

Gopal Gabriel Penny, Ph.D.

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Current

2018-present Postdoctoral researcher, University of Notre Dame
Civil and Environmental Engineering and Earth Sciences (CEEES)
Environmental Change Initiative (ECI)

Education

August 2017 Ph.D., Civil and Environmental Engineering at the University of California, Berkeley
Dissertation: “The drying of the Arkavathy river: understanding hydrological change in a human-dominated watershed” (Advised by Asst. Prof. Sally Thompson)

May 2012 M.S., Civil and Environmental Engineering at the University of California, Berkeley

May 2007 B.S., Electrical Engineering at Virginia Polytechnic Institute and State University

Publications

- Penny, G.**, Mondal, M.S., Biswas, S., Bolster, D., Tank, J.L., Müller, M.F., 2020 (*accepted*). Using natural experiments and counterfactuals for causal assessment: River salinity and the Ganges water agreement. *Water Resources Research*.
- Penny, G.**, Srinivasan, V., Apoorva, R., Jeremiah, K., Peschel, J., Young, S., and Thompson S., 2020. A process-based approach to attribution of historical streamflow decline in a data-scarce and human-dominated watershed. *Hydrological Processes*. doi.org/10.1002/hyp.13707
- Penny, G.**, Rahman, M.M., Mondal, M.S, Zaman, M.H., Kryston, A., M. Salehin, M., Nahar, Q., Islam, M.S., Bolster, D., Tank, J.L, Müller, M.F., 2019. Salinization in large river deltas: Drivers, impacts and socio-hydrological feedbacks. *Water Security*. doi.org/10.1016/j.wasec.2019.100024
- Penny, G.**, Goddard, J.J., 2018. Resilience principles in socio-hydrology: A case study review. *Water Security*. doi.org/10.1016/j.wasec.2018.11.003
- Penny, G.**, Srinivasan V., Dronova. I., Lele S., and Thompson S., 2018. Spatial characterization of long-term hydrological change in the Arkavathy watershed adjacent to Bangalore, India. *Hydrology and Earth System Sciences*. doi.org/10.5194/hess-22-595-2018
- Young, S., Peschel J., **Penny, G.**, Thompson, S., Srinivasan, V., 2017. Robot-Assisted Measurement for Socio-Hydrologic Understanding in Data Sparse Regions. *Water*. doi.org/10.3390/w9070494

Srinivasan, V., Thompson, S., Madhyastha, K., **Penny, G.**, Jeremiah, K., & Lele, S., 2015. Why is the Arkavathy River drying? A multiple-hypothesis approach in a data-scarce region. *Hydrology and Earth System Sciences*. doi.org/10.5194/hess-19-1905-2015

Penny, G., Daniels, K. E., & Thompson, S. E., 2012. Local properties of patterned vegetation: quantifying endogenous and exogenous effects. *Phil Trans R Soc A*. doi.org/10.1098/rsta.2012.0359

Teaching & Mentoring

- 2017 *Faculty lecturer, UC Berkeley: Introduction to Hydrology (CEE 103, Fall)*
Developed syllabus, assignments, and exams, taught undergraduate and graduate students, and incorporated active learning activities.
- 2017 *Graduate Student Instructor, UC Berkeley: Water Systems & Society (CEE 110, Spring)*
Mentored and assisted students with homework, prepared and led exam review sessions, prepared interactive class discussions, developed homework assignments, and graded exams.
- 2014 *Mentor, UC Berkeley: Blue Oak Ranch Reserve field experimentation*
Mentored undergraduate student in field research at Blue Oak Ranch Reserve, CA.
- 2012-2014 *Teaching volunteer, BASIS Program, Oakland, CA*
Developed and taught lessons about the water cycle, watersheds, basic hydrologic processes, and urban water quality. Taught lessons to fifth grade classrooms in the Oakland Unified School District.

Grants & Fellowships

- 2013–2016 National Science Foundation Graduate Research Fellowship (\$132,000)
- 2014 Graduate Research Opportunities Worldwide, NSF & USAID (\$15,000)
- 2013 Tinker Summer Field Research Fellowship (\$5,000)
- 2011 The Wilfred F. Langelier Graduate Fellowship (\$55,000)

Seminars & guest lectures

“Hydrological change in the Arkavathy watershed.” Ashoka Trust for Research in Ecology and the Environment. Bangalore, July 22, 2019. (Invited seminar)

“The drying of the Arkavathy river: understanding hydrological change in a human-dominated watershed.” UC Berkeley Civil and Environmental Engineering Seminar Series, Spring 2017. March 10, 2017. (Invited seminar)

“Managing Social-Ecological Systems (SES) for Resilience.” Environmental Engineering: Sustainable Development in a Changing World, University of Notre Dame, February 13, 2019. (Guest lecture)

“Watershed protection and water supply in California”, CE 110 Water Systems & Society, UC Berkeley, February 22, 2017. (Guest lecture)

“Practical field methods for understanding streamflow generation,” CE 2013 Surface Water Hydrology, UC Berkeley, November 28, 2017. (Guest lecture)

Conference presentations

Penny, G., Biswas, S., Mondal, M.S, Bolster, D., Müller, M.F., 2019. “A counterfactual approach to causal assessment: River salinity and the Ganges water agreement.” American Geophysical Union Fall Meeting 2019. San Francisco, December 10, 2019.

Penny, G., Gurney, R., Ehsani, N., Li, L., Meng, S., Regan, P., Siraj, A., and Hamlet, A., 2019. “Evaluating global shocks to self-assessed household food insecurity.” *Sustainability and Development Conference 2019*. Ann Arbor, October 12, 2019.

Penny, G., Dar Z.A. Dar, and Müller, M.F. “Attributing rapid hydrologic change in a data-scarce and strategic transboundary catchment.” European Geophysical Union General Assembly, 2019. Vienna, April 11, 2019.

Penny, G., Müller, M.F., Muller-Itten, M., and De Los Cobos, G. “What does it take to collaborate over transboundary groundwater?” European Geophysical Union General Assembly, 2019. Vienna, April 9, 2019.

Penny, G. “Resilience Principles in Socio-Hydrology: A Case-Study Review.” Resiliency and Sustainability Workshop. Notre Dame, April 6, 2019.

Penny, G., Srinivasan, V., & Thompson, S. E. “Anthropogenic depletion of water resources in the TG Halli watershed near Bangalore, India.” Toward Sustainable Groundwater in Agriculture: An International Conference Linking Science and Policy 2016. June 28–30, 2016.

Penny, G. “Streamflow generation in a drying catchment outside Bangalore, India.” Presented at the American Geophysical Union Fall Meeting 2015. December 14–18, 2015

Penny, G., Srinivasan, V., & Thompson, S. E. “Environmental and human impacts on Bangalore's regional water scarcity.” Presented at the American Geophysical Union Fall Meeting 2014. December 15–19, 2014.

Penny, G. “Exploring the effects of urban hydrometeorology and hydrology on urban flood risk.” Presented at the conference for Advancing Socio-hydrology, a New Science of People and Water, Champaign, IL, August 28–30, 2013.

Penny, G. “Preliminary Analysis of the Watersheds Surrounding Tababela” (oral, in Spanish) Presented to Empresa Pública Metropolitana de Agua Potable y Saneamiento (EPMAPS), Quito, Ecuador, June 21, 2013.

Penny, G., Daniels, K., Thompson, S. “Local properties of patterned vegetation: endogenous and exogenous effects.” Presented at the American Geophysical Union Fall Meeting 2012, December 10–14, 2012.

Service

- March 2012 *Honduras Biosand Filter Workshop, Linaca, Honduras*
Developed four-day workshop for high school and college students on biosand water filters in a region of Honduras with poor drinking water quality. Taught lessons to 100+ students, led activities, and oversaw installations of biosand filters.
- 2011-2012 *Hydrogeology Team Lead, UC Berkeley Engineers Without Borders*
Initiated hydrogeology research group and recruited 5 UCB graduate students to assist EWB goals of reducing arsenic (As) concentration in drinking water for two communities in Peru.
- 2010-2011 *Co-chair – Grants Committee, Charlottesville Future Fund*
Facilitated grantmaking of \$74,000 in the Future Fund’s second year to inner-city public school programs. Proactively integrated ideas of 30 highly educated and motivated young professionals.

Additional professional experience

- 2009-2011 *Internet Marketing and Strategic Board, Savvy Rest*
 - Managed online marketing initiatives, including branding, ad distribution, web design.
 - Advised on long-term goals and product development as part of the Strategic Board.
- 2008-2009 *Production Manager & Engineer, Earthstar Energy Systems*
 - Managed scheduling and execution of company production tasks.
 - Engineered heating system controls for solar & geothermal heating projects.
 - Improved system efficiency, combining existing technologies with exergy principles.