

## DEANNA S. DURNFORD

### Vita

Deanna Durnford is Professor Emerita in the Civil and Environmental Engineering Department at Colorado State University, where she has been on the faculty since 1985. Her primary research interests include the flow of immiscible organics in porous media, flow and transport processes in the unsaturated zone and the hydraulic connection between groundwater and surface water. She is a Professional Engineer in the State of Colorado. At Colorado State University, she taught graduate level courses in groundwater hydrology and hydraulics, vadose zone hydrology and groundwater contaminant transport processes. She has served as graduate committee chair for 15 Ph.D. students and over 25 M.S. students, as well as a graduate committee member for an additional 75 students.

#### Contact Information:

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Email: Deanna.Durnford@colostate.edu

**Professional Registration:** Professional Engineer, State of Colorado (PE-23153)

**RESEARCH INTERESTS:** Groundwater contaminant fate and transport; mechanics of contaminant transport by unsaturated or multiphase flow through the vadose zone; groundwater-surface water interactions.

#### EDUCATION

Colorado State University	Civil Engineering	Hydraulics	Ph.D.	1982
Colorado State University	Civil Engineering	Structures	M.S.	1976
University of Wisconsin, Platteville	Mathematics		B.S.	1971

#### PROFESSIONAL EXPERIENCE

2010-present **Professor Emerita, Colorado State University, Civil and Environmental Engineering**  
1997-2009 **Professor, Colorado State University, Civil and Environmental Engineering Department**, Ft. Collins, CO. Responsibilities include research in groundwater hydrology and contamination; teaching graduate level courses in hydraulics, subsurface drainage, pumping systems, groundwater hydrology, mechanics of immiscible fluids and groundwater measurements as well as extension responsibilities in ground water quality.  
1994 **Visiting Professor, Cornell University, Agricultural and Biological Engineering Department**, Ithaca, NY (sabbatical leave). Worked in CHESS (Cornell High Energy Synchrotron System) on a multiphase flow research project.  
1993-1997 **Associate Professor, Colorado State University, Chemical and Bioresource Engineering**, Ft. Collins, CO.  
1989-1991 **Civilian employee of U.S. Air Force** under an Intergovernmental Personnel Agreement, total of 9 months during 2-year period.  
1988 **Faculty Research Fellow. U.S. Air Force**, Environics Lab., AFCEA, Tyndall AFB, FL.  
1988 **Drainage Research Institute, Cairo, Egypt**. Short-term assignment.  
1985-1993 **Assistant Professor, Agricultural and Chemical Engineering Dept.**, Colorado State University, Fort Collins, CO.  
1983-1985 **Assistant Professor, Cornell University, Agricultural and Biological Engineering Department**, Ithaca, NY.  
1983 **Drainage Research Institute, Cairo, Egypt**. Short-term assignment.  
1978-1983 **Instructor, Graduate Teaching and Research Assistant**, Civil Engineering Department, Fort Collins, CO. PhD research included a drainage study in Nile Valley and Delta of Egypt.  
1977-1978 **Engineer, M and I Consulting Engineers, Inc. Fort Collins, Colorado**.  
Water use studies, water distribution and supply studies and treatment plant design.

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- 1973-1976     **Graduate Teaching and Research Assistant, Civil Engineering Department,**  
Colorado State University, Fort Collins, Colorado. M.S. research was a wind engineering  
study modeling effects of winds on high-rise building design.
- 1971-1973     **High School Math Teacher, Manitowoc, WI.**

#### **CONSULTING AND EXTRACURRICULAR PROFESSIONAL ACTIVITIES:**

Dr. Durnford has served as a consultant to a number of companies. Of note, she was involved in a vadose zone monitoring field project and estimation of the total volume of diluent at the Guadalupe Oil Field, the largest oil spill in U.S. history. Recently, she has served as a reviewer of long term plans for closure of Area G at Los Alamos National Laboratory in New Mexico. This area is the primary low-level radioactive waste site at LANL and will be the first area closed at the lab. In addition, she served on a National Academy of Science committee on groundwater contamination at Los Alamos. Summaries of selected extracurricular projects include:

- Exxon Corporation through Water, Waste and Land, Inc., Fort Collins, CO., Leaching and Hydraulic Properties of Exxon Spent Oil Shale;
- A.G. Wasenaar, Fort Collins, CO. Hydraulic Properties of Unsaturated Soil; (c) Kennecott Copper Company, Utah, through Highland Engineering, Golden, CO. Cement and Chemical Grout Stability in Acid Groundwater Environments;
- Bingham Environmental Salt Lake City, Utah. Laboratory Tests on the Physical and Unsaturated Hydraulic Properties of Envirocare of Utah Soil Cores;
- Fellow at the U.S. Air Force Environics Lab: Field characterization of jet fuel spills.
- Drainage Institute, Cairo, Egypt. Drainage Engineering and Reuse of Subsurface Water for Irrigation;
- California State Attorney General's Office through Hagler Bailly, Boulder and Stollar Consulting, Laguna Beach, California, Vadose Zone and Volume Estimation Studies at Guadalupe Oil Field, San Luis Obispo, CA.
- Risk Assessment Corporation (RAC): Reviewer for management of water quality data at Los Alamos National Laboratory and RAC risk assessment software.
- Los Alamos National Laboratory: Reviewer for closure of Area B plans submitted by LANL.
- National Research Council of the National Academies: National Academy of Sciences Committee for the Technical Assessment of Environmental Programs at Los Alamos National Laboratories.
- Underground Dam Design with Dr. Smittakorn in Phuket, Thailand

#### **RECENT DEPARTMENTAL AND UNIVERSITY SERVICE:**

- Laboratory Director, Groundwater and Porous Media Laboratory
- Undergraduate Honors Students Advisor, Civil Engineering and Bioresource Engr. Departments
- College Policies and Procedures committee
- Civil Engineering Graduate Instruction Committee
- Colorado State University Site Coordinator, Louis Stokes Colorado Alliance for Minority Participation (CO-AMP)

#### **PUBLICATIONS (The publications listed are in addition to numerous other non-refereed publications and final reports. Most of these represent student work on funded projects. An asterisk indicates students for which Dr. Durnford served as the major research advisor).**

1. Aldred, A.\*, Riley, L., Durnford, D., Oad, R., Falke, J. and Fausch, K. 2010. Evapotranspiration along a High Plains Stream: Comparison of the water-table fluctuation and numerical response function methods. In Review.
2. Falke, J.A., Fausch, K.D., Magelky, R.\*, Squires, A.\*, Durnford, D.S., Riley, L.K. and Oad, R. 2010.

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The role of groundwater pumping and drought in shaping ecological futures for stream fishes in a dryland river basin of the western Great Plains, USA. *Ecohydrology*, published online at <http://onlinelibrary.wiley.com/doi/10.1002/eco.158>

3. Smittakorn, S., N. Jirawongrod, S. Mongkolnchai-arunya, D. Durnford. 2010. Homemade bone charcoal adsorbent for defluoridation of groundwater in Thailand. *Journal of Water and Health*. *Journal of Water and Health* Vol 8 No 4 pp 826–836 doi:10.2166/wh.2010.131.
4. Miller, C.D.\*, D.S. Durnford, M.R. Halstead, J. Altenhofen and V. Flory\*. 2007. Stream depletion in alluvial valleys using the SDF semi-analytical model. *Ground Water* 45 (4):506-514.
5. Lake, L.W., R.C. Ewing, D.S. Durnford, R.U. Halden, I. Hua, A.B. Kersting, A.J. Knepp, C.J. Murray, K.A. Rainwater, A.W. Ray, J.R. Smith. 2007. Plans and Practices for Groundwater Protection at the Los Alamos National Laboratory-Interim Status Report. Committee for the Technical Assessment of Environmental Programs at the Los Alamos National Laboratory. National Academies Press, Washington, DC ([www.nap.edu](http://www.nap.edu))
- ~~4-6.~~ Miller, C.D.\*, and D.S. Durnford, 2005, Modified use of the 'SDF' semi-analytical stream depletion model in bounded alluvial aquifers, Proceedings, Hydrology Days, Fort Collins, Colorado, pp. 146-159.
7. Miller, C.D.\*, D.S. Durnford, A.B. Fowler\*. 2004. Equilibrium nonaqueous phase liquid pool geometry in coarse soils with discrete textural interfaces. *Journal of Contaminant Hydrology* 71:239-260.
8. Durnford, D.S., F. Marinelli\*, and C.D. Miller\*. 2004. Interpreting LNAPL Monitoring Well Data for Estimating Specific Oil Volumes and Mobility, Proc. 2004 API/NGWA Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Assessment, and Remediation, Baltimore, MD, pp. 179-186
9. Miller, C.D.\*, and D.S. Durnford. 2004. Considering hysteresis in LNAPL lens geometry, mobility and well thicknesses. Proceedings, API/NGWA Petroleum Hydrocarbons in Ground Water Conference, Baltimore MD, pp. 139-150,
10. Miller, C.D.\*, and D.S. Durnford. 2004. A Review of the SDF Semi-Analytical Stream Depletion Model in Bounded Alluvial Aquifers, Abstract. Colorado Water Resources Research Institute Information Series No. 98, Fort Collins, Colorado.
11. Miller, C.D.\*, and D.S. Durnford. 2004. Large-Scale Subsurface Dams in Alluvial Aquifers: Potential for New Water Storage in Colorado? Poster and Abstract, South Platte Forum, Longmont, Colo., Colorado Water Resources Research Institute Information Series No. 98, Fort Collins, Colorado.
- ~~4-12.~~ Durnford, D.S. and Fox, G.A.\* 2003. Current advances in modeling stream/aquifer interaction. Colorado Water Congress Workshop on Senate Bill 03-073. Longmont, CO, May 22, 2003.
- ~~2-13.~~ Fox, G.A.\* and D. S. Durnford. 2003. Stream/aquifer analysis tests: estimating streambed and aquifer permeability. *Colorado Water* 20(3): 5-7.
- ~~5-14.~~ Fox, G.A.\*, and D.S. Durnford. 2003. Unsaturated hyporheic zone flow in stream/aquifer conjunctive systems, *Advances in Water Resources*, Volume 26, Issue 9, September 2003, Pages 989-1000
15. Fox, G.A.\*, P. DuChateau, and D.S. Durnford. 2002. Analytical model for aquifer response incorporating distributed pumping-induced stream leakage. *Ground Water* 40(4): 378-384.
16. Durnford, D. S. 2003. Estimating specific oil volumes at Petroleum Hydrocarbon sites. A three-part series for the EPA Internet Course on Modeling Subsurface Petroleum Hydrocarbon Transport, EPA Office of Research and Development, Athens, GA.
17. Fox, G.A.\* and D.S. Durnford. 2002. Effect of aquifer parameter uncertainty on analytical estimates of streambed conductance using STRMAQ. In: Ramirez, J.A. (ed.) Proceedings of the 22<sup>nd</sup> Annual Geophysical Union Hydrology Days. Fort Collins, CO, p. 86-97.
18. Fox, G.A.\* and D.S. Durnford. 2001. Investigation of analytical and numerical models for simulating surface water/groundwater interaction. In: Ramirez, J.A. (ed.) Proceedings of the 21st Annual Geophysical Union Hydrology Days, Fort Collins, CO, p. 58-69.
19. Geiger, S.\* and D. Durnford. 2000. Infiltration in homogeneous sands and a mechanistic model of unstable flow. *J. Soil Science Society of America* 64(2): 460-469.

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20. Trantham, H.\* and D.S. Durnford. 1999. Stochastic aggregation modeling (SAM) for DNAPL-water displacement in porous media. *Journal of Contaminant Hydrology* 36(3-4):377-400.
21. Hoffman, G. and D. Durnford. 1999. Drainage design for salinity control. Chapter 17, In: van Schilfegaarde, J. and R. W. Skaggs. *Agricultural Drainage*. American Society of Agronomy Monograph No. 38, ASA, Madison, WI. p. 567-602
22. Ellerbroek, D.\*, D. Durnford, and J. Loftis. 1998. Modeling pesticide transport in an irrigated field with variable water application and hydraulic conductivity. *J. of Environ. Quality*. Vol.27 (3): 495-504.
23. Marinelli, F.\* and D. Durnford. 1998. Semianalytical solution to the Richards' Equation for Layered Porous Media. *ASCE Journal of Irrigation and Drainage*. 124(6): 290-299.
24. Geiger, S.\* and D. Durnford. 1998. Infiltration stability in homogeneous soils. In: Morel-Seytoux, H.J. (ed.) *Proc. of the 18<sup>th</sup> Annual AGU Hydrology Days*. Fort Collins, CO. pp. 99-110
25. Durnford, D. and H. Trantham\*. 1998. Stochastic aggregation model for DNAPL-water displacement in homogeneous and heterogeneous porous media. *Proc. Conference on Hazardous Waste Research*, May 18-21, Snowbird, Utah.
26. Rimmer, A., D. DiCarlo, T. Steenhuis, B. Bierck, D. Durnford and J.-Y. Parlange. 1998. Rapid fluid content measurement method in an oil-water-sand system using synchrotron X-rays. *J. Contaminant Hydrology* 31:315-335.
27. Tariq, A.\* and D.S. Durnford. 1997. Moisture retention of a swelling soil under capillary and overburden pressures. *Journal of Hydrology* 203:119-126.
28. Charlie, W.A., D.S. Durnford, and T.S. Steenhuis. 1997. Rapid profiling of consolidating clay using synchrotron radiation. *ASTM Geotechnical Testing Journal*, GTJODJ, 20(3): 340-346.
29. Durnford, D. S., D.B. McWhorter, C. Miller\*, F. Marinelli\* and H. Trantham\*. 1997. Modeling and experimental studies of NAPL distribution and flow in porous media. In: *Proceedings of the Joint USAF/US Army contractors/grantees meeting*, Environmental Quality, Panama City, FL.
30. Marinelli, F.\* and D.S. Durnford. 1996. LNAPL thickness in monitoring wells considering hysteresis and entrapment. *Ground Water* 34(3): 405-414.
31. Miller, C.D.\* and D. S. Durnford. 1996. An experimental study of immiscible flow through layered sands In: Reddi, L.K. (Ed.) *Non-Aqueous Phase Liquids (NAPLS) in Subsurface Environments: Assessment and Remediation*. ASCE, New York, NY. p. 628-638.
32. Charlie, W., G. Veyera, D. Durnford and D. Doehring. 1996. Porewater pressure increases in soil and rock from underground chemical and nuclear explosions. *Journal of Engr. Geology*, Vol. 43: 225-236.
33. Swanson, A.B.\* and D.S. Durnford. 1996. Laboratory experiments of LNAPL spreading and distribution at a water table. *Abstr. EOS Transactions, American Geophysical Union* 77, p. 275.
34. Durnford, D.S. and F. Marinelli\*. 1995. Distribution of liquid phase hydrocarbons in layered soil. *Proceedings, USAF/Army Joint Contractors/Grantees Meeting, Basic Research in Environmental Quality, Subsurface Fate and Transport*, Boulder, CO.
35. Steenhuis, T., J.-Y. Parlange, D. Chandler, A. Rimmer, Z. Cohen, W. Condit, D. Durnford, B. Bierck. 1995. Fingers in oil-water systems. *Abstract, International Union of Geodesy and Geophysics XXI General Assembly*. July 2-14, Boulder CO.
36. Bolton, J.\*, D. S. Durnford, and W.A. Charlie. 1994. One-dimensional shock and quasi-static liquefaction of saturated silt. *ASCE Journal of Geotechnical Engineering* 120(10): 1874-1889.
37. Hamdi, M. R.\*, D.S. Durnford and J. Loftis. 1994. Bromide transport under sprinkler and ponded irrigation: experimental results. *ASCE Journal of Irrigation and Drainage*, 120(6): 1086-1097.
38. Charlie, W.A., G.E. Veyera, D.S. Durnford and D.O. Doehring. 1994. Discussion of Geology of the Chinese nuclear test site near Lop Nor, Xinjing, Uygur Autonomous Region, China, by John R. Matzko. *Engineering Geology* 38:177-179.
39. Tariq, A.\* and D. Durnford. 1993. An analytical equation for swelling clay soils. *Soil Science Society of America Journal* 57:1183-1187.
40. Tariq, A.\* and D. Durnford. 1993. Soil volume shrinkage measurements: a simple method. *Soil Science* 155: 325-330.
41. Ellerbroek, D.\*, D. Durnford and C. Pearson\*. 1992. Monitoring groundwater quality in the San Luis

- Valley. Proc. Colorado Water Engineering and Management Conf. p. 121-128.
42. Durnford, D.S. and J.P. King\*. 1992. Experimental study of processes and particle-size distributions of eroded soil. *ASCE Journal of Irrigation and Drainage* 119(2): 383-398.
  43. Durnford, D., J. Brookman, J. Billica\* and J. Milligan. 1991. LNAPL distribution in a cohesionless soil: a field investigation and cryogenic sampler. *Ground Water Monitoring Review*. p. 115-122.
  44. Ellerbroek, D.A. \*, K.R. Thompson\*, D.S. Durnford and G.S. Davies. 1991. Ground water pollution potential assessment in the San Luis Valley. Proceedings, Ground Water Engineering and Management Conference. Denver, Co. p. 305-314.
  45. Ellerbroek D.A. \*, D.S. Durnford, J.C. Loftis, G.S. Davies, K.W. Knutson. 1990. Screening methods for ground water pollution potential from pesticide use in Colorado agriculture. Report No. 157, Colorado Water Resources Research Institute. Ft. Collins, CO. 58 p.
  46. Durnford, D. S., D. R. Hansen\* and J. A. Billica\*. 1990. Investigation of the movement and location of immiscible organic fluids in groundwater systems. Proc. Groundwater Engineering and Management Conference. Colorado Water Resources Research Institute and the Office of the State Engineer, Denver, CO. p. 305-314.
  47. Durnford, D. S., D. R. Hansen\*, J. A. Billica\* and J. A. Brookman. 1990. Estimation of jet fuel contamination in soils. Final Report, Air Force Office of Sponsored Research, Bolling AFB, DC. Contract No. F49620-88-C-0053/SB5881-0378. 102 p.
  48. Niccoli, W. L. \*, J. C. Loftis, D. S. Durnford and Gregg Butters. 1989. Potential pesticide transport in Colorado Agriculture: a model comparison. Report No. 156, Colorado Water Resources Research Institute. Ft. Collins, CO. 96 p.
  49. Durnford, D. S. 1988. Estimation of jet fuel contamination in soils. Final Report, Universal Energy Systems, Air Force Office of Sponsored Research, Bolling AFB, DC. Contract No. F49620-87-0040.
  50. McWhorter, D. B., D. S. Durnford. 1987. Water, Waste and Land, Inc. Characterization of Exxon retorted oil shale. Exxon ESR Combusted Shale Disposal/Reclamation Technologies. 470p.
  51. Durnford, D. S. and J. P. King.\* 1988. Conceptual modeling of erosion processes on heterogeneous soils. Final Report, National Science Foundation, Washington, DC, Contract No. ECE 8515838.
  52. Charlie, W. A., D. O. Doehring, D. S. Durnford and M. Hubert. 1987. Compressional wave-induced liquefaction of carbonate sand. Geological Society of America Meeting, Hilo, HI.
  53. McWhorter, D. B. and D. S. Durnford. 1986. Leaching and hydraulic properties of retorted oil shale including effects from codisposal of wastewater. Final report, US EPA, Washington, DC. CR-807668.
  54. Suter, G. W., L. W. Barnhouse, S. R. Kraemer, M. E. Grismer, D.S. Durnford, D. B. McWhorter, C. F. Baes, A. E. Rosen and F. R. O'Donnell. 1986. Environmental risk analysis for oil from shale. Oak Ridge National Laboratory, Oak Ridge, TN. Final Report for U.S. EPA, Washington, DC.
  55. Doehring, D. O., W. A. Charlie and D. S. Durnford. 1986. Field investigation of compressional wave-induced liquefaction. Geological Society of America, Annual Meeting, San Antonio, TX.
  56. Gebremedhin, K. G., D. S. Durnford and R. A. Parsons. 1984. A proposed wind load standard for agricultural buildings. Paper No. 84-4005. ASAE, St. Joseph, MI.
  57. Durnford, D. S., B. J. Gutwein, T. H. Podmore. 1987. Computerized drainage design for arid, irrigated areas. In: *Drainage design and management*. ASAE, St. Joseph, MI. p. 45-52.
  58. Durnford, D. S., T. H. Podmore, B. J. Gutwein. 1987. Drainage design selection for arid, irrigated areas. In: *Proc. International Workshop on Drainage Design*. Columbus, OH.
  59. Durnford, D. S., T. H. Podmore and E. V. Richardson. 1984. Optimal drain design: a net benefit approach. *Trans. ASAE* 27(4): 1100-1105.
  60. Charlie, W. A., D. O. Doehring, D. S. Durnford and J. P. Martin. 1983. Dewatering tailings impoundments: interior drains. Proc. Seventh Pan American Conference in Soil Mechanics and Foundation Engineering. Intl. Soc. for Soil Mechanics and Foundations Eng. Vancouver

#### **FUNDED RESEARCH PROJECTS:**

- Conceptual Modeling of Erosion Processes, National Science Foundation;

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- Study of Natural Cementation Properties of Hydrating Oil Shale, Electron Microscope Center;
- Leaching and Hydraulic Properties of Retorted Oil Shale Including Effects of Codisposal, Environmental Protection Agency;
- Surface and Groundwater Pollution Potential from Herbicide Use in Colorado Agriculture, CWRRI/USGS;
- Estimation of Jet Fuel Contamination in Soils, U.S. Air Force;
- Screening Methods for Groundwater Pollution Potential from Pesticide Use in Colorado, CWRRI/USGS;
- Jet Fuel Contamination in Soil, U.S. Air Force;
- Predicting Pesticide Leaching from Spatial Variability of Transport Properties, CSRS;
- Effects of Best Management Practices on Groundwater Quality, CSRS;
- A Laboratory Study of the Effects of Soil Heterogeneity on Light Nonaqueous Phase Liquid Movement, National Science Foundation;
- Use of a Calibrated Solute Transport Model for Managing Agricultural Chemicals in the San Luis Valley, CWRRI/USGS;
- Agricultural Chemicals in the Environment, USDA;
- Ground Water Quality and the Effects of BMPs in the San Luis Valley, State of Colorado/USEPA;
- Conjunctive Use of Groundwater/Surface Water, USDA;
- Distribution of Liquid Phase Hydrocarbons in Layered Soil: Hysteresis in Capillary Pressure Saturation Relations, U.S. Air Force;
- Viscous Effects in Pore Scale Modeling of Immiscible Fluid Flow Through Porous Media, USAF.
- Monitoring and Modeling Agricultural Chemical Transport in the Subsurface Environment, Hatch;
- Volume estimation and vadose zone study, Guadalupe Oil Fields, State of California;
- Influence of Flow Augmentation on Water Quality and Quantity in the South Platte River Basin, USDA/NRI;
- The Critical Groundwater Link between Irrigated Agricultural Water Use and Fish Habitat on the High Plains, USDA/CSRS;
- Effects of Managed Groundwater Recharge on the Hydrology and Water Quality of the South Platte River Basin, USDA/CSRS.

## **GRADUATE THESIS SUPERVISION:**

### **Ph.D. Students**

- 2010 Miller, Calvin. Groundwater augmentation in the South Platte River and the Stream Depletion Factor. Civil and Environmental Engineering Department. Current student.
- 2003 Fox, Garey A. Modeling surface water/groundwater interactions during well depletion. Civil Engineering Department (currently Associate Professor at Oklahoma State)
- 2001 Smittakorn, Sunisa. Dissolution and transport of DNAPL from composite source zones. Civil Engineering Department (currently Associate Professor at Thammasat University, Bangkok, Thailand)
- 2001 Varharfard, Hassan. Permeability reduction in porous media due to suspended particles. Civil Engineering Department.
- 1998 Trantham-Hevelone, Heather. Viscous effects in modeling of immiscible fluid flow in heterogeneous porous media, Civil Engineering Department (currently at MFG Consulting).
- 1997 Geiger, Steven. Infiltration in homogeneous sands and a mechanistic model of unstable flow. Chemical and Bioresource Engineering Dept. (currently at Radian Corporation, Los Alamos, NM)
- 1996 Marinelli, Frederick. Modeling multiphase fluid flow in layered soils. Civil Engineering Dept. (currently at Telesto, Inc. Fort Collins, CO)
- 1996 Billica, Judith. A total velocity-based numerical model for immiscible contaminant transport in

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- subsurface environments. Civil Engineering Dept. (currently at City of Fort Collins, CO)
- 1995 LeStrange, Susan. Identifying nitrate-leaching zones in an agricultural field. Chemical Engineering Dept.
- 1994 Hamdi, Moshrik. Steady state and transient transport of bromide under field conditions. Agricultural and Chemical Engr. Dept. (currently Associate Professor, Hashemite University, Jordan)
- 1994 Brito, Rui. Network modeling of two-phase flow in porous media. Agricultural and Chemical Engineering Dept. (currently Dean of Engineering, Univ. of Zimbabwe)
- 1993 Ellerbroek, David. Vadose zone transport of pesticides with macropore flow and spatial variability of parameters. Agricultural and Chemical Engineering Dept.
- 1992 Tariq, Ata-Ur-Rehman. Hydraulic characteristics and drainage analysis of swelling clay soils. Agricultural and Chemical Engr. Dept. (currently at the Water Institute, Lahore)

### M.S. Students

- 2010 Magelky, Robin. Modeling and conceptualization of a groundwater-sustained high plains stream. Civil and Environmental Engineering, Current student.
- 2009 Warner, Jaclyn. Civil and Environmental Engineering (currently at Ayers Engr.)
- 2010 Banning, Ryan. Groundwater/surface water interactions along the Arikaree River Basin, Yuma County, CO. Civil and Environmental Engineering Department. (at TST Engineering).
- 2007 Squires (Aldred), Angela. Groundwater response functions and water balances for parameter estimation and stream habitat modeling. Civil and Environmental Engineering. (at Deere)
- 2005 Azairee, Ayman. Fulbright scholar from Palestine. Saltwater Intrusion study in the Gaza Strip. Civil Engineering Dept.
- 2002 Law, Whitney. Off-channel geometry effects of stream depletion factors.
- 2001 Hartog, Curtis L. A sensitivity analysis of the Multimed model for subtitle D landfill applications, Civil Engineering Department
- 2000 Manz, Brian. Interpretation of well LNAPL thickness including hysteresis. Civil Engineering Department
- 2000 Sarason, Deborah. Areal and vertical distribution of nitrate in the shallow, unconfined aquifer of the San Luis Valley, Colorado. Chemical Engineering Department.
- 1997 Miller, Calvin. Laboratory investigations of solvents in heterogeneous porous media, Chemical and Bioresource Engr.
- 1997 Swanson, Angela. Laboratory investigations of hydrocarbon fuels in heterogeneous porous media, Chemical and Bioresource Engr.
- 1998 Eisen, Brandon. Vadose zone hydrology study for the state of California, Guadalupe Oil Fields. Plan B, Civil Engineering Dept.
- 1998 Cutillo, Paula. Modeling unsaturated flow through the vadose zone. Plan B, Earth Resources.
- 1993 Miller, Cheryl. Monitoring effects of BMPs on groundwater quality, M.S. Thesis, Agricultural and Chemical Engineering Dept. (hydrologist at USGS, Cheyenne, WY)
- 1992 Pearson, Chris. Validation of a solute transport model for conditions in the San Luis Valley, CO, Plan B, Civil Engineering Dept.
- 1992 Cronk, Thomas A. The rate of specific discharge in a well bore, M.S. Thesis, Civil Engineering Dept. (President, Crook Environmental, Grand Junction)
- 1992 Hansen, Douglas R. An experimental study of LNAPL movement and entrapment in saturated, uniform sands, M.S. Thesis, Civil Engineering Dept.
- 1992 Noller, Kathy. Calibration of a dual-energy gamma system to investigate multiphase equilibrium profiles in soil, M.S. Thesis, Agricultural and Chemical Engineering Dept.
- 1990 Niccoli, Walter L. Potential pesticide transport in Colorado agriculture: A model comparison, M.S. Thesis. Agricultural and Chemical Engr. Dept. (President, Telesto, Inc. Fort Collins).
- 1987 King, J. Philip. Water-induced soil erosion processes and modeling, M.S. Thesis, Agricultural

and Chemical Engr. Dept.