Trever Hines

Education

2012–present **PhD candidate Geophysics (certificate in Computational Engineering)**
University of Michigan, Ann Arbor

2008-2012 **BS Geology**, *University of Illinois*, Urbana-Champaign

Doctoral Dissertation

Title Transient deformation in tectonically active regions and implications for viscoelasticity in the crust and upper mantle

Advisor Eric Hetland

Description In this dissertation I introduce novel techniques to identify and model transient ground deformation resulting from earthquakes. My work further constrains the physical properties of the crust and upper mantle, which are key pieces of information needed to improve assessments of seismic hazard.

Publications

in progress Hines, T. T. and E. A. Hetland. Detecting spatially and temporally correlated signals in geodetic data with the radial basis function finite-difference method

2016 Hines, T. T. and E. A. Hetland. Rheologic constraints on the upper mantle from five years of postseismic deformation following the El Mayor-Cucapah earthquake. *J. Geophys. Res.*, 121, doi: 10.1002/2016JB013114

2016 Hines, T. T. and E. A. Hetland. Rapid and simultaneous estimation of fault slip and heterogeneous lithospheric viscosity from post-seismic deformation. *Geophys. J. Int.*, 204, doi: 10.1093/gji/ggv477

2013 Hines, T. T. and E. A. Hetland. Bias in estimates of lithosphere viscosity from interseismic deformation. *Geophys. Res. Lett.*, 40, doi:10.1002/grl.50839

Research Positions

2012–present **Graduate student research assistant**, *University of Michigan*

2011 **Ecological modeling intern**, *Smithsonian Environmental Research Center*

2010-2011 **Crop science research assistant**, *University of Illinois*

Teaching Experience

2014–present **Graduate student instructor**, *University of Michigan*
Taught labs for EARTH 468, Data Analysis and Model Estimation

2015 **Michigan Math and Science Scholars instructor**, *University of Michigan*
Co-taught a summer course for high school students on the mathematics of natural hazard

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Honors

2015 **Best Graduate Student Instructor Award**, *University of Michigan*

2012 **Outstanding Senior Award**, *University of Illinois*

Workshops and Field Courses

2014 **CIG Crustal Deformation Modeling Workshop**, *Stanford University*
One week course on using Pylith, a finite element program for modeling lithosphere dynamics

2014 **InSAR: An Introduction to ISCE and GIAnT**, *UNAVCO*
Three day course on processing Interferometric Synthetic Aperture Radar (InSAR) data

2012 **Wasatch-Uinta Summer Field Camp**, *University of Illinois*
Six week field mapping course in Utah

2012 **The Geology of County Clare, Western Eire**, *University of Illinois*
Two week course studying the evolution of a sedimentary basin in Ireland

Abstracts

2016 Hines, T. T. and E. A. Hetland. Extracting transient strain from GPS: a novel application of the radial basis function-finite dfference method. American Geophysical Union 2016 Fall Meeting, San Francisco, CA.

2016 E. A. Hetland, L. M. Luna, R. H. Styron, and T. T. Hines. Inference of stress from faulting and topographic loading on faults. Seismological Society of America 2016 Annual Meeting, Reno, NV.

2015 Hines, T. T. and E. A. Hetland (invited speaker). Kalman filter based estimation of lithospheric viscosity and fault slip from postseismic deformation: application to the 2010 El Mayor-Cucapah earthquake. American Geophysical Union 2015 Fall Meeting, San Francisco, CA.

2015 Hines, T. T. and E. A. Hetland. Inversion of postseismic deformation for lithospheric viscosity and fault slip. Society for Industrial and Applied Mathematics: Geosciences 2015 Meeting, Stanford CA.

2014 Hines, T. T. and E. A. Hetland. Direct inversion of postseismic deformation for lithospheric viscosity structure and fault slip. American Geophysical Union 2014 Fall Meeting, San Francisco, CA.

2014 Hines, T. T. and E. A. Hetland. Determination of lithosphere rheology from interseismic deformation and implications for fault stress accumulation. Seismological Society of America 2014 Annual Meeting, Anchorage, AK.

2013 Hines, T. T. and E. A. Hetland. Bias in estimates of lithosphere viscosity from interseismic deformation. American Geophysical Union 2013 Fall Meeting, San Francisco, CA.

2013 Hetland, E. A., G. Zhang, and T. T. Hines. Post- and interseismic deformation due to both localized and distributed creep at depth. American Geophysical Union 2013 Fall Meeting, San Fancisco, CA.

2013 Hines, T. T. and E. A. Hetland. Evaluating geodetic constraints on the strength of the lithosphere. Michigan Geophysical Union, Ann Arbor, MI.

Membership

since 2013 Seismological Society of America
since 2013 American Geophysical Union
since 2012 Society for Industrial and Applied Mathematics