

Drew B. Gower

PhD Candidate
Dept. of Civil & Environmental Engineering
Princeton University
Engineering Quadrangle
Princeton, NJ 08544

Office: E-Quad, E201
Email: gower@princeton.edu
Voice: (864) 420-3318
Fax: (609) 258-1436
Twitter: @DBGower

EDUCATION

Doctor of Philosophy, Civil & Environmental Engineering *September 2012 – Present*
Princeton University, NJ

- M.A. degree awarded in 2015 after passing general exams
- Dissertation: *An ecohydrologic framework for modeling stream-fed irrigation in dryland environments*
- Currently studying in the Biological & Environmental Engineering department at Cornell University as a graduate exchange student

Master of Science, Geology (Concentration: Hydrogeology) *Awarded August 2009*
University of Wisconsin-Madison, WI

- Cumulative GPA: 3.88/4.0
- Thesis: *Reservoir seepage to groundwater in the Nariarlé watershed of Burkina Faso, West Africa*

Bachelor of Arts, Environmental Sciences (Minor: Math) *Awarded May 2003*
University of Virginia, VA

- Cumulative GPA: 3.52/4.0; graduated with highest distinction based on thesis defense
- Thesis: *Air bubble enhanced colloid mobilization in an unsaturated porous medium*

RESEARCH EXPERIENCE

Princeton University *Princeton, NJ / Kenya*
Research Assistant & Graduate Student *September 2012 – Present*

- Designed and managed a six-month program to monitor water availability in 25 community water projects in the Laikipia Region of Kenya
- Assisted in the construction and deployment of sensors for use in monitoring the effects of environmental fluctuations on agricultural production
- Contributed to the development of *Mapping Africa*, a project to map smallholder agriculture across Africa using crowd sourcing techniques
- Currently developing a hydrologic model for the Nan province in northeastern Thailand as part of a project to consider how reservoirs can benefit agricultural production

University of Wisconsin-Madison *Madison, WI / Burkina Faso*
Research Assistant & Graduate Student *August 2006 – August 2009*

- Developed objectives and obtained funding for a research project to evaluate the potential for contamination of groundwater by agricultural reservoirs in Burkina Faso
- Conducted an independent survey of wells and boreholes in the study watershed; measured reservoir seepage directly using locally manufactured instruments
- Collected water samples from wells, boreholes and reservoirs for geochemical and isotopic analysis to determine relationships between sources
- Built and parameterized a computer model of groundwater flow within the watershed using ArcMap and MODFLOW; simulated contaminant transport using MODPATH

University of Virginia*Research Assistant & Undergraduate Student*

Charlottesville, VA

January 2001 – August 2003

- Supported a graduate student in performing field research on the Eastern Shore to measure the ecosystem service effect of fiddler crab burrows in regulating salt marsh chemistry
- Assisted with laboratory experiments on intact agricultural soils to observe the generation of clay particles that may facilitate contaminant transport in water
- Developed and performed laboratory experiments to determine the effect of mobile wetting fronts on water turbidity in saturated sand columns
- Wrote and received \$3,000 grant to fund independent laboratory experiments

TEACHING EXPERIENCE

Princeton University*Teaching Assistant*

Princeton, NJ

September 2013 – January 2014

- Led three discussion sections and helped to grade exam questions for undergraduate students enrolled in *Fundamentals of Environmental Studies: Population, Land Use, Biodiversity, and Energy* class

University of Wisconsin-Madison*Teaching Assistant*

Madison, WI

January – June, 2007 & 2009

- Led six discussion sections and developed exam questions for undergraduate students enrolled in *Introduction to Geology* class
- Graded student assignments in graduate level *Contaminant Transport Modeling* class

University of Virginia*Teaching Assistant*

Charlottesville, VA

August 2001 – December 2001

- Led and organized monthly outings for groups of students enrolled in *Orphaned Lands Assessment* to assess the condition and environmental impact of abandoned mine sites around Virginia
- Orientated to specific sites using contour maps and GPS units; documented the condition of the sites and measured the effects of mine drainage on local water bodies

PROFESSIONAL EXPERIENCE

US Forest Service International Programs*Middle East Program Specialist (Contractor)*

Washington, DC

December 2009 – July 2012

- Managed a renewable \$500,000 US Agency for International Development (USAID) fund for forestry-related technical assistance in Lebanon
- Managed a renewable \$100,000 USFS fund for forestry-related technical assistance in Israel
- Recruited and accompanied US experts to conduct trainings and workshops related to reforestation, firefighting and forest management in Lebanon and Israel
- Organized and lead separate study tours to the US for Lebanese and Israeli foresters, land managers and firefighters

Peace Corps*Small Business Development Advisor*

Burkina Faso, West Africa

September 2003 – November 2005

- Assisted local entrepreneurs and the management of an apicultural cooperative to develop new products and services during two-year Peace Corps service
- Managed an artisan training fund with staff from a local nonprofit and two other volunteers
- Implemented and organized, in collaboration with five other volunteers, three craft fairs to showcase local talent and develop countrywide networks among artisans
- Applied and received full funding for a USAID-sponsored grant to integrate HIV/AIDS awareness and prevention material into local language literacy classes

Bunnell-Lammons Engineering, Inc.*Administrative Intern*

- Managed Excel database of customer records
- Communicated project specific information to clients in a timely and professional manner

Greenville, SC

*Summers 1999 & 2000***PUBLICATIONS**

Lopus, S., McCord P.F., Gower, & Evans, T. P. (2017), *Drivers of Farmer Satisfaction with Small-Scale Irrigation Systems*. Manuscript submitted for publication.

McCord P.F., Dell'Angelo, J., Gower, D.B., Caylor, K., & Evans, T. P. (2017), Household-level heterogeneity of water resources within common pool resource systems. *Ecology and Society*, 22(1):48, doi.org/10.5751/ES-09156-220148

Gower, D. B., Dell'Angelo, J., McCord, P. F., Caylor, K. K., & Evans, T. P. (2016). Modeling ecohydrological dynamics of smallholder strategies for food production in dryland agricultural systems. *Environmental Research Letters*, 11(11), 115005, doi:10.1088/1748-9326/11/11/115005

Dell'Angelo, J., McCord, P. F., Gower, D., Carpenter, S., Caylor, K., & Evans, T. P. (2016), Community-based Water Governance on Mount Kenya: An Assessment Based on Ostrom's Design Principles of Natural Resource Management. *Mountain Research and Development*, 36(1), doi:10.1659/MRD-JOURNAL-D-15-00040.1

Levy, M. C., Garcia, M., Blair, P., Chen, X., Gomes, S. L., Gower, D. B., Grames, J., Kuil, L., Liu, Y., Marston, L., McCord, P.F., Roobanannan, M., & Zeng, R. (2016). Wicked but worth it: student perspectives on socio-hydrology. *Hydrological Processes*, doi:10.1002/hyp.10791

McCauley, D.J., Dawson, T.E., Power, M.E., Finlay, J.C., Ogada, M., Gower, D.B., Caylor, K., Nyingi, W.D., Githaiga, J.M., Nyunja, J., Joyce, F.H., Lewison, R.L., & Brashares, J.S. (2015). Carbon stable isotopes suggest that hippopotamus-vectored nutrients subsidize aquatic consumers in an East African river. *Ecosphere*, 6(4): 52, doi:10.1890/ES14-00514.1

Dell'Angelo, J., McCord, P. F., Baldwin, E., Cox, M. E., Gower, D., Caylor, K., & Evans, T. P. (2014). Multilevel Governance of Irrigation Systems and Adaptation to Climate Change in Kenya. In *The Global Water System in the Anthropocene* (pp. 323-341). Springer International Publishing.

Gower, D.B. (2009). Reservoir seepage to groundwater in the Nariarlé watershed of Burkina Faso, West Africa (Master's Thesis). University of Wisconsin, Madison, WI.

Saiers, J.E., Hornberger, G.M., Gower, D.B., & Herman, J.S. (2003). The role of moving air-water interfaces in colloid mobilization within the vadose zone. *Geophysical Research Letters*, 30(21), 2083, doi:10.1029/2003GL018418.

CONFERENCE & WORKSHOP PRESENTATIONS

Gower, D. 2017, April. Forecasting the impact of climate change on community water project growth and household food security in Laikipia, Kenya. Oral presentation at the 7th annual Interdisciplinary Ph.D. Workshop in Sustainable Development, New York, NY.

Gower, D., McCord, P.F., Caylor, K., Dell'Angelo, J., & Evans, T.P. 2016, December. An ecohydrologic framework for simulating catchment constraints on smallholder irrigation systems in drylands. Poster presentation at the American Geophysical Union Fall Meeting, San Francisco, CA.

Gower, D. 2016, March. An ecohydrological framework for modeling smallholder irrigation systems in drylands. Oral presentation at the Association of American Geographers Annual Meeting, San Francisco, CA.

Gower, D., Caylor, K., McCord, P.F., & Evans, T.P. 2015, December. Modeling the impacts of regulatory frameworks on self-organization in dryland agricultural systems. Poster presentation at the American Geophysical Union Fall Meeting, San Francisco, CA.

Gower, D. & Caylor, K., 2015, June. An ecohydrological framework for modeling stream-fed irrigation in dryland environments. Poster presentation at the International Union of Geodesy and Geophysics, Prague, Czech Republic.

Gower, D.B. 2008, October. Reservoir contribution to groundwater flowpaths in the Nariarlé watershed of Burkina Faso. Oral presentation at the Geological Society of America annual meeting, Houston, TX.

Gower, D.B., Sayers, J.E., Lenhart, J.J., & Hornberger, G.M. 2002, September. Air Bubble Enhanced Colloid Mobilization in an Unsaturated Porous Medium. Poster presentation at the International Workshop on Colloids and Colloid-Facilitated Transport of Contaminants in Soils and Sediments. Viborg, Denmark.

ORGANIZED CONFERENCE SESSIONS

“New insights, approaches and challenges in the field of socio-hydrology”, Association of American Geographers Annual Meeting. March 2016.

“New approaches to coupling human and water dynamics”, Association of American Geographers Annual Meeting. April 2015.

RESEARCH GRANTS

Harrison Undergraduate Research Award, *University of Virginia*, 2002

Graduate Student Research Grant, *Geological Society of America*, 2007

Grant-in-Aid of Research, *Sigma Xi*, 2007

AWARDS AND SCHOLARSHIPS

Morris K. Udall Scholarship, *Morris K. Udall and Stewart L. Udall Foundation*, 2002

Undergraduate Hydrology Award, *University of Virginia*, 2003

Weeks Research Assistantship, *University of Wisconsin*, 2006

James J. and Dorothy T. Hanks Award in Geophysics, *University of Wisconsin*, 2008

Science to Achieve Results (STAR) Fellowship, *Environmental Protection Agency*, 2014

SPECIALIZED SKILLS

Languages: Native English speaker; intermediate French (oral and written);

Analytical Software: Competence in Microsoft Office, LaTeX, ArcGIS, Python, R, MATLAB, MODFLOW

Digital Design: Working knowledge of Photoshop and Illustrator