

WILLIAM CHARLES HAMMOND

Professor of Geodesy and Geophysics
Nevada Geodetic Laboratory
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EDUCATION

University of Oregon, Eugene Sept. 1994–Dec. 2000
Department of Geological Sciences
Ph.D. Advisors: Eugene D. Humphreys and Douglas R. Toomey

B.A. Applied Mathematics 1985–1989
University of California, Berkeley

AREAS OF EXPERTISE

Applications of geodesy to solid Earth geophysics
Active deformation of the continents
Seismic hazard and neotectonics

ACADEMIC WORK EXPERIENCE

Professor of Geodesy and Geophysics July 1, 2016–present
Associate Professor in Geodesy and Geophysics July 1, 2010–June 30, 2016
Assistant Professor in Geodesy and Geophysics July 1, 2004–June 30, 2010
Nevada Bureau of Mines and Geology
College of Science, University of Nevada, Reno

Postdoctoral Research Geophysicist Jan. 2001–June 2004
U.S. Geological Survey, Earthquake Hazards Team, Menlo Park
Funded by: NASA Program for Solid Earth and Natural Hazards

PROFESSIONAL ACTIVITY HIGHLIGHTS, HONORS AND AWARDS

- 2016-2017 NSF EarthScope Series Speaker
- 2015-2016 Associate Editor Bulletin of the Seismological Society of America
- 2014 Secretary of AGU Geodesy Section
- 2013 Editors' Citation for Excellence in Refereeing *Journal of Geophysical Research-Solid Earth*
- 2008-2012, Chair, EarthScope Plate Boundary Observatory Advisory Committee
- 2004-2009, Site Selection Working Group, EarthScope Plate Boundary Observatory
- November 2002, USGS Earthquake Hazards Team STAR Performer Award
- May 1999, Thayer Scholarship, Univ. of Oregon Dept. of Geological Sciences
- June 1996, Paul and Helen Weiser Scholarship, Univ. of Oregon Dept. of Geological Sciences

GRANTS AND CONTRACTS

Active Projects

NASA ROSES Sea Level Change Team, Using satellite measurements to improve regional estimates of the impacts of sea level change, \$225,519 subcontract to UNR, PI Steve Nerem, UNR Institutional PI W.C. Hammond.
NASA ROSES Sea Level Change Team, Global interconnections of cryosphere and solid Earth, sea-level change and ice mass balance, \$203,876 subcontract to UNR, PI Erik Ivins, UNR Institutional PI G. Blewitt.

NASA ROSES, GPS Imaging of Solid Earth's Flex and Flow, PI Blewitt, Co-Is Hammond and C. Kreemer \$445,363.
USGS NEHRP Geodetic Networks Program, Western Great Basin geodetic network operations, 2015-2020,
\$327,854, PI Hammond, Co-PI Blewitt.

Past Projects (since 2004)

DOE Frontier Observatory for Research in Geothermal Energy (FORGE), Stage 2 Collection of baseline data for
Fallon enhanced geothermal research, GPS task, PI J. Faulds, \$29,943.
USGS NEHRP, Robust Estimation of Fault Slip, Block Rotation and Off-Fault Strain Rates in the Walker Lane from
GPS Data, \$70,938, PI W.C. Hammond.
NASA ROSES A.15 Sea Level, Observation-Driven Projections of Future Regional Sea Level Change, \$164,436
subcontract to UNR, PI S. Nerem, Institutional PI Blewitt.
NSF EarthScope, Revealing the Nature of Contemporary Uplift and Collapse in the Sierra Nevada - Great Basin
System (II), PI Blewitt, Co-PIs Hammond, Plag, \$407,197.
Pacific Gas and Electric, Analysis of GPS and InSAR data to estimate vertical land motion of coastal California near
Diablo Canyon nuclear power plant, PIs W.C. Hammond and R. Burgette, \$20,000.
NASA ROSES ACCESS, Plug and Play GPS for Earth Scientists: Providing Immediate Access to Low-Latency
Geodetic Products for Rapid Modeling and Analysis of Natural Hazards, \$146,687 subcontract to UNR,
Institutional PI Blewitt and Co-Is Hammond and C. Kreemer.
NASA ROSES, Extending the Global Geodetic Observing System to high frequencies and low latencies, \$362,909,
PI Blewitt, Co-PIs Plag and Hammond.
JAXA, ALOS-2 RA4, Using ALOS-2 Data for Research in Crustal Deformation, Earthquakes and Geothermal
Resources in the Northwest Basin and Range, United States, PI Hammond, 8 Co-PIs, data grant.
DOE EERE, Discovering Blind Geothermal Systems in the Great Basin Region: An Integrated Geologic and
Geophysical Approach for Establishing Geothermal Play Fairways, PI J. Faulds.
Southern California Earthquake Center, Measuring Ventura Area Uplift: A Four-Technique Geodetic Study of Vertical
Tectonics Combining GPS, InSAR, Leveling and Tide Gauges, PIs W.C. Hammond (UNR) and R. Burgette, New
Mexico State University, Las Cruces, \$25,000.
USGS NEHRP Geodetic Networks, Western Great Basin geodetic network operations, 2010-2014, \$312,994, PI
Hammond (Co-PIs Kent, Smith, Biasi).
NSF EarthScope, Using geodesy to separate transient and steady extension in the Basin and Range Province,
\$206,086, PI Hammond (Co-PI Blewitt).
USGS NEHRP, Geodetic Constraints on Block Kinematics and Fault Slip Rates in the Greater Las Vegas Area, PIs
Kreemer and Hammond, \$54,970.
GeoPentech/Metropolitan Water District of Southern California, InSAR and GPS constraints on vertical tectonic
motion near San Geronio Pass, \$10,000.
GeoPentech/Southern California Edison, GPS and InSAR study of Southern CA crustal deformation and slip rates,
subcontract for consulting services, SSHAC process on San Onofre Nuclear Generating Station, \$25,000.
DOE Great Basin Center for Geothermal Energy, Seed Grant Program, Reconnaissance InSAR and GPS surface
deformation analysis of Salt Wells and Stillwater geothermal areas, \$81,036, PI Hammond, Co-PI J. Bell.
NSF EarthScope, Community Workshop: Real-Time GPS Position Data Products and Formats, \$49,918, PI Mencin
(UNAVCO), Co-PIs Hammond and Meertens (UNAVCO).
USGS NEHRP, Using GPS to measure the slip rate of the Honey Lake Fault, California, \$74,281 PI Hammond (Co-
PI Kreemer).
NASA ROSES EarthScope Geodetic Imaging, Geodetic imaging of Earth's surface deformation using integrated
InSAR and GPS observations, \$405,646, PI Hammond (Co-PIs Blewitt, Kreemer, Plag).
Southern California Earthquake Center, Inversions for Fault Slip Using Geodetic and Geologic data for UCERF3:
Block Modeling Using GPS Velocities Corrected for Viscoelastic Postseismic Relaxation, \$20,000, PI Ham-
mond.
GeoGlobal Energy, LLC, Recovery Act: Away from the range front: Intra-basin geothermal exploration, \$144,438, PI
Calvin (Co-PIs Bell, Hammond).
NSF EarthScope, Revealing the nature of contemporary uplift and collapse in the Sierra Nevada - Great Basin
System, \$468,452, PI Blewitt (Co-PIs Hammond, Plag).
USGS NEHRP, Geodetic and seismologic constraints on the kinematics of the Mohawk Valley Fault Zone,
California, \$64,222, PI Kreemer (Co-PI Hammond).
NSF Tectonics/EarthScope, An integrated geologic and geodetic study of strain accumulation and release in the
Northern Walker Lane, \$334,853, PI Wesnousky (Co-PIs Hammond, Kreemer).
NSF Tectonics, Quasi-block modeling of Walker Lane Belt tectonic deformation, using geodetic and geologic data to
constrain system complexity and time-variable behavior, \$236,779, PI Hammond (Co-PIs Blewitt, Kreemer).
NASA SENH, Development of real time tsunami warning systems using continuous GPS, \$393,920, PI Blewitt (Co-
PIs Hammond, Kreemer, Plag)

NASA Space Grant, NASA geophysical space geodesy course development, \$14,554, PI Hammond.
USGS NEHRP, Estimating seismic hazard in the Basin and Range Province using horizontal GPS data: Collaborative research between the University of Nevada, Reno and the USGS, \$66,874, PI Hammond (Co-PI Kreemer).
USGS NEHRP, System design for a GPS component of real-time earthquake source determination and tsunami warning Systems: Collaborative research between University of Nevada, Reno, and Northwestern University, \$80,484, PI Blewitt (Co-PIs Hammond, Kreemer, Plag, Stein, Okal).
DOE Geothermal Program, Targeting of potential geothermal resources in the Great Basin from regional to basin-scale relationships between geodetic strain and geological structures, \$279,375, PI Blewitt (Co-PIs Kreemer, Hammond).

FORMAL TEACHING EXPERIENCE

Taught UNR GPH 411/611/701(I), *Geophysical Geodesy*, Fall 2017.
Taught UNR GEOL 701(i), *InSAR Data Processing*, Fall 2017.
Taught UNR GPH 411/611/701(i), *Geophysical Geodesy*, Fall 2015.
Taught UNR GPH 411/611, *Geophysical Geodesy*, Fall 2013.
Taught UNR GEOL 701(i), *Western US Tectonic Framework*, Fall 2012.
Taught UNR GEOL 701(i), *Geophysical Geodesy*, Fall 2011.
Initiated and Taught new 3 unit course, UNR Geol. 495/695 *Geophysical Geodesy*, Fall 2009.
Graduate Teaching Fellow, University of Oregon section of *Earth Surface Processes and Morph*, Winter 1995.
Graduate Teaching Fellow, University of Oregon section of *Intro. to Geology: Evolving Earth*, Spring 1995.

PROFESSIONAL SOCIETIES

American Geophysical Union, since 1994
Seismological Society of America
Geological Society of America
European Geosciences Union
American Association for the Advancement of Science

PUBLICATIONS

Peer-Reviewed Articles and Maps

Hammond, W.C., R. Burgette, K. Johnson, G. Blewitt, 2017, Uplift of the Western Transverse Ranges and Ventura area of Southern California: A four-technique geodetic study combining GPS, InSAR, leveling and tide gauges, *Journal of Geophysical Research - Solid Earth*, 122, doi: 10.1002/2017JB014499.
Hammond, W.C., G. Blewitt, C. Kreemer, 2016, GPS Imaging of vertical land motion in California and Nevada: Implications for Sierra Nevada uplift, *J. Geophys. Res.*, 121, doi: 10.1002/2016JB013458.
Hamlington, B.D., P. Thompson, W.C. Hammond, G. Blewitt, R. Ray, 2016, Assessing the impact of vertical land motion on 20th century global mean sea level estimates, *J. Geophys. Res.-Oceans*, 121, doi: 10.1002/2016JC011747.
Blewitt, G., C. Kreemer, W.C. Hammond, J. Gazeaux, 2016, MIDAS trend estimator for accurate GPS station velocities without step detection, *J. Geophys. Res. Solid Earth*, 121, 2054-2068, doi:10.1002/2015JB012552.
Bormann, J., W.C. Hammond, C. Kreemer, G. Blewitt, 2016, Accommodation of missing shear strain in the Central Walker Lane, western North America: Constraints from dense GPS measurements, *Earth and Planetary Science Letters*, v. 440, p. 169-177, doi: 10.1016/j.epsl.2016.01.015.
Aster, R, M. Simons, R. Bürgmann, N. Gomez, W.C. Hammond, S. Holbrook, E. Chaussard, L. Stearns, G. Egbert, J. Hole, T. Lay, S. McNutt, M. Oskin, B. Schmandt, D. Schmidt, J. Vidale, L. Wagner, P. Winberry, 2015, Future geophysical facilities required to address grand challenges in the Earth sciences, A Community report to the National Science Foundation, http://www.iris.edu/hq/files/workshops/2015/05/fusg/reports/futures_report.pdf.
Melgar, D., J. Geng, B.W. Crowell, J.S. Haase, W.C. Hammond, Y. Bock, R.M. Allen, 2015, Seismogeodesy of the 2014 Mw6.1 Napa, California, Earthquake: Rapid response and modeling of fast rupture on a dipping strike-slip fault, *J. Geophys. Res.*, 120, doi:10.1029/2015JB011921.
Hammond, W.C., G. Blewitt, C. Kreemer, 2014, Steady contemporary deformation of the central Basin and Range Province, western United States, *J. Geophys. Res.*, 119 p. 5235-5253, doi:10.1002/2014JB011145.
Amos, C.B., P. Audet, W. C. Hammond, R. Bürgmann, I. A. Johanson, and G. Blewitt, 2014, Uplift and seismicity driven by groundwater depletion in central California, *Nature*, doi:10.1038/nature13275.

- Blewitt, G., C. Kreemer, W.C. Hammond, J. Goldfarb, 2013, Terrestrial reference frame NA12 for crustal deformation studies in North America, *J. Geodynamics*, 72, pp. 11-24, ISSN 0264-3707, <http://dx.doi.org/10.1016/j.jog.2013.08.004>.
- Kreemer, C., W.C. Hammond, G. Blewitt, A. Holland, R.A. Bennett, 2012, A geodetic strain rate model for the southwestern United States, scale 1:1,500,000, Nevada Bureau of Mines and Geology publication M178.
- Hammond, W.C., G. Blewitt, Z. Li, C. Kreemer, H.-P. Plag, 2012, Contemporary uplift of the Sierra Nevada, western United States, from GPS and InSAR measurements, *Geology*, v. 40, p. 667-670, doi:10.1130/G32968.1.
- Wesnousky, S., J. Bormann, C. Kreemer, W.C. Hammond, J. Brune, 2012, Neotectonics, geodesy and seismic hazard in the northern Walker Lane of western North America: Thirty kilometers of crustal shear and no strike-slip? *Earth and Planetary Science Letters*, v. 329-330, 133–140, doi:10.1016/j.epsl.2012.02.018.
- Del Pardo, C., B.R. Smith-Konter, L.F. Serpa, C. Kreemer, G. Blewitt, W.C. Hammond, 2012, Interseismic deformation and geologic evolution of the Death Valley Fault Zone, *J. Geophys. Res.* 117, B06404, doi: 10.1029/2011JB008552.
- Hammond, W.C., G. Blewitt, C. Kreemer, 2011, Block modeling of crustal deformation of the northern Walker Lane and Basin and Range from GPS velocities, *J. Geophys. Res.*, v. 116, B04402, doi:10.1029/2010JB007817.
- Hammond, W.C., B. A. Brooks, R. Bürgmann, T. Heaton, M. Jackson, A. R. Lowry, S. Anandakrishnan, 2011, The scientific value of high-rate, low-latency GPS data, *Eos* feature article, v. 92(15), doi:10.1029/2011EO150001, p. 125-132.
- Hammond, W.C., G. Blewitt, C. Kreemer, J.R. Murray-Moraleda, J.L. Svarc, 2011, Global Positioning System constraints on crustal deformation before and during the 21 February 2008 Wells, Nevada M 6.0 Earthquake, *in* The 21 February 2008 M_w 6.0 Wells, Nevada Earthquake, NBMG Special Publication 36, eds. C.M. dePolo and D.D. LaPointe.
- Hammond, W.C., Kreemer, C., Blewitt, G., Plag H.-P., 2010, The effect of viscoelastic postseismic relaxation on estimates of interseismic crustal strain accumulation at Yucca Mountain, Nevada, *Geophys. Res. Lett.*, 37, L06307, doi:10.1029/2010GL042795.
- Kreemer, C., G. Blewitt, and W.C. Hammond, 2009, Evidence for an active shear zone in southern Nevada linking the Wasatch Fault to the eastern California Shear Zone, *Geology*, v. 38, no. 5; p. 475–478; doi: 10.1130/G30477.1.
- Hammond, W.C., Kreemer, C., Blewitt, G., 2009, Geodetic constraints on contemporary deformation in the Northern Walker Lane: 3, Central Nevada seismic belt postseismic relaxation: *in* Oldow, J.S., and Cashman, P.H., eds., Late Cenozoic Structure and Evolution of the Great Basin – Sierra Nevada Transition, Geological Society of America, Special Paper 447, p.33-54, doi: 10.1130/2009.2447(03).
- Blewitt, G., Hammond, W.C., Kreemer, C., 2009, Geodetic constraints on contemporary deformation in the Northern Walker Lane: 1, Semi-permanent GPS strategy: *in* Oldow, J.S., and Cashman, P.H., eds., Late Cenozoic Structure and Evolution of the Great Basin – Sierra Nevada Transition, Geological Society of America, Special Paper 447, p.1-16, doi: 10.1130/2009.2447(01).
- Kreemer, C., Blewitt, G., Hammond, W.C., 2009, Geodetic constraints on contemporary deformation in the Northern Walker Lane: 2, Velocity and strain rate tensor analysis: *in* Oldow, J.S., and Cashman, P.H., eds., Late Cenozoic Structure and Evolution of the Great Basin – Sierra Nevada Transition, Geological Society of America, Special Paper 447, p.17-31, doi: 10.1130/2009.2447(02).
- Blewitt, G. W.C. Hammond, C. Kreemer, H.P. Plag, S. Stein, E. Okal, 2009, GPS for real-time earthquake source determination and tsunami warning systems, *Journal of Geodesy*, vol. 83, pp. 335–343, doi:10.1007/s00190-008-0262-5.
- Kreemer, C. and W.C. Hammond, Geodetic constraints on areal-changes in the Pacific-North America plate boundary zone: What controls Basin and Range extension? 2007, *Geology* v. 35, n.10: p.943-947, doi:10.1130/G23868A.1.
- Hammond, W.C. and W. Thatcher, 2007, Crustal deformation across the Sierra Nevada, Northern Walker Lane, Basin and Range transition, western United States measured with GPS, 2000-2004, *J. Geophys. Res.*, 112, B05411, doi: 10.1029/2006JB004625.
- Blewitt, G., C. Kreemer, W.C. Hammond, H.-P. Plag, S.A. Stein, and E. Okal, 2006, Rapid determination of Earthquake magnitude using GPS for Tsunami Warning Systems, *Geophys. Res. Lett.*, 33, L11309, doi: 10.1029/2006GL026145.
- Kreemer, K., G., Blewitt, W.C., Hammond, H.-P., Plag, 2006, Global deformation from the Great 2004 Sumatra-Andaman earthquake observed by GPS: Implications for rupture process and global reference frame, 2006, *Earth Planets Space*, v. 58, no. 2, p. 141–148.
- Hammond, W.C. and W. Thatcher, 2005, Northwest Basin and Range tectonic deformation observed with the Global Positioning System, 1999–2003, *J. Geophys. Res.*, v. 100, no. B10, B10104, doi:10.1029, 2005JB003751.
- Hammond, W.C. and W. Thatcher, 2004, Contemporary tectonic deformation of the Basin and Range province, western United States: 10 years of observation with the Global Positioning System, *J. Geophys. Res.*, v. 109, no. B8, 8403, doi:10.1029/2003JB002746.

- Hammond, W.C., and D.R. Toomey, 2003, Seismic velocity anisotropy and heterogeneity beneath the Mantle Electromagnetic and Tomography Experiment (MELT) region of the East Pacific Rise from analysis of P and S body waves, *J. Geophys. Res.*, v. 108, no. B4, 2176, doi:10.1029/2002JB001789.
- Toomey, D.R., W.S.D. Wilcock, J.A. Conder, D.W. Forsyth, J.D. Blundy, E.M. Parmentier, W.C. Hammond, 2002, Asymmetric mantle dynamics in the MELT region of the East Pacific Rise, *Earth and Planetary Science Letters*, v. 200, p. 287–295.
- Hammond, W.C., and E.D. Humphreys, 2000, Upper mantle seismic wave velocity: The effect of realistic partial melt geometries, *J. Geophys. Res.*, v. 105, p. 10,975–10,986.
- Hammond, W.C., and E.D. Humphreys, 2000, Upper mantle seismic wave attenuation: The effect of realistic partial melt distribution, *J. Geophys. Res.*, v. 105, p. 10,987–10,999.
- Toomey, D.R., W.S.D. Wilcock, S.C. Solomon, W.C. Hammond, J.A. Orcutt, 1998, Mantle seismic structure beneath the MELT region of the East Pacific Rise from P and S wave tomography, *Science*, v. 280, p. 1224–1227.

Peer-Reviewed Book Chapters

- Weldon, R.J., G. de Lamare, D. Yule, W. C. Hammond, A. Streig, A. Sarmiento, T. Freeman, J. Shamma, M. Beikaie, A. Rodriguez, 2017, Chapter 8: San Andreas Fault-South Branch surface deformation modeling, Chapter in AEG Book: Applied Geology in California, Special Publication Number 26.

Peer-Reviewed Conference Proceedings

- Faulds, J. E., N.H. Hinz, M.F. Coolbaugh, C.M. dePolo, D.L. Siler, L.A. Shevenell, W.C. Hammond, C. Kreemer, J.H. Queen, 2016, Discovering geothermal systems in the Great Basin region: An integrated geologic, geochemical, and geophysical approach for establishing geothermal play fairways, Proceedings of the 41st Workshop on Geothermal Reservoir Engineering, Stanford University, Stanford, California, February 22-24, 2016, SGP-TR-209.
- Faulds, J. E., N.H. Hinz, M.F. Coolbaugh, L.A. Shevenell, D.L. Siler, C.M. dePolo, W.C. Hammond, C. Kreemer, G. Opplinger, P.E. Wannamaker, J.H. Queen, C.F. Visser, 2015, Integrated geologic and geophysical approach for establishing geothermal play fairways and discovering blind geothermal systems in the great basin region, western USA: A progress report, *Geothermal Resources Council Transactions*, vol. 39, p. 11-15.
- Hammond, W.C., C. Kreemer, J. Bormann, G. Blewitt, 2015, Fault slip rates in the Western Great Basin from geodetic and geologic data, *Proceedings Volume of the Basin and Range Seismic Hazard Summit III*, January 12-17, 2015, Salt Lake City, UT, Utah Geological Survey Miscellaneous Publication 15-5.
- Hammond, W.C. and J.W. Bell, 2013, Structural controls on geothermal reservoir deformation at Stillwater, Nevada from InSAR and GPS data, *Geothermal Resources Council Transactions*, vol. 37, p. 11-15.
- Hammond, W.C., Z. Li, H.-P. Plag, C. Kreemer, G. Blewitt, 2010, Integrated InSAR and GPS Studies of crustal deformation in the western Great Basin, western United States, International Archives of the Photogrammetry, Remote Sensing and Spatial Information Science, Volume XXXVIII, Part 8, ISSN 1682-1777, ISPRS-Technical Commission VIII Symposium, Kyoto Japan, August 9-12, 2010.
- Bormann, J., S. Wesnousky, W.C. Hammond, A. Sarmiento, 2010, Holocene earthquakes on the Wassuk Range fault zone: Paleoseismic observations from the Rose Creek Fan, Hawthorne, Nevada, USA, *Geothermal Resources Council Transactions*, vol. 34, p. 391-395.
- Plag, H.-P., G. Blewitt, W.C. Hammond, C. Kreemer, Y. Bar-Sever, 2010, Rapid GPS-based determination of earthquake displacement field and magnitude for tsunami propagation modeling and warning, *IEEE International Geoscience and Remote Sensing*, ISBN 978-1-4244-9564-1, pp. 3039-3042.
- Blewitt, G., C. Kreemer, W. C. Hammond, H.-P. Plag, S. Stein, E. Okal, 2008, Rapid determination of earthquake magnitude using GPS for tsunami warning systems: An opportunity for IGS to make a difference, in *The International GNSS Service (IGS): Perspectives and Visions for 2010 and beyond*, edited by T. Springer, G. Gendt, & J. M. Dow, European Space Agency, ESTEC, Noordwijk, The Netherlands.
- Hammond, W.C., C. Kreemer, G. Blewitt, 2007, Exploring the relationship between geothermal resources and geodetically inferred slip rates on faults in the Great Basin, *Geothermal Resources Council Transactions*, vol. 31, p. 391-395.
- Kreemer, K., G. Blewitt, W.C. Hammond, 2006, Using geodesy to explore correlations between crustal deformation characteristics and geothermal resources, *Geothermal Resources Council Transactions*, vol. 30, p 441-446.
- Plag, H.-P., G. Blewitt, C. Kreemer, W.C. Hammond, 2006, Solid Earth deformations induced by the Sumatra earthquakes of 2004–2005: GPS detection of co-seismic displacements and tsunami-induced loading, in *Dynamic Planet -- Monitoring and Understanding a Dynamic Planet with Geodetic and Oceanographic Tools*, International Association of Geodesy Symposia, v. 130, p. 549-556, ed. P. Tregoning and C. Rizos, Springer Verlag, Berlin.
- Kreemer, K., G. Blewitt, W.C. Hammond, 2006, Using geodesy to explore correlations between crustal deformation characteristics and geothermal resources, *Geothermal Resources Council Transactions*, vol. 30, p 441-446.

Hammond, W.C., 2004, Vertical motion of the Basin and Range, western United States from 10 Years of Campaign GPS, Cahiers du Centre Européen de Géodynamique et de Séismologie, Proceedings of the workshop: The state of GPS vertical positioning precision: Separation of Earth processes by space geodesy, ed. T. van Dam, v. 23, p. 131–136.

Other Publications, Reports and Guidebooks

- Cronin, V. S., P. Resor, B. Pratt-Sitaula, W.C. Hammond, C. Kreemer, 2016, GPS, Strain and Earthquakes, GETSI educational resource module, available at http://serc.carleton.edu/getsi/teaching_materials/gps_strain/index.html.
- Boening, C., Limonadi, Watkins, S. Nerem, + 79 other authors, 2016, Refining Global Sea Level Rise Over The Next Century, A white paper for the NASA Earth Science Decadal Survey in Response to 2nd RFI.
- Donnellan, A., R. Arrowsmith, Y. Ben-Zion, J. Rundle, L. Grant Ludwig, M. Glasscoe, A. Ansar, J. Green, J. Pearson, C. Jones, P. Lundgren, S. DeLong, T. Mulder, E. De Jong, W.C. Hammond, K. Reicherter, T. Scambos, 2016, Connecting Plate Boundary Processes to Earthquake Faults using Geodetic and Topographic Imaging, A white paper for the NASA Earth Science Decadal Survey in Response to 2nd RFI.
- Cronin, V., S. Olds, B. Pratt-Sitaula, P. Resor, N. West, W.C. Hammond, C. Kreemer, 2014, The 2014 South Napa earthquake GPS strain analysis: Extension for the [GPS & Strain module](#), published online by UNAVCO <http://www.unavco.org/education/resources/educational-resources/lesson/majors-gps-strain/napa/napa.html>.
- GeoPentech, R.J. Weldon, A. Streig, W.C. Hammond, 2014, Colorado River Aqueduct San Geronio Pass Seismic Event Vulnerability Study, San Bernardino County, California: *Southern Branch San Andreas Fault Ruptures Coulomb 3.3 Simulations*, for the Metropolitan Water District of Southern California.
- Kreemer, C. and W.C. Hammond W.C., 2014, Geodetic Constraints on Fault Slip Rates and Seismic Hazard in the Greater Las Vegas Area, NEHRP Final Technical Report for award *G13AP0018*, June 30, 2014.
- Petersen, M.D., Y. Zeng, K.M. Haller, R. McCaffrey, W.C. Hammond, P. Bird, M. Moschetti, Z. Shen, J. Bormann, and W. Thatcher, 2014, Geodesy- and geology-based slip-rate models for the Western United States (excluding California) national seismic hazard maps: U.S. Geological Survey Open-File Report 2013–1293, 80 p., <http://dx.doi.org/10.3133/ofr20131293>.
- Parsons, T., K.M. Johnson, P. Bird, J.M. Bormann, T.E. Dawson, E.H. Field, W.C. Hammond, T.A. Herring, R. McCaffrey, Z.-K. Shen, W.R. Thatcher, R.J. Weldon and Y. Zheng, 2013, Appendix C- Deformation models for UCERF3, USGS Open-File Report, v. 2013-1165, 66 pp., http://pubs.usgs.gov/of/2013/1165/pdf/ofr2013-1165_appendixC.pdf.
- Hammond, W.C., 2013, GPS and InSAR for crustal strain rate near the San Onofre Nuclear Generating Station (SONGS) for the Senior Seismic Hazard Analysis Committee (SSHAC), report to GeoPentech, Inc. for consulting project, August, 2013.
- Mencin, D., C. Meertens, W.C. Hammond, 2013, Community Workshop: Real-Time GPS Position Data Products and Formats; Boulder, Colorado, NSF Final Project Report.
- Hammond, W.C., C. Kreemer, J. Bormann, 2013, Using GPS to estimate slip rates of the Honey Lake/Warm Springs and Mohawk Valley fault zones, Northern Walker Lane, Final Technical Report for NEHRP Award G11AP20023.
- Johnson, K., P. Bird, Y. Zeng, W. Thatcher, T. Dawson, R. Weldon, R. McCaffrey, W.C. Hammond, J. Bormann, T. Herring, 2013, Geodetically-derived deformation models for UCERF3, report for the Working Group On California Earthquake Probabilities, available at <http://wgcep.org>.
- Cronin, V., S. Olds, B. Pratt-Sitaula, P. Resor, N. West, W.C. Hammond, C. Kreemer, 2012, Educational Resource Module Team & Development web page- Infinitesimal strain analysis using GPS data: Module for structural geology or geophysics course: http://www.unavco.org/edu_outreach/resources/gps-strain/majors-gps-strain/module-team/module-team.html.
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SELECTED MEDIA CITATIONS

- Press release on Sheldon earthquake swarm Nov. 21, 2014, written by Mike Wolterbeak of UNR media relations, with contributions from Nevada Seismological Laboratory and Nevada Geodetic Laboratory.
- International press release for *Amos et al.*, 2014 paper in *Nature* on groundwater, mountain uplift and San Andreas seismicity, including 6 television, radio and phone interviews (e.g. NPR stations KPCC live show "Airtalk", KUNR, KNPR, KSJO), live television interview on Reno channel 4, coverage of article on dozens of web news outlets and thousands of hits on EurekaAlert Science news service, a record at UNR at that time.
- International press release for publication of *Geology* paper on Sierra Nevada uplift resulted in TV and radio interviews (KGO 810 AM San Francisco, KNPR 88.9 FM Las Vegas, KOLO TV Reno, KFBK Sacramento), over 15 news articles in various outlets inside and outside the United States between May 3 - May 7, 2012, including MSNBC, ABC, Huffington Post, Scotland Herald, Nevada Silver & Blue magazine, etc.
- Interviewed for documentary film "California Geology: 4,500,000,000 years in the making", developed by 6th grade students of Sierra Expeditionary Learning School, to be released January 2012. This film won best documentary in the Yosemite film festival, Education category.
- Television appearance, Fox 11 Reno, Presented earthquake monitoring with geodetic and seismic instrumentation in the Reno area, March 17, 2011.

Kerr, R, News Focus "Snapshots From the Meeting" *Science* v.331. p 143, on *Hammond et al.*, 2010 Fall meeting AGU talk "GPS and InSAR Observations of Active Mountain Growth across the Sierra Nevada/Great Basin Transition", Abstract T43C-03.
Astrocast.tv online produced video on aftermath of Haitian Earthquake, <http://astrocast.tv/greenspace/greenspace.html>, January 20, 2010.
Featured in Sacramento Bee Story on Mogul Swarm May 3, 2008 (<http://www.sacbee.com/101/story/909527.html>)
Television appearance KTVN Reno, April 3, 2007, After earthquake and tsunami in Java, reporters requested information on Tsunami research done by UNR Geodesy Team
Television appearance, Reno NV. Provided comments on tsunami warning using GPS during interview to Channel 8 ABC News, July 17, 2006.
Contributed photos of Venice, Italy subsidence to short produced web video on Astrocast TV, "Earth Observation from Space", <http://astrocast.tv/greenspace/greenspace.html>.

STUDENTS ADVISED

Degrees Completed

Sumant Jha, MS, Geophysics, Primary advisor, Block kinematics and slip rates in the southern Walker Lane estimated From GPS data, University of Nevada, Reno, completed August, 2010.
Jayne Bormann, Ph.D., Primary advisor, Constraints on shear strain accommodation in the Northern Walker Lane and the geometry of normal fault ruptures through geodetic and geologic observation, completed August, 2013, now faculty at Cal State Long Beach.
Annie Kell, Ph.D., Committee member, The application of active-source seismic imaging techniques to transtensional problems in the Salton Trough and Walker Lane, completed April, 2014.
Russell Di Fiori, M.S., Geology, Committee member, Focused geologic mapping and structural analysis of the southern Eureka mining district; assessing structural controls and spatial patterns of mineralization, completed 2014.
Jay Goldfarb, Ph.D., Primary advisor, Anatomy of geodetic time series and their application to the measurement of vertical motion in the Sierra Nevada/Great Basin, advanced to candidacy, deceased prior to completion.
Yang Zhang, M.S., Geophysics, Committee member, Coseismic and Postseismic Deformation of the 2011 MW 9.0 Tohoku Earthquake - A Nonlinear Inversion of GPS Data, completed January, 2015.
Kevin McBean, MS Geophysics, Committee member, Statistics of ground motions in a foam rubber model of a strike-slip fault, completed March, 2015.
Brian Anderson M.S., (DRI), Committee member, Analysis of fault rupture potential resulting from large-scale groundwater withdrawal: application to Spring Valley, Nevada, completed August, 2016.
Meredith Kraner, M.S., Committee member, Evaluating seasonal deformation in the vicinity of active fault structures in central California using GPS data, completed May, 2017.