# William C. Haneberg

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2727 Revere Street #5021
Houston TX 77098

bill@haneberg.com
www.haneberg.com

## SYNOPSIS

23+ years of internationally recognized experience encompassing professional practice, applied research, teaching, technical project management, and professional leadership. Emphasis on engineering geology, physical hydrogeology, structural geology, computational geology, and the use of geologic information in support of policy decisions.

## EMPLOYMENT

**Fugro GeoConsulting, Houston, Texas**

*Consultant*, 10/11 – present. Global deepwater geohazard assessment and engineering geology for offshore oil and gas projects.

**Haneberg Geoscience, Cincinnati, Ohio and Seattle, Washington**

*Consulting Geologist*, 7/99 – 10/11. Planning, execution, and completion of geologic studies with emphasis on landslide hazards and other forms of ground failure as well as fractured rock characterization. Scientific work has included:

- Numerous field and modeling studies of slope instability in support of open-pit mine and quarry operations, timber harvest planning, TMDL sediment source analyses, environmental analysis, infrastructure planning, and litigation.

- Use—and in some cases development—of digital image processing, visualization, and GIS software to aid in geologic interpretation of high resolution LiDAR, radar, and multibeam bathymetric data sets, including identification of faults, joints, rockslides, landslides, and potential subsidence problem areas above abandoned underground coal mines.

- Development and refinement of a publicly available lower hemisphere plotting and orientation data analysis package for the computer program *Mathematica*.

- Use of terrestrial digital terrestrial photogrammetry for 3-D rock slope modeling and virtual discontinuity mapping in support of surface mining and civil construction projects.

- Use of static and kinematic differential GPS surveys, stochastic simulation of elevation error fields, and Monte Carlo simulation of slope angle and factor of safety calculations to assess the effects of DEM uncertainty on process-based mathematical models of landslide hazards.

- Development of process-based probabilistic methods of GIS-based landslide hazard assessment (including seismic effects) using first-order, second-moment analytical approximations and numerical Monte Carlo methods for static and seismic conditions.

- Formulation of continuum mechanics models of deformation above a mid-crustal magma body with implications for tiltmeter placement and data interpretation.

Integration of DEM, InSAR, leveling, and geologic information to constrain and evaluate model results.

- Preliminary evaluation of aquifer compaction and land subsidence potential as a consequence of groundwater pumping in the Española Basin (Santa Fe area), New Mexico.

**Department of Geology, University of Cincinnati, Cincinnati, Ohio**

*Adjunct Professor of Geology*, 9/09 – present.

- Responsible for teaching undergraduate structural geology, including development of innovative and geometrically rigorous *Mathematica*-based digital lab exercises.

- Collaboration on Himalayan slope stability, neotectonic, and geomorphic research.

- Organizationof departmental colloquium series.

*Graduate Teaching/Research Assistant*, Department of Geology (9/82 - 5/85, 9/86 - 5/88) and *Hydrogeologist*, Groundwater Research Center (6/87 - 8/87).

- Assisted in teaching of various undergraduate/graduate geology courses.

- Assembled geologic information and performed preliminary well hydraulics calculations for a proposed experimental well field.

- Assisted with preparation of geologic slice maps illustrating bedrock and surficial geology for use in 3-D landslide hazard assessments.

**Department of Geology, Portland State University, Portland, Oregon**

*Adjunct Associate Professor of Geology*, 9/00 - 12/00.

- Taught structural geology as a sabbatical replacement.

**New Mexico Institute of Mining and Technology, Socorro and Albuquerque, New Mexico**

1) *Senior Engineering Geologist and Assistant Director*, New Mexico Bureau of Mines and Mineral Resources— Office of State Geologist, 12/98 - 6/99. Previously *Engineering Geologist and Assistant Director* (5/94 - 12/98) and *Engineering Geologist* (1/89 - 5/94). Tenure granted 1992. Planning, execution, and completion of applied research and professional practice related to geologic hazards and groundwater hydrology in New Mexico. Proposal preparation and research contract budget administration. Presentation of results at scientific meetings and in peer-reviewed scientific publications. Service on various panels, boards, and committees related to geologic hazards and water resources. Staff supervision and mentoring, including development of job descriptions, service on or leadership of search and performance evaluation committees, and annual employee appraisal. Responsible for training student lab technicians and overseeing operations of a soils and hydrology lab. Scientific project work included:

- Mapping, monitoring, and geomechanical modeling of ground deformation and failure associated with land subsidence due to groundwater pumping near Deming, NM. Deformation was monitored using an array of 0.1 microradian sensitivity tiltmeters and modeled using a combination of analytical thin and thick plate flexural solutions for elastic layers and multilayers.

- Nonlinear regression analysis of geophysical log porosity data and geomechanical modeling of Albuquerque basin aquifer system compaction potential using a porosity gradient method.

- Field, petrographic, and modeling studies of the influence of faults on groundwater flow in the Albuquerque basin. Development and application of analytical and finite-difference models of groundwater flow across faults, development of geometric models to assess the permeability anisotropy of fault rocks from petrographic data, and co-supervision of field characterization studies.

- Geomechanical modeling of the influence of topography and regional stress states on the local state of stress beneath the Rio Grande valley near Albuquerque. Development of analytical solutions for stresses and displacements in elastic half spaces with topography and variable states of regional stress.

- Laboratory determination of pressure-dependent hydraulic conductivity in weakly lithified sediments from the Albuquerque basin, including regression modeling of permeability-void ratio-confining pressure relationships.

- Geologic hazard mapping along a proposed transportation corridor through the Rio Grande gorge, including dormant and active landslide complexes, rock falls, hydrocompactive soils, and liquefaction.

- Field-based geologic mapping, aerial photo interpretation, and digital image analysis to assess the influence of a forest road on debris flow recurrence, travel distance, and deposition in a forested alpine watershed near Red River, NM.

- Forensic investigation of a debris flow mobilized from an irrigation-induced landslide near Cordova, NM. Project included detailed engineering geologic mapping, soil mechanics lab testing, limit equilibrium slope stability analysis to evaluate failure scenarios, and estimation of debris flow rheology.

- Service on a review board assembled to investigate the events that led to reactivation of a large dormant landslide adjacent to Costilla dam in northern New Mexico. Forensic review of pre-construction and construction geological and geotechnical data, slope stability analyses to evaluate the conditions necessary for landslide reactivation, and representation of the State of New Mexico during an arbitration hearing. Also served as a geotechnical consultant during the subsequent first filling of the reservoir.

- Mathematical modeling of the influence of host rock mineralogy on frictional heat dissipation, with implications for the origin of pseudotachylyte and inferred paleoseismicity.

- Statistical characterization and probabilistic modeling of soil lead distribution at an abandoned smelter site in Socorro, NM.

- Investigation of numerous cases of structural distress related to hydrocompactive soils.

- Numerical modeling of groundwater flow and landslide susceptibility, including the effects of rainfall infiltration, using finite-difference and analytical methods. This included a probabilistic modeling component based on Monte Carlo and first-order, second-moment methods and development of linearized pore pressure diffusion models.

- Service on various state and local committees involved with water resources planning and geologic hazard assessment (see Professional Service). Service on

hiring, tenure, and other committees within New Mexico Tech. Oversaw day to day operations at agency's Albuquerque branch office and supervised up to 5 student, support, and research employees.

2) *Faculty Adjunct*, Department of Earth & Environmental Sciences and Department of Mineral & Environmental Engineering, 1/90 – 9/05.

- Taught or team-taught advanced undergraduate and graduate courses in geological engineering, geology, geophysics, and hydrology. Supervised graduate student research and served as a member of M.S. and Ph.D. research committees. See lists of graduate students supervised and courses taught at the end of this document.

**Manitou Exploration Company, Inc., Granville, Ohio**

*Petroleum Geologist*, 6/85 - 7/86.

- Interpreted rotary drill cuttings and geophysical logs in order to make oil and gas well completion recommendations.
- Conducted geologic studies to site new wells, including computer programming for trend surface mapping of geologic attributes.
- Reserve analyses for individual wells and depletion curve analyses for a small oil field.

**Geology Department, Bowling Green State University, Bowling Green, Ohio**

*Graduate Teaching Assistant* (summer field camp, 6/82 - 8/82) and *Undergraduate Research Assistant*, Department of Geology (1/82 - 5/82).

## EDUCATION

**Ph.D.**, 1989, Geology, University of Cincinnati. Primary emphasis: geomechanics. Secondary emphasis: engineering geology and hydrogeology. Dissertation: *Hydrology and Drainage of a Thin Colluvium Hillside in Delhi Township, Ohio*. Advisor: Arvid Johnson.

**M.S.**, 1985, Geology, University of Cincinnati. Primary emphasis: structural geology. Thesis: *Fractures in the Cambrian Rome Formation near Wytheville, Virginia*. Advisor: Kees De Jong.

**B.S. cum laude**, 1982, Bowling Green State University (Ohio). Major: geology. Minor: general science.

## PROFESSIONAL CERTIFICATION AND LICENSES

**Certified Professional Geologist**, American Institute of Professional Geologists, #10311
**Licensed Geologist, Engineering Geologist, and Hydrogeologist** State of Washington, #501
**Professional Geologist**, State of Wisconsin, #356

## PROFESSIONAL AFFILIATIONS

**Fellow**, Geological Society of America
**Member**, American Geophysical Union
**Member**, Association of Environmental & Engineering Geologists

## SELECTED CONSULTING PROJECTS AND RESEARCH CONTRACTS

**Ohio Department of Transportation.** Probabilistic use of LiDAR data to detect and characterize landslides (co-PI with A. Shakoor, C. Toth, and D. Brzezinska (PI)). 2011.

**Fisher & Strickler Rock Engineers.** 3-D photogrammetric rock slope modeling, structural mapping, and statistical analysis of joint sets, Dover Bridge, Idaho. 2011.

**Seattle City Light.** Development of field procedures and design of field program; computer processing for photogrammetric, terrestrial LiDAR, and multibeam sonar 3-D rock slope modeling; and kinematic analysis of potential rock slope stability issues, Boundary Dam, Washington. 2010-2011.

**Seattle City Light.** Emergency 3-D rock slope modeling, structural mapping, and data analysis for a rockslide source area and adjacent slopes, Ross Dam, Washington, using terrestrial digital photogrammetry and airborne LiDAR. 2010.

**Kleinfelder**. 3-D rock slope modeling, structural mapping, data analysis, and high-resolution photo mosaic creation in support of rockfall hazard assessment for a 600-foot high rock face, Boundary Dam, Washington using terrestrial digital photogrammetry. 2010.

**C.F. Watts**. GIS based runoff modeling for a residential area, northern Virginia. 2010.

**Fiji Water.** Estimation of silica particle growth rate from reaction kinetic data (collaboration with J.B. Maynard). 2010.

**URS Corporation**. Preliminary evaluation of Española basin, New Mexico, aquifer compaction and land subsidence potential for the New Mexico Office of State Engineer. 2009-2010.

**MACTEC Engineering & Consulting.** Development of guidance for 3-D subsurface discontinuity characterization and GIS watershed modeling in support of National Cooperative Highway Research Program project on scour at bridge foundations in rock (NCHRP 24-29). 2006-2009.

**Barr & Mudford / C.F. Watts.** Airborne LiDAR DEM creation from point cloud data, rock mass discontinuity mapping and modeling, 2-D and 3-D visualization, structural geologic interpretation, and review of opposition expert reports in support of a lawsuit involving a fatal rock-fall in Yosemite National Park (Terbush v United States). 2009.

**Fisher & Strickler Rock Engineering**. 3-D rock slope modeling, structural mapping, and data analysis in support of quarry operations, eastern Virginia, using terrestrial digital photogrammetry. 2009

**Saguaro GeoServices.** 3-D rock slope modeling and structural mapping in support of highway rock slope design, SR 87, Arizona, using terrestrial digital photogrammetry. 2009.

**Fireman's Fund / Great American Insurance Company / Caufield & James.** Finite element modeling of the effects of rubble pile placement on vadose zone deformation in support of groundwater contamination litigation. Review of opposition expert reports (Angeles Chemical Company *et al* v McKesson Corporation). 2005-2009.

**Wyllie & Norrish Rock Engineers.** 3-D rock slope modeling and structural mapping in support of mine planning, Sonora, Mexico, using terrestrial digital photogrammetry. 2008.

**MMI Engineering.** Remote sensing consultation regarding geologic conditions and excavation issues along a proposed 1000 km petroleum pipeline route, western Kazakhstan. 2008.

**Jordan, Jones & Goulding.** Multi-scale 3-D rock slope modeling and structural mapping in support of engineering design, Bellwood quarry-to-reservoir conversion, Atlanta, Georgia, using terrestrial digital photogrammetry. 2008.

**URS Corporation.** 3-D digital outcrop modeling using terrestrial digital photogrammetry, structural mapping, and 3-D digital surface-subsurface geologic model development in support of rock slope remediation and reconstruction along I-90 Snoqualmie Pass East, Hyak to Keechelus Dam, Washington, in collaboration with Wyllie & Norrish Rock Engineers, Burk GeoConsult, and Strickler's Geologic Consulting. 2006-2008.

**URS Corporation.** Airborne LiDAR data processing, enhancement, and advising in support of natural gas pipeline seismic hazard analysis and landslide hazard assessment, Papua New Guinea. 2007-2008.

**Sanborn**. Application of the in-house probabilistic landslide modeling software PISA-m and support for application of the SHALSTAB and SMORPH landslide hazard models as part of a LiDAR-based comparative evaluation project for the North Coast Regional Water Quality Control Board. Freshwater Creek and Ryan Creek watersheds, Humboldt County, California. 2007-2008.

**Aggregate Industries US.** 3-D digital outcrop modeling and structural mapping support associated with aggregate quarry decommissioning, Colorado, using terrestrial digital photogrammetry. 2007.

**Geosyntec Consultants.** Field reconnaissance, aerial photo image analysis, and report review for a structurally complicated rock slope, San Francisco Bay area. 2007.

**Golder Associates.** 3-D digital outcrop modeling and structural mapping in support of rock slope design in a hard rock quarry, southern California, using terrestrial digital photogrammetry. 2007.

**Stillwater Sciences.** Application of the in-house probabilistic landslide modeling software PISA-m as part of a LiDAR-based comparative evaluation project for the North Coast Regional Water Quality Control Board. Elk River watershed, Humboldt County, California. 2006-2007.

**Aimone-Martin & Associates.** 3-D digital rock mass modeling and structural mapping in support of blast design and crusher effectiveness studies at a limestone quarry near Grants, New Mexico, using terrestrial digital photogrammetry. 2006.

**The Islands Trust.** Consultation and development of DEM based rational probabilistic landslide hazard models to use as screening tools for land use planning on two islands in British Columbia. 2006.

**Rutherford & Chekene Consulting Engineers**. LiDAR processing and interpretation, engineering geologic mapping, watershed-scale static and seismic probabilistic slope stability modeling, and slope risk assessment, University of California at San Francisco Parnassus Campus. 2006.

**City of Henderson, Nevada**. Review of potential blasting- and earthquake-triggered slope hazards. 2006.

**Golder Associates.** 3-D digital outcrop modeling and structural mapping in support of rock slope remediation along Interstate 90, MP 66 near Snoqualmie Pass, Washington, using terrestrial digital photogrammetry in collaboration with Wyllie & Norrish Rock Engineers. 2006.

**Landau Associates.** LiDAR DEM creation, enhancement, slope mapping, and provisional landslide identification in support of critical area ordinance mapping in Edmonds, Washington. 2005-2006.

**Graniterock and GeoSyntec Consultants**. Peer review of hydrogeologic data, report, and groundwater model prepared in support of quarry operations in fractured igneous rocks along a fault zone. Synthesis and hydrogeologic interpretation of structural geologic information in support of model revisions. 3-D digital outcrop modeling and mapping of rock mass discontinuities using terrestrial digital photogrammetry. 2005-2006.

**Pacific Northwest Center for Geologic Mapping Studies (GeoMapNW), University of Washington.** Airborne LiDAR consulting and training in support of quadrangle scale geologic mapping, Mercer Island, Washington. 2005.

**URS Corporation.** LiDAR and slope stability consultant, US Highway 20 improvement project, Pioneer Mountain to Eddyville, Oregon Coast Ranges. 2005.

**Landau Associates**. Gridding, visualization, and preliminary interpretation of a high-resolution LiDAR DEM in support of groundwater modeling and slope stability investigations, Cedar River watershed, Washington. 2004-2005.

**Condor Earth Technologies.** Terrain hazard analysis including LiDAR DEM processing, 2-D and 3-D terrain visualization and analysis, delineation of potential slope stability hazards, field verification, and geotechnical advising. Lihir Mine, Papua New Guinea. 2004.

**State of Washington, General Administration Department, Engineering and Architectural Services.** Geotechnical review and analysis of landslide problems persisting after completion of a $1.5 million slope stabilization project on the Washington state capitol campus. 2004.

**AMEC Earth & Environmental.** Calculation of non-parametric confidence limits for metal concentrations in potential earthwork fill sources for Seattle-Tacoma International Airport. 2004.

**U.S. Geological Survey, National Earthquake Hazards Reduction Program**. Influence of conventional and LiDAR DEM errors on the reliability of earthquake triggered landslide hazard maps. Detailed GPS surveying and geostatistical simulation of elevation error distributions with applications to seismic slope stability modeling. 2003-2004.

**Crowley & Bünger.** Technical expert in lawsuit regarding earth movements and structural damage associated with highway embankment construction (Skow v Iowa). 2003-2004.

**North Coast Regional Water Quality Control Board (California)/Concur, Inc**. Humboldt County Independent Scientific Review Panel. Review of methods for calculating timber harvest rates that will not impede recovery of impaired watersheds; review of the role of timber harvesting on landsliding, downstream flooding, and potential remedial measures; assessment of habitat conservation plan measures as related to surface water quality attainment; outline of future data and technology needs. 2002-2003.

**Northwest Environmental Training Center (Seattle).** Development and teaching of 2-day short courses on applied statistics for MTCA environmental site managers and fundamentals of computational hydrogeology. Teaching of 2-day introductory hydrogeology course for non-hydrogeologists. 2003-2005.

**New Mexico Bureau of Geology and Mineral Resources.** Interpretation of geodetic data and mathematical modeling of deformation above a mid-crustal magma body along the Rio Grande rift. 2001-2003.

**American Planning Association.** Preparation of a chapter on new technologies for landslide hazard assessment, to be included in a nationally distributed handbook for planners. 2002.

**Lerner & Lerner Academic Editors and Publishers.** Contributing author for *World of Earth Science*, *Gale Encyclopedia of Science*, and *Encyclopedia of Espionage, Intelligence, and Security*. 2002-2003.

**US Forest Service, Clearwater National Forest.** Review of slope stability and erosion aspects of North Lochsa Face ecosystem management plan EIS. 2001.

**Scotia Pacific Company.** Development and application of physically based probabilistic landslide hazard assessment models for watershed analysis and forest planning. 2001.

**Vorys, Sater, Seymour and Pease.** Forensic investigation and expert services regarding landslides, precipitation, mine subsidence, blasting vibrations, and structural distress in a residential area adjacent to an active limestone quarry and abandoned coalmines. 2000.

**Chino Mines Company (Phelps-Dodge Corporation)**. Engineering geologic mapping of rock slopes adjacent to an open pit copper mine. Rock slope monitoring system design. 1999-2000.

**Daniel B. Stephens & Associates.** Open-pit mine hydrogeology and slope stability proposal review and comment. 1999.

**National Science Foundation.** Hydrogeologic characterization of the Sand Hill fault zone, Albuquerque Basin, New Mexico (co-PI with L.B. Goodwin, P.S. Mozley, and A.L. Gutjahr). January 1998 - December 2001.

**William Lettis & Associates.** Liquefaction mapping in the Albuquerque/Santa Fe corridor. January-December 1998. PI on subcontract with Wm. Lettis & Associates as part of a National Earthquake Hazard Reduction Program (NEHRP) grant.

**New Mexico Department of Public Safety, Earthquake Preparedness Program.** Engineering geologic and preliminary liquefaction susceptibility mapping of shallow Rio Grande alluvium, Albuquerque, New Mexico. July 1997 - September 1998.

**New Mexico Department of Public Safety, Earthquake Preparedness Program.** World Wide Web earthquake education site and public access computer. July 1997 - June 1988.

**New Mexico Department of Public Safety, Earthquake Preparedness Program.** Development of new tools to evaluate paleoseismicity (with L.B. Goodwin and T.M. Whitworth). September 1997 - August 1998.

**City of Albuquerque, Public Works Department, Water Utility Division.** Characterization of major hydrogeologic units in the northern Albuquerque Basin (with J.W. Hawley). October 1993 - September 1995.

**New Mexico Engineering Research Institute.** First-filling monitoring of Costilla Dam. June 1993 - December 1994.

**New Mexico Interstate Stream Commission**. Costilla Dam Independent Review Team. July - December 1992 and January - June 1994.

**New Mexico State Highway and Transportation Department.** Rio Grande gorge highway corridor study, Rinconada to Pilar. May - June 1992.

**U.S. Geological Survey and New Mexico Water Resources Research Institute.** Cyclic flexure of surficial strata in response to seasonal groundwater withdrawal from the Mimbres Basin, New Mexico. July 1991 - October 1992.

**New Mexico Institute of Mining and Technology, Research Council.** Use of seismic reflection profiles to characterize soil deformation associated with earth fissures and groundwater withdrawal near Deming, New Mexico. 1990.

**The Hillside Trust.** Drainage of a natural colluvium-mantled hillside in western Cincinnati. 1987-1989.

**ARCO Exploration Company.** Fractures in the Cambrian Rome Formation near Wytheville, Virginia. 1983-1985.

**Geological Society of America**. Fractures in the Cambrian Rome Formation near Wytheville, Virginia. 1983 (Penrose Grant).

## HONORS

**Richard H. Jahns Distinguished Lecturer.** Association of Environmental & Engineering Geologists and Geological Society of America (Environmental & Engineering Geology Division), 2010-2011.

**Samuel Mayfield Distinguished Lecturer**, Bowling Green State University, Department of Geology, 2010.

**Fulbright Senior Specialists Program Roster**, Council for International Exchange of Scholars, 2009-present.

**Claire P. Holdredge Award**, Association of Environmental & Engineering Geologists, for *Computational Geosciences with Mathematica* as a recent publication judged to be an outstanding contribution to the advancement of the profession, 2006.

**Meritorious Service Award**, Geological Society of America, Engineering Geology Division, 2006.

**Visiting Scholar,** Western Michigan University, Department of Geosciences, September 2006.

**Presidential Citations**, Association of Environmental & Engineering Geologists, 2004, 2006-2010.

**Editor's Citation for Excellence in Scientific Refereeing,** American Geophysical Union, 2002.

**Certificate of Distinction** from the New Mexico State Engineer for contributions made as a member of the Costilla Dam Independent Review Team resulting in the State's recovery of nearly $5 million in cost overruns associated with the reactivation of a dormant landslide, 1994.

**Outstanding Teaching Assistant**, Department of Geology, University of Cincinnati, 1985.

## PROFESSIONAL SERVICE

**Editorial Policy Board**, *Environmental & Engineering Geoscience*. Chair, 2007-2010. Member, 2001-2007. Joint AEG-GSA appointee, 2008-2010. GSA appointee, 2001-2007. Associate Editor, 1995-2001.

**Trustee**, The Hillside Trust, Cincinnati, Ohio, 2010-2011.

**Chair,** Engineering Geology Division, Geological Society of America, 2003-04. Previously vice-chair (2002-03), secretary (2001-02), and management board member-at-large (2000-01).

**Chair,** Digital and Electronic Technology in Geology Technical Working Group, Association of Environmental & Engineering Geologists, 2007-present.

**Chair**, Professional Development Committee, Geological Society of America, 2004-2006. Committee member, 2003-2004.

**Joint Technical Program Committee Representative,** Engineering Geology Division, Geological Society of America Annual Meeting, 2002 and 2003.

**Organizer**, Mass Wasting in Disturbed Watersheds. AEG Shlemon Conference, Durango, Colorado, Spring 2006 (with S. Cannon, J. Coe, and P. Santi).

**Organizer**, Earth Fissures. AEG Shlemon Conference, El Paso, Texas, April 2004 (with J.R. Keaton).

**Organizer**, Faults and Subsurface Fluid Flow: Fundamentals and Applications to Hydrogeology and Petroleum Geology. Geological Society of America Penrose Conference, Taos, New Mexico, September 1997 (with J.C. Moore, L.B. Goodwin, and P.S. Mozley).

**Advocate/Convener**, Fractured Rock Characterization in Applied Geology. Geological Society of America 2006 Annual Meeting topical session.

**Advocate/Convener**, GIS, GPS, and Remote Sensing Applications in Geologic Hazard Assessment. Geological Society of America 2004 Annual Meeting topical session (with N. Levine).

**Advocate/Convener**, Characterizing Complexity in Geomechanics, Engineering Geology, and Hydrogeology . Geological Society of America 2003 Annual Meeting topical session (with E. Medley).

**Advocate/Convener**, Humans as Geologic Agents. Geological Society of America 2002 Annual Meeting topical session (with J. Ehlen and R. Larson).

**Advocate/Convener**, Nothing Ventured, Nothing Gained: Geology and Risk Assessment in the 21st Century. Geological Society of America 2001 Annual Meeting topical session (with S. Burns).

**Convener**, Quantifying Hazardous Natural Processes for Risk Assessment. Association of Engineering Geologists 1996 Annual Meeting symposium (with J.R. Keaton).

**Convener**, Instability of Clay and Shale Hillslopes. Geological Society of America 1992 Annual Meeting symposium (with R.W. Fleming).

**Member,** International Association for Engineering Geology (IAEG) Commission No. 1 (Engineering Geologic Visualization and Characterization), 2007-present.

**Member,** Geological Society of America *Ad Hoc* Committee on Divisions, 2006.

**Member**, Shlemon Conference Operational Committee, Association of Engineering Geologists, 2004.

**Member**, New Mexico State Engineer Mid-Rio Grande Technical Advisory Committee, 1995-1999.

**Member**, New Mexico Interstate Stream Commission Regional Water Planning Work Group, 1996.

**Member**, Institute Senate Research Committee, New Mexico Tech, 1992-1994.

**Member**, External Awards Committee, Geological Society of America, 1998.

**Member**, E.B. Burwell, Jr. Award Panel, Engineering Geology Division, Geological Society of America, 1990-1992.

**State Delegate**, Western States Seismic Policy Council, alternate years 1992 -1998.

**Faculty Member**, Watershed Assessment and Restoration short course, U.S. Forest Service National Advanced Resource Technology Center, April 1995.

**Vice-chair**, Institute Senate, New Mexico Tech, 1994-1995.

**Member**, City of Cincinnati Infrastructure Commission, 1987.

**Manuscript or Proposal Reviewer** for *Nature, Geological Society of America Bulletin*, *Geology*, *Water Resources Research*, *Geomorphology, Journal of Geology*, *Journal of Geophysical Research*, *Bulletin of the Seismological Society of America*, *Landslides, Catena, Engineering & Environmental Geoscience*, *Engineering Geology, Hydrogeology Journal, Journal of Geotechnical Engineering, American Association of Petroleum Geologists Bulletin, Clays and Clay Minerals, Annals of Geophysics, Advances in Water Resources*, *Computers & Geosciences, Advances in Space Research*, Kansas Geological Survey, U.S. Geological Survey, Columbia University Press, Oxford University Press, National Science Foundation, U.S. Department of Energy, Wyoming Water Resources Research Institute, Petroleum Research Fund.

## PUBLICATIONS

### Books Written

**Haneberg, W.C.**, 2004, *Computational Geosciences with Mathematica*: Springer-Verlag, 381 p.

### Books Edited

Ehlen, J., **Haneberg, W.C.**, and Larson, R.L., editors, 2006, *Humans as Geologic Agents*: Geological Society of America Reviews in Engineering Geology, 158 pp.

**Haneberg, W.C.**, Mozley, P.S., Moore, J.C., and Goodwin, L.B., editors, 1999, *Faults and Subsurface Fluid Flow in the Shallow Crust*: American Geophysical Union Geophysical Monograph 113, 220 pp.

**Haneberg, W.C.** and Anderson, S.A., editors, 1995, *Clay and Shale Slope Instability*: Geological Society of America Reviews in Engineering Geology 10, 160 pp.

### Peer Reviewed Papers in Journals and Books

Gurung, N., **Haneberg, W.C.**, Ramana, G.V., and Datta, M., 2011, Engineering geology and stability of the Laprak landslide, Gorkha District, Nepal: *Environmental & Engineering Geoscience*, v. 17, p. 23-38 (doi: 10.2113/gseegeosci.17.1.23).

**Haneberg, W.C.**, 2009, Improved optimization and visualization of drilling directions for rock mass discontinuity characterization: *Environmental & Engineering Geoscience*, v. 15, p. 107-113 (doi: 10.2113/gseegeosci.15.2.107).

**Haneberg, W.C.**, Cole, W.F., and Kasali, G., 2009, High-resolution LiDAR-based landslide hazard mapping and modeling, UCSF Parnassus Campus, San Francisco, USA: *Bulletin of Engineering Geology and the Environment*, v. 68, p. 273-286 (doi: 10.1007/s10064-009-0204-3).

Adam, B., Dietsch, C., Owen, L.A., Caffee, M.W., Spotila, J.A., and **Haneberg, W.C.**, 2009, Exhumation and incision history of the Lahul Himalaya, northern India, based on (U-Th)/He

thermochronometry and terrestrial cosmogenic nuclide dating techniques: *Geomorphology*, v. 107, p. 285-299 (doi:10.1016/j.geomorph.2008.12.017).

Dortch, J.M. Owen, L.A., **Haneberg, W.C.,** Caffee, M.W., Dietsch, C., and Kamp, U., 2009, Nature and timing of large landslides in the Himalaya and Transhimalaya of northern India: *Quaternary Science Reviews*, v. 28, no. 11-12, p. 1037-1054 (doi:10.1016/j.quascirev.2008.05.002).

**Haneberg, W.C.**, 2009, Simplified analysis of vibration induced rock toppling: *Environmental & Engineering Geoscience*, v. 15, p. 41-45 (doi: 10.2113/gseegeosci.15.1.41).

**Haneberg, W.C.,** 2008, Using close range terrestrial digital photogrammetry for 3-D rock slope modeling and discontinuity mapping in the United States: *Bulletin of Engineering Geology and the Environment*, v. 67, no. 4, p. 457-469 (doi: 10.1007/s10064-008-0157-y).

**Haneberg, W.C.**, 2008, Elevation errors in a LIDAR digital elevation model of West Seattle and their effects on slope stability calculations, *in* R.L. Baum, J. Godt, and L. Highland, editors, *Landslides and Engineering Geology of the Greater Seattle Area, Washington*: Geological Society of America Reviews in Engineering Geology, v. 20, p. 55-66 (doi: 10.1130/2008.4020(03)).

**Haneberg, W.C.,** 2006, Effects of digital elevation model errors on spatially distributed seismic slope stability calculations: an example from Seattle, Washington: *Environmental & Engineering Geoscience*, v. 12, p. 247-260 (doi: 10.2113/gseegeosci.12.3.247).

**Haneberg, W.C.**, 2004, Simulation of 3-D block populations to characterize outcrop sampling bias in block-in-matrix rocks (bimrocks): *Felsbau*, v. 22, no. 5, p. 19-26.

**Haneberg, W.C.**, 2004, A rational probabilistic method for spatially distributed landslide hazard assessment: *Environmental & Engineering Geoscience*, v. 10, p. 23-47, (doi: 10.2113/10.1.27).

**Haneberg, W.C.**, Bauer, P.W., and Chávez, W.X., Jr., 2002, Multilevel geologic hazard assessment mapping in the Rio Grande gorge, northern New Mexico, USA, *in* P. T. Bobrowsky, editor, *Geoenvironmental Mapping: Method, Theory and Practice*: A.A. Balkema, p. 75-91.

**Haneberg, W.C.**, 2000, Deterministic and probabilistic approaches to geologic hazard assessment: *Environmental & Engineering Geoscience*, v. 6, p. 209-226, (DOI: 10.2113/gseegeosci.6.3.209).

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Bretz, R.E., Kieft, T.L, Docher, A., Brandvold, D., Grande, C., Haase, S., **Haneberg, W.**, Stephens, C., and Hendrickx, J., 1992, *In-place slurry-phase production pit bioremediation*: Summary Report, PERF Project 92-17, 19 p.

**Haneberg, W.C.**, Bauer, P.W., and Chavez, W.X., Jr., 1992, *Rio Grande gorge highway corridor study, Rinconada to Pilar*: Completion Report submitted to New Mexico State Highway and Transportation Department, 22 p.

**Haneberg, W.C.** and Tripp, G., 1990, *Engineering geologic investigations of an irrigation-induced debris flow near Cordova, Rio Arriba County, New Mexico*: New Mexico Bureau of Mines and Mineral Resources Open-File Report 371, 80 p.

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Lowell, T.V. and **Haneberg, W.C.**, 1987, *A three-dimensional mapping technique to provide base line data for landslide hazard assessment*: Department of Geology, University of Cincinnati, Final Report to the University Program Advisory Committee (UPAC), 55 p.

## GRADUATE STUDENTS SUPERVISED

Matthieu Sturzenegger, *An evaluation of rock slope characterization using digital photogrammetry and laser scanning techniques*. Ph.D. in Earth Sciences, Simon Fraser University, Canada, 2010. Committee member.

Narayan Gurung, *Landslide investigation and mitigation: a case study of Laprak landslide, Gorkha, Nepal*. M.Tech in Geotechnical and Geoenvironmental Engineering, Indian Institute of Technology, Delhi, India, 2009. External co-supervisor.

Jodi Clark, *Liquefaction susceptibility mapping of the shallow alluvium, Inner Valley, Rio Grande Basin, Albuquerque, New Mexico*. M.S. in Geology, NM Tech, 2004. Research advisor.

Geoff Rawling, *Hydrogeologic characterization of the Sand Hill fault zone, Albuquerque Basin, New Mexico*. Ph.D. in Geology, NM Tech, 2001. Committee member.

Andrew Dunn, *Geology and hydrogeology of the Costilla Dam landslide, northern New Mexico.* M.S. in Hydrology, NM Tech, 2001. Research advisor.

Michiel Heynekamp, *Controls on fault-zone architecture and fluid flow in poorly consolidated sediments: the Sand Hill fault, central New Mexico*. M.S. in Geology, NM Tech, 1998. Committee member.

Daniel Detmer, *Permeability, porosity, and grain size distributions of Pliocene and Quaternary sediments in the Albuquerque Basin, central New Mexico.* M.S. in Geology, NM Tech, 1995. Research advisor.

William Linderfelt, *Field study of capture zones in a shallow sand aquifer.* Ph.D. in Hydrology, NM Tech, 1994. Committee member.

Y.-C. Hsieh, *Identification of debris flow and soil creep deposits in Copper Canyon, Socorro County, New Mexico*. M.S. in Geology, NM Tech, 1994. Research advisor.

Robert Friesen, *Cyclic flexure of surficial strata near an earth fissure in the Mimbres Basin, southern New Mexico*. M.S. in Mineral Engineering, NM Tech, 1992. Research advisor.

Garret Ross, *Environmental geologic maps of Santa Fe County, New Mexico*. M.S. in Mineral Engineering, NM Tech, 1992. Research advisor.

Valerie Rhodes, *Laboratory study of geogrid-reinforced sand-clay mixtures from Cenozoic basin-fill deposits, central New Mexico*. M.S. in Mineral Engineering, NM Tech, 1991. Research advisor.

## UNIVERSITY COURSES TAUGHT

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|---|---|
| Geol 699 | **Geology Colloquium** (UC, 2009-2011) |
| Geol 331 | **Elementary Structural Geology** (UC, 2010, 2011) |
| Geol 394 | **Seminar: Digital Terrain Modeling** (NKU, 2010) |
| Geol/Hydro 572 | **Mechanics of Earth Surface Processes** (NMT, 1997, 1998) |
| Geol/Hydro 504 | **Hydrogeology** (NMT, team taught, 1994) |
| Geol/Geoph 558 | **Brittle Deformation (Mechanics of Earthquakes)** (NMT, team taught, 1994) |
| Geol 571 | **Mechanics of Geologic Processes** (NMT, 1993) |
| Geol 391 | **Structural Geology** (PSU, 2000) |
| Mineral Engrg 540 | **Numerical Methods in Geotechnical Engineering** (NMT, 1990, 1992) |
| Mineral Engrg 581 | **Geologic Hazards** (NMT, 1991) |
| Mineral Engrg 427 | **Site Investigation** (NMT, 1992) |

UC: University of Cincinnati
NMT: New Mexico Tech
NKU: Northern Kentucky University
PSU: Portland State University

## PROFESSIONAL SHORT COURSES TAUGHT

*Digital Terrain Modeling with Airborne LiDAR.* Association of Environmental & Engineering Geologists Annual Meeting, Los Angeles, September 24, 2007.

*Virtual Structural Mapping Using 3-D Digital Rock Slope Models.* Association of Environmental & Engineering Geologists Annual Meeting, Los Angeles, September 25, 2007 (with J. Keaton, G. Poropat, and A. Gaich).

*Introduction to Computational Hydrogeology: Developing Solutions to Groundwater Flow and Transport Equations*. Northwest Environmental Training Center, Seattle WA, February 9-10, 2005.

*Environmental Statistics for Site Managers*, Northwest Environmental Training Center, Seattle WA, June 25-26 and August 21-22, 2003.

*Applied Hydrogeologic Site Characterization for Environmental Professionals*, Northwest Environmental Training Center, Seattle WA, May 29-30, 2003.

*What are the Odds? An Introduction to Probabilistic Methods for Environmental and Engineering Geologists*. AEG-AIPG 2002 Joint Annual Meeting, Reno, September 2002.