

# Ian Bolliger

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## Education

### University of California, Berkeley

- PhD** Energy and Resources, expected Aug 2020  
*Graduate Certificate in Geospatial Information Science and Technology (GIST), 2017*  
*Data Science for the 21<sup>st</sup> Century (DS421) National Science Foundation Research Trainee*
- MS** Civil and Environmental Engineering (Civil Systems), 2017
- MS** Energy and Resources, 2016

### Harvard University

- AB** Applied Mathematics (focus in Geophysical Science), 2011  
*Magna Cum Laude in Field, High Honors in Field, Spanish Language Citation*

## Professional Appointments

- 2019- **Graduate Student Researcher**, UC Berkeley
- 2018 **Graduate Student Instructor**, UC Berkeley
- 2014-19 **Berkeley Graduate Fellow**, UC Berkeley
- 2015-18 **National Defense Science and Engineering Graduate (NDSEG) Fellow**, UC Berkeley
- 2013-14 **Researcher**, Institute for Health Metrics and Evaluation
- 2011-13 **Post-Bachelor Fellow**, Institute for Health Metrics and Evaluation
- 2011 **Scientist**, Anderson Research Group, Harvard University
- 2010 **Teaching Fellow**, Harvard University
- 2009 **Undergraduate Student Research Project (USRP) Intern**, NASA Jet Propulsion Laboratory

## Publications

### Working Papers, Pre-prints, and Submitted Manuscripts

- Rolf, E., ..., **Bolliger, I.**, et al., "A generalizable and accessible approach to machine learning with global satellite imagery." *Submitted*.
- Siegner, A., Webster, B., **Bolliger, I.**, and Karmann, C., "Energy and Water Performance of an Off-Grid Tiny House in California." *Submitted*.
- Almås, I., Auffhammer, M., Bold, T., **Bolliger, I.**, et al., "Destructive Behavior, Judgment, and Economic Decision-making under Thermal Stress." Cambridge, MA. *NBER Working Paper*. Retrieved from <http://www.nber.org/papers/w25785.pdf>.
- Bolliger, I.**, 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.

### In Prep

- Bolliger, I.**, Delgado, M., Hsiang, S., Kopp, R., Greenstone, M., and Houser, T., "Estimating Past, Present, and Future Contributions of Climate Change to Economic Losses from Hurricanes in the United States."

### Peer-reviewed Journal Articles

- Hsiang, S. M., ..., **Bolliger, I.**, et al., "The Effect of Large-Scale Anti-Contagion Policies on the COVID-19 Pandemic." *Nature*, May 2020.
- GBD 2016 Healthcare Access and Quality Collaborators (including **Bolliger, I.**), "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.

3. Haagsma, J., Graetz, N., **Bolliger, I.**, 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.
4. Murray, C. J. L., ..., **Bolliger, I.**, et al., “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.
5. GBD 2013 Disease and Injury Incidence and Prevalence Collaborators (including **Bolliger, I.**). “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.
6. Hotez, P. J., Alvarado, M., Basáñez, M., **Bolliger, I.**, 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.
7. Hay, R., Johns, N., Williams, H., **Bolliger, I.**, et al., “The Global Burden of Skin Disease in 2010: An Analysis of the Prevalence and Impact of Skin Conditions.” *J Invest Dermatol*, Jun. 2014.
8. 200+ authors (including **Bolliger, I.**), “The state of US health, 1990–2010: Burden of diseases, injuries, and risk factors.” *JAMA*, vol. 310, no. 6, pp. 591–608, Aug. 2013.
9. GBD 2010 Country Collaboration (including **Bolliger, I.**), “GBD 2010 country results: a global public good.” *The Lancet*, Mar. 2013
10. 200+ authors (including **Bolliger, I.**), “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.
11. 200+ authors (including **Bolliger, I.**), “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.
12. 200+ authors (including **Bolliger, I.**), “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.
13. **Bolliger, I.**, “Analysis of 3D numerical simulations of subsolidus thermal convection: application to Venus and Europa.” *THURJ*, vol. 5, no. 1, pp. 10–19, May 2012.

#### Reports Authored or Contributed To

1. Hess, H., Delgado, M., Hamidi, A., Houser, T., Kopp, R., **Bolliger, I.**, ... Greenstone, M. (2019). *New Jersey’s Rising Coastal Risk*. Retrieved from <https://rhg.com/research/new-jersey-flooding-hurricanes-costs-climatechange>.
2. Rhodium Group, “Clear, Present and Underpriced: The Physical Risks of Climate Change.” Oakland, CA. Mar 2019. Retrieved from [https://rhg.com/wp-content/uploads/2019/03/RHG\\_PhysicalClimateRisk\\_Report\\_April\\_Final.pdf](https://rhg.com/wp-content/uploads/2019/03/RHG_PhysicalClimateRisk_Report_April_Final.pdf).
3. Blackrock Investment Institute. (2019). *Getting physical: assessing climate risks | BlackRock*. New York, NY. Retrieved from <https://www.blackrock.com/us/individual/insights/blackrock-investment-institute/physical-climate-risks>.

#### Popular Writing

1. Lam, L., **Bolliger, I.**, Chen, J., Liu, A., Yang, J., and Margolis, R. “Chinese Solar Makers’ Strategies to Overcome Trade Conflicts.” *The Energy Collective*. Web. Nov 9, 2016. <http://www.theenergycollective.com>.
2. **Bolliger, I.** “Combating the Growing Environmental and Human Health Hazards of Microplastics.” *The Inertia: Mountain*. Web. Oct 13, 2015. <https://www.theinertia.com/surf/combating-the-growing-environmental-and-human-health-hazards-of-microplastics/>.

3. **Bolliger, I.** "How to Read Weather Forecasts During Snow Season." *The Inertia: Mountain*. Web. Nov 28, 2014. <https://www.theinertia.com/environment/how-to-read-weather-forecasts-during-snow-season/>
4. **Bolliger, I.** "Adventuring in an Evolving World." *The Inertia: Mountain*. Web. Sep 4, 2015. <https://www.theinertia.com/surf/adventuring-through-an-evolving-world-a-series-on-environmental-change/>.
5. **Bolliger, I.** "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/>.
6. **Bolliger, I.** "HIV Positives: Uganda Tackles AIDS." *Solutions Journalism Network*. Web. Aug. 22, 2013. <http://solutionsjournalism.org/2013/08/22/hiv-positives-uganda-tackles-aids/>.

## Research Grants and Fellowships

2016,20	Charles K. Birdsall Fellowship, UC Berkeley
2019	American Geophysical Union Celebrate 100 Award
2017	CITRIS Tech for Social Good, Tech Development Award
2016	Student Technology Fund, UC Berkeley
2015	The Green Initiative Fund, UC Berkeley
2015	National Defense Science and Engineering Graduate (NDSEG) Fellowship
2014	Berkeley Fellowship for Graduate Study
2008	Harvard Club of Seattle Summer Community Service Fellowship

## Honors and Awards

2017,18	3 <sup>rd</sup> place – Energy and Resource Alternatives Category, Big Ideas @ Berkeley Competition
2017	"People's Choice" – Berkeley Energy and Resources Collaborative Innovation Expo Poster Competition
2016	2 <sup>nd</sup> place – Sacramento Municipal Utility District Off-Grid Tiny House Competition
2016	Semi-Finalist – MIT Climate Co-Lab Competition
2016	3 <sup>rd</sup> place – Patagonia Eco-Innovation Case Competition
2012	Best Manuscript – Spring Issue of <i>The Harvard Undergraduate Research Journal</i>

## Conference Participation

### Panels Organized

1. **Primary Convener, Chair.** "Advances in remote sensing, machine learning, and economics to improve risk management and evaluate impacts in socio-environmental systems." *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, Dec 2019.
2. **Chair.** "Protecting Earth's Climate for the Next Centennial." *AGU Fall Meeting*, San Francisco, CA, Dec 2019.
3. **Co-Convener, Chair.** "Science to Inform Climate Resilience and Adaptation Decision-making and Policy." *AGU Fall Meeting*, Washington, DC, Dec 2018.
4. **Primary Convener, Chair.** "Estimating the Impacts of Terrestrial Cryospheric Change on Physical, Social and Economic Systems." *AGU Fall Meeting*, New Orleans, LA, Dec 2017.

### Work Presented

1. **Bolliger, I., et al.,** "Estimating Past, Present, and Future Contributions of Climate Change to Economic Losses from Hurricanes in the United States." *AGU Fall Meeting*, Washington, DC, Dec 2019.
2. **Bolliger, I., et al.,** "Estimating Past, Present, and Future Contributions of Climate Change to Economic Losses from Hurricanes in the United States." *Workshop on Risk Analysis for Extremes in the Earth System*, Lawrence Berkeley National Laboratory, Berkeley, CA, July 2019.

3. **Bolliger, I.**, et al., "A probabilistic assessment of climate change-driven economic losses from tropical cyclones and sea level rise in the United States." *AGU Fall Meeting*, Washington, DC, Dec 2018.
4. **Bolliger, I.**, et al., "Convolutions of random patches as a generalizable featurization for multi-domain prediction using remote sensing imagery." *AGU Fall Meeting*, Washington, DC, Dec 2018.
5. Deems, J. and **Bolliger, I.**, "Snow depth spatial structure from hillslope to basin scale." *AGU Fall Meeting*, New Orleans, LA, Dec 2017.
6. **Bolliger, I.**, "Spatiotemporal Variability in Topographic and Vegetative Controls on Basin-Wide Snow Distribution in the Tuolumne River Basin." *AGU Fall Meeting*, New Orleans, LA, Dec 2017.
7. **Bolliger, I.**, Siegner, A., and Webster, B., "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.
8. **Bolliger, I.**, "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.
9. **Bolliger, I.**, "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.
10. **Bolliger, I.**, "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.
11. **Bolliger, I.**, Chen, J., Lam, L., Liu, A., Yang, J., "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.
12. **Bolliger, I.**, "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.
13. **Bolliger, I.**, "Capturing spatiotemporal variability in the influence of topography and vegetation on snow depth in the Tuolumne River Basin using geographically weighted regression." *2016 Western Snow Conference*, Seattle, WA, 19 Apr 2016.
14. **Bolliger, I.**, "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.
15. **Bolliger, I.**, Siegner, A., and Karmann, C., "Tiny House in My Backyard." *International Alliance of Research Universities Global University Climate Forum*, Paris, France, 05 Dec 2015.
16. **Bolliger, I.** and Siegner, A., "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.
17. **Bolliger, I.**, "Monitoring Disparities in Chronic Conditions: A novel surveillance system to capture county-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 Invited Presentations

1. **Bolliger, I.**, "Quantifying the influence of Climate Change on Economic Risk from Hurricanes in the United States." *Mesoscale and Microscale Meteorology Laboratory Seminar*. National Center for Atmospheric Research, Boulder, CO. 6 Feb 2020.

## Teaching Experience

- 2017 **Graduate Student Instructor**, Spatial Data Analysis, Goldman School of Public Policy, UC Berkeley
- 2013- **Instructor of Record, Avalanche Level 1**, National Ski Patrol, Truckee, CA
- 2014 **Lecturer**, Global Burden of Disease (GBD) Technical Training Workshop, Institute for Health Metrics and Evaluation, Chania, Greece
- 2010 **Teaching Fellow**, Mathematical Methods in the Sciences, Harvard University
- 2008-09 **English as a Second Language Tutor**, Concilio Hispano

## Academic Service

### *American Geophysical Union*

- 2020- Position Statement Committee Member
- 2018- Cryosphere Section CryoMentor
- 2017- Cryosphere Section Executive Committee Member
- 2017- Liaison between Cryosphere and Societal Impacts and Policy Sciences (SIPS) Sections

### *Energy and Resources Group*

- 2019- Student Advisory Committee on Equity and Inclusion Member
- 2017-19 Development Committee Student Member

### *Intergovernmental Panel on Climate Change*

- 2019 Expert Reviewer, First Order Draft, Sixth Assessment Report, Chap 9: Ocean, Cryosphere, and Sea Level Change
- 2018 Expert Reviewer, Second Order Draft, Special Report on the Ocean and Cryosphere in a Changing Climate

*Journal Referee:* Computers and Geosciences, Climatic Change

### *Other Mentorship*

- 2018 Mentor, Environment and Society: Data Science for the 21<sup>st</sup> Century Interdisciplinary Summer Research
- 2015-16 Mentor, Adaptive and Agile Leadership Network (AALN) – UC Berkeley and National Defense University
- 2015 Project Mentor, Berkeley Environmentally Aware Consulting Network (BEACN)

*Memberships:* American Geophysical Union, American Meteorological Society, The International Environmetrics Society, Association of Polar Early Career Scientists, Young Earth System Scientists Community

## Synergistic Activities

- 2020 Co-organizing climate change-focused panel discussions with the advocacy group Protect Our Winters. Panels combine scientists, policy specialists, and athletes at ski areas around the U.S. Discussions center on local impacts of climate change ways to engage with climate policy. Funded by American Geophysical Union Centennial grant.
- 2016- [Ongoing contributions](#) to open-source Python tools for scientific computing (dask, xarray, fastparquet, clawpack, intake-esm, rtree).
- 2014-16 Co-founder and Project Manager for [Tiny House In My Backyard](#) – a \$40,000 project to construct an off-grid, 100% renewable energy-powered tiny house. Won 2<sup>nd</sup> place in the 2016 Sacramento Municipal Utility District Tiny House Competition.
- 2014-15 Coordinator and deputy editor for [a blog series](#) on the outdoor recreation website theInertia.com, focused on environmental and climate change education for outdoor enthusiasts.

## Additional Experience

- 2019      **NCAR/LDEO CMIP6 Hackathon** National Center for Atmospheric Research (NCAR), Boulder, CO.  
**Summer Institute for Preparing Future Faculty** UC Berkeley, Berkeley, CA.
- 2017      **International High Performance Computing Summer School** Extreme Science and Engineering  
Discovery Environment (XSEDE), Boulder, CO.  
**Advanced Study Program Colloquium** NCAR “Interaction of Precipitation with Orography”, Boulder,  
CO.
- 2015      **Methods in Environmental Data Acquisition** University of New Mexico, 14-21 Jun 2015, La Joya, NM.

## Skills

**Climate Modeling** Experience running NCAR’s Weather Research and Forecasting (WRF) Model, experience analyzing CMIP5 and CMIP6 model output

**Programming Languages and Tools** Python, MATLAB, kubernetes, git, docker, CI tools; introductory skills with C, C++, Fortran, OpenMP, MPI, UPC, CUDA, OpenACC, Spark, Tensorflow, R, Stata, Java, Javascript

**Languages** Spanish (conversational)

## References

Solomon Hsiang, University of California, Berkeley

Daniel Kammen, University of California, Berkeley

Robert Kopp, Rutgers University

Benjamin Recht, University of California, Berkeley

Trevor Houser, Rhodium Group