Ian Bolliger

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Education

2014-present **University of California, Berkeley** — **Berkeley, CA**

PhD Student, Energy and Resources Group (Pursuing Designated Emphasis in Computational and Data Science and Engineering)
MS, Civil and Environmental Engineering, 2017
MS, Energy and Resources, 2016

- National Defense Science and Engineering Graduate (NDSEG) Fellow
- Berkeley Graduate Fellow
- *Environment and Society: Data Science for the 21st Century* National Science Foundation Research Trainee (NRT) program graduate
- *Graduate Certificate in Geospatial Information Science and Technology* (GIST)
- Co-founder and project manager, *Tiny House in My Backyard* (THIMBY)
- Member of Global Policy Laboratory and Renewable and Appropriate Energy Laboratory

2011-2013 **University of Washington** — **Seattle, WA**

Researcher, Graduate Non-Matriculated Student

2006-2011 **Harvard University** — **Cambridge, MA**

AB in Applied Mathematics (focus in Geophysical Science)

- *Honors*: Magna Cum Laude in Field, High Honors in Field, Spanish Language Citation
- *Activities:* Varsity Baseball, First-year Outdoor Program leader

Extra-Curricular Research Experience

2016-present **empower** — **Berkeley, CA**

Co-founder – Founded a student team (considering incorporation) that is developing a forecast-informed optimal control product for homeowners with rooftop solar to maximize use of their array and reduce costs/emissions.

2014-present **Tiny House in My Backyard (THIMBY)** — **Berkeley, CA**

Co-founder, Project Manager - Founded and managed an interdisciplinary team of ~20 graduate and undergraduate students building a low-carbon, 100% solar-powered, off-grid, affordable, 170 sq ft. house on a trailer.

2015 **Next Generation Ecosystem Experiments - Arctic** — **Barrow, AK**

Scientist - Assisted with gathering gas flux and energy balance data from tundra field on and near the Barrow Environmental Observatory (BEO); maintained and operated multiple radiative measurement devices; brainstormed satellite-based methods for understanding seasonal snow accumulation/melt mechanisms.

2011-2014 **Institute for Health Metrics and Evaluation** — **Seattle, WA**

Researcher, Post-Bachelor Fellow - Created and improved statistical models estimating morbidity and mortality of multiple diseases and injuries. Developed tools to analyze data from a survey assessing racial disparities in chronic health conditions and risk factors in King County, WA.

2013 **Infectious Diseases Research Collaboration** — **Kampala, Uganda**

Collaborator
Served as an in-country contact for multiple studies performed in collaboration with IHME.

2011 **Anderson Research Group** **Cambridge, MA**
Scientist - Created and improved models to analyze spectroscopic data from a flight-ready optical device that measures carbon dioxide and methane isotope concentrations and fluxes.

2009 **Jet Propulsion Laboratory** **Pasadena, CA**
NASA Undergraduate Student Research Program Intern - Developed visualizations for a 3D numerical simulation of convection within Venus and Jupiter's moon Europa. Investigated whether material from Europa's subsurface ocean could migrate to the surface and be captured by future imaging missions.

Teaching Experience

2017	**Graduate Student Instructor** – Spatial Data Analysis, Goldman School of Public Policy, University of California, Berkeley	**Berkeley, CA**
2013-present	**Volunteer Instructor, Regional Avalanche Advisor, National Ski Patrol** – Teaching Avalanche & Mountain Travel and Rescue (MTR) Courses	**Western US**
2014	**Lecturer, Institute for Health Metrics and Evaluation –** Global Burden of Disease (GBD) Technical Training Workshop	**Chania, Greece**
2010	**Teaching Fellow, Harvard University** – Mathematical Methods in the Sciences, Harvard University.	**Cambridge, MA**
2008-2009	**English as a Second Language Tutor, Concilio Hispano -** Tutored Boston-area Spanish-speaking adults 1-4 hours per week to supplement English language classes.	**Cambridge, MA**

Peer-Reviewed Publications

2018 GBD 2016 Healthcare Access and Quality Collaborators. "Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected subnational locations: a systematic analysis from the Global Burden of Disease Study 2016." *The Lancet*, May 2018.

2015 Haagsma, J. et al. "The global burden of injury: incidence, mortality, disability-adjusted life years, and time trends from the Global Burden of Disease Study 2013." *Injury Prevention*, Dec. 2015.

Murray, C. J. L., R. M. Barber, K. J. Foreman, GBD 2013 DALYs and HALE Collaborators, "Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990–2013: quantifying the epidemiological transition." *The Lancet*, Aug. 2015.

GBD 2013 Disease and Injury Incidence and Prevalence Collaborators. "Global, regional, and national incidence, prevalence, and YLDs for 301 acute and chronic diseases and injuries for 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013." *The Lancet*, Jun. 2015.

2014 Hotez, P. J., M. Alvarado, M. Basáñez, I. W. Bolliger, R. Bourne, M. Boussinesq, S. J. Brooker, et al. "The Global Burden of Disease Study 2010: Interpretation and Implications for the Neglected Tropical Diseases." *PLoS Negl Trop Dis* 8, no. 7, July 24, 2014.

Hay, R. J., N. E. Johns, H. C. Williams, I. W. Bolliger, R. P. Dellavalle, D. J. Margolis, R. Marks, L. Naldi, M. A. Weinstock, S. K. Wulf, C. Michaud, C. J. L. Murray, and M. Naghavi, "The Global Burden of Skin Disease in 2010: An Analysis of the Prevalence and Impact of Skin Conditions." *J Invest Dermatol*, Jun. 2014.

2013 200+ authors, including Bolliger IW, "The state of US health, 1990-2010: Burden of diseases, injuries, and risk factors." *JAMA*, vol. 310, no. 6, pp. 591–608, Aug. 2013.

GBD 2010 Country Collaboration, "GBD 2010 country results: a global public good." *The Lancet*, Mar. 2013

2012 Bolliger, I. W., "Analysis of 3D numerical simulations of subsolidus thermal convection: application to Venus and Europa." *THURJ*, vol. 5, no. 1, pp. 10–19, May 2012. **Awarded Best Manuscript, Spring 2012 Issue.**

200+ authors, including Bolliger IW, "Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010." *The Lancet*, vol. 380, no. 9859, pp. 2095–2128, Dec. 2012.

200+ authors, including Bolliger IW, "Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010." *The Lancet*, vol. 380, no. 9859, pp. 2197–2223, Dec. 2012.

200+ authors, including Bolliger IW, "Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010." *The Lancet*, vol. 380, no. 9859, pp. 2163–2196, Dec. 2012.

Preprints

2017 Bolliger, I.W. et al., "Ground Control to Major Tom: the importance of field surveys in remotely sensed data analysis." Retrieved from https://arxiv.org/abs/1710.09342, Oct. 2017.

Research Grants and Fellowships

2017 – CITRIS Tech for Social Good, Tech Development Award

2017 – Student Opportunity Fund, UC Berkeley

2016 – Academic Opportunity Fund, UC Berkeley

2016 – Student Technology Fund, UC Berkeley – THIMBY

2015, 2016 – Charles K. Birdsall Fellowship, UC Berkeley

2015 – The Green Initiative Fund, UC Berkeley – THIMBY

2015 – National Defense Science and Engineering Graduate (NDSEG) Fellowship

2014 – Berkeley Fellowship for Graduate Study – University of California, Berkeley

2008 – Harvard Club of Seattle Summer Community Service Fellowship

Honors and Awards

2018 – 3rd place, Energy and Resource Alternatives Category, Big Ideas @ Berkeley Competition (empower)

2017 – 3rd place, Energy and Resource Alternatives Category, Big Ideas @ Berkeley Competition (PowerTank)

2017 – "People's Choice Award" – Berkeley Energy and Resources Collaborative (BERC) Innovation Expo Poster Competition (empower)

2016 – 2nd place overall, 1st place in *Sustainability*, *Water Conservation*, *Craftsmanship*, and *Home Life* categories - Sacramento Municipal Utility District (SMUD) Tiny House Competition (THIMBY)

2016 – MIT Climate Co-Lab Semi-Finalist (THIMBY)

2016 – 3rd place, Patagonia Eco-Innovation Case Competition

2014, 2015 – Live Your Dream Grant – American Alpine Club

2014 – The Adventure Fund – Sidetracked Magazine

2012 – Best Manuscript – Spring Issue of The Harvard Undergraduate Research Journal (THURJ)

Conference Participation

Panels Organized

2018 Primary Convener, Session Chair. "Societal Impacts of Global Cryosphere Change and Associated Mitigation and Adaptation Policies," (accepted). *American Geophysical Union Fall Meeting*, Washington, DC, 10-14 Dec 2018.

2017 Primary Convener, Session Chair. "Estimating the Impacts of Terrestrial Cryospheric Change on Physical, Social and Economic Systems," (oral and poster). *American Geophysical Union Fall Meeting*, New Orleans, LA, 11-15 Dec 2017.

Papers Presented

2017 Bolliger, I. W., "Spatiotemporal Variability in Topographic and Vegetative Controls on Basin-Wide Snow Distribution in the Tuolumne River Basin." *American Geophysical Union Fall Meeting*, New Orleans, LA, 15 Dec 2017.

Bolliger, I. W., "Modeling our Snowpack with Terrain and Vegetation: Implications for Water Resource Forecasting Under Climate Change." *Graduate Climate Conference*, Marine Biological Laboratory, Woods Hole, MA, 11 Nov 2017.

Bolliger, I. W., "Modeling the Influence of Terrain and Vegetation on Snowpack: Findings and Implications for Water Management in Snowmelt-fed Regions." *Interdisciplinary PhD Workshop on Sustainable Development*, Columbia University, 21 Apr 2017.

Bolliger, I. W., A. Siegner, B. Webster, "THIMBY: A Platform for the Development and Testing of Off-grid Home Energy Management Systems." *Berkeley Energy and Resources Collaborative Innovation Expo*, Berkeley, CA, 23 Feb 2017.

2016 Bolliger, I. W., "Quantifying Persistent Spatial Variability in the Influence of Topography and Vegetation on Snow Depth in the Tuolumne River Basin: Implications for Prediction and Process Knowledge." *American Geophysical Union Fall Meeting*, San Francisco, CA, 12 Dec 2016.

Bolliger, I. W., J. Chen, L. Lam, A. Liu, J. Yang, "A review of policy and business strategy approaches to photovoltaic trade barriers in China." *International Youth Photovoltaic Forum, China International Fair for Investment and Trade*, Xiamen, CHN, 9 Sep 2016.

Bolliger, I. W., "Geographically Weighted Regression on large raster images: understanding spatial variability in the influence of topography and vegetation on snow depth in the Tuolumne River Basin." *Workshop on Algorithms for Modern Massive Data Sets,* Berkeley, CA, 23 Jun 2016.

Bolliger, I. W., "Capturing spatiotemporal variability in the influence of topography and vegetation on snow depth in the Tuolomne River Basin using geographically weighted regression." *2016 Western Snow Conference*, Seattle, WA, 19 Apr 2016.

Bolliger, I. W., "Satellites, lasers, and global snowpack models: Leveraging new data and models to track and predict water scarcity in meltwater-dependent regions." *Los Angeles Global Health Conference*, Los Angeles, CA, 06 Feb 2016.

2015 Bolliger, I. W., A. Siegner, and C. Karmann, "Tiny House in My Backyard." *International Alliance of Research Universities Global University Climate Forum*, Paris, France, 05 Dec 2015.

Bolliger, I. W., and A. Siegner, "Zero Net Energy Tiny Houses: A Campus Sustainable Housing Solution." *Association for the Advancement of Sustainability in Higher Education 2015 Conference & Expo*, Minneapolis, MN, 26 Oct 2015.

2012 Bolliger, I. W., "Monitoring Disparities in Chronic Conditions: A novel surveillance system to capture country-level data on chronic health conditions, risk factors, and treatment." *SACNAS 2012 National Conference: Creating a Healthy World through Science, Diversity & Technology*. Washington State Convention & Trade Center, Seattle, WA. 11 Oct 2012. Graduate Oral Scientific Symposium.

Other Presentations

2017 Bolliger, I.W., "Modeling Variability in the Influence of Terrain and Vegetation on Snowpack: Findings and Implications for Water Management in Snowmelt-fed Regions." *International High-Performance Computing Summer School*, University of Colorado, Boulder, CO, 27 Jun 2017.

Bolliger, I.W., "The Hunt for the Missing Precipitation." *Advanced Study Program Summer Colloquium,* National Center for Atmospheric Research, Boulder, CO, 16 Jun 2017.

Alexander, L. Asai, J., Baughman, J., Bolliger, I. W., Gordon, H., Ju, Y., Kling, M., Pennington, K., Seidel, D., Stoudt, S., Tubbesing, C., Vasquez, V., & Wilkinson, C. "Interdisciplinary Graduate Education in Data Science: Environment and Society DS421 NRT." *Berkeley Institute for Data Science's Data Science Faire*, Berkeley, California, 1 May 2017.

2016 Bolliger, I. W., "A Walk Through Two Research Projects." *Bay Currents Series: Engaged Locally and Globally – Young Climate Researchers at UC Berkeley*, Berkeley, CA, 08 Mar 2016.

2014 Bolliger, I. W., "Modeling non-fatal outcomes of injuries," "Introduction to the global burden of disease interactive data visualization tools," and "Global Health Data Exchange: Discover the world's health data." *Global Burden of Disease Technical Training Workshop*. Chania, Greece. May 2014.

Popular Writing

2016 Lam, Long T., I. W. Bolliger, J. Chen, A. Liu, J. Yang, R. Margolis. "Chinese Solar Makers' Strategies to Overcome Trade Conflicts." *The Energy Collective*. Web. Nov 9, 2016. http://www.theenergycollective.com.

2014-201 Regular contributions to *The Inertia Mountain*. Wrote and edited series on interface of adventure and environmental change: "Adventuring in an Evolving World." http://www.theinertia.com/author/ian-bolliger.

2013 Bolliger, I. W. "HIV Positives: Uganda's AIDS Epidemic Over Time." *Solutions Journalism Network*. Web. Aug. 30, 2013. http://solutionsjournalism.org/2013/08/30/hiv-positives-how-the-aids-epidemic-has-dramatically-changed-in-uganda/.

Bolliger, I. W. "HIV Positives: Uganda Tackles AIDS." *Solutions Journalism Network*. Web. Aug. 22, 2013. http://solutionsjournalism.org/2013/08/22/hiv-positives-uganda-tackles-aids/.

Additional Experience

Extreme Science and Engineering Discovery Environment (XSEDE) International High Performance Computing Summer School on HPC Challenges in Computation Science, 25-30 Jun 2017, Boulder, CO.

National Center for Atmospheric Research (NCAR) Advanced Study Program Colloquium, "Interaction of Precipitation with Orography", 5-16 Jun 2017, Boulder, CO.

NCAR Coupled Model Intercomparison Project (CMIP) Analysis Tutorial, 16-18 Aug, 2016, Boulder, CO.

NCAR Regional Climate Modeling and Weather Research and Forecasting (WRF) Tutorial, 22 Jul – 7 Aug 2015, Boulder, CO.

University of New Mexico Methods in Environmental Data Acquisition, 14-21 Jun 2015, La Joya, NM.

Skills

Climate Modeling Experience with NCAR's Weather Research and Forecasting (WRF) Model, experience with analyzing CMIP5 model output

Programming Languages and Packages Python, Stata, MATLAB, OpenMP, MPI; introductory skills with C, C++, UPC, CUDA, OpenACC, Spark, Tensorflow, Fortran, R, Java, Javascript

Languages Spanish (conversational ability)

Memberships and Service

American Geophysical Union

- 2017-present – Cryosphere Section Executive Committee Member
- 2017-present – Liaison between Cryosphere and Societal Impacts and Policy Sciences Sections

American Meteorological Society

Energy and Resources Group

- 2017-present – ERG Development Committee Student Member

References

Daniel Kammen, University of California, Berkeley
Solomon Hsiang, University of California, Berkeley
Christopher JL Murray, University of Washington