Research Interests

- Earthquakes
- Active tectonics
- Geodesy
- Tectonic geomorphology
- Earthquake source seismology
- Interferometric Synthetic Aperture Radar (InSAR)
- Light detection and ranging (Lidar)
- Photogrammetry
- Quaternary geochronology
- Paleoseismology
- Seismic hazard and risk
- Earthquake early warning

Employment

University of Victoria, Canada
Associate Professor, School of Earth and Ocean Sciences
Tier 2 Canada Research Chair
2017 –

Colorado School of Mines, USA
Assistant Professor, Department of Geophysics
2012 – 2016

Arizona State University, USA
Exploration Postdoctoral Fellow, School of Earth and Space Exploration
2011 – 2012

University of Cambridge, UK
Postdoctoral Research Associate, Bullard Labs, Department of Earth Sciences
2008 – 2011

Education

University of Oxford, UK
D.Phil in Earth Sciences, University College
Thesis: Active mountain building in Mongolia and Iran
2004 – 2009

University of Cambridge, UK
M.Sc. in Natural Sciences (Geology) with 1st Class Honours, Fitzwilliam College
2003 – 2004
B.A. in Natural Sciences (Geology) with 1st Class Honours, Fitzwilliam College
2000 – 2003

Publications

Articles in review or revision


Published Journal Articles

(* student advisee)


2016  


2015  


2014  


2013  

2012  


2011  

2010  


Technical & Project Reports


Peer-Reviewed Conference Proceedings & Extended Abstracts


Conference abstracts


2017


2016


2015


2014


†Nissen, E. (2014). 3-D Earthquake Deformation from 4-D LiDAR Topography: examples from Mexico and Japan. Geological Society of America Annual Meeting, Vancouver, 272-1
†Nissen, E. (2014). Illuminating active faulting and earthquake deformation with LiDAR. *10th Joint Meeting of the United States-Japan Panel on Earthquake Research, Sendai.*


### Published Journal Articles

<table>
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<tr>
<th>University of Victoria</th>
<th>Nissen 1st author</th>
<th>Student 1st author</th>
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<td>Savidge et al. (2019), Geophys. J. Int.</td>
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<td>Tan et al. (2019), Geophys. J. Int.</td>
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<td>Lajoie et al. (2019), J. Geophys. Res.</td>
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<td>Scott et al. (2018), J. Geophys. Res.</td>
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<th>Colorado School of Mines</th>
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<td>Karasözen et al. (2016), J. Geophys. Res.</td>
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<td>Johnson et al. (2014), Geosphere</td>
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<td>Allen et al. (2013), Tectonics</td>
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<td>Nissen et al. (2011), Geophys. J. Int.</td>
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<td>Walker et al. (2010), Geosphere</td>
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<td>Biggs et al. (2010), Geophys. Res. Lett.</td>
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<td>Roustaie et al. (2010), Geophys. J. Int.</td>
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<td>Talebian et al. (2006), Geophys. J. Int.</td>
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**Total:** 35 11 9 8 1078  

\[ H = 18 \]

*Google scholar statistics, 2019-03-10. Total citation count includes a few conference abstracts or proceedings, not listed.*
## Research Funding

(PI unless stated otherwise)

**University of Victoria – total external funding CAD $3,457,000 ($1,010,000 as PI)**

**2017**  
Canada Foundation for Innovation (CFI) John R. Evans Leaders Fund; **$115,000** 2017–  
*High resolution tectonic deformation of northern Cascadia*  
British Columbia Knowledge Development Fund (BCKDF); **$115,000** 2017–  
*High resolution tectonic deformation of northern Cascadia*  
Canada Foundation for Innovation, Innovation Fund 2017; **$2,447,000** 2017–  
*Northern Cascadia Subduction Zone Observatory* (PI Kate Moran; eight other co-PIs)  
Canada Research Chair (Tier 2) in Geophysics, 950-231462; **$500,000** 4/2017–3/2022  
National Science and Engineering Research Council (NSERC) Discovery Grant, RGPIN-2017-04029; **$160,000** 4/2017–3/2022  
*Illuminating northern Cascadia earthquake faulting using satellite and airborne geodesy*  
*Illuminating northern Cascadia earthquake faulting using satellite and airborne geodesy*  
University of Victoria start-up funds, **$80,000** 1/2017–12/2019

**Colorado School of Mines – total external funding USD $971,000 ($955,000 as PI)**

**2016**  
National Science Foundation, EAR1524815; **$244,000** 3/2016–2/2018  
*Seismotectonics of the Zagros (Iran) from orogen-wide earthquake relocations*  
2015  
Air Force Research Laboratory, 15C0066; **$360,000** 5/2015–5/2018  
*A two-tiered approach to event calibration across Iran*  
Newmont Mining Corporation; **$15,000** 4/2015–3/2016  
*InSAR deformation along the Carlin Trend, NV*  
Southern California Earthquake Center, #15189; **$20,000** 2/2015–1/2016  
*The 1992 Landers rupture re-examined using topography generated from legacy air-photos*  
Newmont Mining Corporation; **$98,000**, 1/2015–12/2015  
*Monitoring pit slope deformation with multi-temporal, multi-spectral photography*  
2014  
Southern California Earthquake Center, #14101; **$50,000** 2/2014–1/2016  
*Advances in imaging shallow fault zone deformation with differential LiDAR: a VISES Collaboration*  
National Science Foundation, EAR1461574; **$16,000** to E. Nissen 10/2014–11/2015  
*Collaborative Research: Low-cost imaging and analysis of the August 24, 2014 M6.1 South Napa, California earthquake surface rupture (RAPID) (PI Michael Oskin; 1 more co-PI)*  
2013  
Southern California Earthquake Center, #13084; **$36,000** 2/2013–1/2014  
*Earthquake behaviour of the San Andreas and San Jacinto Faults with Structure from Motion topography*  
2012  
United States Geological Survey Cooperative grant; **$100,000** 2/2012–8/2014  
*High-resolution mapping of faults and earthquakes using topography derived from LiDAR*  
Southern California Earthquake Center, #12104; **$32,000** 2/2012–1/2013  
*Cm-resolution fault topography and earthquake displacements from UAV photogrammetry*  
Colorado School of Mines start up funds; **$150,000** 8/2012–12/2016

*Edwin Nissen– CV*
Arizona State University

2011 SESE Exploration Fellowship; $55,000 9/2011–8/2012

Rapid collection of topographic data from UAVs: applications for earthquake faulting and Earth surface processes

Small grants

2018 University of Victoria Scholarly Conference Travel Grant; $1,150 4/2018–3/2019
University of Victoria Professional Development Funds; $1,770 7/2018–6/2019
Workshop travel expenses; $1,400 2/2018

Canadian Cordillera Array (CCArray) Workshop, Ottawa, ON

2017 International Union for Quaternary Research Travel Grant; EU €200 11/2017

Workshop on Paleoseismology, Active Tectonics and Archeoseismology, New Zealand

University of Victoria Scholarly Conference Travel Grant; $1,150 4/2017–3/2018
University of Victoria Professional Development Funds; $1,770 7/2017–6/2018
University of Victoria Professional Development Funds; $1,770 1/2017–6/2018
Workshop travel expenses; USD $500 10/2017

Offshore Geophysical Monitoring of Cascadia for Early Warning & Hazards Research, Seattle

2016 Digital Globe Foundation grant for WorldView imagery.

2012 Centre National d’Etudes Spatiales (CNES) grant for SPOT satellite.

Fault segmentation and earthquake magnitude: lessons from the Simav graben, Turkey

2011 NERC Cosmogenic Isotope Analysis Facility grant for cosmogenic isotope analyses.

Exploiting systematic changes in rock uplift rate along a strike-slip restraining bend: what drives mountain erosion?

2009 European Space Agency (ESA) Category 1 grant for Ikonos satellite imagery (co-PI)

Quantifying Crustal Deformation and Lithosphere Rheology with Optical Satellite Imagery and Digital Topography

2007 Centre National d’Etudes Spatiales (CNES) grant for SPOT satellite imagery

Slip-rate determinations and past earthquakes in the Altay mountains of Mongolia

Teaching

Undergraduate/Graduate Lecturer

University of Victoria

EOS519C: Introduction to Earthquake Seismology 1.5 unit graduate elective course.

EOS170: Natural Hazards 1.5 unit undergraduate elective course.

EOS400: Advanced Field Geology 1.5 unit undergraduate elective course. (co-taught 2017)

Fall 2018

Fall 2017, 2018

Summer 2018

Colorado School of Mines

GPGN455/GPGN555: Earthquake Seismology 3 credit senior undergraduate/graduate elective course.

GPGN457/GPGN571: Satellite Remote Sensing 3 credit senior undergraduate/graduate elective course.

GPGN200: Introduction to Geophysics 3 credit sophomore undergraduate required course.


Spring 2015, 2016

Fall 2015, 2016

3 credit senior undergraduate required course

GPGN598: Strong Motion Seismology (taught jointly with two adjunct faculty) Spring 2016

1 credit graduate seminar class

GPGN598: Induced Seismicity Fall 2014

1 credit graduate seminar class.

Graduate student advisor

University of Victoria

Elyse Gaudreau (Ph.D. candidate, SEOS), started 2018. Sole advisor
Anna Diederichs (M.Sc. candidate, SEOS), started 2018. Sole advisor
Haipeng Luo (Ph.D. candidate, SEOS), started 2017. Jointly advised with Kelin Wang (10/90)
Fengzhou Tan (M.Sc. candidate, SEOS), started 2017. Jointly advised with Honn Kao (50/50)
Yijie Zhu (M.Sc. candidate, SEOS), started 2017. Jointly advised with Kelin Wang (10/90)

Colorado School of Mines

Lia Lajoie (Ph.D. candidate, Geophysics), 2015–2019. Sole advisor
Ezgi Karasözen (Ph.D., Geophysics), 2013–2018. (Now post-doc at CSM.) Sole advisor
Kendra Johnson (Ph.D., Geophysics), 2012–2017. (Now post-doc at GEM, Italy) Sole advisor

Undergraduate advisor

University of Victoria

Elena Savidge (NSERC USRA student, SEOS) Summer 2018.

Colorado School of Mines

Andrew Blaney, William Boni, Rowland Chen, Thomas Conklin, Logan Copass, Stuart Farris, Megan Gallagher, Paul Geimer, Vilnis Humeyumptewa, Max Kosmicki, Jacob Larson, Tyler Meng, Ginevra Moore, Stephen Plescia, Hayden Powers, Kristen Prudhomme, Emily Schwans, Meghan West, Andrew Yanke (all Senior Research Project for M.Sc., Geophysics)

University of Cambridge

Andrew Rickerby (Senior Research Project for B.A., Natural Sciences & Physics)

Graduate student committee member

University of Victoria

Dawei Gao (Ph.D. candidate, SEOS). Member since 2017
Matthew Sypus (M.Sc. candidate, SEOS). Member since 2018
Chaired two SEOS graduate student oral examinations. 2017

Colorado School of Mines

Tong Bai (Ph.D Geophysics); Wes Buchanan (Ph.D. Geology); Evan Jones (Ph.D. Geology); Kyle Knipper (Ph.D. Civil & Environmental Engineering); Jennifer Brush (M.Sc. Geophysics); Johannes Douma (M.Sc. Geophysics); Joanna Jansen (M.Sc. Geophysics); Alexandria Mabrey (M.Sc. Geophysics); Daniel Carvalho Rocha (M.Sc. Geophysics); Ben Haugen (M.Sc. Geology)

External Examiner

Genevive Savard (Ph.D. candidate, University of British Columbia) 2018
Teaching Assistant

University of Cambridge

Continental Tectonics, senior undergraduate elective course 2009–2010
Field Schools in Greece, Spain, Scotland, undergraduate required courses 2009–2011

University of Oxford

Geological Maps, undergraduate required course 2004–2008
Structural Geology, undergraduate required course 2004–2008
Field Schools in Scotland, France, Greece, undergraduate required courses 2005–2008

Professional Service – Internal

University of Victoria

Member, Graduate Committee, School of Earth and Ocean Sciences 2017–
Departmental committee in charge of the graduate program and graduate affairs, including chairing oral exams of SEOS graduate students. Meets on an ad-hoc basis.

Member, Appointments Committee, School of Earth and Ocean Sciences 2017–
txitDepartmental committee in charge of faculty hiring. Meets on an ad-hoc basis.

Member, Faculty Search Committee, School of Earth and Ocean Sciences 2017–2018
Departmental committee in charge of faculty search in Tectonics.

Colorado School of Mines

Member, Undergraduate Council, Colorado School of Mines 2013–2016
Represented Geophysics on this campus-wide committee for the undergraduate curriculum. Met monthly during terms.

Chair, Undergraduate Affairs Committee, Department of Geophysics 2013–2016
Committee for the Geophysics undergraduate program. Met on an ad-hoc basis.

Chair, Heiland Committee, Department of Geophysics 2013–2016
In charge of organizing and hosting weekly Geophysics research seminars

Member, Faculty Search Committees 2013–2015
Sat on successful search committees for three hires, including one for State Geologist (i.e. the director of the Colorado Geological Survey).

Member, Graduate Affairs Committee, Department of Geophysics 2012–2013
Committee for the Geophysics graduate program. Met on an ad-hoc basis.

University of Cambridge

Organizer, Bullard Laboratories research colloquia, Department of Earth Sciences 2009–2011
In charge of organizing and hosting weekly geophysics research seminars

Professional Service – External

Committees & Boards

Member, Geoscience Evaluation Group, NSERC 2018–2021
Panel responsible for reviewing NSERC Discovery Grant applications across the geosciences.
Member, **Board of Directors**, UNAVCO (Secretary in 2018) 2017–2020

UNAVCO is an NSF-sponsored, non-profit university-governed consortium which facilitates geoscience research and education using geodesy. It is governed by a Board of Directors elected by its >100 member universities, which meets three times annually for two days.

Member, **Education and Community Engagement Advisory Committee**, UNAVCO 2017–2019

Appointed by the UNAVCO board of Directors, this committee provides recommendations to the board and management on issues of governance, policy, oversight, resource allocation, and strategic direction, in education and outreach management. It meets twice annually.

Member, **Terrestrial Imaging Geodesy Working Group**, UNAVCO 2014–2016

Provides recommendations to UNAVCO management and/or advisory committees on issues pertaining to development of its imaging geodesy equipment pools, engineering services, and data products, as well as education and engagement activities for terrestrial laser scanning and related emerging technologies. The group met on an ad-hoc basis.

Member, **Advisory Group**, Colorado Geological Survey 2013–2016

Provides oversight and advice to the State Geological Survey. Met on an ad-hoc basis. This included overseeing the Survey’s 2013 move to Colorado School of Mines.

Member, **Steering Committee**, National Center for Airborne Laser Mapping 2013–2015

Provides oversight and advice to this NSF-sponsored facility. Met once annually.

**Proposal review panelist**

- Geosciences Evaluation Group, Natural Sciences & Engineering Research Council, Canada 2018–2021
- National Center for Airborne Laser Mapping, Seed Grant Program 2015
- National Science Foundation, Tectonics Program 2014
- United States Geological Survey, National Earthquake Hazard Reduction Program (NEHRP) 2014
  - *Central and Eastern United States section*
- National Center for Airborne Laser Mapping, Seed Grant Program. 2014

**Proposal ad-hoc reviews**

- United States-Israel Binational Science Foundation (USA–Israel). 2019
- National Science Foundation, Tectonics Program (USA). 2018
- Agence Nationale de la Recherche (France). 2018
- National Science Foundation, Tectonics Program (two proposals reviewed). 2016
- National Science Foundation, Geophysics Program. 2016
- Natural Sciences and Engineering Research Council of Canada, Discovery Grant Program. 2016
- National Science Foundation, Geophysics Program. 2015
- National Science Foundation, Tectonics Program. 2014

**Journal reviews**

Twelve article reviews for: Journal of Geophysical Research: Solid Earth (3), Tectonophysics (2), Geophysical Journal International (3), Science Advances (2), Tectonics (2) 2017


Textbook reviews

Natural Hazards, Oxford University Press 2017

Professional memberships

Canadian Geophysical Union 2017–
Geological Association of Canada 2017–
Seismological Society of America 2015–
Geological Society of America 2014–
American Geophysical Union 2006–

Science workshops and short course teaching

Co-organizer & instructor, High Resolution Topography and 3D Imaging II: Introduction to Structure from Motion (SfM) Photogrammetry, Geological Society of America Annual Meeting, Seattle 21/10/2017

Co-organizer & instructor, How to Locate Earthquakes, Middle Eastern Technical University, Ankara, Turkey 7–15/8/2017

Co-organizer & instructor, Introduction to Structure from Motion (SfM) Photogrammetry for Earth Science Research and Education, Geological Society of America Annual Meeting, Denver 24/9/2016

Instructor, Large crustal earthquakes: fault geometry, dynamic rupture, and strong ground motion, SCEC-ERI-DPRI International Summer School on Earthquake Science, Lake Arrowhead Resort, CA 24–27/7/2016

Instructor: Imaging and Analyzing Southern California’s Active Faults with High Resolution Topography, OpenTopography short course, Arizona State University, Tempe 25–26/1/2016

Instructor, LIDAR Derived DEMs applied to Landslide, Fault, Earthquake Rupture, and Landscape Changes, OpenTopography short course, National Autonomous University of Mexico, Mexico City, Mexico 23–24/3/2015

Co-organizer, Four-mile Canyon Flooding workshop field trip (field demonstration of topographic mapping with SM and TLS), UNAVCO Science Workshop, Broomfield, CO 5/3/2014

Co-organizer & instructor, High Resolution Topography Applied to Earthquake Studies, Open Topography short course, Earthquake Research Inst., University of Tokyo, Japan 16–19/9/2013

Science workshops and short courses attended

Attendee, UNAVCO Science Workshop, Broomfield, CO 27–29/3/2018
Attendee, Ocean Networks Canada Seafloor Geodesy Workshop, Victoria, BC 21–22/3/2018
Attendee, CCArray Workshop, Ottawa, ON 22–23/2/2018
Attendee, Offshore Geophysical Monitoring of Cascadia for Early Warning and Hazards Research, University of Washington, Seattle, WA 3–5/4/2017

Attendee, Global Navigation Satellite System (GNSS) for the Canadian Cordillera Array (CCArray), Pacific Geoscience Centre, Sidney, BC 20–21/3/2017

Attendee, Planning Meeting for CCArray, Mount Royal University, Calgary, AB 18–19/11/2016

Attendee, UNAVCO Science Workshop, Broomfield, CO 29–31/3/2016

Attendee, Early Career Geoscience Faculty workshop, National Association of Geoscience Teachers National Science Foundation, University of Maryland, College Park, MD 22–26/6/2014

Attendee, Gazing at the Solar System: Capturing the Evolution of Dunes, Faults, Volcanoes and Ice from Space, Keck Institute for Space Studies, Caltech, Pasadena, CA 16–19/6/2014

Attendee, UNAVCO Science Workshop, Broomfield, CO 4–6/3/2014

Attendee, Imaging and Analyzing Southern California’s Active Faults with High Resolution Topography, OpenTopography short course, University of California, Davis, CA 24–25/10/2011


Scientific meetings and conference sessions organized

Session G024: The Role of Geodesy and Remote Sensing in Preparedness, Hazard Monitoring, and Disaster Response, American Geophysical Union Fall Meeting, Washington DC 12/2018

Session G005: Earth Science Research and Change Detection Using Multi-temporal LiDAR and SfM, American Geophysical Union Fall Meeting, Washington DC 12/2018

Session T233: Tectonics, geohazards and morphodynamics from high-resolution topography and imagery, Geological Society of America Annual Meeting, Seattle, WA 10/2017

Session SE02: The earthquake cycle: squaring the circle, Canadian Geophysical Union Annual Meeting, Vancouver, BC 5/2017

Session on Fault Mechanics and Rupture Characteristics from Surface Deformation, Seismological Society of America Annual Meeting, Denver, CO 4/2017


Session T32B/T33E/T34B/T41C: The Earthquake Cycle: Linking observations from satellite geodesy, high resolution topography and paleoseismology, American Geophysical Union Fall Meeting, San Francisco, CA 12/2014


Session G22A/G33A: 4D Topography: Detecting Changes to the Earth’s Surface with Multi-Temporal, High-Resolution Topographic Data, American Geophysical Union Fall Meeting, San Francisco, CA 12/2013

Session G22A/G23A: 4D LiDAR Topography and Geodetic Imaging, American Geophysical Union Fall Meeting, San Francisco, CA 12/2012

Public outreach & media appearances
Four 1.5 hour evening classes on geological hazards, for UVic’s Uni201 program (free introductory academic courses for people whose economic and social circumstances normally pose obstacles to university education)

Public lecture on earthquake hazards, *Dean’s Lunchtime Lecture Series*, Victoria, BC.

Review panelist, UNAVCO Research Experiences in Solid Earth Science for Students (RE-SESS) applications (internship program for increasing diversity of geoscience students)

Public lecture on earthquake hazards at the *Pint of Science* festival, Victoria, BC.

Telephone interview and quotes for *Goldstream Gazette* and *Oak Bay News* articles on recent Vancouver Island earthquakes.

Live radio interview with *Radio New Zealand* on the anniversary of the Kaikoura event.

Live television interview with *9 News Denver* discussing recent earthquakes in Italy.

Television interview with *China Central Television* on earthquake hazards.

Telephone interview for *Earth Magazine* article on my Nature Geoscience paper.

Volunteer, ‘*Preview Mines*’ campus open day.

Volunteer, ‘*Discover Mines*’ campus open day.

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**Awards**

2017  Canada Research Chair (Tier 2), Canada Research Chairs Program

2011  Exploration Postdoctoral Fellowship, School of Earth and Space Exploration, Arizona State University

2007  Güralp Prize (outstanding progress in graduate studies), Dept of Earth Sciences, University of Oxford

2005  Roger Short Travelling Scholarship, University College, University of Oxford

2004  Natural Environmental Research Council (NERC) algorithm Ph.D. studentship, University of Oxford

1912  Senior Scholarship, Fitzwilliam College, University of Cambridge

2003  Undergraduate Mapping Project Award, Dept of Earth Sciences, University of Cambridge

Thomas Walker Scholarship, Fitzwilliam College, University of Cambridge

Humphrey Prize, Fitzwilliam College, University of Cambridge
Invited research seminars

2019
Department of Earth and Planetary Sciences, McGill University

2018
Department of Geography, University of Victoria
Geology Department, Western Washington University

2017
Pacific Geoscience Centre, Geological Survey of Canada, Sidney, BC
Department of Earth, Ocean and Atmospheric Sciences, University of British Columbia

2016
Department of Geology and Geophysics, University of Utah
School of Earth and Ocean Sciences, University of Victoria
School of Civil Engineering and Geosciences, Newcastle University, UK
School of Earth and Environmental Sciences, University of Wollongong, Australia
Geophysics Group, Los Alamos National Laboratory, NM

2015
Scripps Institute of Oceanography, University of California San Diego
Nevada Bureau of Mines and Geology, University of Nevada Reno

2014
Department of Geology and Geophysics, University of Wyoming
Department of Earth Science and Engineering, Imperial College London, UK
Department of Earth and Environmental Sciences, University of St Andrews, UK
School of Earth and Environment, University of Leeds, UK
Department of Geology, Colorado School of Mines

2013
Department of Geosciences, Colorado State University
Department of Geological Sciences, University of Colorado Boulder
Center for Spatial Information Science, University of Tokyo, Japan
Earthquake Research Institute, University of Tokyo, Japan
UNAVCO, Boulder, CO
SmartGeo, Department of Civil Engineering, Colorado School of Mines

2012
Department of Earth Sciences, University of Oxford, UK
Department of Geophysics, Colorado School of Mines
Department of Earth and Space Sciences, University of California Los Angeles
Department of Earth Sciences, University of Southern California

2011
School of Earth and Space Exploration, Arizona State University
Department of Geophysics, Colorado School of Mines
Department of Geography, Durham University, UK
National Oceanographic Centre, University of Southampton, UK
Department of Geology, University of Otago, New Zealand
School of Earth and Ocean Sciences, University of Cardiff, UK
Department of Earth and Environmental Sciences, University of Michigan
Department of Earth Science and Engineering, Imperial College London, UK

2010
Geological Survey of Norway, Trondheim, Norway
Institut für Geologie, Leibniz Universität Hannover, Germany
Bullard Laboratories, Department of Earth Sciences, University of Cambridge, UK