

Brent Delbridge

Harvard University
Earth and Planetary Sciences
20 Oxford Street
Cambridge, MA 02138

bdelbridge@fas.harvard.edu
www.brentdelbridge.com
Google Scholar: [Delbridge, B.](#)

Education

University of California, Berkeley, Berkeley, CA.
Ph.D., Earth and Planetary Science, 2017.
Advisor: Roland Bürgmann

University of Washington, Seattle, WA.
B.S., Applied Computation Mathematical Sciences, 2011.

University of Washington, Seattle, WA.
B.S., Physics, 2011.

Research Interest

Theoretical and observational seismology. Geodesy, and Active Tectonics. Using GPS, strainmeters and InSAR to measure deformation near active faults, volcanos and landslides. Development of new theoretical and observational frameworks to better understand earthquake source processes and Earth structure.

Professional Experience

Postdoctoral Fellow, Cambridge, MA
Harvard University (Advisor: Prof. Miaki Ishii), 2017-Current

GROW Visiting Research Fellow, Sendai, Japan
Tohoku Univ. RCPEVE, Fall Semester 2013

Awards and Fellowships

NSF Award 1850831
Elucidating the Mechanics of Tsunami
Generating Earthquake Rupture with Long Period Seismology

Dean's Competitive Fund for Promising Scholarship, Cambridge, MA
Harvard University, 2018-2019

NSF Graduate Research Fellow, Berkely, CA
UC Berkeley Dept. of EPS, 2013-2016

Tocher Research Fellow, Berkeley, CA
Berkeley Seismological Laboratory, 2011-2012

Washington State Research Fellowship Fellow, Seattle, WA
Univ. of Washington Dept. of ESS, 2010-2011

Washington Space Grant Scholar, Seattle, WA
Univ. of Washington Dept. of Physics, 2009-2010

Best Overall Undergraduate Poster Presentation, Seattle, WA
Univ. of Washington Dept. of ESS, 2010

Mary Gates Research Scholar. Seattle, WA
Univ. of Washington Dept. of ESS, 2009-2010

VIGRE Research Grant, Seattle, WA
Univ. of Washington Dept. of ACMS, 2009-2010

AmeriCorps Education Award, Seattle, WA
Washington Dept. of Natural Resources, 2009-2010

AmeriCorps Education Award, Seattle, WA
Washington Dept. of Natural Resources, 2008-2009

Publications (ORCID ID: [0000-0003-2808-8772](https://orcid.org/0000-0003-2808-8772))
(* indicates advisor to an undergraduate)

14. **Delbridge, B.**, Nadeau, R.M., Carmichael, J.D., Shelly, D., Bürgmann, R. (2020, Under Review). Geodetic measurements of slow slip events southeast of Parkfield, CA. *J. Geophys. Res. Solid Earth*.
13. **Delbridge, B.**, Ishii, M., (2020, Under Review). Reconciling elasticity tensor constraints from mineral physics and seismological observations: applications to the Earth's inner core. *Geophysical Journal International*.
12. **Delbridge, B.**, Ishii, M., (2020, Under Review). Seismic wave speeds derived from nuclear resonant inelastic X-ray scattering. Invited Paper Submitted to *Minerals*.
11. Mittal, T., **Delbridge, B.** (2019). Detection of the 2012 Havre submarine eruption plume using Argo floats and its implications for ocean dynamics. *Earth and Planetary Science Letters*, 511, doi:10.1016/j.epsl.2019.01.035
10. Saltiel, S., Bonner, B., Mittal, T., **Delbridge, B.**, Ajo-Franklin, J. (2017). Stress-strain hysteresis loops and harmonics show rate-dependent nonlinearity of mated dolomite fracture. *J. Geophys. Res. Solid Earth*, 122, doi:10.1002/2017JB014219.
9. **Delbridge, B.**, Johnson, C.W., Kita, S., Matsuzawa, T., Uchida, N., Bürgmann, R., (2017). Temporal variation of intermediate-depth earthquakes around the time of the M 9.0 Tohoku-oki earthquake. *Geophys. Res. Lett.*, 44, doi:10.1002/2017GL072876.
8. **Delbridge, B.**, Bürgmann, R., Fielding, E., Hensley, S. and Schulz, W.H., (2016). Three-dimensional surface deformation derived from airborne interferometric UAVSAR:

Application to the Slumgullion Landslide. *J. Geophys. Res. Solid Earth*, 121, 3951–3977, doi:10.1002/2015JB012559.

7. **Delbridge, B.**, Bürgmann, R., Fielding, E. and Hensley, S., (2015), July. Kinematics of the Slumgullion Landslide from UAVSAR derived interferograms. *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)* (pp. 3842-3845). IEEE.
6. *Birch, S.P.D., Manga, M., **Delbridge, B.** and Chamberlain, M., (2014). Penetration of spherical projectiles into wet granular media. *Physical Review E*, 90(3), p.032208.
5. Milillo, P., Fielding, E.J., Shulz, W.H., **Delbridge, B.** and Burgmann, R., (2014). COSMO- SkyMed spotlight interferometry over rural areas: The Slumgullion landslide in Colorado, USA. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 7(7), pp.2919-2926.
4. Knecht, A., Hong, R., Zumwalt, D.W., **Delbridge, B.**, Garcia, A., Müller, P., Swanson, H.E., Towner, I.S., Utsuno, S., Williams, W. and Wrede, C., (2012). Precision measurement of the ^6He half-life and the weak axial current in nuclei. *Physical Review C*, 86(3), p.035506.
3. Houston, H., **Delbridge, B.**, Wech, A.G. and Creager, K.C., (2011). Rapid tremor reversals in Cascadia generated by a weakened plate interface. *Nature Geoscience*, 4(6), pp.404-409.
2. Knecht, A., Zumwalt, D.W., **Delbridge, B.**, García, A., Harper, G.C., Hong, R., Müller, P., Palmer, A.S.C., Robertson, R.G.H., Swanson, H.E. and Utsuno, S., (2011). A high-intensity source of ^6He atoms for fundamental research. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 660(1), pp.43-47.
1. Freeman, B.M., Wrede, C., **Delbridge, B.**, García, A., Knecht, A., Parikh, A. and Sallaska, A.L., (2011). Branches of $^{\text{S } 33}$ (p , γ) at oxygen-neon nova temperatures. *Physical Review C*, 83(4), p.048801.

In preparation:

5. **Delbridge, B.**, Ishii, M., The Seismically constrained light-element content of the Earth's inner core
4. **Delbridge, B.**, Ishii, M., Elucidating the mechanics of tsunami generating earthquake rupture with long period seismology
3. **Delbridge, B.**, Mittal, T., Geophysical applications of coupled poro-thermo-visco-elasticity and generalized stability analysis.
2. **Delbridge, B.**, Kita, S., Houston, H., Bürgmann, R. , Variations in intraplate stress beneath NE Japan following the 2011 Tohoku-oki earthquake from earthquake focal mechanisms.
1. *Nelson, O., **Delbridge, B.**, Mittal, T., Randolph-Flagg N., Manga, M., Internal flow dynamics of dikes in analog experiments and their controls on magma ascent processes.

Invited Talks

6. **Delbridge, B.**, Nadeau, R., Bürgmann, R., (2019). Geodetic Measurements of Slow Slip Events Southeast of Parkfield, CA. *SeismoLunch: University of Washington* : Aug. 29, 2019. Seattle, WA.
5. **Delbridge, B.**, Nadeau, R., Bürgmann, R., (2019). Geodetic Measurements of Slow Slip Events Southeast of Parkfield, CA. *Frontiers in Science Lectures: Los Alamos National Laboratory* : Aug. 26, 2019. Los Alamos, NM.
4. **Delbridge, B.**, Nadeau, R., Bürgmann, R., (2018). Geodetic and Seismological Constraints on Quasi-episodic Slow Slip on the San Andreas Fault. *FISH Seminar: Massachusetts Institute of Technology*: Feb. 23, 2018. Boston, MA.
3. **Delbridge, B.**, Nadeau, R., Bürgmann, R., (2017). Geodetic Signature of Slow-Slip and Tremor in Parkfield, CA. *Harvard Solid Earth Seminar*: May 22, 2017. Boston, MA.
2. **Delbridge, B.**, Bürgmann, R., Fielding, E., Hensley, S. and Schulz, W.H., (2016). Airborne and Spaceborne Geodetic Imaging of the Slumgullion Landslide. *USGS Earthquake Science Center Seminars*: Sept. 7, 2016. Menlo Park, CA.
1. **Delbridge, B.**, Bürgmann, R., Fielding, E., Hensley, S. and Schulz, W.H., (2016). 3D surface deformation derived from airborne interferometric UAVSAR: Application to the Slumgullion Landslide. *University of Oregon, Dept. of Earth Sciences*: May 6, 2016. Eugene, OR.

Service

Reviewer for:

Science Advances, Nature Scientific Reports, Pure and Applied Geophysics, IEEE Geoscience and Remote Sensing, and JGR Solid Earth

Educational Publications:

Delbridge, B., Ishii, M. (2019). Earth's Core. *J. AccessScience, McGraw-Hill Education*, doi:10.1036/1097-8542.209875.

Graduate Student and Postdoc Seminar series organizer

Dept. of Earth and Planetary Sciences, Harvard University 2019-2020

Member of the northern California earthquake alarm response

which computes and publishes near real-time earthquake information for both the scientific community and the public, 2011-2017

SZ4d MCS RCN Fluid Transport Workshop

Co-chair/convener for AGU F.M. 2017 Session

“Slow slip, Tectonic Tremor, and the Brittle-to-Ductile Transition Zone: What mechanisms control the diversity of slow and fast earthquakes?”

Co-chair/convener for JPGU 2017 Session

“Shallow and intermediate depth intraslab earthquakes: seismogenesis and rheology of the slab”

Co-chair/convener for AGU F.M. 2016 Session

“Advances in Understanding of Tremor, Slow Slip, and Other Slow Earthquake Phenomena”

Mentor and co-advisor to undergraduate students

Sam Birch (Now graduate student at Cornell in Dept. of EAS)
Ian Ekblaw (Now Research Analyst at LBNL)
Owen Nelson (UC Berkeley Undergraduate)

Teaching

Dept. of Earth and Planetary Sciences, Harvard University

Teaching Fellow, Dimensional Analysis and Scaling, Spring 2019
– with Prof. Miaki Ishii

Faculty of Arts and Sciences, Harvard University

Teaching Fellow, GeoSciFi Movies: Real vs. Fiction, Fall 2018
– with Prof. Miaki Ishii

School of Engineering and Applied Sciences, Harvard University

Teaching Fellow, Mathematical Modeling, Spring 2018
– with Prof. Zhiming Kuang

Dept. of Earth and Planetary Science, UC Berkeley

Graduate Student Assistant, Geologic Field Studies, Spring 2016
– with Prof. Don DePaolo

Graduate Student Assistant, Earth Science in the Field, Spring 2015
– with Prof. Rudy Wenk

Graduate Student Instructor, Computer Simulations in EPS, Fall 2014
– with Prof. Burkhard Militzer

Graduate Student Assistant, Geologic Field Studies, Spring 2014
– with Prof. Don De Paolo

Graduate Student Instructor, Mathematical Methods in Geophysics, Spring 2013
– with Assoc. Prof. Steven Pride
Graduate Student Instructor, Geodynamics, Fall 2012
– with Prof. Michael Manga
Graduate Student Instructor, History and Evolution of Planet Earth , Spring 2011,
– with Prof. Bruce Buffett

Dept. of Mathematics, University of Washington

CLUE Tutor (e.g. Calculus, Linear Algebra, Differential Equations) 2008 - 2011

TEFL, Beijing, China

TEFL International, 2007-2008

Languages
and Skills

English (native), Matlab, Python, R, Mathematica, UNIX/Bash/CSH
L^AT_EX, GDAL, C++

References

[Roland Bürgmann](#)
Earth and Planetary Sciences
UC Berkeley
burgmann@seismo.berkeley.edu

[Miaki Ishii](#)
Earth and Planetary Science
Harvard University
ishii@eps.harvard.edu

[Bruce Buffett](#)
Earth and Planetary Sciences
UC Berkeley
bbuffett@berkeley.edu

[Michael Manga](#)
Earth and Planetary Sciences
UC Berkeley
manga@seismo.berkeley.edu

[Heidi Houston](#)
Earth Sciences
University of Southern California
heidi.houston@gmail.com