

Quinn W. Lewis • qlewis2@illinois.edu • 217.979.3806

<https://sites.google.com/site/qwlfluvialgeomorph/>

Department of Geography and Geographic Information Science

University of Illinois at Urbana-Champaign, Urbana, IL 61801

Education

Ph.D. University of Illinois, Urbana, Illinois, 2017, Geography and Geographic Information Science – Measuring Flow and Mixing at Stream Confluences Using Large-Scale Particle Image Velocimetry, In-Stream Techniques, and Small Unmanned Aerial Systems.

Advisor: Dr. Bruce Rhoads

M.S. University of Illinois, Urbana, Illinois, 2014, Geography - Rates and Patterns of Thermal Mixing at a Small Stream Confluence Under Variable Incoming Flow Conditions. Advisor: Dr. Bruce Rhoads

B.S. University of Wisconsin – La Crosse, La Crosse, Wisconsin, 2011, Geography

Research Interests

- Hydrodynamics, morphology, and sediment transport at stream confluences
- Large-scale particle image velocimetry (LSPIV) techniques, with emphasis on flow structure
- Exploring how unmanned aerial systems (UAS) such as consumer-grade drones can help advance geomorphology and the study of water resources
- Human impacts on watershed evolution and how humans interact with fluvial systems
- Using GIS and remotely sensed imagery to better understand fluvial network processes
- Interdisciplinary research among geographers, geologists, engineers, and natural resource scientists

Academic Positions

January 2018 – current – Post-doctoral Fellow, Department of Earth and Atmospheric Sciences, Indiana University.

Research Experience

Summer 2014 – Summer 2017, Research Assistant – Department of Geography, University of Illinois

Research assistant on NSF-funded study on mixing dynamics at river confluences, field data collection, data processing and analysis, and manuscript writing.

Teaching and Mentoring Experience

Fall 2016, Teaching Assistant – Earth's Physical Systems (GEOG/ESE 103) online course, Department of Geography and Geographic Information Science, University of Illinois
Introductory physical geography course, administered online, responsible for interacting with students and grading assignments.

URAP graduate mentor, 2016 – Chosen as one of ten graduate student mentors for the pilot year University of Illinois Undergraduate Research Apprenticeship Program (URAP).

The goals of URAP are to provide early-career undergraduate students with an opportunity to gain realistic graduate-school-style research experience, while also providing late-career graduate students with a preview of the mentor-mentee relationship that they will experience as professors.

Development of Earth's Physical Systems (GEOG/ESE 103) online course, 2015

Responsible for the transition of GEOG/ESE 103 laboratory material for online study, including editing existing labs and building new computer-based labs using various resources on the internet and Google Earth.

Fall 2011, 2012, 2013, Teaching Assistant – Geography of Developing Countries (GEOG 101), Department of Geography, University of Illinois

Introductory cultural geography section, responsible for three 30-student discussion sections. Lead discussion and interpretation of class material, administered writing assignments.

Spring 2012, 2013, 2014, Teaching Assistant – Earth's Physical Systems (GEOG/ESE 103), Department of Geography, University of Illinois

Introductory physical geography course, responsible for developing and delivering three 30- student lab sections and assigning and grading labs.

Peer-Reviewed Publications

- 1) Wang, Y., Wang, D., **Lewis, Q.W.**, Wu, J., Huang, F. 2017. A framework to assess the cumulative impacts of dams on hydrological regime: a case study of the Yangtze River, *Hydrological Processes*, 31: 3045-3055. doi:10.1002/hyp.11239.
- 2) **Lewis, Q.W.**, and Park, E. 2017. Volunteered Geographic Videos in Physical Geography: Data Mining from Youtube. *Annals of the Association of American Geographers*, 5: 1-19. doi: 10.1080/24694452.2017.1343658.
- 3) Rhoads, B.L. and **Lewis, Q.W.** 2016. The Relation between Mean Flow, Turbulence, and Mixing at a Small Stream Confluence, In *Riverflow 2016*, Constantinescu, G., Garcia, M.H., and Hanes, D. (eds), Taylor Francis, London. pp. 1633-1639.

- 4) **Lewis, Q.W.**, and Rhoads, B.L. 2016. Flow Evolution near the Apex of two Small Stream Confluences using Large-Scale Particle Image Velocimetry, In *Riverflow 2016*, Constantinescu, G., Garcia, M.H., and Hanes, D. (eds), Taylor Francis, London. pp.1640-1647.
- 5) Rhoads, B. L., **Lewis, Q.W.**, and Andresen, W. 2016. Historical Channel Change in an Intensively Managed Landscape: Natural versus Human-induced Effects, *Geomorphology*, 252: 17-31. doi:10.1016/j.geomorph.2015.04.021.
- 6) **Lewis, Q.W.**, and Rhoads, B.L. 2015b. Resolving two-dimensional flow structure in rivers using large-scale particle image velocimetry: An example from a stream confluence, *Water Resources Research*. 51.10: 7977-7994. doi:10.1002/2015WR017783.
- 7) **Lewis, Q.W.**, and Rhoads, B.L. 2015a. Rates and Patterns of Temperature Mixing at a Small Stream Confluence under Variable Incoming Flow Conditions, *Hydrological Processes*, 29:20, p. 4442-4456. doi:10.1002/hyp.10496.

Manuscripts Under Review

Lewis, Q.W., Lindroth, E.M., and Rhoads, B.L. (submitted to *Journal of Hydrology*). Integrating Unmanned Aerial Systems and LSPIV for Rapid, Cost-effective Stream Gauging.

Blair, N.E., Leithold, E.L., Papanicolaou, A.N.T., Wilson, C.G., Keefer, L., Kirton, E., Vinson, D., Schnoebelen, D., Rhoads, B.L., Yu, M., and **Lewis, Q.W.** (submitted to *Biogeochemistry*). The C-biogeochemistry of a Midwestern USA agricultural impoundment in context: Lake Decatur in the Intensively Managed Landscape Critical Zone Observatory.

Lewis, Q.W., and Rhoads, B.L. (submitted to *Water Resources Research*). LSPIV Measurements of Two-dimensional Flow Structure in Streams using Small Unmanned Aerial Systems: 1. Accuracy Assessment based on Comparison with Stationary Camera Platforms and In-stream Velocity Measurements.

Lewis, Q.W., and Rhoads, B.L. (submitted to *Water Resources Research*). LSPIV Measurements of Two-dimensional Flow Structure in Streams using Small Unmanned Aerial Systems: 2. Hydrodynamic Mapping at River Confluences.

Conference Participation

- 1) **Lewis Q.W.**, and Rhoads, B.L. An Assessment of Stream Confluence Flow Dynamics using Large Scale Particle Image Velocimetry Captured from Unmanned Aerial Systems. American Geophysical Union Fall Meeting, 2017, New Orleans, LA. December 13, 2017.

- 2) **Lewis Q.W.**, and Rhoads, B.L. Mixing at Stream Confluences: Rates, Patterns, and Controlling Factors. Association of American Geographers Annual Meeting, Boston, MA. April 8, 2017.
- 3) **Lewis Q.W.**, and Rhoads, B.L. Applying Large-Scale Particle Image Velocimetry (LSPIV) for mean and instantaneous flow measurement– Assessment of water quantity and water quality, Illinois Water 2016, Urbana, IL. October 27, 2016.
- 4) **Lewis Q.W.**, and Rhoads, B.L. Flow Evolution near the Apex of two Small Stream Confluences using Large-Scale Particle Image Velocimetry, 8th International Conference on Fluvial Hydraulics (River Flow), St. Louis, MO. July 13, 2016.
- 5) Rhoads, B.L., and **Lewis Q.W.**, The Relation between Mean Flow, Turbulence, and Mixing at a Small Stream Confluence, 8th International Conference on Fluvial Hydraulics (River Flow), St. Louis, MO. July 13, 2016.
- 6) **Lewis Q.W.**, and Rhoads, B.L. Flow Evolution near the Apex of two Small Stream Confluences using Large-Scale Particle Image Velocimetry, School of Earth, Society, and Environment Research Review, Urbana, IL. February 26, 2016.
- 7) **Lewis, Q.W.**, Rhoads, B.L., and Andresen, W. Historical Channel Change in an Intensively Managed Landscape: Natural versus Human-induced Effects, Association of America Geographers Annual Meeting, Chicago IL. April 24, 2015.
- 8) **Lewis, Q.W.**, and Rhoads, B.L. Field implementation of Particle Image Velocimetry (PIV) for studying flow dynamics at river confluences, American Geophysical Union Fall Meeting, 2014, San Francisco, CA. December 18, 2014.
- 9) **Lewis, Q.W.**, and Rhoads, B.L. Stream Channel Change in an Intensively Managed Agricultural Landscape: Implications for Critical Zone Processes, American Geophysical Union Fall Meeting, 2014, San Francisco, CA. December 18, 2014.
- 10) **Lewis, Q.W.**, Rhoads, B.L., Neal, C., and Andresen, W. Historical Channel Change in an Intensively Managed Landscape: Natural versus Human-induced Effects. Illinois Water 2014, Urbana, IL. October 15, 2014.
- 11) **Lewis, Q.W.**, and Rhoads, B.L. Field Implementation of Particle Image Velocimetry (PIV) for Studying Confluence Dynamics: Potential, Considerations, and Challenges. School of Earth, Society, and Environment Research Review, Urbana, IL. February 21, 2014.
- 12) **Lewis, Q.W.**, and Rhoads, B.L. Temperature Mixing at a Small Stream Confluence under Variable Flow Conditions. School of Earth, Society, and Environment Research Review, Urbana, IL. March 1, 2013.

13) **Lewis, Q.W.** Spatial Variation in Residential Infiltration Rates. School of Earth, Society, and Environment Research Review, Urbana, IL. April 17, 2012.

Research Grants

1) Illinois Water Resources Center Annual Small Grants: Student Research Awards, \$9,915. "Evaluating Water Quantity and Water Quality Issues in Illinois Streams using Large-Scale Particle Image Velocimetry (LSPIV)." 2015. Received. (with Bruce L. Rhoads, University of Illinois, and Frank L. Engel, United States Geological Survey)

2) Department of Geography and Geographic Information Science Summer Field Support Grant, \$579. "Spatial and Temporal Evolution of Shear Layers at River Confluences – A Study of Confluence Dynamics." 2013. Received.

Total \$ received: \$10,494

Honors and Awards

- Department of Geography Marion G. Russell Fellowship – Spring 2017.
- Department of Geography George Beatty Fellowship – 2017.
- Departmental Unit teaching award, Department of GGIS, University of Illinois, 2014.
- List of Teachers Ranked As Excellent by Their Students, University of Illinois, Spring 2014 – GEOG/ESE 103.
- List of Teachers Ranked As Excellent by Their Students, University of Illinois Fall 2014 – GEOG 101 (outstanding rating - top 10% on item one for teaching assistants).
- List of Teachers Ranked As Excellent by Their Students, University of Illinois, Spring 2013 – GEOG/ESE 103 (outstanding rating - top 10% on item one for teaching assistants).
- School of Earth, Society, and Environment Research Review, 1st place poster in Geography and GIS – 2017; 3rd place poster in Geography and GIS – 2013, 2016.

Professional Memberships

- Geological Society of America (2015-present)
- American Geophysical Union (2014-present)
Specialty Groups: Hydrology, Earth and Planetary Surface Processes
- American Association of Geographers (2011-present)
Specialty Groups: Geomorphology, Water Resources

Service

- Manuscript reviewer:
 - *Environmental Fluid Mechanics*

- *Journal of Hydraulic Research*
- *Water Resources Research*
- Geography Graduate Student Association President, 2013-2014
- Geography Graduate Student Association Vice President, 2012-2013
- Chair, UIUC School of Earth, Society, and Environment 2012 Research Review Planning Committee

Skills

- Software: ArcGIS; ERDAS Imagine; Corel Suite; Tecplot 360; HEC-RAS; HEC-GeoRas, Leica GeoOffice, MATLAB, Surfer, Grapher
- Field Equipment: ADV; ADCP; RTK GPS; Total Station operation; Terrestrial LiDar; small boat and all-terrain vehicle operation; radio-frequency identification (RFID) tagging; LSPIV, Sea-Bird SBE Probes, Campbell data loggers, temperature, conductivity, and turbidity probes, and associated equipment, UAS/drone operation and maintenance (FAA licensed).
- Programming Languages: MATLAB, R

References

Dr. Bruce Rhoads, Professor, University of Illinois, Department of Geography and Geographical Information Science.

brhoads@illinois.edu, +1 (217) 333-1322

Dr. Piotr Cienciala, Assistant Professor, University of Illinois, Department of Geography and Geographical Information Science.

piotrc@illinois.edu, +1 (217) 333-1880

Dr. Alexander Sukhodolov, Scientist, Institute of Freshwater Ecology and Inland Fisheries, Berlin, Germany.

alex@igb-berlin.de, +49 (0)30 64181 675