James O. Knighton, Ph.D., P.E.

Assistant Professor

University of Connecticut Department of Natural Resources and the Environment

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EDUCATION

Ph.D., Spring 2019, Biological and Environmental Engineering, Cornell University, Ithaca NY

M.A., 2013, Environmental Studies, University of Pennsylvania, Philadelphia, PA

B.S., 2007, Civil Engineering, Drexel University, Philadelphia, PA

PROFESSIONAL APPOINTMENTS

2020 -	Assistant Professor, University of Connecticut Department of Natural Resources and the Environment, Storrs, CT
2019 - 2020	Postdoctoral Fellow, The National Socio-Environmental Synthesis Center (SESYNC), Annapolis, MD
2019	Research Associate, New York Water Resources Institute, Ithaca, NY
2015 - 2019	Graduate Research and Teaching Assistant, Cornell University Dept. of Biological & Environmental, Ithaca, NY
2013 - 2015	Flood Risk Division Research Associate, Enercon Services, Inc., Pittsburgh, PA
2007 - 2013	Hydraulic & Hydrologic Engineer, Philadelphia Water Department, Philadelphia, PA

TEACHING EXPERIENCE

Instructor of Record

University of Connecticut NRE2010: Natural Resources Measurements	(Fall 2021 - present)
University of Connecticut NRE3125: Watershed Hydrology	(Fall 2021 - present)
University of Connecticut NRE5605: Environmental Data Analysis	(Spring 2022 - present)
University of Connecticut NRE6135: Small Watershed Modeling	(Spring 2022 - present)
Cornell U. BEE 4940/6940: Introduction to Hydrologic Modeling	(Spring 2019)
Cornell U. BEE 6740: Ecohydrology	(Spring 2018)

Teaching Assistant

Cornell U. BEE 3710: Physical Hydrology for Ecosystems	(Spring 2017)
Cornell U. BEE 6740: Ecohydrology	(Spring 2016)
Cornell U. BEE 4710: Introduction to Groundwater	(Spring 2016)
Cornell U. BEE 4730: Watershed Engineering	(Fall 2015)

Guest Instructor (selected)

Cornell U. Landscape Design & Research Department Studio	(Spring & Fall 2015 - 2018)
Cornell U. BEE 4730: Watershed Engineering	(Fall 2016, Fall 2017)

GRANTS & FELLOWSHIPS

2023 NSF-HS ($689,896). Examining differential drought responses of forest trees with phylogenies and process-based catchment water age modeling. **Knighton, J.**, Fahey, B., Wang, G.

NFWF Long Island Sound Futures Fund ($480,554). A Peer-to-Peer Cohort Approach to Soil Health Management Planning and Water Quality on Farms. White, A., **Knighton, J.**, Darby H.

CAHNR Teaching Enhancement Grant ($27,405) Modernization of Outdoor Field Instruments for Natural Resources Undergraduate Education. **Knighton, J.**, Dietz, M., Helton, A., Lawrence, B., Ortega, M., Ren, W., Rittenhouse, T.

2022 USDA/NRCS Soil Science Collaborative Research. ($299,981) Quantifying Saturated Hydraulic Conductivity (Ksat) and Other Soil Hydraulic Properties for Soil Health Assessments and Climate Change Adaptation. Gan, H., **Knighton, J.**, Haiying, T.

2021 USDA/NIFA Foundational & Applied Science ($299,910). Studying how insect infestation affects forest water use and resilience to future climate stressors with isotopic tracers and process-based modeling. **J. Knighton**, R. Fahey, T. Worthley

Connecticut Sea Grant College Program ($146,881). Risk Averse or Risk Enduring? Understanding the Relationships between Long Island Sound Communities and Flooding to Support Equitable Risk Mitigation Planning. **J. Knighton**

USDA/NIFA Workforce Development Program ($153,619). Tracing the movement of and management potential for pharmaceuticals in agricultural soils via tracer-aided monitoring (^{2}H, ^{18}O, Pharmas) and social surveys. Georgakakos, C., **Knighton, J.**

Anonymous Donor ($148,673): Can They Get Out? Loss of Connectivity for Juvenile Alewives Out-Migrating to Long Island Sound. Schultz, E., **Knighton, J.**

McIntire-Stennis Capacity Fund ($58,652). Assessing the Impact of Silviculture on Forest Root Zone Water Residence Times. **Knighton, J.**, Fahey, R., Worthley, T.

American Farmland Trust ($231,045). Evaluating the Influence of On-Farm BMPs on Soil Phosphorus Mobility. **Knighton, J.,** Connelly, C.

2020 Long Island Sound Research Study ($231,013): Can They Get Out? Loss of Connectivity for Juvenile Alewives Out-Migrating to Long Island Sound. Schultz, E., **Knighton, J.**

CT IWR ($20,456): Investing Root Water Uptake Variations Between Younger and Older Riparian Trees. **Knighton, J.**

2019 The National Socio-Environmental Synthesis Center Competitive Postdoctoral Funding ($153,000): Exploring the Roles of Hydrologic Uncertainty, Future Flood Risk, Anticipation, and Memory in Guiding National Flood Mitigation Policies. **Knighton, J.**, Elliott, R.

Great Lakes Research Consortium Small Grant ($10,000): Shifts in Northeastern US Flood Frequency Following Eastern Hemlock Loss and Succession. **Knighton, J.**, Singh, K., Walter, M.T.

CUAHSI IDTG ($1,000): Analysis of Soil and Stem Water with Integrated Cavity Output Spectroscopy. **Knighton, J.**, Kim, M., Troch, P.

2018 NSF Critical Zone Observatory SAVI International Scholar Grant ($6,500): Investigating the Influence of Plant Water Uptake, Climate, and Geology on Root Zone Travel Times. **Knighton, J.**, Walter, M.T., Sprenger, M., Soulsby, C., Tetzlaff, D.

Atkinson Center Sustainable Biodiversity Fund ($6,237): Flooding Risk Implications of Biodiversity Loss in Eastern US Forests: Hydrologic Modeling of Eastern Hemlock Decline. **Knighton, J.**

Nature Conservancy ($30,000): Statewide Vulnerability-Based Assessment of Future Riverine Flood Risk Using a Modified Peaks-Over-Threshold Approach with a Hydrologic Model. Walter, M.T., **Knighton, J.**

2017 American Geophysical Union (AGU) Horton Research Grant ($10,000): Spatial and Temporal Variability of Ecohydrologic Separation in a Snow-Dominated Watershed. **Knighton, J.**

American Geophysical Union (AGU) Conference Travel Grant ($550). **Knighton, J.**
Northeast Sustainable Agriculture Research and Education (recommended for funding): Designing Waste Manure Application Schemes to Reduce Freshwater Eutrophication Risk under Climate Change. **Knighton, J.**, Walter, M.T.

Engaged Cornell Graduate Student Grant ($10,000): Mapping Riverine Flood Risk by Meteorological Mechanism for Central New York, USA: Linking Increased Flooding Risk to Global Climate Change. **Knighton, J.**

2016 IGERT Cross-Scale Biogeochemistry and Climate Small Grant ($3,879): Ecohydrologic Separation as a Framework for Soil Residence Times. **Knighton, J.**

Cornell Conference Travel Grant ($440). **Knighton, J.**

Ram Sagi Dairy Engineering Award ($1,000): Partitioning evaporation and transpiration through Soil Stable Water Isotopic Measurements. **Knighton, J.**

2012 University of Pennsylvania EES Research Award ($2,000): DNA Barcoding of Invertebrate Freshwater Indicator Species. **Knighton, J.**, Dapkey, T., Willig, S.

2007 New Economy Technology Scholarship. **Knighton, J.**

A.J. Drexel Scholarship. **Knighton, J.**

PEER REVIEWED JOURNAL PUBLICATIONS

Advisees: *graduate student, **undergraduate student, †postdoctoral advisee

In Review or Revision

2024 Poudel, S.*, Elliott, R., **Knighton, J.** (In Prep). Projected trends of housing market, population density, & flood loss across US coast.

Knighton, J., Sanchez-Martinez, P., Anderegg, L. (In Review). A Globally Comprehensive Database of Tree Hydraulic and Structural Traits Imputed from Phylogenetic Relationships

Sharkus, C., Givens, J., Saia, S., **Knighton, J.** Guzman, C. (In Review). Spatial and Temporal Analysis of Flood Risk in Massachusetts Environmental Justice Communities

Sobota, M.*, Li, K.*, **Knighton, J.**, (In Review). Neighboring Tree Species Composition Alters the Position of Maple Trees in the Drought Frequency Domain.

Accepted Articles

2024 Sobota, M.*, Li, K.*, Hren, M., **Knighton, J.**, (2024). Evidence for species-level variations in deuterium biases from cryogenic extraction of plant xylem water. *Hydrological Processes*. DOI: 10.1002/hyp.15079

Georgakakos, C.†, **Knighton, J.** (2024). How you teach changes who you reach: understanding the effect of teaching modality on student engagement, content interest, and learning in undergraduate hydrology. *Journal of Geography in Higher Education*. DOI: 10.1080/03098265.2024.2316704

2023 Poudel, S.*, Caridad, C.**, Elliott, R., **Knighton, J.**, (2023). Housing Market Dynamics of the Post-Sandy Hudson Estuary, Long Island Sound, and New Jersey Coastline are Explained by NFIP Participation. *Environmental Research Letters*. DOI: 10.1088/1748-9326/acea38

Haynes, A., Briggs, M., Moore, E., Jackson, K., **Knighton, J.**, Rey, D., Helton, A. (2023). Shallow and local or deep and regional? Inferring source groundwater characteristics across mainstem riverbank groundwater discharge faces. *Hydrological Processes*. DOI: 10.1002/hyp.14939

King, K.*, Burgess, M., Schultz, E., **Knighton, J.** (2023). Forecasting Juvenile River Herring Out-Migration Loss with Process-Based Hydrologic Modeling and Machine Learning. *Journal of Environmental Management*. DOI: 10.1016/j.jenvman.2023.118420

Li, K.*, **Knighton, J.** (2023). Characterizing the heterogeneity of eastern hemlock xylem water isotopic compositions: Implications for the design of plant water uptake studies. *Ecohydrology*. DOI: 10.1002/eco.2571

Knighton, J., Berghuijs, W. (2023). Water ages explain tradeoffs between long-term evapotranspiration and ecosystem drought resilience. *Geophysical Research Letters*. DOI: 10.1029/2023GL103649

Snarski, J.*, Helton, A., Dietz, M., **Knighton, J.** (2023). Potential Hydrologic Pathways of Deicing Salt Chloride Transport Evaluated with SWMM. *Journal of Hydrologic Engineering*. DOI: 10.1061/JHYEFF/HEENG-5907

Li, K.*, Kuppel, S., **Knighton, J.** (2023). Parameterizing vegetation traits with a process-based ecohydrological model and xylem water isotopic observations. *Journal of Advances in Modeling Earth Systems*. DOI: 10.1029/2022MS003263

2021 **Knighton, J.,** Fricke, E., Ricker, B., Evaristo, J., Wassen, M. (2021). Phylogenetic Underpinning of Groundwater Use by Trees. *Geophysical Research Letters*. DOI: 10.1029/2021GL093858

Knighton J., Hondula, K., Sharkus, C., Guzman, C., Elliott, R., (2021) Flood Risk Behaviors of US Riverine Metropolitan Areas are Driven by Local Hydrology and Shaped by Race. *Proceedings of the National Academy of Sciences*. DOI: 10.1073/pnas.2016839118

Zhao, Y., Wang, L., **Knighton, J.**, Evaristo, J., & Wassen, M. (2021). Contrasting adaptive strategies by Caragana korshinskii and Salix psammophila in a semiarid revegetated ecosystem. *Agricultural and Forest Meteorology*, 300, 108323.

2020 **Knighton, J.**, Souter-Kline, V., Singh, K., Walter, M.T. (2020). Hammond Hill Research Catchment: Supporting Hydrologic Investigations of Rooting Zone and Vegetation Water Dynamics under Climate Change. *Hydrological Processes*. DOI: 10.1002/hyp.13887

Knighton, J., Vijay, V., Palmer, M. (2020). Alignment of Tree Phenology and Climate Seasonality Influences the Runoff Response to Forest Cover Loss. *Environmental Research Letters*. DOI: 10.1088/1748-9326/abaad9

Knighton J., Buchanan, B., Guzman, C., Elliott, R., Rahm, B. (2020). Predicting Flood Insurance Claims with Hydrologic and Socioeconomic Demographics via Machine Learning: Exploring the Roles of Topography, Minority Populations, and

Political Dissimilarity. *Journal of Environmental Management*. DOI: 10.1016/j.jenvman.2020.111051

Knighton J., Kuppel, S., Smith, A., Sprenger, M., Soulsby, C., Tetzlaff, D. (2020). Using Isotopes to Incorporate Tree Water Storage and Mixing Dynamics into a Distributed Ecohydrologic Modelling Framework. *Ecohydrology*. DOI: 10.1002/eco.2201

Knighton, J., Singh, K., Evaristo, J. (2020). Understanding Catchment-Scale Forest Root Water Uptake Strategies across the Continental US through Inverse Ecohydrological Modeling. *Geophysical Research Letters*. DOI: 10.1029/2019GL085937

Singh, K., **Knighton, J.**, Lassoi, J., Walter, M.T., Whitmore, M. (2020). Simulation and statistical modeling approaches to investigate hydrologic regime transformations following Eastern hemlock decline. *Hydrological Processes*.

Rosero-Lopez, D., **Knighton, J.**, Lloret, P., Encalada, A. (2020). Invertebrate response to Impacts of Water Intake and Flow Regulation in High Altitude Tropical Streams. *River Research and Applications*. DOI: 10.1002/rra.3578

2019 **Knighton J.,** Souter-Kline, V., Volkmann, T., Troch, P., Kim, M., Harman, C., Morris, C., Buchanan, B., Walter, M.T. (2019). Spatial and Topographic Variations in Ecohydrologic Separation in a Small, Temperate, Snow-Influenced Catchment. *Water Resources Research*. DOI:10.1029/2019WR025174

Knighton J., Coneelly, J., Walter, M. (2019). Possible Increases in Flood Frequency Due to the Loss of Eastern Hemlock in the Northeastern US: Observational Insights and Predicted Impacts. *Water Resources Research*. DOI: 10.1029/2018WR024395

Knighton J., Pleiss, G., Carter, E., Lyon, S., Walter, M.T., Steinschneider, S., (2019). Reproduction of Regional Precipitation and Discharge Extremes with Meso-Scale Climate Products via Machine Learning: An Evaluation for the Eastern CONUS. *Journal of Hydrometeorology.* DOI: 10.1175/JHM-D-18-0196.s1.

Menzies Pluer, E. G., **Knighton, J. O.**, Archibald, J. A., & Walter, M. T. (2019). Comparing Watershed Scale P Losses from Manure Spreading in Temperate Climates across Mechanistic Soil P Models. *Journal of Hydrologic Engineering*, 24(5), 04019009.

2018 **Knighton J.,** Tsuda, O,.Elliott R., Walter, M.T. (2018). Challenges to Implementing Bottom-Up Flood Risk Decision Analysis Frameworks: How Strong are Social Networks of Flooding Professionals? *Hydrology and. Earth Systems Sciences*. DOI: 10.5194/hess-2018-327.

Buchanan, B., Auerbach, D. A., **Knighton, J.**, Evensen, D., Fuka, D. R., Easton, Z., ... & Walter, T. (2018). Estimating dominant runoff modes across the conterminous United States. *Hydrological Processes*, 32(26), 3881-3890.

2017 **Knighton J.,** Steinschneider, S., Walter, M.T. (2017). A Vulnerability-Based, Bottom-Up Assessment of Future Riverine Flood Risk Using a Modified Peaks-over-Threshold Approach and a Physically Based Hydrologic Model. *Water Resources Research*. DOI: 10.1002/2017WR021036

Knighton, J, Menzies, E., M. T. Walter. (2017). Evaluation of Topographic Wetness Guided Dairy Manure Application Schemes to Reduce Stream Nutrient Loading in SWAT. *Journal of Hydrology: Regional Studies*. DOI: 10.1016/j.ejrh.2017.11.003

Knighton J., Saia, S., Morris, C., Archibald, J., Walter, M.T. (2017). Ecohydrologic Considerations for Modeling of Stable Water Isotopes in a Small Intermittent Watershed. *Hydrological Processes*. DOI: 10.1002/hyp.11194

Knighton J., DeGaetano, A., Walter, M.T. (2017). Hydrologic State Controls on Riverine Flood Hazard: Negative Feedbacks on the Effects of Climate Change. *Journal of Hydrometeorology*. DOI: 10.1175/JHM-D-16-0164.1

2016 **Knighton J.,** Walter, M.T. (2016). Critical Rainfall Statics for Predicting Watershed Flood Responses: Rethinking the Design Storm Concept. *Hydrological Processes*. DOI: 10.1002/hyp.10888

Knighton, J., Lennon, E., Bastidas, L., & White, E. (2016). Stormwater detention system parameter sensitivity and uncertainty analysis using SWMM. *Journal of Hydrologic Engineering*. DOI: 10.1061/(ASCE)HE.1943-5584.0001382

2015 **Knighton J.,** Bastidas, L. (2015). A Proposed Probabilistic Seismic Tsunami Hazard Analysis Methodology. *Natural Hazards*. DOI: 10.1007/s11069-015-1741-7

Bastidas, L. A., **Knighton, J.**, & Kline, S. W. (2016). Parameter sensitivity and uncertainty analysis for a storm surge and wave model. *Natural Hazards and Earth System Sciences*, 16(10), 2195-2210.

2014 **Knighton J.,** White E, Lennon E, Rajan R. (2014). Development of Probability Distributions for Urban Hydrologic Model Parameters and a Monte Carlo Analysis of Model Sensitivity. *Hydrological Processes* 28: 5131 – 5139. DOI: 10.1002/hyp.10009

Knighton J., Dapkey T, Cruz J. (2014). Random Walk Modeling of Adult *Leuctra ferruginea* (Stonefly) Dispersal. *Ecological Informatics* 19: 1 – 9. DOI: 10.1016/j.ecoinf.2013.11.001

2011 Maimone, M., O'Rourke, D. E., **Knighton, J. O.**, & Thomas, C. P. (2011). Potential impacts of extensive stormwater infiltration in Philadelphia. *Environ. Eng. Appl. Res. Pract*, 14, 1-12.

HONORS & AWARDS

2024 UConn CAHNR Early Career Research Award
2021 Outstanding Reviewer *Journal of Hydrologic Engineering*
2017 Outstanding Reviewer *Journal of Hydrologic Engineering*
AGU Horton Research Grant (competitive award)
2016 National Science Foundation (NSF) Graduate Research Fellowship Honorable Mention
2007 Chi-Epsilon inductee- honor society for civil engineering

SELECTED PRESENTATIONS

2022 **Knighton, J.** The Age of Transpiration Drives Ecosystem Water Use. ACES.

2019 **Knighton, J.,** Kuppel, S., Sprenger, M., Smith, A., Soulsby, C., Tetzlaff, D. (2019). Interpreting Xylem Isotopic Measurements in the context of Tree Water Storage and Mixing. 2019 American Geophysical Union Fall Meeting.

2018 **Knighton, J.,** Coneelly, J., Walter, M.T. (2018). Oral Presentation. The Influence of Eastern Hemlock Loss on the Flood Frequency Distribution of a Small Temperate Catchment. 2018 American Geophysical Union Fall Meeting.
Knighton, J., Elliott, R. (2018). Oral Presentation. What do we talk about when we talk about flooding? 2018 CaRDI Flood Risk & Community Resiliency.

2017 **Knighton, J.** Souter-Kline, V., Walter, M.T. (2017). Oral Presentation. Spatial and Temporal Variability of Ecohydrologic Separation in a Snow-Dominated Watershed. 2017 American Geophysical Union Fall Meeting.

2016 **Knighton, J.** Morris, C., Saia, S., Walter, M.T. (2016). Oral Presentation. The Importance of Plant Growth and Unsaturated Zone Mixing for the Simulation of Stable Water Isotopes. 2016 American Geophysical Union Fall Meeting.

2015 **Knighton, J.** (2015). Oral Presentation. Estimating the Effects of DEM Uncertainty through Two-Dimensional Spatial Stochastic Watershed Simulation. World Environmental and Water Resources Congress 2015.

PUBLISHED DATASETS

Knighton, J. (2021). Fenton Tract Research Forest – Hydrologic Data. CUAHSI HydroShare. https://www.hydroshare.org/resource/8996065d3ba34907a018be9b4369c1d3/

Knighton, J. (2019). CUISO: Cornell Six Mile Creek Isotopes. CUAHSI HydroClient. DOI: 10.4211/his-5651

Knighton, J. (2018). Tompkins County Flood Expert Survey, HydroShare, DOI: 10.4211/hs.93dbbcda406349e691030e92c882fb3a

OUTREACH & SERVICE

Tompkins County Environmental Management Council Associate Member (2016 – 2019)

US Global Change Research Program & AGU Climate Resiliency Dialogues (2018): Carlisle, PA

US Global Change Research Program & AGU Climate Resiliency Dialogues (2017): Savannah, GA

PROFESSIONAL REGISTRATIONS & MEMBERSHIPS

Registered Professional Engineer (Delaware) License No.: 19216

Member of AAAS (2016 – present)

Member of American Geophysical Union (2016 – present)

Member of Chi Epsilon Civil Engineering Honor Society (member since 2006; active 2006 – 2007)

Member of the American Entomological Society (active member since 2012)

PRESS

2022 *UConn Today:* The Travails of an Alewife: Dams, Drought, and Climate Change.
https://today.uconn.edu/2022/10/alewives-can-they-get-out/
https://phys.org/news/2022-10-travails-alewife-drought-climate.html
https://www.newsbreak.com/news/2790070115592/the-travails-of-an-alewife-dams-drought-and-climate-change
https://www.planetswater.com/the-travails-of-an-alewife-dams-drought-and-climate-change-uconn-today-university-of-connecticut

EOS: Evolution is More Important than Environment for Water Uptake.
https://eos.org/editor-highlights/evolution-is-more-important-than-environment-for-water-uptake

2021 *Gizmodo:* Racist Zoning Practices Are So Prevalent, 'You Can Even See It in the Flood Data'. URL*:* *https://earther.gizmodo.com/racist-zoning-practices-are-so-prevalent-you-can-even-1846480471*

2020 *ABC News 10*: Demographics data helps predict New York flood insurance claims.

Cornell Chronicle: Demographics data helps predict NY flood insurance claims.

2014 *Environmental News Network:* Returning insects are an imperfect measure of stream restoration potential.