

Educational background

Duke University	Ph.D. Earth and Ocean Sciences.	Expected Spring 2017
Syracuse University	M.S. Earth Sciences.	2013
Oberlin College	B.A. Env. Studies with Economics and Geology minors.	2011

Research experience

GRIP Fellow, United States Geological Survey, Reston, Virginia	2016-present
NSF-funded internship with USGS researchers to examine nutrient concentration – discharge relationships in large U.S. rivers.	
Research Assistant, Duke University	2013-present
Study hillslope and in-stream flow dynamics using piezometers, wells, capacitance water level recorders, and in-stream physical and chemical sensors.	
Short residence at Johns Hopkins University	Oct. 3-6, 2016
Collaboration with Dr. Ciaran Harman's research group to apply Duke Forest hydrologic data to a time-variable transit time distribution model (rSAS).	
Research Assistant, Syracuse University	2011-2013
Studied spatial and temporal variations of hyporheic geochemistry pre- and post- restoration during storm events. Used ion chromatography and heat tracing techniques in site analysis.	
Research Assistant, Hubbard Brook Experimental Forest, New Hampshire	2010
Continuation of research described below.	
NSF REU Intern, Hubbard Brook Experimental Forest, New Hampshire	2009
Implemented six watershed-scale sample surveys to monitor spatial and temporal stream chemistry. Compared results to groundwater chemistry of samples collected from wells I installed in varying soil types.	
Research Aide, University of Alaska-Fairbanks	2008
Conducted reach-scale conservative/non-conservative tracer tests to study stream-groundwater interactions and nutrient uptake rates in sub-arctic streams.	

Teaching experience

Duke Certificate in College Teaching	In progress
Program with required classes, online portfolio development, and pedagogy seminars.	
Teaching Assistant, EOS 102 - Dynamic Oceans, Duke University	2016
Held office hours and graded assignments.	
Teaching Assistant, EOS 323/723 - Landscape Hydrology, Duke University	2015
Lead paper discussion sessions, guest lectured, and graded assignments.	
Invited Guest Lecturer – Watershed Hydrology, SUNY ESF	2013
Teaching Assistant, EAR 225 -Volcanoes and Earthquakes, Syracuse University	2012
Designed weekly assignments for the lab portion of course. Taught and graded daily labs.	
Teaching Assistant, EAR 117 – Oceanography, Syracuse University	2011
Designed weekly assignments for the lab portion of course. Taught and graded daily labs.	
Soil Science Course Developer and Teacher, Geology Dept., Oberlin College	2010
Designed, developed, led course schedule, 20 4-hr lectures/lab activities, field trips, grading.	

Notable awards and honors

Outstanding Student Paper Award –AGU Fall Meeting (top 3-5% of student presenters)	2016
Invited Seminar Speaker, Geology Dept., Washington and Lee University	2016
NSF Graduate Research Internship Program Fellowship	2016
Invited Seminar Speaker, SESYNC Institute, University of Maryland	2016

Geological Society of America Graduate Student Research Grant	2016
NSF Graduate Research Program Fellowship	2013-2018
Invited Speaker, Gordon Research Seminar and Conference on Catchment Hydrology	2015
CUAHSI Travel Grant	2014
Most Outstanding Graduate Student, Earth Sciences, Syracuse University	2013
Publication Award, Earth Sciences, Syracuse University	2013
Invited participation in US-Japan Catchment Hydrology Conference, Honolulu, HI	2013
Outstanding Student Paper Award –AGU Fall Meeting	2011
Geological Society of America Graduate Student Research Grant	2011
Sigma Xi Scientific Honor Society	2011

Publications

In review/revision

[1] **Zimmer MA** and BL McGlynn. Accepted. Time-lapse animation of hillslope groundwater dynamics details event-based and seasonal bi-directional stream-groundwater gradients. *Hydrological Processes Eye (HPEye)*.

[2] **Zimmer MA** and BL McGlynn. Minor revisions. Bidirectional stream-groundwater flow in response to temporary streamflow and seasonal groundwater dynamics. *Hydrological Processes*.

[3] **Zimmer MA** and BL McGlynn. In review. Ephemeral streamflow generation in a low relief, highly weathered catchment. *Water Resources Research*.

Published

[4] **Zimmer MA**, Lautz LK. 2015. Pre- and post- restoration assessment of stream-ground water interactions: impacts on hydrological and chemical heterogeneity in the hyporheic zone. *Freshwater Science*. DOI: 10.1086/679514. **Invited Special Issue**.

[5] Smidt SJ, Cullin JA, Ward AS, Robinson J, **Zimmer MA**, Lautz LK, Endreny TA. 2014. A comparison of hyporheic extent at a stream restoration structure and natural feature. *Groundwater*. DOI:10.1111/gwat.12288.

[6] **Zimmer MA**, Lautz LK. 2013. Temporal and spatial response of hyporheic zone geochemistry to a storm event. *Hydrological Processes*. DOI: 10.1002/hyp.9778

[7] **Zimmer MA**, Bailey SW, McGuire KJ, Bullen TD. 2013. Fine scale variations of surface water chemistry in an ephemeral to perennial drainage network. *Hydrological Processes*. DOI:10.1002/hyp.9449

In preparation

[8] Barefoot, EA, TM Pavelsky, G Allen, **MA Zimmer**, and BL McGlynn. In prep. Stream width dynamics in a small headwater catchment. *Water Resources Research*. Target submission Jan 2017.

[9] **Zimmer MA**, B Pellerin, D Holtschlag, D Burns. In prep. Temporal variability in nitrate concentration – discharge relationships in large U.S. rivers. *Water Resources Research*. Target submission Jan 2017 for special issue on nutrient sensors.

Select presentations and published abstracts

Zimmer MA, McGlynn BL. 2016. Shallow and deep groundwater contributions to ephemeral streamflow generation. Abstract H52E-01. 2016 Fall Meeting, AGU, San Francisco, CA. 12- 16 Dec. Oral.

Barefoot EA, Pavelsky T, Allen GH, **Zimmer MA**, McGlynn BL. 2016. Stream width dynamics in a small headwater catchment. Abstract H23I-1690. 2016 Fall Meeting, AGU, San Francisco, CA. 12-16 Dec.

Erwin EG, Gannon JP, **Zimmer MA**. 2016. Mapping active stream lengths as a tool for understanding spatial variations in runoff generation. Abstract H23I-1695. 2016 Fall Meeting, AGU, San Francisco, CA. 12-16 Dec.

Zimmer MA, McGlynn BL. 2016. The hydrological and biogeochemical characteristics of temporary streams. Geology Department, Washington and Lee University, 7 Nov 2016. **(Invited)**

Zimmer MA, McGlynn BL. 2016. The characteristics and importance of temporary streams. Socio-Environmental Synthesis Center, University of Maryland Seminar Series, 27 Sept 2016. **(Invited)**

Zimmer MA, McGlynn BL. 2015. Ephemeral streamflow generation and its influence on downstream perennial watershed observations. Abstract H41M-04. 2015 Fall Meeting, AGU, San Francisco, CA. 14-18 Dec. Oral.

Zimmer MA, McGlynn BL, Miller JP. 2015. Flowpath and stream network activation threshold influences on Piedmont runoff generation and biogeochemistry. Gordon Graduate Student Research Seminar on Catchment Science, June 13-14. Andover, NH. **(Invited)**. Oral.

Also (invited) oral presentation at Gordon Research Conference.

Zimmer MA, McGlynn BL. 2014. The roles of groundwater flowpaths and stream network expansion in landscape connectivity and resulting runoff and solute dynamics in an ephemeral Piedmont catchment. Abstract H31I-0753. 2014 Fall Meeting, AGU, San Francisco, CA. 15-19 Dec.

Lautz LK, Gordon R, Daniluk T, **Zimmer M**, Endreny T, McGrath K. 2014. Restoring hydrological and biogeochemical ecosystem services in streams: How science can inform practice. Abstract H24B-06-06, 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec. **(Invited)**.

Zimmer MA, McGlynn BL. 2014. The role of groundwater and stream network dynamics in baseflow and stormflow generation. Consortium of Universities for the Advancement of Hydrologic Sciences (CUAHSI) Biennial Colloquium, Sheperdstown, WV, July 28-30.

Zimmer MA, Lautz, LK. 2013. The effects of restoration on hyporheic exchange rates and streambed geochemistry, Abstract H43A-1435, oral presentation at 2013 Fall Meeting, AGU, San Francisco, CA, 9-13. Oral.

Seybold EC, McGlynn BL, **Zimmer MA**, Kaiser KE. 2013. Utilizing high frequency in-situ sensor networks to understand carbon and nitrogen dynamics from reach to watershed scales. Abstract H53H-1513 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9-13.

Zimmer MA, Bailey SW, McGuire KJ, Bullen TD. 2013. Variation in surface water chemistry at two scales of observation at the Hubbard Brook Experimental Forest. US-Japan Joint Seminar on Catchment Hydrology, Honolulu, HI, Mar 4-7.

Zimmer MA, Lautz LK. 2012. Temporal and spatial effects of a storm event on hyporheic zone geochemistry, Abstract H11D-1204 presented at 2012 Fall Meeting, AGU, San Francisco, CA, 3-7.

Ward AS, Robinson J, Endreny TA, Cullin J, Smidt S, Lautz L, **Zimmer MA**. 2012. Do stream restoration structures create hyporheic zones that are comparable to those at natural features? Abstract H12B-06 presented at 2012 Fall Meeting, AGU, San Francisco, CA, Dec. 3-7.

Zimmer, MA. 2012. What can spatial and temporal stream chemistry tell us about the main chemical drivers and water sources at Hubbard Brook Experimental Forest? Lunch and Learn Seminar. US Geological Survey, Troy, NY, Sept. 24, 2012. Oral.

Also presented at Natural Science Seminar, Le Moyne College, Syracuse, NY, Oct. 12, 2012.

Zimmer MA, Bailey SW, McGuire, KJ. 2011. Fine scale variations of surface water chemistry in an ephemeral to perennial drainage network in the Hubbard Brook Experimental Forest, NH, USA, Abstract H53F-1490 presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec.

Bullen TD, Bailey SW McGuire KJ, **Zimmer MA**, Ross DS. 2011. Determining solute sources and water flowpaths in a forested headwater catchment: advances with the Ca-Sr-Ba multi-tracer, Abstract EP51F-07 presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec.

Zimmer MA. Fine scale variations of surface water chemistry in an ephemeral to perennial drainage network. Western Ecology Division at EPA, Corvallis, OR. Nov. 2011. **(Invited)**. Oral.

Zimmer MA, Bailey SW, McGuire KJ. 2011. Fine scale variations of surface water chemistry in an ephemeral to perennial drainage network in the Hubbard Brook Experimental Forest, NH, USA. GSA 43(5) 472. Fall Meeting Suppl., 9-12 Oct.

Zimmer MA, Bailey SW, McGuire KJ, Bullen TD. 2011. Hydrogeology reveals spatial distribution of processes controlling stream solute export: clues from spatial and temporal variation in surface water chemistry. Gordon Research Conference on Catchment Science, July 10-15, Lewiston, ME.

Bullen TD, Bailey SW, **Zimmer MA**, McGuire KJ, Bourgault R, Ross D. 2011. Hydrogeology reveals spatial distribution of processes controlling stream solute sources: chemical and isotopic clues. Gordon Research Conference on Catchment Science, July 10-15, Lewiston, ME.

Zimmer MA, Bailey SW, McGuire KJ, Bullen TD. 2010. Determining surface water sources using spatial and temporal variation in stream chemistry in a headwater catchment. Abstract B43C-0469 presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13-17 Dec.

Bullen TD, Bailey SW, McGuire KJ, Brousseau P, Ross DS, Bourgault R, **Zimmer MA**. 2010. Understanding metal sources and transport processes in watersheds: a hydrogeologic approach. Abstract B23K-06 presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13-17 Dec. **(Invited)**.

Service to the hydrology community/outreach

Lead biannual public tours of my field site in Duke Forest	Ongoing
Reviewer for peer-review journals/books: Hydrological Processes and Elsevier	Ongoing
Duke River Center Chalk Talk Organizer	2015
AGU Fall Meeting session convener.	

H23I: The generation and function of temporary streams	2016
H23N: The flow below: defining, quantifying, and understanding baseflow.	2013
Graduate Student Seminar Organizer, Earth Sciences Dept. Syracuse University	2012-2013