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Poeter Engineering
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Education:

Ph.D.   Washington State University, 1980; Engineering Science
M.S.   Washington State University, 1978; Engineering
B.S.   Lehigh University, 1975; Geology

Employment History:

1984-Present, **Poeter Engineering**, Golden, CO
> **Consultant**: Responsible for groundwater analysis, model evaluation, and instruction. Projects are summarized at the end of this document.

2011-Present, **Colorado School of Mines**, Golden, CO, **Emeritus Professor**:

1987-2011, **Colorado School of Mines**, Golden, CO
> **Emeritus Professor (2008-2011)**: Responsible for senior and graduate level instruction in ground water engineering, modeling, and model calibration. Projects involved parameter estimation (including software development), water resource evaluation, flow and contaminant transport modeling, and characterization of heterogeneous and fractured aquifers using a variety of hydraulic and geophysical techniques. (Assistant Professor 1987, Associate Professor 1991, Professor 1996)
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> **Director International Ground Water Modeling Center (IGWMC) (1997-2011)**: Primary responsibility for managing and guiding the center in its mission to stimulate the appropriate use of simulation models and related computer-based support technology in the management and protection of groundwater resources. As a focal point for ground-water professionals, the Center supports and advances the appropriate use of quality-assured models in ground-water resources protection and management. http://www.mines.edu/igwmc/

1984-1987,   **Washington State University**, Pullman, Washington
> **Assistant Professor**: Responsible for senior and graduate level instruction and research programs in the fields of groundwater and geophysics. Emphasis was in the areas of borehole geophysics and groundwater modeling. Projects included research in the nature of full acoustic waveforms in fracture media, investigation of groundwater contributions to phosphorus loading of lakes and geohydrologic and borehole geophysical studies of hazardous waste sites and potential high-level nuclear waste disposal sites.

1980-1984,   **Golder Associates - Senior Hydrologist**: Involved in all phases of hydrologic, geohydrologic and borehole geophysical studies and specialized in computer modeling. Managed a large project to assess geohydrologic conditions at seven potential high-level, nuclear waste, repository sites. Served as lead hydrologist on a large project to establish a methodology and study the design and performance of engineered barriers for deep geologic nuclear waste repositories. Other projects involved evaluation of pump tests; tailings pond seepage; mine water inflow; dewatering for foundations and slope stability; design of storm drainage systems, landfill closures and dewatering systems; and coupled heat and groundwater flow in the vicinity of deep geologic repositories for high-level nuclear waste. Responsibilities also included the continued development, maintenance, marketing, instruction, and user support of the Golder Groundwater Package computer software. (Hydrologist 1980, Senior Hydrologist 1983)

1980,   **Washington State University - Research Technician**: Traveled to field sites, recorded geophysical logs, and performed preliminary interpretations on site. Interpretations provided information pertinent to construction and development of water wells.

1976-1980,   **Washington State University, Research Assistant**: Responsible for interpretation and correlation of geophysical logs, mathematical modeling of radiation processes involved in nuclear logging, computer programming of mathematical models and designing calibration tanks for logging tools.

Registration: Professional Engineer, No. 25286, Colorado State

Consulting Projects:

Brownstein, Hyatt, Farber, and Schreck, P.C., Advisor for groundwater modeling of Supplemental Aquifer Storage and Recovery in the South Platte Alluvium, Aurora Prairie Waters Project, Colorado (2011)

AECOM, Advising on Groundwater Modeling in the Powder River Basin, Wyoming (2010-2011)

MWH, Review of modeling of groundwater withdrawal near Owen's Lake, CA (2009-2011)

AECOM (formerly ENSR), Evaluation of Groundwater Modeling for Clark, Lincoln, and White Pine Counties, Nevada, Groundwater Development Project (2008-2011)

Brownstein, Hyatt, Farber, and Schreck, P.C., Review of groundwater modeling for water resources management. Cases 02CW404 and 03CW442 (2010-2011)

RJH, Advising on Groundwater Model Development for Dam Seepage and Safety (2010-2011)

The Benham Companies, Review of Groundwater Modeling of Brine Migration in the Poplar River drainage, Montana (2010-2011)

Sherman & Howard, Evaluation of Gravel Pit Slurry Wall in the South Platte River drainage, Colorado (2010-2011) Provided Expert Testimony

Brownstein, Hyatt, Farber, and Schreck, P.C., Advisor for groundwater modeling of Aquifer Storage and Recovery in the South Platte Alluvium, Aurora Prairie Waters Project, Colorado (2007-2009)

Deere and Ault Consultants, Inc., Advisor for groundwater modeling South Platte drainage, Colorado (2007-2008)

Leonard Rice Engineering, Advisor for groundwater modeling (2007)

ENSR, Evaluation of FEMFLOW3D, MESHMAKER, MAKEFAULT (2005-2007)

Hatch & Parent, A Law Corporation, Review of groundwater model (2005)

Applied Hydrology International, Modeling Advisor (2005)

U.S. Environmental Protection Agency, Development of Jupiter Software (2003-05)

Concurrent Technologies Corporation – Development of Conceptual Model for the Carbon Tetrachloride spill in the 200W Area and Procedures for Testing the Model (2003-04)

Battelle Pacific Northwest Laboratory. - Modification of UCODE for Inverse Modeling of Flow and Transport on the Hanford Reservation (2003)

Glorieta Geoscience Inc. - Ground-water Model review of dewatering impacts. (2003)

Sinclair Oil - Ground-water Modeling of a refinery in Evansville, Wyoming. (2001-2003) Wisconsin Department of Natural Resources – Review of Analytical Element Modeling software (2001)

US Army Corp of Engineers, Advise on inverse modeling for ground-water applications (2001)

Battelle Pacific Northwest Laboratory. - Modification of UCODE and guidance on Inverse Modeling of Flow and Transport on the Hanford Reservation (2000)

Baker Consultants Inc. - Numerical groundwater modeling review for a mining project, the Battle Mountain Gold Company (1999)

Haight, Brown & Bonesteel, Attorneys, Assessment and modeling of groundwater flow for the Southern California Water Company (1999)

Jefferson County, CO. - Numerical groundwater modeling review for the proposed Rail Line Quarry (1998-99) Provided Expert Testimony

South Florida Water Management District - Review of the Post-Calibration and the Martin Coastal Sub-Regional Models (1997-1998)

Riverside Technology Inc. - Geohydrology and numerical groundwater modeling review for mining projects, the Barrick Goldstrike Model and the Kinross Goldbanks Model (1996-1998)

Hatton Water Consultants, Advise on groundwater modeling in the Denver Basin (1995-1998).

Baker Consultants Inc. - Numerical groundwater modeling review for a mining project, the Battle Mountain - Phoenix Groundwater Model (1997)

W&EST Inc. - Geohydrology and numerical modeling problems, water supply, contaminant migration, and litigation projects (1990-1996), including Cotter Mill, Canon City CO; Colorado Springs Model; Central Arizona Basin Project

Holme, Roberts, and Owen, LLC, Assessment of a petroleum plume in the groundwater system at a refinery site for Sinclair Oil (1994-1996) Provided Expert Testimony

Fleck, Mather, & Strutz, Ltd, Assessment of groundwater conditions in the vicinity of Oil Field Brine disposal ponds (1996)

Haight, Brown & Bonesteel, Attorneys, Assessment and modeling of groundwater flow and transport near a gas compressor site for Pacific Gas and Electric (1996)

ESE Inc., Flow and transport modeling in the vadose and saturated zones at the Hanford Site (1995-1996)

TDA Research Inc. - Remediation of contamination plumes using in situ biopolymer based selective barriers (1994-1995)

Woodward Clyde - Modeling groundwater flow near a dam in Arkansas (1993)

ACZ Inc. - Modeling of groundwater flow at a tailings disposal site at the Choquelimpie Mine in Rio Lauca Chile (1992) and dam seepage and stability - Cambior Alaska Inc. (1992)

Lincoln Park Area Concerned Citizens - the Cotter Mill Superfund Site (1989-1992) Provided Expert Testimony

AQUASAN Inc. - Modeling of stream-aquifer interaction (1991)

Westinghouse Hanford Company - Hydrogeological conditions in the 300 Area of the Hanford Reservation (1991)

Doty and Associates - Interpretation of potentially perched groundwater conditions from geophysical logs (1991)

Advanced Sciences, Inc., - Field measurement of recharge rates on the Rocky Flats Plant Site (1990-1991)

Woodward-Clyde Consultants - Remediation of the Yak Tunnel (February-March 1990)

Washington State Department of Ecology, Review of Summary Report - A Potential Hazardous Waste Disposal Site (December 1988)

Department of Energy, Chairman of a Licensing Assurance Review committee for the Site Characterization Plans of the Basalt Waste Isolation Project (December 1986-September 1987)

Dames & Moore, - Geophysical log interpretation regarding perched water conditions (August-October 1986)

Mansfield, Reinbold & Gardner, Attorneys at Law - Assessment of impact of the Bureau of Reclamation dewatering project on local water levels (July-August 1985)

Expert Testimony was provided for the following projects:

Sherman & Howard, Evaluation of Gravel Pit Slurry Wall in the South Platte River drainage, CO (2010)

Jefferson County, CO. - Numerical groundwater modeling review for the proposed Rail Line Quarry (1998-99)

Holme, Roberts, and Owen, LLC, Assessment of a petroleum plume in the groundwater system at a refinery site for Sinclair Oil (1994-1996)

Lincoln Park Area Concerned Citizens - the Cotter Mill Superfund Site (1989-1992)

Primary Publications (* indicates student/post-doc working with Poeter):

Major, E.*, D. A. Benson, J. Revielle*, H. Ibrahim, A. M. Dean*, R. M. Maxwell, E. P. **Poeter**, and M. Dogan (2011), Comparison of Fickian and temporally non-local transport theories over many scales in an exhaustively sampled sandstone slab, *Water Resour. Res.*, doi:10.1029/2011WR010857, in press.

McMahon,P.B., C.P. Carney*, E.P. **Poeter**, and S.M. Peterson, 2010, Use of Geochemical, Isotopic, and Age Tracer Data to Develop Models of Groundwater Flow for the Purpose of Water Management, Northern High Plains Aquifer, USA, Applied Geochemistry, doi:10.1016/j.jhydrol.2010.05.012.

Stannard, David I., William T. Paul*, Roy Laws, and Eileen P. Poeter, 2010, Consumptive Use and Resulting Leach-field Drainage from a Mountain Residence, Journal of Hydrology, doi:10.1016/j.jhydrol.2010.05.012.

Hill M.C., E.P. **Poeter**, and C. Zheng, 2010, Foreword: Groundwater Modeling and Public Policy, Editorial, Ground Water, v. 48, no.5, September/October 2010, pp. 625–626.

Katherine Walton-Day, Eileen **Poeter**, 2009, Investigating hydraulic connections and the origin of water in a mine tunnel using stable isotopes and hydrographs, Applied Geochemistry, Available online 18 September 2009, ISSN 0883-2927, DOI: 10.1016/j.apgeochem.2009.09.015. (http://www.sciencedirect.com/science/article/B6VDG-4X85F85-5/2/c4cd1b849ffe4683f27d0111d7473f75)

Geza*, M., E.P. **Poeter**, and J.E. McCray, 2009, Quantifying Predictive Uncertainty for a Mountain-Watershed, Journal of Hydrology, HYDROL16698PII:S0022-1694(09)00418-1DOI:10.1016/j.jhydrol.2009.07.025

McCray, J.E., M. Geza*, K.E. Murray, E.P. **Poeter**, and D.S. Morgan, 2009, Modeling Onsite wastewater Systems at the Watershed scale: A User guide, International Water Association (IWA) Publishing, London, U.K. (ISBN 978-1-84339-528-7/1-84339-528-2).

LeFrancois*, M. and E. **Poeter**, 2008, Use of Observations Below Detection Limit for Model Calibration, Ground Water, doi: 10.1111/j.1745-6584.2008.00515.x

Poeter, E.P., and McCray. J.E., 2008, Modeling Water Table Mounding to Design Cluster and High-Density Wastewater Soil Absorption Systems, ASCE Journal of Hydrologic Engineering, doi:10.1061/(ASCE)1084-0699(2008)13:8(702).

McCray. J.E., John Nieber, and Eileen P. **Poeter**, 2008, Ground-Water Mounding in the Vadose Zone from Onsite Wastewater Systems: Analytical and Numerical Tools, ASCE Journal of Hydrologic Engineering doi:10.1061/(ASCE)1084-0699(2008)13:8(710).

Poeter, Eileen P., and Mary C. Hill, 2008, SIM_ADJUST -- A Computer Code that Adjusts Simulated Equivalents for Observations or Predictions, GWMI 2008-01, http://typhoon.mines.edu/freeware/sim_adjust/

Dano*, Kathleen, Eileen **Poeter**, and Geoff Thyne, 2007, Fate of individual sewage disposal system wastewater within regolith in mountainous terrain, Hydrogeology Journal, doi:10.1007/s10040-007-0244-3.

Banta, E.R., M. C. Hill M.C., E.P. **Poeter**, J.E. Doherty, and J. Babendreier, 2007, Building Model Analysis Applications with the Joint Universal Parameter IdenTification and Evaluation of Reliability (JUPITER) API, Computers & Geosciences, doi:10.1016/j.cageo.2007.03.016.

Poeter, E., 2007, All Models Are Wrong: How Do We Know Which Are Useful? –Looking Back At The 2006 Darcy Lecture Tour, Ground Water, Volume 45 Issue 4 Page 309-391: doi: 10.1111/j.1745-6584.2007.00350.x

Poeter, E.P., and H. Seo*, 2007, The Interactive Roles of Surface Water and Ground Water, National Ground Water Association (NGWA). A 20-miunte animated video based on ground water model simulations

Poeter, Eileen P., and Mary C. Hill, 2007, MMA, A computer code for Multi-Model Analysis: U.S. Geological Survey Techniques and Methods 6-E3, 113 p.

Johnson*, R., and E. **Poeter**, 2006, Insights into the use of Time-Lapse GPR Data as Observations for Inverse Multiphase Flow Simulations of DNAPL Migration, Journal of Contaminant Hydrology, v.89, doi:10.1016/j.jconhyd.2006.08.003.

Wellman* T. P., and E. P. **Poeter**, 2006, Evaluating the uncertainty in predicting spatially variable representative elementary scales in fractured aquifers, Water Resources Research v. 42 W08410, doi:10.1029/2005WR004431.

Edington*, Dwaine, and Eileen **Poeter**, 2006, Stratigraphic Control of Flow and Transport Characteristics, Ground Water, Volume 44 Issue 6 Page 826: doi:10.1111/j.1745-6584.2006.00185.x

Zheng C., E.P. **Poeter**, Hill M.C., and J. Doherty, 2006, Foreword: Understanding through Modeling, Editorial, Ground Water, v. 44, no. 6, November–December 2006, Pages: 769–770.

Poeter, Eileen, and David Anderson, 2005, Multi-model Ranking and Inference in Ground-Water Modeling, Ground Water, v. 43, no. 4: 597–605.

Johnson*, Raymond and Eileen **Poeter**, 2005, Iterative use of the Bruggeman-Hanai-Sen Mixing Model to Determine the Proportions of Air, Water and Sand Mixtures, Geophysics, vol. 70 no. 5, K33-K38.

Wellman*, Tristan, and Eileen **Poeter**, 2005, Estimating Spatially Variable Representative Elementary Scales in Fractured Architecture Using Hydraulic Head Observations, Water Resources Research v. 41, W03001, doi:10.1029/2004WR003287.

Johnson*, Raymond and Eileen **Poeter**, 2005, Interpreting DNAPL Saturations in a Laboratory-Scale Injection Using One- and Two-Dimensional Modeling of GPR Data, Ground Water Monitoring and Remediation, v. 25, no. 1, pp.159-169.

Poeter, E., J. McCray, G. Thyne, and R. Siegrist, 2005, Designing Cluster and High-Density Wastewater Soil Absorption Systems to Control Groundwater Mounding, Small Flows Quarterly, Fall 2005, Volume 7, No. 4.

Thyne, G.D., Güler*, C. and. **Poeter**, E., 2004, Sequential analysis of hydrochemical data for watershed characterization, Ground Water, v. 42, no. 5, pp. 711-723.

Poeter, E., G. Thyne, G. VanderBeek*, and C. Güler*, 2003, Ground water in the Turkey Creek Basin of the Rocky Mountain Front Range in Colorado, in Engineering Geology in Colorado: Contributions, Trends, and Case Histories, ed. Douglas Boyer, Paul Santi, and Pat Rogers, Association of Engineering Geologists Special Publication 15 and Colorado Geological Survey Special Publication 55.

Johnson*, Raymond and Eileen **Poeter**, 2003, Interpreting DNAPL saturations in a laboratory-scale injection with GPR data and direct core measurements, U.S. Geological Survey Open File Report, OFR-03-349.

Hill M.C., E.P. **Poeter**, C. Zheng, and J. Doherty, 2003, MODFLOW 2001 and Other Modeling Odysseys, Editorial, Ground Water, v. 41, no. 2, pp. 113.

Edington*, Dwaine, and Eileen **Poeter**, 2002, Relating flow and transport characteristics to stratigraphic process-response variables, Acta Universitatis Carolinae Geologica, and in Calibration and Reliability in Groundwater Modelling: A few steps closer to reality, IAHS Publication 277, pg 286-295.

Johnson*, Raymond, and Eileen **Poeter**, 2002, Inverting Multiphase Flow Simulations with DNAPL Saturation Observations Estimated from Geophysical Surveys, Acta Universitatis Carolinae Geologica, and in Calibration and Reliability in Groundwater Modelling: A few steps closer to reality, IAHS Publication 277, pg 259-268.

Olsthoorn, Theo, Eileen **Poeter**, and Jos Moorman, 2002 Lessons from Analyzing Trial-and-Error Calibrated Models for Prediction Reliability, Acta Universitatis Carolinae Geologica, and in Calibration and Reliability in Groundwater Modelling: A few steps closer to reality, IAHS Publication 277, pg 247-258.

Poeter, E.P. and M.C. Hill, 1999, UCODE, a computer code for universal inverse modeling, Computers & Geosciences, v. 25 n. 4, pp 457-462.

Wingle*, W.L., E.P. **Poeter**, and S.A. McKenna, 1999, UNCERT: geostatistics, uncertainty analysis and visualization software applied to groundwater flow and contaminant transport modeling, Computers & Geosciences, v. 25 n. 4, pp. 365-376.

Poeter, E.P. and S.A. McKenna*, 1998, Combination of Geologic Information and Inverse Parameter Estimation for Improving Groundwater Modeling, Chapter of SEPM Special Publication: Concepts in Hydrology and Environmental Geology.

Folger*, P.F., **Poeter**, E., Wanty, R.B., Day, W., and Frishman, D., 1997, Radon Transport in a Fractured Crystalline Rock Aquifer: Results from Numerical Simulations, Journal of Hydrology, 195, p. 45-77.

Poeter, E.P., S.A. McKenna*, and W.L. Wingle*, 1997, Improving Ground-Water Project Analysis with Geophysical Data, The Leading Edge, November 1997, p. 1675-1681.

Poeter, E.P. and M.C. Hill, 1997, Inverse Methods: A Necessary Next Step in Groundwater Modeling, Ground Water, v. 35, no. 2, pp. 250-260.

Anderman*, E.R., Hill, M.C., and E.P. **Poeter**, 1996, Two Dimensional Advective Transport in Groundwater Flow Parameter Estimation, Ground Water, v. 34, no. 6, pp. 1001-1009.

Folger*, P.F., **Poeter**, E., Wanty, R.B., Frishman, D. and Day, W., 1996, Controls on Radon Variations in a Fractured Crystalline Rock Aquifer Evaluated Using Aquifer Tests and Geophysical Logging, Ground Water, v 34, no.2.

Poeter, E.P., and S.A. McKenna*, 1995, Reducing Uncertainty Associated with Groundwater Flow and Transport Predictions, Ground Water, v 33, no 6.

McKenna*, S.A., and E.P. **Poeter**, 1995, Field Example of Data Fusion in Site Characterization, Water Resources Research, v31, no 12.

Poeter, E. and P. Townsend*, 1994, Assessment of Critical Flow Path for Improved Remediation, Ground Water, v 32 no 3, pp. 439-447.

McKenna*, S.A. and **Poeter**, E.P., 1994, Applications of Soft Data in Hydrogeology, in, eds. Yarus J.M. and R.L. Chambers: Stochastic Modeling and Geostatistics: Case Histories and Practical Examples, AAPG Special Publication, Computer Application in Geology, no. 3.

Folger*, P.F., Nyberg, P., Wanty, R.B. and **Poeter**, E.P., 1994 Relationships between [222]Radon Dissolved in Groundwater Supplies and Indoor [222]Radon Concentrations in some Colorado Front Range Houses, Health Physics, vol, 67, no. 3, pp 245-253.

Farrar J.A. and E.P. **Poeter**, 1993, Improved Site Characterization for Ground Water and Contaminant Transport Modeling, Currents, U.S. Bureau of Reclamation.

Wingle*, W.L. and E.P. **Poeter**, 1993, Uncertainty Associated with Semivariograms Used for Site Simulation, Ground Water, v 31 no 5, pp. 725-734.

Poeter, E.P., S. Ashlock, and J. Proud, eds., 1993, Proceedings of the 1993 Ground Water Modeling Conference, IGWMC - International Ground Water Modeling Center, Golden, CO.

Lawrence*, Errol, Eileen **Poeter**, and Richard Wanty, 1991, Geohydrologic, Geochemical and Geologic Controls on the Occurrence of Radon in Groundwater Near Conifer, Colorado, USA, Journal of Hydrology, 1817, v. 127, p. 367-386.

Poeter, E.P., and Belcher*, W.R., 1991, Assessment of Aquifer Heterogeneities by Inverse Contaminant Plume Analysis, Ground Water, v. 29, no. 1, p. 56-62.

Poeter, E.P., and Gaylord, D.R., 1990, Influence of Aquifer Heterogeneity on Contaminant Transport at the Hanford Site, Ground Water, v. 28, no. 6, p. 900-909.

Poeter, E.P., 1990, A New Tool: Delineating Aquifer Heterogeneities with Microgravity Surveys During Aquifer Testing, Bulletin of the Association of Engineering Geologists, v. 27, no. 3, p. 315-325.

Poeter, E., 1988, "Perched Water Identification with Nuclear Logs", Ground Water, v. 26, n. 1, p. 15-21.

Zlatev*, P., **Poeter**, E., and Higgins, J., 1988, Physical Modeling of the Full Acoustic Waveform in a Fractured, Fluid Filled Borehole, Geophysics, v. 53, n. 9, p. 1219-1224.

Poeter, E., 1987, Characterizing Fractures at Potential Nuclear Waste Repository Sites with Acoustic Waveform Logs, The Log Analyst, v. 28, n. 5, p. 453-461.

Software Development:

UCODE, public domain software that performs inverse modeling, posed as a parameter-estimation problem, using nonlinear regression, and is distributed by the USGS at http://water.usgs.gov/software/ucode.html

MMA, public domain software that performs multi- model evaluation and averaging, and is distributed by the USGS at http://water.usgs.gov/software/mma.html

SimAdjust, public domain software to facilitate replace the value of a simulated equivalent needed by a universal code when the value is missing or assigned a default value by the process model., and is distributed by the IGWMC at http://igwmc.mines.edu/freeware/sim_adjust/

A member of the **JUPITER** (Joint Parameter IdenTification and Evaluation of Reliability) development team. JUPITER is an application-programming interface for evaluating sensitivity, assessing data needs, estimating parameters, selecting/ranking models, and evaluating uncertainty currently under development by the USGS, in coordination with EPA. http://water.usgs.gov/software/JupiterApi/