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Arthur H. Feagin Chair Professor of Civil Engineering
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Professional Experience

- Feagin Chair Professor, Department of Civil Engineering, Auburn University, Alabama, USA, since September 2007.
- Professor, Department of Civil Engineering, Auburn University, Alabama, USA, since August 2007.
- Associate Professor, Department of Civil Engineering, Auburn University, Alabama, USA, August 2002- July 2007
- Senior Lecturer, Department of Environmental Engineering, University of Western Australia, Perth, Australia, January 2000 – July 2002
- Senior Research Engineer, Battelle Pacific Northwest National Laboratory, Richland, Washington, USA, April 1994 – December 1999.
- Graduate Assistant, Department of Civil Engineering, Auburn University, Sept 1989 - March 1994.
- Research Engineer, Center for Environ. Sciences and Engineering, Indian Institute of Technology, Bombay, India, June 1988 - July 1989.
- Project Engineer, AIC Watson Consultants Limited (a member of Montgomery-Watson's international group), Bombay, India, March 1987 - May 1988.

Education

- Ph.D. (Civil Engineering), Auburn University, USA. Dissertation title: Numerical modeling of variably-saturated groundwater flow with a seepage-face boundary, Advisors: Professors Fred Molz and William Wise, December, 1993.
- M.Tech. (Environ. Sci. & Eng.), Indian Institute of Technology, Bombay, India, 1987.
- M.Sc. (Physics), American College, Madurai University, India, June 1985.
- B.Sc. (Physics), Loyola College, Madras University, India, June 1983.

Professional Registration

- P.E. (Professional Engineer), Registered Civil Engineer in the State of Washington, USA

Honors and Awards

- Appointed to serve as the Arthur H. Feagin Chair Professor of Civil Engineering, October 2007-Sepember 2010.
- Montgomery-Watson-Harza Consulting Engineers/AEESP's National-Level Award for Outstanding MS Thesis, 2008 (jointly with my masters student Mr. V. Srinivasan).
- Auburn Alumni Engineering Council Research Award for Excellence, Senior Award, 2006. This award represents the highest faculty honor for research accomplishments within the College of Engineering at Auburn University.
- Appointed as an associate editor of Journal of Contaminant Hydrology, Elsevier publishers, June 2006-2008.
- Teaching award: Outstanding Civil Engineering Faculty Member, 2006.
- Appointed as an associate Editor of Soil Science Society of America's Vadose zone journal, 2005-2007.
- Appointed as an associate editor of American Society of Civil Engineers' Journal of Hydrologic Engineering, 2004-2008
- Federal Laboratory Consortium (FLC) seal of achievement. The FLC national awards committee recognized the technology transfer efforts related to the development of the RT3D computer tool. May 1999.
- Outstanding performance award in recognition for the support of the RT3D development project, Battelle Pacific Northwest National Laboratory, 1999.
- Semifinalist of the Discover Magazine Award1999. Invited by the awards committee as a nominee for the technological innovation work related to RT3D.
- National Academy of Sciences and Engineering and National Research Council's Research Associate Award - Sponsored by the USEPA Lab, Georgia, December 1993.
- Research Fellowship Award, Oak Ridge National Laboratory (ORNL), Tennessee, Feb 1994.
- Honor Society of Phi Kappa Phi, December 1993.
- Academic Excellence Award, Auburn University, May 1991.

<u>Awards received by my MS/PhD students</u>

- Advisor of the MS thesis research of Ms. Linzy Brakefield, who received Outstanding Student Paper Award for her presentation at American Geophysical Union (AGU) 2007 Fall Meeting in San Francisco.
- Advisor of the MS thesis of Mr Srinivasan who received Association of Environmental Engineering and Science Professors sponsored Montgomery-Watson-Harza Award (2^{nd} place), a national award for Outstanding MS Theses, 2008 ($500 cash prize and $750 travel grant).
- Advisor of the MS thesis research of Ms. Linzy Brakefield, who received Len Assante Scholarship Award (cash prize of $500) in recognition of best poster presentation at the National Groundwater Association's (NGWA) Groundwater Summit Conference, Albuquerque, New Mexico, 2008.
- Advisor of the MS thesis work of V. Srinivasan, who was recognized by the EWR faculty and was awarded the CH2MHILL Best Master Student Award, 2007 ($1000 cash prize).

- Advisor of the MS thesis work of V. Srinivasan, who was selected as the outstanding international masters student within the Department of Civil Engineering, Auburn University, 2007.
- Advisor of the MS thesis work of C. Quezada, who was recognized by the EWR faculty and as awarded the CH2MHILL Best Master Student Award, 2005 ($1000 cash prize).
- Advisor of a PhD dissertation (of M.J. Simpson) which was awarded distinction (top 5% of PhD dissertations receive this recognition at the University of Western Australia), 2004.
- Advisor of the honors research of Bradley Hiller, who received the best honors thesis award, Environmental Engineering Department, Univ. of Western Australia, 2001.

Professional Activities

National/international Proposal Review Work: Served on multiple review panels of National Science Foundation (NSF) and USDOE's Environmental Remediation Sciences Program. Provided reviews via email to the University Grants Committee (UGC) of Hong Kong, and The Engineering and Physical Sciences Research Council (EPSRC) of UK.

Reviewer for Journals: Water Resources Research, Ground Water, Journal of Hydrology, Journal of Contaminant Hydrology, Advances in Water Resources, Hydrological Processes, Environmental Science & Technology, ASCE Journal of Hydrologic Engineering, Environmental Science & Technology, Journal of the American Water Resources Association, and Environmental Pollution.

External PhD Dissertation Examiner: The University of Wollongong, Australia (June 2006), The University of Newcastle, Australia (January 2002), University of Hong Kong, Hong Kong (January 2002), and The University of Western Australia (1999).

National Level Committee/Panel Memberships

- Member of the National Academies Committee on Contaminated Drinking Water at Camp Lejeune, North Carolina, July 07-January 09.
- Member of the SERDP-DOD program's proposal review panel 2008
- Member of the NSF panel for assessing the tsunami impacts on Sri Lankan groundwater systems (September, 2005)
- Member of ASCE groundwater quality committee (2004-)
- Member of the 2004 NSF Hydrology proposals review panel
- Member of the 2006 USDOE's ERSP technical proposal review panel.

Nation/ International Conference/workshop Committees

- Technical program review committee, ASCE-EWRI's 3rd International Perspective on Current & Future state of water resources & the environment, January 5-7, 1010, Chennai, India.
- Scientific Advisory Committee Member, SWIM, 20th Salt Water Intrusion Meeting, June 23-27, 2008, Naples, Florida, USA.
- Scientific Advisory Committee Member, International groundwater modeling conference MODEL CARE 2007, September 9th to 13th, 2007, Copenhagen, Denmark.

- Conference Committee Member, Water Resources Conference on Bridging the Gap Between Science, People, and Policies, June 14-15 2007, Auburn University, Alabama.
- Conference Technical Committee Member, MODFLOW and More 2006 conference: Managing Ground Water Systems, May 21-24, 2006. Golden, Colorado, USA. Technical committee member.
- Conference Technical Committee Member, MODFLOW and More 2003 conference: Understanding through Modeling - September 16-19, 2003 - Golden, Colorado, USA. Technical committee member.
- Organizational committee member, 2000 Contaminated Site Remediation Conference, Melbourne, Australia, December 4-8, 2000.
- Workshop on Subsurface Reactive Transport Modeling", October 29 - November 1, 1997, Environmental Molecular Sciences Laboratory, Richland, Washington. Organizational committee member.

Session Chair Positions

- Groundwater management session at the ASCE EWRI conference in Tampa, Florida, May 2007.
- MODFLOW and More 2006 conference, May, 2006: chaired two sessions titled: "Reactive transport modeling," and "Use of models for analysis of experimental data."
- Groundwater management session at the ASCE EWRI conference in Alaska, May 2005.
- Reactive transport modeling session at the MODFLOW and More 2003 conference, September 2003.
- Groundwater remediation sessions at the 2000 Contaminated Site Remediation Conference, Melbourne, Australia, 2000.

Invited Conference Presentations

- Dynamics of density coupled flow involving stable and unstable interfaces, invited feature presentation at the MODELCARE 2007 conference. Denmark. September 2007.
- Dynamics of Fresh and Saltwater Mixing in Groundwater Systems -- A brief summary of our research efforts, Invited feature presentation at the MODFLOW and More 2006 conference, May, 2006.
- Invited opening speaker at the International Symposium on Soil & Groundwater Environment, organized by the Korean Society of Soil & Groundwater Environment, October 27-28th Seoul, Korea, 2005.
- Impacts of saltwater flooding on coastal aquifers, invited talk to at the workshop organized by NSF-Sri Lanka and the University of Peradeniya in Colombo, September 2005.
- Bioremediation modeling- current status and future challenges, Invited talk at the MODFLOW and More 2003 conference, September 2005.

Invited Visits/ Seminars

Visited and presented seminars at the following institutes/ universities: Seoul National University, Korea; USEPA Robert S. Kerr Lab, Ada, Okalahoma; USEPA Research Lab, Athens,

Georgia; University of Hong Kong; University New Castle, Australia; University of Auckland, New Zealand; Denmark Technical University, Denmark; Delft University, Netherlands; Anna University, India; University of Peradeniya, Sri Lanka; Technical University of Cartagena, Spain; University of Wollongong, Sydney; Vanderbilt University; Clemson University; Washington State University; Georgia Tech; Colorado School Mines; Indian Institute of Technology, Madras, India; University of Hawaii; Rice University; University of Washington at St Louis; Indian Institute of Science, Bangalore, India; and the University of Illinois at Urbana-Champaign.

Scholarly Publications

- Total of 86 articles that include 48 published/in press journal articles, 2 published journal discussions, 4 published book chapters, and 32 published conference papers
- My publications have received over **500** ISI web of science citations (data was collected from: www.isiknowledge.com)
- In the list below, post-doc, PhD, and masters students' names are underlined.
- *****Indicates corresponding authorship

Peer-Reviewed Journal Articles Published

1) Abarca, E., and ***T. P. Clement****, A novel approach for characterizing the mixing zone of a saltwater wedge, Geophysical Research Letters, 36, L06402, doi:10.1029/2008GL036995, 2009.
2) Goswami R.R., B. Ambale and ***T.P. Clement****, Estimating errors in concentration measurements obtained from image analysis, Vadose Zone Journal, vol.8(1), p.108-118, 2009.
3) Loganathan,V.A., Y. Feng, G.D. Sheng, and ***T.P. Clement***, Influence of sorption and desorption on bioavailability of atrazine in soils, Soil Science Society of America Journal, 73:967-974, 2009.
4) Zech, W.C., ***T. P. Clement***, and J. S. McDonald, Field evaluation of silt fence tieback systems at a highway construction site, ASCE Practice Periodical on Structural Design and Construction, accepted for publication, 2008.
5) Rolle, M., ***T.P. Clement***, R. Sethi, A.D. Molfetta, A Kinetic Approach for Simulating Redox-controlled Fringe and Core Biodegradation Processes in Groundwater: Model Development and Application to a Landfill Site in Piedmont, Italy, Hydrological Processes Journal, Vol 22 (25), P 4905 – 492, 2008.
6) Kanel, S.R., R. R. Goswami, ***T. P. Clement****, M. O. Barnett, and D. Zhao, Two dimensional transport characteristics of surface stabilized zero-valent iron nanoparticles in porous media, *Environmental Science & Technology*, v.42, p.896-900, 2008.
7) Srinivasan, V. and ***T.P. Clement****, Analytical solutions for sequentially coupled one-dimensional reactive transport problems – Part I: Mathematical Derivations, *Advances in Water Resources*, v. 31(2), P. 203-218, 2008.
8) Srinivasan, V. and ***T.P. Clement****, Analytical solutions for sequentially coupled one-dimensional reactive transport problems – Part II: Special Cases, Implementation and Testing, *Advances in Water Resources*, v. 31(2), P. 219-232, 2008.

9) Zech, W.C., J.L. Halverson, and ***T.P. Clement****, Evaluating the effectiveness of silt fence installations to control sediment discharge from highway construction sites, *ASCE Journal of Hydrologic Engineering*, vol.13(6), p.497-504, 2008.
10) Xu, Y., D. Zhao and ***T.P. Clement***, Modeling elution histories of copper and lead from a contaminated soil treated by Poly(amidoamine) dentrimers, *ASCE Journal of Environmental Engineering Division*, vol. 134 (4), p. 238-246, 2008.
11) Radu, T., Kumar, A., ***T.P. Clement****, G. Jeppu, M.O. Barnett, Development of a scalable model for predicting arsenic transport coupled with oxidation and adsorption reactions, In press, *Journal of Contaminant Hydrology*, v.95, pages 30–41, 2008.
12) Goswami, R.R. and ***T.P Clement****, Laboratory-scale investigation of saltwater intrusion dynamics, *Water Resources Research*, Vol. 43, W04418, doi:10.1029/2006WR005151, 2007.
13) Zech, W.C., J.L. Halverson, and ***T.P. Clement***, Development of a silt fence tieback design methodology for highway construction installations, *Journal of Transportation Research Record*, No.2011 Environmental Issues, DOI 10.3141/2011-03, pp.21-28, 2007.
14) Lee, K.K., and ***T.P. Clement***, Remediation of groundwater and soil environments: an emerging field of research in Korea, Guest Editorial Article, *Geosciences Journal*, vol. 11 (2), p. 93-94, 2007.
15) Truex, M.J., C.D. Johnson, J.R. Spencer, ***T.P. Clement*** and B.B. Looney, A deterministic approach to evaluate monitored natural attenuation for chlorinated solvents, *Remediation-The Journal of Environmental Cleanup Costs, Technologies & Techniques*, v. 17(4), p.23-40, 2007.
16) Phillippi, J.M.,V.A. Loganathan, M. J. McIndoe, M. O. Barnett, ***T.P. Clement*** and E. E. Roden, Theoretical solid/solution ratio effects on adsorption and transport: uranium (VI) and carbonate, *Soil Science Society of America Journal*, 71:329-335, DOI: 10.2136/ sssaj2006 .0159, 2007.
17) Lim, MS, I.N. Yeo, ***T.P. Clement***, Y. Roh, K.K. Lee, Mathematical model for predicting microbial reduction and transport of arsenic in groundwater systems, *Water Research*, Vol. 41 (10), P. 2079-2088, 2007.
18) Srinivasan, V., ***T.P. Clement****, and K.K. Lee, Domenico model – Is it valid? *Ground Water*, v45 (2), p. 136-146, 2007.
19) Illangasekare, T., S W. Tyler, ***T.P. Clement***, K.G. Villholth, A.P.G.R.L. Perera, J. Obeysekera, A., Gunatilaka, C.R. Panabokke, D. W. Hyndman, K. J. Cunningham, J. J. Kaluarachchi, W W-G. Yeh, M Van Genuchten, and K. Jensen, Impacts of the 2004 Tsunami on Groundwater Resources in Sri Lanka, *Water Resources Research*, doi:10.1029/2006WR004876, v.42 (5), p.1-9, 2006.
20) Jones, N.L., ***T.P. Clement***, C.M. Hansen, A three-dimensional analytical modeling tool for solving reactive transport problems, *Ground Water*, vol. 44 (4), p 613-617, 2006.
21) Lee, M., K.K. Lee, ***T.P. Clement***, and D. Hamilton, Nitrogen transformation and transport Modeling in groundwater aquifers, *Ecological Modeling*, vol. 192, p. 143-159, 2006.
22) Simpson, M.J., K.L. Landman, and ***T.P. Clement***, Assessment of a non-traditional operator split algorithm for simulation of reactive transport, *Mathematics and Computer Simulations Journal*, 70 (1): 44-60, 2005.

23) Westbrook S.J., J.L. Rayner, G.B. Davis, ***T.P. Clement***, P.L. Bjerg, and S.J. Fisher, Interaction between shallow groundwater, saline surface water and contaminant discharge at a seasonally- and tidally-forced estuarine boundary, *Journal of Hydrology*, vol (302) p. 255-269, 2005.
24) Quezada, C.R., ***T.P. Clement****, K.K. Lee, Generalized solution to multi-dimensional, multi-species transport equations coupled with a first-order reaction network involving distinct retardation factors, *Advances in Water Resources Journal*, vol. 27, p. 507-520, 2004.
25) ***Clement****, **T.P.,*** Y.C. Kim, T.R. Gautam, and K.K. Lee, Experimental and numerical investigation of NAPL dissolution processes in a laboratory scale aquifer model, accepted for publication, *Groundwater Monitoring and Remediation Journal*, vol 24(4), p. 88-96, 2004.
26) ***Clement****, **T.P.***, T.R. Gautam, K.K. Lee, M.J. Truex, and G.B. Davis, Modeling Coupled NAPL-dissolution and rate-limited sorption reactions in biologically active porous media, *Bioremediation Journal*, 8(1-2): p.47-64, 2004.
27) Simpson, M.J., and ***T.P. Clement****, Improving the worthiness of the Henry problem as a benchmark for density-dependent groundwater flow models, *Water Resources Research*, vol 40 (1), W01504, doi:10.1029/2003WR002199, 2004.
28) Hipsey, M.R., M. Sivapalan, M. and ***T.P. Clement***, A numerical and field investigation of surface heat fluxes from small wind-sheltered waterbodies in semi-arid Western Australia, *Journal of Environmental Fluid Mechanics*, vol 4. P. 79-106, 2004.
29) Wilkes, S.M, ***T. P. Clement***, and C.J. Otto, An investigation of the hydrogeology of the Augustus River catchment, Western Australia, *Hydrogeology Journal*, 12:209-223, DOI 10.1007/s10040-003-0298-9, 2004.
30) Wilkes, S.M., ***T.P. Clement***, and C.J. Otto, The hydro-geological significance of fractures within a weathered rock catchment, *Australian Geomechanics*, vol 39(2): 27-36 (2004).
31) Simpson, M.J., and ***T.P. Clement****, Comparison of finite difference and finite element solutions to the variably saturated flow equation, v.270, p.49-64, *Journal of Hydrology*, 2003.
32) Simpson, M.J., and ***T.P. Clement****, Worthiness of the Henry and Elder problems for validating density-dependent flow models, *Advances in Water Resources Journal*, vol (26) p. 17-31, 2003.
33) Simpson, M.J., ***T.P. Clement****, and F.E. Yeomans, An analytical method for computing groundwater residences times near a pumping well, *Ground Water Journal*, vol 41 (3), p. 351-354, 2003.
34) Simpson, M.J., ***T.P. Clement****, and T.A. Gallop, Laboratory and numerical investigation of flow and transport near a seepage-face boundary, *Ground Water Journal*, vol 41(5), p.690-700, 2003.
35) ***Clement****, **T.P.***, M.J. Truex, and P. Lee, A Case Study for demonstrating the application of U.S. EPA's monitored natural attenuation screening protocol at a hazardous waste site, *Journal of Contaminant Hydrology*, vol 59 (nos.1-2), p.133-162, 2002.
36) Ginn, T. R., K. E. Nelson, T. D. Scheibe, E. M. Murphy, and ***T. P. Clement***, Processes in Microbial Transport in the Natural Subsurface, *Advances in Water Resources Journal*, vol(25), p. 1017-1042, 2002.

37) ***Clement*, T.P.***, A generalized analytical method for solving multi-species transport equations coupled with a first-order reaction network, *Water Resources Research*, vol 37, p. 157-163, 2001.
38) ***Clement*, T.P.***, C.D., Johnson, Y. Sun, G.M. Klecka, C. Bartlett, Natural attenuation of chlorinated solvent compounds: Model development and field-scale application, *Journal of Contaminant Hydrology*, vol.42, p.113-140, 2000.
39) Lu, G., ***T.P. Clement***, C. Zheng, and T.H. Wiedemeier, Natural attenuation of BTEX compounds: Model development and field-scale application, *Ground Water*, vol.37(5), p.707-717, 1999.
40) Sun, Y., J.N. Petersen, ***T.P. Clement***, and R.S. Skeen, Development of analytical solutions for multi-species transport with serial and parallel reactions, *Water Resources Research*, Vol. 35, No. 1, p. 185-190, 1999.
41) Sun, Y., J.N. Petersen, ***T.P. Clement***, A new analytical solution for multiple species reactive transport in multiple dimensions, *Journal of Contaminant Hydrology*, (35)4, pp. 429-440, 1999.
42) Sun, Y., J.N. Petersen, Bear, J., ***T.P. Clement***, B.S. Hooker, Modeling microbial transport and biodegradation in a dual-porosity system, *Transport in Porous Media Journal*, vol.35(1), p. 49-65, 1999.
43) Sun, Y., and ***T. P. Clement****, A generalized decomposition method for solving coupled multi-species reactive transport problems, *Transport in Porous Media Journal*, 37/3 (December), pp. 327-346, 1999.
44) ***Clement*, T.P.***, Y. Sun., B.S. Hooker, J.N. Petersen, Modeling Multi-species Reactive Transport in Groundwater Aquifers, *Groundwater Monitoring & Remediation Journal*, vol 18(2), spring issue, p. 79-92, 1998.
45) Sun, Y., J.N. Petersen, ***T.P. Clement***, B.S. Hooker, Effect of reaction kinetics on predicted concentration profiles during subsurface bioremediation, *Journal of Contaminant Hydrology*, v. 31, p 359-372, 1998.
46) Franzen, M.F.L., J.M. Petersen, ***T.P. Clement***, B.S. Hooker, and R.S. Skeen, Pulsing as a strategy to achieve large biologically active zones during in situ carbon tetrachloride remediation, *Computational Geosciences*, vol. 1 (no. 3-4), 217-288, 1997.
47) ***Clement*, T.P.***, M.J. Truex, and B.S. Hooker, A steady-state, two-well testing method for determining hydraulic properties of confined and unconfined aquifers, 35(4), 698-703, *Ground Water*, 1997.
48) ***Clement*, T.P.***, B.S. Hooker, and R.S. Skeen, Macroscopic models for predicting changes in saturated porous media properties cause by microbial growth, *Ground Water*, 34(5), 934-942, 1996.
49) ***Clement*, T.P.***, P.M. Peyton, R.S. Skeen, B.S. Hooker, J.M. Petersen, and D. Jennings, Microbial growth and transport in porous media under denitrification conditions: Experiment and simulations results, *Journal of Contaminant Hydrology*, 24, 269-285, 1997.
50) ***Clement, T.P.***, W. R. Wise, F.J. Molz, and M. Wen, A Comparison of Modeling Approaches for Steady-State Unconfined Flow, *Journal of Hydrology*, 181, 189-209, 1996.

51) ***Clement*, T.P.,*** B.S. Hooker, and R.S. Skeen, Numerical modeling of biologically reactive transport from a nutrient injection well, *ASCE Journal of Environmental Engineering*, 122(9), 833-839, 1996.
52) ***Clement,T.P.,*** W.R. Wise and F.J. Molz, A physically based, two-dimensional, finite-difference algorithm for variably-saturated flow, *Journal of Hydrology*, v. 161, p. 71-90, 1994
53) Wise, W.R., ***T.P. Clement***, and F.J. Molz, Variably-saturated modeling of transient drainage: Sensitivity to soil parameters, *Journal of Hydrology*, v. 161, p. 91-108, 1994

Note: *****Indicates Corresponding Authorship; also, Post-doc, PhD, and masters students' names are underlined

Peer-Reviewed Journal Discussion Papers

54) Wise, W.R. and ***T.P. Clement***, Discussion of "Maximum water-table drawdown at a fully penetrating pumping well", *Ground Water*, v. 33 (3), p. 499-502, 1995.
55) ***Clement, T.P.***, Discussion of "The groundwater pollution of the Madras urban aquifer", *Ground Water*, p. 1029-1030, 1993.

Peer-Reviewed Book Chapters

56) Hogan, M.B., R. R. Goswami, K. G. Villholth, T. H. Illangasekare, and T. P. Clement, Understanding the Flow and Mixing Dynamics of Saline Water Discharged into Coastal Freshwater Aquifers, Proceeding of the SWIM/SWICA joint meeting, Cagliari, Chia Laguna, Italy, September 25th-29th, Section-2-Modeling to Elucidate Processes, Edited by G. Barrocu, pages 55-61, 2006.
57) Ginn, T.R., T. Camesano, T.D. Scheibe, K.E. Nelson, ***T.P. Clement***, B.D. Wood, Microbial Transport in the Subsurface, *Encyclopedia of Hydrological Sciences*, edited by Anderson M.G. and vol 3, p. 1603-1626, 2005.
58) Simpson, MJ, and ***T.P. Clement***, Testing numerical models of variable density ground water flow: Current trends and the renaissance of the Henry problem. Publication title: Groundwater and Saline Intrusion, selected peer-reviewed papers from the 18th saltwater intrusion meeting SWIM-18, Cartagena, Spain. Edited by Araguas, Custodio and Manzano, p 41-48, 2005.
59) Peyton, B.M., ***T.P Clement***, and J.P. Connolly, Modeling of natural remediation: Contaminant fate and transport, Natural Remediation of Environmental Contaminants, Book Chapter-5, pages, 79-120, edited by Swindoll et. al., Society for Environmental and Toxicology and Chemistry, ISBN-1-880611-33-3, 2000.
60) ***Clement, T.P.***, B.M. Peyton, T.R. Ginn, and R.S. Skeen, Modeling bacterial transport and accumulation processes in saturated porous media: a review, Book Chapter in *Advances in Nuclear Science and Technology*, Edited by J. Lewins and M. Becker, Kluwer Academic/ Plenum Publishers, New York, pages 59-78, 1999.

Articles Published in Conference Proceedings

1) Clement, T.P., R.R. Goswami, M. Hogan, Understanding the dynamics of freshwater and saltwater mixing processes in unconfined aquifers – laboratory scale model results, Proceedings of the international conference on MODFLOW and More 2006 Managing Ground Water Systems, Golden Colorado, May 2006, p. 16-17.
2) Johnson, C.D., M.J. Truex, and T.P. Clement, New features in RT3D for modeling MNA at chlorinated solvent sites, Proceedings of the international conference on MODFLOW and More 2006 Managing Ground Water Systems, Golden Colorado, May 2006, p. 185-189.
3) Rolle, M., V. Zolla, R. Seti, A. D. Molfetta, and T.P. Clement, Modeling TEAPs and computing redox zonation in contaminated aquifers, Proceedings of the international conference on MODFLOW and More 2006 Managing Ground Water Systems, Golden Colorado, May 2006, p. 215-219.
4) Rolle, M., V. Zolla, R., Sethi, A. Di Molfetta, and ***T.P. Clement***, Modeling TEAPs and computing redox zonation in contaminated aquifers, In press, Proceeding of the MODFLOW 2006 conference, May 22-24th, Golden, Colorado, 2006.
5) ***Clement, T.P,*** K.K. Lee, and V. Srinivasan, Analytical Tools for Modeling Natural Attenuation Processes at Chlorinated Solvent Contaminated Sites, ASCE Environmental and Water Resources Conference, Alaska, May 2005.
6) Rolle, M, A. Di Molfetta, R. Sethi, T. P. Clement. Modeling of redox zonation down-gradient of landfill sites, ASCE Environmental and Water Resources Conference, Alaska, May 2005.
7) Méndez-Sánchez, N., ***T.P. Clement***, and C.R. Lange, An assessment of microcosm tests used for evaluating chlorinated solvent bioremediation model parameters, Proceeding of the MODFLOW and more 2003: Understanding through modeling, Sept 17-19th, Golden, Colorado, vol-2, pages 814-818, 2003.
8) Quezada, C.R., C.M. Hansen, ***T.P. Clement***, N.L. Jones, K.K. Lee, ART3D- An analytical model for predicting 3-dimensional reactive transport, Proceeding of the MODFLOW and more 2003: Understanding through modeling, Sept 17-19th, Golden, Colorado, vol-1, pages 275-279, 2003.
9) Lee, M., K.K. Lee, ***T.P. Clement***, and D.P. Hamilton, Nitrogen transformation and transport model in saturated soils: Model formulation and field application, Accepted, Proceeding of the MODFLOW and more 2003: Understanding through modeling, Sept 17-19th 2003, Golden, Colorado.
10) Geistlinger, H., D. Eisermann, M. Schirmer, U. Mayer, and ***T.P. Clement*** Development of New Modeling Tools for Simulating and Designing Reactive Gas Walls, Proceedings of the Probabilistic Approaches & Groundwater Modeling Symposium, S. Mishra, Editor, ASCE World Water and Environmental Resources Congress held in Philadelphia, Pennsylvania, June 24-26, pp. 192-203, 2003.
11) Gautam, T.R. and ***Clement. T.P.*** Modeling of multiple limited reactive transport processes in saturated porous media . Fourteenth International Conference on Computational Methods in Water Resources (CMWR 2002), Delft University of Technology, The Netherlands, 23-28 June 2002, Vol 1: 735-742, 2002.

12) Gautam T.R., Y.C. Kim, ***T. P. Clement***, and K.K. Lee, Modeling biodegradation coupled with NAPL dissolution processes using the RT3D code, will be presented at the Third International Conference on Water Resources and Environment Research (ICWRER), 22nd – 25th of July 2002 in Dresden, Germany.
13) Hiller, B.T., Dogramaci, S., ***Clement, T.P.*** and Wills, R. Solutes, stable isotopes and radiocarbon isotopes as tracers of groundwater flow, Carnarvon Basin, Western Australia. Processing of the International Groundwater Conference on Balancing the Groundwater Budget, Darwin, Northern Territory, Australia, May 12-17, 2002.
14) Wilkes, S.M., ***Clement, T.P.,*** and C.J. Otto, The hydrogeology of a bauxite refinery in the upper Augustus river catchment, Western Australia, Processing of the International Groundwater Conference on Balancing the Groundwater Budget, Darwin, Northern Territory, Australia, May 12-17, 2002.
15) Truex, M.J., C.D. Johnson, J.R. Spencer, and ***T.P Clement***, Evaluating Natural Attenuation Of Chlorinated Solvents At A Complex Site, Proceedings of the Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, May 20-23, 2002.
16) Spencer, J.R., C.D. Johnson, and ***T.P. Clement***, Modeling biological transformation of chlorinated ethanes and ethenes in support of natural attenuation, Proceedings of the Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, May 20-23, 2002.
17) M.J. Simpson and ***T. P. Clement***, 2001, Implication of Dupuit-Forchheimer approximations on solute transport, Proceedings of the 2nd Australia-New Zealand Conference on Environmental Geotechnics, GeoEnvironment 2001, Newcastle, 28-30 November, editors Smith, D., S. Fityus, and M. Allman, p. 215-220.
18) M.J. Simpson and ***T. P. Clement***, 2001, Density dependent groundwater flow 11thane11g: An evaluation of common benchmark problems, Modeling in Hydrogeology, editors L. Elango and R. Jayakumar, UNESCO Workshop, Anna University, India, December 3rd – 7th, 2001, Allied Publishers, p.157-168.
19) ***Clement, T. P.,*** and T. R. Gautam, 2001, Modeling and design of bioremediation systems, Proceedings of the 2nd Australia-New Zealand Conference on Environmental Geotechnics, GeoEnvironment 2001, Newcastle, 28-30 November, editors Smith, D., S. Fityus, and M. Allman, p. 255-265 (***Invited Paper***).
20) ***Clement T.P.***, Review of methods for 11thane11g the fate and transport hydrocarbon plumes using RT3D, Modeling in Hydrogeology, editors L. Elango and R. Jayakumar, UNESCO Workshop, Anna University, India, December 3rd – 7th, 2001, Allied Publishers, p.239-257 (***Invited Paper***).
21) ***Clement, T.P.,*** and M.J. Truex, Natural Attenuation Assessment of Mixed Chlorinated Ethene and Ethane Plumes at a Hazardous Waste Site in Louisiana, USA, p.355-362, volume 2, 2000 Contaminated Site Remediation Conference Proceedings, edited by C.D. Johnson, Melbourne, 4-8, December, 2000.
22) Westbrook, S.J., G.B. Davis, J.L. Rayner, S.J. Fisher, and ***T.P. Clement***, Initial site characterization of a dissolved hydrocarbon groundwater plume discharging to a surfacewater environment, p.189-196, volume 1, 2000 Contaminated Site Remediation Conference Proceedings, edited by C.D. Johnson, Melbourne, 4-8, December, 2000.

23) ***Clement, T.P***., C.D., Johnson, Y. Sun, G.M. Klecka, C. Bartlett, Modeling natural attenuation of chlorinated solvent plumes at the Dover Air Force Base site, In Press, Proceedings of the Fifth international in situ and on-site bioremediation symposium, San Diego, California, vol, 5(1), pages 29-34, 1999.
24) Aziz, C.E., C.J. Newell, J.R. Gonzales, P.E., Hass, ***T.P. Clement***, and Y. Sun, BIOCHLOR natural attenuation model for chlorinated solvent sites, Proceedings of the Fifth international in situ and on-site bioremediation symposium, San Diego, California, vol, 5(1), pages 83-88, 1999.
25) ***Clement, T.P.***, Y. Sun, and C. Zheng, RT3D- A Modflow-family reactive transport simulator, MODFLOW 98 conference proceedings, October 4-8, Golden, Colorado, vol 1., p.397-403, 1998.
26) Davis, R.J., N.L. Jones, and ***T.P. Clement***, Efficient tools for building multi-component transport models, Accepted for publication, MODFLOW 98 conference proceedings, October 4-8, Golden, Colorado, vol. 1., p.195-202, 1998.
27) Johnson, C.D., R.S. Skeen, D.P. Leigh, ***T.P. Clement***, and Y. Sun, Modeling natural attenuation of chlorinated ethenes at a Navy site using the RT3D code, Proceedings of WESTEC 98 conference, sponsored by Water Environmental Federation 71st annual conference, WEFTEC '98,Orlando, Florida, October 3-7th, vol.3-part-I: Remediation of Soil & Groundwater, p. 225-247, 1998.
28) Newell, C.J. C.E. Aziz,A. P. Smith J.R. Gonzales, P.E. Haas, ***T. P. Clement***, and Y. Sun, 1998. The Air Force Biochlor Natural Attenuation Model and Database for Chlorinated Solvent Sites, Proceedings of the Third Tri-Service Environmental Technology Workshop, San Diego, California, August 18-20.
29) ***Clement, T.P***., Y. Sun, B.S. Hooker, and J.N. Petersen, Modeling natural attenuation of contaminants in saturated groundwater aquifers, Proceeding of the In-Situ and On-Site Bioreclamation, Natural Attenuation Session, The Fourth International Symposium, New Orleans, Louisiana, vol. 1., 37-42, 1997.
30) ***Clement, T.P***., B.S. Hooker, and R.S. Skeen, Modeling biologically reactive transport in porous media, Proceedings of the international conference on mathematics and computations,reactor physics, and environmental analyses, Portland, Oregon, April-May 1995, Vol. 1., p. 192-201, 1995.

Platform and Poster Presentations

1) Goswami, R.R. and T.P. Clement, Methods for analyzing optimal spatial and temporal grids required for solving density-coupled groundwater models, National Ground Water Association Conference, San Antonio, April, 2006.
2) Cheng, T., M. O. Barnett, M. Romero, J. M. Phillippi, M. J. McIndoe, T. P. Clement and E. E. Roden (2006). Adsorption and transport of uranium(VI) and phosphate: An examination of the applicability of batch experiments to porous media transport. 231st American Chemical Society National Meeting, Atlanta, GA, March 26-30.
3) Hogan, M.B., R.R. Goswami, T.H. Illangasekare, and T.P. Clement, Understanding saltwater transport in tsunami-impacted coastal aquifers, Hydrological sciences for Managing Water Resources in the Asian Developing World meeting in Guangzhou, China, 8 – 10, June 2006.

4) Brakefield L., V. Srinivasan, C.R. Quezada, and T.P. Clement, Analytical models for predicting reactive transport at chlorinated solvent contaminated sites, accepted, Hydrological sciences for Managing Water Resources in the Asian Developing World meeting in Guangzhou, China, 8 – 10 June 2006.
5) Clement, T.P., R.R. Goswami, and M. Hogan, Laboratory investigation of submarine groundwater flow and recirculation patterns in coastal aquifers, H43F-0550, AGU Fall Meeting, San Francisco, California, December 5-9, 2005.
6) Goswami, R.R., M. Hogan, and T.P. Clement, Laboratory visualization and numerical investigation of saltwater intrusion processes in unconfined aquifers, Groundwater 2005, National Ground Water Association Conference, San Antonio, April 17-21, 2005.
7) Simpson, M.J. and ***T.P. Clement***, Novel methods for benchmarking density-coupled groundwater flow codes, Platform presentation made at the 18th Saltwater Intrusion Meeting (SWIM), Technical University of Cartagena, Spain, May 31st to June 3rd 2004.
8) Barnett, M. O., J. Y. Choi, T. R. Gautam, M. J. McIndoe, J. M. Phillippi, ***T. P. Clement***, C. R. Lange and E. E. Roden. "Subsurface reactive transport of U(VI)." Presented at the Biogeochemical Controls on the Mobility and Bioavailability of Metals in Soils and Groundwater International Conference, March 2-7, Monteverita, Switzerland, 2003.
9) ***Clement, T.P.,*** Modeling and Design of Bioremediation Systems, Platform Presentation, Alabama's Water Environment Association, 26th Annual Conference, Orange Beach, Alabama, April 11th to 16th, 2003.
10) ***Clement, T.P.*** and T.R. Gautam, Moving from Batch to Field Using the RT3D Reactive Transport Modeling System, Poster Presented at the 2002 Fall Meeting of the American Geophysical Union, San Francisco, December 6-10, 2002, EOS Transactions AGU, 83(47), Fall Meeting Supplement, p. F238, 2002
11) Gautam,T.R, Kim,Y.C., ***Clement,T.P***. and Lee, K-K, Use of Model Error as a Screening Tool for Selecting a Model Structures for a Lab-Scale NAPL Dissolution Experiment. Poster resented at the 2002 Fall Meeting of the American Geophysical Union, San Francisco, December 6-10 2002, EOS Transactions AGU, 83(47), Fall Meeting Supplement, p. F499, 2002.
12) Sun, Y., ***T.P. Clement***, J.N. Petersen, R.S. Skeen, Effects of bioremediation on pump and treat design, poster presentation, Presented at the First International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, May, 1998.
13) ***Clement, T.P.***, RT3D- A computer tool for simulating reactive transport and natural attenuation processes in saturated porous media, Invited Speaker at the International Business Communications Environmental Monitoring Tools conference, Scottsdale, Arizona, December, 1997.
14) Hooker, B. S., M. J. Truex, ***T. P. Clement***, and D. R. Newcomer, Preliminary Validation of Intrinsic Remediation of Carbon Tetrachloride at the Hanford Site., poster presentation, presented at the Intrinsic Remediation Conference, Salt Lake City, UT, April 1996.
15) ***Clement, T.P.*** and B.S. Hooker, Macroscopic models for predicting changes in the physical properties of porous media caused by biological growth, poster presentation, presented at the In-Situ and On-Site Bioreclamation, The Third International Symposium, San Diego, California, April, 1995.

16) Franzen,M.E., J.N. Petersen, ***T.P. Clement***, R.S. Skeen, and B.S. Hooker, Determining nutrient addition strategies to minimize the time needed to complete In Situ bioremediation, Presented at the In-Situ and On-Site Bioreclamation, The Third International Symposium, San Diego, California, April, 1995.
17) ***Clement T.P.***, B.S. Hooker, R.S. Skeen, Development of soil column (Cartesian) and Near-well (Radial) simulation design tools for in situ bioremediation, poster presentation, presented at the 1994 Annual meeting of American Institute of Chemical Engineers (AIChe), San Francisco, November, 13-18, 1994.
18) ***Clement, T. P.***, William R. Wise, Fred J. Molz, and Menghong Wen, Numerical Modeling of Seepage Faces: Saturated vs. Variably-Saturated Formulations. Presented at the 1993 Spring Meeting of the American Geophysical Union, Baltimore, Maryland, May 24-28, 1993, EOS Transactions AGU, 74(16), Spring Meeting Supplement, p. 153, 1993.

Key Project Reports and Technical Manuals

1) Clement, T.P., V. Srinivasan, M.J. Truex, and T.P. Clement, Development of a new analytical tool for modeling the fate and transport of chlorinated solvents, submitted to DOE Savannah River National Laboratory, pages 63, 2006.
2) Johnson, C.D., M.J. Truex, and T.P. Clement, Natural and enhanced attenuation of chlorinated solvents using RT3D, Pacific Northwest National Laboratory Research Report, PNNL-15967, 2006.
3) Truex, M.J., and T.P. Clement, Initial screening assessment of natural attenuation potential at the Brooklawn site, Battelle Project Report, 1999.
4) Aziz, C. E, C.J. Newell, J.R. Gonzales, P. Haas, ***T.P. Clement***, Y. Sun, BIOCHLOR – Natural attenuation decision support system v1.0, User's Manual, United States Environmental Protection Agency Report, Cincinnati, Ohio, EPA/600/R-00/008, January, 2000; http://www.epa.gov/ada/csmos/models/biochlor.html.
5) ***Clement, T.P***, RT3D – A modular computer code for simulating reactive multi-species transport in 3-Dimensional groundwater aquifers, Battelle Pacific Northwest National Laboratory Research Report, PNNL-SA-28967, September, 1997. Available at: http://bioprocess.pnl.gov/rt3d.htm.
6) ***Clement, T.P.***, and N.L. Jones, RT3D tutorials for GMS2.1 Users, Battelle Pacific Northwest National Laboratory Research Report, draft version, PNNL-SA-11805, December 1997. Available at: http://bioprocess.pnl.gov/rt3d.htm.
7) ***Clement, T.P.***, Numerical modeling of variably-saturated groundwater flow problems with seepage-face boundaries, Ph.D. Dissertation, submitted to Auburn University, Alabama, USA. Research advisors: Prof. Fred Molz and Dr. William R. Wise.
8) ***Clement, T.P.***, Computer mapping of air quality, M.Tech. Thesis, Indian Institute of Technology, Bombay, India. Research advisor: Dr. Prasad M. Modak

Current Funding Support

1) DNAPL Dissolution in Bedrock Fractures and Fracture Networks. Funding agency: DOD SERDP/ESTCP Environmental Restoration Program (subcontracted from Shaw

Environmental & Infrastructure). Total funding request: $65,000. **Role: PI (single investigator.**

2) Assessment of Groundwater Resources of Dauphin Island and its Impact Future Urban Sprawl and Economic Growth, Funded by Auburn University Centre for Forestry Management, Auburn University, Total funding: $33,500. Role PI along with Dr Kalin.
3) Evaluating the efficiency of erosion control blankets, Highway Research Center, $40,000. FY 08-09. Role co –PI with Dr Zech.
4) Assessment of the impacts of natural and economic activities on the land use and hydrological patterns of Dauphin Island, Forest Sustainability Center, Auburn University, $25,000. **Role: PI**. Co-Pis Dr Kalin and A, Clark.
5) Impacts of human activities and climate change on water resources and ecosystem health of Wolf Bay basin: A coastal diagnostic and forecast system (CDFS) for integrated assessment. Role co-PI: Funding $70,000. March 2008- February 2011. Alabama University Water Research Initiative Grant.
6) Development of a test facility to evaluate the optimal design of BMPs for managing environmental problems at construction sites. Total funding request: $347,693. Funding agency: Alabama Department of Transportation Status: Approved for funding. **Role: co-PI** with Dr Zech.
7) *Project Title*: Development of modeling methods and tools for predicting reactive transport processes in porous media under multiple scales, Environmental Management Science Program (EMSP), Funded by USDOE Office Science's Competitive Grants program. Award amount: $949,851. April 06 – December 08. **Role: PI.** Co-PI's include Dr Mark Barnett (Auburn), Prof. Chunmiao Zheng (UA) and Prof. Norm Jones (BYU).
8) *Project Title:* Development and application of reactive transport modeling tools to design bioremediation systems (Aug 2003 – Mar 2011). *Role*: Principal investigator; *Source of Support*: Korean Research Council's Frontier 2000 program, *Award Amount*: US $ 262, 174. **Role: PI (single investigator).**

Past Funding Support

9) *Project Title*: Development of RT3D reaction packages and tools for assessing monitored natural attenuation, Funded by USDOE' MNA/EPR project. Award amount: $24,000. June 04-Dec 06. **Role: PI (single investigator).**
10) *Project title:* Investigating the role of surface-ground water interactions on surface water quality by characterizing the hyporheic zone processes, April 2006 to March 2007. USGS water resources program, Alabama Water Resources Research Institute. Total cash funding: $25, 000. **Role:** Wrote the proposal jointly with Dr Alhan and after her departure I became the project PI to complete the work.
11) *Project Title*: Development of an analytical framework for modeling the natural attenuation patterns of chlorinated solvents. Funded by USDOE' MNA/EPR project. Award amount: $46,000. June 04-Dec 06. **Role: PI (single investigator).**
12) *Project title:* Spatial dynamics of runoff-contributing areas for effective management of phosphorous from land-applied poultry litter, Alabama USGS- Water Resources Program,

Total funds $25,000. **Role: Co-PI.** Project PI. Dr. Srivastava, Biosystems Period: March 05 to April 06.

13) *Project Title:* "Characterization of the biodegradation rates of chlorinated compounds under natural and anthropogenic electron donor conditions." Jan 2003- May 2004. USGS water resources program funding via Alabama Water Resources Research Institute. Total cash funding: $39, 500. Co-authored with Dr Lange. **Role: PI.**
14) *Project Title*: Development of a design framework for modeling enhanced and natural bioremediation processes at groundwater contaminated sites (Jan 2001- Jan 2004). *Role*: Principal investigator; *Source of Support*: ARC, Australian Research Council (*note, these ARC dollars are national level competitive grant dollar, identical to NSF in the US system*), *Award Amount*: AUS $ 283, 000. *This project funds supported to buy a multi-processor computer and supported two research positions at Auburn University. The post-doctoral fellow (Dr. Tirtha Gautam) visited from Sept 2002 to April 2003, the exchange research scholar (Katie Hill) visited from February 2003 to July 2003.* **Role: PI (single investigator).**
15) *Project Title*: Application of the RT3D code (version 2.0) to design an active bioremediation systems for cleaning a TCE plume at the US Department of Energy's Tan site in Idaho (June 2000- January 2001); *Source of Support*: Idaho National Engineering Laboratory and the Battelle Pacific Northwest National Laboratory, USA, *Award Amount*: AUS $110, 000. **Role: PI (single investigator).**
16) *Project Title*: Application of RT3D to model natural attenuation processes at the Brooklawn Superfund site, Baton Rouge, Louisiana (March 2000- March 2002). *Source of Support*: Battelle Pacific Northwest National Laboratory, Washington, USA, *Award Amount*: AUS $57, 000. **Role: PI (single investigator).**
17) *Project Title*: Experimental and numerical investigation of unconfined groundwater flow near a saltwater interface (Jan 2001 to Jan 2002); *Source of Support*: Small ARC grant, *Award Amount*: AUS $13, 000. **Role: PI (single investigator).**
18) *Project Title*: Laboratory analysis of unconfined groundwater flow with seepage-face boundaries, (January 2000- December 2000); *Source of Support*: Small ARC grant, *Award Amount*: AUS $13, 000. **Role: PI (single investigator).**
19) *Project Title*: Assessment of natural attenuation and DNAPL migration processes, and testing of microbial degradation pathways at the Brooklawn Superfund site (Oct, 1998 – March 2001). Project manager (until December, 1999) and principal investigator of the natural attenuation modeling/assessment work. *Source of Support*: NPC Services Inc., *Award Amount*: $450,000. **Role: PI.**
20) *Project Title*: Development of a RT3D reaction package to model couple Chlorinated ethane/16thane at a Superfund Site (Oct 1998- March 1999). *Source of Support*: NPC Services Inc., *Award Amount*: $60, 000. **Role: PI (single investigator).**
21) *Project Title*: Support for the development of the natural attenuation decision support system BIOCHLOR (Oct 1997- March 1998); *Source of Support*: Air Force Center for Environmental Excellence (AFCEE), San Antonio, Texas, *Award Amount*: $16, 000. **Role: PI (single investigator).**
22) *Project Title*: Technical Support for the Remediation Technology Development Forum on In Situ Bioremediation (Oct, 1996 – September 1999). Served as the project manager and

principal investigator for RT3D software development and field application tasks. *Source of Support*: DoD EM50 subsurface contamination area. *Award Amount*: FY 97- $560,000, FY 98 – $231,000, and FY 99 – $68,000. **Role: co-PI**

23) *Project Title*: Development of Risk Modules for the RT3D Bioremediation Code (Oct, 1996 – September 1997). *Role*: Principal investigator *Source of Support*: Pacific Northwest National Laboratory LDRD funds, *Award Amount*: $30,000. **Role: PI (single investigator).**

Short-Courses and Workshops

- Groundwater flow and reactive transport modeling short course: Seoul National University, Korea, Jan 23rd to 27th 2006.
- Reactive Transport Modeling Short course: University of Hawaii, June 13st to 17th 2005.
- Reactive Transport Modeling of Natural Attenuation, course instructors: Dr. Mark Widdowson (Virginia Tech.) and Dr. T.P. Clement, June 1st 2002, Disney's Coronado Springs Resort complex, Orlando, Florida.
- Bioremediation System Design Using Visual MODFLOW and RT3D, course instructors: Dr. T.P. Clement, Mr. C.D. Johnson (Battelle), and H. McCreadie (Waterloo Hydrogeologic, Inc.), June 6th 2003, Disney's Coronado Springs Resort complex, Orlando, Florida.
- Lead instructor of the National Ground Water Association (NGWA) sponsored short course: "*Computer Modeling of Natural Attenuation and Bioremediation Systems",* several instructors including Dr. Chunmiao Zheng, Dr. Norman Jones, and Mr. Todd Wiedemeier have participated in this course. The first course was held in Baltimore, Maryland, June 16-19, and sixty-three participants from six different countries attended the course. Second course was held in Las Vegas, Nevada, December 1-4th 1998, and twenty-one participants attended the course. Third course was held in Atlanta, Georgia, June 22- 25th1999 and thirty participants attended the course. Fourth course was held in Salt Lake City, Utah, December 1999 and forty participants (including representatives from Japan and Australia, and Finland) attended this course. Fourth course was held in San Francisco, California, December 2000 and twenty participants attended this course. Fifth course was held in Seoul, Korea, February 2001 and twenty-five participants attended this course. Sixth course was held in Orlando, Florida, March 2002.
- Advanced Ph.D. course on "Transport and Biodegradation in Heterogeneous Groundwater Aquifers". Lyngby, August 7 – 12, 2000, Denmark Technical University; Course instructors: Philipe Baveye Cornell University, Albert Valocchi, University of Illinois, and Prabhakar Clement, University of Western Australia, Peter Engesgaard, Denmark Technical University.
- Organized and conducted a reactive-groundwater modeling short course on using the RT3D computer code for modeling natural-attenuation/ subsurface bioremediation processes (held at the Washington State University during December 1996). A similar course was also completed at the U.S EPA Robert S. Kerr Lab at Ada, Oklahoma, during July 1997. Also presented RT3D code details and ran tutorial sessions at other Visual Modflow and GMS training courses (September 97 Visual Modflow course at Boston, 60 participants; October 97 GMS short course at Park City, Utah, about 50 participants).

- Organized and conducted river-water-quality modeling training programs (Two short courses with about 25 participants) at the Indian Institute of Technology (IIT), Bombay, 1988-89.

Graduate/Undergraduate Teaching Experience

- Civil engineering analysis, 3rd year undergrad class, (Book: Chapra: Times taught: 4; average class size: 40-45 students)
- Groundwater hydrology, Grad/undergrad class, (Books: Fetter and Bear. Times taught: 5; average class size: 10-15 students)
- Numerical (finite-difference) solution to hydraulics and hydrology problems (Books: Multiple references. Times taught: 6; average class size: 5-10 students)
- Finite-element solution to environmental engineering problems (Segerlind, Times taught: 2; average class size: 6 students)
- Computational methods in environmental engineering, 3rd year undergraduate class, (Books: Chapra & Canale; Times taught: 2)
- Fluid Mechanics (Books: Young et al. Times taught: 1)
- Environmental engineering design (Books: Multiple references. Times taught: 1)

SUMMARY OF STUDENT SUPERVISION

(6 current graduate students, 4 former post-docs, 6 PhD graduates, 19 masters graduates, and 6 undergraduate honors students).

Current Graduate Students

1) Gautham Jeppu (PhD Candidate, BE-Chemical Engineering, National Institute of Technology Karnataka, Surathkal, India)
2) Sunwoo Chang (PhD Candidate, BS/MS Civil Engineering, Seoul National University, Seoul, Korea)
3) Jagadish Torlapati (MS Candidate, BE Civil, IIT-Madras, India)
4) Robert Cardwell (MS Candidate, BS Civil, Auburn University, USA)
5) Katherine Petty (MS Candidate, BS Environmental, University of Virginia, USA)
6) Vivek Patil (MS Candidate, BS Chemical Engineering, VKIT, Pune University, India.).

Post-doctoral Fellows

1) Dr. Elena Abarca, 2006-2008, she was a Fulbright Fellow from Spain. Received PhD from the University of Catalonia, Spain under Professor Jesus Carrera. Post-doctoral Research Project: Understanding saltwater intrusion dynamics using laboratory scale physical models. Current position: Research Fellow, MIT.
2) Dr. Sushil Kanel, 2005-2008, He was from Korea Institute of Science and Technology, Post-doctoral Research Project: Interaction of uranium with iron coated sediments, Funded by USDOE. Current position: Research associate, Georgia Tech Univ.
3) Dr. Tirtha Gautam, 2001-2003. Asian Institute of Technology and also University of Western Australia. Post-doctoral Research Project: Development of reactive transport models, project funded by Australian Research Council (ARC). Current position: Hydrologist, Dept. of Natural Resour. And Mines, Queensland, Australia.
4) Dr. Yunwei Sun, 2002-2007. He was from the Tecnion Institute of Technology, Israel. Received PhD under Professor Jacob Bear. Post-doctoral Research Project: Numerical and analytical solution to reactive transport equations involving chlorinate solvents. Funded by USDOE. Current position: Research Engineer, Lawrence Livermore National Laboratory, California.

PhD Graduates

1) Dr. Rohit Goswami, 2002-2008, Major Professor, Auburn University. Past institution: BE Civil, Panjab Engineering College. Dissertation topic: Experimental and numerical analysis of variable-density flow and transport scenarios. Current position: Consulting Engineer, Geosyntech, Florida.
2) Dr. Sumit Sen, 2004-2009, co-major professor with Dr. Srivastava, Dissertation topic: Runoff generation in pastures of the Appalachian Plateau region of North Alabama, Current position: Research Associate.
3) Dr. Tanja Radu, 2002-2007, co-major professor with Dr. Barnett, Auburn University. Dissertation title: Factors affection arsenic transport in experimental subsurface systems, Current position: Research Asst., Belfast University.
4) Dr. Massimo Rolle, 2004-2006. Foreign advisor, Turin Polytechnic University, Italy. Massimo studied at Auburn University for year as a visiting PhD fellow. He took classes and completed a substantial portion of his dissertation work under my supervision. Dissertation topic: Modeling redox controlled reactive transport processes in groundwater aquifers. Current position: Research fellow, University of Tubingen, Germany.
5) Dr. Matthew Simpson, 2000-2004, Major Professor. University of Western Australia. Past institution: BS. Environmental, The University of Newcastle. PhD Dissertation topic: Analysis of unconfined ground water flow characteristics near a seepage-face boundary. His dissertation work received distinction award. Current position: Lecturer, Department of Applied Mathematics, Queensland University of Technology, Brisbane, Australia.
6) Dr. Guoping Lu, 1997-2000. Co-supervised with Dr. Chunmiao Zheng and sponsored (from PNNL) his RT3D-model development efforts. University of Alabama. Dissertation topic: Geological and biological processes in groundwater systems: field observations and modeling studies. Current position: Scientist, Berkeley National Laboratory.

Masters Graduates

1) Mr. Shayamsunder Ayalur, MS, 2009, Major Professor. Auburn University. Previous degree: BE Chemical Engineering, Sri Venkateswara College of Engineering, Chennai. Thesis topic: Use of hydroxyapatite derived from catfish bones for remediating uranium contaminated groundwater.
2) Mr. Gopal Saha, MS, 2009. Major Professor. Auburn University. Previous degree: Meng. Water Resources Engineering, Stuttgart University, Germany. Thesis topic: Experimental and numerical investigation of unconfined hill slope flows.
3) Mr. Anand Gupta, MS, 2009. Co-major Professor with Dr Srivastava. Thesis topic: An ecologically-sustainable surface water withdrawl framework for managing cropland irrigation in Alabama.
4) Ms. Linzy Brakefield, MS, 2008. Major Professor. Auburn University. Previous degree: BS Mathematics, Maryville College, Tennessee. Thesis topic: Physical and numerical modeling of buoyant groundwater plumes. She received Len Assante Scholarship Award in recognition of best presentation at a NGWA conference and also the Outstanding Student Paper Award for her presentation at the American Geophysical Union (AGU) 2007 Fall Meeting.
5) Mr. Jared McLaughlin, MS, 2008. Co-supervised with Dr Norm Jones. Brigham Young University. Previous degree: BS Civil, BYU. Jared spent two semesters as an exchange student and studied at Auburn University and studied under my supervision. MS Thesis topic: Use of parallel computing techniques for solving reactive transport problems.
6) Mr. Venkat Srinivasan, MS, 2007. Major Professor. Auburn University. Previous degree: BS Civil Engineering, IIT-Madras, Chennai. Thesis topic: Analytical solution for sequentially coupled multi-species reactive transport problems. This thesis received a national award for best MS thesis. Association of Environmental Engineering and Science Professors sponsored Montgomery-Watson-Harza Cash Prize Award.
7) Mr. Rohit Goswami, MCE 2007. Major Professor. Auburn University. Previous degree: BE Civil, Panjab Engineering College. Engineering project topic: Solution to density coupled flows.
8) Mr. Justin McDonald, MS, 2007. Co-major professor with Dr. Zech. Auburn University. Previous degree: BE Civil, Auburn University. Thesis topic: Evaluation of silt fence and polymer additive to control sediment transport from construction sites.

9) Mr. Che-An Kuo, MCE, 2006. Major Professor, Auburn University. Engineering project topic: Visualization of contaminant transport in porous media systems.
10) Mr. Matthew Hogan, MS. 2006. Major Professor. Auburn University. Previous degree: BE Civil, Virginia Tech. Thesis topic: Understanding the flow and mixing dynamics of saline water discharged into coastal freshwater aquifers.
11) Mr. Anjani Kumar, MS 2006. Major Professor. Auburn University. Previous degree: BE Civil IIT-Roorkie. Thesis topic: Coupling transport codes with reactive transport models.
12) Mr. Vijay Loganathan, MS. 2006. Co-major professor with Yucheng Feng. Auburn University. Previous degree: BE Civil. Anna University – Guindy Campus, Chennai. Thesis topic: Influence of sorption and desorption on bioavailability of atrazine in soils with crop residues.
13) Mr. Jarid Halverson, MS. 2005. Co-major professor with Dr Zech. Auburn University. Previous degree: BE Civil. The United States Military Academy at West Point. Thesis topic: Evaluation of silt fence performance using laboratory scale model of highway slopes.
14) Mr. John Phillipi, MS, 2004. Co-major professor with Dr Barnett. Auburn University. Previous degree: BE Civil, Auburn University. Thesis topic: Use of surface complexation models to study the effects of solid-to-solution ratios.
15) Mr. Cristhian Quezada, MS. 2004. Major Professor. Auburn University. Previous degree: BE Civil, University of Chile, Santiago. Thesis topic: Generalized solute to multi-species transport equations coupled with a first-order reaction network with distinct retardation factors. He received the CH2MHILL-sponsored best graduate student award.
16) Mr. Shane Wilkes, MS. 2004. Co-supervised with Dr. Reynolds. University of Western Australia. Thesis topic: An investigation of the hydro-geological significance of fractures on the hydrogeology of the Augustus River catchment, Western Australia.
17) Ms. Mee Sun Lee, MS, 2003. Co-supervised with Dr K.K. Lee, Seoul National University. Mee-Sun studied at the Univ. of Western Australia, under my supervision, as a visiting graduate student for two semesters. Thesis topic: Understanding nitrogen transformation and transport in saturated soils: Model development and field application.
18) Ms. Marley Franzen, MS. 1996. Co-supervised with Dr Petersen. Washington State University. Thesis topic: Modeling nutrient pulsing strategies using an injection well.
19) Mr. David Jennings, MS. 1995. Co-supervised with Dr Petersen. Washington State University. Thesis topic: Understanding microbial growth and transport in porous media under denitrification conditions.

PhD Committees

Student Name	**Institution**	**Period**
Vijay Loganathan	Auburn University	Since 2002
Byungryul An	Auburn University	Since 2007
Completed students		
Feng He	Auburn University	2003-2007
Dr. Lucida Xu	Auburn University	2002-2006
Dr. Guoping Lu	Univ. Alabama	1999-2002

Masters student committees

Student Name	**Institution/ degree**	**Year**	**My Role**
Alex Shoemaker	MS Auburn	2009	Committee
Doug Kilgour	MS, Auburn University	2004-2007	Committee
Yu Wang	MS, Auburn University	2004-2006	Committee
Byungryul An	MS, Auburn University	2004-2006	Committee

Steinwinder, Thomas	MS, Auburn University	2004-2006	Committee
Katie Green	MS, Auburn University	2004-2006	Committee
Christhian Broadbeck	MS, Auburn University	2003-2005	Committee
Chris Johnson	MCE, Auburn University	2003-2005	Committee
Maria Romero	MS, Auburn University	2002-2004	Committee
Melissa McIndoe	MS, Auburn University	2002-2003	Committee
Clarrisa Hansen	MS, Brigham Young Univ.	2001-2002	Committee
Alex Shoemaker	MS, Auburn University	2007-	Committee

Undergraduate Honors Thesis Supervision

1) Mr. Thomas Gallop, first-class honours thesis (Nov 2000 – Oct 2001). Thesis title: Laboratory investigation of seepage-face boundaries. Tom secured 1st rank in the 2001 graduating class, and is currently employed as an environmental consultant.
2) Ms. Katina Thomas, first class honours thesis (Nov 2000 – Oct 2001). Thesis title "Bioremediation of acid mine drainage under sulfate reducing conditions. Katina secured 3rd rank in the 2001 graduating class, and she is currently employed as a Project Planning Engineering with the Water Corporation in Perth, Australia.
3) Mr. Bradley Hiller, first-class honours thesis (Nov 2000 – Oct 2001). Thesis title: Dissolved solute, stable isotopes and radiocarbon isotopes as tracers of groundwater flow, Carnarvon Basin, Western Australia. Brad received best honours thesis award for 2001 and is now working as Environmental Engineering at the Water Corporation in Perth, Australia.
4) Ms. Ruth Bax, first class honours thesis (Nov 2000 – Oct 2001). Thesis title "Protocol for implementing artificial aquifer recharge for drinking water supply with a case study on the Albany region". She is currently pursuing her PhD degree at the Centre for Water Research, University of Western Australia.
5) Ms. Natalee Steeres, 2nd class honours thesis (Nov 2000 – Oct 2001). Thesis title: Laboratory and numerical investigation of contaminant transport in a model aquifer.
6) Ms. Sabika Abid, Honors project (Jan 2000 – Oct 2000). Thesis title "Modeling couple PCE-TCA reactive transport at a hazardous waste.