

Seth E. Younger

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Education

- **University of Georgia** **Athens, GA**
Warnell School of Forestry and Natural Resources, Ph.D. 8/2014 – 8/2020
 - **University of Georgia** **Athens, GA**
Department of Geography, M.S. Physical Geography 8/2010 – 12/2013
 - **Radford University** **Radford, VA**
Department of Geography, B.S. Geography 08/2006 – 05/2010
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Experience

- **The Jones Center at Ichauway** **Newton, GA**
Postdoctoral Hydrologist 1/2021 - present
 - Conducted the full life cycle of research including defining a research problem, developing hypotheses, grant writing, collecting data, quality control, database development, developing innovative techniques for analysis, publishing results, and communicating the findings to a wide audience. Analysis with Python, R, SQL, and Google Earth Engine.
 - Quantified longleaf pine restoration effects on hydrology using long-term streamflow data, southeast U.S. watersheds with longleaf have higher streamflow and less extreme low flows.
 - Mentored a graduate student on hydrologic analysis as part of a collaborative project quantifying the hydrology and economics of different forest restoration practices, one paper has been submitted and another is underway.
 - Developed Soil and Water Assessment Tool (SWAT) models to quantify the effects of future climates on the hydrology of longleaf pine ecosystems.
 - Lead manuscript development including team meetings, analysis, writing, revising, and journal correspondence.
 - Contributed to the writing of a successful grant proposal (600k) quantifying the role of upland forest management on wetland health, 2024-2026.
- **Writing and Consulting** **Athens, GA**
9/2020 - 12/2020
 - Manuscript preparation and revisions.
 - Cartography work as a contractor for Nutter and Associates environmental consultants.
- **UGA, Warnell Hydrology Lab** **Athens, GA**
Graduate Research Assistant 8/2014 – 7/2020
 - Investigated long-term watershed scale evapotranspiration as a function of biotic & abiotic factors in the Southeastern U.S. Published in the Journal of Hydrology: [Younger et al. 2020](#)
 - Lead: Construction of two cryogenic water extraction systems, >20 field campaigns for plant & soil water, & groundwater, 100 field campaigns for precipitation & throughfall amounts, & isotopes.
 - Lead cryogenic vacuum extraction of 1,300 plant and 1,300 soil samples for water isotope analysis.
 - Developed plot level component water budgets for *Pinus taeda* & *Eucalyptus benthamii* trees using estimates of precipitation, canopy interception, evaporation, transpiration isotopic water sourcing techniques including: sap flow sensors, lysimeters: [Younger et al. 2023](#)
 - Contributed to five publications with study design, data analysis, visualization, reviewing & editing.
- **UGA, Warnell Hydrology Lab** **Athens, GA**
Hydrologic Field & Laboratory Technician 6/2013 – 7/2014
 - Collected weekly and monthly tree, soil, lysimeter, throughfall, and well samples.
 - Conducted data quality and assurance, pack and ship samples to analytical laboratories.
 - Prepared reports on rainfall, bare soil lysimeter, and soil moisture data.
 - Hydrologic monitoring, including streamflow and well water measurements.

- Management of HOBO data loggers, ISCO samplers, Global Water level meters, and Decagon soil moisture sensors.
- Assisted with tree planting, fertilization, herbicide application and monitoring experimental plots.
- Conducted GIS Analysis in support of experimental watershed hydrologic investigations using ArcGIS 10.1.
- Developed ArcGIS tools using ArcPy for watershed hydrologic analysis.
- Supported and trained staff with spatial data analysis tasks.

• **UGA, Geography Department**

Graduate Research Assistant

Athens, GA

1/2011 – 6/2013

- Investigated the use of satellite meteorological data to drive hydrologic simulations in ungauged basins.
- Managed time series data using Python, R and Unix scripting, MS Access and Excel.
- Modeled streamflow with BASINS 4.1 & Hydrologic Simulation Program Fortran (HSPF).
- Spatial analysis and modeling in ArcGIS 10.1 and QGIS, including development of applications using model builder and ArcPy scripting.
- Developed and contributed to development of reports and presentations, MS Word & Powerpoint.

• **Radford University, Geography Department**

Natural Hazard Mapping Technician

Radford, VA

5/2009 – 7/2010

- Collected, analyzed and managed spatial data and made maps to support the New River Valley, VA Planning District Commission 2010 FEMA Hazard Mitigation Plan update.

• **City of Radford, Virginia**

GIS Technician

Radford, VA

1/2008 – 7/2010

- Collected and processed Trimble GPS data using Trimble Terra Sync, ArcPad, and GPS Pathfinder Office.
- Management of File Geodatabases data using ArcGIS 9.1-10.0 for Parcels, E911, Public Works, Water, Fire, and Electric departments.
- Cartographic production for internal use and publishing on public web applications (ArcGIS FLEX).

Technical Skills

Data analysis Analysis and statistics in *R* & *Python*. Documentation with *LaTeX* and *Markdown*. Version control with *Github*. Writing and presentation with *Microsoft Office*

Geographic Information Systems Proficient in *ESRI* products and open source alternatives including: *QGIS*, *gdal*, *Whitebox*, *R spatial packages*, & *Google Earth Engine*. Skilled at developing and adapting spatial data analysis workflows.

Hydrologic modeling Experience with *HSPF*, *SWAT* & *MODFLOW*. Familiar with hydrologic modeling principles and able to learn new models quickly.

Natural Surface Trail design, construction, and maintenance. Crew leader certified with >400 hours of crew leading experience.

Publications

Younger, S.E., Blake, J.I., Jackson, C.R., & Aubrey, D.P. (In press). Hydrogen isotopic offsets in xylem water measurements under cryogenic vacuum distillation: quantifying and correcting wood-water hydrogen exchange influences. *Ecohydrology* DOI: 10.1002/ECO.2640

Younger, S.E., Cannon, J.B & Brantley, S.T. (2023). Impacts of longleaf pine (*Pinus palustris* Mill.) on long-term hydrology at the watershed scale, *Science of The Total Environment*, Volume 902, 2023, 165999, ISSN 0048-9697, <https://doi.org/10.1016/j.scitotenv.2023.165999>.

Younger, S.E., Monda, L.G., Jackson, C.R., Blake, J.I., & Aubrey, D.P. (2023). Little vertical and circumferential variations in stem xylem water $\delta^2\text{H}$ and $\delta^{18}\text{O}$ in three tree species. *Trees*. <https://doi.org/10.1007/s00468-023-02431-3>

Younger, S.E., Jackson, C.R., Dix, M.J., Caldwell, P.V., & Aubrey, D.P. (2023). Evapotranspiration partitioning of *Eucalyptus benthamii* and *Pinus taeda* during early stand development. *BioEnergy Research*. <https://doi.org/10.1007/s12155-023-10591-w>

Ruzol, R., Staudhammer, C.L., **Younger, S.E.**, Aubrey, D.P., Loescher, H.W., Jackson, C.R., & Starr, G. (2022). Water Use in a Young *Pinus taeda* Bioenergy Plantation: Effect of Intensive Management on Stand Evapotranspiration. *Ecosphere*. 13(6): e4100, <https://doi.org/10.1002/ecs2.4100>

- Younger, S.E.**, Jackson, C.R., & Rasmussen, T.C. (2020). Relationships among forest type, watershed characteristics, and watershed ET in rural basins of the Southeastern US. *Journal of Hydrology*. 125316, ISSN 0022-1694, <https://doi.org/10.1016/j.jhydrol.2020.125316>
- Raulerson, S., Jackson, C.R., Melear, N.D., **Younger, S.E.**, Dudley, M., & Elliott, K.J. (2020). Do southern Appalachian Mountain summer stream temperatures respond to removal of understory rhododendron thickets? *Hydrological Processes*. 1– 16, <https://doi.org/10.1002/hyp.13788>
- Meles Bitew, M., Jackson, C.R., Goodrich, D.C., **Younger, S.E.**, Griffiths, N.A., & Vache, K.B, Rau, . B (2020). Dynamic domain kinematic modelling for predicting interflow over leaky impeding layers. *Hydrological Processes*. 34: 2895– 2910, <https://doi.org/10.1002/hyp.13778>
- Meles, M.B., **Younger, S.E.**, Jackson, C.R., Du, E., & Drover, D. (2020). Wetness Index based on Landscape position and Topography (WILT): Modifying TWI to reflect landscape position. *Journal of Environmental Management*. Volume 255, ISSN 0301-4797, <https://doi.org/10.1016/j.jenvman.2019.109863>
- Caldwell, P.V., Jackson, C.R., Miniati, C.F., **Younger, S.E.**, Vining, J.A., McDonnell, J.J., & Aubrey, D.P., (2018). Woody bioenergy crop selection can have large effects on water yield: A southeastern United States case study. *Biomass and Bioenergy*. Volume 117, Pages 180-189, ISSN 0961-9534, <https://doi.org/10.1016/j.biombioe.2018.07.021>

Under Review Publications

- English, C.J., **Younger, S.E.**, Cannon, J.B, Brantley, S.T., Markewitz, D., & Dwivedi, P. (Under review - revised). Forest Management for Water Yield: Assessing the Barriers and Impacts of Privately-Owned Open Pine Woodlands in the Southeastern U.S. *Ecological Economics*.

Grants and Awards

- Cannon J.B., Brantley, S.T. & **Younger, S.E.** (2023). Developing tools and knowledge to improve restoration in wetlands and associated longleaf pine forests on private lands in Georgia. USDA Natural Resources Conservation Service. 2024-2027. \$605,700
- Younger, S.E.** (2016). Sigma Xi Grants-in-Aid of Research. Sampling effects on the deuterium isotope signature of tree xylem water. \$800
- Younger, S.E.** (2019). Travel Award from UGA's Warnell School of Forestry and Natural Resources to present research at the 2019 Annual Meeting of the American Geophysical Union. \$1300
- Aubrey, D.P and Jackson, C.R. (2019). Comparative Hydrologic Budgets and Water Use Efficiencies of Developing Woody Bioenergy Plantations. \$498,633. 6/1/2019-5/31/2023. USDA NIFA. As a student, **S.E. Younger** could not be listed as co-PI, but contributed to the proposal with preliminary data, hypothesis development, experimental design, writing, and editing.

Conference Proceedings

- Rasmussen, T.C., Deemy, J. & **Younger, S.E.**. (2017). Big Data in Hydrology: From Continental to Hillslope Scales. Georgia Water Resources Conference, Athens, GA. April 2017.

Scientific Presentations

- Younger, S.E.**, Cannon, J.B., Brantley, S.T. Impacts of longleaf pine (*Pinus palustris* Mill.) on long-term hydrology at the watershed scale. American Geophysical Union Fall Meeting, San Francisco, CA. December 2023
- Younger, S.E.**, Monda, L.G., Jackson, C.R., Blake, J., Aubrey, D.P. Little vertical and circumferential variations in stem xylem water $\delta^2\text{H}$ and $\delta^{18}\text{O}$ in three tree species. Poster presented at American Geophysical Union Fall Meeting, San Francisco, CA. December 2023
- Brantley, S.T., English, C., **Younger, S.E.**, Dwivedi, P, and Cannon, J.B.. (2023). Managing Forestlands for Increased Water Yields: Economic and Ecological Tradeoffs. Alabama Water Resources Conference. Orange Beach, AL. September 6-8, 2023.
- Younger, S.E.**, Cannon, J.B., Brantley, S.T., Golladay, S.W, English, C.J. (2023). Simulating hydrologic responses of longleaf pine (*Pinus palustris*) restoration across southeastern U.S. river basins. Georgia Water Resources Conference. Athens, GA March 2023
- English, C.J., **Younger, S.E.**, Cannon, J.B., Brantley, S.T., Markewitz, D., Dwivedi, P. (2023). Forest Management for Water Yield: Assessing the Barriers and Impacts of Privately-Owned Open Pine Woodlands in the Southeastern U.S. Georgia Water Resources Conference. Athens, GA March 2023

- Aubrey, D.P. Jackson, C.R., & **Younger, S.E.** (2022). Evapotranspiration partitioning of three to five-year-old *Eucalyptus benthamii* and *Pinus taeda* in the southeast, US. Short Rotation Woody Crop International Conference. Asheville, NC May 2-4 2022
- Aubrey, D.P. Jackson, C.R., & **Younger, S.E.** (2022). Consideration of Forest Water Cycle Dynamics Throughout Stand Development Can Improve Water Use Efficiency of Woody Bioenergy Production Systems. Short Rotation Woody Crop International Conference. Asheville, NC May 2-4 2022
- Aubrey, D.P., Jackson, C.R., & **Younger, S.E.** (2022). Consideration of Forest Water Cycle Dynamics Throughout Stand Development Can Improve Water Use Efficiency of Woody Bioenergy Production Systems (invited). American Geophysical Union Fall Meeting, New Orleans, L.A.
- Starr, G., Ruzol, R., Aubrey, D.P., Staudhammer, C. **Younger, S.E.**, Loescher, H., & Jackson, C.R. (2021). Water Use From An Intensively Managed Loblolly Pine Plantation: Implications Of Silviculturally-Enhanced Tree Growth On Stand Evapotranspiration. Poster presented at the American Geophysical Union Fall Meeting, New Orleans, L.A.
- Younger, S.E.**, Cannon, J.B., & Brantley, S.T. (2021). Quantifying watershed scale Longleaf Pine (*Pinus palustris*) evapotranspiration effects on streamflow using the long-term water balance. Poster presented at the American Geophysical Union Fall Meeting, New Orleans, L.A.
- Younger, S.E.**, Aubrey, D.P., & Jackson, C.R. (2019), Water budget comparison of two fast growing bioenergy tree species during canopy closure (Invited), B11J-2240 poster presented at the American Geophysical Union Fall Meeting, San Francisco, CA, 9-13 Dec.
- Younger, S.E.** & Jackson, C.R. (2019). Influence of forest and vegetation type on annual evapotranspiration estimated by water budgets across 46 rural basins in the Southeastern US. Georgia Water Resources Conference. Athens, GA
- Raulerson, S., Jackson, C.R., Melear, N.D., **Younger, S.E.**, Dudley, M., Elliott, & K.J. (2019). Impacts of understory rhododendron removal on Southern Appalachian Mountain stream temperatures. Poster presented at Georgia Water Resources Conference. Athens, GA
- Younger, S.E.**, Aubrey, D.P., & Jackson, C.R. (2018). Water budget comparison of early rotation *Pinus taeda* and *Eucalyptus benthamii* in the Upper Coastal Plain of South Carolina. Warnell Graduate Student Association. Warnell Graduate Student Symposium. Athens, GA
- Aubrey, D. P., C. R. Jackson, J.J. McDonnell, C.R. Miniati, P.V. Caldwell, & **Younger, S.E.** (2017). Hydrologic Budgets for Short Rotation Loblolly Pine and Eucalyptus. USDA-NIFA AFRI Sustainable Bioenergy Annual Project Director Meeting. Tampa, FL. (Invited)
- Younger, S.E.** & Jackson, C.R. (2017). Variation of Annual ET Determined from Water Budgets Across Rural Southeastern Basins Differing in Forest Types, Poster [H33B-1667] presented at 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec.
- Brockman, L.E., **Younger, S.E.**, Jackson, C.R., McDonnell, J.J., Janzen, K.F., & Aubrey, D.A. (2017). Differential soil water sourcing of managed Loblolly Pine and Sweet Gum revealed by stable isotopes in the Upper Coastal Plain, USA, Poster [H23H-1776] Fall Meeting, AGU, New Orleans, LA, 11-15 Dec.
- Dix, M.J., **Younger, S.E.**, & D.P. Aubrey. (2017). The Role of Plants in the Water and Carbon Cycles. Touch An Animal Day, August 26, Savannah River Ecology Lab, Aiken, SC
- Younger, S.E.**, D.P. Aubrey, & C.R. Jackson. (2017). Comparing Water Use of *Pinus taeda* and *Eucalyptus benthamii* in the Upper Coastal Plain of South Carolina: Experimental Design and Preliminary Data. Warnell Graduate Student Symposium, Athens, GA.
- Bitew, M.M., C.R. Jackson, K.B. Vache, N. Griffiths, G. Starr, J. McDonnell, & B. Rau, **Younger, S.E.**, and K. Fouts. (2016). Water Quantity and Water Quality Impacts of Intensive Woody Biomass Feedstock Production in the Southeastern USA. Poster. Fall Meeting, AGU, December 12-16, San Francisco, CA.
- Rasmussen, T.C., Deemy, J.B., & **Younger, S.E.**, Kirk, S.E., Brockman, L.E. (2016). HIS Design: Big Data that Supports Hydrologic Modeling from Continental to Hillslope Scales. Poster. Fall Meeting, AGU, December 12-16, San Francisco, CA.
- Bitew, M.M., C.R. Jackson, K. Vache, J.J. McDonnell, N. Griffiths, G. Starr, **Younger, S.E.**, K. Fouts, & B. Rau. (2016). Modeling hydrologic impacts of intensive woody biomass feedstock production in the southeastern U.S. Short Rotation Woody Crop Science and Technology in an Uncertain Global Marketplace. Poster. 11th Biennial Short Rotation Woody Crops Operations Working Group Conference, October 11-13, Fort Pierce, FL.
- Younger, S.E.**, & Jackson, C. R. (2015). Comparison of evapotranspiration and forest cover type in the southeast United States: A long-term water budget approach.. Poster session presented at the meeting of American Geophysical Union Conference, Dec. 14-19, San Francisco, CA.
- Younger, S.E.** & Leigh, D.S. (2014). Sediment Source Ascription of Forest Roads in the Upper Little Tennessee River Basin. Talk at the Southeast Division of the Association of American Geographers. November 23-25.

Grundstein, A., B. Avant, **Younger, S.E.**, A. Ignatius, T. Rasmussen, T. Mote, & J.M. Shepherd. (2012). A Methodology for Hydrological Modeling in Data Poor Regions using TRMM Precipitation Data and MERRA Reanalysis Meteorological Data. AAG Annual Meeting, 24-28 February, New York, NY.

Rasmussen T.C., Grundstein, A., Mote, T, Shepherd, M., Ignatius, A., Avant, B., & **Younger, S.E.** (2012). Remote Sensing-Based River Fluxes, National Nuclear Security Administration (NA-22), U.S. Department of Energy, December 1, Washington D.C.

Younger, S.E. & Foy, A.S. (2010). Conservation Land Use Analysis for the City of Radford, VA. Poster presented at the Big South Undergraduate Research Symposium April 9 & 10.

Professional Societies

American Geophysical Union
 The American Water Resources Association
 The Longleaf Alliance

Teaching

Fall 2018- Laboratory section instructor for [Soils and Hydrology 3060](#). I taught a lab section and helped to update some of the class [teaching materials](#) and course textbook.

Volunteer and Service Work

- Reviewer: Frontiers in Forests and Global Change, Forest Hydrology Section - September 2023
- Friendly manuscript review - Brantley et al. 11/2022
- Friendly manuscript review - Qi et al. 05/2020
- Volunteer work with SORBA-Athens, local mountain bike trail advocacy non-profit, 2014-present
- Assisting numerous students and community members with GIS and data analysis projects, 2017-2020
- Session technical support - 2017 Georgia Water Resources Conference, April 19 & 20, 2017
- American Water Resources Association - UGA Chapter Club President (2015-16)
- Volunteer trail maintenance and construction with SORBA-CSRA. Over 100 hours in 2014
- Session moderator – 2013 Georgia Water Resources Conference. April 10 & 11, 2013
- Assistant to Brad Suther, soil sampling a late Holocene Pee Dee River point bar, Marion, SC., 50 hrs, 1/2013
- Judge/Staff – 13th Annual Geography Undergraduate Conference. April 19th 2012
- Stream cross section measurement using a photographic technique, Masters Student Dustin Menhart 12/2011
- Measurement of stream cross-sections and channel slopes at Coweeta LTER intensive sampling sites, 10/2011.
- Initiated reactivation of the Kappa Omicron Chapter of Gamma Theta Upsilon – Fall 2009
- Initiated and assisted in sponsoring and clean-up of city roadway. April 2009 – Spring 2010
- Co-organized a group of students to present at the AAG Annual Meeting, Washington, D.C. 2010
- Assisted in organizing Geography Awareness Week events, 11/2010
- Geography Club (all officer roles) Radford University. Fall 2007 to Spring 2010
- Field assistant to Dr. Bernd H. Kuennecke, Salinas De Garanda, Bolivar, Ecuador. (2 weeks) 7/2009