

# Tiegan E. Hobbs

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## Education

### PhD Geophysics (2019)

School of Earth & Atmospheric Sciences, Georgia Institute of Technology

Thesis: *Using Dense Geodetic and Seismic Instrumentation to Characterize Postseismic Behavior of the Nicoya Megathrust* (Andrew Newman)

### MSCE Geotechnical Engineering (2019)

School of Civil & Environmental Engineering, Georgia Institute of Technology

### MSc Geophysics (2014)

School of Earth & Ocean Sciences, University of Victoria

Thesis: *Insights from the Mw 7.8 Haida Gwaii Earthquake: Static Stress Modelling and Empirical Green's Function Analysis* (John Cassidy and Stan Dosso)

### BSc Geology (2012)

Department of Earth & Planetary Science, McGill University

Honours Thesis: *Seismic Anisotropy in Southern Quebec using SkS Splitting* (Fiona Darbyshire)

## Published Work

**Hobbs, T.E.**, Newman, A.V., Protti, M. (2019), *Enigmatic Upper-Plate Sliver Transport Paused by Megathrust Earthquake and Afterslip*. Earth and Planetary Science Letters, PII:S0012-821X(19)30285-7.

**Hobbs, T.E.**, Kyriakopoulos, C., Newman, A.V., Protti, M., Yao, D. (2017), *Large and Primarily Updip Afterslip following the 2012 Mw 7.6 Nicoya, Costa Rica earthquake*. Journal of Geophysical Research: Solid Earth, 122, doi:10.1002/2017JB014035.

Yao, D., Walter, J.I., Meng, X., **Hobbs, T.E.**, Peng, Z., Newman, A.V., Schwartz, S.Y., Protti, M. (2017), *Detailed Spatio-Temporal Evolution of Microseismicity and Repeating Earthquakes following the 2012 Mw7.6 Nicoya Earthquake*. Journal of Geophysical Research: Solid Earth, doi:10.1002/2016JB013632.

Bird, A.L., Cassidy, J.F., Kao, H., Leonard, L.J., Allen, T.I., Nikolaishen, L., Dragert, H., **Hobbs, T.E.**, Farahbod, A.M., Bednarski, J.M., James, T.S., Lamontagne, M., Shan, S., Hyndman, R., Fine, I.V., Cherniawsky, J.Y., Brillon, C., Wang, K., and Rogers, G.C., (2016), *The October 2012 magnitude (MW) 7.8 earthquake offshore Haida Gwaii, Canada*. Summary of the Bulletin of the International Seismological Centre, **49**, 7-12.

Darbyshire, F.A., Bastow, I.D., Forte, A.M., **Hobbs, T.E.**, Calvel, A., Gonzalez-Monteza, A., Schow, B. (2015), *Variability and Origin of Seismic Anisotropy Across Eastern Canada: Evidence from Shear-wave Splitting Measurements*. Journal of Geophysical Research: Solid Earth, **120**, 8404–8421, doi:10.1002/2015JB012228.

**Hobbs, T.E.**, Cassidy, J.F., Dosso, S.E., and Brillon, C. (2015), *Coulomb Stress Changes Following the Mw 7.8 2012 Haida Gwaii, Canada Earthquake: Implications for Seismic Hazard*. Bulletin of the Seismological Society of America, **105**, 2B. doi: 10.1785/0120140158.

**Hobbs, T.E.**, Cassidy, J.F., and Dosso, S.E. (2015), *Rupture Process of the Mw 7.8 2012 Haida Gwaii Earthquake from an Empirical Green's Function Method*. Bulletin of the Seismological Society of America, **105**, 2B. doi: 10.1785/0120140175.

**Hobbs, T.E.** and Darbyshire, F.A (2012), *Point Estimates of Crustal Thickness Using Receiver Function Stacking*. McGill Science Undergraduate Research Journal, **7**, p. 19–25.

## Work In Preparation

**Hobbs, T.E.**, Yao, D., Newman, A.V., Peng, Z., Protti, M. (2020), *Investigating Apparent Anticorrelation of Repeating Aftershocks and Afterslip in Nicoya, Costa Rica*. Journal of Geophysical Research — In Prep.

**Hobbs, T.E.**, Frost, J.D., Sadegh, M. (2020), *Multivariate Analysis of Landslide Triggers Along the Big Sur Coastline, California*. Geophysical Research Letters — In Prep.

**Hobbs, T.E.**, Journeay, J.M., Rao, A., Silva, V., Cassidy, J. (2020), *Benchmarking Canada's National Seismic Risk Model*. Earthquake Spectra — In Prep.

## Conference Proceedings

**Hobbs, T.E.**, Journeay, J.M., Bird, A.L. *Assessing and Communicating Risk from Low-Activity Faults in British Columbia, Canada*. SAGE GAGE Workshop, Portland, OR, USA, 2019. *Poster Presentation*.

**Hobbs, T.E.** *Seismicity in British Columbia*. Union of British Columbia Municipalities Annual Convention, Vancouver, BC, Canada, 2019. *Invited Presentation*.

**Hobbs, T.E.**, Newman, A.V., Protti, M. *Unexpected forearc sliver translation during relocking of the Nicoya, Costa Rica megathrust*. Megathrust Modeling Workshop (Modeling Collaboratory for Subduction Research Coordination Network), Eugene, OR, USA, 2019. *Poster Presentation*.

**Hobbs, T.E.** *Seismicity in British Columbia*. Union of British Columbia Municipalities Convention, Vancouver, BC, Canada, 2019. *Invited Presentation*.

Newman, A.V., **Hobbs, T.E.**, Kyriakopoulos, C., Protti, M., Dixon, T., Schwartz, S.Y. *Translating megathrust behavior into the Nicoya Crust, revealing a dynamic dance across the seismic cycle*. Annual Meeting of the Seismological Society of America, Seattle, WA, USA, 2019. *Oral Presentation*.

Schmidt, B.E., Lawrence, J., Meister, M., Dichek, D., Ramey, C., Spears, A., Mullen, A., Bryson, F., **Hobbs, T.E.** *In Situ Observations of the Erebus Glacier Tongue Grounding Zone by the Icefin HROV*. European Geophysical Union General Assembly, Vienna, Austria, 2019. *Oral Presentation*.

**Hobbs, T.E.**, Yao, D., Newman, A.V., Peng, Z., Protti, M. *Investigating Apparent Anticorrelation of Repeating Aftershocks and Afterslip in Nicoya, Costa Rica*. American Geophysical Union Fall Meeting, Washington, DC, USA, 2018. ID: T52B-03. *Oral Presentation*.

**Hobbs, T.E.**, Newman, A.V., Protti, M. *Transient Forearc Sliver Transport Found During Postseismic Recovery*. Wegener 2018: 19th General Assembly of WEGENER, Grenoble, France, 2018. *Oral Presentation*.

**Hobbs, T.E.**, Newman, A.V., Protti, M. *Episodic forearc sliver translation during relocking of the Nicoya, Costa Rica megathrust: an unexpected observation*. Joint Meeting of the Latin American and Caribbean Seismological Commission and the Seismological Society of America, Miami, FL, USA, 2018. *Invited Presentation*.

**Hobbs, T.E.**, Newman, A.V., Protti, M. *Unexpected forearc sliver translation during relocking of the Nicoya, Costa Rica megathrust*. UNAVCO Science Workshop, Boulder, CO, USA, 2018. *Poster Presentation*.

**Hobbs, T.E.**, Newman, A.V., Protti, M. *Accelerated sliver transport during transition from postseismic to interseismic conditions*. American Geophysical Union Fall Meeting, New Orleans, LA, USA, 2017. ID: G43A-0902. *Poster Presentation*.

Voss, N.K., Liu, Z., **Hobbs, T.E.**, Schwartz, S.Y., Malservisi, R., Dixon, T., Protti, M. *Aseismic Slip Throughout the Earthquake Cycle in Nicoya Peninsula, Costa Rica*. American Geophysical Union Fall Meeting, New Orleans, LA, USA, 2017. ID: T13E-02. *Oral Presentation*.

**Hobbs, T.E.**, Newman, A.V., and Peng, Z. *Defining the Temporal Relationship Between Afterslip and Aftershocks Using Dense Seismic and Geodetic Networks in Nicoya, Costa Rica*. Seismological Society of America Annual Meeting, Denver, CO, USA, 2017. *Oral Presentation*.

**Hobbs, T.E.**, Kyriakopoulos, C., Newman, A.V., Yao, D., Dixon, T., Protti, M. *Recovering the Full Afterslip Following the 2012 Mw 7.6 Nicoya, Costa Rica Earthquake*. American Geophysical Union Fall Meeting, San Francisco, CA, USA, 2016. ID: 137120. *Oral Presentation*.

Newman, A.V., Yao, D., Kyriakopoulos, C., Moore-Driskell, M.M., **Hobbs, T.E.**, Peng, Z., Schwartz, S., Protti, M., Gonzalez, V. *The Possible Decapitation of a Megathrust Indenter: Evidence from Imaging of Time-dependent Microseismic Structures before and after the 2012 Mw 7.6 Nicoya, Costa Rica*. American Geophysical Union Fall Meeting, San Francisco, CA, USA, 2016. ID: 149139. *Oral Presentation*.

Newman, A.V., **Hobbs, T.E.**, Kyriakopoulos, C., Dixon, T., Schwartz, S.Y., Protti, M. *Partitioning of the Total Slip Signal through the Seismic Cycle: Results from the Nicoya Seismic Cycle Observatory (NSCO)*. Subduction Zone Observatory Workshop, Boise, ID, USA, 2016. *Poster Presentation*.

**Hobbs, T.E.**, Newman, A.V., Yao, D., Protti, M. *Continued Trenchward Procession of Upper Plate GPS Sites Following the 2012 Mw 7.6 Nicoya Earthquake*. General Assembly of the Latin American and Caribbean Seismological Commission, San Jose, Costa Rica, 2016. Paper Number 230. *Oral Presentation*.

Walter, J.I., Kao, H., Meng, X., Peng, Z., **Hobbs, T.E.**, Dotray, P., Newman, A.V., Mulder, T. *Dynamic interactions between the October 28th 2012 Haida Gwaii and January 5th 2013 Craig earthquakes and other faults in Southeast Alaska*. American Geophysical Union Fall Meeting, San Francisco, CA, USA, 2015. Abstract ID: S13D-07. *Oral Presentation*.

**Hobbs, T.E.**, Newman, A.V., Protti, M. *Continued Trenchward Procession of Upper Plate GPS Sites Following the 2012 Mw 7.6 Nicoya Earthquake*. American Geophysical Union Fall Meeting, San Francisco, CA, USA, 2015. Abstract ID: T43C-3017. *Poster Presentation*.

Newman, A.V., Kyriakopoulos, C., Feng, L., **Hobbs, T.E.**, Dixon, T.H., Malservisi, R., Protti, J.M. *The Continuum of Slip along the Subduction Megathrust: Observations and Understanding Gained from the Nicoya Seismic Cycle Observatory*. Seismological Society of America Annual Meeting, Pasadena, CA, USA, 2015. *Invited*.

**Hobbs, T.E.**, Cassidy, J.C., and Dosso, S.E. *Possible Interactions between the 2012 Mw 7.8 Haida Gwaii Subduction Earthquake and the Transform Queen Charlotte Fault*. American Geophysical Union Fall Meeting, San Francisco, CA, USA, 2014. Abstract ID: S23A-4483. *Poster Presentation*.

**Hobbs, T.E.**, Cassidy, J.C., and Dosso, S.E. *Rupture Properties of the Mw 7.7 2012 Haida Gwaii Earthquake from an Empirical Green's Function Method*. Seismological Society of America Annual Meeting, Anchorage, AK, USA, 2014. Abstract ID: 14-003. *Oral Presentation*.

**Hobbs, T.E.**, Cassidy, J.C., and Dosso, S.E. *Coulomb Stress Changes Resulting from the Mw 7.7 2012 Haida Gwaii Earthquake*. Seismological Society of America Annual Meeting, Anchorage, AK, USA, 2014. Abstract ID: 14-002. *Poster Presentation*.

**Hobbs, T.E.**, Brillon, C., Cassidy, J.C., Dosso, S.E., and Dragert, H. *Coulomb Stress Changes Following the Mw 7.7 2012 Haida Gwaii Earthquake*. Canadian Geophysical Union Annual Meeting, Saskatoon, SK, Canada, 2013. Abstract ID: 3D4.3--6606. *Oral Presentation*.

**Hobbs, T.E.**, and Darbyshire, F.A. *SkS Splitting Measurement of Seismic Anisotropy in Southern & Central Quebec*. Canadian Geophysical Union Annual Meeting, Banff, AB, Canada, 2012. *Poster Presentation*.

Darbyshire, F.A., and **Hobbs, T.E.** *Crustal Thickness Variations Across Central and Southern Québec From Receiver Function Analysis*. Canadian Geophysical Union Annual Meeting, Banff, AB, Canada, 2011. *Poster Presentation*.

**Hobbs, T.E.**, and Darbyshire, F.A. *Crustal Thickness Variations Across Eastern Canada and Maine From Receiver Function Analysis*. American Geophysical Union Fall Meeting, San Francisco, CA, USA, 2010. Abstract ID: T33D-2285. *Poster Presentation*.

## Speaking Engagements

**Hobbs, T.E.**, Journeay, M., Cassidy, J.C. *Earthquakes in British Columbia: Preparing for the 'Big One' and the 'Other Ones'*. Metro Vancouver Regional District & Regional Engineers Advisory Committee Utility Tabletop Exercise, Burnaby, BC, Canada, 2019.

**Hobbs, T.E.**, Journeay, M. *An Earthquake Risk Profile of Canada: Knowledge to Inform Disaster Resilience Planning*. Director General Interdepartmental Table on Earthquake Risk, Government of Canada, Ottawa, ON, Canada, 2019.

**Hobbs, T.E.**, Journeay, M. *Eastern Canada Earthquake Scenarios*. Earthquake Risk Modeling in Canada: From Knowledge to Action, London, ON, Canada, 2019.

## Unrefereed Works

**Hobbs, T.E.** (2019), *Can science tell when a large earthquake will be followed by an even larger one?*, Temblor, <http://doi.org/10.32858/temblor.056>

**Hobbs, T.E.** (2019), *Over 66 million people participate in international ShakeOut; prompts evaluation of personal preparedness*, Temblor, <http://doi.org/10.32858/temblor.052>

**Hobbs, T.E.** (2019), *Indonesian “Black Swan” quake: a painful reminder of last year’s M 7.5 Palu shock*, Temblor, <http://doi.org/10.32858/temblor.044>

**Hobbs, T.E.** (2019), *August 1, 2019, magnitude-6.8 Chile earthquake reveals stress is building on the megathrust*, Temblor, <http://doi.org/10.32858/temblor.042>

**Hobbs, T.E.** (2019), *How Apollo 11’s moonquakes changed our understanding of earthquakes*, Temblor, <http://doi.org/10.32858/temblor.041>

Stein, R.S., Rollins, C., Sevilgen, V. **Hobbs, T.E.** (2019), *M 7.1 SoCal earthquake triggers aftershocks up to 100 mi away: What’s next?*, Temblor, <http://doi.org/10.32858/temblor.038>

Stein, R.S., **Hobbs, T.E.**, Rollins, C., Ely, G., Sevilgen, V., Toda, S. (2019), *Magnitude 7.1 earthquake rips northwest from the M6.4 just 34 hours later*, Temblor, <http://doi.org/10.32858/temblor.037>

**Hobbs, T.E.**, Rollins, C. (2019), *Earthquake Just North of Cascadia is Felt Along Canada’s West Coast*, Temblor, <http://doi.org/10.32858/temblor.036>

**Hobbs, T.E.**, Rollins, C. (2019), *Earthquake early warning system challenged by the largest SoCal shock in 20 years*, Temblor, <http://doi.org/10.32858/temblor.035>

**Hobbs, T.E.** (2019), *The first Marsquake is recorded*, Temblor, <http://doi.org/10.32858/temblor.031>

**Hobbs, T.E.**, Stein, R.S. (2019), *El Salvador Earthquake: A Moderate Event in An Area of Extreme Seismic Risk*, Temblor, <http://doi.org/10.32858/temblor.025>

**Hobbs, T.E.** (2019), *Deep earthquake in Peru is felt along the length of South America*, Temblor, <http://doi.org/10.32858/temblor.024>

**Hobbs, T.E.** (2019), *Large Earthquake in Papua New Guinea re-ruptures major fault in just 19 years: More to follow?*, Temblor, <http://doi.org/10.32858/temblor.022>

**Hobbs, T.E.** (2018 – present) *T. Hobbs Field Research Blog* Retrieved from <https://thobbsfield.wordpress.com>

**Hobbs, T.E.** (2018, October-December) *Planetary Habitability & Technology Blog* Retrieved from <https://nobusinesslikesnowbusiness.wordpress.com>

**Hobbs, T.E.** (2018, July 11-25) *Alaska Amphibious Community Seismic Experiment Blog* Retrieved from <https://alaskaamphibious.wordpress.com/2018/07/11/> ; <https://alaskaamphibious.wordpress.com/2018/07/18/>

**Hobbs, T.E.**, Toda, S. (2018), *Did Tuesday’s M 7.9 Kodiak earthquake nudge the Alaskan Megathrust closer to failure?*, Temblor, <http://doi.org/10.32858/temblor.005>

**Hobbs, T.E.** (2018, January 23) *M 7.9 Alaska earthquake strikes off the coast of Kodiak Island, triggering a tsunami and questions*. Retrieved from <http://temblor.net/earthquake-insights/m7-9-alaska-earthquake-strikes-off-the-coast-of-kodiak-island-triggering-a-tsunami-and-questions-6143/>

## Techniques

GPS & seismic fieldwork

H/V spectral ratio

Surface wave dispersion

SkS splitting

Risk Modelling (OpenQuake)

Slope Stability Analysis

Empirical Green’s functions

Receiver function stacking

Coulomb stress analysis

GIS Software

Geodetic inversion

InSAR processing

## Experience & Training

**Postdoctoral Seismic Risk Scientist** Natural Resources Canada, *2019-present*

**Consultant & Field Party Leader** Europa Seismic Package Science Development Team, Washington Glacier Deployment (NASA ICEE-2), *2019-present*

**Field Technician** RISEUP Planetary Habitability & Technology Field Work in Antarctica (NASA PSTAR), *2018*

**Apply-to-Sail Participant** Alaska Amphibious Community Seismic Experiment (GeoPRISMS), *2018*

**Short Course** Aftershock Forecasting (SSA), *2018*

**Short Course** Probabilistic Seismic Hazard Analysis with Slab 2.0 (SSA), *2018*

**Teaching Assistant** Georgia Institute of Technology, Earth & Atmospheric Sciences, *2015-2018*

**Short Course** Communicating Science for Impact (UNAVCO), *2018*

**Short Course** Gipsy-X User Training (JPL), *2017*

**Instructor**, Georgia Tech 'Kids Interested in Discovering Science' Club, *2015-2017*

**Short Course** Probabilistic Seismic Hazard Analysis (SSA), *2017*

**Short Course** Advanced INSAR Processing (UNAVCO), *2015*

**Teaching Assistant** University of Victoria, School of Earth & Ocean Sciences, *2012-2014*

**Research Assistant**, University of British Columbia, Department of Civil Engineering, *2012*

**Short Course** Practical Sequence Stratigraphy: Concepts and Applications (CSPG), *2012*

**Geological Assistant**, Osisko Gold, *2011*

## Awards

**Award for Outstanding Service**

Georgia Institute of Technology, School of Earth and Atmospheric Sciences  
2019

**Student Presentation Honorable Mention**

GeoPRISMS  
2018

**Student Presentation Award**

Seismological Society of America  
2018

**NSERC Post-Graduate Doctoral Fellowship**

Natural Sciences and Engineering Research Council of Canada  
2016 – 2018

**Kurt Frankel Award for Excellence in Field Work**

Georgia Institute of Technology, School of Earth and Atmospheric Sciences  
2017

**Student Travel Award**

Seismological Society of America  
2017

**Invitation for Dean's Lecture Series**

University of Victoria, Faculty of Graduate Studies  
2014

**Fellowship for Graduate Students**

University of Victoria, Faculty of Science  
2012, 2013

**Student Travel Award**

Canadian Geophysical Union  
2012, 2013

**Introduction to Research Scholarship**

GEOTOP, Montreal, Quebec  
2012

**Logan Award**

McGill University, Faculty of Science  
2011

**Frederick M. Connell Award**

McGill University, Faculty of Science  
2011

**Graham Scholarship in Science**

McGill University, Faculty of Science  
2011

## Involvement

**Curriculum Development**, Master of Disaster Program

Emergency Management British Columbia  
2019 – current

**Scientist**, Skype A Scientist Program

<https://www.skypeascientist.com/>  
2018 – current

**Coordinator**, Georgia Tech Science Showcase Series

Ponce City Farmers Market, Atlanta, GA  
2018

**Science Coordinator**, Graduate Student Symposium

Georgia Institute of Technology, School of Earth and Atmospheric Sciences  
2017

**Member**, Society of Exploration Geophysicists

Georgia Institute of Technology Chapter  
2015 – 2018

**First Year Mentoring Chair**, Graduates in Earth and Atmospheric Sciences Council

Georgia Institute of Technology  
2015 – 2017

**Vice President**, Graduates in Earth and Atmospheric Sciences Council

Georgia Institute of Technology  
2014 – 2016

**Volunteer & Member**, Planetary Society

Georgia Institute of Technology Chapter  
2014 – 2016

**Volunteer**, 'Let's Talk Science' National Outreach Program

University of Victoria  
2013 – 2014

**Vice President External**, Montereian Society

Department of Earth and Planetary Science's Undergraduate Student Council  
McGill University  
2010 – 2011

**President**, Environmental Residence Council  
**Vice President of Environment**, University Residence Council  
McGill University  
2008 – 2009

## Professional Organizations

American Geophysical Union (*AGU*)  
Seismological Society of America (*SSA*)  
Society of Exploration Geophysicists (*SEG*)  
Latin American and Caribbean Seismological Coalition (*LACSC*)