisconsin.

- 2015 Preparing for an Academic Career in the Geosciences. National Association of Geoscience Teachers.  
 Creating an Individual Development Plan. University of Wisconsin-Madison.  
 Integrating Broader Impacts into your Research Proposal. University of Wisconsin-Madison.
- 2014 Structural Equation Modeling Workshop. James Grace, US Geological Survey.

## Professional Service

### Leadership

- 2018– **AGU Ecohydrology Technical Committee Member**  
 current **Chair of Social Media Subcommittee**  
*American Geophysical Union, Hydrology Section*  
 Contributions include integrating multiple social media platforms, creating Career Resources page, and publicizing events and resources related to ecohydrology.
- 2013– **Graduate Student Site Representative**  
 2015 *North Temperate Lakes, Long Term Ecological Research Network (NTL-LTER)*  
 Contributions include organizing network-wide student research day at 2015 All Scientist Meeting and serving as bridge between NTL site and nationwide LTER network.
- 2012– **Graduate Student Representative**  
 2015 *University of Wisconsin Ecology*  
 Contributions include planning and staffing symposia, organizing ecology job fair.

### Open Science Initiatives

Author of streamDepletr R package for analytical streamflow depletion models (<https://cran.r-project.org/package=streamDepletr>)

Curator of CRAN Hydrology Task View (<https://cran.r-project.org/web/views/Hydrology.html>)

Organized daily ‘Coding Help Desk’ in Student Center at 2018 American Geophysical Union Fall Meeting (with Sheila Saia).

Community Ambassador for *EarthArxiv*, the earth science pre-print server ([eartharxiv.org](http://eartharxiv.org)); Contributor of first pre-print in ‘Hydrology’ category.

High-Resolution Mapping of EvapoTranspiration (HRMET) model on GitHub ([link](#)).

All dissertation data available online at North Temperate Lakes LTER repository ([link](#)).

Code and data for all current projects public on GitHub ([link](#)).

### Conference Sessions Chaired

Agrohydrology in a Changing World: From Global Processes to Local Outcomes. American Geophysical Union Fall Meeting. Recurring session in 2018, 2019.

Putting Humans in the Hydroscape: Mapping the world's sociohydrologic landscapes. Santa Fe Institute Workshop on Socio-Hydrological Dynamics. 2018.

Understanding the Extent and Impacts of Land Use/Land Cover Change on Water Resources (H42H). American Geophysical Union Fall Meeting, 2017.

Agriculture, Food Security, and Ecohydrology. Green Talents Alumni Meeting, 2016.

Water Quality A. American Water Resources Association Wisconsin Section meeting, 2016.

Drought resistance and resilience: Definitions, drivers, and responses across LTER ecosystems. Long Term Ecological Research Network (LTER) All Scientist Meeting, 2015.

## Peer Reviewer

Outstanding Reviewer Award, 2017, *Environmental Research Letters*

36 *ad hoc* reviews for journals: Agricultural and Forest Meteorology, Archives of Agronomy and Soil Science, Environmental Research Letters, Geophysical Research Letters, Groundwater Management & Remediation, Hydrology and Earth System Sciences, Hydrogeology Journal, Hydrological Processes, Journal of Hydrology: Regional Studies, Journal of Water Resources Planning and Management, Remote Sensing, Remote Sensing of Environment, Stochastic Environmental Research and Risk Assessment, Urban Forestry & Urban Greening, Vadose Zone Journal, Water, Water Resources Research

Scientific reviewer for Environmental Protection Agency, USGS Technical Reports and The Nature Conservancy.

## Society Memberships

- American Geophysical Union (2009–current)
- American Water Resources Association (2011–2016)
- Geological Society of America (2015–current)

## University Committees

- KGS Groundwater Sustainability postdoc search (chair), 2019

## Public Engagement, Outreach, & Education

### Writing for a Public Audience

2015-present Professionally engaged on scientific social media (Twitter: [@ZipperSam](#)), >1300 followers

2019 Doing Hydrogeology in R. *Water Underground*. ([link](#))

Getting your toes wet in R: Hydrology, meteorology, and more. *rOpenSci*. ([link](#))

Dowsing for interesting water science: What's exciting at EGU 2019? *Water Underground* ([link](#))

2018 Using social media to advance your knowledge, skills, and career. *GeoGradGuide*. ([link](#))

- Socio-hydrology meets Broadway: Can we survive drought if we stop using the toilet? *Water Underground* ([link](#)).
- 2017 Good groundwater management makes for good neighbors. *Water Underground* ([link](#)).  
Groundwater and agriculture: Tapping the hidden benefits. *Water Underground* ([link](#)).
- 2016 The great American groundwater road trip: Interstate 80 over the Ogallala Aquifer. *Water Underground* ([link](#)).  
Baseflow, groundwater pumping, and river regulation in the Wisconsin Central Sands. *Water Underground* ([link](#)).
- 2015 Lake Mendota's spring thaw and why it matters. *Yahara in situ* ([link](#)).  
1 city, 25,000 geoscientists. *Yahara in situ* ([link](#)).
- 2014 Going global with lessons from the Yahara. *Yahara in situ* ([link](#)).  
Pollination and groundwater. *Yahara in situ* ([link](#)).  
Crunch time for corn growers and field scientists. *Yahara in situ* ([link](#)).

## Events

- Skype a Scientist. West University Elementary, Houston TX (2018).
- What's Your Water Footprint? Childpeace Montessori School, Portland OR (2017)
- Earth Day Every Day, Toki Middle School, Madison WI (2014).
- Wisconsin State Fair Limnology Exploration Station, Milwaukee WI (2013).
- Winter Limnology Open House, Madison WI (2013).
- Day of Science, Badger Ridge Middle School, Verona WI (2012).

## Interviews and Media Coverage

- 2019 Tweets yield crop progress. *FarmLife Magazine*, Spring 2019 issue. ([link](#))  
Looking below the surface for landscape resilience. *UW-Madison Engineering News*. ([link](#))
- 2018 Spring comes quickly in Louisville. Can we blame the heat island? *WPFL (NPR local)*. ([link](#)).
- 2017 Letting lawns go brown can preserve water for others during drought. *National Drought Mitigation Center* ([link](#))  
Groundwater and tundra fires may work together to thaw permafrost. *Geological Society of America* ([link](#)), *ScienceDaily* ([link](#)), *Phys.org* ([link](#))  
Legacy phosphorus and Wisconsin water. *Wisconsin Public Radio* ([link](#)).  
Wisconsin study looks at ways to reduce legacy phosphorus. *Wisconsin Public Radio* ([link](#)).  
Study quantifies effect of legacy phosphorus in reduced water quality. *Science Newsline* ([link](#)).  
The costs of soil's phosphorus stockpile. *WisContext* ([link](#)).  
Greener cities could help urban plants endure summer heat. *AGU GeoSpace* ([link](#)).  
Here's more reason to green our cities. *Yahara In Situ* ([link](#)).

- 2016 How will drought affect US maize and soybean production? *EnvironmentalResearchWeb* ([link](#)).
- Parks can reduce urban heat island. *Environmental Monitor* ([link](#)).
- Parks provide islands of cool in urban areas. *Conservation Magazine* ([link](#)).
- Spring comes earlier to urban environments. *Voice of America* ([link](#)), *Big News Network* ([link](#)).
- Spring comes sooner to urban heat islands, with potential consequences for wildlife. *Environmental News Network* ([link](#)), *ScienceDaily* ([link](#)), *Phys.org* ([link](#)), *EnvironmentalResearchWeb* ([link](#)).
- Soil texture determine how groundwater and rain impacts crops. *AGU Eos* ([link](#)).
- 2015 UW Ph.D. student wins German sustainability award. *The Badger Herald* ([link](#)).
- Ph.D. student wins Germany's Green Talents Award. *UW-Madison News* ([link](#)).
- UW-Madison study looks at crop benefits of higher water tables. *WI Ag Connection* ([link](#)).
- Soggy not always a bad thing. *Agri-View* ([link](#)).
- High water tables impact crop yields. *Wisconsin State Farmer* ([link](#)).
- High water tables can be a boon to crop yields. *Yahara In Situ* ([link](#)).
- 2014 Thermal imagery to precision ag: understanding crop water needs. *Yahara In Situ* ([link](#)).