

Curriculum Vitae

Dr. Guoquan Wang

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EDUCATION

- 07/1998—06/2001: Ph.D. in Solid Earth Geophysics, Institute of Geology, China Earthquake Administration, Beijing, China.
- 07/1996—06/1998: M.S. in Hydrogeology and Engineering Geology, Nanjing University, Nanjing, China.
- 08/1992—06/1996: B.S. in Geology, China University of Geosciences, Wuhan, China.

PROFESSIONAL EXPERIENCE

- 01/2015---Present: Assistant Director, University of Houston Coastal Center (UHCC), Texas, USA.
- 09/2014---Present: Associate Professor, Department of Earth and Atmospheric Sciences, University of Houston, Texas, USA.
- 09/2011---08/2014: Assistant Professor, Department of Earth and Atmospheric Sciences, University of Houston, Texas, USA.
- 07/2011—08/2011: Associate Professor, Department of Geology, University of Puerto Rico at Mayaguez, Puerto Rico, USA (Tenured on 7/1/2011).
- 08/2006—06/2011: Assistant Professor, Department of Geology, University of Puerto Rico at Mayaguez, Puerto Rico, USA.
- 07/2004—07/2006: Research Associate, Applied Geophysical Science Laboratories, College of Arts and Sciences, North Carolina A&T State University, North Carolina, USA.
- 01/2004—06/2004: Visiting Research Scholar, Multidisciplinary Center for Earthquake Engineering Research (MCEER), University of New York at Buffalo, New York, USA.
- 06/2001—12/2003: Postdoctoral Scholar, Institute of Geophysics, Department of Geosciences, University of Munich, Germany.

MAJOR AWARDS

NSF CAREER (2009)

RESEARCH INTERESTS

- (1) Coastal hazards (e.g., sea-level change, faulting, subsidence, wetland loss) along the Gulf Coast area
- (2) Caribbean neotectonics
- (3) GPS seismology, strong earthquake ground motion
- (4) Applications of GPS and LIDAR technologies in natural hazards studies
- (5) Geological hazard risk analysis and mitigation
- (6) Structural health monitoring
- (7) Numerical modeling---Numerical 3D simulation (e.g., Parallel Super-Computer Numerical Simulation, MPI and Finite Difference Method)

RESEARCH GRANTS

I have raised over **\$2 million** in research funds as a **PI** (Total > \$2.2 million: NSF-\$1,531,137; NASA-\$69,301; Local Government Agency: \$275,900; Local Institutes: \$354,057), and over **\$6 million** in research funds as a **CO-PI** during the past 10 years (2007-2016) (NSF-\$6,035,221; Shell Inc. \$62,802). The total **NSF fund** that I received at UH (2012 Fall---2017 Fall) as a PI is over \$1.1 million (\$1,122,015).

Current Active Grants

- (1) **Houston Subsidence Monitoring and GPS Data Processing Center**, funded by the University of Houston (UH) and the Harris-Galveston Subsidence District (HGSD). Operational funds are committed by HGSD (January 1, 2016-December 30, 2019, \$220,000). **PI: Guoquan Wang**
- (2) **NSF IRES** (International Research Experience for Students): US-China Collaboration on Landslide Research and Student Training (Sep. 1, 2015—Aug. 30, 2018, \$245,945.00), <http://ires.nsm.uh.edu>. **PI: Guoquan Wang**
- (3) **NSF TUES** (Transforming Undergraduate Education in Science, Technology, Engineering and Mathematics): Integrating GPS and LIDAR into geosciences education (October 1, 2013—December 30, 2017, \$168,187). **PI: Guoquan Wang**
- (4) **NSF-IF** Program, Collaborative Instrumentation: COCONet (Continuously Operating Caribbean GPS Observational Network), an Infrastructure Proposal for a Multi-hazard Tectonic and Weather Observatory (October 1, 2010---December 31, 2017, \$6,035,221) **PI: UNAVCO** (Meghan M. Miller), **CO-PIs: Guoquan Wang (UH)**, Glen Mattioli (UNAVCO), Karl Feaux (UNAVCO), John Braun (UCAR), Eric Calais (previous co-PI), Mike Jackson (previous co-PI).

Awards Finished

- (1) **NSF MRI** (Major Research Instrumentation Grant--**HoustonNet**). MRI: Acquisition of GPS Equipment for Establishing a Continuously Operating Dense GPS Network in Houston Metropolitan Area for Urban Natural Hazards Study (September 1, 2012---August 30, 2016, \$573,391—NSF: \$401,374; UH Matching: \$172,017 for installation). **PI: Guoquan Wang**, Co-PIs: Shuhab Khan (Geosciences), Barry Lefer (Atmospheric Science), Thomas Hsu (Civil Engineering), Ramesh Shrestha (Geodetic Imaging).
- (2) **NSF-CAREER** (Faculty Early Career Development), Integrating Research and Education to Apply High-Rate GPS in Natural Hazards Reduction (September 2009---December 2015, total \$468,431--UPR: 161,922; UH: \$306,509). **PI: Guoquan Wang**.
- (3) 2013 **UH QEP** Curriculum/Course Development Program, Enhancing undergraduate new course EOL4332 Geoscience Applications of GPS and LIDAR (September 1, 2013---August 30, 2015, \$5,000). **PI: Guoquan Wang**
- (4) **Shell Inc.**, Oblique Lidar/Photo Scanning and Construction of Virtual Outcrop: Ferron Sandstone Member, Nielson Wash, Utah. PI: Janok P. Bhattacharya, **CO-PIs:** Shuhab Khan, **Guoquan Wang**. 10/15/2011-09/30/2013, \$62,802.
- (5) **NSF-REU** (Research Experience for Undergraduates) Supplement to EAR-0722540, GPS Landslide Monitoring and Education (January 2009—December 2009, \$19,550). **PI: Guoquan Wang**.
- (6) **NSF-REU** (Research Experience for Undergraduates) Supplement to EAR-0722540, Undergraduate Training in GPS Data Processing (November 2007—October 2008, \$17,500). **PI: Guoquan Wang**.
- (7) **NSF-MRI** (Major Research Instrumentation), EAR-0722540, MRI: Acquisition of High-rate GPS units for developing a real broadband earthquake monitoring system in Puerto Rico and the U.S. Virgin Islands (August 2007---July 2009, NSF: \$210,200, UPR: \$42,040). **PI: Guoquan Wang**; CO-PI: Christa von Hillebrandt, Victor A. Huerfano, Johannes H. Schellekens, and Jose A. Martinez.
- (8) **NASA-Puerto Rico Space Grant**, Introducing GPS and its Applications in Earth Science to Students and Educators of Puerto Rico (April 2008---June 2009, NASA-\$69,301). **PI: Guoquan Wang**; CO-PIs: Christa von Hillebrandt and Jose A. Martinez.
- (9) Ponce Municipal Administration, High-Precision GPS Monitoring for Land Stability Evaluation in the Cerca del Cielo Urbanization, Ponce, Puerto Rico (September 15, 2010—August 31, 2011, \$55,900). **PI: Guoquan Wang**, Co-PI: James Joyce, Fernando Gilbes.

- (10) University of Puerto Rico, Researcher and Development Center SEED Money Grant, Programming Algorithm for Integrating Real-Time GPS and Seismograph Data (December 2006---November 2007, \$5,000). **PI: Guoquan Wang.**
- (11) University of Puerto Rico, College of Arts and Sciences SEED Money Grant, Real-Time Earthquake Magnitude Assessment Using Strong Motion Accelerometer Data (May 2007---April 2008, \$5,000). **PI: Guoquan Wang.**

MAJOR REPRESENTATIVE PEER-REVIEWED JOURNAL PUBLICATIONS

(*denotes graduate student under my primary supervision)

- (1) Kearns* T. J., **Wang G.**, Turco M., Welch J., and Tsibanos V. (2017). Houston16: A stable geodetic reference frame for subsidence and faulting study in the Houston metropolitan area, Texas, U.S. *Geodesy & Geodynamics* (Submitted in August 2017)
- (2) **Wang G.**, Bao Y., Gan W., Geng J., Xiao G., and Shen J. S. (2017). NChina16: A stable geodetic reference frame for geological hazard studies in North China. *Journal of Geodynamics* (Submitted in June 2017)
- (3) Bao Y., Guo W., **Wang G.**, Gan W., Zhang M., and Shen J. S. (2017). Millimeter-Accuracy Structural Deformation Monitoring Using Stand-Alone GPS: Case Study in Beijing, China. *J. Surv. Eng.* DOI: 10.1061/(ASCE)SU.1943-5428.0000242
- (4) **Wang G.**, Turco M., Soler T., Kearns T., and Welch, J. (2017). Comparisons of OPUS and PPP solutions for subsidence monitoring in the greater Houston area. *J. Surv. Eng.* 143(4), 05017005, doi:10.1061/(ASCE)SU.1943-5428.0000241
- (5) Zhou* X., **Wang G.**, Bao Y., Xiong L., Guzman V., and Kearns T. J. (2017). Delineating Beach and Dune Morphology from Massive Terrestrial Laser Scanning Data Using the Generic Mapping Tools, *J. Surv. Eng.*, 143(4), 04017008, doi: 10.1061/(ASCE)SU.1943-5428.0000223
- (6) Xiong* L., **Wang G.**, and Wessel P. (2017). Anti-aliasing filtering for deriving high-accuracy DEMs from TLS data: case study at Freeport, Texas, *Computers & Geosciences*, 100, 125-134. doi:10.1016/j.cageo.2016.11.006
- (7) Yu* J., and **Wang G.** (2017). Introduction to the GNSS Geodetic Infrastructure in the Gulf of Mexico Region. *Survey Review*, 352(49), 51-65, doi:10.1080/00396265.2015.11108069.
- (8) Lyu H., Wang G., Shen J. S., Lu L., and **Wang G.** (2016). Analysis and GIS mapping of flooding hazards on 10 May 2016, Guangzhou, China. *Water*, 447(8), doi:10.3390/w8100447

- (9) Yang* L., **Wang G.**, Huerfano V., von Hillebrandt-Andrade C. G., Martínez-Cruzado J. A., and Liu H. (2016). GPS Geodetic Infrastructure for Natural Hazards Study in the Puerto Rico and Virgin Islands Region, *Natural Hazards*, 83(1), 641-665, doi:10.1007/s11069-016-2344-7.
- (10) Soler T., and **Wang G.** (2016). Interpreting OPUS-Static Results Accurately, *J. Surv. Eng.*, 142(4), 05016003, doi:10.1061/(ASCE)SU.1943-5428.0000191.
- (11) Yu* J., and **Wang G.** (2016). GPS derived ground motions (2005–2014) within the Gulf of Mexico region referred to a stable Gulf of Mexico reference frame. *Natural Hazards and Earth System Sciences*, 16(7), 1583-1602, doi:10.5194/nhess-16-1583-2016.
- (12) Yang* L., **Wang G.**, Bao Y., Kearns T. J., and Yu J. (2016). Comparisons of Ground-Based and Building-Based CORS: a Case Study in the Puerto Rico and Virgin Islands Region. *J. Surv. Eng.*, 142(3), 05015006, doi: 10.1061/(ASCE)SU.1943-5428.0000155.
- (13) **Wang G.**, Welch J., Kearns T. J., Yang L., and Serna J. (2015). Introduction to GPS geodetic infrastructure for land subsidence monitoring in Houston, Texas, U.S.A. The proceeding of the Ninth International Symposium on Land Subsidence, Nov. 15-19, 2015, Nagoya, Japan. Proc. IAHS, 92, 1–7, 2015, doi:10.5194/piahs-92-1-2015
- (14) Liu* H., and **Wang G.** (2015). Delineating relative motion between St. Croix and the Puerto Rico-Virgin Islands block using continuous GPS observations (1995-2014). *International Journal of Geophysics*, 915753:1-9, doi: 10.1155/2015/915753
- (15) **Wang G.**, Bao Y., Cuddus Y., Jia X., Serna J. J., and Jing Q. (2015). A methodology to derive precise landslide displacements from GPS observations in tectonically active and cold regions: A case study in Alaska. *Natural Hazards*, 77:1939-1961, doi: 10.1007/s11069-015-1684-z
- (16) Kearns* T. J., **Wang G.**, Bao Y., Jiang J., and Lee D. (2015). Current Land Subsidence and Groundwater Level Changes in the Houston Metropolitan Area, Texas (2005-2012), *J. Surv. Eng.*, 141(4), 05015002:1-16, doi: 10.1061/(ASCE)SU.1943-5428.0000147
- (17) Antuna J. C., M. Miller, G. Mattioli, K. Feaux, R. Anthes, J. Braun, **G. Wang**, and A. Robock (2014). Partnering with Cuba: Weather extremes, *Science*, Vol. 345, ISSUE6194, 278.
- (18) Yu* J., **Wang G.**, Kearns T. J., and Yang L. (2014). Is there deep-seated subsidence in the Houston-Galveston area? *Int. J. Geophys.*, 942834, 1-11, doi:10.1155/2014/942834

- (19) **Wang G.**, and T. Soler (2014). Measuring Land Subsidence Using GPS: Ellipsoid Height vs. Orthometric Height, *J. Surv. Eng.*, 141(2), 05014004, doi:10.1061/(ASCE)SU.1943-5428.0000137
- (20) **Wang G.**, J. Yu, T. J. Kearns, and J. Ortega (2014). Assessing the accuracy of long-term subsidence derived from borehole extensometer data using GPS observations: case study in Houston, Texas, *J. Surv. Eng.*, DOI: 10.1061/(ASCE)SU.1943-5428.0000133
- (21) **Wang G.**, T. J. Kearns, J. Yu, and G. Saenz (2014). A Stable Reference Frame for Landslide Monitoring Using GPS in the Puerto Rico and Virgin Islands Region, *Landslides*, 11(1):119-129, doi:10.1007/s10346-013-0428-y
- (22) **Wang G.**, J. Yu, J. Ortega, G. Saenz, T. Burrough, and R. Neill (2013). A Stable Reference Frame for Ground Deformation Study in the Houston Metropolitan Area, Texas, *Journal of Geodetic Science*, 3(3), 188-202. doi:10.2478/jogs-2013-0021
- (23) **Wang G.**, T. Soler (2013). Using OPUS for Measuring Vertical Displacements in Houston, TX, *J. Surv. Eng.*, 139(3), 126-134, DOI: 10.1061/(ASCE)SU.1943-5428.0000103
- (24) **Wang G.** (2013). Millimeter-Accuracy GPS Landslide Monitoring Using Precise Point Positioning with Single Receiver Phase Ambiguity Resolution: A Case Study in Puerto Rico, *Journal of Geodetic Science*, 3(1), 22-31.
- (25) **Wang G.**, J. Joyce, D. Phillips, R. Shrestha, and W. Carter (2013), Delineating and Defining the Boundaries of an Active Landslide in the Rainforest of Puerto Rico Using a Combination of Airborne and Terrestrial LIDAR Data, *Landslides*, 10(4):503-513, DOI:10.1007/s10346-013-0400-x.
- (26) **Wang G.** (2013), Teaching High-Precision GPS to Undergraduates Using Online Processing Services, *Journal of Geoscience Education*, 61 (2), 202-212.
- (27) Braun, J. J., E. Calais, K. Dausz, K. Feaux, B. Friesen, G.S. Mattioli, M. M. Miller, J. Normandeau, E. Seider, and **G. Wang** (2012), COCOnet (Continuously Operating Caribbean GPS Observational Network): Infrastructure Enhancements To Improve Sea Level Monitoring, Paper No. 212178, *Geological Society of America* 44(7).
- (28) Braun, J. J., G.S. Mattioli, E. Calais, D. Carlson, T. Dixon, M. Jackson, R. Kursinski, H. Mora-Paez, M.M. Miller, R. Pandya, R. Robertson, and **G. Wang** (2012). Multi-Disciplinary Natural Hazards Research Initiative Begins Across the Caribbean Basin, *EOS transactions, American Geophysical Union*, 93, 9, doi:10.1029/2012EO090001.

- (29) **Wang G.**, and T. Soler (2012). OPUS for Horizontal Subcentimeter-Accuracy Landslide Monitoring: A Case Study in the Puerto Rico and Virgin Islands Region, *J. Surv. Eng.*, 138(3):135-143, doi:10.1061/(ASCE)SU.1943-5428.0000079.
- (30) **Wang G.**, F. Blume, C. Meertens, P. Ibanez, and M. Schulze (2012). Performance of high-rate kinematic GPS during strong shaking: observations from shake table tests and the 2010 Chile earthquake (M 8.8), *Journal of Geodetic Sciences*, 2(1):1-16, doi:10.2478/v10156-011-0020-0.
- (31) **Wang G.** (2012), Kinematics of the Cerca del Cielo, Puerto Rico landslide derived from GPS observations, *Landslides*, 9 (1):117-130, doi: 10.1007/s10346-011-0277-5.
- (32) **Wang G.** (2011), GPS Landslide Monitoring: Single Base vs. Network Solutions, a case study based on the Puerto Rico and Virgin Islands Permanent GPS Network, *Journal of Geodetic Sciences*, 1(3): 191-203, DOI: 10.2478/v10156-010-0022-3.
- (33) **Wang G.**, D. Phillips, J. Joyce, and F. O. Rivera (2011). The integration of TLS and Continuous GPS to study landslide deformation: a case study in Puerto Rico, *Journal of Geodetic Science*, 1(1): 25-34, DOI: 10.2478/v10156-010-0004-5.
- (34) **Wang G.**, D. M. Boore, G. Tang, and X.-Y. Zhou (2007). Some observations on collocated and closely spaced 1-second sampled GPS and ground-motion accelerograph data from the 2003 San Simeon (M 6.5), California, earthquake, *Bull. Seism. Soc. Am.* 97, 76-90.
- (35) **Wang G.**, G. Tang, C. R. Jackson, X.-Y. Zhou, and Q. Lin (2006). Strong ground motions observed at the UPSAR during the 2003 San Simeon earthquake (M 6.5) and the 2004 Parkfield earthquake (M 6.0) , *Bull. Seism. Soc. Am.* 96, S159-S182.
- (36) **Wang G.**, G. Tang, D. M. Boore, G. V. Burban, C. R. Jackson, X.-Y. Zhou, and Q. Lin. (2006). Strong surface waves observed in the Western Coastal Plain of the Taiwan Island from one aftershock of the 1999 Chi-Chi, Taiwan, Earthquake, *Bull. Seism. Soc. Am.* 96, 821-845.
- (37) **Wang G.**, and X.-Y. Zhou (2006). Three-Dimensional Finite-Difference Simulations of Strong Ground Motions during the 1720 Shacheng Earthquake of Yanhuai Area, Beijing, China using a Stochastic Finite-Fault model, *Soil Dyn. Earthquake. Eng.* 26 (10), 960-982.
- (38) Tong, M., **G. Wang**, and G. C. Lee (2005). Time derivative of earthquake acceleration, *Earthquake Engineering and Engineering Vibration*, 4(1), 1-16.

- (39) **Wang G.**, D. M. Boore, H. Igel, and X.-Y. Zhou (2004). Comparisons of ground motions from five aftershocks of the 1999 Chi-Chi, Taiwan Earthquake with empirical predictions largely based on data from California, *Bull. Seism. Soc. Am.* 94, 2198-2212.
- (40) **Wang G.**, and X. Y. Zhou (2004) Baseline Correction of Near Fault Ground Motion Recordings Caused by 1999 Chi-Chi, Taiwan Earthquake, *Earthquake and Geology*, 26(1), 1-15.
- (41) **Wang G.**, D. M. Boore, H. Igel, and X.-Y. Zhou (2003). Some observations on colocated and closely-spaced strong ground motion records of the 1999, Chi-Chi, Taiwan Earthquake, *Bull. Seism. Soc. Am.* 93, 674-693.
- (42) **Wang G.**, and X. Y. Zhou (2003). The Randomness of Near Fault Acceleration Time History of the 1999 Chi-Chi, Taiwan, Earthquake, *Journal of Hazard Resistant and Mitigation Engineering*, 23 (4), 10-18.
- (43) **Wang G.**, X.-Y. Zhou, P. Z. Zhang, and H. Igel (2002). Characteristics of amplitude and duration for near fault strong ground motion from the 1999 Chi-Chi, Taiwan, Earthquake, *Soil Dyn. Earthquake. Eng.*, 22, 73-96.
- (44) **Wang G.**, X.-Y. Zhou, Z. J. Ma, and P. Z. Zhang (2001). A preliminary study on the randomness of response spectra of the 1999 Chi-Chi, Taiwan, Earthquake, *Bull. Seism. Soc. Am.* 91, 1358-1369.
- (45) **Wang G.**, X.-Y. Zhou, Z. J. Ma, and P. Z. Zhang (2001). Data files from a preliminary study on the randomness of response spectra of the 1999 Chi-Chi, Taiwan, Earthquake, *Bull. Seism. Soc. Am.* 91, 1388-1389.
- (46) **Wang G.**, X. Y. Zhou, Z. J. Ma, and D. M. Zeng (2001). The Statistical Properties of Amplitude and Period of Near Fault Ground Motion of 1999 Chi-Chi, Taiwan, Earthquake, *Earthquake Resistant Engineering*, 1,1-10.
- (47) Ma, Z.-J., and **G. Wang** (1999). Strip-shaped Tectonic Zonation of Contemporary Lithospheric Structure of East China, *Geology Journal of China Universities*, 1, 25-27.
- (48) **Wang G.**, Z. J. Ma, X. Y. Zhou, and G.W. Su (1999). Study on several post-earthquake fires of Japan and America, *Journal of Natural Disasters*, 8 (3), 72-79.
- (49) **Wang G.**, and X. Z. Li (1999). A Preliminary Research on Potential Effect of Underground Engineering on Groundwater Environment, *Engineering Geology*, 7(1), 15-19.

- (50) **Wang G.**, G.-Y. Luo, and X.-Z., Li (1998). Optimization of Construction Scheme of Xuanwu lake Subaqueous Highway Tunnel, *Hydrogeology and Engineering Geology*, 2, 35- 40.
- (51) **Wang G.**, G.-Y. Luo, and X.-Z. Li (1998). Application of Box Culvert Jacking in Xuanwu lake Subaqueous Highway Tunnel Scheme, *Exploration Engineering (Drilling & Tunneling)*, 5, 50-52.

PEER-REVIEWED ARTICLES IN CONFERENCE PROCEEDINGS

- (1) **Wang G.**, J. Welch, T. J. Kearns, L. Yang, and J. Serna (2015), Introduction to GPS geodetic infrastructure for land subsidence monitoring in Houston, Texas, U.S.A. The proceeding of the Ninth International Symposium on Land Subsidence, Nov. 15-19, 2015, Nagoya, Japan. Proc. IAHS, 92, 1–7, 2015, doi:10.5194/piahs-92-1-2015
- (2) Woo, G., **Wang G.**, and Tang G. (2006). Insights from Parkfield array data for probabilistic modeling (Article), Proceedings of 8th U.S. National Conference on Earthquake Engineering, 18-22 April 2006, San Francisco, California.
- (3) Su G. W., **Wang G.**, and Ma Z. J. (1998). Some Preliminary Discussion on Natural Disaster Risk and its Assessment, Proceedings of the First China-Japan Conference on Risk Assessment and management, P.224—231.

BOOK REVIEW

Wang G. (2011), A comprehensive reference for OPUS, “GORS and OPUS for Engineers” edited by T. Soler, Monograph of new and collected articles provides first “one-stop” resource for using key National Geodetic Survey services, *Inside GNSS*, September/October 2011, 93-94.