DR. DAVID FRANCIS BOUTT

Department of Geosciences
University of Massachusetts – Amherst
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http://blogs.umass.edu/hydrogeology/
Google Scholar - http://scholar.google.com/citations?hl=en&user=p9bfM84AAAAJ

Relevant Research Experience:

- Fluid and mass transport through fractured and faulted rocks
- Constraining the contribution of groundwater in catchment scale hydrologic processes
- Coupling between fluid flow and deformation in geologic materials
- Impacts of Climate Variability on Groundwater Recharge and Surface-Water Interactions

Education:

B.S. (1997) Env. Geosciences, Lyman Briggs School of Science, Michigan State University, East Lansing, MI, USA

M.S. (1999) Geological Sciences, Michigan State University, East Lansing, MI, USA
Thesis: *Interpreting the impacts of land use on water quality using groundwater flow and transport simulations in the Grand Traverse Bay Watershed*
Thesis advisor: Professor David Hyndman

Ph.D. (2004) Hydrology – Earth and Environmental Sciences, New Mexico Institute of Mining and Technology, Socorro, NM, USA
Dissertation: *The role of fluids in the genesis of opening mode fractures in the crust*
Dissertation advisor: Professor Brian J. O. L. McPherson

Appointments:

Co-Director of Environmental Science Undergraduate Program (January 2014 – Present) Department of Geosciences, University of Massachusetts, Amherst, MA, USA

Associate Professor (January 2012 – Present) Department of Geosciences, University of Massachusetts, Amherst, MA, USA

Lilly Distinguished Teaching Fellow (August 2011 – May 2012), University of Massachusetts, Amherst, MA, USA

Assistant Professor (January 2005 – December 2011) Department of Geosciences, University of Massachusetts, Amherst, MA, USA

Postdoctoral Appointee (May 2004 – January 2005) Geomechanics Division, Sandia National Laboratories, Albuquerque, NM, USA
Sandia staff sponsor: Dr. Benjamin Cook

Graduate Research Intern (April 2002 – May 2004) Geomechanics Division, Sandia National Laboratories, Albuquerque, NM, USA
Sandia staff sponsor: Dr. Benjamin Cook

Research and Teaching Assistant (September 1999 – August 2003) New Mexico Institute of Mining and Technology, Socorro, NM, USA

Research Assistant September 1997 – August 1999 Michigan State University, East Lansing, MI, USA

Student Trainee – Hydrology (November 1997 – August 1999), USGS Water Resources Division, Lansing, MI, USA

Publications:

** indicates student authors*

Peer Reviewed Manuscripts:

1. **Boutt, D.F.**, Assessing Hydrogeologic Controls on Dynamic Groundwater Storage Using Long-Term Instrumental Records of Water Table Levels, Hydrological Processes, Accepted manuscript online: 30 DEC 2016 04:30PM EST | DOI: 10.1002/hyp.11119.
2. **Boutt, D. F.**, Hynek, S. A., Munk, L. A., *and* Corenthal, L. G.* *(*2016*) *Rapid recharge of fresh water to the halite-hosted brine aquifer of Salar de Atacama*, Chile. Hydrol. Process., *doi:*10.1002/hyp.10994.
3. Corenthal, L. G.*, **D. F. Boutt**, S. A. Hynek, and L. A. Munk (2016), *Regional groundwater flow and accumulation of a massive evaporite deposit at the margin of the Chilean Altiplano*, Geophys. Res. Lets., 43, doi:10.1002/2016GL070076
4. Briggs, M.A., Hare, D.K.*, **Boutt, D.F**., Davenport, G. and Lane, J.W. (2016), *Thermal infrared video details multiscale groundwater discharge to surface water through macropores and peat pipes*, Hydrol. Process., doi: http://dx.doi.org/10.1002/hyp.10722
5. Munk, L. A., S. A. Hynek, D. Bradley, **D. F. Boutt**, K. Labay, and H. Jochens (2016), *Lithium brines: A global perspective*, Reviews in Economic Geology, v. 18, pp. 339–365
6. Hare, D.K*., Briggs, M.A., Rosenberry, **D.F., Boutt**, D.F., Lane, J.W. (2015), *A comparison of thermal infrared to fiber-optic distributed temperature sensing for evaluation of groundwater discharge to surface water, Journal of Hydrology*, doi: http://dx.doi.org/10.1016/j.jhydrol.2015.09.059
7. Yellen, B*, and **Boutt, DF** (2015), *Hydropeaking induces losses from a river reach: observations at multiple spatial scales*. Hydrol. Process., 29, 3261–3275. doi: 10.1002/hyp.10438.
8. Cook, J*, and Goodwin, LB., **Boutt, D.F**, and Tobin, H. (2015) *The effect of systematic diagenetic changes on the mechanical behavior of a quartz-cemented sandstone*, Geophysics, Vol. 80, No. 2 (March-April 2015); P. D145–D160,10.1190/Geo2014-0026.1
9. **Boutt, D.F**, Plourde, K.E.*, Cook, J, and Goodwin, LB. (2014) *Cementation and the hydromechanical behavior of siliciclastic aquifers and reservoirs*, Geofluids 14 (2), 189-199
10. Earnest, E*, and **Boutt, D.F.** (2014) *Investigating the role of hydromechanical coupling on flow and transport in shallow fractured-rock aquifers*, Hydrogeology Journal, Vol. 20, pages 1-19, 2014.
11. Ito, T., A. Funato, W. Lin, M.-L. Doan, **D. F. Boutt**, Y. Kano, H. Ito, D. Saffer, L. C. McNeill, T. Byrne, *and* K. T. Moe (2013), *Determination of stress state in deep subsea formation by combination of hydraulic fracturing in situ test and core analysis: A case study in the IODP Expedition 319,* J. Geophys. Res. Solid Earth, 118, 1203–1215, *doi:*10.1002/jgrb.50086.
12. Saffer, D. M., P. B. Flemings, **D. Boutt**, M.-L. Doan, T. Ito, L. McNeill, T. Byrne, M. Conin, W. Lin, Y. Kano, E. Araki, N. Eguchi, *and* S. Toczko (2013), *In situ stress and pore*

pressure in the Kumano Forearc Basin, offshore SW Honshu from downhole measurements during riser drilling, Geochem. Geophys. Geosyst.*,* 14*,* 1454–1470*, doi:*10.1002/ggge.20051.

13. Manda, A.K., Mabee, S.B., **Boutt, D.F**. and Cooke, M. *A method of estimating bulk potential permeability in fractured-rock aquifers using field-derived fracture data and type curves, Hydrogeology Journal,* Vol. 21, number 2, pages 357-369, 2013.
14. Murdoch, L., Germanovich, L, Wang, H., Onstott, T., Elsworth, D., Stetler, L., and **D.F. Boutt**, *Hydrogeology of the vicinity of DUSEL Homestake*, Hydrogeology Journal, Vol. 20, pages 27-43, 2012.
15. **Boutt, D. F.,** et al. (2012), *Scale dependence of in-situ permeability measurements in the Nankai accretionary prism: The role of fractures*, *Geophys. Res. Lett.*, 39, L07302, doi:10.1029/2012GL051216.
16. French, M. E., **D. F. Boutt**, and L. B. Goodwin (2012), Sample dilation and fracture in response to high pore fluid pressure and strain rate in quartz-rich sandstone and siltstone, *J. Geophys. Res.*, 117, B03215, doi:10.1029/2011JB008707.
17. Moe, Kyaw Thu (**D. F. Boutt** 4th author). Operational review of the First Wireline In Situ Stress Test in Scientific Ocean Drilling, vol 13, 2012.
18. Doan, M.L., Conin, M., Henry, P., Wiersberg, T., **Boutt, D.F**., Buchs, D., Saffer, D., McNeill, L., and D. Cukur, *Quantification of Free Gas in the Kumano Forearc Basin detected from Borehole Physical Properties: IODP NanTroSEIZE drilling Site C0009*, Geochem. Geophys. Geosyt., 12, Q0AD06, doi:10.1029/2010GC003284.
19. *Weider, K. and **D.F. Boutt**, *Heterogeneous water table response to climate revealed by 60 years of ground water data*, Geophys. Res. Lett., VOL. 37, L24405, doi:10.1029/2010GL045561, 2010.
20. *Cook, J.B., Goodwin, L.B., and **D.F. Boutt,** *Systematic diagenetic changes in the grain-scale morphology and permeability of a quartz-cemented quartz arenite*, AAPG Bulletin, 95(6), 1067-1088, 2011.
21. McNeil, L, Saffer, D.M., Byrne, T., Araki, E., and IODP Expedition 319 Scientists (**D.F. Boutt**), *IODP Expedition 319, NanTroSEIZE Stage 2: First IODP Riser Drilling Operations and Observatory Installation Towards Understanding Subduction Zone Seismogenesis*, Scientific Drilling, 10, p 4-13.
22. Lin, W., et al. (2010), *Present-day principal horizontal stress orientations in the Kumano forearc basin of the southwest Japan subduction zone determined from IODP NanTroSEIZE drilling Site C0009*, Geophys. Res. Lett., 37, L13303, doi:10.1029/2010GL043158.
23. **Boutt, D.F**., Mabee, S.B., and *J.P. Diggins, *A field study of the factors controlling the depth of ground water flow systems in crystalline fractured rock terrain, Hydrogeology Journal*, 2010, Published Online September 7th, DOI: 10.1007/s10040-010-0640-y.
24. **Boutt, D.F**., Cook, B.K., and J.R. Williams, *A coupled fluid-solid model for problems in geomechanics: application to sand production*, International Journal of Analytical and Numerical Methods in Geomechanics. published online: 2 AUG 2010 | DOI: 10.1002/nag.938,
25. **Boutt, D.F**., *Poroelastic response of an unconsolidated aquifer to daily releases of water from an upstream dam*, Ground Water, doi:10.1111/j.1745-6584.2009.00,663.x, 2010.

26. **Boutt, D.F.**, Goodwin, L.B, and McPherson, B.J.O.L., *The Role of Permeability and Storage in the Initiation and Propagation of Natural Hydraulic Fractures*, Water Resources Research, 45 (W00C13), doi:10.1029/2007WR006557, 2009.
27. **Boutt, D.F** and *B.J. Fleming, *Implications of anthropogenically driven river stage fluctuations on mass transport in a valley fill aquifer*, Water Resources Research, doi:10.1029/2007WR006526, 2009.
28. **Boutt D.F.**, Cook, B.K, McPherson, B.J.O.L., and J.R. Williams, 2007, *Direct simulation of fluid-solid mechanics in porous media using the discrete element and lattice-Boltzmann methods*, Journal of Geophysical Research – Solid Earth, 112, B10209, doi:10.1029/2004JB003213.
29. McPherson, B.J.O.L., and **D.F. Boutt**, 2007, *Evaluation of Forces Responsible for Fracturing in the Spraberry Trend*, Midland Basin, Geofluids, 7(4), p 415-426.
30. **Boutt D.F.,** Grasselli G., Fredrich J.T., Cook B.K., Williams J.R., 2006, *Trapping zones: The effect of fracture roughness on the directional anisotropy of fluid flow and colloid transport in a single fracture,* Geophysical Research Letters, V. 33, L21402,10.1029/2006GL027275.
31. Wayland, K.G, D.W. Hyndman, **D.F. Boutt**, B.C. Pijanowski, D.T. Long, *Modeling The Impact Of Historical Land Uses On Surface Water Quality Using Ground Water Flow And Solute Transport Models*, Lakes and Reservoirs, 7(3), p 189-199, 2002.
32. **Boutt, D.F.**, and McPherson, B.J.O.L, *Simulation of sedimentary rock deformation: Lab-scale model calibration and parameterization*, Geophysical Research Letters 29(4), 10.1029/2001GL013706, 2002.
33. **Boutt, D.F.**, Hyndman, D.W., Pijanowski, B.C., and David T. Long, *Identifying potential land use-derived solute sources to stream baseflow using ground water models and GIS*, Ground Water 39(1), 24-34, 2001.

Peer Reviewed Book Chapters

34. Frisbee, M.D, Shope, C.L., Briggs, M.A. and **D. F. Boutt**, Field Methods for them Evaluation of Groundwater and Surface Water Interactions, Eds. Cushman and Tartakovsky, The Handbook of Groundwater Engineering, Third Edition, CRC Press, In press.

Manuscripts In Preparation for Submission in next 3 Months:

1. **Boutt D.F**., Yu, Q., Mabee, S., The lasting impact of an extreme precipitation event on the stable isotopic composition of surface water, In Preparation for Submission to GRL.
2. Hare, D.K., **Boutt, D.F.,** Clement, W.C., Davenport, G.D., Hatch, C.E, and A. Hackman, Hydrogeological controls on spatial patterns of groundwater discharge in peatlands, In Preparation for Submission to HESS
3. Earnest, E., **Boutt, D.F.,** Murdoch, L., Hisch, D., Ebenhack, J., and W.C. Clement, Seasonal and induced dynamic permeability in a fractured crystalline rock aquifer, In Preparation for Groundwater
4. **Boutt D.F**., Corenthal, LC, Hynek, S.A, Munk, L.A. Extreme imbalance in the modern hydrologic budget of topographic catchments along the west slope of the Andes (21-26^{o}S), In Preparation for Submission to WRR.
5. Settembrino, M., **Boutt, D.F.,** Ingari, J, DeMars, R., and Bonarigo, A., and U. Maharaj. Groundwater Recharge to a Structurally Complex Island Aquifer System, In Preparation for Submission to Hydrogeology Journal
6. Munk, L.A, **Boutt D.F**.,Hynek, S.A,. Hydrogeochemical fluxes and lithium accumulation in the Salar de Atacama, Chile, In Preparation for Submission to Applied Geochemistry.

Peer-reviewed articles and reports:

1. Saffer, D., McNeill, L., Byrne, T., Araki, E., Toczko, S., Eguchi, N., Takahashi, K., and the Expedition 319 Scientists, NanTroSEIZE Stage 2: NanTroSEIZE riser/riserless observatory *Expedition 319 of the riser drilling platform Shingu, Japan, to Yokkaichi, JapanSites C0009 & C0011 5 May -31 August 2009* Integrated Ocean Drilling Program, Japanese Implementing Organization, Center for Deep Earth Exploration (CDEX) at the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), and U.S. Implementing Organization Science Services, Texas A&M University, 2010.

Non peer-reviewed articles and reports:

1. Munk, L.A., **Boutt, D.F.**, Hynek, S.A., Sources of Calcium and Lithium to the Salar de Atacama, Final Report to Rockwood Lithium, May 2016, 162 p.
2. **Boutt, D.F.**, Water Flow Modeling of Tobago Aquifers, Final Report Volume III, submitted to Lennox Petroleum Services for WASA, Trinidad and Tobago, 108 p.
3. **Boutt, D.F.**, Hydrogeological Reassessment Study – Inception Report, submitted to Lennox Petroleum Services for WASA, Trinidad and Tobago, 217 p.
4. Mabee, S.B., *B.J. Fleming, and **D.F. Boutt**, *Hydrogeologic assessment of the West Charlemont aquifer,* Charlemont, Massachusetts, project completion report, 2007.
5. Grasselli G., **Boutt D.F.**, Fredrich J.T., Cook B.K., Williams J.R., 2005, *Experimental and numerical study of colloid transport in a single fracture,* in Proc. IACMAG 2005 Conference, Turin, Italy, pp 277-284
6. Cook BK, **Boutt DF**. and Strack O.E. DEM-fluid model development for near wellbore mechanics. *Numerical modeling in Micromechanics via Particle Methods*, 2004, Shimizu, Hart & Cundall (eds). Taylor & Francis Group, London, ISBN 90 5809 679 3.
7. **Boutt, D.F.**, *Discrete Analysis of the Role of Pore Fluids in the Genesis of Opening Mode Fractures in the Shallow Crust*, Ph.D. Thesis, New Mexico Institute of Mining and Technology, Socorro, NM, 2004, 239 pp.
8. **Boutt D.F.**, McPherson, B.J.O.L., Cook, B.K, and J.R. Williams, *Application of a directly coupled numerical model of fluid-solid mechanics*, in *Soil and Rock America 2003 Proceedings*, edited by P.J. Culligan, H.H Einstein, and A.J. Whittle, Volume 1, p 977-983
9. **Boutt, D.F.**, and B.J.O.L. McPherson, *The role of particle packing in modeling rock mechanical behavior using discrete elements*, in *Discrete Element Methods: Numerical Modeling of Discontinua*, edited by B.K. Cook, and R.P. Jensen, pp. 86-92, ASCE, Santa Fe, NM, 2002.
10. Villeneuve, P.J. and **D.F. Boutt**, Hydrogeologic Investigation of Leverett, Massachusetts, May 2008, UMass Hydrogeology Group.
11. 2009 Integrated Ocean Drilling Program Expedition 319 Preliminary Report NanTroSEIZE Stage 2: NanTroSEIZE riser/riserless observatory, Demian Saffer, Lisa McNeill, Eiichiro Araki, Tim Byrne, Nobuhisa Eguchi, Sean Toczko, Kyoma Takahashi, and the Expedition 319 Scientists, doi:10.2204/iodp.pr.319.

Research Funding Awarded:

The stable isotopic composition of shallow and deep ground waters in Massachusetts

PIs: **D.F. Boutt**

Funding agency: USGS, NIWR 104B Grant Program
Amount: $25,000 to UMass
Duration: 3/1/2016- 2/28/2017

Geochemistry and Hydrogeology of South Salar de Atacama: A Focus on Lagoons, Region II, Chile
PI: LA. Munk (UAA), S. Hynek (Penn State) **D.F. Boutt**
Funding Agency: Rockwood Lithium, Santiago, Chile
Amount: ~$800,000 ($150,000 to UMass)
Duration: 1/1/2013 – 6/31/2015

Hydrogeologic Analysis of the island of Tobago, Trinidad and Tobago, West Indies
PI: **D.F. Boutt**
Funding Agency: Water and Sewage Authority, Trinidad and Tobago, West Indies
Amount: $200,000 to UMass
Duration: 5/15/2014 – 5/15/2015

Rapid: A Plio-Pleistocene record of environment and climate from the Salar de Atacama basin based on recently recovered cores
PI: LA. Munk (UAA), S. Hynek (Penn State) **D.F. Boutt (Collaborator)**
Funding Agency: NSF, EAR
Amount: $75,000
Duration: 6/15/2014 – 5/31/2015

Geothermal Technologies Program – MA and CT
PIs: S.B. Mabee, J. M. Rhodes, **D.F. Boutt**
Funding Agency: U.S. DOE, Arizona Geological Survey
Amount: $441,062
Duration: 7/1/2010 – 6/30/2013

Characterizing and quantifying recharge at the bedrock interface
PIs: **D.F. Boutt**, S.B. Mabee
Funding agency: USGS, NIWR 104G Grant Program
Amount: $174,490 to UMass
Duration: 9/1/2009 – 8/31/2013

Collaborative Research: EcoHydrology of Deep Crystalline Rocks at DUSEL Homestake
PIs: **D.F. Boutt**
Funding agency: National Science Foundation, Division of Earth Sciences
Amount: $111,416 to UMass
Duration: 5/1/2009 – 4/31/2013

Upgrade of Department of Geosciences Digital Mapping and Modeling Laboratory at the University of Massachusetts Amherst
PI: Chris Condit, Rob Deconto, Michele Cooke, Jon Woodruff, **D.F. Boutt**
Funding Agency: NSF, EAR-I&F

Amount: $74,999 to UMass
Duration: 8/1/2010 – 7/31/2012

Permeability Anisotropy and Poroelastic Property Evolution of Mudstones recovered from Exp. 319
PI: **D.F Boutt**
Funding Agency: Consortium For Ocean Leadership
Amount: $14,910
Duration: 4/1/2010-12/1/2011

Salary for Participation in IODP Expedition 319
PI: **D.F. Boutt**
Funding Agency: Consortium For Ocean Leadership
Amount: $18,000
Duration: 6/4/2009-12/1/2011

Homestake-DUSEL ICDP Observatory for In-Situ Stress, Hydrology, and Life: Workshop Proposal
PIs: H. Wang, **D.F. Boutt**, G.Grasselli, T. Kieft, L. Murdoch, T. C. Onstott, K. Pedersen, W. Roggenthen, B. Sherwood Lollar, G. Slater, G. Southam, T. Tokunaga, and M. D. Zoback.
Funding Agency: ICDP
Amount: $48,000
Duration: 7/14/2010-7/13/2011

Collaborative Research: Using Pore Fluid Pressure Gradients to Test the Relative Importance of Hydrologic Versus Mechanical Heterogeneity in Fracture Formation (EAR-0635876)
PIs: **D.F. Boutt** (UMass), Laurel Goodwin (Univ. Wisconsin)
Funding agency: National Science Foundation, Division of Earth Sciences, Tectonics Program
Amount: $227,750 among 2 institutions; $140,780 to UMass
Duration: 8/1/07 – 7/31/2011

Carbon Sequestration: Developing An Assessment of Potential CO2 Storage Resources in Massachusetts
PIs: S. Petsch, S.B. Mabee , **D.F. Boutt**
Funding agency: MA Clean Energy Center
Amount: $120,968 to UMass
Duration: 7/1/2009 – 6/30/2011

Surface Water-Ground Water Interactions on the Deerfield River
PI: **D.F. Boutt**
Funding Agency: NIWR 104B Competition Massachusetts Water Resources Center
Amount: $4,998
Duration: 4/1/2010-4/1/2011

Geologic mapping and hydrogeologic modeling of the Nashoba Terrane, Eastern Massachusetts.

PI: Steve Mabee
Co-PI: **D.F. Boutt**, USGS WRD-Marlborough
Funding agency: State of Massachusetts, Department of Environmental Protection
Amount: $94,315; USGS received an undisclosed amount
Duration: 4/25/07 – 6/01/10

Quantifying the Micromechanical Effects of Variable Cement in Porous Media, Department of Energy
PIs: **D. F. Boutt**, Laurel Goodwin (Univ. Wisconsin); Thomas Buchheit (Sandia National Laboratories)
Funding agency: Department of Energy, Basic Energy Sciences, Geosciences Program
Amount: $697,733 among 3 institutions; $185,180 to UMass
Duration: 8/15/05 – 8/14/09

Hydrogeologic assessment of the West Charlemont Aquifer, Charlemont, Massachusetts.
PI: Steve Mabee, **D.F. Boutt**
Funding agency: State of Massachusetts, Department of Environmental and Executive Affairs
Amount: $30,903; $13,803 matching from Office of the Massachusetts State Geologist
Duration: 4/25/07 – 6/01/09

Water quantity and quality of the bedrock and surficial aquifers of the Town of Leverett
PI: **D.F. Boutt**
Funding agency: Town of Leverett, Massachusetts
Amount: $15,171
Duration: 9/1/07 – 8/31/2008

Influence of anthropogenically produced stream-stage fluctuations on groundwater-surfacewater interactions in the Deerfield River, Massachusetts.
PI: **D.F. Boutt**
Funding agency: University of Massachusetts – Amherst, Faculty Research Grant
Amount: $13,337; $6689 matching from Department of Geosciences
Duration: 5/1/07 – 4/31/2008

AGU 2002 Horton Research Grant: Discrete coupling of fluid flow and rock deformation: A new approach to a fundamental problem in hydrogeology
PI: **D.F. Boutt**
Funding agency: American Geophysical Union, Hydrology Section
Amount: $10,000

Awards:
2003 Best TA Award – New Mexico Tech Hydrology Program
AGU Fall Meeting 2002, Best Student Paper Award – Hydrology
Warren T. Wood Hydrogeology Award at Michigan State University

Summary of International Scientific Involvement:

Invited Participant in the COSC Swedish Drilling Program as Hydrogeologist, full proposal submitted to ICDP, Sweden

Member of IODP Expedition 319, Drilling into the Kumano Basin for NanTROSEIZE project, off-shore Japan

Co-PI on workshop proposal for the InterContinental Drilling Program for 5-km deep hole at DUSEL-Homestake

Participant and contributor to IODP writing program and INVEST meeting in Bremen, Germany

IODP 319 Post-cruise meeting in Barcelona, Spain

PI on an Office of International Science and Engineering proposal for visit and work at the ASPO underground laboratory, Sweden

Associate editor for Hydrogeology Journal, a journal of the International Association of Hydrogeologists

Presentations:

Invited Seminars:

- 2014 Geological Society of America Annual Meeting
- 2013 Bay State Groundwater Forum sponsored by NGWA
- University of Alaska Anchorage, Department of Geology, Anchorage, AK (June 2012)
- MA-RI Water Resources Division, United States Geological Survey, Northborough, MA (October 2010)
- K.D. Nelson Lecturer, Department of Geosciences, Syracuse University, Syracuse, NY (September 2010)
- Department of Earth and Planetary Sciences, University of New Mexico, Albuquerque, NM, (March 2008)
- Department of Civil and Environmental Engineering, University of Massachusetts – Amherst (April 2006)
- Weeks Lecture, Department of Geology and Geophysics, University of Wisconsin (February 2006)
- Department of Civil Engineering, Massachusetts Institute of Technology (Fall 2007)
- Geophysics Brown Bag Seminar, Department of Geology and Geophysics, University of Wisconsin (February 2006)
- Deerfield River Watershed Association (October 2006)

Master and Doctoral Student Advising

Graduate Students (all in Dept. of Geosciences):

Doctoral Students

1. Zackary Smith, Subsurface temperature response to climate variability in advectively dominated aquifers, (Anticipated 2016).
2. Amy L. Hudson (2016), *Geochemical signatures of hydraulically active fractures: A new tool for fractured rock aquifer characterization*.
3. Evan Earnest (2014), *The Role of In Situ Stress on Shallow Crustal Permeability: Evaluating the Role of Hydromechanical Coupling in the Hydrogeologic Properties of Fractured-Rock Aquifers using Field-Based Observations and Numerical Methods*, Now at Chevron

4. Alex Manda (2009), *Combining outcrop data and groundwater numerical models to investigate the role played by hydrostructural domains in controlling fluid flow in crystalline rock aquifers*. *Note:* Co-advised with Steve Mabee, Now an Assistant Professor at East Carolina University

Research Master Students

1. Carrie Glauner, Sources of Groundwater to Clayton Valley, Nevada, (MS Anticipated 2017)
2. Brendan Moran, Closing the hydrologic budgets of salars on the Alti-Puna Pleateau, (MS Anticipated 2017)
3. Mitchell Isaacson, *Streamflow generation in till-mantled bedrock catchments*, (MS Anticipated 2016), Now at TetraTech
4. Lilly Corenthal (2016), *Regional-Scale Groundwater Flow to the Salar de Atacama*, Now at Sanborn Head
5. Danielle Hare (2014), *Ground water surface water interactions in a peat-dominated wetland: Establishing a baseline for restoration, Now at AECOM*
6. Liam Bevan (2014), *Characterization of Groundwater Recharge to Fractured Bedrock Aquifers Through Glacial Till,* Now at AECOM
7. Erin Bradley (2012), *Microfractures associated with Natural Hydraulic Fractures*, Now at New England Research.
8. Brian Yellen (2011), *A reach-scale study of dam-induced hyporheic exchange: controlling mechanisms and effects, Deerfield River, Massachusetts.* Now Pursueing PhD in Department of Geosciences at UMass-Amherst
9. Kaitlyn Weider (2010), *A data-driven study if the water table fluctuations in New England over the last 60 years*, Now at HRP Associates, Connecticut
10. Brandon Fleming (2009), *Ground water-surface water interactions in a valley-fill aquifer subject to daily stream stage changes*, Now at USGS, WRD-MD, Baltimore, Maryland.
11. Kathleen Plourde (2009), *Micromechanical basis for the storage properties of weakly cemented sandstones*, Now at Exxon-Mobil, Houston, Texas.
12. John Patrick Diggins (2009), *Characterizing the regional-scale flow in fractured crystalline bedrock aquifers of the Northeast*, US, Now at Environmental Resources Management, Boston, MA.
13. Phil Villenevue (2009), *Ground water surfacewater interactions in a mixed alluvial fractured bedrock environment*, Now at Sovereign Consulting, Amherst, MA.

Professional Master Students

14. Elizabeth Schrang (2016)
15. Alex Schwartz (2016)
16. Leah Santangelo (2015)
17. Seth Oliver (2015)
18. Ben Spencer (2014)
19. Matt Winslow (2014)
20. Jon Schneyer (2013)

Undergraduate Theses:

1. Mark Settembrino (2016), Controls on the geochemical evolution of groundwater on Tobago, Umass Amherst Commonwealth Honors College.
2. Orion Hatch (2016), Borehole temperature profiles constrain groundwater flow, evaporation rates, and discharge to the Salar de Atacama, Chile, Umass Amherst Commonwealth Honors College.
3. Shakib Ahmed, Analyzing the Hydraulic Properties of Soil at Assabet River Watershed, Eastern Massachusetts, UMass Amherst Commonwealth Honors College.
4. Taylor Lucey, A Look Inside the Deerfield River's Metabolism using a Cotton Strip Assay, UMass Amherst Commonwealth Honors College.
5. Adam Brown, *Ground water flow dynamics in a New England glacial aquifer system*, May 2010, UMass Amherst Commonwealth Honors College.
6. Willie Guerra, *A complex interplay of groundwater and climate at Ft. Kent*, ME, May 2008, UMass Amherst Commonwealth Honors College.

Undergraduate Research Assistants:

Brandon Fleming (UMass Geosciences)
Martin Gosselin (UMass Geosciences)
Sabrina Moreau (Univ. New Hampshire)
Ben Clinton (UMass Geosciences)
Nick Castonguay (UMass Geosciences)
Matt Walsh (UMass Geosciences) - Graduate Research Assistant
William Guerra (UMass Geosciences)
Taylor Lucey (UMass Geosciences)
Nathaniel Goodhue (UMass Geosciences)
Orion Hatch (UMass Geosciences)
Mark Settembrino (UMass Env. Sci.)

Scientific Outreach and Synergistic Activities:

Professional affiliations:

American Geophysical Union
National Groundwater Association
Geological Society of America

Requested Reviewer:

journals:

AAPG Bulletin Hydrogeology Journal Geophysical Research Letters
Ground Water International Journal for Numerical and Analytical Methods in Geomechanics
International Journal for Numerical Methods in Engineering Water Resources Research
Geofluids Journal of Geophysical Research – Solid Earth
Journal of Geophysical Research – Earth Surface Journal of Hydrology
Geophysical Journal International

funding agencies:

National Science Foundation – ad hoc reviewer
Department of Energy, Basic Energy Sciences
Department of Energy – panel review: ESRP 2007 review panel,

National Science Foundation, Hydrological Sciences, EAR – panel member
Swiss National Science Foundation
Canadian Research Foundation

Synergistic activities:

Editor for International Journal Hydrological Processes

In collaboration with the Office of the State Geologist and the MA Department of Environmental Protection students and faculty in the hydrogeology program are now responsible for monthly monitoring of 19 climate response network wells in western Massachusetts. These wells, many of which have been active for over 50 years, are critical indicators for the subsurface response to climatic variability. Due to budget shortfalls the USGS and partners have faced decisions on whether to eliminate monitoring of these wells or find alternatives. Students in the Geo-Hydrology MS program and MS students in the hydrogeology program are volunteering to spend a day a month travelling around the state to assist with the tape-down water level measurements.

Associate Editor for Hydrogeology Journal, 2009-2012

Session Chair for National Meetings:

- Co-Chair of GSA Session entitled "Dynamics of Groundwater Temperature: From Recharge to Discharge Zones" at the 2014 Geological Society of America Annual Meeting, Vancouver, BC.
- Chair of NGWA Session at the Ground Water Summit in Baltimore, MD entitled " Recent advances in Fractured Rock Hydrogeology", 2013
- Co-Chair of AGU Session on Groundwater/Surface Water Interactions: Dynamics and Patterns Across Spatial and Temporal Scales at the AGU Fall 2010 Meeting
- Session chair 2009 Portland GSA Annual Meeting T29. Recent Advances in the Conceptualization, Characterization, and Interpretation of Fluid Movement and Transport Dynamics in Fractured and Karst Aquifers (GSA Hydrogeology Division; GSA Structural Geology and Tectonics Division)
- Co-chair of session in honor Madhi Hantush at the Geological Society of America Annual Meeting 2007
- Co-chair of WCCM-VII Minisyposium on Discrete Elements Models, 2006
- Organizer and session moderator for the Massachusetts Water Resources Research Conference, 2005

Lead investigator for the development of a working group for fractured rock hydrology at the proposed site of the Deep Underground Science and Engineering Laboratory at the former Homestake Mine, Black Hills, South Dakota.

INVEST 2010 Participant - Traveled to Bremen, Germany as an invited member of the US Science team to prepare the next generation of ocean drilling program

Member of the International Organizing Committee for the 5th International Conference on Discrete Element Methods

AGU best student paper reviewer from 2006-2009

Invited participant in 15 person panel on Compaction bands, Sponsored by DOE Basic Energy Sciences, Geosciences, 2004

Volunteer Judge for Hydrology Section Outstanding Student Paper Awards, AGU Fall 2006, 2008, 2009 Meeting,

Hydrogeology Team member of DUSEL-Henderson NSF S3 Proposal, 2006

Member of the subcommittee on Ground Water, a subgroup of the federal Advisory Committee on Water Information (ACWI), 2007

Community Outreach:

I have given in-kind support through advice and consulting to the following local agencies:

- Northfield Aquifer Protection Committee
- Town of Charlemont
- Town of Sunderland, Board of Health
- VT-PACE
- Deerfield River Watershed Association
- Town of Leverett
- Connecticut River Watershed Association

Departmental, College, and University Service:

Member – UMass-Amherst Geosciences Department, Executive and Personnel Committee (2005-2006,2008-2009)
College of Natural Sciences Environmental Sciences Curriculum Committee (2009-2010)
College of Natural Sciences Scholarship Committee (Spring 2010-Present)
Geosciences Department Award Committee (2007-Present)
Geosciences Department Graduate Student Applications Review Committee (2006-Present)
Earth Systems Program Undergraduate Advisor (2008-Present)
Environmental Sciences Program Undergraduate Advisor (Fall 2010-Present)
Search Committees:

Aqueous
Chair of UMass-Extension Water and Climate Change Search Committee, Department of Geosciences, UMass (2012)
Member Department of Geosciences Head Search (2009)
Member of Geography Water Search Committee, Department of Geosciences, UMass (2008)
Member Sedimentology/Stratigraphy position, Department of Geosciences, UMass (2006-2007)
Jr. Faculty evaluator, UMass College of Natural Sciences and Mathematics Dean Search (2005)

Judge for Department of Geosciences Research Review
Member of UMass Amherst The Environmental Institute sponsored Climate Change and Water Resources working groups