CHRISTIAN D. GUZMAN

Department of Civil and Environmental Engineering
130 Natural Resources Rd, University of Massachusetts Amherst
Amherst, Massachusetts 01003 email: cdguzman@umass.edu

Education

Cornell University	Biological and Environmental Engineering	Ph.D.	2016
Cornell University	Biological and Environmental Engineering	M.S.	2011
University of Florida	Agricultural and Biological Engineering	B.S.	2009

Appointments

2019-Current	University of Massachusetts Amherst, Assistant Professor
2017-2019	Washington State University, Postdoctoral Research Associate
2016-2016	Cost-effective Biochar Reactor Project, Cornell University, Research Associate
2015-2015	CienciAmerica, Latina American Studies Program, Cornell (Colombia) instructor
2014-2015	CIAT-International Center for Tropical Agriculture (Colombia), Visiting Researcher
2013-2013	Panamerican School of Agriculture at Zamorano (Honduras), Visiting Researcher
2010-2014	Bahir Dar University (Ethiopia), Visiting Researcher
2010-2012	Food Systems and Poverty Reduction IGERT Fellow
2010-2015	NSF Graduate Research Fellow

Publications (37 in total; 34 published, 3 in review), *advisee, $^{+}$committee member

2025 (3 *manuscripts under review/in revisions*)

37. *Carneiro Marques, A.C., Veras, C.E., Carr, J.W., Crocker, D., Drury, T., **Guzman, C.D**., (submitted May 2025). Distribution, extent, and seasonality of freshwater salinization in surface and groundwater across Massachusetts, Northeast US. *Submitted to* Ecological Informatics.
36. *Sharkus, C.A., Embke, H., Harper, K., Pereira-Roa, V., Comcowich, J., Roque, H., Smith, S.I., Fernandez, S., Vogel, E., **Guzman, C.D.** (submitted May 2025). Understanding Perception of Risk and Adaptation Strategies to Climate Change Through Participatory Research with a Massachusetts Urban Farming Community. *Submitted to* Environmental Research Communications
35. *Shakhawat, M.K., Roberts, C.O., Gelda, R.K., Moore, K.E., Mukundan, R., Wagner, S.J., Rose, K., **Guzman, C.D.,** Reckhow, D. (submitted August 2024). Impact of Spatial and Temporal Variability on Dissolved Organic Matter and disinfection byproduct precursors in a Northeastern US Drinking Water Source. *Submitted to* Environmental Science Technology Water.

2025 (one peer-reviewed article)

34. *Sharkus, C. A., Givens, J.E., Saia, S., Knighton, J., Vogel, E., Salap-Ayca, S., Hatch, C., **Guzman, C.D.** (2025). Spatial and Temporal Analysis of Flood Risk in Massachusetts Environmental Justice Communities. Journal of Water Resources Planning and Management. DOI: 10.1061/JWRMD5.WRENG-6482

2024 (two peer-reviewed article)

33. *Shakhawat, M.K., Lopes, M., McBeath, S., **Guzman, C.D.,** Reckhow, D. (2024). Storm impacts on natural organic matter (NOM) characteristics changes in drinking water sources: A case study in Neversink Reservoir watershed, New York. Water Research. 255, 121445 https://doi.org/10.1016/j.watres.2024.121445
32. Weldegebriel, L., Thompson, S., Tilahun, S., Guzman, C.D. (2023, revised and resubmitted on November 10) Tolerance to waterlogging determines the effectiveness of biodrainage in mitigating runoff in hillslope-scale simulations. Catena, 243, https://doi.org/10.1016/j.catena.2024.108149

Publications (37 in total; 34 published, 3 in review)

2023 (one peer-reviewed article)

31. *Carneiro Marques, A., Veras, C. E., Kumpel, E., Tobiason, J., **Guzman, C.D**., (2023). Assessment of nutrients and conductivity in the Wachusett Reservoir watershed: An investigation of land use contributions and trends. International Soil and Water Conservation Res. https://doi.org/10.1016/j.iswcr.2023.07.004

2022 (one peer-reviewed article)

30. Mhiret, D.A., Dersseh, M.G., **Guzman, C.D**., Dagnew, D.C., Abebe, W.B., Zimale, F.A., Zaitchik, B.F., Tilahun, S.A., Walraevens, K. and Steenhuis, T.S., 2022. Topography Impacts Hydrology in the Sub-Humid Ethiopian Highlands. Water, 14(2), p.196. https://doi.org/10.3390/w14020196

2021 (three peer-reviewed article)

29. +Soper, J.J., **Guzman, C.D**., Kumpel, E., Tobiason, J.E. 2021. Long-term analysis of road salt loading and transport in a rural drinking water reservoir watershed. J. Hydrol. https://doi.org/10.1016/j.jhydrol.2021.127005
28. Womber, Z.R., Zimale, F.A., Kebedew, M.G., Asers, B.W., DeLuca, N.M., **Guzman, C.D**., Tilahun, S.A., Zaitchik, B.F. 2021. Estimation of Suspended Sediment Concentration from Remote Sensing and In Situ Measurement over Lake Tana, Ethiopia. Advances in Civil Engineering, https://doi.org/10.1155/2021/9948780
27. Knighton, J.O., Hondula, K., *Sharkus, C., **Guzman, C.D**., Elliot, R., 2021. Flood risk behaviors of United States riverine metropolitan areas are driven by local hydrology and shaped by race. PNAS, 118 (13) e2016839118 https://doi.org/10.1073/pnas.2016839118

2020 (four peer-reviewed article)

26. Knighton, J.O., Buchanan, B., **Guzman, C.D.**, Elliott, R., White, E., 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. J. Environ. Manage., https://doi.org/10.1016/j.jenvman.2020.111051
25. Mhiret, D.A., Dagnew, D.C., Guzman, C.D., Alemie, T.C., Zegeye, A.D., Tebebu, T.Y., Langendoen, E.J., Zaitchik, B.F., Tilahun, S.A., Steenhuis, T.S. 2020. A nine-year study on the benefits and risks of soil and water conservation practices in the humid highlands of Ethiopia: The Debre Mawi watershed, J. Environ. Manage., 270, https://doi.org/10.1016/j.jenvman.2020.110885.
24. Steenhuis, T.S., Tilahun, S.A., Collick, A.S., Zimale, F.A., **Guzman, C.D.**, Moges, M., Nicholson, C., Enku, T., Pell, A.N., 2020. Intricacies of an effective global "rooted" collaboration in soil and water research. Geoderma. https://doi.org/10.1016/j.geoderma.2020.114301
23. Hassanpour, B., Riazi, S.F., Menzies Pluer, E. G., Geohring, L.D**. Guzman, C.D.** Steenhuis. T.S. (2020) Biochar Acting as an Electron Acceptor Reduces Nitrate Removal in Woodchip Denitrifying Bioreactors. Ecol. Engineering.

2019 (four peer-reviewed articles)

22. Mhiret, D.A., Dagnew, D.C., Alemie, T.C., **Guzman, C.D.**, Tilahun, S.A., Zaitchik, B.F., Steenhuis, T.S. (2019) Impact of Soil Conservation and Eucalyptus on Hydrology and Soil Loss in the Ethiopian Highlands. Water. 11, 2299.

21. Muñoz, E., **Guzman, C.D.,** Medina, Y., Boll, J., Arumi, J, L. (2019) An adaptive basin management rule to improve water allocation resilience. Water, 11, 1733.
20. **Guzman, C.D.**, Hoyos Villada, F., Da Silva, M., Zimale, F.A., Chirinda, N., Botero Vargas, C.A., Morales Vargas, A., Rivera, B., Moreno, P., Steenhuis, T.S. (2019) Variability of Soil Surface Characteristics in a Mountainous Watershed in Valle Del Cauca, Colombia. J. Hydrol. https://doi.org/10.1016/j.jhydrol.2019.06.002
19. Ochoa-Tocachi, B., Alemie, T., Buytaert, W., Tilahun, S.A., **Guzman, C.D.**, Zimale, F.A., Steenhuis, T.S (2019) Sensitivity Analysis of the Parameter-Efficient Distributed (PED) Model for Discharge and Sediment Concentration Estimation in Humid Climates. Land Degrad. Dev. https://doi.org/10.1002/ldr.3202

2018 (three peer-reviewed articles)

18. Givens, J., Padowski, J., **Guzman, C.D.,** Malek, K., Witinok-Huber, R., Cosens, B., Boll, J., Adam, J. (2018) Incorporating Social System Dynamics in the Columbia River Basin: Food-Energy-Water Resilience and Sustainability Modeling in the Yakima River Basin. Front Environ. Sci.
17. Zegeye, A.D., Langendoen, E.J., **Guzman, C.D.**, Dagnew, D.C., Tilahun, S.A., Steenhuis, T.S. (2018) Gullies, A Critical Link in Landscape Soil Loss: A Case Study in The Sub-Humid Highlands of Ethiopia. Land Degradation and Development. doi: 10.1002/ldr.2875.
16. **Guzman, C.D.**, Tilahun, S.A., Zegeye, A. D., Yitaferu, B., Kay, R.W., Nagle, G.N., Steenhuis, T.S. (2018) Developing Soil Conservation Strategies with Technical and Community Knowledge in a Degrading Sub-Humid Mountainous Landscape. Land Degrad Develop. doi: 10.1002/ldr.2733.

2017 (five peer-reviewed articles)

15. **Guzman, C.D.**, Tilahun, S.A., Dagnew, D.C., Zimale, F.A., Zegeye, A. D., Boll, J., Parlange, J-.Y., Steenhuis, T.S. (2017) Spatio-temporal Patterns of Groundwater Depths and Soil Nutrients in a Small Watershed in the Ethiopian Highlands: Topographic and Land-use Controls. J Hydrol. 555, 420-434. doi: 10.1016/j.jhydrol.2017.09.060.
14. Dagnew, D.C., **Guzman, C.D.**, Akal, A.T., Tebebu, T.Y., Zegeye, A.D., Mekuria, W., Tilahun, S. A., Steenhuis, T.S. (2017) Effects of Land Use on Catchment Runoff and Soil Loss in the Sub-Humid Ethiopian Highlands. Ecohydrol & Hydrobiol. doi: 10.1016/j.ecohyd.2017.07.004
13. Zimale, F.A., Tilahun, S.A., Tebebu, T.Y., **Guzman, C.D.,** Hoang, L., Schneiderman, E.M., Langendoen, E.J., Steenhuis, T.S. (2017) Improving Watershed Management Practices in Humid Regions. Hydrol Process. doi: 10.1002/hyp.11241.
12. **Guzman, C. D.**, Zimale, F.A., Tebebu, T. Y., Bayabil, H. K., Tilahun, S. A., Yitaferu, B., Rientjes, T. H. M., Steenhuis, T. S. (2017) Modeling Discharge and Sediment Concentration After Landscape Interventions in a Humid Monsoon Climate: The Anjeni Watershed in the Highlands of Ethiopia. Hydrol Process. doi: 10.1002/hyp.11092.
11. **Guzman, C.D**., Tilahun S.A., Dagnew, D.C., Zegeye A.D., Tebebu, T.Y., Yitaferu, B., Steenhuis T.S. (2017) Modeling sediment concentration and discharge variations in a small Ethiopian watershed with contributions from an impermeable road. J Hydrol Hydromech. doi: 10.1515/johh-2016-0051.

2016 (three peer-reviewed articles)

10. Dagnew, D.C., **Guzman, C.D**., Zegeye, A.D., Akal, A. T., Moges, M. A., Tebebu, T.Y., Mekuria, W., Ayana, E.K., Tilahun, S. A., Steenhuis, T. S. (2016) Sediment loss patterns in the sub-humid Ethiopian highlands; the Debre Mawi catchments. Land Degrad. Develop. doi: 10.1002/ldr.2643.

9. Tilahun, S. A., Ayana, E. K., **Guzman, C. D**., Dagnew, D. C., Zegeye, A. D., Tebebu, T. Y., Yitaferu, B., Steenhuis, T. S. (2016) Revisiting Storm Runoff Processes in the Upper Blue Nile Basin: The Debre Mawi Watershed. Catena. 143, 47-56.
8. Zegeye, A.D., Langendoen, E.J., Stoof, C.R., Tilahun, S.A., Dagnew, D.C., Zimale, F.A., **Guzman, C.D**., Yitaferu, B., Steenhuis, T.S. (2016). Morphological dynamics of gully systems in the sub-humid Ethiopian Highlands: The Debre Mawi watershed. SOIL, 2:1-16. doi:10.5194/soil-2-1-2016.

2015 (three peer-reviewed articles)

7. Dagnew, D.C., **Guzman, C.D**., Zegeye, A.D., Tebebu, T.Y., Getaneh, M., Abate, S., Zemale, F., Ayana, E.K., Tilahun, S. A., Steenhuis, T. S. (2015) Impact of conservation practices on runoff and soil loss in the sub-humid Ethiopian Highlands: The Debre Mawi watershed. J Hydrol. Hydromech. 63, 210-219.
6. Tebebu, T.Y. Steenhuis, T. S., Dagnew, D. C., **Guzman, C. D**., Bayabil, H. K., Zegeye, A. D., Collick, A. S., Langan, S., MacAlister, C., Langendoen, E. J., and Tilahun, S. A. (2015) Improving efficacy of landscape interventions in the (sub)humid Ethiopian Highlands. Front Earth Sci. doi: 10.3389/feart.2015.00049.
5. Tilahun, S. A., **Guzman, C.D**., Zegeye, A. D., Dagnew, D.C., Collick, A. S., Yitaferu, B., Steenhuis, T.S. (2015) Distributed discharge and sediment concentration predictions in the sub-humid Ethiopian highlands: the Debre Mawi watershed. Hydrol. Process. 29: 1817–1828. doi:10.1002/hyp.10298.

Prior to 2014

4. Tilahun, S. A., Engda, T. A., Legesse, E. S., **Guzman, C. D**., Zegeye, A. D., Collick, A. S., Rimmer, A.,and Steenhuis, T. S. (2013) An efficient semi-distributed hillslope sediment model: the Anjeni in the sub humid Ethiopian Highlands. Hydrol. Earth Syst. Sci., 17, 1051-1063, doi:10.5194/hessd-17-1051-2013.
3. Steenhuis, T. S., Hrncir, M., Poteau, D., Romero Luna, E., Tilahun, S., Caballero, L., **Guzman C. D.**, Stoof, C, Sanda, M, Yitaferu, B, Cislerova, M. (2013) A saturated excess runoff pedo-transfer function for vegetated watersheds. Vadose Zone J., 12 (4). doi:10.2136/vzj2013.03.0060.
2. **Guzman C.D**., Tilahun S.A., Zegeye A.D., Steenhuis T.S. (2013) Suspended Sediment Concentration-Discharge Relationships in the Sub-Humid Ethiopian Highlands. Hydrol. Earth Syst. Sci., 17, 1067-1077, doi:10.5194/hess-17-1067-2013.
1. Tilahun, S. A., Mukundan, R., Demisse, B. A., **Guzman, C. D**., Tarakegn, B. C., Engda, T. A., Easton, Z. M., Collick, A. S., Zegeye, A. D., Schneiderman E. M., Parlange, J.-Y., Steenhuis, T. S. (2013) A saturation excess erosion model. T. ASABE., 56: 681-695.

Proceedings papers

vi. Steenhuis, T.S., Zimale, F.A., Boll, J., Tilahun, S.A., Brooks, E., **Guzman, C.D**., Hoang, L., Schneiderman, E.M., Mukundan, R., Langendoen, E.J. 2017. Designing Erosion And Nutrient Control Practices In Watersheds In Humid Regions: Lessons Learned. ASABE Annual International Meeting, Spokane, WA, USA.

v. Hassanpour, B., **Guzman, C.D.**, Geohring, L.D., Steenhuis, T.S. 2017. Removing Atrazine from agricultural drainage water using woodchips bioreactors; effect of biochar amendment. ASABE Annual International Meeting, Spokane, WA, USA.

iv. Dagnew, D.C., **Guzman, C.D.**, Akale, A., Zegeye, A.D., Mekuria, W., Ayana, E.K., Tilahun, S.A., Steenhuis, T. (2016) Modeling runoff and soil loss with conservation practices in sub-humid Ethiopian highlands. International Conference of the Advancement of Science and Technology. pp 85-93. Bahir Dar, Ethiopia, 17-18 May 2016.

iii. Dagnew, D.C., Tilahun, S.A., **Guzman, C.D.**, Ayana, E.K., Zegeye, A.D., Tebebu, T.Y., Mehari, M., Getaneh, M., Abate, S., Steenhuis, T.S., (2014) Hydrologic and Sediment response to the large-scale soil and water conservation implementation in a sub-humid watershed in the Ethiopian

highlands. pp 230-236. In: B. Bantyirga, M.Mehari, V.S. Rao, B.L. Manocha, K.K. Singh, S. Geremew and E. Tadesse, Eds. 2nd International Conference on the advancements of Science and Technology, Bahir Dar Institute of Technology, Bahir Dar Ethiopia.

ii. Zegeye, A.D., S. Damtew, S.A.Tilahun, E.J. Langendoen, Dagnew, D. C., **Guzman**, **C.D.,** Tebebu, T .Y., Steenhuis, T.S., (2014) Gully development processes in the Ethiopian highlands, pp 220-229 In: B. Bantyirga, M.Mehari, V.S. Rao, B.L. Manocha, K.K. Singh, S. Geremew and E. Tadesse, Eds. 2nd International Conference on the advancements of Science and Technology, Bahir Dar Institute of Technology, Bahir Dar Ethiopia.

i. **Guzman, C.D**., Tilahun, S.A., Zegeye, A. D., Yitaferu, B., Kay, R.W., Nagle, G.N., Steenhuis, T.S. (2012) Finding Eroding Areas and Patterns with GIS and Community Knowledge in the Ethiopian Highlands. Proceedings for the ITU/MEDFRIEND International Conference on Sediment Transport Modeling in Hydrological Watersheds and Rivers, Istanbul, Turkey.

Book and Other Contributions

Guzman, C.D., 2019. Hillslope sediment transport across climates and vegetative influences. Geology, 47(5), pp.495-496.

Tilahun, S.A., **Guzman, C.D**., Zegeye, A. D., Ayana, K. E., Collick, A. S., Yitaferu, B., Steenhuis, T.S. (2013) Chapter 9: Spatial and Temporal Patterns of Soil Erosion in the Semi-humid Ethiopian Highlands: a case study of Debre Mawi Watershed. In: Melesse AM, Abtew W, and Setegn SG. (Eds) Nile River Basin: Ecohydrological Degradation, Climate Change and Hydropolitics. Springer.

Forthcoming

Guzman, C.D., Mairal, G., Colfer C.J.P., Makki, F.M., Tilahun, S.A., Dagnew, D.C., Zegeye, A. D., Tebebu, T.Y., Yitaferu, B., Steenhuis, T.S. (to be submitted 2024) Interlinking Outsiders' and Insiders' Perceptions of Soil Erosion Risk. Agriculture and Human Values.

Yilak, D.L., Tilahun, S.A., Schmitter, P., Haile, A.T., Tibebu Kassawmar, N., **Guzman, C.D.,** Steenhuis, T.S. (to be submitted 2024) Adaptation of the SCS Runoff Equation for a (Sub) Humid Monsoon Climate.

Zimale, F.A., **Guzman, C.D.**, Knighton, J., Tilahun, S.A., Steenhuis, T.S. (to be submitted 2024) Predictive and parameter uncertainty of a hydrologic model in a humid watershed in the Blue Nile Basin.

Courses Taught

Department of Civil and Environmental Engineering, University of Massachusetts Amherst, Amherst, MA

CEE357: Elementary Fluid Mechanics (3 units, undergraduate, required) – Fall 2023 (54 students), Fall 2022 (93 students); Fall 2020 (85 students); Fall 2019 (25 students)

CEE 577: Surface Water Quality Modeling - (3 units, graduate) – Spring 2023 (5 students); Spring 2022 (6 students); Spring 2021 (14 students); Spring 2020 (5 students)

Student Advising

*co-advised/co-chaired; IS=Independent study

Graduate Student Committees Chaired

Current

Tim Nsubuga	PhD	CEE, UMass Amherst	expected 2026
		Spaulding Smith Fellowship, Awarded 2019	

		AGU CUAHSI Travel Award 2022 *SPATIAL Isotope Travel Award 2022* *UMass Public Writing Fellow, Awarded 2022*	
Zelalem Regassa Womber	PhD	CEE, UMass Amherst	in progress
Vishawjot Sandhu Singh	PhD	CEE, UMass Amherst	in progress
Cielo A Sharkus	PhD	CEE, UMass Amherst *Spaulding Smith Fellowship, Awarded 2019* *NECASC Fellowship, Awarded 2021* *AWWA Scholarship, Awarded 2021* *Agents of Change Fellowship, Awarded 2021* *NSF NRT ELEVATE Fellow, Awarded 2021-2022* *USGS Diverse Knowledge Systems Fellowship 2022* *SPATIAL Isotope Travel Award 2022* *Switzer Environmental Fellowship, 2023* *AWWA Scholarship, Awarded 2023*	September 2024
Amanda Carneiro Marques*	PhD	CEE, UMass Amherst *Sisson Fellowship, Awarded 2020* *AGU CUAHSI Travel Award 2022* *SPATIAL Isotope Travel Award 2023* *CUASHI Pathfinder Fellowship, Awarded 2023*	May 2024

Graduate Committee Participation

<u>Current</u>			
Moussa Siri	PhD	Environ Conserv, UMass Amherst	Expected 2025
Pedro Matos-Llavona	PhD	Earth Geog Clim Sci, UMass Amherst	Expected 2025
Vicente Pereira Roa	MS	Earth Geog Clim Sci, UMass Amherst	January 2024
<u>Graduated</u>			
Josh Soper	MS	CEE, UMass Amherst	2020

Undergraduate Research Advising

<u>Current</u>			
Raul Vera	BS	CEE, UMass Amherst, LSAMP	Expected 2024
Brooke DeJesus	BS	CEE, UMass Amherst, SLOAN	Expected 2026
<u>Graduated Chaired</u>			
Tess Hachey	BS	CEE, UMass Amherst	2024
Jacob Cowley	IS	CEE, UMass Amherst	2020
Chinyere Ogala	BS	CEE, UMass Amherst	2022

Awards

Water Quality in DCR Reservoirs 2024-2026, Massachusetts Department of Conservation and Recreation, Division of Water Supply Protection, 07/2022-06/2024, $333,000. PI: **Christian D. Guzman** Co-PI: Emily Kumpel, John Tobiason.

Water Quality Modeling Support (WQ-MODEL-19) NYC Dept. of Environmental Protection, 8/2023 - 9/2024, $80,000. PI: **Christian D. Guzman**, Co-PIs: Dave Reckhow, Sean McBeath.

Water Quality in DCR Reservoirs 2022-2024, Massachusetts Department of Conservation and Recreation, Division of Water Supply Protection, 07/2022-06/2024, $320,000. PI: **Christian D. Guzman** Co-PI: Emily Kumpel, John Tobiason.

Water Resources Research Center Massachusetts FY21 Annual Application, U.S. Geological Survey, 9/2021 – 8/2022, $124,999.00, PI: Marie-Francoise Hatte, Co-PIs: **Christian Guzman**, Alison Roy, Christine Hatch

VIC-SNiP: Assimilating remotely sensed data to model water, Sediment, Nitrogen, and Phosphorous transport at continental scales 2021-2023, National Aeronautics and Space Administration, $530,266.58, PI: Dongmei Feng, Co-PIs: **Christian Guzman**, Colin Gleason.

Water Quality in DCR Reservoirs 2020-2022, Massachusetts Department of Conservation and Recreation, Division of Water Supply Protection, 07/2020-06/2022, $306,000. PI: Emily Kumpel, Co-PI: **Christian D. Guzman,** John Tobiason.

Understanding changing natural and human-altered watersheds in the Inland Pacific Northwest through isotope hydrology and urban-ecological resiliency 2020-2023, US Department of Agriculture, $54,000 PI: **Christian Guzman**

Water Quality in DCR Reservoirs 2018-2020, Massachusetts Department of Conservation and Recreation, Division of Water Supply Protection, 07/2018-06/2020, $290,000. PI: Emily Kumpel, Co-PI: **Christian D. Guzman,** John Tobiason.

Internally Supported Projects

Connecting STEM to Social Justice to Create Systemic Change in Broadening Participation, 2024-2025, $29,976, PI: Nilanjana Dasgupta, Co-PI: **Christian Guzman**

Investigating SUELO (Sustainable Urban agriculture for Environmental justice and Landscape Observations of carbon cycling and water dynamics), 2023-2024, $50,000, PI: **Christian Guzman**, Co-PI: Rachel Hestrin

Assessing Social Vulnerability and Understanding the Flood Risk Factors in Massachusetts 2021-2022 (UMass Amherst Institute of Diversity Sciences), $13,000: PI: **Christian Guzman**, Co-PIs: Şalap-Ayça, Eve Vogel, Christine Hatch, Cielo Sharkus.

Mill River-Lake Warner Watershed Hydrology Research Massachusetts Society of Professors (MSP) Research Support Award, 2019-2020, $1,000, PI: **Christian D. Guzman**

Honors

2018 USDA NIFA Postdoctoral Fellowship ($163,000)
2016 CUAHSI Pathfinder Fellow Travel Support, Biennial Science Colloquium ($500)
2016 Cornell University Graduate School Diversity Advisory Council Member
2015 Degree Marshal at the 147th Cornell University Commencement Ceremony
2015 College of Agriculture and Life Science Alumni Grant ($250)
2015 Cornell University Diversity Programs in Engineering Graduate Student of the Year ($250)
2014 NSF GROW/USAID Research and Innovation Fellowship ($16,500)

2013 US Borlaug Fellows in Global Food Security Program Award ($15,000)
2012 CUAHSI Pathfinder Graduate Student Fellowship ($4,180)
2012 Cornell University Graduate School Research Travel Grant ($2,000)
2010 Food Systems and Poverty Reduction IGERT Fellow ($70,000)
2010 NSF Graduate Research Fellowship Program ($90,000)
2009 State University of New York (SUNY) Diversity Fellowship ($28,000)

Oral Presentation(*indicates mentee)

2024, Guzman, C.D., Nsubuga, T., Hachey, T., DeJesus, B., Vera, R., Using tracers to discern flow paths across the Lake Warner-Mill River Watershed, Northeastern US. AGU CUAHSI WaterSciCon 19-24 June 2024, Minnesota, MN.

2023, Hatch, C, Salap-Ayca, S, Guzman, C, Vogel, E, A just map: community and fluvial science working together for flood hazard vulnerability mapping in Massachusetts, EGU General Assembly, 23-28 April 2023, Vienna, Austria.

2023, *Marques, AC, Ferreira, CSS, Martínez-Carreras, N, Kalantari, Z, Guzman, C Characterizing landscape influences on hydrological flow pathways in a peri-urban Mediterranean catchment

2022, *Marques, AC, Guzman, C, Drinking Water Supply Reservoir Water Quality Responses to Changes in Management Practices and Strategies, AGU Fall Meeting, 12-16 December 2022, Chicago, IL.

2022, Friedmann, E, Gleason, CJ, Feng, D, Guzman, CD, Monitoring CONUS River Sediment Concentration Through Landsat, Sentinel, and MODIS Satellite Sensor Fusion, AGU Fall Meeting, 12-16 December 2022, Chicago, IL.

2022, *Sharkus, C., Givens, J., Saia, S., Guzman, C.D. Spatial and Temporal Variation of Hydrological Risk in Rural and Urban Environmental Justice Communities, AGU CUAHSI FIHM 19-24 June 2022, San Juan, PR.

2022, Spikes, A, Nsubuga, T, Tilahun, SA, Zimale, FA, Zegeye, AD, Steenhuis, T, Guzman, C, Building Hydrological Observatories for Assessment of Erosion and Gully Formation in the Ethiopian Highlands, AGU CUAHSI FIHM 19-24 June 2022, San Juan, PR.

2022, *Marques, AC, Kumpel, E, Tobiason, J, Guzman, C, Analysis of flow, nutrient, and road salt trends in a rural drinking water reservoir watershed, AGU CUAHSI FIHM 19-24 June 2022, San Juan, PR.

2022, *Marques, AC, Kumpel, E, Tobiason, J, Guzman, C, Using Stable Isotopes to Assess Surface-Groundwater Interactions and Contaminant Pathways in a Drinking Water Supply Watershed System, EGU General Assembly, 23-27 May 2022, Vienna, Austria.

2022, *Sharkus, C, Givens, J, Saia, S, Knighton, J, Guzman, C, Spatial and Temporal Variation of Hydrological Risk in Rural and Urban Environmental Justice Communities EGU General Assembly, 23-27 May 2022, Vienna, Austria.

2019, Integration of Socio-Cultural-Environmental Data in the Columbia River Basin: Food-Energy-Water Resilience Assessment, AGU's 52nd annual Fall Meeting, 9-13 December 2019, San Francisco, CA

2018, Variability of Soil Surface Characteristics in a Mountainous Watershed in Valle Del Cauca, Colombia, AWRA 2018 Spring Specialty Conference, 22-25 April 2018, Orlando, FL

2018, Understanding changing natural and human-altered watersheds in the Inland Pacific Northwest through hydrological and sedimentological connectivity, EGU General Assembly, 9-13 April 2018, Vienna, Austria.

2017, Designing Erosion and Nutrient Control Practices in Watersheds in Humid Regions: Lessons Learned, ASABE Annual International Meeting, 16-19 July 2017, Spokane, WA.

2016, Investigating the impact of soil erosion in Ethiopia and cloud forests in Honduras for improved water quality management, CUAHSI Biennial Symposium, 24-27 July 2016, Shepherdstown, WV.

2014, Prioritizing landscape interventions in the Ethiopian highlands, EGU General Assembly, 27 April- 2 May 2014, Vienna, Austria.

2013, Erosion and gully formation in the Ethiopian highlands: Physical observations and community observations AGU's 46th annual Fall Meeting, 9-13 December 2013, San Francisco, CA.

2013, Finding Eroding Areas and Patterns with GIS and Community Knowledge in the Ethiopian Highlands, Yale Bouchet Conference on Diversity and Graduate Education, New Haven, CT.
2012, Finding Eroding Areas and Patterns with GIS and Community Knowledge in the Ethiopian Highlands, ITU/MEDFRIEND International Conference on Sediment Transport Modeling in Hydrological Watersheds and Rivers, Istanbul, Turkey.

Poster Presentation (*indicates mentee)

2025, Guzman, C.D., Nsubuga, T., Vera, R. Small head water contributions in a heterogenous watershed of the Connecticut River Valley. EGU General Assembly 27 April-2 May, 2025, Vienna, Austria
2023, *Nsubuga, T.N., Guzman, C.D. Total Phosphorus Concentration and Loading Analysis of the Mixed-Use Lake Warner-Mill River Watershed, AGU's 56th Annual Fall Meeting, 11-15 December 2023, San Francisco, CA.
2023, *Sharkus, C.S., Embke, H., Guzman, C.D. Understanding Knowledge Systems and Adaptation Practices in Response to Extreme Precipitation Events: Insights from Community-Engaged Research in Massachusetts. AGU's 56th Annual Fall Meeting, 11-15 December 2023, San Francisco, CA.
2023, *Marques, A.C., Guzman, C.D. Salinity patterns in surface water and groundwater across Massachusetts. AGU's 56th Annual Fall Meeting, 11-15 December 2023, San Francisco, CA.
2022, *Nsubuga, T, AK Tebebu, TY, Zimale, FA, Steenhuis, TS, Guzman, C. Assessing soil organic matter and soil degradation in tropical climates, AGU CUAHSI FIHM 19-24 June 2022, San Juan, PR.
2020, *Sharkus, C., Givens, J., Saia, S., Guzman, C.D. Comparison of Social Vulnerability and Flood Risks in Massachusetts, AGU Fall Meeting, 9-13 December 2020, Virtual.
2020, *Marques, AC, Kumpel, E, Tobiason, J, Guzman, C, Assessment of Nutrients in the Wachusett Reservoir Watershed: An Investigation of Land Use Contributions and Trends, AGU Fall Meeting, 9-13 December 2020, Virtual.
2019, *Sharkus, C., Givens, J., Saia, S., Guzman, C.D. Assessing Social Vulnerability and Hydrological Risk in Massachusetts, AGU's 52nd annual Fall Meeting, 9-13 December 2019, San Francisco, CA.
2019, Isotope hydrology of a semi-arid, snow-melt dominated watershed of the Inland Pacific Northwest: the Palouse River basin, AGU's 52nd annual Fall Meeting, 9-13 December 2019, San Francisco, CA.
2018, Estimating water residence times with stable water isotopes in the Inland Pacific Northwest: Importance of input signal measurements during winter months, AGU's 51th annual Fall Meeting, 10-14 December 2018, Washington DC.
2018, Variability of Soil Surface Characteristics in a Mountainous Watershed in Valle Del Cauca, Colombia, EGU General Assembly, 9-13 April 2018, Vienna, Austria.
2016, Investigating the impact of soil erosion in Ethiopia and cloud forests in Honduras for improved water quality management, CUAHSI Biennial Symposium, 24-27 July 2016, Shepherdstown, WV.
2015, Spatial patterns of soil nutrients and groundwater levels within the Debre Mawi watershed of the Ethiopian highlands, EGU General Assembly, 12-17 April, Vienna, Austria.
2014, Sediment and solute transport in a mountainous watershed in Valle del Cauca, Colombia, AGU's 47th annual Fall Meeting, 15-19 December 2014, San Francisco, CA.
2014, Erosion and gully formation in the Ethiopian highlands: Physical observations and community observations, EGU General Assembly, 27 April- 2 May, Vienna, Austria.
2014, Finding Eroding Areas and Patterns with GIS and Community Knowledge in the Ethiopian Highlands, USDA Borlaug Symposium, 25 March, Washington, D.C.
2013, Assessing Smallholder GABA Rice Production in Na Ngoi, Thailand, Cornell International Institute for Food, Agriculture and Development (CIIFAD) 4th Annual Student Multidisciplinary Applied Research Team (SMART) Symposium, 28 April, Ithaca, NY.
2012, Finding Eroding Areas and Patterns with GIS and Community Knowledge in the Ethiopian Highlands, AGU's 45th annual Fall Meeting, 3-7 December 2012, San Francisco, CA.
2010, Challenges to Defining Sediment Concentration-Discharge Relationships in the Ethiopian Highlands AGU's 43th annual Fall Meeting, 13-17 December 2010, San Francisco, CA.

International Collaborations

2014 NSF GROW/USAID Research and Innovation Fellowship: Integrating tropical watershed hydrology and ecosystem services research for improved nutrient and water use efficiency in the Colombian Andes with CIAT (International Center for Tropical Agriculture).

2013 US Borlaug Fellows in Global Food Security Program: Collaborative Soil and Water Management for Enhanced Agricultural Productivity in the Ethiopian Highlands with Bahir Dar University and Amhara Region Agricultural Research Institute.

2013 CUAHSI Pathfinder Fellowship: Comparative research on solute and sediment transport in forested watershed with the Department of Environment and Development Studies at the Panamerican School of Agriculture, Zamorano, Honduras.

2013 Cornell International Institute for Food, Agriculture and Development (CIIFAD)Student Multidisciplinary Applied Research Team (SMART) project: GABA Rice Project Group in Sakon Nakhon Province, Thailand in collaboration with King Mongkut's University of Technology Thonburi (KMUTT).

2012-2015 USAID, NSF Partnerships for Enhanced Engagement in Research (PEER) Science: Reducing soil loss through effective soil and water conservation practices using hydrologic considerations and farmers' participation in the Blue Nile Basin with Bahir Dar University.

2012 Food Systems and Poverty Reduction IGERT Fellowship: Field Research Experience in Debre Mewi, Ethiopia with Bahir Dar University and Amhara Region Agricultural Research Institute.

2011 Systems Dynamics Concept Mapping and GIS Teff Suitability Mapping with Ethiopian Institute for Agricultural Research Debre Zeit Agricultural Research Center.

Outreach and Professional Development Activities

Undergraduate Research Mentorship

Mentor for Undergraduate Research Experience, Civil and Environmental Engineering, (Elias Buja, Nobuharu Ichimura) Fall, 2022, University of Massachusetts Amherst, Amherst, MA.

Mentor for Undergraduate Research Experience, Civil and Environmental Engineering, (Chinyere Ogala) Spring, 2021, University of Massachusetts Amherst, Amherst, MA.

Mentor for Undergraduate Research Experience, Civil and Environmental Engineering, (Eduardo Hernandez, Alex Rogel) Spring, 2019, Washington State University, Pullman, WA.

Mentor for Undergraduate Research Experience, Civil and Environmental Engineering, (Sam Ferguson, Alex Rogel) Fall, 2018, Washington State University, Pullman, WA.

Mentor for Summer Undergraduate Research Experience, Civil and Environmental Engineering, (Sam Ferguson) Summer, 2018, Washington State University, Pullman, WA.

Mentor for Undergraduate Research Experience, Team Mentoring Program, Louis Stokes Alliance for Minority Participation program, and Civil Engineering, (Zara Guzman, Alexis Guzman, Sam Ferguson, Raul Rodriguez, Alex Rogel) Spring, 2018, Washington State University, Pullman, WA.

Mentor for Undergraduate Research Experience, Team Mentoring Program, Louis Stokes Alliance for Minority Participation program, and Civil Engineering, (Alyssa Resurreccion, Jesus Policarpo, Marco Meza, Sam Ferguson, Raul Rodriguez, Alex Rogel) Fall, 2017, Washington State University, Pullman, WA.

Mentor for Undergraduate Independent Research (BEE4990), Karin Teuffer, "Investigating the role of CEC in clay soils in the northeastern US and northwestern Ethiopian highlands", Spring 2014, Cornell University, Ithaca, NY.

Mentor for Undergraduate Thesis Research, Martin Bonilla Portillo and Nazario Garay Ellington, "Relacion precipitacion-escorrentia y concentracion de los sedimentos suspendidos en las microcuencas Capiro y Zapotillo, Guinope, El Paraiso, Honduras," Summer 2013, Panamerican School of Agriculture, Zamorano, Honduras.

Lectures

Guest Lecture on Employing long-term data assessment, novel environmental tracers, and modeling to elucidate drinking water supply quality to support decision-making, Rutgers University Newark, 10 October 2023, Seminar.

Guest Lecture on Employing long-term data assessment, novel environmental tracers, and modeling to elucidate drinking water supply quality to support decision-making, Bahir Dar University, 14 July 2023, Seminar.

Guest Lecture on Building Hydrological Observatory, University of Connecticut, 3 Mar 2023, Spring Seminar.

Guest Lecture on Building Hydrological Observatory, Toronto Metropolitan University, 9 Nov 2022, Fall Virtual Seminar.

Guest Lecture on Soil Erosion and Water Resources, Hydrology, Pennsylvania State University, 21 April 2020, Virtual Seminar.

Guest Lecture on Soil Erosion and Conservation, Hydrology, Bahir Dar University, 13 January 2020, Bahir Dar, Ethiopia.

Guest Lecture on Soil and Water Resources Research, Sustainable Development in Water Resources, 17 October 2017, Pullman, WA

Guest Lecture on Research Methods in Water Resources, 20 October 2017, Pullman, WA

Guest Lecture on Water Resources Research, 4H Career Exploration program, 30 June 2016, Ithaca, NY.

Guest Lecture on International Research, 4H Career Exploration program, 3 July 2014, Ithaca, NY.

Guest Lecture on Participatory Research Methods, Farmer-Centered Research and Extension (IARD 7830), 26 February 2104, Cornell University, Ithaca, NY.

Guest Lecture on Hydrological Research Methods during field visit to Valle de Angeles, Introduction to Hydrology (9IAD3113), 22 June 2013, Panamerican School of Agriculture, Zamorano, Honduras.

Guest Lecture on Sediment Transport Research in Ethiopia, Introduction to Groundwater (BEE4710), 25 January 2013, Cornell University, Ithaca, NY.

Campus Outreach

Wonky Water Quality workshop Eureka! Girls Inc. of the Valley Summer Program. July 2024 UMass Amherst, Amherst, MA.

Panelist for New Faculty Orientation, Navigating Your First Year: Advice from Colleagues, 29 Aug 2023, UMass Amherst, Amherst, MA.

Wonky Water Quality workshop Eureka! Girls Inc. of the Valley Summer Program. July 2023 UMass Amherst, Amherst, MA.

Facilitator for College of Engineering Teaching Fellows Training, “Group work for new students and new facilitators”, 18 May 2023, UMass Amherst, Amherst, MA.

Wonky Water Quality workshop Eureka! Girls Inc. of the Valley Summer Program. July 2022 UMass Amherst, Amherst, MA.

Panelist for Cougs Rise Discussion on Navigating Undergraduate Experience, 13 July, 2018, WSU, Pullman, WA.

Speed Mentoring for Robert McNair Achievement Program, Transformation Tuesday Event, 07 November, WSU, Pullman, WA.

Panelist for College Assistant Migrant Program Discussion on Navigating Undergraduate Experience, 24 October, 2017, WSU, Pullman, WA.

Panelist for Discussion on Navigating Graduate School, Team Mentoring Program, 16 September, 2017, WSU, Pullman, WA.

Panelist for DPE Spotlight Master Your Future: How to Integrate International Research Experience Into Your Graduate Studies, Diversity Programs in Engineering, 26 March 2014, Cornell University, NY.

Panelist for DPE Spotlight Master Your Future: NSF Graduate Research Fellowship, Diversity Programs in Engineering, 21 September 2011, Cornell University, Ithaca, NY.

Workshops and training

Sloan Faculty Mentor Training. Culturally Aware Mentorship, National Research Mentoring Network, January 2024. Amherst, MA.

Faculty Development Institute, Society of Hispanic Professional Engineers National Conference, 2 November 2023, Salt Lake City, UT.

Sloan Faculty Mentor Training. National Research Mentoring Network, 22 May 2023. Amherst, MA.

Open Explore NEON workshop. National Ecological Observatory Network (NEON) Program. June 14-17, 2021.

National Center for Faculty Development & Diversity (NCFDD) Faculty Success Program, Jun-Aug 2021.

Mentor Training to become a more effective and confident mentor of graduate students. National Research Mentoring Network, Fall 2019. Amherst, MA.

Center for Integration of Research Teaching and Learning (CIRTL) Network Course, Planning Your Teaching-as-Research Project, Fall 2018.

NSF Leverage Faculty Development Institute, Society of Hispanic Professional Engineers National Conference, 2 November 2017, Kansas City, MO.

USDA Forest Service Spatial Statistical Modeling in Stream Networks Workshop 4-6 October, 2017, Pullman, WA.

NOAA Center for Weather and Climate Prediction, HYSPLIT Workshop, 13-16 June, 2017, College Park, MD.

Liberating Structures Workshop, 7-9 April, 2017, Pullman, WA

Professional Service

Reviewer for 52 articles since 2013:

- Catena (1)
- Earth Surface Processes and Landforms (1)
- Ecohydrology (1)
- Ecohydrology and Hydrobiology (2)
- Environments (MDPI Journal) (1)
- Environmental Research Letters (1)
- Geology (1)
- Geoderma (4)
- Hydrological Processes (5)
- International Journal of Environmental Research and Public Health (1)
- International Soil and Water Conservation (1)
- Journal of African Earth Sciences (2)
- Journal of Environmental Management, (7)
- Journal of Environmental Quality (1)
- Journal of Hydrology (7)
- Journal of Hydrology: Regional Studies (1)
- Journal of Soils and Sediments (4)
- Journal of Water Resources and Protection (1)
- Land Degradation and Development (2)
- PLOS One (2)
- Sustainability (MDPI Journal) (1)
- Transactions of the ASABE (2)
- Water Resources Research (3)

UMass Amherst Society of Hispanic Professional Engineers- Faculty Advisor (2022-Present)

Town of Amherst Water Supply Protection Committee (2023- Present)

UMass Amherst Sloan Faculty Fellow (2023-2024)

WSU Team Mentoring Program, Faculty Mentor (2018-Present)
WSU Chicano Latino Faculty Staff Association-Member (2017-Present)
WSU Society of Latino Engineers and Scientist, Student Chapter- Mentor (2017-Present)
WSU American Society of Civil Engineers, Student Chapter- Mentor (2017-Present)
WSU Postdoctoral and Professional Research Association- Member (2017- Present)
Edward A. Bouchet Honor Society (2013- Present)
Cornell University Graduate School Diversity Advisory Council (2016- Present)
Cornell University College of Engineering Diversity Advisory Council Member (2013, 2014, 2015)
Alpha Epsilon National Honor Society, President (2009- 2010), Member (2009-Present)
Latino Graduate Student Coalition, President (2010- 2011), Member (2009-2016)
Graduate Christian Fellowship, New Student Outreach Coordinator (2011), (2009- 2016)
International Students, Inc. Language Partner Volunteer (2009- 2011)
Friends of Farmworkers ESL Tutor (2010-2011)