

## **Erich T. Hester, Ph.D., P.E.**

Via Department of Civil and Environmental Engineering  
Virginia Tech  
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### PROFESSIONAL APPOINTMENTS

**Virginia Tech** – Blacksburg, VA  
Department of Civil and Environmental Engineering  
Associate Professor, 2016-present  
Assistant Professor, 2009-2015

**Herrera Environmental Consultants** – Seattle, WA  
Hydraulic Engineer, 2002-2003

**Philip Williams and Associates** – San Francisco, CA  
Water Resources Engineer, 2001-2002

**LFR** – Emeryville, CA  
Project Engineer, 1998-2001

**Ecology and Environment** – San Francisco, CA  
Staff Scientist, 1993-1995

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### EDUCATION

**Ph.D. University of North Carolina – Chapel Hill**  
Ecology, 2008

*Dissertation: Impact of Geomorphic Structures on Hyporheic Exchange, Temperature, and Biological Processes in Streams*

**M.S. Stanford University**  
Civil and Environmental Engineering, 1998  
*Specialization: Environmental Fluid Mechanics and Hydrology*

**A.B. Dartmouth College**  
Biology, 1992  
*Specialization: Ecology*

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### HONORS AND AWARDS

**AAAS Science & Technology Policy Fellow**, U.S. Dept of Energy, Water Power Technologies Office, 2022-present

**Fulbright Senior Scholar**, National Taiwan University, 2017-2018

**U.S. EPA STAR Graduate Fellowship**, 2006-2008

**UNC Kenan Fellowship**, 2004-2008

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### PROFESSIONAL REGISTRATION

**Professional Engineer**, Civil Engineering  
Washington State, 2003  
Virginia, 2009

PEER REVIEWED  
PUBLICATIONS

Underline = student  
from Hester Lab

Santizo, K.Y., M.W. Widdowson, and E.T. Hester. 2022. Numerical modeling of an abiotic hyporheic mixing-dependent reaction: Chemical evolution of mixing and reactant production zones. *Journal of Contaminant Hydrology*, 251:104066.

Amaya, M., F. Duchin, E.T. Hester, and J.C. Little. 2022. Applying a coupled hydrologic-economic modeling framework: Evaluating conjunctive use strategies for alleviating seasonal watershed impacts caused by agricultural intensification. *Frontiers in Water* 4:913501.

Amaya, M., F. Duchin, E.T. Hester, and J.C. Little. 2022. Applying a coupled hydrologic-economic modeling framework: Evaluating alternative options for reducing impacts for downstream locations in response to upstream development. *Sustainability*, 14:6630.

Lotts, W.S., and E.T. Hester. 2022. Pipe dreams: The effects of stream bank soil pipes on hyporheic denitrification caused by a peak flow event. *Water Resources Research*, 58, e2021WR030312.

Calfe, M.L., D.T. Scott, Hester, E.T. 2022. Nitrate removal by watershed-scale hyporheic stream restoration: Modeling approach to estimate effects and patterns at the stream network scale. *Ecological Engineering*, 175: 106498.

Hester, E.T., K.Y. Santizo, A.A. Nida, and M.A. Widdowson. 2021. Hyporheic transverse mixing zones and dispersivity: Laboratory and numerical experiments of hydraulic controls. *Journal of Contaminant Hydrology*, 243: 103885.

Hester, E.T., and G.A. Fox. 2020. Preferential flow in riparian groundwater: Gateways for watershed solute transport and implications for water quality management. *Water Resources Research*, 56, e2020WR028186.

Santizo, K.Y., M.A. Widdowson, and E.T. Hester. 2020. Abiotic mixing-dependent reaction in a laboratory simulated hyporheic zone. *Water Resources Research* 56, e2020WR027090.

Hester, E.T., A.M. McEwen, B. Kim, and E. Rost. 2020. Abundance, distribution, and geometry of naturally occurring streambank soil pipes. *Freshwater Science* 39(4):735–751.

Hester, E.T., A.Y.-C. Lin, and C.W. Tsai. 2020. Effect of floodplain restoration on photolytic removal of pharmaceuticals. *Environmental Science & Technology* 54, 3278–3287.

Lotts, W.S., and E.T. Hester. 2020. Filling the void: the effect of streambank soil pipes on transient hyporheic exchange during a peak flow event. *Water Resources Research* 56(2), e2019WR025959.

Rana, S.M.M., D.L. Boccelli, D.T. Scott, and E.T. Hester. 2019. Parameter uncertainty with flow variation of the one-dimensional solute transport model for small streams using Markov chain Monte Carlo. *Journal of Hydrology* 575:1145-1154.

Hester, E.T., L.A. Eastes, and M.A. Widdowson. 2019. Effect of surface water stage fluctuation on mixing-dependent hyporheic denitrification in riverbed dunes. *Water Resources Research* 55(6):4668-4687.

Little, J.C., E.T. Hester, S. Elsayah, G.M. Filz, A. Sandu, C.C. Carey, T. Iwanaga, and A.J. Jakeman. 2019. A tiered, system-of-systems modeling framework for resolving complex socio-environmental policy issues. *Environmental Modelling and Software* 112:82-94.

Hester, E.T., K.L. Little, J.D. Buckwalter, C.E. Zipper, and T.J. Burbey. 2019. Variability of subsurface structure and infiltration hydrology among surface coal mine valley fills. *Science of the Total Environment* 651:2648–2661.

Wade, C.M., K.M. Cobourn, G.S. Amacher, and E.T. Hester. 2018. Policy targeting to reduce economic damages from land subsidence. *Water Resources Research* 54:4401–4416.

- Keys, T.A., H. Govenor, C.N. Jones, W.C. Hession, E.T. Hester, and D.T. Scott. 2018. Effects of large wood on floodplain connectivity in a headwater Mid-Atlantic stream. *Ecological Engineering* 118:134-142.
- Hester, E.T., K.E. Brooks and D.T. Scott. 2018. Comparing reach scale hyporheic exchange and denitrification induced by instream restoration structures and natural streambed morphology. *Ecological Engineering* 115:105-121.
- Greer, B.M., T.J. Burbey, C.E. Zipper, and E.T. Hester. 2017. Electrical resistivity imaging of preferential flow through surface coal mine valley fills with comparison to other land forms. *Hydrological Processes* 31(12):2244-2260.
- Hester, E.T., M.B. Cardenas, R. Haggerty, and S.V. Apte. 2017. The importance and challenge of hyporheic mixing. *Water Resources Research* 53(5):3565-3575.
- Rana, S.M.M., D.T. Scott, and E.T. Hester. 2017. Effects of in-stream structures and channel flow rate variation on transient storage. *Journal of Hydrology* 548:157-169.
- Hester, E.T., B. Hammond, and D.T. Scott. 2016. Effects of inset floodplains and hyporheic exchange induced by in-stream structures on nitrate removal in a headwater stream. *Ecological Engineering* 97:452-464.
- Clark, E.V., B.M. Greer, C.E. Zipper, and E.T. Hester. 2016. Specific conductance-stage relationships in Appalachian valley fill streams. *Environmental Earth Sciences* 75:1222.
- Hester, E.T., C.R. Guth, D.T. Scott, and C.N. Jones. 2016. Vertical surface water-groundwater exchange processes within a short residence time floodplain induced by experimental floods along a headwater stream. *Hydrological Processes* 30(21):3770-3787.
- Julian, J., C. Podolak, K. Meitzen, M. Doyle, R. Manners, E. Hester, S. Ensign, and N. Wilgruber. Bio-hydro-geomorphic connections in stream channels. 2016. Chapter in *Streams in a Changing Environment* (J. Jones and E. Stanley, eds.).
- Little, J. C., E.T. Hester, and C.C. Carey. 2016. Assessing and enhancing environmental sustainability - A conceptual review. *Environmental Science & Technology* 50:6830-6845.
- Jones, C.N., D.T. Scott, C.R. Guth, E.T. Hester, and W.C. Hession. 2015. Seasonal variation in floodplain biogeochemical processing in a restored headwater stream. *Environmental Science & Technology* 49:13190-13198.
- Evans, D., C. Zipper, E.T. Hester, and S. Schoenholtz. 2015. Hydrologic effects of surface coal mining in Appalachia (USA). *Journal of the American Water Resources Association* 51(5):1436-1452.
- Menichino, G.T., and E.T. Hester. 2015. The effect of macropores on bi-directional exchange between a stream channel and riparian groundwater. *Journal of Hydrology* 529(3):830-842.
- Menichino, G.T., D.T. Scott, and E.T. Hester. 2015. Abundance and dimensions of naturally occurring macropores along stream channels and the effects of artificially constructed large macropores on transient storage. *Freshwater Science* 34(1):125-138.
- Hester, E.T., K.I. Young, and M.A. Widdowson. 2014. Controls on mixing-dependent denitrification in hyporheic zones induced by riverbed dunes: a steady-state modeling study. *Water Resources Research* 50(11):9048-9066.
- Azinheira, D.L., D.T. Scott, W.C. Hession, and E.T. Hester. 2014. Comparison of effects of inset floodplains and hyporheic exchange induced by in-stream structures on solute retention. *Water Resources Research* 50(7):6168-6190.

Menichino, G.T., and E.T. Hester. 2014. Hydraulic and thermal effects of in-stream structure-induced hyporheic exchange across a range of hydraulic conductivities. *Water Resources Research* 50(6):4643-4661.

Hester, E.T., and E.N. Cranmer. 2014. Variation of hyporheic exchange potential among urban streams and implications for stream restoration. *Environmental & Engineering Geoscience* 20(3):287-304.

Menichino, G.T., A.S. Ward, and E.T. Hester. 2014. Macropores as preferential flow paths in meander bends. *Hydrological Processes* 28(3):482-495.

Hester, E.T., K.I. Young, and M.A. Widdowson. 2013. Mixing of surface and groundwater induced by riverbed dunes: implications for hyporheic zone definitions and pollutant reactions. *Water Resources Research* 49:5221–5237.

Hester, E.T., and J.C. Little. 2013. Measuring environmental sustainability of water in watersheds. *Environmental Science & Technology* 47(15):8083-8090. Article featured on the cover of August 6, 2013, issue.

Hester, E.T., and K.S. Bauman. 2013. Stream and retention pond thermal response to heated summer runoff from urban impervious surfaces. *Journal of the American Water Resources Association* 49(2):328-342.

Hester, E.T. and M.W. Doyle. 2011. Human impacts to river temperature and their effects on biological processes: a quantitative synthesis. *Journal of the American Water Resources Association* 47(3):571-587.

Hester, E.T. and M.N. Gooseff. 2011. Hyporheic restoration of streams and rivers. Chapter in AGU Geophysical Monograph entitled *Stream Restoration in Dynamic Fluvial Systems: Scientific Approaches, Analyses, and Tools* (Simon, A., S.J. Bennett, and J.M. Castro, Eds.).

Hester, E.T. and M.N. Gooseff. 2010. Moving Beyond the banks: Hyporheic restoration is fundamental to restoring ecological services and functions of streams. *Environmental Science & Technology* 44(5):1521-1525. Article featured on the cover of March 1, 2010, issue.

Hester, E.T., M.W. Doyle, and G.C. Poole. 2009. The influence of in-stream structures on summer water temperatures via induced hyporheic exchange. *Limnology and Oceanography* 54:355-367.

Hester, E.T. and M.W. Doyle. 2008. In-stream geomorphic structures as drivers of hyporheic exchange. *Water Resources Research* 44:W03417.

Chervitz S.A., Hester E.T., Ball C.A., Dolinski K., Dwight S.S., Harris M.A., Juvik G., Malekian A., Roberts S., Roe T., Scafe C., Schroeder M., Sherlock G., Weng S., Zhu Y., Cherry J.M., Botstein D. 1999. Using the Saccharomyces Genome Database (SGD) for analysis of protein similarities and structure. *Nucleic Acids Research* 27(1):74-78.

Cherry J.M., Adler C., Ball C., Chervitz S.A., Dwight S.S., Hester E.T., Jia Y.K., Juvik G., Roe T., Schroeder M., Weng S.A., Botstein D. 1998. Saccharomyces Genome Database. *Nucleic Acids Research* 26(1):73-79.

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NEWSLETTERS  
AND TRADE  
PUBLICATIONS

Grant, S.B., H. Zhang, S.V. Bhide, T. Birkland, E. Berglund, A. Dietrich, J.L. Druhan, M. Edwards, S. Entrekin, J. Gomez-Velez, E. Hester, E.M. V. Hoek, E.R. Hotchkiss, D. Jassby, S.S. Kaushal, P. Kumar, K. Lopez, A. Maile-Moskowitz, K. McGuire, S. Mohanty, E.A. Parker, G. Prelewicz, M.A. Rippey, E.J. Rosenfeldt, T. Schenk, K. Schwabe, and P. Vikesland. 2021. Reversing freshwater salinization: A holistic approach. *Advances in Water Research* July-September: 24-28.

Hester, E.T., K.L. Little, J.D. Buckwalter, C.E. Zipper, and T.J. Burbey. 2019. How infiltration hydrology varies among Appalachian coal-mine valley fills. *Reclamation Matters* Spring:37-39.

Hester, E.T., B.M. Greer, C.E. Zipper, and T.J. Burbey. 2016. Using geophysical imaging to track water movement through surface coal mine valley fills. *Reclamation Matters* Spring:36-39.

Science Wednesday: Going with the Flow - Does Stream Restoration Work? *Greenversations*: Official blog of the U.S. Environmental Protection Agency. November 5, 2008. [blog.epa.gov/blog/2008/11/05/sw-stream-restoration/](https://blog.epa.gov/blog/2008/11/05/sw-stream-restoration/)

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PUBLISHED DATA  
ARCHIVES

Santizo, K. Y., M. A. Widdowson, and E. T. Hester. 2020. Abiotic mixing-dependent reaction in a laboratory simulated hyporheic zone, HydroShare, <https://doi.org/10.4211/hs.2fcd4f8978734d0fb0843ff0604929a7>.

Lotts, W. S., and E. Hester. 2020. Filling the void: the effect of riverbank streambank soil pipes on transient hyporheic exchange during a peak flow event, HydroShare, <https://doi.org/10.4211/hs.fbf812c4d72d4a89b941645ffb69df75>.

McEwen, A. M., and E. Hester. 2019. Abundance, distribution, and geometry of naturally occurring streambank soil pipes, HydroShare, <https://doi.org/10.4211/hs.deeacf38f730458d87957b8aeeb6f52f>.

Hester, E., L. A. Eastes, and M. A. Widdowson. 2019. Effect of surface water stage fluctuation on mixing-dependent hyporheic denitrification in riverbed dunes, HydroShare, <https://doi.org/10.4211/hs.4a46c1445fb144a8a03b00d2e338bcfd>.

Hester, E., K. L. Little, J. D. Buckwalter, C. E. Zipper, and T. J. Burbey. 2018. Variability of subsurface structure and infiltration hydrology among surface coal mine valley fills, HydroShare, <https://doi.org/10.4211/hs.b1d5fd2c2d3e49878d86cb7c2d483d2a>.

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CONFERENCE  
PRESENTATIONS  
(last ~5 years)

Hester, E.T., M. Calfe, C. Federman, L. Goodman, and D.T. Scott. 2022. Cumulative impacts of watershed-scale hyporheic stream restoration on nitrate loading to downstream waterbodies. National Stream Restoration Conference, Nashville, TN. August 1, 2022.

Underline = student  
from Hester Lab

Hester, E.T., D.T. Scott, L. Goodman, C. Federman, and N. Kruse Daniels. Translation by David Hirschman. 2022. Watershed effects on success of stream restoration for excess nitrogen mitigation. Chesapeake Bay Trust Pooled Monitoring Form, June 16, 2022.

**Bold** = student  
presenter from  
Hester Lab

Goodman, L., C. Federman, D.T. Scott, and E.T. Hester. 2022. Cumulative effects of stream restoration and watershed characteristics on watershed-scale nitrate removal. World Environmental and Water Resources Congress (American Society of Civil Engineers, Environmental and Water Resources Institute), Atlanta, GA. June 7, 2022.

Hester, E.T., W.S. Lotts, H. Monterroso, K. Strom, and M.W. Widdowson. Effects of microbial growth and death and sediment movement on hyporheic zone biogeochemistry. U.S. Department of Energy Environmental System Science PI Meeting, May 25, 2022.

Hester, E.T., M. Calfe, C. Federman, L. Goodman, and D.T. Scott. 2022. Cumulative effects of multiple stream restoration projects on nitrate removal at the watershed scale. River Restoration Northwest, Skamania, WA. February 9, 2022.

Hester, E.T., W.S. Lotts, H. Monterroso, K. Strom, and M.W. Widdowson. Effects of microbial growth and death and sediment movement on hyporheic zone biogeochemistry. U.S. Department of Energy Environmental System Science PI Meeting, August 18, 2021.

**Lotts, W.S., H. Monterroso,** K. Strom, M. Widdowson, and E.T. Hester. 2021. Interacting effects of microbial growth and dune translation on hyporheic reactions. American Geophysical Union Fall Meeting. December 15, 2021.

Hester, E.T., **M. Calfe, C. Federman,** L. Goodman, and D. T. Scott. 2021. Cumulative effects of stream restoration on nitrate removal at the watershed scale: data synthesis and numerical modeling (**invited**). American Geophysical Union Fall Meeting. December 14, 2021.

**Lotts, W.S.,** and E.T. Hester. 2020. Effect of soil pipes on riverbank denitrification during transient hyporheic exchange caused by a peak flow event. American Geophysical Union Fall Meeting. December 11, 2020.

**Santizo, K.Y.,** M.A. Widdowson, and E.T. Hester. 2020. Numerical modeling of an abiotic hyporheic mixing-dependent reaction: Chemical evolution of mixing and reactant production zones. American Geophysical Union Fall Meeting. December 16, 2020.

**Lotts, W.S.,** and E.T. Hester. 2020. Effect of soil pipes on hydrologic exchange between river channels and riparian zone groundwater with implications for nitrate transport. American Society of Agriculture and Biological Engineering Annual International Meeting, Omaha, NE. July 14, 2020.

Hester, E.T., D.T. Scott, **D.L. Azinheira, K.E. Brooks, M. Calfe, C. Guth, B. Hammond,** A.Y. Lin, and C.W. Tsai. 2020. Can stream and river restoration solve the excess nitrogen problem? River Flow 2020, Delft, Netherlands. July 8, 2020.

**Santizo, K.Y.,** M.A. Widdowson, and E.T. Hester. 2019. Abiotic mixing dependent reaction of sodium sulfite and dissolved oxygen in a laboratory simulated hyporheic zone. American Geophysical Union Fall Meeting, San Francisco, CA. December 12, 2018.

Hester, E.T., **K.Y. Santizo,** M.A. Widdowson, A.I. Nida. 2019. Mixing zones in shallow submerged/hyporheic sediments: experiments and modeling of hydraulic controls. American Geophysical Union Fall Meeting, San Francisco, CA. December 9, 2019.

**Lotts, W.S.,** and E.T. Hester. 2019. Filling the void: the effect of riverbank soil pipes on transient hyporheic exchange during a peak flow event. American Geophysical Union Fall Meeting, San Francisco, CA. December 9, 2019.

Little, J.C, E.T. Hester, S. Elsayah, T. Iwanaga, and A. Jakeman. 2019. A tiered, system-of-systems modeling framework for resolving complex socio-environmental policy issues. Nanjing China. May, 2019.

Hester, E.T., A.Y-C. Lin, and C.W. Tsai. 2019. Effect of floodplain restoration on removal of nitrate and pharmaceuticals: anaerobic and photolytic processes. World Environmental and Water Resources Congress (American Society of Civil Engineers, Environmental and Water Resources Institute), Pittsburgh, PA. April 22, 2019.

Hester, E.T. 2019. Can stream restoration solve the excess nitrogen problem? (**invited**) Engineering Sustainability 2019, Pittsburgh, PA. April 9, 2019.

**Santizo, K.Y.,** E.T. Hester, and M.A. Widdowson. 2018. Simulating abiotic mixing dependent reactions in the hyporheic zone using a laboratory mesocosm. American Geophysical Union Fall Meeting, Washington, DC. December 11, 2018.

Hester, E.T., **L.A. Eastes,** and M.A. Widdowson. 2018. Effect of unsteady surface water hydraulics on mixing-dependent hyporheic denitrification in riverbed dunes. American Geophysical Union Fall Meeting, Washington, DC. December 11, 2018.

**Lotts, W.S.,** and E.T. Hester. 2018. Modeling the effects of macropore length, diameter, and connectivity on transient hyporheic exchange during a peak flow event. American Geophysical Union Fall Meeting, Washington, DC. December 11, 2018.

Hester, E.T., K.E. Brooks, and D.T. Scott. 2018. Comparing reach scale nitrate removal of instream restoration techniques. Ecostream Conference, Asheville, NC. August 14, 2018.

Duchin, F., N. Springer, E.T. Hester, and J.C. Little. 2018. Economic analysis of alternative scenarios about the future. Chesapeake Research & Modeling Symposium, Annapolis, MD. June 13, 2018.

Little, K.L., J. Buckwalter, C. Zipper, T. Burbey, and E.T. Hester. 2018. Using novel geophysical techniques to relate surface coal mining fill characteristics to effluent stream water quality. Annual Meeting of the Association of Mining and Reclamation, St. Louis, MO. June 5, 2018.

McEwen, A.M. and E.T. Hester. 2018. Abundance, distribution, and geometry of naturally occurring macropores in stream banks. Society for Freshwater Science Annual Meeting, Detroit, MI. May 23, 2018.

Keys, T., H. Govenor, C.N. Jones, W.C. Hession, D.T. Scott, E.T. Hester, and L.H. Krometis. 2017. Effects of large wood on river-floodplain connectivity in a headwater Appalachian stream. American Geophysical Union Fall Meeting, New Orleans, LA. December 15, 2017.

Hester, E.T., A.Y.-U. Chen, C.W. Tsai, and D. Kao. 2017. Effect of floodplain inundation on river pollution in Taiwan's strong monsoonal climate. American Geophysical Union Fall Meeting, New Orleans, LA. December 15, 2017.

Hester, E.T. 2017. Recent advances in hyporheic zone science (**invited**). American Geophysical Union Fall Meeting, New Orleans, LA. December 14, 2017.

Santizo, K.Y., L.A. Eastes, E.T. Hester, and M.A. Widdowson. 2017. Mixing-dependent reactions in the hyporheic zone: laboratory and numerical experiments. American Geophysical Union Fall Meeting, New Orleans, LA. December 12, 2017.

Brooks, K.E., D.T. Scott, and E.T. Hester. 2017. Comparing reach scale nitrate removal of instream restoration techniques. World Environmental and Water Resources Congress (American Society of Civil Engineers, Environmental and Water Resources Institute), Sacramento, CA. May 23, 2017.

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STUDENT  
RESEARCH  
ADVISED

**PhD:** Garrett Menichino (2013), Katherine Santizo (2021), William S. Lotts (2022)

**MS:** Kalen Bauman (2010), Elizabeth Cranmer (2011), David Azinheira (2013), Katie Young (2013), Christopher Guth (2014), Abenezer Nida (2015), Breeyn Greer (2015), Benjamin Hammond (2015), Masud Rana (2015), Kristen Brooks (2017), Katie Little (2018), Amiana McEwen (2018), Lauren Eastes (2018), Michael Calfe (2019), Carly Federman (2021), Hector Monterroso (2021), Morgan Oehler (current)

**Undergraduate Research:** Amanda Donaldson (2017 NSF-REU), Dylan Honardoust (2017), Aubrey McCutchan (2016 NSF-REU), Jacob Schlotterer (2016), Alejandra Revilla Cisneros (2014), Kenneth Sears (2013 NSF-REU), Jingjie Chen (2012), Kate Aulenbach (2012 NSF-REU), Victoria Sicking (2011 NSF REU), Katie Young (2011-12), Lei Jiang (2010, 2009), Taylor Priest (2009), Jason Johnson (2007), Myles Killar (2005-7), Meredith Harvill (2006)

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SPONSORED  
RESEARCH

Chesapeake Bay Trust, \$213,857 (PI). "Watershed effects on success of stream restoration for excess nitrogen mitigation". 2020-2023.

U.S. Department of Energy, Subsurface Biogeochemical Research, \$200,000 (PI). “Effects of surface water fluctuations and sediment movement on hyporheic zone biogeochemistry and microbial communities.” 2020-2023.

Fulbright Core Scholar Program in Taiwan (PI). “Effect of floodplain inundation on river pollution in Taiwan’s strong monsoonal climate.” 2017-2018.

Office of Surface Mining Reclamation and Enforcement, \$200,000 (PI). “Using novel geophysical techniques to relate surface coal mining fill characteristics to effluent stream water quality.” 2017-2019.

NSF-GEO-Hydrologic Sciences, \$252,411 (PI). “Impact of macropores and soil pipes on hyporheic exchange in streams.” 2015-2019.

NSF-ENG-Environmental Engineering, \$330,000 (PI). “Natural attenuation of groundwater contaminant plumes in riverbeds: Control by hyporheic mixing.” 2014-2019.

Virginia Tech College of Engineering, \$32,245 (PI). “Stream Restoration to Clean Up Chesapeake Bay.” 2014-2015.

Institute for Critical Technology and Applied Science (ICTAS) at Virginia Tech, \$45,000 (co-PI, PI=Durelle Scott). “Floodplain restoration: Balance between nutrient retention and greenhouse gas production.” 2014-2015.

Wells Fargo Innovation Grant, \$100,000 (PI). “Subsurface imaging: A technology application to aid water management by Appalachian coal mines.” 2013-2015.

Jeffress Memorial Trust, \$10,000 (PI). “Importance of macropores for hyporheic exchange and function in stream and river ecosystems.” Follow-on grant. 2013.

NSF-ENG-Environmental Sustainability, \$300,998 (PI). “Helping stream help themselves: Restoring sustainable and distributed water pollution mitigation.” 2011-2017.

ICTAS at Virginia Tech, \$75,063 (PI). “Helping streams help themselves: Developing a sustainable water pollution mitigation technique.” 2011-2013.

Jeffress Memorial Trust, \$20,000 (PI). “Importance of macropores for hyporheic exchange and function in stream and river ecosystems.” 2011.

Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI) HydroGeoPhysics travel grant, \$2,000 (PI). “Use of electrical resistivity imaging to characterize hyporheic flow through macropores.” 2011.

NSF-REU Site, \$382,000 (research mentor, PI=Vinod Lohani). “Interdisciplinary Water Sciences and Engineering.” 2014-2016.

NSF-REU Site, \$314,289 (research mentor, PI=Cully Hession). “Dynamics of Water and Societal Systems – An Interdisciplinary Research Program at the Virginia Tech StREAM Lab.” 2012-2014.

NSF-REU Site, \$379,519 (research mentor, PI=Vinod Lohani). “Interdisciplinary Water Sciences and Engineering.” 2011-2013.

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INVITED  
SEMINARS

River Restoration to Improve Water Quality: Restoring Hyporheic and Floodplain Exchange.  
University of Connecticut, Department of Natural Resources and the Environment, Storrs, CT,  
October 5, 2018.

River Restoration to Improve Water Quality: Restoring Hyporheic and Floodplain Exchange. National Taiwan University, Graduate Institute of Environmental Engineering, Taipei, Taiwan, March 26, 2018.

River Restoration to Improve Water Quality: Restoring Hyporheic and Floodplain Exchange. National Taiwan University, Bioenvironmental Systems Engineering, Taipei, Taiwan, March 22, 2018.

River Restoration to Improve Water Quality: Restoring Hyporheic and Floodplain Exchange. University of Hong Kong, Civil Engineering, Hong Kong, China, November 13, 2017.

River Restoration to Improve Water Quality: Restoring Hyporheic and Floodplain Exchange. National Taiwan University, Civil Engineering, Taipei, Taiwan, November 8, 2017.

River Restoration to Improve Water Quality: Restoring Hyporheic and Floodplain Exchange. National Cheng Kung University, Civil Engineering, Tainan, Taiwan, October 24, 2017.

Hydrology fundamentals (short course). Virginia Department of Environmental Quality, Richmond, VA, May 23, 2017.

Urban waterways: Helping urban watersheds help themselves. University of Washington, Department of Civil and Environmental Engineering, Seattle, WA, May 9, 2014.

Urban waterways: Helping urban watersheds help themselves. University of Washington, Center for Urban Waters, Tacoma, WA, May 8, 2014.

Recent research at Virginia Tech: natural attenuation of contaminants upwelling from aquifers to rivers. Virginia Department of Environmental Quality, Richmond, VA, March 11, 2014.

Temperature surges in urban streams from heated storm runoff and bioretention as a possible solution. Appalachian State University, Department of Geology, Boone, NC. May 3, 2013.

Ecohydraulics of streams and rivers in an urbanizing world. University of North Carolina at Charlotte, Department of Engineering Technology, Charlotte, NC. July 12, 2010.

Ecohydraulics of streams and rivers in an urbanizing world. Oregon State University, School of Civil and Construction Engineering, Corvallis, OR. March 11, 2010.

Ecologists and engineers: bridging the divide to solve ecological and environmental issues in streams and rivers. Virginia Commonwealth University, Department of Biology, Richmond, VA. January 25, 2010.

Impact of in-stream structures on hyporheic exchange, temperature, and ecological processes in fluvial systems. Virginia Tech, Department of Civil and Environmental Engineering, Blacksburg, VA. March 10, 2008.

Impact of in-stream structures on surface-subsurface water exchange, temperature, and ecological processes in fluvial systems. Michigan State University, Department of Biological and Agricultural Engineering, East Lansing, MI. February 8, 2008.

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TEACHING

CEE 2804: Introduction to Civil Engineering  
CEE 3314: Water Resources Engineering  
CEE 4334: Design of Hydraulic Structures  
CEE 5344: Surface Water-Groundwater Interaction

PROFESSIONAL  
SERVICE

**Associate Editor**, *Water Resources Research*, 2014-present

**Board of Directors**, Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI), 2016-2018

**Professional Committees:**

CUAHSI Standing Committee for Instrumentation (committee chair 2014-2016, committee member 2010-2016), also University Representative for Virginia Tech, 2011-present

American Society of Civil Engineers (ASCE) Environmental and Water Resources Institute (EWRI) River Restoration Committee (committee member 2014-present)

**Short Course:** Hydrology Fundamentals, Virginia Department of Environmental Quality, Richmond VA, May 23, 2017

**Proposal Review:** EPA-USDA panel, NSF-ENG-Environmental Sustainability panel, NSF-ENG-Environmental Engineering panel, NSF-EAR-Hydrologic Sciences adhoc, NSF-EAR-Geobiology and Low Temperature Geochemistry adhoc, USDOE-Subsurface Biogeochemical Research panel

**Manuscript Review:** *Advances in Water Resources*, *Environmental Science & Technology*, *EOS*, *Hydrological Processes*, *Hydrogeology Journal*, *Hydrology and Earth System Science*, *Journal of Hydrology*, *Limnology and Oceanography*, *Limnology and Oceanography – Fluids and Environments*, *Nature Water*, *Reviews of Geophysics*, *River Research and Applications*, *Water Resources Research*,

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PROFESSIONAL  
SOCIETIES

American Geophysical Union  
American Society of Civil Engineers  
American Water Resources Association