

# WILLIAM CHARLES HAMMOND

Professor of Geodesy and Geophysics

Nevada Geodetic Laboratory  
Nevada Bureau of Mines and Geology  
College of Science, University of Nevada, Reno

*whammond@unr.edu*  
Reno, Nevada 89557 Mail Stop 178  
ORCID: 0000-0001-7367-9489

## EDUCATION

Ph.D. University of Oregon, Eugene, Department of Geological Sciences 1994–2000  
B.A. Applied Mathematics, University of California, Berkeley 1985–1989

## ACADEMIC WORK EXPERIENCE

Interim Director, Nevada Bureau of Mines and Geology Sept. 1, 2024–present  
Associate Director, Nevada Bureau of Mines and Geology July 1, 2022–Sept. 1, 2024  
Professor of Geodesy and Geophysics, Graduate Faculty, Univ. of Nevada, Reno July 1, 2016–present  
Visiting scientist for sabbatical leave, INGV, Rome Italy February - June, 2019  
Associate Professor in Geodesy and Geophysics, Univ. Nevada, Reno July 1, 2010–June 30, 2016  
Assistant Professor in Geodesy and Geophysics, Univ. Nevada, Reno July 1, 2004–June 30, 2010  
Postdoctoral Research Geophysicist, USGS Earthquake Hazards Team, Menlo Park Jan. 2001–June 2004  
Graduate Research and Teaching Assistant, Univ. of Oregon, Dept. Geological Science 1994-2000

## PROFESSIONAL ACTIVITY HIGHLIGHTS AND AWARDS

- 2023-present Chair, EarthScope Network Instrumentation Advisory Committee
- 2021-2024 AGU Geodesy Section Secretary (two consecutive 2-year terms)
- 2022-2023 Co-Chair, UNAVCO Geodetic Infrastructure Advisory Committee
- 2022 Co-chair, EarthScope Transitional Nominating Committee for Inaugural EarthScope Board of Directors
- 2021 UNAVCO Nominating Committee - elected by UNAVCO membership
- 2020-2021 NSF EAR Seismic and Geodetic Portfolio Review Committee, a Federal Advisory Committee
- 2019-2021 National Academy of Science, Board on Earth Sciences and Resources
- 2016-2017 NSF EarthScope Speaker Series
- 2015-2016 Associate Editor Bulletin of the Seismological Society of America
- 2015-2016 AGU Geodesy Section Secretary
- 2013 Editors' Citation for Excellence in Refereeing *Journal of Geophysical Research-Solid Earth*
- 2008-2012 Chair, EarthScope Plate Boundary Observatory Advisory Committee
- 2002 USGS Earthquake Hazards Team STAR Performer Award

## GRANTS AND CONTRACTS

### *Active Projects*

NASA Sea Level Change Team, Fused InSAR+GNSS Vertical Land Motion for RSLR.  
USGS National Earthquake Hazard Reduction Program, Modeling Slip Rates and Off-Fault Deformation in Western US Fault Networks from GNSS Velocities and Precisely Located Seismicity, \$93,937.  
USGS Geodetic Networks Program, Supplement #5: Upgrades for 6 GPS Receivers in the MAGNET GPS Network to Continuous Operation 2024-2025, \$81,686.  
Jet Propulsion Laboratory/OPERA, Applications of UNR's GNSS Data Catalog to OPERA Surface Displacement Validation, \$89,920.  
NASA ROSES Improving and Expanding GPS Data Products to Address Key Challenges of Solid Earth Science, PI G. Blewitt, Co-Is Hammond, Kreemer, Argus, \$817,667.  
USGS Geodetic Networks Program, Western Great Basin Geodetic Network Operations: MAGNET 2020-2025, PI W.C. Hammond, Co-PI G. Blewitt, \$361,196.

### *Past Projects (since 2004)*

USGS Geodetic Networks Program, Supplement #4: Upgrades for 6 GPS Receivers in the MAGNET GPS Network to Continuous Operation, \$79,704.  
NASA Support of STV Incubator Team Workshops, PI Hammond, \$10,895.16.

Lettis Consulting International, Senior Seismic Hazard Analysis Committee (SSHAC) Project for TerraPower Kemmerer, Wyoming Natrium power plant, \$46,200.

USGS Earthquake Hazards Program, Supplemental Funding #3 to Upgrade 6 GPS Receivers in the MAGNET GPS Network Backbone, PI W.C. Hammond, \$67,000.00.

NASA ROSES GPS Imaging of time-variable Earth deformation for multi-disciplinary science, PI G. Blewitt, Co-Is Hammond and Kreemer \$477,585.

USGS Earthquake Hazards Program, Supplemental funding #2 to upgrade 6 GPS Receivers in the MAGNET GPS Network backbone, PI W.C. Hammond, \$70,064.00.

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 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.

Idaho National Laboratory, Geodetic analysis of fault slip rates in the Centennial Tectonic Belt, Eastern Snake River Plain and surrounding regions, PI: W.C. Hammond, \$79,548.85.

USGS Earthquake Hazards Program, Supplemental Funding for a Socially Distant MAGNET GPS Response to the May 15, 2020 Monte Cristo Range, Nevada Earthquake, \$46,175.23.

NSF EAR Geophysics, RAPID: Collaborative: Response to the Searles Valley Earthquake Sequence, UNR Institutional PI W.C. Hammond \$19,000.

USGS Geodetic Networks Program, Supplemental Funding for MAGNET GPS Network to Address Deferred Maintenance of GPS Receivers, PI W.C. Hammond, \$145,000.

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 Blewit.

USGS NEHRP Geodetic Networks Program, Supplement to Western Great Basin geodetic network operations, 2015-2020, \$94,227, PI Hammond, Co-PI Blewit.

UNR International Activities Travel Grant, Analogs between active crustal deformation in Italy and the Sierra Nevada/Great Basin transition, \$1,200.

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 Blewit, 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 Gorgonio 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 Hammond.

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

UNR GPH 455/655 *Global Geophysics and Geodynamics*, Fall 2018, 2020, 2022, 2024.

UNR GEOL 701(i), *InSAR Data Processing*, Fall 2017.

UNR GPH 768, *GPS and InSAR Data Analysis*, Fall 2018.

UNR GPH 411/611/701(i), *Geophysical Geodesy*, Fall 2009, 2011, 2013, 2015, 2017, 2019, 2021, 2023.

UNR GEOL 701(i), *Western US Tectonic Framework*, Fall 2012.

UNR GEOL 790 Geoscience Seminar, Spring 2023.

Graduate Teaching Fellow, University of Oregon, *Intro. to Geology: Evolving Earth, Earth Surface Processes and Morphology*, Winter+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

Miller, N., C. Kreemer, **W.C. Hammond**, G. Blewitt, 2024, Geodetic evidence for distributed shear below the brittle crust of the Walker Lane, Western United States, *J. Geophys. Res. - Solid Earth*, 129(9), e2024JB028848, <https://doi.org/10.1029/2024JB028848>.

Li, Z., M. Hao, **W. C. Hammond**, F. Cheng, G. Zhang, Q. Wang, L. Liu, B. Hou, W. Gan, 2023, Geodetic constraints on three-component motion of the Ordos Block (China) and their implications for lithospheric dynamics, *GSA Bulletin*, 136(11-12): 5217–5230, <https://doi.org/10.1130/B37423.1>.

**Hammond, W.C.**, C. Kreemer, G. Blewitt, 2024, Robust imaging of fault slip rates in the Walker Lane and Western

- Great Basin from GPS data using a multi-block model approach, *J. Geophys. Res. - Solid Earth*, 129, e2023JB028044. <https://doi.org/10.1029/2023JB028044>.
- Johnson, K., **W.C. Hammond**, R. Weldon, 2024, Review of geodetic and geologic deformation models for 2023 US National Seismic Hazard Model, *Bull. Seis. Soc. Am.* <https://doi.org/10.1785/0120230137>.
- Li, X., **W.C. Hammond**, I.K.D. Pierce, J. M. Bormann, Z. Zhang, C. Li, W. Zheng, P. Zhang, 2023, Present-day strike-slip faulting and intracontinental deformation of North China: Constraints from improved GPS observations, *G-cubed*, v. 24(7), GGGE23102, <https://doi.org/10.1029/2022GC010781>.
- Yuan, P., G. Blewitt, C. Kreemer, **W.C. Hammond**, D. Argus, X. Yin, R. Van Malderen, M. Mayer, W. Jiang, J. Awange, H. Kutterer, 2023, An enhanced integrated water vapour dataset from more than 10,000 global ground-based GPS stations in 2020, *Earth System Science Data*, 15, 723-743, <https://doi.org/10.5194/essd-15-723-2023>.
- Young, Z., C., Kreemer, **W.C. Hammond**, G. Blewitt, 2023, Interseismic strain accumulation between the Colorado Plateau and the Eastern California Shear Zone: Implications for the seismic hazard near Las Vegas, Nevada, *Bull. Seis. Soc. Am.*, <https://doi.org/10.1785/0120220136>.
- Overacker, J., **W.C. Hammond**, C. Kreemer, G. Blewitt, 2022, Vertical land motion of the High Plains Aquifer region of the United States: Effect of aquifer confinement style, climate variability, and anthropogenic activity, 2021WR031635R, *Water Resources Research*, <https://doi.org/10.1029/2021WR031635>.
- Pollitz, F., C. W. Wicks, and **W.C. Hammond**, 2022, Kinematic slip model of the 2021 M6.0 Antelope Valley, California, earthquake, *The Seismic Record*, 2 (1): 20-28, <https://doi.org/10.1785/0320210043>.
- Hatch-Ibarra, R., R.E. Abercrombie, C. Ruhl, K.D. Smith, **W.C. Hammond**, I. Pierce, 2022, The 2016 Nine Mile Ranch earthquakes: Hazard and tectonic implications of orthogonal conjugate faulting in the Walker Lane, *Bull. Seis. Soc. Am.*, 112(3): 1727-1741, <https://doi.org/10.1785/0120210149>.
- Harvey, T. C., B. D. Hamlington, T. Frederikse, R. S. Nerem, C.G. Piecuch, **W.C. Hammond**, G. Blewitt, P.R. Thompson, D.P.S. Bekaert, F.W. Landerer, J.T. Reager, R.E. Kopp, I. Fenty, D. Trossman, J. Walker, C. Boening, 2021, Ocean mass, sterodynamic effects and vertical land motion largely explain US coast relative sea level rise, *Nature Communications Earth and Environment*, 2, 233, Open access at: <https://www.nature.com/articles/s43247-021-00300-w>.
- Hammond W.C.**, G. Blewitt, C. Kreemer, R.S. Nerem, 2021, Global vertical land motion for studies of sea level rise, *J. Geophys. Res. - Solid Earth*, 126(7), e2021JB022355, <https://doi.org/10.1029/2021JB022355> [Article spotlight selected by editors to appear in *Eos*: <https://eos.org/research-spotlights/measuring-sea-level-rise-along-the-coast>].
- Li, X., I.K.D. Pierce, J. Bormann, **W.C. Hammond**, Z. Zhang, C. Li, W. Zheng, P. Zhang, 2021 Tectonic deformation of the Northeastern Tibetan Plateau and its surroundings revealed with GPS block modeling, *J. Geophys. Res. - Solid Earth*, 126(5), e2020JB020733, <https://doi.org/10.1029/2020JB020733>, special section on the 100-year Anniversary of the Great 1920 Haiyuan Earthquake: *What have we learnt on large continental earthquakes and faults?*
- Pan, Y., **W.C. Hammond**, H. Ding, R. Mallick, X. Xu, C. K. Shum, W. Shen, R. Chen, 2021, GPS Imaging of vertical bedrock displacements: Quantification of two-dimensional vertical crustal deformation in China, accepted for publication in *J. Geophys. Res. - Solid Earth*, 126(4), e2020JB020951, <https://doi.org/10.1029/2020JB020951>.
- Pollitz, F. F., **W.C. Hammond**, C.W. Wicks, 2020, Rupture process of the M6.5 Stanley, Idaho, earthquake inferred from seismic waveform and geodetic data, *Seis. Res. Lett.*, Focus Section on Intermountain West Earthquakes in Spring 2020, 92 (2A): 699-709, <https://doi.org/10.1785/0220200315>.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, R.D. Koehler, S. Dee, 2020, Geodetic observation of seismic cycles before, during and after the 2020 Monte Cristo Range Earthquake using the MAGNET GPS Network, *Seismological Research Letters*, Focus Section on Intermountain West Earthquakes in Spring 2020, <https://doi.org/10.1785/0220200338>.
- Martens, H., D. Argus, C. Norberg, G. Blewitt, T.A. Herring, A.W. Moore, **W.C. Hammond**, C. Kreemer, 2020, Atmospheric pressure loading in GPS positions: Dependency on GPS processing methods and effect on assessment of seasonal deformation in the contiguous U.S. and Alaska, *J. Geodesy*, 94, 115, <https://doi.org/10.1007/s00190-020-01445-w>.
- Johnson, K., **W.C. Hammond**, R. Burgette, S.T. Marshall, and C.C. Sorlien, 2020, Present-day and long-term uplift across the Western Transverse Ranges of Southern California, *J. Geophys. Res. - Solid Earth*, 125(8), <https://doi.org/10.1029/2020JB019672>, [selected by JGR editors for research spotlight in *Eos*, <https://eos.org/research-spotlights/southern-californias-crustal-motion-tells-of-earthquake-hazards>].
- Hamlington, B., A.S. Gardner, E. Ivins, J. T. M. Lenaerts, J.T. Reager, D. S. Trossman, E. D. Zaron, S. Adhikari, A. Arendt, A. Aschwanden, B.D. Beckley, D.P.S. Bekaert, G. Blewitt, L. Caron, H.A. Chandanpurkar, K. Christianson, R.I. Cullather, R. M. DeConto, J. T. Fasullo, T. Frederikse, J. T. Freymueller, D. M. Gilford, M. Giroto, **W.C. Hammond**, R. Hock, N. Holschuh, R. E. Kopp, F. Landerer, E. Larour, D. Menemenlis, M. Merrifield, J. X. Mitrovica, R.S. Nerem, I. J. Nias, V. Nieves, S. Nowicki, K. Pangaluru, C.G. Piecuch, D.R. Rounce, N.-J. Schlegel, H. Seroussi, M. Shirzaei, I. Velicogna, N. Vinogradova, T. Wahl, D. N. Wiese, M. J. Willis, 2020, Understanding of contemporary regional sea level change and the implications for the future, *Reviews of Geophysics*, v. 58(8), e2019RG000672, <https://doi.org/10.1029/2019RG000672>.

- Murray, J., N. Bartlow, Y. Bock, B.A. Brooks, J. Foster, J. Freymueller, **W.C. Hammond**, K. Hodgkinson, I. Johanson, A. Lopez-Venegas, D. Mann, G.S. Mattioli, T. Melbourne, D. Mencin, E. Montgomery-Brown, M.H. Murray, R. Smalley, V. Thomas, 2019, Regional Global Navigation Satellite System networks, *Seismo. Res. Lett.*, 91(2A), 552-572, <https://doi.org/10.1785/0220190113>.
- Anderson, J. G., R.D. Koehler, R. Abercrombie, S. K. Ahdi, S. Angster, J. Bormann, J. N. Brune, S. Dee, C. dePolo, S. Dickinson, M. Dunn, J.E. Faulds, **W.C. Hammond**, R. Hatch, A. Kell, G. Kent, C. Kreemer, J. Louie, I. Pierce, C. Ruhl, K.D. Smith, W. Taylor, S. Wesnousky, I. Wong, 2019, A seismic hazards overview of the urban regions of Nevada: Recent advancements and research directions, *Seis. Res. Lett.*, 90(4): 1577-1583, <https://doi.org/10.1785/0220180357>.
- Hammond, W.C.**, C. Kreemer, I. Zaliapin, G. Blewitt, 2019, Drought-triggered magmatic inflation, crustal strain and seismicity near the Long Valley Caldera, Central Walker Lane, *Journal of Geophysical Research - Solid Earth*, 124(6), 6072–6091, <https://doi.org/10.1029/2019JB017354>.
- Blewitt, G., **W.C. Hammond**, C. Kreemer, 2018, Harnessing the GPS data explosion for tomorrow's science applications, *Eos*, 99, <https://doi.org/10.1029/2018EO104623>. In print version came out in March, 2019 as *Eos* v. 100, n. 3, pp. 19-22.
- Kreemer, C., **W.C. Hammond**, G. Blewitt, 2018, A robust estimation of the 3D intraplate deformation of the North American plate from GPS, *Journal of Geophysical Research - Solid Earth*, 123, doi: 10.1029/2017JB015257.
- Melgar, D., X. Pérez-Campos, L. Ramirez-Guzman, Z. Spica, V.H. Castro, **W.C. Hammond**, and E. Cabral-Cano, 2017, Bend faulting at the edge of a flat slab during the 2017  $M_w$ 7.1 Puebla-Morelos, Mexico earthquake, *Geophys. Res. Lett.*, 45, p. 2633–2641, doi: 10.1002/2017GL076895.
- Hammond, W.C.**, R. Burgette, K. Johnson, G. Blewitt, 2018, 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, n. 10, p. 7681-7703, 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, <https://doi.org/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](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  $M_w$ 6.1 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*, 509, p. 483-486, 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>.
- 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<sub>w</sub> 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**, 2010, 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; <https://doi.org/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, [https://doi.org/10.1130/2009.2447\(03\)](https://doi.org/10.1130/2009.2447(03)).
- Blewitt, G., **W.C. Hammond**, C. Kreemer, 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, [https://doi.org/10.1130/2009.2447\(01\)](https://doi.org/10.1130/2009.2447(01)).
- Kreemer, C., G. Blewitt, **W.C. Hammond**, 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, <https://doi.org/10.1029/2005JB003678>.
- 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 Maps

- 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.

## 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, 2016, Chapter 8: San Andreas Fault-South Branch surface deformation modeling and risk to the Colorado River aqueduct, Chapter in AEG Special Publication: Applied Geology in California, R. Anderson, H. Ferriz, Eds. (Association of Environmental and Engineering Geologists, 2016), pp. 147–219, ISBN 978-0-89863-399-3.

## Peer-Reviewed Conference Proceedings and Reports

- Faulds, J.E., R.D. Koehler, K.D. Smith, C. Kreemer, **W.C. Hammond**, C.M. dePolo, G. Kent, 2021, Review of previous geologic, paleoseismic, seismic, and geodetic studies at Yucca Mountain, Nevada: Implications for understanding seismic hazards at the proposed high-level nuclear waste repository, Nevada Bureau of Mines and Geology Report 59, 50 p., <https://pubs.nbmng.unr.edu/Review-of-Yucca-Mountain-p/r059.htm>.
- García-Cañada, L., and **W.C. Hammond**, 2020, Advances in GNSS time series filtering for volcano monitoring in the Canary Islands, May 26-29, 2020, Asamblea Hispano Portuguesa de Geodesia y Geofísica, Toledo, Spain, <https://congreso.ign.es/web/10asambleahppg/inicio>.
- Ayling, B., +10 authors, **W.C. Hammond**, +23 authors, 2018, Phase 2 update for the Fallon FORGE site, 43rd Annual Stanford Geothermal Workshop, Stanford, CA, February 12-14, 2018.
- 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.
- 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.

#### Datasets

Yuan, P., G. Blewitt, C. Kreemer, **W.C. Hammond**, D. Argus, X. Yin, R. Van Malderen, M. Mayer, W. Jiang, J. Awange, H. Kutterer, 2022, An enhanced integrated water vapour dataset from more than 10,000 global ground-based GPS stations in 2020 [Data set], *Zenodo*, <https://doi.org/10.5281/zenodo.6973528>.

#### Software

**Hammond, W. C.**, Blewitt, G., & Kreemer, C., 2024, Block modeling software (v1.0), *Zenodo*, <https://doi.org/10.5281/zenodo.10672393>.

**Hammond, W. C.**, Blewitt, G., & Kreemer, C., 2024, GPS Imaging software (v1.0), *Zenodo*, <https://doi.org/10.5281/zenodo.10672265>.

#### Other Publications, Reports and Guidebooks

**Hammond, W.C.**, 2023, Analysis of GPS Data Constraints on Crustal Strain Rates for Seismic Hazard Characterization in Wyoming and Surrounding Areas, Final report for SSHAC study for Lettis Consultants International, Inc.

**Hammond, W.C.**, G. Blewitt, 2023, Annual progress report of “Western Great Basin Geodetic Network Operations: MAGNET 2020-2025”, for USGS Geodetic Networks program.

**Hammond, W.C.**, G. Blewitt, 2022, Annual progress report of “Western Great Basin Geodetic Network Operations: MAGNET 2020-2025”, for USGS Geodetic Networks program.

**Hammond, W.C.**, 2021, Geodetic analysis of regional fault slip rates in and around the Centennial Tectonic Belt, and Eastern Snake River Plain, Final report of SSHAC L3 study for Idaho National Laboratory and Battelle Energy Alliance, LLC.

Johnson, K.M., **W.C. Hammond**, R.J. Weldon II, 2022, Review of geodetic and geologic deformation models for 2023 US National Seismic Hazard Model, Report to the USGS NSHM Steering Committee.

**Hammond, W.C.**, G. Blewitt, 2021, Annual progress report of “Western Great Basin Geodetic Network Operations: MAGNET 2020-2025”, for USGS Geodetic Networks program.

Arrowsmith, J.R., E. Brodsky, C.M. Cooper, J.L. Elliot, D. Fee, K. Fischer, **W.C. Hammond**, P. La Femina, V. Lekic, H. Wang, L.L. Worthington, 2021, Recommendations for enabling Earth science through NSF’s geophysical facility - A portfolio review of EAR seismology and geodesy instrumentation, Report from the NSF Instrumentation Portfolio Review Committee, a federal advisory committee, <https://www.nsf.gov/geo/adgeo/ear-instrumentation-review/AC-GEO-EAR-Instrumentation-Portfolio-Review-April-2021%20Report.pdf>

**Hammond, W.C.**, C. Kreemer, I. Zaliapin, G. Blewitt, 2019, Drought-triggered magmatic inflation, crustal strain and seismicity at the Long Valley Caldera, Central Walker Lane, chapter in Friends of the Pleistocene Field trip Guidebook, Central Walker Lane, Nevada, Oct. 3-6, 2019.

**Hammond, W.C.**, 2018, Online interactive review comments to Masson et al., “Precision of continuous GPS velocities from statistical analysis of synthetic time series”, *Solid Earth Discuss.*, <https://doi.org/10.5194/se-2018-77-RC2>.

**Hammond, W.C.**, 2017, Robust estimation of fault slip, block rotation and off-fault strain rates in the Walker Lane from GPS data, NEHRP Final Technical Report for award *G17AP00004*, February, 2018.

Anderson, J., R. Kohler, ..., **W.C. Hammond**, et al., (18 coauthors), 2018, Report by the 2018 Nevada Working Group, 2018 Working Group on Nevada Seismic Hazards, meeting February 5 and 6, Reno, Nevada.

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](http://serc.carleton.edu/getsi/teaching_materials/gps_strain/index.html)

Boening, C., Limonadi, Watkins, S. Nerem, ..., **W.C., Hammond**, + 78 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 Gorgonio 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**, 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](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](http://www.unavco.org/edu_outreach/resources/gps-strain/majors-gps-strain/module-team/module-team.html).
- Mencin, D., **W.C. Hammond**, and J. Langbein, 2012, Applications of real-time GPS for science and hazard monitoring, Community Workshop on Real-Time GPS Position Data Products and Formats, Boulder, Colorado, March 26-28, 2012, *Eos*, v. 93, no. 50, p. 526.
- Hammond, W.C.**, G. Blewitt, H.-P. Plag, C. Kreemer, 2012, Geodetic imaging of Earth's surface deformation using integrated InSAR and GPS Observations, Final Technical Report for NASA project NNX09AD24G.
- Hammond, W.C.**, C. Kreemer, G. Blewitt, J. Bormann, 2012, GPS Measurement of active crustal deformation of the Lake Tahoe Basin and vicinity, *Friends of the Pleistocene Field Trip Guidebook*, compiled by G. Seitz, Sept. 13-16, 2012.
- Bormann, J., **W.C. Hammond**, C. Kreemer, G. Blewitt, 2012, Using GPS measurements of active crustal deformation to estimate slip rates on the Honey Lake/Warm Springs and Mohawk Valley fault systems, Northern Walker Lane, *Friends of the Pleistocene field trip Guidebook*, compiled by G. Seitz, 2012.
- Briggs, R.W. and **Hammond, W.C.**, 2011, Evaluation of geodetic and geologic datasets in the Northern Walker Lane-Summary and recommendations of the Workshop: U.S. Geological Survey Open-File Report 2010–1282, 76 p.
- Li, Z., **W. C. Hammond**, G. Blewitt, C. Kreemer and H.-P. Plag, 2011, Vertical tectonic signals from integrated InSAR and GPS observations: Southern Walker Lane and Sierra Nevada, NCEO Science highlight, 2011.
- Blewitt, G., H.-P. Plag, **W.C. Hammond**, C. Kreemer, NASA Final technical report for Award NNX08AE75G "Development of a Real-Time Tsunami Warning System using Continuous GPS ", March 25, 2011.
- Hammond, W.C.**, B. A. Brooks, R. Bürgmann, T. Heaton, M. Jackson, A. R. Lowry, S. Anandkrishnan, 2010, The scientific value of high-rate, low-latency GPS data, A White Paper, [http://unavco.org/community\\_science/science\\_highlights/2010/RealTimeGPSWhitePaper2010.pdf](http://unavco.org/community_science/science_highlights/2010/RealTimeGPSWhitePaper2010.pdf).
- Hammond, W.C.** and C. Kreemer, 2010, "The Overall Geodetic Picture", Contribution to the Friends of the Pleistocene 2010 Field Trip Guidebook.
- Kreemer, C. and **W.C. Hammond**, 2010, Geodetic constraints on the slip rate of the Mohawk Valley Fault Zone, California, Final Technical Report for NEHRP Award 08HQGR0027, April 2010.
- Briggs, R.W. and **W.C. Hammond**, 2009, Integration of geodetic and geologic data in the National Seismic Hazard Maps, report on workshop on geodetic and geologic datasets in the Northern Walker Lane, Reno Nevada, 21-22 April 2009, *Eos*, v. 90, no. 38, 22 Sept. 2009.
- Hammond, W.C.**, Geodetic constraints on active deformation of the eastern Nevada Basin and Range near Highway 50, Contribution to Guidebook for the Friends of the Pleistocene field trip, Highway 50 Nevada, ed. R. Koehler, Sept 24-27, 2009.
- Hammond W.C.** and C. Kreemer, 2008, Estimating seismic hazard in the Basin and Range province using horizontal GPS Data, NEHRP final technical report for award 07HQGR0027, March 31, 2008.

- Blewitt, G., **W.C. Hammond**, C. Kreemer, H.-P. Plag, S. Stein, E. Okal, 2008, System design for a GPS component of real-time earthquake source determination and tsunami warning systems, NEHRP Final technical report for awards 07HQGR0011 and 07HQGR0016, February 29, 2008.
- LaPointe, D. D., J. G. Price, C. D. Henry, **W. C., Hammond**, K. D. Smith, E. M. Price, 2007, *Taking the pulse of the Earth, Earth Science Week 2007 Field Trip Guide* (Educational Series E46, 6 p.) Nevada Bureau of Mines and Geology.
- Plag, H.-P., **W.C. Hammond**, D. Pugh, M.N. Tsimplis, 2006, Appraisal of relative sea level rise scenarios for Venice, Final Project Report for the Consorzio Venezia Nuova, Nevada Bureau of Mines and Geology, University of Nevada, Reno.
- Hammond, W.C.**, 2005, The ghost of an earthquake, Perspective for *Science*, v. 310, p. 1440–1442.
- Hammond, W.C.**, 2000, Dynamics, flow and melt content of the southern East Pacific Rise upper mantle from teleseismic tomography, Ph.D. thesis, Univ. of OR, Eugene.

## PRESENTATIONS WITH PUBLISHED ABSTRACTS

### 2024

- Hammond, W.C.**, G. Blewitt, C. Kreemer, D. Argus, 2024, Seasonal amplitude and phase of Central Sierra Nevada and Western Great Basin uplift from robust gap filling of semi-continuous GNSS time series, AGU Fall Meeting, G11A-03, Washington D.C., Dec. 9-13, 2024.
- Unruh, J., A., Bubeck, **W.C. Hammond**, 2024, Transtensional deformation Kinematics in the seismic parabola around the Eastern Snake River Plain, Idaho, Montana, and Utah, Geological Society of America Joint Cordilleran Rocky Mountain section meeting, Spokane, WA, May 15-17, 2024.

### 2023

- Crandall-Bear, A., **W.C. Hammond**, 2023, Seasonal to multi-annual hydrological mass loading changes of the Southern Sierra Nevada and Walker Lane faults from GPS and InSAR time series, AGU Fall Meeting, Dec. 11-15, 2023, San Francisco, CA.
- Miller, N., C. Kreemer, **W.C. Hammond**, 2023, Geodetic evidence for distributed flow below the brittle crust of the Walker Lane, Western United States, AGU Fall Meeting, Dec. 11-15, 2023, San Francisco, CA.
- Hammond, W.C.**, Active crustal strain rates in Western Wyoming and surrounding areas: Very slow but not zero, presentation G12A-04, AGU Fall Meeting, Dec. 11-15, 2023, San Francisco, CA.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, U. Sanli, S. Bakici, 2023, Unique insight into the February 6 2023 Türkiye earthquake doublet from GNSS geodesy, presentation S13C-0365, AGU Fall Meeting, Dec. 11-15, 2023 San Francisco, CA.
- Trotta, S., Binda, G., Morlang, D., Noble, P.J., Pozzi, A., Poulson, S., Stillings, L., **Hammond, W.C.**, Michetti, A.M., 2023, Understanding Earthquake-related Hydrogeochemical Responses: Results from a Long-term Monitoring Study Applied to the 2020's Monte Cristo Seismic Sequence (Nevada), XXI INQUA Congress, Time for Change, Sapienza University, Rome, Italy, July 12-20, 2023.
- Blewitt, G., **W.C. Hammond**, C. Kreemer, D. U. Sanli, S. Bakici, 2023, Unique insight into the Feb 6 2023 Türkiye earthquake sequence from GNSS geodesy, IUGG Berlin 2023, Berlin, Germany, July 11-20, 2023.
- Overacker, J., **W.C. Hammond**, G. Blewitt, C. Kreemer, 2023, Hydrological unloading of the High Plains Aquifer from space geodesy and ground networks, SAGE/GAGE 2023 Community Science Workshop, Pasadena, CA, March 26-29, 2023 [INVITED plenary talk].

### 2022

- Overacker, J., **W.C. Hammond**, G. Blewitt, C. Kreemer, 2022, Vertical land motion of the High Plains Aquifer region of the central United States, AGU Fall Meeting, Dec. 12-16, 2022, Chicago IL [INVITED Oral Presentation].
- Crandall-Bear, A. and **W.C. Hammond**, 2022, InSAR and GPS measurement of co- and post-seismic deformation for the Mw 6.5 Monte Cristo Range, Nevada Earthquake constrain tectonic models in the Mina Deflection, AGU Fall Meeting, Dec. 12-16, 2022, Chicago IL.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, D. Argus, 2022, Robust station score cards characterize and categorize GNSS time series to enhance utility for Earth science, AGU Fall Meeting, Dec. 12-16, 2022, Chicago IL.

- Hammond, W.C.** G. Blewitt, C. Kreemer, D. Argus, 2022, Robust characterization and categorization of GNSS stations to enhance utility for solid Earth science, NASA Solid Earth Team Meeting, La Jolla, CA, November 8-10, 2022.
- Blewitt, G., **W.C. Hammond**, C. Kreemer, D. Argus, 2022, GPS data products and recent NASA-ESI research contributions from NGL, NASA Solid Earth Team Meeting, La Jolla, CA, November 8-10, 2022.
- Hammond, W.C.**, 2022, Bringing recent Basin and Range earthquakes and the seismic cycle into focus with geodetic networks, Basin and Range Earthquake Summit (BRES), Salt Lake City, UT, October 17-21, 2022 [INVITED plenary talk].
- Young, Z., C. Kreemer, **W.C. Hammond**, G. Blewitt, 2022, Interseismic Strain Accumulation Across the Central Basin and Range: Implications for Southern Nevada Seismic Hazard, Basin and Range Earthquake Summit (BRES), Salt Lake City, UT, October 17-21, 2022.
- Pollitz, F. F., C. W. Wicks, J. Svarc, and **W. C. Hammond**, 2022, Kinematic slip models of four moderate Intermountain West earthquakes of 2020 and 2021, Basin and Range Earthquake Summit (BRES), Salt Lake City, UT, October 17-21, 2022 [INVITED plenary talk].
- Kreemer, C., **W.C. Hammond**, Z.M. Young, N. Miller, G. Blewitt, 2022, Geodetic insights into present-day strain accumulation and release in the Walker Lane, AEG Annual Meeting, Las Vegas, NV, Sept. 12-17, 2022.
- Morlang, D, P. Noble, L. Stillings, S. Poulson, **W.C. Hammond**, A. Crandall-Bear, G. Binda, A. Pozzi, S. Trotta, A. M. Michetti, 2022, Hydrochemical response of groundwater and coseismic strain following the 2020 Monte Cristo Range Earthquake sequence within Mineral and Esmeralda counties, NV, Annual conference of the Nevada Water Resources Association, Jan. 31 - Feb. 3, 2022, Las Vegas, NV.
- Hammond, W.C.**, C. Kreemer, G. Blewitt, 2022, Unbiased and robust estimation of fault slip rates in the Walker Lane using spontaneous block modeling of active crustal deformation, 2022, USGS Northern California Earthquake Hazards Workshop, Virtual meeting Jan. 25-27, 2022.

## 2021

- Hammond, W.C.**, C. Kreemer, G., Blewitt, 2021, Unbiased and robust estimation of fault slip rates in the Walker Lane using spontaneous block modeling of active crustal deformation, 2021, AGU Fall Meeting, New Orleans, LA, Dec. 13-17, 2021.
- Overacker, J., **W.C. Hammond**, C. Kreemer, G. Blewitt, 2021, Capturing global earthquakes with the GPS meganetwork, AGU Fall Meeting, New Orleans, LA, Dec. 13-17, 2021.
- Morlang, D., Noble, P., **W.C. Hammond**, A. Crandall-Bear, A., S.R. Poulson, L. Stillings, M.R. Rosen, G. Binda., A. Pozzi, S. Trotta, A.M. Michetti, 2021, Hydrochemical response of groundwater following the 2020 Monte Cristo Range earthquake sequence within Mineral and Esmeralda counties, NV, AGU Fall Meeting, Dec. 13-17, 2021, New Orleans, LA, <https://doi.org/10.1002/essoar.10510296.1>.
- Miller, N., C. Kreemer, **W.C. Hammond**, 2021, No evidence for strain localization above strike-slip faults in the Northern Walker Lane, USA: Invalidation of the elastic dislocation model? AGU Fall Meeting, New Orleans, LA, Dec. 13-17, 2021.
- Kreemer, C., Z. Young, **W. C. Hammond**, and G. Blewitt, 2021, A holistic approach to modeling contemporary crustal deformation in the Western U.S. by comparing and integrating geodetic, geologic and seismologic data, AGU Fall Meeting, New Orleans, LA, Dec. 13-17, 2021.
- Young, Z.M., C. Kreemer, **W.C. Hammond**, G. Blewitt, 2021, Interseismic strain accumulation between the Colorado Plateau and the Eastern California Shear Zone: Implications for the seismic hazard near Las Vegas, Nevada, AGU Fall Meeting, New Orleans, LA, Dec. 13-17, 2021.
- Yuan, P., G. Blewitt, C. Kreemer, **W.C. Hammond**, D. Argus, H. Kutterer, 2021, A high temporal resolution integrated water vapor dataset from more than 10,000 global ground-based GPS stations in 2020, AGU Fall Meeting, New Orleans, LA, Dec. 13-17, 2021.
- Pollitz, F., C.W. Wicks, and **W.C. Hammond**, 2021, Kinematic slip model of the July 8, 2021 M6.0 Antelope Valley earthquake, AGU Fall Meeting, New Orleans, LA, Dec. 13-17, 2021.
- Overacker, J., **W.C. Hammond**, C. Kreemer, G. Blewitt, 2021, Evaluating a Global Dataset of GPS Earthquake Offsets for Catalog Completeness, SAGE/GAGE Virtual Workshop, Aug. 17-19, 2021.
- Crandall-Bear, A., and **W.C. Hammond**, 2021, Complementary GPS and InSAR Data are Required to Constrain Models of Active Tectonic Deformation using the Mw 6.5 Monte Cristo Range, Nevada Earthquake, SAGE/GAGE Virtual Workshop, Aug. 17-19, 2021.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2021, Optimizing MAGNET for a wet world: Semi-continuous GNSS network observation strategies that address hydrological loading, SAGE/GAGE Virtual Workshop, Aug. 17-19, 2021.

Crandall-Bear, A., and **W.C. Hammond**, 2021, Testing models of active tectonics in the Central Walker Lane using satellite geodetic measurement of the Mw 6.5 Monte Cristo Range Earthquake, 2021 SSA Virtual Annual Meeting, April 19-23, 2021.

## 2020

Overacker, J., **W. C. Hammond**, C. Kreemer, G. Blewitt, Exploring the limits of earthquake offset detection in GPS geodesy, AGU Fall Meeting, Dec. 7-11, 2020.

**Hammond, W.C.**, G. Blewitt, C. Kreemer, 2020, GPS Imaging of vertical and horizontal crustal motion across the Centennial Tectonic Belt and eastern Snake River Plain of central Idaho, western United States, AGU Fall Meeting, Dec. 7-11, 2020.

Martens., H., D. Argus, C. Norberg, G. Blewitt, T.A. Herring, A.W. Moore, **W.C. Hammond**, C. Kreemer, 2020, Non-tidal atmospheric loading and GPS data processing, AGU Fall Meeting, Dec. 7-11, 2020.

Faulds, J. E., R. Koehler, **W. C. Hammond**, 2020, The Walker Lane: An incipient plate boundary dissecting the American West and potential heir to the San Andreas Fault, AEG Annual Meeting, Sept. 16-18, 2020.

Floyd, M., T. Herring, Z.-K. Shen, J. Murray, **W.C. Hammond**, M. Murray, 2020, Current status and future plans for the Community Geodetic Model (GNSS) products, 2020 SCEC Annual Meeting, Sept. 14-17, 2020 (virtual).

García Cañada, L., and **W.C. Hammond**, 2020, Advances in GNSS time series filtering for volcano monitoring in the Canary Islands, May 26-29, 2020, Asamblea Hispano Portuguesa de Geodesia y Geofísica, Toledo, Spain, <https://congreso.ign.es/web/10asambleahpgg/inicio>.

D'Agostino, N. and **W.C Hammond**, 2020, GPS Imaging of mantle driven uplift of the Apennines, Italy, Geophys. Res. Abs.,v. 22, EGU2020-13278, EGU Meeting, Vienna Austria, May 3-8, 2020.

Funning, G., M. Floyd, R. Terry, Y. Fialko, **W.C. Hammond**, T. Herring, 2020, Deformation before, during, and after the 2019 Ridgecrest earthquakes from campaign and continuous GNSS data, SSA Annual Meeting, Albuquerque, NM, April 27-30, 2020, [INVITED - Meeting cancelled owing to COVID-19].

## 2019

**Hammond, W.C.**, C. Kreemer, G. Blewitt, 2019, Geodetic observations suggest Sierra Nevada Hydrological loading encouraged the July 2019 Ridgecrest/Searles Valley earthquake sequence, AGU Fall Meeting, San Francisco, CA, December 9-13, 2019, [INVITED].

**Hammond, W.C.**, and N. D'Agostino, 2019, GPS Imaging of uplift and extension in the Apennines, Italy, AGU Fall Meeting, San Francisco, CA, December 9-13, 2019.

Overacker, J., **W.C. Hammond**, G. Blewitt, C. Kreemer, 2019, Investigating Vertical Motions in the Ogallala Aquifer Region of the United States: Is Anthropogenic Activity Causing Crustal Uplift?, AGU Fall Meeting, San Francisco, CA, December 9-13, 2019.

Blewitt, G., C. Kreemer, **W.C. Hammond**, D. Argus, 2019, Improved GPS position time series spanning up to 25 years for over 18,000 stations resulting from IGS Repro3 products, JPL's GipsyX software, and more advanced modeling techniques, AGU Fall Meeting, San Francisco, CA, December 9-13, 2019.

Floyd, M., G. Funning, R. Terry, T. Herring, Y. Fialko, J. Haase, B. Brooks, **W.C. Hammond**, 2019, Pre-Earthquake deformation, coseismic displacements and post-earthquake transient motions in the region of the Ridgecrest earthquakes from survey and continuous GNSS observations, S43C-01, AGU Fall Meeting, San Francisco, CA, December 9-13, 2019.

**Hammond, W.C.**, and N. D'Agostino, 2019, GPS Imaging of mantle flow and flexural uplift of the Apennines, Italy, 2019 SAGE/GAGE Workshop, Oct. 9-11, 2019, Portland, OR.

Overacker, J., **W.C. Hammond**, G. Blewitt, C. Kreemer, 2019, GPS Imaging of crustal uplift in the High Plains Aquifer, Central United States, 2019 SAGE/GAGE Workshop, Oct. 9-11, 2019, Portland, OR.

Faulds, J.E, R. Koehler, **W. C. Hammond**, C. Carlson, I. Pierce, C.M. dePolo, and C.D. Henry, 2019, The Walker Lane-Eastern California Shear Zone, potential heir to the San Andreas Fault: Outstanding regional-scale research questions and lessons learned from geodesy, historical seismicity, and long-term evolution, Geological Society of America Annual Meeting, Sept. 22-25, 2019, Phoenix, AZ.

Funning, G., B. Brooks, Y. Fialko, M. Floyd, J. Haase, **W.C. Hammond**, D. Sandwell, J. Svarc, X. Xu, 2019, Initial geodetic results from the response to the 2019 Ridgecrest earthquake sequence, Geological Society of America Annual Meeting, Sept. 22-25, 2019, Phoenix, AZ.

Hatch, R., K. Smith, R. Abercrombie, C. Ruhl, **W.C. Hammond**, I. Pierce, 2019, Conjugate structures in the Walker Lane: Characteristics of the The Nine Mile Ranch Sequence from 2016-2019 and a comparison to the Ridgecrest Sequence of 2019, Sept. 8-10, 2019 SCEC Annual Meeting.

- Caron, L., E. Ivins, G. Blewitt, C. Kreemer, **W.C. Hammond**, 2019, Quantifying the information content of relative sea-level and geodetic data for constraint on North American GIA models, IUGG Symposium, July 8-18, 2019, Montreal, Quebec.
- Overacker, J., **W.C. Hammond**, G. Blewitt, C. Kreemer, 2019, GPS Imaging and Interpretation of Vertical Motion of the Cascade Arc, IUGG Symposium, July 8-18, 2019, Montreal, Quebec.
- Hatch, R., K. Smith, R. Abercrombie, C. Ruhl, **W.C. Hammond**, I. Pierce, 2019, Relocations and tectonic implications of the Nine Mile Ranch sequence from 2016-2018: 3  $M_w$  5.4-5.6 near Hawthorne, Nevada, SSA Annual Meeting, Seattle, WA, April 23-26, 2019.
- Hammond, W.C.**, C. Kreemer, G. Blewitt, 2019, Robust animation of time variable Earth surface deformation using 3D GPS Imaging: Example of the Central Walker Lane and Long Valley Caldera, Geophys. Res. Abs., v. 21, EGU2019-11549, EGU Meeting, Vienna Austria, April 7-12, 2019.
- Blewitt, G., C. Kreemer, **W.C. Hammond**, 2019, GGOS bearing essential fruit: Globally-consistent land motion and integrated water vapor from >17,000 Sites, Geophys. Res. Abs., v. 21, EGU2019-11599, EGU Meeting, Vienna Austria, April 7-12, 2019.
- Caron, L., E. Ivins, C. Kreemer, G. Blewitt, **W.C. Hammond**, 2019, Quantifying the information content of relative sea-level and geodetic data for constraint on North American GIA models, Geophys. Res. Abs., v. 21, EGU2019-6821, EGU Meeting, Vienna Austria, April 7-12, 2019.
- Năstase, E.I., V. Mocanu, A. Muntean, A.A.C. Boudewijn, C. Kreemer, **W.C. Hammond**, G. Blewitt, S. Nistor, D. Tătaru, 2019, Integrated GNSS and seismotectonic study of the slow lithospheric deformation in NW Galati seismogenic area, Geophys. Res. Abs., v. 21, EGU2019-13090, EGU Meeting, Vienna Austria, April 7-12, 2019.
- Faulds, J., R. Koehler, S. Dee, C. dePolo, **W.C. Hammond**, 2019, Finding fault with the Basin and Range Province: opportunities and challenges in evaluating active faults in an integral part of an evolving plate boundary, Keynote talk at AEG Foundation Shlemon Specialty Conference, Las Vegas, NV, March 28-29, 2019.
- Hammond, W.C.**, and G. Blewitt, 2019, GPS Imaging of non-seasonal uplift variability: A new method for separating tectonic versus non-tectonic vertical land motion, NASA Sea Level Change Team Meeting, Annapolis, MD, March 11-13, 2019.
- Heijkoop, E.R., **W.C. Hammond**, R.S. Nerem, M.J. Willis, G. Blewitt, 2019, Estimating global vertical land motion from GPS for relative sea level change studies, NASA Sea Level Change Team Meeting, Annapolis, MD, March 11-13, 2019.

## 2018

- Kreemer, C., G. Blewitt, **W.C. Hammond**, 2018, Estimation of North America Plate rotation in the presence of intraplate deformation, Fall AGU Meeting, Washington, D.C., Dec. 10-14, 2018 [INVITED].
- Blewitt, G., C. Kreemer, **W.C. Hammond**, 2018, Assessment of GPS time series from 17,000 stations using JPL Re-pro 3.0 products in the IGS14 framework, Fall AGU Meeting, Washington, D.C., Dec. 10-14, 2018.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2018, GPS Imaging of non-seasonal uplift variability in California and Nevada: A key for separating tectonic versus non-tectonic vertical land motion, Fall AGU Meeting, Washington, D.C., Dec. 10-14, 2018.
- Heijkoop, E.R., R.S. Nerem, **W.C. Hammond**, G. Blewitt, K.F. Tiampo, 2018, Using satellite measurements to improve regional estimates of the impacts of sea level change, Fall AGU Meeting, Washington, D.C., Dec. 10-14, 2018.
- Adhikari, S., E. Ivins, L. Caron, J. Nilsson, S.A. Kahn, E. Larour, G. Blewitt, A.S. Gardner, **W.C. Hammond**, 2018, Climate-driven bedrock displacements in Greenland and Antarctica, Fall AGU Meeting, Washington, D.C., Dec. 10-14, 2018.
- Blewitt G., C. Kreemer, **W.C. Hammond**, 2018, Going beyond reference frames to improve them: The example of GIA-induced horizontal deformation, COSPAR 42nd Assembly, Pasadena, CA July 14-22, 2018.
- Năstase, E. I., V. Mocanu, A. Muntean, A.A.C. Boudewijn, C. Kreemer, **W.C. Hammond**, G. Blewitt, S. Nistor, D. Tătaru, Integrated GNSS and seismotectonic study of the NW Galati seismogenic area, 18th International Balkan Workshop on Applied Physics and Materials Science, July 10-13, 2018 Constanta, Romania.
- Blewitt G., C. Kreemer, **W.C. Hammond**, 2018, Prospect for robust constraints on glacial isostatic adjustment models using GPS Imaging of ultra-low strain rates, Geophys. Res. Abs., v. 20, EGU2018-18788, EGU Meeting, Vienna Austria, April 8-13, 2018.
- Hammond, W.C.**, C. Kreemer, G. Blewitt, 2018, Robust estimation of fault slip rates in the Walker Lane using GPS Imaging and Spontaneous Blocks, UNAVCO Science Workshop, Broomfield, CO, March 27-29, 2018.
- Blewitt, G., **W.C. Hammond**, C. Kreemer, 2018, Harnessing the GPS data explosion for tomorrow's

science applications, UNAVCO Science Workshop, Broomfield, CO, March 27-29, 2018.

- Kreemer, C., **W.C. Hammond**, G. Blewitt, 2018, Extracting subtle secular and seasonal horizontal strain rate signals from noisy GPS data, UNAVCO Science Workshop, Broomfield, CO, March 27-29, 2018.
- Kraner, M., A. Borsa, **W.C. Hammond**, C. Kreemer, 2018, Investigating the hydrological source of seasonal GPS motions in Central California, UNAVCO Science Workshop, Broomfield, CO, March 27-29, 2018.
- Overacker, M., **W.C. Hammond**, G. Blewitt, C. Kreemer, 2018, Investigating vertical deformation in the interior Pacific Northwest shown by GPS Imaging, , UNAVCO Science Workshop, Broomfield, CO, March 27-29, 2018.
- Năstase, E. I., C. Kreemer, **W.C. Hammond**, A. Muntean, 2018, Overview of GNSS Research in Romania for Geodynamic Studies, UNAVCO Science Workshop, Broomfield, CO, March 27-29, 2018.
- Murray, J., M. Floyd, T. Herring, A. Borsa, **W.C. Hammond**, Z. Liu, Z.-K. Shen, 2018, The SCEC Community Geodetic Model: Development of a consensus Global Positioning System time series data set and velocity field, UNAVCO Science Workshop, Broomfield, CO, March 27-29, 2018.
- Hammond, W.C.**, C. Kreemer, G. Blewitt, 2018, Robust estimation of fault slip rates using GPS Imaging in the Walker Lane and Western Great Basin, 2018 Working Group on Nevada Seismic Hazards, February 5-7, Reno, Nevada.
- Kreemer, C., Z. Young, **W.C. Hammond**, G. Blewitt, Robust estimation of the secular and time-variable strain rate field in the American Southwest, 2018 Working Group on Nevada Seismic Hazards, February 5-7, Reno, Nevada.
- Bormann, J., **W.C. Hammond**, C. Kreemer, G. Blewitt, 2018, GPS constraints on present-day slip rates in the northernmost Walker Lane: Reno, Carson City, and Tahoe region, Nevada and California, 2018 Working Group on Nevada Seismic Hazards, February 5-7, Reno, Nevada.

## 2017

- Overacker, J., **W. C. Hammond**, M. L. Kraner, G. Blewitt, 2017, Using GPS Imaging to unravel vertical land motions in the interior Pacific Northwest, Abstract NH31B-0216, Fall AGU Meeting, New Orleans, LA, Dec. 11-15, 2017.
- Hammond, W.C.**, C. Kreemer, G. Blewitt, 2017, GPS Imaging suggests links between climate, magmatism, seismicity, and tectonics in the Sierra Nevada-Long Valley Caldera-Walker Lane system, western United States, Abstract G41A-02, Fall AGU Meeting, New Orleans, LA, Dec. 11-15, 2017.
- Hammond, W.C.**, 2017, Effects of water on active crustal deformation in California and Nevada from GPS data, NSF EarthScope Hydrogeodesy Synthesis Workshop, UC San Diego, Scripps IGPP, October 25-27, 2017, [INVITED].
- Kraner, M.L., **W.C. Hammond**, C. Kreemer, I. Zaliapin, 2017, Seasonal variation of strain in Central California and its correlation with seismicity, NSF EarthScope Hydrogeodesy Synthesis Workshop, UC San Diego, Scripps IGPP, October 25-27, 2017.
- Kraner, M.L., **W. C. Hammond**, C. Kreemer, and I. Zaliapin, 2017, Correlating seasonal strain patterns to seismicity in central California, SCEC Annual Meeting, Palm Springs, CA, Sept 10-13, 2017.
- Kreemer, C., **W.C. Hammond**, G. Blewitt, W.R. Peltier, K. Roy, 2017, Constraints on intra-continental strain rates and glacial isostatic adjustment from thousands of GPS velocities, IGS Workshop 2017, Paris, France, July 3-7, 2017.
- Blewitt, G., C. Kreemer, **W.C. Hammond**, 2017, Robust realization of a no-net rotation reference frame on a deforming tectonic plate, IAG Symposium, July 30-Aug. 6, Kobe, Japan.
- Hammond, W.C.**, and L. Flesch, 2017, Eye-popping EarthScope Science: A synthesis, celebration and exploration of new horizons for geodetic and geodynamic imaging, Plenary Talk at EarthScope National Meeting, Anchorage Alaska, May 26-28, 2017 [INVITED].
- Overacker, J., **W.C. Hammond**, G. Blewitt, M. Kraner, 2017, GPS Imaging of Pacific Northwest vertical land motions, EarthScope National Meeting, Anchorage Alaska, May 26-28, 2017.
- Kreemer, C., **W.C. Hammond**, G. Blewitt, 2017, A robust estimation of the North American intra-continental strain rate field with implications for seismic hazard, SSA Annual Meeting, Denver CO, April 18-20, 2017 [INVITED].

## 2016

- Blewitt G., C. Kreemer, **W.C. Hammond**, 2016, Fixing a reference frame to a moving and deforming continent, Abstract G34B-02, Fall AGU Meeting, San Francisco, CA [INVITED].

- Hammond, W.C.**, G. Blewitt, 2016, GPS Imaging of time-variable earthquake hazard: The Hilton Creek fault, Long Valley California, Abstract G51B-1112, Fall AGU Meeting, San Francisco, CA.
- Kraner, M., **W. C. Hammond**, C. Kreemer, A.A. Borsa, G. Blewitt, 2016, GPS Imaging of time-dependent seasonal strain in Central California, Abstract G42A-01, Fall AGU Meeting, San Francisco, CA.
- Anderson, B.J., R. Schumer, S.W. McCoy, **W. C. Hammond**, 2016, Analysis of fault rupture potential resulting from large-scale groundwater withdrawal: Application to Spring Valley, Nevada, Abstract S31B-2751, Fall AGU Meeting, San Francisco, CA.
- Kraner, M., **W. C. Hammond**, C. Kreemer, 2016, GPS Imaging of Time-Dependent Seasonal Strain in Central California, SCEC Annual Meeting, Palm Springs, CA Sept. 9-11, 2016.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, R. Burgette, K. Johnson, C. Meertens, F. Boler, 2016, New Constraints on Uplift and Earthquake Potential in Southern California from Geodetic Imaging of Vertical Crustal Motion, SCEC Annual Meeting, Palm Springs, CA Sept. 11-14, 2016 [INVITED KEYNOTE].
- Brailo, C., G.M. Kent, S.G. Wesnousky, **W.C. Hammond**, A.M. Kell, I.K. Pierce, C.J. Ruhl, K. D. Smith, 2016, A LiDAR and GPS study of the greater Truckee Meadows: Evidence for a distinct transition from primarily east-west dominated extension to NW-trending right-lateral slip centered in Reno, Nevada, SSA Annual Meeting, April 20-22, 2016, Reno, NV.
- Wesnousky, S.G., I.K. Pierce, E. Milawsky, J. Louie, C. Kreemer, **W.C. Hammond**, J. Faulds, C. Carlson, J. Brune, J.M. Bormann, 2016, Neotectonics Brings Interesting Challenges To The Assessment Of Seismic Hazard In The Northern Walker Lane, SSA Annual Meeting, April 20-22, 2016, Reno, NV.
- Kreemer, C., **W.C. Hammond**, G. Blewitt, 2015, GPS Imaging of the North American Intracontinental Strain Rate Field, SSA Annual Meeting, April 20-22, 2016, Reno, NV.
- Meertens, C., F. Boler, S. Wier, G. Blewitt, **W.C. Hammond**, C. Kreemer (2016). Plug and Play GPS for Earth Scientists: Providing Immediate Access to Low-Latency Geodetic Products for Rapid Modeling and Analysis of Natural Hazards, 2016 UNAVCO Science Workshop Abstracts, March 28-31, Broomfield, CO.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2016, GPS Imaging of crustal strain and uplift rates in the western United States, UNAVCO Science Workshop, Broomfield, CO, March 28-31, 2016.
- Kraner, M., C. Kreemer, **W.C. Hammond**, G. Blewitt, 2016, Anatomy of Seasonal Motion in California: How Well Can GPS Data Determine the Station's Geologic Setting?, UNAVCO Science Workshop, Broomfield, CO, March 28-31, 2016.
- Blewitt, G., **W.C. Hammond**, C. Kreemer, 2016, Operational GPS Imaging system at multiple scales for Earth science and monitoring of geohazards, Abstract EGU 17867, 2016-European Geoscience Union General Assembly, Vienna, Austria, April 17-22, 2016 [INVITED].
- Faulds, J.E., N. H. Hinz, M. F. Coolbaugh, D. L. Siler, L. A. Shevenell, J. H. Queen, C. M. dePolo, **W. C. Hammond**, and C. Kreemer, 2015, Discovering geothermal systems in the Great Basin region: An integrated geologic, geochemical, and geophysical approach for establishing geothermal play fairways, 41st Annual Stanford Geothermal Workshop, February 22-24, 2016.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, GPS Imaging of the Uplift of the Sierra Nevada Mountain Range, Western United States, Keynote Talk at the 11th Annual AfricaArray Workshop, Johannesburg, South Africa, 2016 [INVITED KEYNOTE].

## 2015

- Tamisiea, M., S. P. D. Williams, C.W. Hughes, R.M. Bingley, G. Blewitt, **W.C. Hammond**, C. Kreemer, 2015, Multiple geodetic observations for identifying glacial isostatic adjustment and the causes of sea-level change, AGU Fall meeting session G53A-08, Dec. 14-18, San Francisco, CA.
- Meertens, C., F. Boler, S. Wier, G. Blewitt, **W.C. Hammond**, C. Kreemer, 2015, Plug and Play GPS for Earth Scientists: Providing Immediate Access to Low-Latency Geodetic Products for Rapid Modeling and Analysis of Natural Hazards, AGU Fall meeting session G11B-0983, Dec. 14-18, San Francisco, CA.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2015, GPS Imaging of Sierra Nevada uplift, AGU Fall meeting session G21C-06, Dec. 14-18, San Francisco, CA [INVITED].
- Hammond, W.C.**, G. Blewitt, B. Hamlington, 2015, GPS imaging of global vertical land motion for sea level studies, AGU Fall meeting session G53A-04, Fall AGU Dec. 14-18, San Francisco, CA.
- Blewitt, G., **W.C. Hammond**, C. Kreemer, 2015, GPS Imaging of solid Earth flex and flow: A new paradigm, session U009, Fall AGU Dec. 14-18, San Francisco, CA [INVITED].
- Blewitt, G., **W.C. Hammond**, C. Kreemer, Z. Altamimi, 2015, Independent assessment of ITRF site velocities using GPS imaging, session G017, Fall AGU Dec. 14-18, San Francisco, CA, [INVITED].
- Hammond, W.C.**, G. Blewitt, B. Hamlington, 2015, GPS Imaging of global vertical crustal motion for sea level studies, NASA Sea level change workshop, UCLA Conference center, Lake Arrowhead, CA, November 10-12, 2015.

- Burgette, R., K. Johnson, **W.C. Hammond**, 2015, Observations of vertical deformation across the western Transverse Ranges and constraints on Ventura area fault slip rates, SCEC Annual Meeting, Palm Springs, CA Sept. 9-11, 2015.
- Shaw, J.H., M. Barrall, R. Burgette, J. F. Dolan, E. Geist, J. Grenader, T. Gobel, **W.C. Hammond**, E. Hauksson, J.A. Hubbard, K. Johnston, L. McAuliffe, S. Marshall, C. Nicholson, D. Oglesby, A. Plesch, L. Reynolds, T. Rockwell, K. Ryan, A. Simms, C. Sorlien, C. Tape, H.K. Thio, and S. Ward, 2015, The Ventura special fault study area: Assessing the potential for large, multi-segment thrust fault earthquakes and their hazard implications, SCEC Annual Meeting, Palm Springs, CA Sept. 9-11, 2015.
- Wesnously, S. G., J. Bormann, C. Kreemer, **W. C. Hammond**, and J. Brune, 2015, Neotectonics, geodesy, and seismic hazard in the northern Walker Lane of western North America: Thirty kilometers of crustal shear and no strike-slip?, 6<sup>th</sup> International INQUA meeting on Paleoseismology, Active Tectonics, and Archaeoseismology, April 19-24, Pescara, Italy Miscellanea INGV, Abstracts Volume 6<sup>th</sup> International INQUA meeting, Anno 2015-Numero 27, ISSN 2039-6651, 529-532, [INVITED].
- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2015, GPS Imaging of solid Earth flex and flow using EarthScope networks, EarthScope National Meeting, Stowe, VT, June 14-17, 2015 [INVITED].
- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2015, GPS Imaging of solid Earth flex and flow: The future of geodetic networks, Lightning talk with white paper for NSF workshop on *Future Seismic and Geodetic Facility Needs in the Geosciences*, Lansdowne Resort and Conference Center, Leesburg, United States, May 4-6, 2015 [INVITED].
- G. de Lamare, R. Weldon, D Yule, **W. C. Hammond**, T. Freeman, and A. Rodriguez, 2015, San Andreas Fault surface deformation modeling for protection of critical southern California infrastructure, SSA Annual Meeting, Pasadena, CA, April 21-23, 2015.

## 2014

- Hammond W.C.**, C. Kreemer, and G. Blewitt, 2014, Co- and postseismic slip on the West Napa Fault seen with GPS after the South Napa Earthquake of August 24, 2014, S33F-4907, Fall AGU Dec. 15-19, San Francisco, CA.
- Resor, P.G., V.S. Cronin, **W.C. Hammond**, B. Pratt-Sitaula, S.E. Olds, 2014, A Teachable Moment in Earth Deformation: An Undergraduate Strain Module Incorporating GPS Measurement of the August 24, 2014 M6.0 South Napa Earthquake, S33F-4951, Fall AGU Dec. 15-19, San Francisco, CA.
- Chacko, R., **W. C. Hammond**, G. Blewitt, 2014, Magmatic-Tectonic Interactions: Implications for Seismic Hazard Assessment in the Long Valley Caldera Region, G31A-0407, Fall AGU Dec. 15-19, San Francisco, CA.
- Hammond, W.C.**, C. Kreemer, G. Blewitt, J. Broermann, R. A. Bennett, 2014, Geodetic constraints on fault slip rates and seismic hazard in the greater Las Vegas area, T33E-05, Fall AGU Dec. 15-19, San Francisco, CA [INVITED].
- Blewitt, G, C. Kreemer, **W.C. Hammond**, 2014, Robust, automatic GPS station velocities and velocity time series, G23B-0489, Fall AGU Dec. 15-19, San Francisco, CA.
- C. B. Amos, P. Audet, **W. C. Hammond**, R. Bürgmann, I.A. Johanson, and G. Blewitt, 2014, Uplift and seismicity driven by groundwater depletion in central California, Fall AGU Dec. 15-19, San Francisco, CA [INVITED].
- C. B. Amos, P. Audet, **W. C. Hammond**, R. Bürgmann, I.A. Johanson, and G. Blewitt, 2014, Uplift and seismicity driven by groundwater depletion in central California, GSA Annual Meeting, Vancouver BC, [INVITED].
- Johnson, K., **W.C. Hammond**, R. Burgette, 2014, Geodetic constraints on shortening, uplift, and fault slip across the Ventura Basin, SCEC Annual meeting, Palm Springs, CA, Sept. 6-10, 2014.
- Hammond, W.C.**, R. Burgette, K. Johnson, 2014, Measuring Ventura Area Uplift: A four-technique geodetic study of vertical tectonics combining GPS, InSAR, leveling and tide gauges, SCEC Annual meeting, Palm Springs, CA, Sept. 6-10, 2014.
- Blewitt, G., C.B. Amos, P. Audet, **W.C. Hammond**, R. Bürgmann, I.A. Johanson, 2014, Regional variation in near-surface mass and coulomb stress inferred by GPS, Wegener 2014 Conference, Measuring and Modeling our Dynamic Planet, Leeds, UK, Sept 1-4, 2014.
- Amos, C.B, P. Audet, **W.C. Hammond**, R. Bürgmann, I.A. Johanson, G. Blewitt, 2014, Uplift and seismicity driven by groundwater depletion in central California, 3rd Biennial Structure and Tectonics Forum, SERC, in Golden, CO, June 14-20, 2014.
- Goldfarb, J., J. Broermann, G. Blewitt, **W.C. Hammond**, R.A. Bennett, C. Kreemer, 2014, What fraction of common-mode errors in the NA12 datum are artifacts of GPS data processing? 2014 UNAVCO Science Workshop, Broomfield, Colorado, March 4-6, 2014.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, K. Johnson, R. J. Weldon, 2014, Vertical crustal motion across southern California fault systems from GPS and InSAR, 2014 UNAVCO Science Workshop, Broomfield, Colorado, March 4-6, 2014.



- Hammond, W.C.**, K. Johnson, G. Blewitt, C. Kreemer, R. J. Weldon, R. Burgette, 2014, GPS and InSAR constraints on vertical tectonic motion improve the estimate of slip rate of the San Andreas Fault in southern California, EGU General Assembly, Vienna, Austria, April 7-12, *Geophysical Research Abstracts*, v. 16, 2014.
- Amos C, P. Audet, **W. C. Hammond**, R. Bürgmann, I. A. Johanson, and G Blewitt, 2014, A human-induced mechanism for mountain uplift of the Sierra Nevada and seismicity modulation on the San Andreas Fault, EGU General Assembly, Vienna, Austria, April 7-12, *Geophysical Research Abstracts*, v. 16, 2014.
- Zhang, Y., C. Kreemer, **W.C. Hammond**, G. Blewitt, 2014, Geodetic inversion of afterslip in viscoelastic Earth media for the 2011 Mw=9.0 Tohoku Earthquake, EGU General Assembly, Vienna, Austria, April 7-12, *Geophysical Research Abstracts*, v. 16, 2014.

## 2013

- Hammond, W.C.**, J.M. Bormann, G. Blewitt, C. Kreemer, 2013, A province-scale block model of Walker Lane and western Basin and Range crustal deformation constrained by GPS observations, Fall AGU, G43C-08, San Francisco, CA, Dec 9-13, 2013, [INVITED].
- Hammond, W.C.**, K. Johnson, R. J. Weldon, G. Blewitt, R. Burgette, 2013, A new look at vertical motion around the San Andreas Fault in the Southern California from integrated GPS and InSAR measurements, Fall AGU session G41C-02, San Francisco, CA, Dec 9-13, 2013.
- Blewitt, G., C. Kreemer, **W.C. Hammond**, 2013, EarthScope's Plate Boundary Observatory as the mother of invention, Fall AGU, S24A-01, San Francisco, CA, Dec 9-13, 2013 [INVITED].
- Blewitt, G., **W.C. Hammond**, S. Nerem, 2013, Regional sea level variation: California coastal subsidence, Fall AGU, G33C-02, San Francisco, CA, Dec 9-13, 2013 [INVITED].
- Kreemer, C., G. Blewitt, **W.C. Hammond**, 2013, The GPS velocity field in the Western U.S. and what it tells us about earthquakes, seismic hazard, and driving forces, Fall AGU, S23C-05, San Francisco, CA, Dec 9-13, 2013 [INVITED].
- Amos C, P. Audet, **W. C. Hammond**, R. Bürgmann, I. A. Johanson, and G Blewitt, 2013, Contemporary vertical uplift and modulation of seismicity due to groundwater removal in the southern San Joaquin Valley of California, Fall AGU, G43A-0955, San Francisco, CA, Dec 9-13, 2013.
- Zhang, Y., C. Kreemer, **W.C. Hammond**, G. Blewitt, 2013, Evidence for viscoelastic relaxation following the 2011 Mw 9.0 Tohoku Earthquake using GPS, Fall AGU, G31C-07, San Francisco, CA, Dec 9-13, 2013.
- Hammond, W.C.**, J. Bormann, G. Blewitt, C. Kreemer, 2013, Walker Lane and western Basin and Range transtension and rotation rates from GPS observations, continuum and block models, GSA Annual Meeting Session No. 85 T205, Denver CO, Oct. 27-30, 2013 [INVITED].
- Johnson, K., **W.C. Hammond**, R. J. Weldon, G. Blewitt, R. Burgette, Modeling to reconcile geodetic estimates of shortening rates and vertical motion in the Western Transverse Ranges, SCEC Annual Meeting, Palm Springs, CA, September 8-11, 2013.
- Hammond, W.C.** and J. Bell, Structural controls on geothermal reservoir deformation at Stillwater, Nevada from InSAR and GPS Data, Geothermal Resources Council Annual Meeting, Las Vegas, NV, Sept. 30-Oct. 2, 2013.
- Blewitt, G., **W.C. Hammond**, S. Nerem, Geodetic observations of California coastline subsidence, NRC Sea level workshop, Irvine, CA, June 20-21, 2013, [INVITED].
- Hammond, W.C.**, C. Kreemer, G. Blewitt, Seismic hazard in the eastern Nevada and western Utah Basin and Range from GPS measurements, SSA Annual Meeting, Salt Lake City, Utah, April 17-19, 2013.
- Bormann, J., **W.C. Hammond**, G. Blewitt, C. Kreemer, S. Jha, A synoptic model of fault slip rates in the Eastern California Shear Zone and Walker Lane from GPS velocities for seismic hazard studies, SSA Annual Meeting, Salt Lake City, Utah, April 17-19, 2013.
- Kreemer, C., G. Blewitt, **W.C. Hammond**, J. Bormann, R.A. Bennett, Improved seismic hazard assessment for the Colorado Plateau region from new geodetic data, SSA Annual Meeting, Salt Lake City, Utah, April 17-19, 2013.
- Blewitt G., H.-P. Plag, Y. Bar-Sever, C. Kreemer, **W.C. Hammond**, J. Goldfarb, GPS time series in ITRF and derivative frames: Trade-offs between precision, frequency, and latency, EGU General Assembly, Vienna, Austria, April 7-12, *Geophysical Research Abstracts*, v. 15, 2013.

## 2012

- Bormann, J., **W.C. Hammond**, C. Kreemer, G. Blewitt, 2012, Active transtensional deformation in the Northern Walker Lane: A detailed geodetic study of the Mohawk Valley and Honey Lake/Warm Springs fault systems, AGU Fall Meeting, G22B-03, 2012 San Francisco, CA, Dec. 3-7, 2012.
- Dickinson, H., A. Freed, **W.C. Hammond**, Insights into the rheology of the upper mantle in Western Nevada from a combined postseismic and lake unloading study, AGU Fall Meeting, MR23C-2420, San Francisco, CA, Dec 3-7, 2012.

- Cronin, V., B. Pratt-Sitaula, P. Resor, S. Olds, N. West, **W.C. Hammond**, C. Kreemer, 2012, Developing a curricular module for introductory geophysics or structural geology courses to quantify crustal strain using PBO GPS velocities, AGU Fall Meeting, ED41B-0681, San Francisco, CA, Dec 3-7, 2012.
- Resor, P. V. Cronin, **W.C. Hammond**, C. Kreemer, S. Olds, B. Pratt-Sitaula, N. West, 2012, Using EarthScope Plate Boundary Observatory GPS velocities to introduce strain to undergraduate structural geology students, GSA Annual Meeting, Session T60, Charlotte, NC, November 4-7, 2012.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, Using GPS geodesy to assess very low strain rates in the North American continent, USGS Mid-continent Geodesy Workshop, Oct. 31-Nov.1 Evanston, IL [INVITED].
- Kreemer, C., G. Blewitt, **W.C. Hammond**, GPS data and its use in large-scale crustal deformation models, Earth-Cube End-User Domain Workshop for EarthScope, Oct. 29-30, Arizona State University, Tempe Arizona, [INVITED].
- Hammond, W.C.**, C. Kreemer, G. Blewitt, 2012, Potential contributions of geodesy to monitoring volcanic unrest in the southwest United States, USGS Workshop on Volcanism in the American Southwest, Flagstaff, AZ October 18-20, 2012 [INVITED].
- Hammond, W.C.**, C. Kreemer, G. Blewitt, J. Bormann, 2012, GPS Measurement of active crustal deformation of the Lake Tahoe Basin and vicinity, *Friends of the Pleistocene Pacific Cell Field Trip*, Lake Tahoe, CA/NV, September 14-16, 2012
- Bormann, J., **W.C. Hammond**, C. Kreemer, G. Blewitt, 2012, Using GPS measurements of active crustal deformation to estimate slip rates on the Honey Lake/Warm Springs and Mohawk Valley fault systems, Northern Walker Lane, *Friends of the Pleistocene Pacific Cell Field Trip*, Lake Tahoe, CA/NV, September 14-16, 2012.
- Bormann, J., **W.C. Hammond**, C. Kreemer, G. Blewitt, 2012, Using GPS to measure slip rates on the Mohawk Valley and Honey Lake/Warm Springs fault systems, Northern Walker Lane, SCEC Annual Meeting, Palm Springs, CA, September 9-12, 2012.
- Mencin, D., **W.C. Hammond**, C. Meertens, J. Langbein, B. Woodward, 2012, UNAVCO's community planning for real-time GPS in EarthScope's Plate Boundary Observatory using IGS products, IGS workshop, Olsztyn, Poland, July 23-27, 2012, [INVITED].
- Hammond, W.C.**, Kreemer, C., Blewitt, G., Bormann, J., Wesnousky, S., 2012, What geodesy tells us about earthquake hazard in the Basin and Range Province: Fault-scale to province-scale studies, Annual meeting of the Association of Environmental and Engineering Geologists, Salt Lake City, UT, Sept. 19-21, 2012 [INVITED].
- Blewitt, G., C. Kreemer, J. Goldfarb, H.-P. Plag, **W.C. Hammond**, Global Spatial Filtering (GSF) of GNSS coordinates to capture small transient signals, 2012, *Geophysical Research Abstracts* Vol. 14, EGU General Assembly, Abstract EGU2012-6887, Vienna, Austria April 22-27, 2012.
- Kreemer, C., **W.C. Hammond**, G. Blewitt, A. A. Holland, and R. A. Bennett, 2012, A geodetic strain rate model for the Pacific-North American plate boundary, western United States, *Geophysical Research Abstracts* Vol. 14, EGU General Assembly, Abstract EGU2012-6785, Vienna, Austria April 22-27, 2012.
- 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? presented at the Seismological Society of America Annual meeting, San Diego, CA, April 17-19, 2012.
- Plag, H.-P., G. Blewitt, Y. Bar-Sever, **W.C. Hammond** and C. Kreemer, GPS-determined surface displacements and tsunami early warning: Potential, obstacles, and current capabilities, Community Workshop on Real-Time GPS Position Data Products and Formats, UNAVCO, Inc., Boulder, CO, March 26-28, 2012.
- Hammond, W.C.**, J. Bormann, C. Kreemer, G. Blewitt, Measuring long-term motion of the Sierra Nevada/Great Valley Microplate with GPS: Effect of earthquake cycle transients, UNAVCO Science Workshop, Meeting, Feb. 28-March 1, 2012.
- Plag, H.-P., **W.C. Hammond**, G. Blewitt, A community geodesy workbench for the integrated modeling and analysis of geodetic observations, UNAVCO Science Workshop, Meeting, Feb. 28-March 1, 2012.
- Goldfarb, J., **W.C. Hammond**, G. Blewitt, H.-P. Plag, Automated transient identification and characterization in GNSS time series, UNAVCO Science Workshop, Meeting, Feb. 28-March 1, 2012.
- Kreemer, C., **W.C. Hammond**, G. Blewitt, A. A. Holland, and R. A. Bennett, 2012, A Geodetic strain rate model for the Pacific-North American plate boundary, western United States, UNAVCO Science Workshop, Meeting, Feb. 28-March 1, 2012.

## 2011

- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2011, Using GPS to separate transient and steady extension in the Basin and Range Province, western United States, Abstract G43C-04, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec. [INVITED].
- Bormann, J., **W.C. Hammond**, C. Kreemer, S. Wesnousky, G. Blewitt, 2011, Resolving the discrepancy between geodetic and geologic estimates of fault slip rates in the central Walker Lane: A block modeling approach, Abstract G53C-04, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec.

- Plag, H.-P., **W.C. Hammond**, G. Blewitt, 2011, Facilitating joint analysis of data from several systems using geophysical models, Abstract G52A-06, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec, [INVITED].
- Plag, H.-P., C. Kreemer, G. Blewitt, **W.C. Hammond**, 2011, Using empirical orthogonal functions to quantify and predict global and regional common modes of the global geodetic reference frame, Abstract G31B-0965, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec.
- Goldfarb, J., **W.C. Hammond**, G. Blewitt, H.-P. Plag, 2011, Discontinuity detection and characterization in GNSS time series, Abstract G31B-0968, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec.
- Blewitt, G., C. Kreemer, J. Goldfarb, H.-P. Plag, **W.C. Hammond**, 2011, Chasing small signals using Global Spatial Filtering (GSF) of GNSS coordinates, Abstract G31B-0967, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec.
- Wesnousky, S., C. Kreemer, **W.C. Hammond**, J. Bormann, J.N. Brune, 2011, Neotectonics, geodesy and seismic hazard in the Northern Walker Lane, Abstract S12A-02, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec. [INVITED].
- Hammond, W.C.**, G. Blewitt, Z. Li, C. Kreemer, H.-P. Plag, 2011, EarthScope Plate Boundary Observatory GPS and InSAR measurements reveal uplift of the Sierra Nevada Mountains, western U.S., GSA Annual Meeting Minneapolis, MN, Oct. 9-12, 2011, Pardee Keynote Symposium [INVITED].
- Hammond, W. C.**, G. Blewitt, Z. Li, C. Kreemer, H.-P. Plag, 2011, Geodetic imaging, seismic hazard and mountain building across the Sierra Nevada/Great Basin transition using InSAR and GPS, ESA FRINGE Workshop, Frascati Italy, Sept 19-23, 2011.
- Li, Z., **W.C. Hammond**, G. Blewitt, C. Kreemer, H.-P. Plag, Y. Wen, C. Xu, 2011, InSAR Time series with atmospheric estimation model (InSAR TS + AEM) for regional deformation mapping, ESA FRINGE Workshop, Frascati Italy, Sept 19-23, 2011.
- Thatcher, W., P. Bird, J. Bormann, T. Dawson, E. Field, **W.C. Hammond**, E. Hearn, K. Johnson, R. McCaffrey, D. Sandwell, Y. Zeng, Incorporating GPS velocities into UCERF3, SCEC Annual meeting, 2011.
- Bormann, J., **W.C. Hammond**, C. Kreemer, G. Blewitt, 2011, GPS constraints on crustal deformation in the central Walker Lane and Sierra Nevada range front, SCEC Annual Meeting, Palm Springs, CA, Sept 11-14, 2011.
- Blewitt, G., Y. Bar-Sever, R. Gross, **W. C. Hammond**, K. W. Hudnut, R. Khachikyan, H.-P. Plag, Y. T. Song, A prototype system for tsunami early warning based on real-time GPS, Fragile Earth conference, Munich, Germany, Sept 4-7, 2011.
- Hammond, W.C.**, G. Blewitt, Z. Li, H.-P. Plag, C. Kreemer, 2011, EarthScope Plate Boundary Observatory reveals uplift of the Sierra Nevada mountains, EarthScope National Meeting, Austin, TX, May 17-20, 2011 [Plenary Talk].
- Blewitt, G., H.-P. Plag, **W. C. Hammond**, C. Kreemer, 2011, A constantly growing, up-to-date, on-line, homogeneous set of GPS time series for global and regional geodetic studies, EarthScope National Meeting, Austin, TX, May 17-20, 2011.
- Plag, H.-P., G. Blewitt, **W.C. Hammond**, C. Kreemer, Y. Bar-Sever, 2011, Real-time PBO for tsunami early warning along the Pacific Coast of North America, EarthScope National Meeting, Austin, TX, May 17-20, 2011 [INVITED].
- Bormann, J., **W.C. Hammond**, C. Kreemer, 2011, Using EarthScope and MAGNET GPS to determine the slip rate on the Honey Lake Fault, northern Walker Lane, California, EarthScope National Meeting, Austin, TX, May 17-20, 2011.
- Goldfarb, J., **W.C. Hammond**, G. Blewitt, H.-P. Plag, 2011, Step discontinuity detection in GPS time series, EarthScope National Meeting, Austin, TX, May 17-20, 2011.
- Li, Z., **W.C. Hammond**, G. Blewitt, C. Kreemer, H.-P. Plag, InSAR and GPS time series analysis: Crustal deformation of the Southern Walker Lane, western Great Basin, United States, vol. 13, EGU 2011-3037, EGU General Assembly, April 3-8, 2011.

## 2010

- Hammond, W.C.**, G. Blewitt, Z. Li, C. Kreemer, H.-P. Plag, 2010, GPS and InSAR Observations of Active Mountain Growth across the Sierra Nevada/Great Basin Transition, Abstract T43C-03, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13-17 Dec. See related Snapshots from the meeting news focus in *Science*, v. 331, p. 143, January 14, 2011, <http://www.sciencemag.org/content/331/6014/143.2.full.pdf>.
- Li, Z., **W.C. Hammond**, G. Blewitt, C. Kreemer, H.-P. Plag, 2010, InSAR and GPS time series analysis: Crustal deformation in the Yucca Mountain region, Nevada, Abstract G13B-07, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13-17 Dec.
- Bormann, J.L., **W.C. Hammond**, C. Kreemer, G. Blewitt, S. Wesnousky, 2010, Crustal deformation of the central Walker Lane from GPS velocities: Block rotations and slip rates, Abstract T33A-2224, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13-17 Dec.

- Hammond, W.C.**, C. Kreemer, G. Blewitt, 2010, Using geodesy to reveal deformation partitioning and to probe the lower crust beneath the northern Walker Lane, GSA Session T151, Denver, CO, Oct. 31-Nov. 3, 2010 [INVITED].
- Bormann, J., S. Wesnousky, **W.C. Hammond**, A. Sarmiento, Holocene Earthquakes along the Wassuk Range fault zone: Paleoseismic Observations from the Rose Creek Fan, Hawthorne, Nevada, USA, Geothermal Resource Council Annual Meeting, Oct, 24-27, Sacramento, CA.
- Blewitt, G., C. Kreemer, **W.C. Hammond**, H.-P. Plag, 2010, Separating tectonic, magmatic, hydrological, and landslide signals in GPS measurements near Lake Tahoe, Nevada-California, *IGCP 565 Workshop 3: Separating Hydrological and Tectonic Signals in Geodetic Observations*, Reno, NV, Oct. 11-13, 2010.
- Hammond, W.C.**, G. Blewitt, H.-P. Plag, C. Kreemer, 2010, Towards geodetic observation of active mountain growth in the Sierra Nevada/Great Basin transition, *IGCP 565 Workshop 3: Separating Hydrological and Tectonic Signals in Geodetic Observations*, Reno, NV, Oct. 11-13, 2010.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, H.-P. Plag, Contemporary vertical motions across the Sierra Nevada/Great Basin Transition: GPS Measurements and Models, GSA Penrose Conference "Uplift and Origin of the Sierra Nevada, California", Bridgeport, CA, Aug 16-20, 2010.
- Hammond, W.C.** and H.P Plag, 2010, Integrated InSAR and GPS Studies of crustal deformation in the western Great Basin, western United States, ISPRS-VIII Commission Symposium, Kyoto, Japan, August 9-12, 2010 [INVITED, Talk given by Plag].
- Plag, H.-P., G. Blewitt, **W.C. Hammond**, C. Kreemer, Rapid GPS-based determination of earthquake displacement field and magnitude for tsunami propagation modeling and warning, IGARSS 2010, July 25-30, 2010 Honolulu, HI.
- Blewitt, G., Y. Bar-Sever, R.S. Gross, **W.C. Hammond**, V. Hsu, K.W. Hudnut, R. Khachikyan, C. Kreemer, R. Meyer, H.-P. Plag, M. Simons, Y. Song, F. Webb, 2010, A GPS real-time earthquake and tsunami (GREAT) alert system, *IGS Workshop*, Newcastle upon Tyne, UK, June 28- July 2, 2010 [INVITED].
- Plag, H.-P., G. Blewitt, **W.C. Hammond**, C. Kreemer, 2010, The Global Earth Observation System of Systems (GEOSS): Building the link from global to local in the southwest United States, Nevada Geographic Information Society Conference, June 23-25, Las Vegas, NV [INVITED].
- Kreemer, C., **W.C. Hammond**, Strain map of California and Nevada, results and issues for future versions, short talk presented at *SCEC Workshop on Incorporating Geodetic Surface Deformation Data into UCERF3*, Pomona, CA April 1-2, 2010, talk given by Hammond [INVITED].
- Hammond, W.C.**, J. Bormann, S. Jha, C. Kreemer, G. Blewitt, Block models of Walker Lane and Great Basin tectonic deformation, slip rates and seismic cycle effects, talk and poster presented at *SCEC Workshop on Incorporating Geodetic Surface Deformation Data into UCERF3*, Pomona, CA April 1-2, 2010, [INVITED].
- Hammond, W.C.**, G. Blewitt, C. Kreemer, H.-P. Plag block modeling in the vertical dimension constrained by three-component GPS measurements, UNAVCO Inc. Science Workshop, March 8-10, 2010, Boulder, CO.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, J. Bormann, S. Jha, Highlights of geodetic measurement of the rifting of continental lithosphere in the Walker Lane, Western Great Basin, United States, MARGINS Successor Workshop, San Antonio, TX, Feb. 15-18, 2010.

## 2009

- Bar-Sever, Y., G. Blewitt, R.S. Gross, **W.C. Hammond**, V. Hsu, K.W. Hudnut, R. Khachikyan, C. Kreemer, R. Meyer, H.-P. Plag, M. Simons, J. Sundstrom, Y. Song, F. Webb, A GPS real-time earthquake and tsunami (GREAT) alert system, *Eos Trans. AGU*, 90(52) Fall Meet. Suppl., Abstract G21A-02, December 14-18, 2009 [INVITED].
- Hammond, W.C.**, G. Blewitt, H.-P. Plag, C. Kreemer, Effects of the troposphere on GPS and InSAR point target analysis for measurement of crustal deformation and vertical motion near Yucca Mountain, Nevada, *Eos Trans. AGU*, 90(52) Fall Meet. Suppl., Abstract G23A-0666, December 14-18, 2009.
- Jha, S., **W.C. Hammond**, C. Kreemer, G. Blewitt, New GPS constraints on Owens Valley fault slip rates, *Eos Trans. AGU*, 90(52) Fall Meet. Suppl., Abstract G23D-07, December 14-18, 2009.
- Kreemer, C., **W.C. Hammond**, G. Blewitt, Geodetic constraints on the transition from the Sierra Nevada Micro-Plate to the Basin and Range Province, *Eos Trans. AGU*, 90(52) Fall Meet. Suppl., Abstract G23D-06, December 14-18, 2009.
- Bormann, J. **W.C. Hammond**, C. Kreemer, G. Blewitt, S.G. Wesnousky, GPS constraints on shear accommodation in the northern Walker Lane, western Nevada, USA, *Eos Trans. AGU*, 90(52) Fall Meet. Suppl., Abstract G33B-0651, December 14-18, 2009.
- Hammond, W.C.**, C. Kreemer, G. Blewitt, New geodetic constraints on the location and style of eastern and northern Sierra Nevada crustal deformation, AEG Annual Meeting, September 21-26, 2009, South Lake Tahoe, NV [INVITED].

- Hammond, W.C.**, C. Kreemer, G. Blewitt, Strain partitioning in the northern Walker Lane and western Basin and Range from GPS measurements, *Eos Trans. AGU*, 90(22) AGU Joint Assembly, Abstract G12A-06, May 24-27, 2009.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, Deformation of the eastern Nevada Basin and Range Province measured with continuous GPS, EarthScope National Meeting, Boise Idaho, May 12-15, 2009.
- Bormann, J., C. Kreemer, S. Wesnousky, **W.C. Hammond**, Geodetic and geologic constraints on shear accommodation through en-echelon basin development in the Walker Lane, western Nevada, USA, EarthScope National Meeting, Boise Idaho, May 12-15, 2009 [WON BEST STUDENT PRESENTATION].
- Blewitt, G. **W.C. Hammond**, C. Kreemer, H.-P. Plag, The 2008 Mogul, Nevada earthquake swarm: Geodetic evidence for largely aseismic afterslip equivalent to ~Mw 5.0, EarthScope National Meeting, Boise Idaho, May 12-15, 2009.
- Kreemer, K., G., Blewitt, **W.C., Hammond**, H.-P., Plag, A high-resolution strain rate tensor model for the western U.S., EarthScope National Meeting, Boise Idaho, May 12-15, 2009, [INVITED].
- Plag, H.-P., C. Kreemer, **W.C. Hammond**, G. Blewitt, A fingerprint method for the rapid determination of earthquake displacement fields in support of tsunami early warning, EGU General Assembly, Session SM4.2/NH6.2, 20 April, 2009.
- Wesnousky, S.G., J. Bormann, C. Kreemer, **W.C. Hammond**, J. Brune, Problems in integrating neotectonics and geodesy to assess seismic hazard in the northern Walker Lane, SSA Annual Meeting, April 8-10, Monterey, CA *Seismological Research Letters* v. 80, No. 2 p. 370.
- Kreemer, C., G. Blewitt, **W.C. Hammond**, R. Bennett, Constraints from GPS and earthquake focal mechanisms on the active deformation between the Colorado Plateau and the Basin and Range Province, Seismological Society of America, Annual Meeting, April 8-10, 2009, Monterey, CA, *Seismological Research Letters* v. 80, No. 2.

## 2008

- Hammond, W.C.**, G. Blewitt, C. Kreemer, GPS constraints on eastern Nevada Basin and Range crustal deformation before and during the February 21, 2008 M6.0 Wells, NV earthquake, *Eos Trans. AGU*, 89(53) Fall Meet. Suppl., Abstract S51B-1747, December 15-19, 2008.
- Wesnousky, S., J. Bormann, C. Kreemer, **W.C. Hammond**, Neotectonic and geodetic observations bearing on the structural development of the Walker Lane, western Nevada, USA, *Eos Trans. AGU*, 89(53) Fall Meet. Suppl., Abstract G21A-0660, December 15-19, 2008.
- Jha, S., **W.C. Hammond**, C. Kreemer, G. Blewitt, New GPS velocity constraints on block kinematics of the southern Walker Lane, *Eos Trans. AGU*, 89(53) Fall Meet. Suppl., Abstract G21A-0662, December 15-19, 2008.
- Kreemer, C., G. Blewitt, **W.C. Hammond**, R.A. Bennett, Geodetic constraints on strain transfer between the Colorado Plateau and Basin and Range, southwestern United States, *Eos Trans. AGU*, 89(53) Fall Meet. Suppl., Abstract G34A-06, December 15-19, 2008, [INVITED].
- Blewitt, G., C. Kreemer, **W.C. Hammond**, H.-P. Plag, GPS velocity and strain rate field in the Great Basin and California, *Eos Trans. AGU*, 89(53) Fall Meet. Suppl., Abstract G21A-0658, December 15-19, 2008.
- Blewitt, G., J. Bell, **W. C. Hammond**, C. Kreemer, H.-P. Plag, C. DePolo, GPS and InSAR monitoring of the Mogul Swarm: Evidence for mainly aseismic fault creep, with implications for seismic hazard, *Eos Trans. AGU*, 89(53) Fall Meet. Suppl., Abstract S53C-03, December 15-19, 2008. [INVITED].
- Bell J., K. Katzenstein, G. Oppliger, **W.C. Hammond**, InSAR search for earthquakes across the Sierra Nevada-Basin and Range transition zone, *Eos Trans. AGU*, 89(53) Fall Meet. Suppl., Abstract S23B-1892, December 15-19, 2008.
- Wesnousky, S., J. Bormann, C. Kreemer, **W.C. Hammond**, Structural development of the Walker Lane: Neotectonics and geodesy, paper 233-5, GSA 2008 Joint Annual Meeting, Houston, TX, October 5-9, 2008.
- Hammond, W.C.**, Kreemer, C., Blewitt G., 2008, Contemporary deformation of the Basin and Range lithosphere from GPS observations, and what they imply for continental dynamics, Pardee Keynote Symposia paper 263-3, GSA 2008 Joint Annual Meeting, Houston, TX, October 5-9, 2008 [INVITED].
- Blewitt, G., C. Kreemer, **W.C. Hammond**, H.-P. Plag, S. Stein, E. Okal, Y. Bar-Sever, R. Gross, T. Song, F. Webb, V. Hsu, K. Hudnut, M. Simons, 2008, Toward real-time GPS for tsunami warning systems and post-earthquake damage assessment and emergency response, GGEO Symposium, Chania, Crete, Greece, June 23-27, 2008.
- Plag, H.-P., C. Kreemer, **W.C. Hammond**, 2008, Using global absolute gravity observations to constrain the tie between the origin of ITRF and the center of mass of the Earth system, GGEO Symposium, Chania, Crete, Greece, June 23-27, 2008.
- Plag, H.-P., **W.C. Hammond**, H. P. Kierulf, G. Blewitt, 2008, Improving the alignment of GPS solutions to ITRF with advanced loading models, GGEO Symposium, Chania, Crete, Greece, June 23-27, 2008.
- Hammond, W.C.**, C. Kreemer, G. Blewitt, 2008, Geodetic vs. geologic measures of fault slip rates in the northern Walker Lane, Basin and Range province, western United States, *Eos Trans. AGU* 89(23), AGU Joint Assembly, Abstract G31A-02, Ft. Lauderdale, FL, May 27-30, 2008.

- Kreemer, C., **W.C. Hammond**, G. Blewitt, 2008, GPS velocity constraints on the kinematics of active tectonics in greater southern Nevada, GSA Abstracts with Programs, vol. 40, No. 1, GSA Cordilleran Section Las Vegas, NV, March 20, 2008.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, H.-P. Plag, 2008, Walker lane tectonic deformation and fault slip rates constrained by GPS data, UNAVCO Science Workshop, Boulder, CO, March 11-13.
- Blewitt, G., C. Kreemer, **W.C. Hammond**, H.-P. Plag, S. Stein, E. Okal, Y. Bar-Sever, R. Gross, V. Hsu, K. Hudnut, M. Simons, T. Song, F. Webb, 2008, Toward real-time GPS for tsunami warning systems and post-earthquake damage assessment and emergency response, UNAVCO Science Workshop, Boulder, CO, March 11-13, 2008 [INVITED Plenary Talk].

## 2007

- Hammond, W.C.**, H.-P. Plag, G. Blewitt, and C. Kreemer, 2007, Postseismic Relaxation at the Central Nevada Seismic Belt Observed in Vertical GPS Time Series, *Eos Trans., AGU*, 88(52), Fall Meeting Supplement, Abstract G52A-04, December 10-14, 2007 [INVITED].
- Plag, H.-P., **W.C. Hammond**, 2007, On the use of local sea level scenarios for managing and mitigating the impact of coastal inundation, *Eos Trans. AGU*, 88(52) Fall Meet. Suppl., Abstract G44A-04, December 10-14, 2007 [INVITED].
- 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 Annual Meeting*, Sparks, NV, Oct 1-3, 2007.
- Blewitt, G., C. Kreemer, **W.C. Hammond**, H.-P. Plag, Realizing the potential of GGOS for Geohazard prediction and early warning, International Geohazards Week workshop, Frascati, November 5-9, 2007.
- Blewitt, G., C. Kreemer, **W.C. Hammond**, H.-P. Plag, S. Stein, E. Okal, Y. Bar-Sever, R. Gross, V. Hsu, K. Hudnut, M. Simons, T. Song, F. Webb, 2007, Toward real-time GPS for tsunami warning systems and post-earthquake damage assessment and emergency response, International Geohazards Week workshop, Frascati, November 5-9, 2007.
- Plag, H.-P., **W.C. Hammond**, C. Kreemer, G. Blewitt, Integrating point positioning and image geodesy: Mutual benefits and requirements, DESDynI Workshop, Orlando, FL, July 17-20, 2007.
- Blewitt, G., C. Kreemer, **W.C. Hammond**, H.-P. Plag, 2007, Toward broadband exploration of tectonic-magmatic interactions: Demonstration of self-consistent, "All-in-One" Rapid Analysis of GPS Mega-Networks using the Ambizap Algorithm, IUGG Perugia, July 2-13, 2007.
- Kreemer, C., **W.C. Hammond**, G. Blewitt, 2007, New constraints on the motion and boundaries of the Sierra Nevada block and Colorado Plateau from continuous GPS velocities, IUGG Perugia, July 2-13, 2007.
- Plag, H.-P., C. Kreemer, **W.C. Hammond**, 2007, Collocated absolute gravity measurements help to tie the geometric reference frame to the center of mass of the Earth system, IUGG Perugia, July 2-13, 2007.
- Hammond, W.C.**, C. Kreemer, G. Blewitt, 2007, Block modeling of crustal deformation in the Northern Walker Lane, western Basin and Range, to improve estimates of seismic hazard, *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl. Abstract G42A-03, Acapulco, May 22-25, 2007.
- Kreemer, C., **W.C. Hammond**, H.-P. Plag, Detection of postseismic relaxation from the 1999 Hector Mine earthquake in southern Basin and Range GPS time series, *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl. Abstract G42A-03, Acapulco, May 22-25, 2007, [INVITED] (talk given by Hammond).
- Hammond, W.C.**, H.-P. Plag, C., Kreemer, G. Blewitt, 2007, Postseismic relaxation from remote earthquakes observed in non-linearity of southern Basin and Range/Yucca mountain GPS time series, Seismological Society of America Annual Meeting, Kona, HI, April 11-13, 2007.
- Hammond, W.C.**, and C. Kreemer, 2007, Geodetic constraints on plate boundary control of Basin and Range extension, plenary session talk, EarthScope National Meeting, Monterey, CA, March 27-30, 2007 [INVITED].
- Hammond, W.C.**, C., Kreemer, G. Blewitt, 2007, The Walker Lane: How complex is it? Geodetic and geologic strain in the western Basin and Range using enhanced block-modeling algorithms, EarthScope National Meeting, Monterey, CA, March 27-30, 2007.
- Plag, H.-P., C. Kreemer, **W.C. Hammond**, 2007, Combination of GPS-observed vertical motion with absolute gravity changes constrain the tie between reference frame origin and Earth center of mass, EarthScope National Meeting, Monterey, CA, March 27-30, 2007.
- Plag, H.-P., **W.C. Hammond**, C. Kreemer, G. Blewitt, 2007, Vertical motion observed with GPS: What can we learn about regional geophysical signals, Earth structure, and rheology? EarthScope National Meeting, Monterey, CA, March 27-30, 2007.
- Kreemer, C. G. Blewitt, **W.C. Hammond**, 2007, Continuous GPS velocities in the Intermountain West: New constraints on the motion of the Colorado Plateau, EarthScope National Meeting, Monterey, CA, March 27-30, 2007.

**Hammond, W.C.**, G. Blewitt, C. Kreemer, H.-P. Plag, J. Anderson, K. Smith, 2006, Recent seismicity and surface deformation at Lake Tahoe: An update on lower crustal magma movement, abstract for inclusion in UNAVCO, Inc. abstract for inclusion in UNAVCO, Inc. proposal to NSF, February 2007.

## 2006

**Hammond, W. C.**, Z. Li, H.-P. Plag, G. Blewitt, C. Kreemer 2006, Results of InSAR and GPS measurement of tectonic deformation near the Eastern California Shear Zone and Yucca Mountain, Nevada, *Eos Trans., AGU*, 87(52), G53D-0931, Fall Meeting Supplement.

Kreemer, C., **W.C. Hammond**, G. Blewitt, 2006, On the motion and geometry of the Sierra Nevada – Great Valley micro-plate: Implications for Walker Lane tectonics, *Eos Trans., AGU*, 87(52), G42A-05, Fall Meeting Supplement [INVITED].

Plag, H.-P., **W.C. Hammond**, G. Blewitt, C. Kreemer, and Z. Li, 2006 Vertical motion observed with GPS and InSAR in the Nevada Basin and Range: What can we learn about geophysical signals, Earth structure, and rheology?, *Eos Trans., AGU*, 87(52), G21A-06, Fall Meeting Supplement.

Blewitt, G., C. Kreemer, **W.C. Hammond**, H.-P. Plag, S. Stein, E. Okal, 2006, Rapid determination of earthquake magnitude using GPS for tsunami warning systems: An opportunity for IGS to make a difference, meeting of the US-Japan Natural Resources Panel for Earthquake Research.

Plag, H.-P., **W. C. Hammond**, 2006, Requirements for global reference frame stability: The cases of global and local sea level studies, IAG Geodetic Reference Frame Symposium, Munich Germany, October 9-14, 2006.

Plag, H.-P., R. M. Bingley, F. N. Teferle, H. P. Kierulf, S. D. P. Williams, and **W.C. Hammond**, 2006, Reference-frame induced uncertainties in measurements of vertical land motion at tide gauges: A case study for the European tide gauge network of the ESEAS, IAG Geodetic Reference Frame Symposium, Munich Germany, October 9-14, 2006.

Shevenell, L. J. Bell, G. Blewitt, W. Calvin, M. Coolbaugh, J. Faulds, L. Garside, A. Gates, **W.C. Hammond**, K. Kratt, C. Kreemer, P. Lechler, G. Oppliger, C. Sladek, and R. Zehner, 2006, Update of Great Basin Center for Geothermal Energy activities, meeting of the Geothermal Resource Council, San Diego, CA, September 2006.

Kreemer, C., G. Blewitt, **W.C. Hammond**, 2006, Using geodesy to explore correlations between crustal deformation characteristics and geothermal resources, meeting of the Geothermal Resources Council San Diego, CA.

Kreemer, C and **W.C. Hammond**, 2006, Active Basin and Range Deformation Inferred from Horizontal GPS: A Kinematic Overview, *Intermountain West Seismic Hazard workshop*, Reno, NV, May 2006, [INVITED].

**Hammond, W.C.**, 2006, Active Basin and Range deformation measured with GPS: A kinematic overview, *Meeting of the U.S.G.S. Basin and Range Province Earthquake Working Group*, Salt Lake City, Utah, March 2006 [INVITED].

**Hammond, W.C.**, G. Blewitt, C. Kreemer, H.-P. Plag, J. Anderson, K. Smith, 2006, Recent seismicity and surface deformation at Lake Tahoe: An update on lower crustal magma movement, UNAVCO, Inc. Annual Meeting, Denver, CO, March 13-16, 2006.

**Hammond, W.C.**, 2006, Northwest Basin and Range campaign GPS results: What they imply for backarc extension and forearc motion, *plus* a look at the northern NV & CA Basin and Range, PANGA Annual Meeting, Eugene OR, Feb 17-18, 2006.

## 2005

**Hammond, W.C.** and H.-P. Plag, 2005, Assessing land motion of Venice, Italy with GPS: Effects of regional filtering on vertical rate estimates: *Eos, Trans. AGU*, v. 86, no. 52, G41B-0359, Fall Meeting Supplement.

Plag, H.-P., **W.C. Hammond**, M.N. Tsimplis, 2005, Assessing past and future local sea level rise in Venice: a complex balance of vertical land motion, atmospheric forcing, and oceanic contributions: *Eos, Trans. AGU*, v. 86, no. 52, G210-08, Fall Meeting Supplement.

Kreemer, C., G. Blewitt, **W.C. Hammond**, and Plag, H.-P., 2005, Constraints on the postseismic deformation processes after the December 2004 and March 2005 Sumatra earthquakes from continuous GPS observations: *Eos, Trans. AGU*, v. 86, no. 52, U11A-0825, Fall Meeting Supplement.

Blewitt, G., **W.C. Hammond**, C. Kreemer, H.-P. Plag, 2005, Nevada Earthquake Response GPS Network (NEARNET): *Eos, Trans. AGU*, v. 86, no. 52, G11A-1182, Fall Meeting Supplement.

Blewitt, G., **W.C. Hammond**, C. Kreemer, and H.-P. Plag, 2005, From Yucca Mountain local stability to global quaking: GPS point-positioning strategies spanning the spatio-temporal spectrum, COMET- Advances in GPS Data Processing and Modeling for Geodynamics, University of London, [KEYNOTE ADDRESS], 9-10 November, 2005.

Plag, H.-P., G. Blewitt, C. Kreemer, **W.C. Hammond**, 2005. Sumatra earthquakes induced solid earth deformations detected by GPS: co-seismic displacements, normal modes, tsunami-induced loading, and post-seismic deformations, in *Dynamic Planet 2005: Program & Abstract Book*, p. 75, Abstract 053.

- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2005, Secular crustal deformation of the westernmost Basin and Range as inferred from MAGNET and other GPS networks, Geological Society of America meeting, October 2005, Salt Lake City, Utah, paper no. 85-3, [INVITED].
- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2005, First MAGNET results: Site and network performance assessment and future prospects for estimating slip rates on western Basin and Range faults, UNAVCO-IRIS Joint Workshop, Stevenson, Washington.
- Blewitt, G., **W.C. Hammond**, and C. Kreemer, 2005, Targeting of potential geothermal resources in the Great Basin from relationships between geodetic strain and geological structures, DOE Geothermal Technologies Program Peer Review Meeting, July 26-28, 2005.
- Blewitt G., C. Kreemer, H.-P. Plag, and **W.C. Hammond**, 2005, GPS strong motion at a various time scales from the Great Sumatra Earthquakes, UNAVCO-IRIS Joint Workshop, Stevenson, Washington, 2005.
- Kreemer, C. and **W.C. Hammond**, 2005, Using a geodetic strain rate model for western North America to improve our understanding of the driving forces behind Basin and Range extension: *Eos, Trans. AGU*, v. 86(18), Jt. Assem. Suppl., G23C-05, [INVITED].
- Hammond, W.C.**, and C. Kreemer, 2005, Anomalous geodetic dilatation at the central Nevada seismic belt: Inferring secular and transient contributions: *Eos, Trans. AGU*, v. 86, no. 18, Jt. Assem. Suppl., G23C-04, [INVITED].
- Kreemer, C., and **W.C. Hammond**, 2005, Using a geodetic strain rate model for the western United States to improve our understanding of the driving forces in continental extension zones, *Geophys. Res. Abstract*, 7, [INVITED].
- Blewitt, G., H.-P. Plag, C. Kreemer, **W.C. Hammond** V.V. Titov, 2005, Effects of the Mw 9.0 Sumatra earthquake and tsunami on Earth's shape: *Eos, Trans. AGU*, v. 86 (18), U52A-01, [INVITED].
- Hammond, W.C.** and C. Kreemer, 2005, Using geodetic data to estimate seismic hazard in the western Great Basin, *Seismol. Res. Lett.*, v. 76, no. 2.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2005, Geodetic constraints on the rate and style of contemporary deformation in the northern Walker Lane, *Seismol. Res. Lett.*, v. 76, no. 2 [INVITED].
- Blewitt, G., H.-P. Plag, C. Kreemer, and **W.C. Hammond**, 2005, Effects of the Mw 9.0 Sumatra earthquake and tsunami on Earth's shape, *Seismol. Res. Lett.*, v. 76, no. 2.
- Hammond, W.C.**, G. Blewitt, C. Kreemer, 2005, Understanding northwest Basin and Range tectonics, from the northern Walker Lane to the central Nevada seismic belt, using EarthScope data: EarthScope Annual Meeting, Albuquerque, New Mexico, March, 2005.

#### 2004

- Hammond, W.C.**, W. Thatcher, G. Blewitt, 2004, Crustal deformation across the Sierra Nevada-northern Walker Lane, Basin and Range transition, western United States measured with GPS, 2000–2004: *Eos, Trans. AGU*, v. 85, no. 47, G31D-07, Fall Meeting Supplement.
- Kreemer, C., G. Blewitt, **W.C. Hammond**, M.F. Coolbaugh, 2004, A new strain rate model for the Great Basin and its implications to tectonic and geodynamic studies: *Eos, Trans. AGU*, v. 85, no. 47, G31D-06, Fall Meeting Supplement.
- Hammond, W.C.**, 2004, Constraints on Basin and Range lithospheric dynamics from the Global Positioning System, EarthScope Workshop: Great BREAK, Reno, Nevada.
- Hammond, W.C.**, 2004, Recognizing postseismic relaxation at the Central Nevada Seismic Belt: Basin and Range Seismic Hazard Summit, II, Reno, Nevada.
- Thatcher, W., and **W.C. Hammond**, 2004, Present-day deformation of the Great Basin and its implications for seismic hazard assessment: Basin and Range Seismic Hazards Summit II, Reno, Nevada.
- Hammond, W.C.**, 2004, How well can GPS data constrain variations in lithospheric rheology? A Basin and Range case study: UNAVCO Annual Meeting, Boulder Colorado, February 26–27.

#### 1995-2003

- Hammond, W.C.**, and W. Thatcher, 2003, Crustal Deformation of the northern Basin and Range [northern California, Oregon, northern Nevada] from measurement with the Global Positioning System: *Eos, Trans. AGU*, v. 84, G32B-07, Fall Meeting Supplement.
- Poland, M., D. Dzurisin, **W.C. Hammond**, E. Endo, E. Iwatsubo, M. Lisowski, 2003, New results from a proposed PBO Cascade volcano cluster I: Deformation in the Medicine Lake region of northeast California from leveling, GPS, and InSAR, *GSA Abstracts with Programs*, 35, paper 231-12.
- Hammond, W.C.**, and W. Thatcher, 2003, Crustal deformation across the Basin and Range province [Nevada and Utah], western United States, measured with the Global Positioning System, 1992–2002, EGS-AGU-EUG Joint Assembly, Nice, France, *Geophys. Res. Abstracts*, 5.
- Hammond, W.C.**, and W. Thatcher, 2002, GPS Measurement of deformation of the Basin and Range province, western United States: *Eos, Trans. AGU*, v. 83, G714–0952, Fall Meeting Supplement.



- M. Nyst and **W.C. Hammond**, 2002, Present-day kinematics of crustal deformation of the Walker Lane and central Nevada, derived from GPS data: *Eos, Trans. AGU*, v. 83, T71E-1201, Fall Meeting Supplement.
- Hammond, W.C.** and W. Thatcher, 2001, Integrated kinematic analysis of GPS and fault slip data in the Eastern California Shear Zone, Walker Lane and Sierra Nevada: *Eos, Trans. AGU*, v. 82, G41A-0199, Fall Meeting Supplement.
- Hammond, W.C.** and W. Thatcher, 2001, The dynamics of western United States tectonism: EarthScope Workshop, Making and Breaking a Continent, Snowbird, Utah.
- Barclay, A.H., D.R. Toomey, W.S.D. Wilcock, **W.C. Hammond**, 2001, Geodynamic and seismic modeling of the MELT region of the East Pacific Rise: An example of plate scale hotspot-ridge interaction: *Eos, Trans. AGU*, v. 82, T42C-0946, Fall Meeting Supplement.
- Toomey, D.R., W.S.D. Wilcock, J. Blundy, **W.C. Hammond**, 1999, Asymmetric mantle dynamics in the MELT region of the East Pacific Rise: A result of hot, asthenospheric return flow: *Eos, Trans. AGU*, v. 80, T21F-06, Fall Meeting Supplement.
- Hammond, W.C.**, and D.R. Toomey, 1999, Seismic anisotropy beneath the MELT region of the East Pacific Rise from tomography and shear wave splitting: *Eos, Trans. AGU*, v. 80, S21E-03, Fall Meeting Supplement.
- Hammond, W.C.**, and E.D. Humphreys, 1998, The effects of partial melt on frequency dependent upper mantle seismic velocities: finite element modeling and pressure equalization via fluid flow: Incorporated Research Institutions for Seismology Annual Meeting, Santa Cruz, California.
- Hammond, W.C.**, and D.R. Toomey, 1998, Seismic structure and anisotropy beneath the MELT region of the East Pacific Rise: Annual Meeting of the Incorporated Research Institutions for Seismology, Santa Cruz, California.
- Hammond, W.C.**, and E.D. Humphreys, 1997, Finite element modeling of the effect of partial melt on the velocity and attenuation of seismic waves and permeability in the upper mantle, presented at RIDGE Mantle Flow and Melt Generation Beneath Mid-Ocean Ridges: Constraints from MELT and Other Experiments, Providence, RI, October 5-7.
- Toomey, D.R., A.H. Barclay, R.A. Dunn, **W.C. Hammond**, 1997, Tomographic imaging in anisotropic media: results from studies of mid-ocean ridges: *Annales Geophysicae*.
- Hammond, W.C.**, and E.D. Humphreys, 1997, Finite element modeling of the effect of partial melt on the velocity and attenuation of seismic waves and permeability in the upper mantle: Incorporated Research Institutions for Seismology, Breckenridge, Colorado.
- Toomey, D.R., S.C. Solomon, W.S.D. Wilcock, D.K. Blackman, J.A. Orcutt, **W.C. Hammond**, 1996, Upper mantle structure beneath the MELT Region of the East Pacific Rise from initial observations of P and S delay times: *Eos, Trans. AGU*, v. 77, Fall Meeting Supplement.
- Hammond, W.C.**, and E.D. Humphreys, 1996, Gravity and bathymetry of the Hawaiian hotspot predicted from 3D finite element modeling with surface and sub-surface loading: *Eos, Trans. AGU*, v. 77, Fall Meeting Supplement.
- Hammond, W.C.**, and E.D. Humphreys, 1995, Finite element modeling of the effect of partial melt on the velocity and attenuation of seismic waves: *Eos, Trans. AGU*, v. 76.

## SPECIAL LECTURING WITHOUT PUBLISHED ABSTRACTS

### 2024

*Geodesy for Seismic Hazard at the Nevada Geodetic Laboratory*, presentation in for the Kazakhstan Visiting Delegation organized by UNR office of International Relations, August 23, 2004.

### 2023

*Robust Imaging of Fault Slip Rates with Geodetic Networks in the Walker Lane, Western United States*, University of South Florida, Geoscience Colloquium speaker, October 6, 2023.

*Tectonics, Earthquakes and Space Geodesy, in the Walker Lane, Great Basin and Sierra Nevada*, GEOL 101 Guest Lecture in UNR Lake Tahoe Campus

*Active faults, crustal strain rates, and hydrological surface loading of the Lake Tahoe Basin*, Field trip for NASA Surface Topography and Vegetation Incubator Study Team Meeting, University of Nevada, Reno Lake Tahoe Campus, Incline Village, NV, June 12-14, 2023.

*Exploring the Earth's hazards and changing climate with geodetic networks*, Southern Methodist University, weekly department seminar series, April 14, 2023.

*Exploring the Earth's hazards and changing climate with geodetic networks*, University of California, Davis, Dept. Earth and Planetary Science weekly seminar series, March 8, 2023.

*Natrium demonstration project GPS data analysis discussion and question period*, SSHAC Technical Integrator Team Working Virtual Meeting, January 19, 2023.

## 2022

*Natrium demonstration project GPS data analysis*, SSHAC SSC Team Working Virtual Meeting, December 8, 2022.

*The Place and Peaks of the Sierra Nevada Mountain Range*, Ms. Elizabeth Bell's 1st grade class, Sierra Expeditionary Learning School, Truckee CA, November 16, 2022, Invited.

*MAGNET: A Flexible Multi-Purpose Geodetic Network For Hazard Science in the Western Great Basin*, AASG Annual Meeting, Lake Tahoe, NV, June 14, 2022.

*Sierra Nevada Uplift Fast and Slow: The Science of Geodesy in a Wet World*, Public presentation at the “Spark of Genius AG 2022”, Mensa Annual gathering, July 6-10, 2022, Invited.

*Geodetic datasets available for study of crustal deformation in Wyoming and adjacent areas*, SSHAC virtual workshop, April 12-14, 2022.

*Unbiased and Robust Estimation of Fault Slip Rates in the Walker Lane Using Spontaneous Block Modeling*, USGS Northern California Earthquake Hazards Workshop, virtual, Jan. 25-27, 2022, Invited.

## 2021

*GPS Imaging of Vertical and Horizontal Crustal Motion Across the Centennial Tectonic Belt and Eastern Snake River Plain of Central Idaho*, Idaho State University Department of Geosciences, Pocatello, Sept. 8, 2021.

*GPS Geodesy for Intermountain West Tectonics, Earthquakes, Uplift, and Mantle Flow*, Invited presentation at Univ. Utah virtual field camp, May 14, 2021.

*Geodetic Analysis For Idaho National Laboratory SSHAC L3 Project*, SSC Working Group Meeting, April 1, 2021.

## 2020

*Using GPS Networks to Measure Global Vertical Land Motion and its Impact on Sea Level Rise*, Invited presentation at the meeting of the National Academy of Science Committee on Solid Earth Geophysics, virtual meeting November 12-13, 2020.

*Recent Adventures in Earthquake Geodesy in California and Nevada*, San Rafael, CA Las Gallinas Lions Club, online meeting August 19, 2020.

*Geodetic Analysis for the Idaho National Laboratory SSHAC L3 Project*, SSC Working Meeting Webinar September 24, 2020.

*Geodetic Analysis for the Idaho National Laboratory SSHAC L3 Project*, SSC Working Meeting Webinar June 17, 2020.

*GPS Geodesy and the Vertical Motion of Earth's Surface: Volcanos, Mountain Ranges, and Mantle Flow*, public talk for Spring Meeting of the National Academy of Science Board of Earth Science and Resources, May 11-12, 2020 (given online owing to COVID-19 cancellation of in-person meeting).

## 2019

*Robust animation of time variable Earth surface deformation using 3D GPS Imaging: Example of the Central Walker Lane and Long Valley Caldera*, poster at NASA ESI Team Meeting, Scripps, San Diego CA, November 4-6.

*Massive Reprocessing of >18,000 GPS Sites Improves Repeatability by 17%*, Blewitt, G., C. Kreemer, W.C. Hammond, poster at NASA ESI Team Meeting, Scripps, San Diego CA, November 4-6.

*Drought-triggered magmatic inflation, crustal strain and seismicity at the Long Valley Caldera, Central Walker Lane*, Friends of the Pleistocene Field Trip, Central Walker Lane, Nevada and California, Oct. 3-6, 2019.

*Drought-triggered magmatic inflation, crustal strain and seismicity near the Long Valley Caldera, Central Walker Lane*, talk at Workshop on Hydrological Deformation, Instituto Nazionale di Geofisica e Vulcanologia, Rome, Italy, June 16-17, 2019.

*Harnessing the GPS data explosion for Interdisciplinary Earth Science*, plenary talk at National Institute for Earth Physics, Magurele, Romania, June 6, 2019.

*GPS Imaging Reveals Interactions Between Drought, Seismicity, Tectonics, and Magmatic Inflation: Long Valley Caldera, Western US*, plenary talk at National Institute for Earth Physics, Magurele, Romania, June 6, 2019.

*Harnessing the GPS data explosion to understand hydrological, magmatic, and tectonic Earth movements of the western United States*, plenary talk at Instituto Nazionale di Geofisica e Vulcanologia, Rome, Italy, April 2, 2019.

## 2018

- The Place and Peaks of the Sierra Nevada Mountain Range*, Ms. Bell's Kindergarten and 1st grade class, Sierra Expeditionary Learning School, Truckee CA, Oct. 17, 2018.
- Space Geodesy and Active Uplift of the Sierra Nevada*, Invited Lecture for University of California Naturalist course held at the UC Berkeley Sagehen Research Station, July 16, 2018.
- Crustal Extension and Prehistoric Shorelines at Pyramid Lake*, Sierra Expeditionary Learning School, May 29, 2018
- GPS Measurement of Active Tectonics and Uplift of the Sierra Nevada and Lake Tahoe*, DGSE, GradVenture Weekend, Incline Village Beach, NV, Talk for prospective grad students, March 10, 2018.
- Sea Level Rise as Seen Through Matrices*, Ms. Jody Burrill's pre-calculus class, Truckee High School, January 10, 2018.

## 2017

- Block Modeling in the Walker Lane*, USGS GPS Modeling workshop, Menlo Park, CA, September 21, 2017.
- The Influence of Water on Active Crustal Deformation in California and Nevada*, Department Seminar, Scripps IGPP, University of California, San Diego, August 18, 2017.
- GPS Imaging of Earth's Vertical Motion: From Sierra Nevada to North America*, EarthScope Speaker Series presentation, Winona State University Dept. of Geoscience, March 20, 2017.
- GPS Imaging of Earth's Vertical Motion: From Sierra Nevada to North America*, EarthScope Speaker Series presentation, University of California, Berkeley, Seismological Laboratory, March 7, 2017.
- GPS Imaging of Earth's Vertical Motion: From Sierra Nevada to North America*, EarthScope Speaker Series presentation, New Mexico State University, Las Cruces, Dept. of Geological Science, February 22, 2017.
- GPS Imaging of Earth's Vertical Motion: From Sierra Nevada to North America*, EarthScope Speaker Series presentation, University of Montana, Dept. of Geosciences, Missoula, MT, February 6, 2017.

## 2016

- GPS Imaging of Earth's Vertical Motion: From Sierra Nevada to North America*, EarthScope Speaker Series presentation, Bowling Green State University Dept. of Geology, Nov. 3, 2016.
- GPS Imaging of Earth's Vertical Motion: From Sierra Nevada to North America*, EarthScope Speaker Series presentation, University of North Dakota, Dept. of Geology and Geological Engineering, Oct. 19, 2016.
- GPS Imaging of Earth's Vertical Motion: From Sierra Nevada to North America*, EarthScope Speaker Series presentation, North Dakota State University, Dept. of Geoscience, Oct. 18, 2016.
- Earth's Flex and Flow in Nevada: Observing Active Uplift of the Sierra Nevada Mountains with GPS*, Nevada Bureau of Mines and Geology Open House, Oct. 15, 2016.
- GPS Imaging of Earth's Vertical Motion: From Sierra Nevada to North America*, EarthScope Speaker Series presentation, UC Davis Dept. of Earth and Planetary Sciences, Oct. 12, 2016.
- The Place and Peaks of the Sierra Nevada Mountain Range*, Ms. Bell's Kindergarten and 1st grade class, Sierra Expeditionary Learning School, Truckee CA, Oct. 25, 2016.
- Uplift Across the Western Transverse Ranges from Integrated Analysis of GPS, InSAR, Leveling and Tide Gauge Data*, W.C. Hammond, R. Burgette, K. Johnson, G. Blewitt, 2016, SCEC Ventura Special Fault Study Area Workshop, Palm Springs, CA, Sept. 10, 2016.
- GPS Imaging of Vertical Land Motion for Sea Level Studies: Overview, Latest Progress and Outlook for the Future*, W.C. Hammond, G. Blewitt, 2016, NASA Sea-Level Change Team Workshop, Norfolk, VA, Sept. 7-9, 2016.
- The Plug and Play GPS Portal and Short Course*, UNAVCO Science Workshop, breakout session, March 29-31, 2016.
- GPS Imaging of vertical motions in California and Nevada*, Invited talk USGS/SCEC CGM, January 28-29, 2016.
- Short course: Plug and Play GPS for Earth Scientists: Providing Immediate Access to Low-Latency Geodetic Products for Rapid Modeling and Analysis of Natural Hazards*, 2016, January 20, 2016, AfricaArray workshop, University of Witwatersrand, Johannesburg, South Africa.

## 2015

- Harnessing the GPS data explosion for geophysics*, C. Kreemer, G. Blewitt, W.C. Hammond, 2015, University of Nevada, Reno Big Data conference, University of Nevada, Reno November 12, 2015.

*What Made Lake Tahoe?* Tahoe Expeditionary Learning School, Kings Beach, CA, Katie Bloom's 2nd Grade class, May 13, 2015.

*Witnessing Changes in Elevation and Mountain Growth using Space Geodesy in the Western United States*, invited department colloquium at Old Dominion University, Mitigation and Adaptation Research Institute and Center for Coastal Physical Oceanography, Norfolk VA, March 16, 2015.

#### 2014

*Understanding the Growth of Mountains and Deformation of Continents in the Pacific-North America Plate Boundary Zone with Tectonic Geodesy*, Invited Department Colloquium at New Mexico State University, Las Cruces, November 20, 2014.

*NISAR Application Requirements for Vertical Tectonics and Geothermal Energy Applications*, NISAR Applications Workshop, October 28-29, 2014, U.S.G.S. headquarters, Reston Virginia.

*Tectonic Context of Earthquakes in the Western Great Basin and Sierra Nevada, Where We Go and How We Know*, Public talk for National Earth Science Week, hosted by Nevada Bureau of Mines and Geology Discover Nevada Series, Great Basin Science and Sample Record Library, October 16, 2014.

*The Place and Peaks of the Sierra Nevada Mountain Range*, Ms. Bell's Kindergarten and 1st grade class, Sierra Expeditionary Learning School, Truckee CA, Oct 9, 2014.

*GPS Data Processing At The Nevada Geodetic Laboratory: What's Available And How To Get It*, Community Geodetic Model breakout session, Saturday, Sept. 6, 2014.

*What Made Lake Tahoe?* Tahoe Expeditionary Learning School, Kings Beach, CA, Stephanie Gibbons, 2nd-3rd Grade class, April 10, 2014.

#### 2013

*The UNR MAGNET Report*, Presentation in USGS NEHRP Geodetic Networks telecon (with slides), November 22, 2013.

*Rocks That Melt, Flow and Explode!*, Mt. Lassen field trip campfire talk for Ms. McMains 6th grade class, Sierra Expeditionary Learning School, September 24, 2013.

*Report on GPS and InSAR data analysis*, SONGS SSC SSHAC Proponents Meeting workshop #2, organized by GeoPentech, Inc., 3 short talks, Irvine, CA, August 12-14, 2013.

*Combining InSAR and GPS data to quantify surface deformation in active geothermal areas* NSF Industry/University Cooperative Research Center meeting, Grand Sierra Resort, Reno NV, June 25-26, 2013.

*A GPS block model for the 2014 USGS National Seismic Hazard Maps*, presented at the USGS NSHMP Workshop on Western US Geodesy, U.S. Geological Survey, Menlo Park, CA, February 20, 2013.

#### 2012

*A GPS block model for the 2014 USGS National Seismic Hazard Maps*, Western US National Seismic Hazard Map (MHMP) GPS Mini-workshop, Hood River, OR, September 25, 2012.

*Measuring Contemporary Uplift of the Sierra Nevada Mountains with GPS and InSAR*, Public lecture at Tahoe Environmental Research Center, Incline Village, CA, September 11, 2012.

*Developments in GPS Geodesy for Seismic Hazard Studies in the Western Great Basin and Uplift of the Sierra Nevada*, Nevada Earthquake Safety Council, August 8, 2012 meeting at University of Nevada, Reno.

*UNR geodesy report*, USGS Geodesy virtual workshop, June 13-14, 2012.

*Report on Real Time GPS workshop*, USGS Geodesy virtual workshop, June 13-14, 2012.

#### 2011

*Uplift of the Sierra Nevada Measured with GPS*, Sierra Expeditionary Learning School, Ms. McMains's 6th Grade class, October 16, 2011.

*What Made Lake Tahoe?* Sierra Expeditionary Learning School, Ms. Bacon's 4th Grade class, October 18, 2011.

*What geodesy can tell us about mountain building*, Cooperative Institute for Dynamic Earth Research (CIDER) Workshop, Faculty Instructor, University of California, Berkeley, June 26 -July 2, 2011.

*What Made Lake Tahoe?* Sierra Expeditionary Learning School, Ms. Brisbin's 5th Grade class field trip to Lake Tahoe, CA, April 27, 2011.

#### 2010

*The overall geodetic picture*, Friends of the Pleistocene 2010 Field Trip.

*Earth model and network design considerations for the GREAT Alert Tsunami-Warning System*, Jet Propulsion Laboratory, Pasadena, CA, July 21, 2010.

*What geodetic measurements tell us about deformation of the western United States*, University of Glasgow, Dept. of Geographic and Earth Sciences Seminar, May 11, 2010.

*What GPS Studies tell us about deformation in the interior western US*, Department Seminar, Univ. Oregon, Eugene, Feb. 10, 2010.

## 2009

*Considering the effects of postseismic viscoelastic relaxation in construction a western U.S. GPS velocity field*, NSF Supported Workshop on the Western U.S. velocity field, UNAVCO, Inc. Sept, 26-27, 2009.

*Geodetic constraints on active deformation of the eastern Nevada Basin and Range near Highway 50*, Friends of the Pleistocene field trip, Highway 50 Nevada.

*Expected constraints on tsunamigenic coseismic slip from the JPL GREAT and global GPS networks*, presentation made at JPL GREAT project meeting, Honolulu, HI, Aug. 13-14, 2009.

*Overview of MAGNET GPS network, data, velocity field and block modeling*, presentation at USGS/NBMG Workshop on geodetic and geologic datasets in the Northern Walker Lane, April 21-22, 2009, University of Nevada Reno.

*GPS and InSAR monitoring of the Mogul Swarm: Evidence for mainly aseismic fault creep, with implications for seismic hazard*, NBMG Brown Bag seminar, February 4, 2009.

## 2008

*Crustal deformation at the Sagehen Creek Research Station, a part of the Western Basin and Range, Walker Lane, Sierra Nevada Transition Zone*, University of California, Berkeley, Sagehen Field Station, Kidzone Family Camp, August 15-16, 2008.

*GPS detection of magma injection, seismic swarms with silent slip, and extension across the Tahoe Basin*, EarthScope Basin and Range Workshop for Interpretive Professionals, Reno, NV, October 21, 2008.

*GPS monitoring of the Mogul Swarm: Evidence for mainly non-seismic fault slip*, public information session at University of Nevada, Reno, August 12, 2008.

*Using GPS measurements to infer crustal deformation and fault slip rates in the western Great Basin*, CIG 2008 Workshop on Numerical Modeling of Crustal Deformation and Earthquake Faulting, Golden, CO, June 23, 2008, 1 hour science talk [INVITED].

*Crustal Deformation of the northern Walker Lane, and western Basin and Range Province from GPS Measurements*, University of Miami, Rosenstiel School of Marine and Atmospheric Science department seminar Miami, FL, June 2, 2008 [INVITED].

*Mogul Swarm Open Discussion*, NBMG Brown Bag, May 8, 2008.

*Open forum on the Mogul Swarm*, NBMG, April 29, 2008

*Concepts of maps and spatial awareness*, Glenshire Elementary School, Truckee CA.; Mrs. Woodard's Kindergarten class, April 10, 2008.

## 2007

*Crustal Deformation of the Western Basin and Range, Walker Lane, Sierra Nevada Transition Zone*, U.C. Berkeley, Sagehen Station Research Review, October 29, 2007.

*Measuring Continental Deformation, Earthquake Fault Potential and Magmatic Activity with the Global Positioning System*, Earth Science Week Field Trips, Oct, 20-21, 2007.

*Concepts of Maps, Rocks and Geological Science*, Glenshire Elementary School, Truckee, CA: Ms. Sampson's 2<sup>nd</sup> grade class, October 3, 2007.

*Exploring the relationship between geothermal resources and geodetically inferred slip rates on faults in the Great Basin*, Nevada Bureau of Mines and Geology, University of Nevada Reno, September 10, 2007.

*GPS measurement of crustal deformation in the western Basin and Range and Lake Tahoe area*, TEAC 2007 Interpretive Field Trip for Nevada public school teachers, July 10, 2007.

*Crustal Deformation across the Sierra Nevada, Northern Walker Lane, Basin and Range Transition, Western United States Measured with GPS, 2000-2004*, Basin and Range Brown Bag Seminar, Nevada Bureau of Mines, May 16, 2007.

*Concepts of maps and spatial awareness*, Glenshire Elementary School, Truckee, CA: Mrs. Batie's 1<sup>st</sup> grade class, February 9, 2007.

## 2006

*The Active Geology of Sagehen Creek, Lake Tahoe and the Sierra Nevada*, University of California, Berkeley, Sagehen Field Station, Kidzone Family Camp, August 11-13, 2006.

*Campaign GPS measurements and Block Modeling of the Northern Walker Lane*, Basin and Range Brown Bag Seminar, Nevada Bureau of Mines and Geology, May 2006.

*Yucca Mountain InSAR analysis update*, Department of Energy Yucca Mountain Project Meeting, Summerlin, NV, May 2006.

*Kinematic overview of active Basin and Range deformation measured with GPS*, Basin and Range Working Group meeting, Western States Seismic Policy Council, Basin and Range Province Working Group, Salt Lake City, Utah, March 8-10, 2006.

*Northwest Basin and Range Campaign GPS Results, What They Imply for Backarc Extension and Forearc Motion, plus a look at the Northern NV, CA Basin and Range*, University of Oregon, Eugene, PANGA meeting: Feb. 18-19, 2006.

*Concepts of maps and spatial awareness*, Glenshire Elementary School, Truckee, CA: Ms. Pilar's Kindergarten class, January, 2006.

#### 2005 and prior

*Postseismic relaxation at the Central Nevada Seismic Belt*, Nevada Bureau of Mines and Geology, University of Nevada Reno, November 2, 2005.

*Crustal deformation across the Sierra Nevada, Northern Walker Lane, Basin and Range transition, western United States measured with GPS, 2000–2004*, Nevada Bureau of Mines and Geology, University of Nevada Reno, November 24, 2004.

*New Geodetic results, their relationship to geologic data, and implications for seismic hazard estimation*, University of Nevada, Reno, Seismological Laboratory, Seismic Hazard Workshop, Oct. 8, 2004.

*Basin and Range lithospheric dynamics measured with the Global Positioning System*, Nevada Bureau of Mines and Geology, University of Nevada Reno, April, 2004.

*Basin and Range lithospheric dynamics measured with the Global Positioning System*, RMS Corporation, Newark, CA, March 30, 2004.

*Basin and Range lithospheric dynamics measured with GPS*, U.S. Geological Survey, Earthquake Hazards Team, March 26, 2004.

*Basin and Range lithospheric dynamics measured with the Global Positioning System*, University of Arizona, Dept. Geological Sciences, Tucson, March 3, 2004.

*The dynamics behind Basin and Range deformation from measurement with the Global Positioning System*, California State University, Hayward, February 4, 2004.

*Seismic Velocity and Heterogeneity Beneath the MELT Region of the East Pacific Rise from Analysis of P and S Body waves*, U.C. Berkeley Seismological Laboratory, February 26, 2002.

*Dynamics, flow, and melt content of the southern East Pacific Rise upper mantle from teleseismic tomography*, U.S. Geological Survey, Earthquake Hazards Team, May 3, 2001.

#### **SELECTED MEDIA CITATIONS AND INTERVIEWS**

Subject of Eos.org research spotlight on Hammond et al., 2021 article selected by editors of the *Journal of Geophysical Research - Solid Earth* "GPS Imaging of Global Vertical Land Motion for Studies of Sea Level Rise" <https://eos.org/research-spotlights/measuring-sea-level-rise-along-the-coast>

Listed as collaborator in 2021 Earth & Environment article *Taking the waters in Italy: Identifying co-seismic groundwater changes*, by Binda, G., P. Noble, A. Pozzi, A. Michetti, <https://researchoutreach.org/articles/testing-waters-italy-identifying-co-seismic-groundwater-changes/>

Eos.org Research Spotlight on Johnson et al., 2020 article selected by editors of the *Journal of Geophysical Research - Solid Earth*, "Present-day and long-term uplift across the Western Transverse Ranges of Southern California", <https://eos.org/research-spotlights/southern-californias-crustal-motion-tells-of-earthquake-hazards> appeared on October 9, 2020.

Nevada Today article by Mike Wolterbeek, Monte Cristo earthquake fault still active with 6,500 aftershocks University geoscience teams monitoring, finding, mapping damage and surface ruptures, June 1, 2020, <https://www.unr.edu/nevada-today/news/2020/monte-cristo-earthquake>.

Interviewed and quoted in E&E news article on Farquharson and Amelung, 2020 Nature article (<https://www.nature.com/articles/s41586-020-2172-5>), April 22, 2020, <https://www.eenews.net/stories/1062945803>.

Nevada Today article by Mike Wolterbeek, Finding Faults, How the burgeoning Walker Lane may split the American West, February 20, 2020, <https://www.unr.edu/nevada-today/stories/walker-lane>

Interviewed by and mentioned in Wired Magazine, for article “Move Over San Andreas: There’s An Ominous New Fault in Town” appearing April 19, 2019, <https://www.wired.com/story/walker-lane-move-over-san-andreas-fault/>.

Interviewed by Wired Magazine, March 8, 2018 on Shirzaei and Bürgmann paper in *Science Advances* on sea level impacts in San Francisco Bay Area.

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*

C. J. McNeil, Ph.D., Committee member, “Paleoseismic observations of faults in central Nevada, USA: Slip partitioning and seismic hazards between the central Walker Lane and western Basin and Range”

Justine Overacker, Ph.D., Primary advisor, GPS Imaging of vertical land motion and earthquake coseismic displacements in the GPS mega-network, completed August, 2023.

Zachary Young, Ph.D., Committee member, GPS Studies of subtle deformation signals in the Western United States, completed July, 2022.

Dylan Morlang, MS, Committee member, Hydrochemical response of groundwater following the 2020 Monte Cristo Range Earthquake sequence within Mineral and Esmeralda counties, NV, completed August, 2022.

Ian Pierce, Ph.D., Committee member, “Active faulting in the Central Walker Lane”, completed November, 2019.

Steve Angster, Ph.D., Committee member, “Late Quaternary slip rates and styles of faulting associated with the Walker Lane Shear Zone and the transition to southern Cascadia”, completed May, 2018.

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.

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.

Kevin McBean, MS Geophysics, Committee member, “Statistics of ground motions in a foam rubber model of a strike-slip fault”, completed March, 2015.

Yang Zhang, M.S., Committee member, “Coseismic and postseismic deformation of the 2011 MW 9.0 Tohoku Earthquake - A nonlinear inversion of GPS data”, completed January, 2015.

Russell Di Fiori, M.S., Committee member, “Focused geologic mapping and structural analysis of the southern Eureka mining district; assessing structural controls and spatial patterns of mineralization”, completed 2014.

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.

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.  
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.  
Sumant Jha, M.S., Primary advisor, “Block kinematics and slip rates in the southern Walker Lane estimated From GPS data”, University of Nevada, Reno, completed August, 2010.

*Degrees In Progress*

Nina Miller, Ph.D., Advanced to Candidacy, Committee member  
Aren Crandall-Bear, Ph.D., Advanced to Candidacy, Committee chair  
Xincheng (Henry) Zhou, Ph.D., Committee member  
Rob Fuller, M.S., Committee Member