

John P. Gannon

Collegiate Assistant Professor of Environmental Informatics
Dept. of Forest Resources and Environmental Conservation
Virginia Tech
jpgannon@vt.edu

Academic Employment

2019 – Present Collegiate Assistant Professor, Dept. of Forest Resources and Environmental Conservation, Virginia Tech, Blacksburg, VA

2014 – 2019 Assistant Professor, Dept. of Geosciences and Natural Resources, Geology Program and Affiliate Faculty, Environmental Science Program. Western Carolina University, Cullowhee, NC

Employment

2010-2011 Source Water Protection Specialist, Virginia Rural Water Association, Buena Vista, VA

Education

2014 Ph.D., Forest Resources and Environmental Conservation (Hydrology), Virginia Tech, Blacksburg, VA

2010 M.S., Geosciences (Hydrogeology), Virginia Tech, Blacksburg, VA

2007 B.S., Physics, The College of New Jersey, Ewing, NJ

Teaching Experience

Virginia Tech

Hydroinformatics (Spring 2021, 2022)

Environmental Informatics Capstone (Spring 2020, 2021, 2022)

Digital Planet (Spring 2020, 2021, 2022, Summer 2020, 2022)

Introduction to Environmental Informatics (Fall 2019, 2020, 2021, 2022)

Information Technologies for Natural Resource Management (Fall 2019, 2020, 2021, 2022)
Water, Environment, and Society (Fall 2020)

Special Study: College Teaching in Natural Resources (Fall 2021, 2022)

WCU

Investigations of Environmental Geology (Fall 2015, 2018, Spring 2015, 2016, 2017, 2019)

Catchment Hydrology (Spring 2019)

Introduction to Geospatial Analysis (Spring 2018)

Geology Field Trip, NC Piedmont (Spring 2017, 2019)

Geoscience Careers (Fall 2016, 2017, 2018)

Principles of Soils and Hydrology for Construction Management (Fall 2014, 2015, 2016, 2017, 2018)

Soils and Hydrology (Spring 2015, 2016, 2017, 2018)

Field Methods and Spatiotemporal Analysis (Summer 2017)

Geology Senior Capstone Research Project (Fall 2014, 2017)

J.P. Gannon

Geology, Landscapes, and Human Psyche (Summer 2015, Fall 2016)
Environmental Data Management and Analysis (Spring 2016)

Formal Mentoring

Mentor for 20+ Undergraduate Independent Study Projects (Spring 2015- Spring 2022)
Mentor of 2 Independent Senior Research Theses (AY2015/2016, AY2016/2017)
Mentor of Summer Undergraduate Research Program Student (Summer 2016)
WCU L.E.A.R.N. Undergraduate Research Mentor Program (AY2016/2017, AY2017/2018, AY2018/2019)
Graduate Advisor for 1 M.S. Student (Summer 2016 – May 2018)

Publications

Gannon, J.P., Kelleher, C., and M. Zimmer. 2022. Controls on watershed flashiness across the continental US. *Journal of Hydrology*. doi:10.1016/j.hydrol.2022.127713

Gannon, J.P. and K.J. McGuire. 2022. An Interactive Web Application Helps Students Explore Water Balance Concepts. *Frontiers in Education*. doi:10.3389/educ.2022.873196

Kelleher, K., **Gannon, J.P.**, Jones, C.N., and S. Aksoy. 2022. Best management practices for teaching hydrologic coding in physical, hybrid, and virtual classrooms. *Frontiers in Water*. doi: 10.3389/frwa.2022.875732

Gannon, J.P., Kinner, D., Styers, D., and M. Lord. 2020. Diel discharge variations in dormant and growing seasons in a headwater catchment suggest potential sources of an evapotranspiration signal. *Hydrological Processes*. doi:10.1002/hyp.13670

Chen, J., L.A. Pangle, **J.P. Gannon**, and R.D. Stewart, 2020. Soil water repellency after wildfires in the Blue Ridge Mountains, United States, *International Journal of Wildland Fire*. DOI: 10.1071/WF20055

Gannon, J.P., D. Kinner, D. Styers, and M. Lord, 2020. Diel discharge variations in dormant and growing seasons in a headwater catchment suggest potential sources of an evapotranspiration signal, *Hydrological Processes*. DOI: 10.1002/hyp.13670

Miller, J. R., **J.P. Gannon**, and K. Corcoran, 2019. Concentrations, mobility, and potential ecological risks of selected metals within compost amended, reclaimed coal mine soils, tropical South Sumatra, Indonesia, *AIMS Environmental Science*. DOI: 10.3934/environsci.2019.4.298.

Zimmer, M.A., and **J.P. Gannon**. 2018. Runoff processes from mountains to foothills: The role of soil stratigraphy and structure in influencing runoff characteristics across high to low relief landscapes. *Hydrological Processes*. DOI: 10.1002/hyp.11495

Gannon, J.P., McGuire, K.J., Bailey, S.W., Bourgault, R.R., and D.S. Ross. 2017. Lateral water flux in the unsaturated zone: a mechanism for the formation of spatial soil heterogeneity in a headwater catchment. *Hydrological Processes*. DOI: 10.1002/hyp.11279

Bourgault, R.R., Ross, D.S., Bailey, S.W., Bullen, T.D., McGuire, K.J., and **J.P. Gannon**. 2017. Redistribution of soil metals and organic carbon via lateral flowpaths at the catchment scale in a glaciated upland setting. *Geoderma*. DOI: 10.1016/j.geoderma.2017.05.039

Gannon, J.P., Kinner, D.A., and M.L. Lord. 2016. Beyond the Clean Water Rule: Impacts of a non-jurisdictional ditch on headwater stream discharge and water chemistry. *Water*. DOI: 10.3390/w8120607.

Gannon, J.P., Bailey, S.W., McGuire, K.J., and J. Shanley. 2015. Flushing of distal hillslopes as an alternative source of stream dissolved organic carbon in a headwater catchment. *Water Resources Research*. DOI: 10.1002/2015WR016927.

Gannon, J.P., Bailey, S.W., and K.J. McGuire. 2014. Organizing groundwater regimes and response thresholds by soils: a framework for understanding spatial patterns of water movement in a headwater catchment. *Water Resources Research*. DOI: 10.1002/2014WR015498.

Gillin, C.P., Bailey, S.W., McGuire, K.J., and **J.P. Gannon**. 2014. Mapping of hydrogeological spatial patterns in a steep headwater catchment. *Soil Science Society of America Journal*. DOI: 10.2136/sssaj2014.05.0189.

Gannon, J.P., Burbey T.J., Bodnar, R.J., and J. Aylor. 2012. Geophysical and geochemical characterization of the groundwater system and the role of the Chatham Fault in groundwater movement at the Coles Hill uranium deposit, Virginia, USA. *Hydrogeology Journal*, 20(1), 45-60. DOI: 10.1007/s10040-011-0798-y.

Select Presentations

*Indicates undergraduate student

^Indicates graduate student

*O'Brien, B., **Gannon, J.P.** 2022. American Geophysical Union Frontiers in Hydrology Meeting, Are Near-stream Soil Moisture Wetting Patterns Correlated with Streamwater Conductivity? American Geophysical Union, Dr. Pedro Rosello Gonzalez Convention Center

Gannon, J.P. ^Bretz, K. 2022. American Geophysical Union Frontiers in Hydrology Meeting, Does bedrock structure influence runoff generation in headwater streams of the Valley and Ridge physiographic province in the eastern US? American Geophysical Union, Dr. Pedro Rosello Gonzalez Convention Center

Gannon, J.P. 2021. American Geophysical Union Fall Meeting, A free web-based resources on hydrologic analyses in R for instructors and learners. American Geophysical Union, Ernest N. Morial Convention Center, New Orleans, LA. (invited)

Gannon, J.P., Zimmer, M., Kelleher, C. 2021. American Geophysical Union Fall Meeting, What makes a stream flashy? Controls on river flashiness across the continental US. American Geophysical Union, Ernest N. Morial Convention Center, New Orleans, LA.

^Bretz, K., **Gannon, J.P.**, Hotchkiss, E. 2021. American Geophysical Union Fall Meeting, Metabolic patterns of non-perennial temperate forest streams. American Geophysical Union, Ernest N. Morial Convention Center, New Orleans, LA.

*Ndlovu, W., ^Wade, J., Kelleher, C., **Gannon, J.P.**, Zimmer, M., 2021. American Geophysical Union Fall Meeting, Examining flashiness trends across the northeastern USA. American Geophysical Union, Ernest N. Morial Convention Center, New Orleans, LA.

*O'Brien, B., **Gannon, J.P.**, 2021. Southeast Geological Society of America Annual Meeting, Potential causes for marked water temperature differences in two adjacent streams. Virtual Meeting.

*Crum, K., **Gannon, J.P.**, 2021. Southeast Geological Society of America Annual Meeting, Relating water temperature-derived flow presence/absence to colluvial valley sections in a headwater stream. Virtual Meeting.

Gannon, J.P., Kelleher, C., Zimmer, M. 2020. American Geophysical Union Fall Meeting, Controls on River Flashiness Across the Continental United States. Virtual Meeting.

*Gilliam, M., *Braatz, S., *Crum, K., **Gannon, J.P.** 2020. Dennis Dean Undergraduate Research and Creative Scholarship Conference. Virginia Tech, Blacksburg, VA.

*Crum, K., **Gannon, J.P.** 2020. Dennis Dean Undergraduate Research and Creative Scholarship Conference. Insights into critical zone structure and subsurface storage from streamflow recession analysis. Virginia Tech, Blacksburg, VA.

*Crum, K., **Gannon, J.P.** 2020 (CANCELLED due to COVID19 pandemic). Insights into critical zone structure and subsurface storage from streamflow recession analysis. Southeast Northeast Geologic Society of America joint section meeting.

Hoover, J., DePerno, C., **Gannon, J.P.**, Rockhill, A.P. 2020. The North Carolina Chapter of The Wildlife Society Annual Meeting, Carnivore Distribution in an Urban Interface in Western North Carolina. Haw River, North Carolina.

Gannon, J.P., Zimmer, M.A. 2019. American Geophysical Union Fall Meeting, Insights into hillslope-scale critical zone structure and runoff generation from a regional-scale analysis. American Geophysical Union, Moscone Center, San Francisco, CA. (invited)

Gannon, J.P. 2019. American Geophysical Union Fall Meeting, A cloud-based solution to introducing programming-based analysis in a hydrology classroom. American Geophysical Union, Moscone Center, San Francisco, CA.

*Morgan, J., **Gannon, J.P.** and C. Kelleher. 2019. American Geophysical Union Fall Meeting, Characterization of water temperature variations in stream heads in the southern Appalachian Mountains. American Geophysical Union, Moscone Center, San Francisco, CA.

*Wright, C., *Hogan, H., *Duggins, H., **Gannon, J.P.**, Styers, D., Lord, M., and D. Kinner. American Geophysical Union Fall Meeting, 2019. Developing a method to remotely locate road-draining gullies using a high resolution digital elevation model. American Geophysical Union, Moscone Center, San Francisco, CA.

*Morgan, J., Godsey, S., **Gannon, J.P.**, and ^J. Dohman. 2018. American Geophysical Union Fall Meeting, "Using stream temperature to infer runoff generation pathways: Implications for Thermal Refugia in the Southeastern US," American Geophysical Union, Walter E. Washington Convention Center, Washington DC.

Kelleher, K., *Morgan, J., and **J.P. Gannon**. 2018. American Geophysical Union Fall Meeting, "Using stream temperature to infer runoff generation pathways: Implications for Thermal Refugia in the Southeastern US," American Geophysical Union, Walter E. Washington Convention Center, Washington DC.

Zimmer, M., and **J.P. Gannon**. 2018. American Geophysical Union Fall Meeting, "Hillslope-scale critical zone structure effects on regional-scale watershed hydrology," American Geophysical Union, Walter E. Washington Convention Center, Washington DC.

Gannon, J.P., Kinner, D., Styers, D., and M. Lord. 2018. American Geophysical Union Fall Meeting, "Year-round daily discharge fluctuations indicate evapotranspiration signal from near-stream vegetation," American Geophysical Union, Walter E. Washington Convention Center, Washington DC.

^Corcoran, K., **Gannon, J.P.**, and J.R. Miller. 2018. Southeastern Geological Society of America, "Biogeochemical characteristics of subsurface waters in reclaimed soils at PT Bukit Asam coal mine, South Sumatra, Indonesia," Geological Society of America, Knoxville convention center, Knoxville, TN.

*Ferry, V., *Little, D., and **J.P. Gannon**. 2018. Southeastern Geological Society of America Annual Meeting, "Concentration-discharge relationships highlight differences in streamflow generation between two tributaries in a headwater catchment," Geological Society of America, Knoxville convention center, Knoxville, TN.

*Morgan, J., **Gannon, J.P.**, and C. Kelleher. 2018. Southeastern Geological Society of America Annual Meeting, "Determining groundwater contributions in a headwater catchment using changes in stream water temperature," Geological Society of America, Knoxville convention center, Knoxville, TN.

*Ramsey, S., *Tatum, J., *Peeler, M., *Streicher, M., and **J.P. Gannon**. 2018. Southeastern Geological Society of America Annual Meeting, "The role of weathered and unweathered bedrock chemical composition and mineralogy in producing varying stream water chemistries in a headwater catchment in western North Carolina," Geological Society of America, Knoxville convention center, Knoxville, TN.

*Hurst, E., *Mann, A., *Skeen, E., *Marlor, D., and **J.P. Gannon**. 2018. Southeastern Geological Society of America Annual Meeting, "The use of soil chemistry, soil morphology, and particle size to explain stream water chemistry differences across a

headwater catchment in the southern Appalachian Mountains," Geological Society of America, Knoxville convention center, Knoxville, TN.

Fagan, A., Udry, A., **Gannon, J.P.**, *Cato, M., and *Spring 2017 WCU Petrology Class. 2018. Northwest Africa 8632 – Crystal Size Distribution Variation and Potential Link to Northwest Africa 032. Lunar and Planetary Science Conference, The Woodlands, TX.

*Morgan, J., **Gannon, J.P.**, and K. Kelleher. 2017. American Geophysical Union Fall Meeting, "How and why does stream water temperature vary at small spatial scales in a headwater stream?" American Geophysical Union, New Orleans, LA.

Gannon, J.P., and M.A. Zimmer. 2017. American Geophysical Union Fall Meeting, "More soil, less storage: The influence of soil characteristics on rainfall-runoff responses across high to low relief landscapes." American Geophysical Union, New Orleans, LA.

*Hayes, I., Styers, D., and **J.P. Gannon**. 2017. Association of Southeastern Biologists Annual Meeting, "Eco-hydrologic impacts of invasive evergreen shrub species in a headwater catchment area." Association of Southeastern Biologists, Montgomery, AL.

*Erwin, E., **Gannon, J.P.**, and M. Zimmer. 2017. Geological Society of America Southeastern Section Annual Meeting, "Mapping active stream lengths as a tool for understanding spatial variations in runoff generation." Geological Society of America, Richmond, NC.

*Tatum, J. and **J.P. Gannon**. 2017. Geological Society of America Southeastern Section Annual Meeting, "Using surface and groundwater chemistry to investigate spatial variations in stream water chemistry and their possible connection to previous land use in a headwater stream." Geological Society of America, Richmond, NC.

*Vascik, B., **Gannon, J.P.**, Kinner, A., and M. Lord. 2017. Geological Society of America Southeastern Section Annual Meeting, "Examining water flow paths and stream response of a disturbed headwater catchment in the Southern Appalachian Mountains, NC," Geological Society of America, Richmond, NC.

Lord, M., Kinner, D., **Gannon, J.P.**, Campbell, T., and J. Miller. 2017. Geological Society of America, "It's complex: groundwater-surface water interaction in headwater streams in the southern Appalachians," Richmond, VA.

*Earle, S., *Bartl, E., *Hudspeth, R., *Mead, C., *Ross, A., *Winter, J., Kinner, D., Lord, M., and **J.P. Gannon**. 2017. Southeastern Section Geological Society of America Annual Meeting, "Erosion and deposition in a disturbed watershed: Gullies, fans, and tunnel features," Geological Society of America, Richmond, VA.

Gannon, J.P., Kinner, D., Lord, M., and D. Styers. 2017. Geological Society of America Southeastern Section Annual Meeting, "Generation and Implications of Winter Diel Discharge Fluctuations in a Headwater Catchment in Western NC, USA," Geological Society of America (GSA), Omni Richmond Hotel, Richmond, VA.

*Hurst, E., *Mann, A., *Marlor, D., *Ramsey, S., *Ross, A., *Vascik, B., Lord, M., Kinner,

D., and **J.P. Gannon**. 2017. Southeastern Section Geological Society of America Annual Meeting, "Characteristics of groundwater– stream water interaction in a disturbed headwater catchment within the southern Appalachian Mountains," Geological Society of America, Richmond, VA.

Gannon, J.P., Kinner, D., and M. Lord. 2016. American Geophysical Union Annual Meeting, "Catchment structure and previous land use influence spatial streamwater chemistry in a headwater catchment in the southern appalachians." American Geophysical Union, San Francisco, CA.

*Erwin, E., **Gannon, J.P.**, and M. Zimmer. 2016. American Geophysical Union Annual Meeting, "Mapping active stream lengths as a tool for understanding spatial variations in runoff generation." American Geophysical Union, San Francisco, CA.

Gannon, J.P., Kinner, D., Lord, M., and T. Krenz. 2016. Geologic Society of America Southeastern Section Annual Meeting, "Isolating the impacts of a disturbed, ephemeral gully on water quality and stream ecology in a headwater catchment in western North Carolina," Geological Society of America, Columbia, SC.

*Corcoran, K., **Gannon, J.P.**, Bailey, S., McGuire, K., and M. Green. 2016. Geologic Society of America Southeastern Section Annual Meeting, "Biogeochemical Hotspots in Shallow to Bedrock Zones: Sources of Dissolved Organic Carbon (DOC) in the Appalachian Mountain Region of the Eastern USA," Geological Society of America, Columbia, SC.

*Dodgin, L., **Gannon, J.P.**, and K. *Corcoran. 2016. Geologic Society of America Southeastern Section Annual Meeting, "Utilizing specific ultraviolet absorbance to classify variable lability of dissolved organic carbon collected in terrestrial and stream environments," Geological Society of America, Columbia, SC.

*Ward, C., and **J.P. Gannon**. 2016. Geologic Society of America Southeastern Section Annual Meeting, "A low-cost, multi-parameter water quality sensor," Geological Society of America, Columbia, SC.

*Erwin, E., and **J.P. Gannon**. 2016. Geologic Society of America Southeastern Section Annual Meeting, "Exploring near-stream groundwater measurements in a headwater catchment," Geological Society of America, Columbia, SC.

Gannon, J.P. 2016. "Potential effects of past and present land use on water chemistry in a forested headwater stream in Cullowhee, NC," Invited Seminar, Department of Earth and Planetary Sciences, University of Tennessee, Knoxville, TN.

Gannon, J.P. 2015. "Hydropedology in a Headwater Catchment: What Can Soil Morphology Tell Us about Hydrologic Flowpath and Streamwater Chemistry?," Invited Seminar, Washington State Department of Natural Resources, Pacific Cascade Office, Castle Rock, WA.

Gannon, J.P., Kinner, D., and M. Lord. 2015. "Experimentally Isolating the Contributions of a Disturbed Ephemeral Drainage to a Headwater Stream in the Southern Appalachians," American Geophysical Union Fall Meeting, San Francisco, CA.

*Corcoran, K., **Gannon, J.P.**, Bailey, S., McGuire, K., and M. Green. 2015. "Biogeochemical Hotspots in Shallow to Bedrock Zones: Sources of Dissolved Organic Carbon (DOC) in the Appalachian Mountain Region of the Eastern USA," American Geophysical Union Fall Meeting, San Francisco, CA.

*Corcoran, K., *Bartl, E., *Dodgin, L., **Gannon J.P.**, and C. Kelly. 2015. Molecules in the Mountains, "Dissolved Organic Carbon (DOC) Transport Patterns in a Headwater Stream in Cullowhee, NC," North Carolina Biotech Center, Western Carolina University, Cullowhee, NC.

*Stephens, C., *Keever, M., *Beck, H., *Hudspeth, R., Lord, M., **Gannon, J.P.**, Kinner, D., and T. Campbell. 2015. Geologic Society of America Southeastern Section Annual Meeting, "Hydrogeomorphic Influences of Hyporheic Exchange in A Headwater Stream, Cullowhee, NC," Geological Society of America, Chattanooga, TN.

*Bartl, E., *Mountjoy, B., *Hartigan, S., *Gatlin, J., Lord, M., Kinner, D., and **J.P. Gannon**. 2015. Geologic Society of America Southeastern Section Annual Meeting, "Hydrogeologic Traits and Setting of Headwaters Stream Bound By Alluvial AND Colluvial Deposits With A Disturbance History Typical Of The Southern Appalachians: A Case Study," Geological Society of America, Chattanooga, TN.

Gannon, J.P., Bailey, S., McGuire, K., and J. Shanley. 2014. Simply active, or contributing too? Investigating the hydrologic connectivity of shallow water tables in a headwater catchment. Invited, AGU Fall Meeting, San Francisco, CA.

Gannon, J.P., McGuire, K., and S. Bailey. 2013. The inextricable link between hillslope scale hydrologic flow paths and soil morphology. AGU Fall Meeting, San Francisco, CA.

Gannon, J.P., McGuire, K., and S. Bailey. 2013. Hydrologic haikus: soils as an organizational framework to describe complex patterns of water movement. Hubbard Brook Cooperators Meeting, Woodstock, NH.

Gannon, J.P., McGuire, K., and S. Bailey. 2013. Frequency of lateral water flux in relation to soil morphology and as a tool for examining changes in catchment wetness over time. Gordon Conference on Catchment Science, Andover, NH.

Gannon, J.P., McGuire, K., and S. Bailey. 2012. How soil morphology can help decipher flow paths in headwater catchments. AGU Fall Meeting, San Francisco, CA.

Research Grants

Gannon, J.P. December 2019, Creating a stream monitoring station in partnership with the town of Blacksburg to facilitate independent and course-based undergraduate research experiences. Undergraduate Research Faculty Grant, Virginia Tech Office of Undergraduate Research, \$10,000

Gannon, J.P., Styers, D., Kinner, D., and M. Lord. December 2017, Hidden sediment sources: Locating and studying road-draining gullies using a geospatial model and field measurements. NC Water Resources Research Institute and USGS 104(B) Program, \$105,000.

Lord, M., Kinner, D., and **J.P. Gannon**. January 2016, Hydrologic thresholds for stormflow and groundwater recharge in a southern Appalachian watershed with a complex environmental history. Provost External Funding Support Grant, Western Carolina University, \$10,000.

Gannon, J.P., December 2015, Identifying hotspots for dissolved organic carbon (DOC) generation in Appalachian forests. College of Arts and Sciences Faculty Research Grant, Western Carolina University, \$1,000.

Gannon, J.P., Lord, M., and D. Kinner. January 2015, A “Significant Nexus”: How does a drainage gully in a headwater watershed affect downstream water quality? Provost External Funding Support Grant, Western Carolina University, \$9,996.

Professional Organizations and Service Activities

Howard Hughes Medical Institute Inclusive Excellence Program, department lead, 2021

Member, American Geophysical Union, 2008 - Present.

Member, Geologic Society of America, 2015 – Present.

WHEE Firsts first generation student mentor, Western Carolina University, Fall 2014 – 2015, 2017 - Present

Faculty Advisor, WCU Cycling Club, Fall 2017 – Present

Faculty Advisor, WCU Geology Club, Fall 2018 - Present

WCU Environmental Science Program Counsel, Fall 2016 – Present

WCU One Book freshman reading experience committee, AY2017/18 and 2018/19

Created and run an informal “Chalk Talk” series in the WCU Geosciences and Natural Resources department, Fall 2018 – Present

WCU liaison to the River Management Society, 2018 – Present

WCU Campus Greenway Committee

Secured \$50,000 of internal funding for design of an on-campus greenway

Generation of Geospatial Products for Trail Routing, USFS Pisgah District, 2017

J.P. Gannon

Presentation to Southern Off-Road Bicycle Association Summit on Trail Erosion Processes, March 2015, Bryson City, NC

American Geophysical Union Catchment Hydrology technical committee, 2018 – Present

Reviewer for the following journals: Water Resources Research, Hydrological Processes, Biogeochemistry, Journal of Hydrology, and Air, Soil, and Water Research

Reviewer for National Science Foundation Hydrologic Sciences and University of Wisconsin Aquatic Sciences Center

Awards and Honors

Gannon, J.P., March 2018, Outstanding Community Service Award. WCU Center for Service Learning.

Gannon, J.P., February 2017, Linking spatiotemporal variations in stream water temperature to water chemistry in a headwater catchment. WCU Faculty Research and Creative Activities Award.