Laura E Erban, PhD

Groundwater hydrologist | US EPA
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Education

2014 PhD | Earth System Science
Stanford University, Stanford CA
Dissertation: Groundwater exploitation and arsenic occurrence in the Mekong Delta aquifer system

2013 Hasso Plattner Institute of Design (aka d.school)
Stanford University, Stanford CA
Design for Science coursework and community engagement

2012 MS | Civil and Environmental Engineering,
Environmental Fluid Mechanics and Hydrology
Stanford University, Stanford CA

2006 BS | Environmental Sciences with Distinction
University of Virginia, Charlottesville, VA

2005 Semester in Guatemala, Nicaragua, El Salvador
Center for Global Education, Augsburg College, Minneapolis, MN
Sustainable Development and Social Change in Central America

Appointments

2017 Adjunct faculty, Biology
Salve Regina University, Newport, RI

2015 - pres Physical scientist, US EPA
Atlantic Ecology Division, Narragansett, RI

2014 - 2015 Postdoctoral Scholar, Hydrogeology and Water Resources
Stanford University, Stanford, CA

2008 - 2013 Graduate Research Assistant, Hydrogeology and Water Resources
Stanford University, Stanford, CA

2006 - 2008 Research Assistant, Geochemistry
US Geological Survey, Woods Hole, MA

2005 Summer Research Assistant, Biocomplexity Project
Marine Biological Laboratory, Woods Hole, MA

2002 - 2006 Laboratory Assistant, Department of Environmental Sciences
University of Virginia, Charlottesville, VA

Funding

2013 - 2015 Linking land subsidence to deep arsenic release in the Mekong Delta aquifer system. NSF Hydrology award EAR-1313518: $256,403 *(co-authored with PIs S. Gorelick, S. Fendorf, H.Zebker)*

2010 - 2014 Urban growth, land-use change, water resources management, and human exposure to arsenic in Cambodia. UPS Endowment Fund award: $37,153 *(co-authored with PI S. Gorelick)*

2009 - 2010 Land use change impacts on arsenic contamination in the Mekong Delta: a study in hydrogeography. McGee Research Grant, Stanford School of Earth Sciences: $5869

2004 Coastal study in Mozambique. DoubleHoo Research Award, University of Virginia: $5000. *(co-authored with graduate student M. Ferdie)*

Teaching

2017 Adjunct faculty, Salve Regina University
BIO 140L: Humans and Their Environment Lab (fall semester)
Topics cover a range of issues related to the Anthropocene. Class of 14 mixed-rank undergraduate students.

2015 Co-instructor, California State University, East Bay
Team-teaching of "Human's Dependence on Earth's Mineral Resources", *NSF-InTeGrate module to class of 62 freshman.* ***Associated training****: InTeGrate's 2-day workshop on pedagogy specific to undergraduate-level earth sciences*

2011 - 2012 Teaching Assistant, Stanford University
EESS221/CEE260C Contaminant Hydrogeology
Conducted office hours, exam reviews, assignment grading for advanced graduate-level course of 10-20 students

2011 Guest lecturer, Geoscape workshop
Demonstrated groundwater contamination and remediation using a physical aquifer model to 13 high school science teachers

2012 Guest lecturer, Hydrogeology, Stanford University
Delivered lecture "Darcy's Law and Hydraulic Properties" for graduate-level course

2010 - 2011 Volunteer Instructor, Yerba Buena High School, San Jose, CA
Designed and conducted weekly lecture and lab instruction for AP Environmental Sciences classroom

2009 - 2011 Volunteer Instructor, Flood Elementary, East Palo Alto, CA
With non-profit Science is Elementary, taught hands-on basic science lessons to kindergarten and first grade students

2008 - 2009 Teaching Assistant, Stanford University
EESS220/CEE260A Physical Hydrogeology
Conducted office hours, exam reviews, assignment grading for advanced graduate-level course of 15-25 students

Mentoring

2013 School of Earth Science Summer Undergraduate Research (SESUR) Program, Stanford University
Directed summer research project of Stanford undergraduate student

2011 Earth Sciences High School Internship Program, Stanford University
Directed summer research project of high school intern

Publications

2019 Twichell J, Mulvaney K, Gleason T, Munns W, Chintala M, Rea A, Hubbell B, **Erban L**, Berry W, Crocker Z, Horsley S, Reyes S, Smith S 2019 "Developing a roadmap for solutions-driven research: Collaborating with stakeholders and partners in the design, implementation, and

translation of non point source nutrients research." Workshop evaluation report, US EPA Office of Research and Development, *in review*

2018 **Erban LE**, HA Walker 2018 Beyond old pipes and ailing budgets: systems thinking on water infrastructure in Chicago *in review*

2018 Minderhoud PSJ, L Coumou, **LE Erban**, E Stouthamer, EA Addink 2018 The relation between land use and subsidence in the Vietnamese Mekong Delta, *Sci Tot Environ* 634(1) 715-726

2018 **Erban LE**, SB Balogh, DE Campbell, HA Walker 2018 CityWaterBalance for R: an open, reproducible process for modeling urban water systems, with application to Chicago. *Open Water Journal*, 5(1) 26-40

2017 Minderhoud PSJ, G Erkens, VH Pham, VT Bui, **L Erban**, H Kooi, E Stouthamer 2017 Impacts of groundwater extraction on subsidence in the Mekong Delta, Vietnam. *Environmental Research Letters*, 12 064006

2016 **Erban LE**, Gorelick SM 2016 Closing the irrigation deficit in Cambodia: implications for transboundary impacts on groundwater and Mekong River flow *Journal of Hydrology* 535 85-92

2014 **Erban LE**, SM Gorelick, HA Zebker, 2014 Groundwater extraction, land subsidence, and sea-level rise in the Mekong Delta, Vietnam *Environmental Research Letters* 9 084010

2014 **Erban LE**, SM Gorelick, S Fendorf 2014 Arsenic in the multi-aquifer system of the Mekong Delta, Vietnam: analysis of large-scale trends and controlling factors *Environmental Science & Technology* 48(11) 6081-6088

2013 **Erban LE**, SM Gorelick, HA Zebker, S Fendorf 2013 Release of arsenic to deep groundwater in the Mekong Delta, Vietnam, linked to pumping-induced land subsidence *Proceedings of the National Academy of Sciences of the United States of America* 110(34) 13751-13756

2011 **Erban LE** 2011 Win-win: a story of research and outreach *The Earth Scientist* newsletter of the Stanford School of Earth Sciences, Fall 2011 edition

2007 Crusius J, P Berg, D Koopmans, **L Erban** 2007 Eddy correlation measurements of submarine groundwater discharge *Marine Chemistry* 109 77-85

Conference presentations

2018 **L Erban**, Stephen B Balogh, Henry A Walker, Daniel E Campbell 2018 "Tracking flows of water through a complex urban system: Chicago Sixth Interagency Conference on Research in the Watersheds. Shepherdstown, WV, Jul 23-26, 2018

2017 Campbell D, H Walker, S Balogh, **L Erban**, R Boumans, T Gleason 2017 "Change and transition in urban systems: The story of Chicago told with Energy Systems Language models" *The International Society for Ecological Modelling Global Conference*, Jeju, Jeju, South Korea, Sept 17 - 21, 2017

2017 **Erban, LE**, SB Balogh, HA Walker, DE Campbell, T Gleason 2017 Assessment of the urban water system with an open, reproducible process applied to Chicago. *Joint Conference of the International Society of Industrial Ecology (ISIE) & the International Symposium on Sustainable Systems and Technology (ISSST).* Chicago IL, June 25-29, 2017

2017 Boumans R, D Campbell, **L Erban,** S Balogh, H Walker, T Gleason 2017 "Thermodynamics and the evolution of a city: a tale of how Chicago came to be, from biophysical and socio-economic perspectives" *US Regional Association of the International Association for Landscape Ecology Annual Meeting*, Baltimore MD, April 9 - 13, 2017

2014 **Erban LE**, Gorelick SM, Fendorf S 2014 Regional-Scale Controls on Arsenic Contamination in the Multi-aquifer System of the Mekong Delta, Vietnam. *American Geophysical Union Fall Meeting Abstract H32B-03*

2013 **Erban L**, S Gorelick, HA Zebker, SE Fendorf 2013 Arsenic in groundwater of the Mekong Delta, Vietnam: contaminant expulsion from deep clays due to over-exploitation of aquifers. *American Geophysical Union Fall Meeting Abstracts 1, 1382*

2008 Crusius J, KD Kroeger, P Zhang, S Zhao, JF Bratton, H Bokuniewicz, R Coffey, A Green, S Baldwin, **L Erban**, M Casso 2008 "Significant groundwater discharge of nutrients to Western Long Island Sound inferred

from radioisotope, nutrient, and organic chemical tracers" *American Geophysical Union Fall Meeting Abstracts 1, 1279*

2008 SM Baldwin, JF Bratton, KD Kroeger, JC Crusius, AC Green, **L Erban** 2008 "The role of submarine groundwater discharge in the delivery of nitrogen to the Corsica River estuary, Maryland*" American Geophysical Union Fall Meeting Abstracts 1, 08*

2007 **Erban L**, J Crusius, K Kroeger, D Koopmans, J Bratton and A Giblin 2007 "Improving our understanding of the control of radon-222 in groundwater with a goal of enhancing its value as a tracer of groundwater discharge to the coastal ocean" *Northeast Geological Society of America Meeting Abstracts 1, 1279*

2007 Crusius J, A Giblin, K Foreman, J Bratton, **L Erban**, D Koopmans 2007 "Nutrient delivery to West Falmouth Harbor (MA) from groundwater: examining the contribution from the wastewater treatment facility" *Northeast Geological Society of America Meeting*

2005 Ferdie M, **L Erban**, KJ McGlathery, and JC Zieman 2005 "Spatial variability of leaf nutrient (CNP) and isotope (13C, 15N) content for seven seagrass species on Inhaca Island, Mozambique" *Estuarine Research Federation Meeting*

Invited talks

2018 "Groundwater hazards near and far: from the Mekong Delta to the Willamette Valley" *USGS Washington Water Science Center*, September 25, 2018

2018 "Systems thinking on water infrastructure redesigns for Chicago: a conversation" *US EPA Office of Research and Development, Atlantic Ecology Division,* July 12, 2018

2017 "CityWaterBalance: an open workflow with R, Git, GitHub" *US EPA Data Analytics and Community of Practice webinar*, September 21, 2017

2015 "Arsenic in deep groundwater: a new source in the Mekong Delta, Vietnam linked to human activities" *US EPA Office of Research and Development, Atlantic Ecology Division*, August 17, 2015

2015 "Hydrogeography in the Mekong Delta: water, people, arsenic, and pathways to sustainability" *University of Vermont Rubenstein School of Environment and Natural Resources*, April 14, 2015

2015 "Groundwater exploitation and arsenic occurrence in the Mekong Delta aquifer system" *University of Massachusetts Lowell, Department of Environmental, Earth & Atmospheric Sciences,* March 2, 2015

2013 "Arsenic in Deep Groundwater: InSAR and hydromechanical modeling in the Mekong Delta" *Consortium for the Advancement of Hydrologic Science, Inc (CUAHSI*) *Early Career Scientist Cyberseminar*, October 25, 2013

Workshops

2018 "Three Bays Nonpoint Source Nutrient Management Problem Formulation Workshop" Two-day stakeholder engagement hosted by the US EPA Office of Research and Development and the Barnstable Clean Water Coalition. Woods Hole, MA. October 30-31, 2018. *Invited participant and member of the evaluation team*

2018 "Systems Thinking Training" One-day workshop, by instructors from Cornell, for EPA scientists at the Atlantic Ecology Division and partners on structuring complex research projects. Instructors from Cornell University. Narragansett, RI. October 16, 2018. *Lead organizer and co-developer of workshop content*

Awards

2014	Graduate Student Award for Scholarly/Research Achievement
2011	Stanford Graduate Fellowship
2009, 2010	McGee Research Grant, Stanford School of Earth Sciences
2009	William K Whiteford Fellowship, Stanford School of Earth Sciences
2008	Blaustein Fellowship
2005	Hydrology Award, University of Virginia
2002	Echols Scholar, University of Virginia

Skills

R, Python, Matlab, UNIX scripting, Git/GitHub
Groundwater flow and transport modeling | MODFLOW/MT3DMS
Spatial analysis | ArcGIS, QGIS
Remote sensing | optical and radar
MS Office | Word, Excel, Access
Adobe CS | Illustrator, Photoshop, InDesign
Extensive field and lab experience
Spanish, high proficiency | speaking, reading, writing

Software development and instruction

R package *CityWaterBalance* v 0.1.0 available on CRAN
development version at https://github.com/USEPA/CityWaterBalance

Assistant: rhodyRstats: Introduction to R Workshop. University of Rhode Island Coastal Institute. 2017-01-19. Materials available at: https://github.com/rhodyrstats/intro_r_workshop

Peer review

Nature Geoscience; Scientific Reports, Environmental Science & Technology; Geophysical Research Letters; Remote Sensing; Environmental Health Perspectives; Estuarine, Coastal and Shelf Science; Water; Advances in Water Resources; Journal of Hydrology; Hydrological Sciences Journal; Hydrogeology Journal; Hydrology and Earth System Science

Publons profile: https://publons.com/author/1242271/laura-erban-phd#profile