

Rebecca (Manners) Diehl

Research Assistant Professor · Department of Geography
University of Vermont · 200 Old Mill, 94 University Place · Burlington, VT 05405

Rebecca.Diehl@uvm.edu

813-240-6382

EDUCATION

2013	PhD, Watershed Sciences	Utah State University
2006	MA, Geography	University of North Carolina, Chapel Hill
2004	BA, Geography Modified with Earth Sciences	Dartmouth College

POSITIONS HELD

2019-present	<i>Research Assistant Professor</i> , Department of Geography, University of Vermont
2018-2019	<i>Postdoctoral Associate</i> , Department of Geography and Gund Institute, University of Vermont
2015-2018	<i>NSF Science, Engineering, and Education for Sustainability Fellow</i> , Department of Geosciences, University of Montana
2013-2015	<i>Postdoctoral Researcher</i> , Department of Geosciences, University of Montana
2011-2012	<i>Primary Instructor</i> , Department of Watershed Sciences, Utah State University
2008-2012	<i>SJ Quinney Fellow</i> , Department of Watershed Sciences, Utah State University
2006-2008	<i>Consultant-Fluvial Geomorphologist</i> , Inter-fluve, Inc., Hood River, Oregon

PUBLICATIONS IN REVIEW

2022. Diehl, R.M., K.L. Underwood, S.P. Triantafyllou, D.S. Ross, S. Drago, B.C. Wemple. Multi-scale Drivers of Spatial Patterns in Floodplain Deposition. Submitted to *Earth Surface Processes and Landforms* August 19, 2022.

PEER-REVIEWED PUBLICATIONS

2022. Wiegman, A.R.H., G.H. Myers, I.C. Augustin, M.J. Fein-Cole, V.L. Perillo, D.S. Ross, **R.M. Diehl**, K.L. Underwood, W.B. Bowden, E.D. Roy. Potential for soil legacy phosphorus release from restored riparian wetlands within an agricultural landscape. *Biogeochemistry*, <https://doi.org/10.1007/s10533-022-00972-2>
2022. Bywater-Reyes, S., **R.M. Diehl**, A.C. Wilcox, J. Stella, L. Kui. Green New Balance: Interactions among riparian vegetation plant traits and morphodynamics in alluvial rivers. *Earth Surface Processes and Landforms*, 47(10), 2410-2436.
2022. Gourevitch, J.D., **R.M. Diehl**, B.C. Wemple, T.H. Ricketts. Inequities in the distribution of flood risk under floodplain restoration and climate change scenarios, *People and Nature*, <https://doi.org/10.1002/pan3.10290>
2021. **Diehl, R.M.**, J.D. Gourevitch, S. Drago, B.C. Wemple. Improving flood hazard datasets using a low-complexity, probabilistic floodplain mapping approach. *PLOS ONE*, 16(3): e0248683. <https://doi.org/10.1371/journal.pone.0248683>
2020. **Diehl, R.M.**, A.C. Wilcox, J.C. Stella. Evaluation of the integrated riparian ecosystem response to future flow regimes on semiarid rivers in Colorado, USA. *Journal of Environmental Management*, 271:111037
2019. Kui, L., J.C. Stella, R.M. Diehl, A.C. Wilcox, A. Lightbody, L. Sklar. Can environmental flows moderate riparian invasions? The influence of seedling morphology and density on scour losses in experimental floods. *Freshwater Biology*, 64(3): 474-484.
2018. **Diehl, R.M.**, A.C. Wilcox, D.M. Merritt, D. Perkins, J.A. Scott. Development of an eco-geomorphic modeling framework to evaluate riparian ecosystem response to flow-regime changes. *Ecological Engineering*, 123: 112-126.
2018. Bywater-Reyes, **R.M. Diehl**, A.C. Wilcox. The influence of a vegetated bar on channel-bend flow dynamics. *Earth Surface Dynamics*, 6, 487-503.
2017. **Diehl, R.M.**, D.M. Merritt, A.W. Wilcox, M. Scott. Applying Functional Traits to Ecogeomorphic Processes in Riparian Ecosystems. *Bioscience*, 67, 729-743.
2017. Bywater-Reyes, S., A.C. Wilcox, and **R.M. Diehl**. Multi-scale influence of woody riparian vegetation on

- fluvial topography quantified with ground-based and airborne LiDAR. *Journal of Geophysical Research-Earth Surface*, 122, 1218-1235.
2017. **Diehl, R.M.**, A.W. Wilcox, J. Stella, L. Jui, Sklar, L, and A. Lightbody. Fluvial sediment supply and pioneer woody seedlings as a control on bar-surface topography. *Earth Surface Processes and Landforms*, doi:10.1002/esp.4017.
2015. **Manners, R.B.**, A.W. Wilcox, L. Jui, A. Lightbody, J. Stella, and Sklar, L. When do plants matter? Plant-morphodynamic interactions under variable flow and sediment supply rates. *Journal of Geophysical Research- Earth Surface*, 120, 324-325, doi:10.1002/2014JF003265.
2014. **Manners, R.B.**, J.C. Schmidt, and M. Scott. Mechanisms of vegetation-induced channel narrowing on an unregulated canyon-bound river: Results from a natural field-scale experiment. *Geomorphology*, 211, 100-115.
2013. **Manners, R.B.**, J.C. Schmidt, and J.M. Wheaton. Multi-scalar model for the determination of spatially explicit riparian vegetation roughness. *Journal of Geophysical Research- Earth Surface*, DOI: 10.1029/2011JF002188.
2008. Magilligan, F.J., P.B. Goldstein, G.B. Fisher, B.C. Bostick, and **R.B. Manners**. Late Quaternary hydroclimatology of a hyper-arid Andean watershed: Climate change, floods, and hydrologic responses to the El Niño- Southern Oscillation in the Atacama Desert. *Geomorphology*, 101, 14-32.
2008. **Manners, R.B.** and M.W. Doyle. A mechanistic model of woody debris jam evolution and its application to wood-based restoration and management. *River Research and Applications*, 24, 1104-1123.
2008. Small, M.J., M.W. Doyle, **R.B. Manners**, and R. Fuller. Hydrologic vs. geomorphic limitation on CPOM storage in stream ecosystems. *Freshwater Biology*, 53, 1618-1631.
2007. **Manners, R.B.**, M.W. Doyle and M.J. Small. The Structure and Hydraulics of Natural Debris Jams. *Water Resources Research*, 43, W06432, doi:10.1029/2006WR004910.
2007. **Manners, R.B.**, F.J. Magilligan, P. Goldstein. Floodplain development, El Niño, and cultural adaptation in a hyper-arid Andean environment. *Annals of the Association of American Geographers*, 97, 229-249.

BOOK CHAPTERS

2016. Julian, J.P., C.J.P. Podolak, K.M. Meitzen, M.W. Doyle, **R.B. Manners**, E.T. Hester, S. Ensign, N.A. Wilgruber. Shaping the Physical Template: Biological, Hydrological, and Geomorphic Connections in Stream Channels in Stream Ecosystems in a Changing Environment, ed. Jones, J. and E.H. Stanley, Academic Press.
2012. Riggsbee, J.A., M.W. Doyle, J.P. Julian, **R.B. Manners**, J. Sholtes, J. Muehlbauer, and M.J. Small. Influence of Aquatic and Semi-Aquatic Organisms on Channel Forms and Processes in Treatise on Geomorphology, ed. John Schroder, Academic Press

OTHER SIGNIFICANT PRODUCTS

2021. **Diehl, R.M.**, B.C. Wemple, K.L. Underwood, D. Ross. Evaluating floodplain potential for sediment and phosphorus deposition: Development of a framework to assist in Lake Champlain Basin planning. Technical Report to the Lake Champlain Basin Program, https://www.lcbp.org/wp-content/uploads/2016/03/100_EvaluatingFloodplainPotentialforSedimentandPhosphorusDeposition.pdf
2021. Underwood, K.L., **R.M. Diehl**, J.E. Matt, S. Drago. Integration of stream geomorphic assessment data with low-complexity hydraulic models to improve floodplain mapping. Technical Report to the Vermont Water Resources and Lake Studies Center, September 30, 2021.

INVITED PRESENTATIONS

2021. **Diehl, R.M.** and K. Underwood. “Creating better flood inundation maps from a topographically-driven model”, VCGI Geo-enlightenment Series, December 8, 2021.
2020. **Diehl, R.M.** ““The inundation frequency and phosphorus retention capacity of floodplains: Development of a framework to support Lake Champlain Basin planning”, Lake Champlain Federal Partners Meeting, December 10th, 2020.
2020. **Diehl, R.M.** “Flood inundation mapping with implications for nutrient retention”, University of Vermont’s Gund Institute for Environment GundxChange Seminar Series, September 25, 2020.
2019. **Diehl, R.M.** “Insights into controls on floodplain sediment deposition over multiple scales: from the stem to

- the watershed,” UVM Geology Department Seminar, November 11, 2019.
2018. **Diehl, R.M.** “Insights into controls on floodplain sediment deposition over multiple scales: from the stem to the watershed,” UVM Gund Institute of Environment Tea, October 18, 2018.
2015. **Diehl, R.M.**, D.M. Merritt, A.C. Wilcox, M. Scott, “Identifying vegetation’s influence on multi-scale fluvial processes based on plant trait adaptations,” EP53-01, American Geophysical Union, December 14-18, 2015, San Francisco, CA.
2015. **Manners, R.B.**, “Identifying Flows Necessary to Maintain Critical Physical and Ecological Processes for the Riparian Ecosystems of the Yampa and Green Rivers”, Dinosaur National Monument Research Symposium, February 11, 2015, Dinosaur, CO.
2014. **Manners, R.B.**, “The structural and hydraulic dynamics of natural wood jam evolution”, ASCE EWRI Congress, June 1-5, 2014, Portland, OR.
2014. **Manners, R.B.**, “When do plants influence river process and form? Plant-morphodynamic interactions under variable flow and sediment transport rates,” University of Montana Department of Geosciences Seminar, February 24, 2014, Missoula, MT.
2013. **Manners, R.B.**, A. Lightbody, A.C. Wilcox, L. Sklar, J. Stella, and L.Kui, “Observations on the balance between abiotic and biotic factors in plant-morphodynamic feedbacks,” American Geophysical Union, December 9-13. San Francisco, CA.
2013. **Manners, R.B.**, “Geomorphic-vegetation linkages in environmental flows,” USGS Northern Rocky Mountain Science Center EcoLunch Seminar Series, May 14, 2013, Bozeman, MT.
2013. **Manners, R.B.** and J.C. Schmidt, “Environmental flows for the maintenance of a multi-thread planform on the Yampa River,” Dinosaur River Science Symposium, Dinosaur National Monument, February 27, 2013, Dinosaur, CO.
2012. **Manners, R.B.** and J.C. Schmidt, “Geomorphic and vegetative interactions and feedbacks on the Yampa and Green Rivers, Dinosaur National Monument,” Dinosaur National Monument Outfitters and Guides Seminar, May 10, 2012, Dinosaur, CO.

CONTRIBUTED PRESENTATIONS AT PROFESSIONAL MEETINGS

2020. **Diehl, R.M.**, B.C. Wemple, K.L. Underwood, E.D. Roy, D.S. Ross. “Building a mechanistic understanding of phosphorus retention on floodplains to inform restoration prioritization in the Lake Champlain Basin” American Geophysical Union’s Fall Meeting, December 14th, 2020.
2019. **Diehl, R.M.**, B.C. Wemple, S. Drago, D.S. Ross. “Building an understanding of floodplain functioning to inform effective management in the Lake Champlain Basin.” H53L-1939. American Geophysical Union’s Fall Meeting, December 13, 2019, San Francisco, CA.
2019. Drago, S., **R.M. Diehl**, K. Underwood, J. Gourevitch, B.C. Wemple. “Quantifying floodplain water storage and benefits of floodplain restoration for the Lake Champlain Basin in Vermont.” H53L-1949, American Geophysical Union’s Fall meeting, December 13, 2019, San Francisco, CA.
2019. **Diehl, R.M.**, B.C. Wemple, K. Underwood, D.S. Ross. “Evaluating floodplain potential for sediment and nutrient retention: Development of a framework to assist in Lake Champlain Basin Planning”, Vermont Geological Society’s Winter Meeting, February 2, 2019, Norwich University, Northfield, Vermont.
2018. **Diehl, R.M.**, “Geomorphic and hydrologic controls on invasive riparian plants may guide bottom-up management: Lessons imported from the Southwestern United States. Lake Champlain Research Conference”, UVM, January 8-9, 2018
2018. **Diehl, R.M.**, A. Wilcox, D. Merritt, J. Scott, and D. Perkins. “Insights into the sensitivity and resilience of riparian ecosystems to flow regime shifts through a coupled ecogeomorphic model.” 39th Annual Researchers Meeting of the Upper Colorado River Endangered Fish Recovery Program, Vernal, Utah, January 23-24, 2018.
2017. **Diehl, R.M.**, A. Wilcox, D. Merritt, and D. Perkins. “Insights into the sensitivity and resilience of the Yampa and Green River’s ecosystems to flow regime shifts through a coupled ecogeomorphic model.” American Geophysical Union Fall Meeting, December 11-15, 2017, New Orleans, LA.
2012. **Manners, R.B.** and J.C. Schmidt, “A 50-year natural experiment: The impact of non-native riparian vegetation on an unregulated canyon-bound river,” American Geophysical Union Fall Meeting, December 3-7, 2012, San Francisco, CA.
2011. **Manners, R.B.**, J.C. Schmidt, and J.M. Wheaton, “Multi-scalar model for the determination of spatially explicit roughness,” American Geophysical Union Fall Meeting, December 5-9, 2011, San Francisco, CA.

2010. **Manners, R.B.**, J.C. Schmidt, and J.M. Wheaton, “Field characterization of stand structure and the quantification of flow field alterations of a woody riparian shrub indicates that scale matters,” American Geophysical Union Fall Meeting, December 13-17, 2010, San Francisco, CA.
2009. **Manners, R.B.** and J.C. Schmidt, “Chicken or egg? Geomorphic controls on tamarisk and tamarisk controls on geomorphology within the Colorado River Basin,” Binghamton Geomorphology Symposium. October 2-4, 2009, Blacksburg, VA
2006. **Manners, R.B.** and M.W. Doyle, “The Structure and Hydraulics of Natural Debris Jams,” International Conference on Riverine Hydroecology: Advances in Research and Applications, August 14-18, 2006, Stirling, Scotland.
2005. **Manners, R.B.**, F.J. Magilligan and P. Goldstein, “Floodplain development, El Niño, and cultural adaptation in a hyper-arid Andean environment,” Association of American Geographers Annual Meeting, April 2005, Denver, CO.

GRANTS

- Cooperative Institute of Research to Operations in Hydrology (CIROH). “Improved representation of floodplains and natural features in the National Water Model.” B.C. Wemple (PI), R.M. Diehl (co-PI), K. Underwood (co-PI). **September 2022 to August 2025**, \$2.25 million.
- Lake Champlain Sea Grant. “Scientific and procedural development of evidence-based floodplain crediting protocol to meet water quality goals in the Lake Champlain Basin.” R.M. Diehl (PI), K. Underwood, B. Wemple, **February 2022 to January 2024**, \$147,484.
- NRCS Conservation Effects Assessment Project. “Quantifying the water quality benefits provided by restored riparian wetlands in Vermont’s agricultural landscape.” E. Roy (PI), R.M. Diehl (co-PI), K. Underwood, **August 2021 to September 2024**, \$333,741.
- VT NASA EPSCoR Research Infrastructure Development. “Evaluation of Remote Sensing of Total Suspended Solids in the Lake Champlain Basin.” R.M. Diehl (PI), Luis Garcia, and Kristen Underwood, **September 2021 to September 2022**. \$25,000.
- The National Park Service. “Development and critique of a flow prescription for the Yampa River.” R.M. Diehl (PI), **November 2021 to March 2022**. \$18,296.
- The Nature Conservancy Vermont. “TNC-UVM Geography Partnership: Towards an improved understanding of floodplain sediment and phosphorus deposition rates.” R.M. Diehl (PI), **May 2021 to March 2022**. \$14,808.
- Vermont DEC. “Phase 2 of the Vermont Functioning Floodplain Initiative: Functioning Floodplain Assessment, Mapping, Valuation, and Tracking to Support Floodplain Restoration and Protection in the Lake Champlain Basin.” K. Underwood (PI), R.M. Diehl, B.C. Wemple, E. Roy, D. Rizzo (co-Is). **March 2020 to March 2022**. \$243,961.
- USGS New England Water Science Center. “Hydraulic Modeling to Support Vermont’s Functioning Floodplain Initiative,” K. Underwood (PI), R.M. Diehl (co-I). **March 2020 to March 2021**. \$31,000
- Lake Champlain Basin Program Technical Grant. Evaluating floodplain potential for sediment and nutrient retention: Development of a framework to assist in Lake Champlain Basin planning. B. Wemple (PI), **R.M. Diehl** (co-PI), K. Underwood, D. Ross (co-Is). **2019 to 2020**. \$168,076.
- NSF Science, Engineering, and Education for Sustainability (SEES) Fellowship. An Integrative Model of Riparian Ecosystem Dynamics to Support Sustainable Management of Regulated Rivers. **R.M. Diehl** (PI), A. Wilcox, D. Merritt (co-Is). **2014 to 2018**. \$375,300.
- Colorado Plateau Cooperative Ecosystem Studies Unit. Investigate floodplain processes and riparian ecosystem linkages on the Yampa River and on the middle Green River in Dinosaur National Monument, Moffat County, Colorado, and Uintah County, Utah. J. Schmidt (PI), **R. Manners** (co-I). **2011-2013**. \$13,500
- NSF Doctoral Dissertation Improvement Grant. Multi-scalar geomorphic and vegetative feedbacks in the Colorado River Basin. J. Schmidt (PI), **R. Manners** (co-I). 2010-2012. \$12,000.
- USGS Southwest Biological Science Center. Predicting and detecting changes to riparian vegetation communities along the large rivers of the Colorado Plateau as a result of climate change. J. Schmidt (PI), **R. Manners** (co-I). 2010-2011. \$34,655.

TEACHING & ADVISING

Student Committees

Jeremy Matt (PhD)

Scott Lawson (M.S.)
Stephanie Drago (M.S.)
Shayla Triantifillou (B.S.)

Co-Instructor (2016-2018)

Wetland/Riparian Ecology and Management, Graduate Level
LRES, Montana State University

Co-Instructor (2015)

Geomorphology, Upper/Graduate Level
Department of Geosciences, University of Montana

Primary Instructor (2011, 2012)

Fluvial Geomorphology, Upper/Graduate Level
Department of Watershed Sciences, Utah State University

Teaching Assistant (2010)

Small Watershed Hydrology, Upper Level
Watershed Sciences Department, Utah State University

Teaching Assistant (2006, 2007)

Physical Geography, Introductory
University of North Carolina, Chapel Hill

Guest Lecturer

The Geography of Water: Hydrology of Forested Landscapes, University of Vermont, **Fall 2019**
Ecological Stream Restoration in the Context of Montana Regulations,
Professional Workshop, MT Water Center, **Fall 2015**
Freshwater Ecology, Montana State University, **Fall 2014**
Process Geomorphology, University of Montana, **Spring 2014**
Fluvial Geomorphology, University of Montana, **Fall 2013**
Small Watershed Hydrology, Utah State University, **Spring 2010**
Fundamentals of Watershed Science, Utah State University, **Spring 2010**
Physical Geography, University of North Carolina, **Fall 2007**

AWARDS AND HONORS

Association of American Geographers- Reds Wolman Student Research Award, **2005&2012**
Stirling Hydroecology Student Presentation Winner, ISWWR II, **2006**
Magna Cum Laude, Dartmouth College, **2004**
Presidential Scholar, Dartmouth College, **2004**
George Perkins Marsh Thesis Award, Dartmouth College, **2004**
Geography Department Honors Thesis Award, Dartmouth College, **2004**

SERVICE AND OUTREACH

Board of Directors: *Friends of the Mad River* (2021-)
Service-Learning Partner: *GEOG244 Dendrochronology* Fall 2021
Journal Reviewer: *Annals of the Association of American Geographers*, *Earth Surface Processes & Landforms*,
Environmental Management, *Geomorphology*, *Journal of Geophysical Research-Earth Surface*, *Journal of*
Geophysical Research-Biogeosciences, *Journal of Hydraulic Engineering*, *Water Resources Research*
Committees/Panels: *Graduate student representative on Geography faculty position search committee at Utah State*
University, *ASCE technical committee on River Restoration*, *Participant on Tamarisk Coalition's Tamarisk*
Beetle Expert Panel, *Member of UVM Gund Institute Post-Doc Review Committee*
Media: *LCBP documentary on Water Street Park*, *University of Montana University Relations Interview*, *UVM*
Office of Engagement story: <https://www.uvm.edu/news/engagement/uvm-lab-receives-funds-produce-updated-vermont-map>