

# MATT T. TRENTMAN

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## APPOINTMENTS

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### FLATHEAD LAKE BIOLOGICAL STATION-U. OF MONTANA

Post-doctoral Researcher  
Advisor: Bob Hall

Polson, MT  
May 2020-Present

## EDUCATION

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### UNIVERSITY OF NOTRE DAME

PhD, Biological Sciences  
Advisor: Dr. Jennifer L. Tank

Notre Dame, IN  
May 2020

Dissertation: Linking land use, land cover, and floodplains with phosphorus cycling and ecosystem function in streams

### KANSAS STATE UNIVERSITY

Master's degree, Biology  
Advisor: Dr. Walter K. Dodds

Manhattan, KS  
May 2015

Thesis: Biotic and abiotic effects on biogeochemical fluxes across multiple spatial scales in a prairie stream network.

### MANCHESTER UNIVERSITY

B.A., *cum laude*, Environmental Science

North Manchester, IN  
May 2012

## PUBLICATIONS- *underlined = REU student co-mentored by Trentman*

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14. **M.T. Trentman**, J.L. Tank, T.V. Royer, S.L. Speir, U.H. Mahl, L.R. Sethna. The role of cover crops and antecedent precipitation on soluble reactive phosphorus losses via tile drain flow in an agricultural watershed. *Hydrological Processes*. In Press.
13. **M.T. Trentman**, J.L. Tank, S.E. Jones, S.K. McMillian, T.V. Royer. 2020. Seasonal evaluation of biotic and abiotic factors suggests phosphorus retention in constructed floodplains in three agricultural streams. *Science of the Total Environment*. 729, 138744.
12. **M.T. Trentman**, W.K. Dodds, K.B. Gido, J. Rüegg, and C.M. Ruffing. 2020. Biotic and abiotic controls of patch-scale biogeochemical fluxes along a prairie stream network. *Aquatic Sciences* 82:26.
11. **M.T. Trentman**. 2018. The impact of long-term regional air mass patterns on nutrient precipitation chemistry and nutrient deposition within a United States grassland ecosystem. *Journal of Atmospheric Chemistry* 75:399.
10. B.R. Hanrahan, J.L. Tank, S.F. Christopher, **M.T. Trentman**, U.H. Mahl, T.V. Royer. 2018. Winter cover crops reduce nitrate loss from an agricultural watershed in the central U.S. *Journal of Agriculture, Ecosystems, and Environment* 265(1): 513-523.

9. **M.T. Trentman**, C.L. Atkinson, J.D. Brant. 2018. Native freshwater mussel effects on nitrogen fluxes in benthic sediments: interactive impacts of nutrient limitation and biomass dependency. *Freshwater Science* 37(2): 276-286.
8. C. Song, W.K. Dodds, J. Rüegg, A. Argerich, C.L. Baker, W.B. Bowden, M.M. Douglas, K.J. Farrell, M.B. Flinn, E.A. Garcia, A.M. Helton, T.K. Harms, S. Jia, J.B. Jones, L.E. Koenig, J.S. Kominoski, W.H. McDowell, D. McMaster, S.P. Parker, A.D. Rosemond, C.M. Ruffing, K.R. Sheehan, **M.T. Trentman**, M.R. Whiles, W.M. Wollheim, F. Ballantyne IV. 2018. Warming induces asymmetric convergence of stream metabolic balance. *Nature Geoscience* 11: 415-420.
7. K.J. Farrell, A.D. Rosemond, J.S. Kominoski, S.M. Bonjour, J. Rüegg, L.E. Koenig, C.L. Baker, **M.T. Trentman**, T.K. Harms, W.H. McDowell. Variation in detrital resource stoichiometry signals differential carbon to nutrient limitation for stream consumers across biomes. *Ecosystems* 1-16.
6. B.R. Hanrahan, J.L. Tank, M.M. Dee, **M.T. Trentman**, E.M. Berg, S.K. McMillan. 2018. Restored floodplains enhance denitrification compared to naturalized floodplains in agricultural streams. *Biogeochemistry*. 1-19.
5. S.F. Christopher, J.L. Tank, U.H. Mahl, H Yen, J.G. Arnold, **M.T. Trentman**, S.P. Sowa, M.E. Herbert, J.A. Ross, M.J. White, T.V. Royer. 2017. Modeling nutrient removal using watershed-scale implementation of the two-stage ditch. *Ecological Engineering*. 108 (B):358-369.
4. C. Song, W.K. Dodds, **M.T. Trentman**, J. Rüegg, and F. Ballantyne IV. 2016. Methods of approximation influence stream metabolism estimates. *Limnology and Oceanography: Methods*. (14):557-569.
3. J. Rüegg, K.R. Sheehan, C.L. Baker, W.B. Bowden, M.D. Daniels, W.K. Dodds, K.J. Farrell, M.B. Flinn, T.K. Harms, J.B. Jones, L.E. Koenig, J.S. Kominoski, W.H. McDowell, S.P. Parker, A.D. Rosemond, **M.T. Trentman**, M. Whiles, and W.M. Wollheim. 2016. Multi-scale comparison of baseflow physio-geomorphic heterogeneity in stream networks across diverse biomes. *Landscape Ecology* (31):119-136.
2. **M.T. Trentman**, W.K. Dodds, J.S. Fencl, K. Gerber, J. Giarneri, S. Hitchman, Z. Peterson, and J. Rüegg. 2015. Quantifying ambient nitrogen uptake and functional relationships of uptake versus concentration in streams: a comparison of stable isotope, pulse, and plateau approaches. *Biogeochemistry* 125 (1): 65-79.
1. J. Rüegg, J. Brant, D. Larson, **M.T. Trentman**, and W.K. Dodds. 2015. A portable, modular, self-circulating chamber to measure benthic processes under controlled water velocity. *Freshwater Science* 34 (3), 831-844.

## **PUBLICATIONS-** *in revision, review, or preparation*

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M.T. Trentman, J.L. Tank, R.T. Davis, B.R. Hanrahan, U.H. Mahl, S.S. Roley. Watershed-scale land use change increases ecosystem metabolism in an agricultural stream. *In Revision*.

M.T. Trentman, J.L. Tank, D. Braund, S.A. Entrekin. Agricultural intensity explains variation in sediment P dynamics in streams draining two distinct agricultural biomes. *In Revision*.

**M.T. Trentman**, J.L. Tank, H.A.M. Shepherd, A.J. Marrs, J.R. Welsh, and H.V. Goodson. Understanding disturbance driven variation in bioavailable phosphorus using a novel yeast growth assay in an agricultural stream. *In Prep, Biogeochemistry*.

M. Ardón et al. Experimental nitrogen and phosphorus enrichment stimulates multiple trophic levels through algal and detrital food web pathways: A global meta-analysis from streams and rivers. *In Revision*

A. Johnson, S. McMillan, J.L. Tank, **M.T. Trentman**, M. Williams. Phosphorus dynamics in constructed and naturalized floodplains in agricultural streams. *In Prep*.

Song et al. Interaction between physiology and environmental heterogeneity determines discrepancies in stream metabolism across spatial scales. *In Prep*.

## GRANTSMANSHIP

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### EXTERNAL:

PI: Matt Trentman; Co-PI: Jennifer L. Tank, Matthew J. Cohen. Using the SeaBird Scientific HydroCycle PO<sub>4</sub> sensor to measure diel phosphorus patterns in streams and ponds. Instrument Discovery Travel Grant, CUAHSI. Funding for June 2019; \$1.0 K

PI: Sally Entrekin; Co-PI: Jennifer L. Tank, Matt T. Trentman. Do stream phosphorus dynamics correspond with biological condition in the Lake Conway Point Remove Watershed, Arkansas? USGS 104B program, Arkansas Water Resources Center. Funding for Oct 2017 – June 2019: \$7.5 K

### INTERNAL:

University of Notre Dame; Notre Dame, IN  
Environmental Change Initiative- Linked Experimental Ecosystem Facility Research grant

Funding for May 2019-August 2019: \$2.0 K  
Using the SeaBird Scientific HydroCycle PO<sub>4</sub> sensor to measure diel phosphorus patterns in ND-LEEF streams and ponds

PI: Matt T. Trentman; Co-PI: Jennifer L. Tank

Funding for May 2018-August 2018: \$1.5 K  
Partitioning heterotrophic and autotrophic uptake of simple and complex phosphorus in ND-LEEF streams using a shading experiment. **Science communication video for this project:**  
<https://tinyurl.com/TrentmanLEEF2018>

PI: Matt T. Trentman; Co-PI: Jennifer L. Tank, Shannon L. Speir

Funding for May 2016-August 2017: \$1.5 K  
Calculating phosphorus uptake in streams using simple and complex release solutions. **Science communication video for this project:** <https://tinyurl.com/TrentmanLEEF2016>

PI: Matt T. Trentman; Co-PI: Jennifer L. Tank

## **FELLOWSHIPS AND HONORS**

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Center for Environmental Science and Technology Predoctoral Research Fellowship (\$11,646), University of Notre Dame, 2019-2020. Advisor: J. L. Tank

Social Responsibility of Researchers Fellow, John J. Reilly Center for Science, Technology, and Values, University of Notre Dame, IN, 2016-2017. Advisor: J. L. Tank

General Endowment Fund Award (\$1000), Society of Freshwater Science Endowment Fund, May 2019. Advisor: J. L. Tank

Mulholland Fund Award, Society of Freshwater Science Endowment Fund (\$1000), May 2015. Advisor: W. K. Dodds

## **TEACHING EXPERIENCE**

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### **Teaching Assistant**

UNIVERSITY OF NOTRE DAME	Notre Dame, IN
Graduate Teaching Assistant, Department of Biological Sciences Biostatistics Lab, undergraduate enrollment = 25	Spring 2019
Stream Ecology Lab, undergraduate and graduate enrollment = 16	Fall 2018
Aquatic Insects Lab, undergraduate and graduate enrollment = 9	Fall 2017
KANSAS STATE UNIVERSITY	Manhattan, KS
Graduate Teaching Assistant, Biology Department Freshwater Ecology, undergraduate and graduate enrollment = 18	Fall 2014
Organismic Biology, undergraduate enrollment = 40	Fall 2013, Spring 2014
Principles of Biology, undergraduate enrollment = 60	Fall 2012, Spring 2013, 2015
MANCHESTER UNIVERSITY	North Manchester, IN
Undergraduate Lab Assistant, Biology Department Principles of Biology	Fall 2010, Fall 2011, Spring 2012

## **INVITED SEMINARS**

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**M.T. Trentman**, J.L. Tank, T.V. Royer. The influence of floodplain restoration on water quality in agricultural streams. Friends of Lake Champlain; Franklin, VT. Aug. 2019.

**M.T. Trentman**, J.L. Tank, T.V. Royer. The influence of floodplain restoration on water quality in agricultural streams. The Nature Conservancy; Delphi, IN. Aug. 2019.

**M.T Trentman**, J.L. Tank, S. McMillan, T.V. Royer. Comparing the role of biotic and abiotic factors influencing P cycling in multiple agricultural stream floodplains. University of Central Arkansas; Conway, AR. May 2018.

**M.T Trentman**, J.L. Tank, B. Hanrahan, S. Christopher, K. Prior. T.V. Royer. Can watershed-scale cover crops reduce nutrient export from agricultural watersheds? North American Manure Expo; London, OH. Aug. 2016.

### **SELECTED CONFERENCE PRESENTATIONS-** *First author only*

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**M.T Trentman**, J.L. Tank, S. McMillan, T.V. Royer. Comparing the role of biotic and abiotic factors influencing P cycling in multiple agricultural stream floodplains. Indiana Water Resource Association. May 2019

**M.T Trentman**, J.L. Tank, S. McMillan, T.V. Royer. Comparing the role of biotic and abiotic factors influencing P cycling in multiple agricultural stream floodplains. Society of Freshwater Science meeting. May 2018

**M.T Trentman**, J.L. Tank, B. Hanrahan, S. Christopher, K. Prior., U.H. Mahl, S.L. Speir, T.V. Royer. Comparing the Effectiveness of Increased Winter Land Cover on Nutrient Export Across Two Indiana Agricultural Watersheds. University Council on Water Resources Annual meeting. June 2017

**M.T Trentman**, J.L. Tank, H.V. Goodson, B. Peters, Y. Wu. Measuring uptake of organic and inorganic phosphorous using experimental streams. Society of Freshwater Science meeting. June 2017

**M.T Trentman**, J.L. Tank, B. Hanrahan, R.T. Davis, S. Roley, K. Prior. T.V. Royer. The interaction between floodplain restoration and changing land cover on stream metabolism in a Midwestern agricultural stream. Indiana Water Resources Association annual meeting. June 2016

**M.T Trentman**, J.L. Tank, B. Hanrahan, R.T. Davis, S. Roley, K. Prior. T.V. Royer. The interaction between floodplain restoration and changing land cover on stream metabolism in a Midwestern agricultural stream: continuation of a multi-year dataset reflecting a range of conservation practices. Society of Freshwater Science annual meeting. May 2016.

**M.T Trentman**, W.K. Dodds, K. Gido, J. Rüegg, C. Ruffing. Using structural equation modeling to determine effects of fish presence and environmental factors on stream benthic biogeochemical rates. Society of Freshwater Science annual meeting. May 2015.

**M.T. Trentman**, W.K. Dodds, K. Gido, J. Rüegg, C. Ruffing. Watershed position, habitat heterogeneity, and macro consumers affect ecosystem rates at patch scales. Society of Freshwater Science annual meeting. May 2014.

**M.T. Trentman**, W.K. Dodds, K. Gido, J. Rüegg, C. Ruffing. Watershed position, habitat heterogeneity, and macro consumers affect ecosystem rates at patch scales. KSU Division of Biology Forum. Mar 2014.

**M.T. Trentman**, J. Rüegg, W. Dodds, K. Gido, D. Larson. Scaling metabolism and nutrient uptake at patch (0.1 m) and reach (60 m) scales in a reference prairie stream. Society of Freshwater Science annual meeting. May 2013.

**M.T. Trentman**. The effect of retention ponds and riparian vegetation on nutrient concentrations in a golf course stream in Millbrook, NY. Manchester University Student Research Symposium. April 13, 2012. Manchester University. North Manchester, IN. March 2012.

**M.T. Trentman**, W. Schlesinger, S. Findlay. The effect of retention ponds and riparian vegetation on nutrient concentrations in a golf course stream in Millbrook, NY. REU Undergraduate Research Symposium. Cary Institute of Ecosystem Studies. Millbrook, NY. August 2011.

**M.T. Trentman**. Population estimation of Gypsy moths (*Lymantria dispar*) for determination of potential sites of eradication along a quarantine line. Manchester University Student Research Symposium. North Manchester, IN. April 2011.

**POSTERS-** *underlined = student mentored by Trentman*

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A.A. White, **M.T. Trentman**, J.L. Tank. The impact of row-crop agriculture on the biodiversity of stream macroinvertebrates. University of Notre Dame College of Science and Engineering- Joint Annual Meeting. May 2019.

E. Lopez, **M.T. Trentman**, J.L. Tank. Spatial and temporal variation in nutrient availability drives biotic nutrient removal in agricultural streams and floodplains. University of Notre Dame College of Science and Engineering- Joint Annual Meeting. May 2019.

**M.T. Trentman**, J.L. Tank, T.V. Royer, B.R. Hanrahan, U.H. Mahl, K. Prior, S.L. Speir. Comparing biotic controls on phosphorus cycling in stream sediments and floodplain soils in agricultural streams. University of Notre Dame College of Science and Engineering- Joint Annual Meeting. December 2018.

A-S Hoppe, J.L. Tank, **M.T. Trentman**. The impact of stream restoration on aquatic insect community and diversity in an agricultural stream. Society of Freshwater Science meeting. May 2018. *Awarded best poster by an Undergraduate Student.*

**M.T. Trentman**, J.L. Tank, T.V. Royer, B.R. Hanrahan, U.H. Mahl, K. Prior, S.L. Speir. The impact of winter cover crops on the export of phosphorus from tile drains in the agricultural Midwest. WaterSmart Innovations Conference. Las Vegas, NV. October 2017.

A-S Hoppe, J.L. Tank, **M.T. Trentman**. The impact of stream restoration on aquatic insect community and diversity in an agricultural stream. University of Notre Dame REU Summer Symposium. Notre Dame, IN. August 2017.

**M.T. Trentman**, W.K. Dodds, K.B. Gido, J. Rüegg, C.M. Ruffing, C. Song. Scaling nested measurements of biogeochemical rates across prairie stream reaches with varying biotic and abiotic characteristics. LTER-All Scientists Meeting. Estes Park, CO. September 2015.

J. Brant, **M.T. Trentman**, K. Culbertson, W.K. Dodds. Crayfish effects on ecosystem rates in prairie streams. Society of Freshwater Science annual meeting. May 2014.

## **AWARDS**

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Graduate School, University of Notre Dame

- Fall 2018-Graduate Student Professional Development Grant (\$1000)
- Spring 2017-Zahm Research Travel Grant Fund (\$500)

Graduate Student Union, University of Notre Dame

- Fall 2018, Spring 2017, and Spring 2016-Conference Presentation Grant- (total=\$570)

Department of Biological Sciences, University of Notre Dame

- Fall 2018- Matching funds for student research (\$500)
- Fall 2017- Matching funds for student travel (\$500)

WaterSmart Innovations Conference

- Fall 2017, Student travel grant (\$1000)

CUAHSI workshop

- Fall 2017, Student travel grant (\$500)

College of Arts and Sciences, Kansas State University

- Fall 2013 and 2015, Arts & Sciences Graduate Student Research Travel Award (total=\$2000)

Biology Graduate Student Association, Kansas State University

- Spring 2014, Conference travel grant (\$500)
- Spring 2014, Workshop travel grant (\$300)

## **PROFESSIONAL TRAINING AND WORKSHOPS**

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Heterotrophic regimes in streams, Switzerland. Sept. 2018

Using In-Situ Water Quality Sensors: Lagrangian and Eulerian Applications, Gainesville, FL. Nov. 2017

Multivariate Statistics in PRIMER Short Course, Raleigh, NC. July 2016

Fundamentals of Ecosystem Science Short Course, Millbrook, NY. Jan 2016

An Introduction to Structural Equation Modeling for Ecology & Evolutionary Biology, Boston, MA. Jan 2015

Hybrid Single Particle Integrated Trajectory (HYSPLIT) Model Workshop, Silver Spring, MD 2014.

## **SERVICE AND TRAINING**

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Journal ad-hoc reviewer for: Science of the Total Environment, Hydrology, Environmental Science and Technology, Journal of Soil Management, Biogeochemistry, Freshwater Biology, Ecosystems, Freshwater Science, Environmental Monitoring and Assessment, Journal of Environmental Quality, Journal of Great Lakes Research.

Indiana Master Naturalist, Lecture for the Water Cycle, 2019.

ND Linked Experimental Ecosystem Facility (LEEF), Science Sunday (2015, 2016, 2017, 2018, 2019), open to community

ND Linked Experimental Ecosystem Facility (LEEF), Earth Day Every Day (2016), Teachers and HS students

ND Linked Experimental Ecosystem Facility (LEEF), Developed curriculum for Advanced Chemistry Class (Penn HS, Mishawaka, IN) to teach measurement of phosphorus in aquatic systems. (2016). **Resulted in video which was filmed and aired by local Public Broadcast Station (<https://tinyurl.com/TrentmanOutdoorElements>)**

Society of Freshwater Science- Student Resources Committee; Mentor-Mixer committee chair (2016), Silent Book Auction committee member (2017), Silent Book Auction committee member, (2018)

Society of Freshwater Science- Session Organizer (2014), A. Rugenski, C.L Atkinson, E. Moody, M. T. Trentman. From individuals to ecosystems: Consumer driven nutrient recycling across aquatic ecosystems.

UND Biology Graduate Student Organization Executive Committee; Vice President (2017-2018), Treasurer (2016-2017)

KSU Biology Graduate Student Association Executive Committee; Treasurer (2014), Food-Fun Committee Chair (2014)

Wamego High School Science Fair (KS), Guest Judge (2014)