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Kentucky Geological Survey
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University of Kentucky
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EDUCATION

Doctor of Philosophy, Geophysics, University of Kentucky - 1998

Master of Science, Environmental Engineering, University of Kentucky - 1998

Bachelor of Science, Geotechnical Engineering, University of Kentucky - 1996

Master of Science, Geophysics, University of Kentucky - 1993

Bachelor of Science, Geology, Peking University (Beijing, China) - 1982

EXPERIENCE

Registration: Professional Engineer (PE), Commonwealth of Kentucky, License No. 23823

Work Experience

2006 to Present **Head**, Geologic Hazards Section, Kentucky Geological Survey, University of Kentucky, Lexington, Kentucky

2015 to Present **Adjunct Associate Professor**, Department of Earth and Environmental Sciences, University of Kentucky, Lexington, Kentucky

2011 to Present **Adjunct Research Professor**, Institute of Crustal Dynamics, China Earthquake Administration, Beijing, China

2002 to 2014 **Adjunct Assistant Professor**, Department of Earth and Environmental Sciences, University of Kentucky, Lexington, Kentucky

2004 to 2006 **Manager (Geologist V)**, Geologic Hazards Section, Kentucky Geological Survey, University of Kentucky, Lexington, Kentucky

2001 to 2004 **Geologist IV**, Geologic Hazards Section, Kentucky Geological Survey, University of Kentucky, Lexington, Kentucky

2000 to 2001 **Acting Director**, Earthquake and Landslide Program, Oregon Department of Geology and Mineral Industries, Portland, Oregon

2000 to 2001 **Adjunct Assistant Professor**, Department of Civil and Environmental Engineering, University of Portland, Portland, Oregon

1997 to 2000 **Earthquake Geotechnical Specialist**, Oregon Department of Geology and Mineral Industries, Portland, Oregon

1991 to 1997 **Research Assistant**, Department of Geological Sciences/Kentucky Geological Survey/Kentucky Transportation Research Center/Center for Computational Sciences, University of Kentucky, Lexington, Kentucky

1987 to 1991 **Head (Engineer), Geophysics Group**, Fujian Earthquake Administration, Fuzhou, Fujian, China

1982 to 1987 **Assistant Engineer**, Fujian Earthquake Administration, Fuzhou, Fujian, China

Teaching Experience

Department of Earth and Environmental Sciences, University of Kentucky – Lexington, Kentucky
Fall 2005, 2015, Spring 2010, 2011, 2013, 2014

Course: GLY-625/EES-675 – Earthquake Seismology

Department of Earth and Environmental Sciences, University of Kentucky – Lexington, Kentucky
Spring 2009

Course: Independent Study – Earthquake Seismology

Department of Earth and Environmental Sciences, University of Kentucky – Lexington, Kentucky
Fall 2006

Course: Independent Study – Earthquake Seismology

Department of Geological Sciences, University of Kentucky – Lexington, Kentucky
Spring 2004

Course: GLY782 – Individual Work in Geology (Seismology)

Department of Geological Sciences, University of Kentucky – Lexington, Kentucky
Fall 2003

Course: GLY560 – Engineering Seismology (Co-teach)

Department of Civil and Environmental Engineering, University of Portland – Portland, Oregon
Fall 2000

Course: CE452 – Geotechnical Earthquake Engineering

Post-Doctoral Advising

Caibo Hu (2011-2012), Peking University, Beijing, China

Graduate Student Advising and Committee Services

Seth Carpenter, Ph.D. Dissertation (2018), Department of Earth and Environmental Sciences
Wisam Muttashar, Ph.D. Dissertation (2018), Department of Earth and Environmental Sciences
Matthew Crawford, Ph.D. Dissertation (2017), Department of Earth and Environmental Sciences
Clara Rose Rucker, M.S. Thesis (2017), Department of Earth and Environmental Sciences
Andrew Holcomb, M.S. Thesis (2016), Department of Earth and Environmental Sciences
Paul Rodriguez Asihama, M.S. Thesis (2016), Department of Earth and Environmental Sciences
Christopher Warren Van Dyke, Ph.D. Dissertation (2015), Department of Geography
Corey Burkett, M.S. Thesis (2014), Department of Earth and Environmental Sciences
Mahnaz Sepehrmanesh, M.S. Thesis (2014), Department of Earth and Environmental Sciences
Clayton Brengman, M.S. Thesis (2014), Department of Earth and Environmental Sciences
Alice Orton, M.S. Thesis (2014), Department of Earth and Environmental Sciences
Ali Almayahi, Ph.D. Dissertation (2013), Department of Earth and Environmental Sciences
Jiwei Feng, M.S. Thesis (2013), Institute of Engineering Mechanics, Harbin, China
Carrington Wright, M.S. Thesis (2012), Department of Earth and Environmental Sciences
Jamin Frommel, M.S. Thesis (2012), Department of Earth and Environmental Sciences
Elizabeth Coyle, Ph.D. Dissertation (2011), Department of Civil Engineering
Shoba Gowda, M.S. Thesis (2011), Department of Earth and Environmental Sciences
Jingwei Liu, Ph.D. Dissertation (2011), Institute of Crustal Dynamics, Beijing, China
David Butler, M.S. Thesis (2011), Department of Earth and Environmental Sciences
Anthony Paschall, M.S. Thesis (2011), Department of Earth and Environmental Sciences
Daniel Hunter, M.S. Thesis (2011), Department of Earth and Environmental Sciences
Kenneth A. Macpherson, Ph.D. Dissertation (2009), Department of Earth and Environmental Sciences
Jonathan L. McIntyre, M.S. Thesis (2008), Department of Earth and Environmental Sciences
Cora Anderson, M.S. Thesis (2008), Department of Earth and Environmental Sciences
James Whitt, M.S. Thesis (2007), Department of Earth and Environmental Sciences
David Vance, M.S. Thesis (2006), Department of Earth and Environmental Sciences

Yosep Erwin Supranata, Ph.D. Dissertation (2006), Department of Civil Engineering
William Reid, M.S. Thesis (2005), Department of Geological Sciences
Frederick Rutledge, M.S. Thesis (2004), Department of Geological Sciences
Ting-Li Lin, M.S. Thesis (2003), Department of Geological Sciences

Undergraduate Student Advising

Andrew Holcomb (2013), Department of Earth and Environmental Sciences
Eric Altobellis (2012), Department of Earth and Environmental Sciences
Catherine Burton (2012), Department of Earth and Environmental Sciences
Cora Anderson (2006), Department of Earth and Environmental Sciences
David Vance (2001-2004), Department of Geological Sciences

High School Student Advising

Kyle Combs (2015-2016), Paul Laurence Dunbar High School, Lexington, Kentucky

Visiting Scholar Advising

Junjie Sun (2016-2017), Lanzhou Institute of Seismology, Lanzhou, China
Lifang Zhang (2016), Institute of Crustal Dynamics, Beijing, China
Jifeng Chen (2015-2016), Lanzhou Institute of Seismology, Lanzhou, China
Mianshui, Rong (2014-2015), Institute of Crustal Dynamics, Beijing, China
Jianhong Kang (2015), Earthquake Administration of Jilin Province, Changchun, China
Gengqing Zhu (2014), Earthquake Administration of Fujian Province, Fuzhou, China
Kun Liu (2013-2014), Lanzhou Institute of Seismology, Lanzhou, China
Zehua Qiu (2013-2014), Institute of Crustal Dynamics, Beijing, China
Jindong Song (2013), Institute of Engineering Mechanics, Harbin, China
Zhuojuan Xie (2013), Institute of Crustal Dynamics, Beijing, China
Qian Li (2012), Lanzhou Institute of Seismology, Lanzhou, China
Lifang Zhang (2012), Institute of Crustal Dynamics, Beijing, China
Jingyan Lan (2012), Institute of Crustal Dynamics, Beijing, China
Yi Du (2012), Institute of Crustal Dynamics, Beijing, China
Xunhua Xu (2011), Lanzhou Institute of Seismology, Lanzhou, China
Qiyang Yang (2011), Institute of Earthquake Engineering of Hebei, Shijiazhuang, China
Zhongxia Yuan (2010), Lanzhou Institute of Seismology, Lanzhou, China
Yuxia Lu (2007), Lanzhou Institute of Seismology, Lanzhou, China
Zhijian Wu (2006), Lanzhou Institute of Seismology, Lanzhou, China

RECENT PUBLICATIONS (Past 5 years)

Peer-Reviewed

Chen, J., Carpenter, N.S., Wang, Z., Zuo, K., and Yang, L., 2016, Evidence of complex faulting near the Huangcheng-Shuangta Fault, Gansu, China from the 11 May 2012 Mw 4.8 Sunan earthquake, *Bulletin of Seismological Society of America*, doi: 10.1785/0120160094 (in press).

Wang, Z., Orton, A., Wang, L., and Woolery, E.W., 2016, Seismic hazard mapping and mitigation policy development in the central United States and western China, *Natural Hazards*, 81: 387–404, DOI 10.1007/s11069-015-2086-y.

Woolery, E.W., Wang, Z., Carpenter, N.S., Street, R., and Bregman, C., 2016, the Central United States Seismic Observatory: site characterization, instrumentation, and recordings, *Seismological Research Letters*, 87: 215–228, doi: 10.1785/0220150169.

Rong, M., Wang, Z., Woolery, E.W., Lu, Y., Li, X., and Li, S., 2016, Nonlinear site response from the

- strong ground-motion recordings in western China, *Soil Dynamics and Earthquake Engineering*, **82**: 99-110, doi:10.1016/j.soildyn.2015.12.001.
- Qiu, Z., Chi, S., Wang, Z., Carpenter, S., Tang, L., Guo, Y., and Yang, G., 2015, The strain seismograms of P- and S-waves of a local event recorded by four-gauge borehole strainmeter, *Earthquake Sciences*, 8 p., doi: 10.1007/s11589-015-0120-5.
- Wang, Z., 2015, Predicting or Forecasting of Earthquake and the Resulting Ground Motion Hazards: A Dilemma for Earth Scientists, *Seismological Research Letters*, **86**: 1–5.
- Wang, Z. and Wang, L., 2014, Comparison of Seismic Design Ground Motion between China and the United States, *Earthquake Engineering and Engineering Dynamics (in Chinese)*, **34 Suppl.**: 76–86.
- Feng, J., Li, S., and Wang, Z., 2014, Ground Motion Prediction Equation of Sichuan Basin, China, *Earthquake Engineering and Engineering Dynamics (in Chinese)*, **34**: 73–82.
- Liu, J, Wang, Z., Xie, F., Lu, Y., 2014, Seismic Hazard and Risk Assessment for the Greater North China Based on the Historical Intensity Observations, *China Earthquake Engineering (in Chinese)*, **36**: 134–143.
- Carpenter, S., Woolery, E.W., and Wang, Z., 2014, The Mw 4.2 Perry County, Kentucky, Earthquake of November 10, 2012: Evidence of the Eastern Tennessee Seismic Zone in Southeastern Kentucky, *Seismological Research Letters*, **85**: 931–939.
- Liu, J, Wang, Z., and Xie, F., 2013, Seismic Hazard Assessment for the Greater North China from Historical Intensity Observations, *Engineering Geology*, **164**: 117–130.
- Hu, C., Cai, Y., Liu, M., Wang, Z., 2013, Aftershocks Due to Property Variations in the Fault Zone: A Mechanical Model, *Tectonophysics*, **588**: 179–188.
- Wang, Z., Butler, D., Woolery, E.W., and Wang, L., 2012, Seismic Hazard Assessment for the Tianshui Urban Area, Gansu Province, China, *International Journal of Geophysics*, v. 2012, Article ID 461863, 10 p., doi:10.1155/2012/461863.
- Du, Y., Xie, F., and Wang, Z., 2012, Wenchuan Earthquake Surface Fault Rupture and Disaster: A Lesson on Seismic Hazard Assessment and Mitigation, *International Journal of Geophysics*. Volume 2012, Article ID 974763, 6 p., doi:10.1155/2012/974763.
- Yang, Q., Yang, J., Wang, Z., Sheng, Y., and Fan, Q., 2012, Scenario Earthquake Hazard Evaluation in Langfang Area, *Technology for Earthquake Disaster Prevention (in Chinese)*, **7**: 285–293.
- Wang, Z., 2012, Comment on “PSHA Validated by Quasi Observational Means” by R.M.W. Musson, *Seismological Research Letters*, **83**: 714–716.
- Hu, C., Cai, Y., and Wang, Z., 2012, Effects of Large Historical Earthquakes, Viscous Relaxation, and Tectonic Loading on the 2008 Wenchuan Earthquake, *Journal of Geophysical Research*, **117**, B06410, 11 p., doi:10.1029/2011JB009046.
- Wang, Z., and Lu, M., 2011, A Short Note on Ground-Motion Recordings from the M7.9 Wenchuan, China, Earthquake and Ground-Motion Prediction Equations in the Central and Eastern United States, *Seismological Research Letters*, **82**: 731–733.
- Panza, G. F., Irikura, K., Kouteva, M., Peresan, A., Wang, Z., and Saragoni, R., 2011, Advanced Seismic Hazard Assessment, *Pure and Applied Geophysics*, **168**: 1–10.
- Wang, Z., 2011, Seismic Hazard Assessment: Issues and Alternatives, *Pure and Applied Geophysics*, **168**: 11–25.
- Xie, F., Z. Wang, and J. Liu, 2011, Seismic Hazard and Risk Assessments for Beijing-Tianjin-Tangshan, China, area, *Pure and Applied Geophysics*, **168**: 731–738.

Proceedings and Book Contributions

- Wang, Z., Rong, M., and Carpenter, S., 2016, Obtaining shear-wave velocity structure from broadband seismic and strong-motion recordings, Proceedings of the 7th International Conference on Environmental and Engineering Geophysics, June 26-29, 2016, Beijing, China, p. 394–397.
- Crawford, M., Wang, Z., and Carpenter, S., 2016, Earthquake and Landslide Hazard Assessments,

- Communication, and Mitigation in Kentucky, *Geoscience for the Public Good and Global Development: Toward a Sustainable Future*, Geological Society of America Special Paper 520, p. SPE520-31, first published on April 1, 2016, doi:10.1130/2016.2520(31).
- Wang, Z., 2014, Comparison of Design Ground Motion between Coastal California and the Central United States, *Proceedings of the Tenth U.S. National Conference on Earthquake Engineering Frontiers of Earthquake Engineering*, July 21-25, 2014, Anchorage, Alaska (DOI: 10.4231/D3NP1WJ9K), 11 p.
- Wang, Z., 2014, Seismic Design in Western Kentucky: Issues and Alternatives. *Seismic Hazard Design Issues in the Central United States*, in Beavers, J., and Uddin, N., eds, Seismic Hazard Design Issues in the Central United States, Chapter 9, p 111-141, doi: 10.1061/9780784413203.ch09.
- Wang, Z., 2013, Seismic Hazard Assessment and Design Ground Motion: Lessons Learned From Recent Earthquakes, *Proceedings of the Seventh International Conference on Case Histories in Geotechnical Engineering and Symposium in Honor of Clyde Baker*, April 29-May 4, 2013, Wheeling, IL, Paper No. 4.23a, 12 p.
- Wang, Z., and Cobb, J.C., 2012, A critique of probabilistic versus deterministic seismic hazard analysis with special reference to the New Madrid seismic zone, in Cox, R.T., Tuttle, M.P., Boyd, O.S., and Locat, J., eds., *Recent Advances in North American Paleoseismology and Neotectonics East of the Rockies: Geological Society of America Special Paper 493*, p. 259–275, doi:10.1130/2012.2493(13).
- Wang, Z., Woolery, E.W., and Hu, C., 2012, The Central United States Seismic Observatory: Site Characterization, *Proceedings of the 5th International Conference on Environmental and Engineering Geophysics*, June 15-18, 2012, Changsha, China, p. 223–227.
- Woolery, E.W., Almayahi, A., Hampson, S., Blits, C., Wang, Z., 2012, SH-wave Reflection Imaging in Unlithified Sediment—an Environmental and Seismic Hazards Application, *Proceedings of the 5th International Conference on Environmental and Engineering Geophysics*, June 15-18, 2012, Changsha, China, p. 287–293.
- Lu, Y., Woolery, E.W., Wang, Z., Liu, K., Teng, G., Sheng, Z., Qiang, Z., Li, Q., 2012, Comparison of S-wave Velocity Profile Obtained from Surface Seismic Detection and Borehole Data, *Proceedings of the 5th International Conference on Environmental and Engineering Geophysics*, June 15-18, 2012, Changsha, China, p. 500–504.
- Wang, Z., 2011, Seismic Risk Assessment and Application in the Central United States, *Proceedings of the GeoRisk 2011 Conference*, June 26 – 28, 2011, Atlanta, GA, p. 1020–1027.

Major Reports and Expanded Abstracts

- Orton, A., Wang, Z., Wang, L., and Woolery, E., 2016, Earthquake Hazard Mitigation in the New Madrid Seismic Zone: Science and Public Policy, Kentucky Geological Survey, ser. 12, **Report of Investigation 32** (in press).
- Wang, Z., 2015, the USGS National Seismic Hazard Mapping Project: Issues and Improvements, Proceedings of the ATC/USGS Seismic Hazard User-Needs Workshop, September 21-22, 2015, Menlo Park, California.
- Feng, J., Wang, Z., Woolery, E., and Li, S., 2015, Comparison of Ground Motion Attenuation Relationship Between Wenchuan, China, Area and the Central and Eastern United States, Kentucky Geological Survey, ser. 12, **Report of Investigations 28**, 45p.
- Wang, Z., and Woolery, E., 2013, Operation and Maintenance of the Seismic Network in the Vicinity of the Paducah Gaseous Diffusion Plant: April 2009–September 2012, Kentucky Geological Survey, ser. 12, Contract Report 5, 11 p.
- Wang, Z., 2011, Comment on NRC-2011-0204, Proposed Generic Communication; Draft NRC Generic Letter 2011-XX: Seismic Risk Evaluations for Operating Reactors, 3p. (pbadupws.nrc.gov/docs/ML1126/ML11263A182.pdf)

PROFESSIONAL AFFILIATIONS AND SERVICES

Affiliations

American Association for the Advancement of Science (AAAS)
American Geophysical Union (AGU)
Earthquake Engineering Research Institute (EERI)
Seismological Society of America (SSA)

Services

Peer Reviewer (journal article reviews)

Bridge Engineering
Bulletin of Seismological Society of America
Earth System Science
Engineering Geology
Geodynamics
Geology
Geophysical Research Letter
International Journal of Disaster Risk Reduction
Journal of Geophysics
Natural Hazards
Pure and Applied Geophysics
Seismological Research Letters
Tectonophysics

Lecturer, Lanzhou Institute of Seismology, Lanzhou, China, July 15, 2015, “Shale Gas Production and Induced Seismicity in the Central and Eastern United States”

Speaker, the 2014 Kentucky Professional Engineering Seminar, Prestonsburg, Kentucky, October 21, 2014, “Landslide and Other Geologic Hazards in Kentucky”

Speaker, the 2014 Kentucky Professional Engineering Seminar, Somerset, Kentucky, September 17, 2014, “Earthquakes and Seismic Design in Kentucky”

Lecturer, Fujian Earthquake Administration, Fuzhou, China, August 27, 2014, “Issues and Challenges of Earthquake Prediction and Hazard Mitigation”

Lecturer, Jilin Earthquake Administration, Changchun, China, August 22, 2014, “Earthquake Research and Hazard Mitigation in Kentucky”

Lecturer, Institute of Crustal Dynamics, Beijing, China, August 18, 2014, Workshop on Engineering Seismology

Lecturer, Lanzhou Institute of Seismology, Lanzhou, China, August 15, 2014, Workshop on Engineering Seismology

Speaker, the 2013 Kentucky Professional Engineering Seminar, Lexington, Kentucky, December 17, 2013, “Earthquakes and Seismic Design in Kentucky”

Speaker, the Paducah Area Home Builder Association Meeting, Paducah, Kentucky, October 17, 2013, “Earthquake and Seismic Issues in Western Kentucky”

Speaker, the 2013 Kentucky Professional Engineering Seminar, Prestonsburg, Kentucky, October 15, 2013, “Earthquakes and Seismic Design in Kentucky”

Speaker, the 2013 Kentucky Professional Engineering Seminar, Bowling Green, Kentucky, October 1, 2013, “Earthquakes and Seismic Design in Kentucky”

Speaker, the 2013 Kentucky Professional Engineering Seminar, Somerset, Kentucky, September 17, 2013, “Earthquakes and Seismic Design in Kentucky”

Lecturer, Fujian Earthquake Administration, Fuzhou, China, August 3, 2013, “Earthquake Prediction and Forecast: From a Layperson’s Viewpoint”

Lecturer, Institute of Engineering Mechanics, Harbin, China, July 23, 2013, “Introduction to the Post-

Earthquake Damage and Intensity Assessments in the United States”

Lecturer, Lanzhou Institute of Seismology, Lanzhou, China, July 18, 2013, “Earthquake Prediction and Forecast: From a Layperson’s Viewpoint”

Speaker, the 2013 Kentucky Professional Engineering Seminar, Paducah, Kentucky, June 18, 2013, “Earthquakes and Seismic Design in Kentucky”

Lecturer, Purdue University, February 19, 2013, West Lafayette, IN, “Science and Public Policy: Earthquake Hazard Mitigation in the Central US and Western China”

Presenter, the USGS National Seismic Hazard Map (NSHMp) Workshop on Ground Motion Prediction Equations (GMPEs), December 12-13, 2012, I-House, Berkeley, CA, “Constraints on GMPEs for CEUS Using Wenchuan Data”

Lecturer, Institute of Engineering Mechanics, Harbin, China, August 8, 2012, “Seismic Hazard Assessment in the United States: Issues and Alternatives”

Speaker, Workshop on near-surface geophysics at the China University of Geosciences (CUG), June 14, 2012, “Near-Surface Geophysics and Environmental Application in Kentucky”

Speaker, ASCE Symposium: Seismic Hazard Design Issues in the Central United States, Memphis, Tennessee, April 10, 2012, “Seismic Design in Western Kentucky”

Speaker, the CEUS Sources Workshop for the USGS National Seismic Hazard Maps, 22-23 February 2012, Fogelman Center, University of Memphis, Memphis, TN, “Seismic Design and Public Policy in Western Kentucky: Issues and Alternatives”

Speaker, the Paducah Chamber of Commerce, Paducah, Kentucky, February 8, 2012, “Seismic Hazard Issues in Western Kentucky”

Speaker, the 2011 Kentucky Professional Engineering Seminar, Paducah, Kentucky, November 15, 2011, “Seismic Hazards and Building Codes in Kentucky”

Speaker, the 2011 Structural Engineer Association of Kentucky (SEAOK) Conference, Lexington, Kentucky, May 12-13, 2011, “Seismic Hazards and Building Codes in Kentucky”

Speaker, the 2011 Kentucky Society of Professional Engineers (KSPE) Annual Convention, Covington, Kentucky, April 27-29, 2011, “Seismic Issues and Building Codes for Kentucky”