

Jonathan L. Bradshaw

Civil & Environmental Engineering
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EDUCATION

PhD **Stanford University**, Civil & Environmental Engineering, expected 2019
MS **Stanford University**, Management Science & Engineering, expected 2019
MS **Stanford University**, Civil & Environmental Engineering, 2015
BSE **Princeton University**, Civil & Environmental Engineering (high honors), 2010
Certificates of Proficiency: Environmental Studies, Sustainable Energy, Urban Studies

RESEARCH EXPERIENCE

2013–pres. **Graduate Researcher**, Stanford University
Develop and apply methods for modeling and optimizing groundwater recharge systems using stormwater and recycled water.

2008–2010 **Undergraduate Researcher**, Princeton University
Designed and implemented method for modeling the costs and benefits of residential weatherization treatments.
Developed and applied method for quantifying populations' vulnerability and resilience to climate change as a potential predictor of civil unrest.

2009 **Research Intern**, International Water Association, The Hague, Netherlands
Researched energy costs associated with municipal water use. Developed cost-benefit analysis of residential water conservation programs.
Created an online tool for mapping water utilities' responses to climate change.

2008 **Research Fellow**, Drexel University
Developed software for visualization of geographically distributed environmental and social data. Identified spatial trends in groundwater contamination.
Visualized output from socio-hydrological model simulating the effect of development initiatives on a United Nations Millennium Village.

PUBLICATIONS

Refereed Journal Articles

- [5] **J.L. Bradshaw**, M. Osorio, T.G. Schmitt, and R.G. Luthy. 2019. System modeling, optimization, and analysis of recycled water and dynamic stormwater deliveries to spreading basins for urban groundwater recharge. **Water Resources Research**. DOI: 10.1029/2018WR024411.
- [4] **J.L. Bradshaw**, N. Ashoori, M. Osorio, and R.G. Luthy. 2019. Modeling cost, energy, and water quality trade-offs for stormwater spreading basin systems receiving recycled water produced using membrane-based, carbon-based, and

hybrid advanced treatment trains. **Environmental Science & Technology**. DOI: 10.1021/acs.est.9b00184.

- [3] **J.L. Bradshaw**, and R.G. Luthy. 2017. Modeling and optimization of recycled water systems to augment urban groundwater recharge through underutilized stormwater spreading basins. **Environmental Science & Technology**. DOI: 10.1021/acs.est.7b02671.
- [2] **J.L. Bradshaw**, E. Bou-Zeid and R.H. Harris. 2016. Greenhouse gas mitigation benefits and cost-effectiveness of weatherization treatments for low-income, American, urban housing stocks. **Energy and Buildings**. DOI: 10.1016/j.enbuild.2016.07.020.
- [1] **J.L. Bradshaw**, E. Bou-Zeid and R.H. Harris. 2014. Comparing the Effectiveness of Weatherization Treatments for Low-income, American, Urban Housing Stocks in Different Climates, **Energy and Buildings**. DOI: 10.1016/j.enbuild.2013.11.035.

Conference Proceedings

- [4] **J.L. Bradshaw** and R.G. Luthy. July 2017. Optimizing recycled water and stormwater networks to augment urban groundwater recharge. **Proceedings of 11th IWA International Conference on Water Reclamation and Reuse**.
- [3] **J.L. Bradshaw**, N. Ashoori, and R.G. Luthy. April 2016. Integrated use of stormwater, recycled water, and agricultural processing water to replenish urban aquifers in California. **Proceedings of US-Iran Symposium on Wetlands**. National Academies of Sciences.
- [2] **J.L. Bradshaw**, P.L. Gurian, and D. Breen. February 2010. ENVision: Visualizing water quality from geographically distributed wells. **Proceedings of 11th IASTED International Conference on Computer Graphics and Imaging**.
- [1] **J.L. Bradshaw**, P.L. Gurian, A. Kumar, and D. Breen. June 2009. Spatial trends in groundwater arsenic concentrations. **Proceedings of American Water Works Association Annual Conference and Exhibition**.

Other Publications

- [4] The National Academies of Sciences, Engineering, and Medicine. 2016. *Using Graywater and Stormwater to Enhance Local Water Supplies: An Assessment of Risks, Costs, and Benefits*. Washington, DC: The National Academies Press. (**J.L. Bradshaw** as contributor on regional groundwater recharge projects)
- [3] ReNUWIt. 2015. *Briefing Book: Technology Diffusion Workshop on Open Unit Process Wetlands*. (**J.L. Bradshaw** as contributor on ecological regulations)
- [2] **J.L. Bradshaw**. May 2010. Cost-effectiveness of weatherization in low-income urban housing stock. **Princeton University Undergraduate Senior Thesis**. DOI: 10.13140/RG.2.1.3647.8964.
- [1] **J.L. Bradshaw**, P.L. Gurian, A. Kumar, and D. Breen. January 2010. Spatial trends shed light on arsenic concentrations. **Opflow**.

SOFTWARE CREATED

- 2018 **AquaCharge**, model to describe and optimize designs of groundwater recharge systems wherein recharge ponds receive both stormwater and recycled water
- 2008 **TerraMeaure**, data analytics system to quantify populations' vulnerability and resilience to climate change based on environmental, social, political, and economic indicators
- 2008 **ENVision**, interactive visualization system for geographically distributed data
- 2007 **Water Usage Visualization System**, interactive visualization system for water usage data at Princeton University

GRANTS AND FELLOWSHIPS

- 2018 National Science Foundation INTERN Supplemental Funding (NSF 17-091), "Enhancing Northern California Water Security through Advanced Water Utility Planning." **Awarded \$50,000.** (**J.L. Bradshaw** lead writer, grant awarded to R.G. Luthy).
- 2018 Stanford Woods Institute for the Environment Realizing Environmental Innovation Program, "Advanced planning methods to enhance urban water security by delivering both stormwater and recycled water to existing groundwater recharge ponds." **Awarded \$130,000.** (**J.L. Bradshaw** lead writer, grant awarded to R.G. Luthy and A. Saberi)
- 2015 Army Research Office (through National Defense Science & Engineering Graduate Fellowship Program). Stipend, tuition, and fees for three years, **ca. \$240,000.** (1 of 4 awards nationally in Civil Engineering)
- 2013 David and Lucile Packard Foundation (through Stanford Graduate Fellowship Program). Stipend, tuition, and fees for three years, **ca. \$240,000.** (1 of 4 program awards in Civil & Environmental Engineering)
- Pre-PhD Senior Thesis Research Grant, Princeton University; National Science Foundation Research Experience for Undergraduates Fellowship, Drexel University

PRESENTATIONS

Invited Talks

- [7] Stanford University. March 2019. "Optimizing drought-proof water supplies in California and beyond." Guest lecture, CEE 70: Environmental Science and Technology. Stanford, CA. (Individual)
- [6] The World Bank. December 2018. "Enhancing water security: groundwater recharge through stormwater and recycled wastewater." Washington, DC. (Individual)
- [5] United States Environmental Protection Agency Webinar Series: Innovative Methods for Managing Stormwater and Wastewater. April 2018. "Optimizing groundwater recharge systems to infiltrate stormwater and wastewater through

spreading basins: A new planning method to enhance urban water resiliency.”
Online seminar. (With R.G. Luthy)

- [4] 255th American Chemical Society National Meeting. March 2018. “Connecting recycled water to spreading basins for combined operation and greater water supply resiliency.” New Orleans, Louisiana. (Individual)
- [3] Geosyntec Consultants. August 2017. “Advanced methods for systems-level planning of urban groundwater recharge systems that infiltrate both stormwater and recycled water through spreading basins.” Oakland, California. (Individual)
- [2] American Society of Civil Engineers Innovation Contest Award Celebration. June 2017. “AquaCharge: An optimization tool for enhancing water resiliency and sustainability by recharging groundwater using both stormwater and recycled water.” Reston, Virginia. (Individual)
- [1] Gordon Research Seminar, Environmental Sciences: Water. June 2016. “Cost-effective strategies for recharging urban groundwater with stormwater and recycled water.” Holderness, New Hampshire. (Individual)

Conference Presentations

- [4] **J.L. Bradshaw**, N. Ashoori, M. Osorio, T.G. Schmitt, and R.G. Luthy. December 2018. “Systems modeling and optimization of groundwater recharge using stormwater, recycled water, and existing spreading basins: Planning methods and California case study.” **American Geophysical Union Fall Meeting 2018**. Washington, DC. (Poster)
- [3] **J.L. Bradshaw** and R.G. Luthy. July 2017. “Optimizing recycled water and stormwater networks to augment urban groundwater recharge.” **11th IWA International Conference on Water Reclamation and Reuse**. Long Beach, California. (Oral)
- [2] **J.L. Bradshaw**, T. Schmitt, N. Ashoori, W. Eisenstein, and R.G. Luthy. July 2016. “Cost-effective strategies for recharging urban groundwater with stormwater and recycled water.” **STREAM Annual One Day Conference**. Torquay, England. (Poster)
- [1] **J.L. Bradshaw**, T. Schmitt, N. Ashoori, W. Eisenstein, and R.G. Luthy. June 2016. “Cost-effective strategies for recharging urban groundwater with stormwater and recycled water.” **Gordon Research Seminar & Conference, Environmental Sciences: Water**. Holderness, New Hampshire. (Poster)

Other Presentations

- [5] **J.L. Bradshaw**. August 2017. “Advanced methods for modeling and optimizing infrastructure systems that recharge groundwater using stormwater and recycled water.” **Day of Data, Decisions, and Defense**. Naval Postgraduate School Department of Operations Research. Monterey, California. (Oral)
- [4] **J.L. Bradshaw**, T. Schmitt, N. Ashoori, W. Eisenstein, and R.G. Luthy. September 2016. “Cost-effective strategies for recharging urban groundwater with stormwater and recycled water.” **Statewide Forum on Water Reuse**. Sacramento, California. (Poster)

- [3] **J.L. Bradshaw**, N. Ashoori, W. Eisenstein, and R.G. Luthy. June 2016. “Combined stormwater/recycled water recharge for urban water supply.” **Sustainable Urban Systems Symposium**. Stanford University. Stanford, California. (Poster)
- [2] **J.L. Bradshaw**. January 2010. “Green building retrofits for water management.” **Princeton Environmental Film Festival**. Princeton, New Jersey. (Oral)
- [1] **J.L. Bradshaw**. February 2009. “Interactive visualization of geographically distributed water quality.” **Alumni Day Independent Work Symposium**. Princeton University. Princeton, New Jersey. (Poster)

MEDIA COVERAGE

- 2017 Research highlighted in academic, industry, Spanish-speaking, and Chinese news sources (e.g., ASCE News, Agencia EFE, BC Water News, Municipal Sewer & Water Magazine, Stanford News, WEF Stormwater Report, Xinhua). Samples:
- “New tool developed by Stanford engineers helps parched regions plan how to replenish aquifers,” Stanford News, August 4, 2017
- “Ingenieros de Stanford desarrollan un software para combatir la escasez de agua,” Agencia EFE, August 5, 2017
- “Stanford engineers develop planning tool for replenishing aquifers,” Xinhua, August 5, 2017

AWARDS AND HONORS

- 2018 Accel Innovation Scholars Program, Stanford University
- 2017 American Society of Civil Engineers Innovation Contest Awards:
 Overall Best Student Submission
 Most Efficient & Feasible Award in Sustainable Engineering Category
 Best Value Proposition & Relevance Award in Resilience Category
- 2017 Outstanding Reviewer Status, Sustainable Cities and Society
- 2016 Rising Environmental Leaders Program, Stanford University
- 2016 Student Video Competition Honorable Mention, Association of Environmental Engineering & Science Professors
- 2015 Student Essay Competition Award, American Society of Civil Engineers San Jose Branch
- 2015 Perfect Pitch Competition Finalist, National Science Foundation Engineering Research Centers Program
- Pre-PhD W. Mack Angas Prize, Princeton University; Associate Membership, Sigma Xi Scientific Research Society, Princeton University Chapter; Best Poster Award, Drexel University Engineering Cities Research Experience for Undergraduates

RESEARCH INTERESTS

Stormwater and recycled wastewater reuse; managed aquifer recharge; water resources; environmental management; water infrastructure; infrastructure planning; energy-water nexus; energy efficiency; engineering economics; system modeling; optimization; data analytics

PROFESSIONAL EXPERIENCE

- 2010–2013 **Associate**, ENVIRON International Corporation (now Ramboll Group A/S), Arlington, Virginia
- Conducted environmental site assessments at industrial properties to evaluate potential liabilities related to soil and groundwater contamination and regulatory compliance.
- Compiled, analyzed, and provided technical review of environmental data related to various alleged contamination instances of river, ocean, land, and air systems.
- 2007–2008 **Engineering Intern**, Princeton University Office of Sustainability, Princeton, New Jersey
- Designed and developed software for accessing and visualizing Princeton University water usage data.

TEACHING AND MENTORING EXPERIENCE

Courses

- 2015 **Teaching Assistant**, CEE 270: Movement and Fate of Organic Contaminants in Waters, Stanford University. Instructor of Record: Richard G. Luthy. 59 Students. Teaching score: 3.8 / 4

Students Supervised

- 2018 Anpothowin Jensen, undergraduate researcher, Stanford University. Current senior at Stanford University
- 2017 Mauricio Osorio, graduate researcher, Stanford University. Current hydrogeologist at EKI Environment & Water, Inc.

Additional Experience

- 2014–pres. **Volunteer**, ReNUWIt Education & Outreach Program, Stanford University
- 2016 **Peer Mentor**, Civil & Environmental Engineering, Stanford University
- 2008–2010 **Peer Advisor**, Butler College, Princeton University
- 2008 **Undergraduate Engineering Advisor**, Princeton University
- 2007–2008 **Tutor**, English Language Conversation Partners, Princeton University
- 2007 **Tutor**, Introductory Calculus

PROFESSIONAL SERVICE

- 2018–pres. **Member**, Countywide Water Reuse Master Plan Stakeholder Task Force, Santa Clara Valley Water District, San Jose, California

- 2016–pres. **Reviewer:** Energy and Buildings, Sustainable Cities and Society
- 2016 **Organizer,** Technology Diffusion Workshop on Groundwater Recharge Using Stormwater and Recycled Water, Metropolitan Water District of Southern California, Los Angeles, California

DEPARTMENTAL AND UNIVERSITY SERVICE

- 2016–pres. **Diversity Advisory Board and Student & Postdoc Committee on Diversity & Inclusion,** ReNUWIt, Stanford University
- 2016–2017 **Graduate Life Committee,** Civil & Environmental Engineering, Stanford University
- 2017 **Multi-Department Faculty Search Student Subcommittee,** Civil & Environmental Engineering, Chemical Engineering, Materials Science & Engineering, Stanford University
- 2014–2015 **Energy & Environment Committee,** Associated Students of Stanford University, Stanford University

LEADERSHIP EXPERIENCE

- 2016–2018 **Secretary,** Student & Postdoc Committee on Diversity & Inclusion, ReNUWIt, Stanford University
- 2016–2017 **Campus Representative,** Student Leadership Council, ReNUWIt, Stanford University
- 2015–2016 **Secretary,** Student Leadership Council, ReNUWIt, Stanford University
- 2014–2015 **Co-president,** Stanford Students Environmental Consulting Group, Stanford University
- 2009–2010 **Treasurer,** Two Dickinson Street Food Co-operative, Princeton University
- 2007–2010 **Editor,** American Foreign Policy Magazine, Princeton University
- 2009 **Publisher,** Cornerstone Magazine, Princeton University
- 2008–2009 **Managing Editor,** Cornerstone Magazine, Princeton University
- 2007–2009 **Service Trip Leader,** Student Volunteers Council, Princeton University

SOFTWARE SKILLS

Advanced Knowledge: MATLAB

Proficiency: ArcGIS, Java, Microsoft Excel, Microsoft PowerPoint, Microsoft Word, Python, R

Familiarity: HEC-RAS, HTML, JavaScript, LexisNexus Concordance, LSPC, Microsoft Access MODFLOW, NetLogo, PHP, Stata

PROFESSIONAL CREDENTIALS

Engineer-in-Training, Environmental Engineering, Virginia (#0420065287)

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PROFESSIONAL MEMBERSHIPS

American Academy of Environmental Engineers & Scientists
American Society of Civil Engineers
American Water Works Association
Water Environment Federation