The UNIVERSITY CONSORTIUM

Dr. Tom Sale

- Professor, Civil Engineering, Colorado State University
- Director, Center for Contaminant Hydrology
- Associate Director, University Consortium for Field-Focused Groundwater Research
- tsale@engr.colostate.edu

Dr. Tom Sale is a Professor and the Director of the Center for Contaminant Hydrology in Civil and Environmental Engineering at Colorado State University. Research and consulting over the past 30-years have focused on innovative solutions for groundwater contaminants in source zones and plumes. The Center for Contaminant Hydrology currently supports five full-time staff members, three PhD students, six MS students and three undergraduate students. The center conducts ~ $2 million in remediation research annually. Current sponsors include the USDoD, Chevron, DuPont, Chemours, Suncor Energy, ExxonMobil, and Corteva. The innovative nature of the Center's research is reflected in acquisition of ten patents over the last fifteen years and seeding new commercial enterprises for ZVI-Clay, CO2 Traps, Cryogenic Coring, and Sensors.

Dr. Sale received his Ph.D. from Colorado State University, M.S. Degree from the University of Arizona, and B.A. degrees from Miami of Ohio. His abilities are reflected in his publications, extensive conference presentations, the careers of his students, long-term financial support from industry and participation in ITRC, USEPA, National Research Council's Army Committees.

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Honours and Awards

- 2017, Faculty Award for Excellence in Research, CSU CEE, Fort Collins, CO, United States.
- 2014, SERDP Project of the Year, SERDP, Washington D.C., United States.
- 2011, George T. Abell Award for Outstanding Contributions to Economic Development, Colorado State University, Fort Collins, CO, United States.
- 2010, Faculty Award for Excellence in Research, Colorado State University, Fort Collins, CO, United States.
- 2008, Selected as the academic representative for Interstate Remediation Council's panel advancing guidance for use of combined remedies for subsurface releases of chlorinated solvents, ITRC, Fort Collins, Colorado, United States.
- 2003, Research Faculty Award for Excellence, Colorado State University, Fort Collins, Colorado, United States.
- 2003, Member of the National Research Council Committee addressing Contaminants in the Subsurface – Source Zone Assessment and Remediation., National Research Council, Fort Collins, Colorado, United States.
- 2003, Member of the USEPA Advisory Panel Addressing The DNAPL Remediation Challenge: Is There a Case for Source Depletion? USEPA, Fort Collins, Colorado, United States.
- 1997, Best Ph.D. Presentation, Hydrology Days - American Geophysical Union, Fort Collins, Colorado, United States.
- 1996, Harlan Erker Scholarship, Colorado Ground Water Association, Fort Collins, CO, United States.
- 1992, Innovation Award for the Union Pacific Railroad In Situ Treatment Process Development Program, CH2M HILL Office of Innovation, Denver, CO, United States.

Selected Papers

Karimi Askarani, K., Stockwell, E. B., Piontek, K., Sale, T. (2018) Thermal Monitoring of Natural Source Zone Depletion. Groundwater Monitoring & Remediation. National Ground Water Association. DOI: 10.1111/gwmr.12286

Garg, S., Newell, C. J., Kulkarni, P. R., King, D. C., Adamson, D. T., Irianni Renno, M., Sale, T. C. (2017). Overview of Natural Source Zone Depletion: Processes, Controlling Factors, and Composition Change. Journal of Groundwater Monitoring and Remediation. DOI: 10.1111/gwmr.12219.

Halihan, T., Lyverse, M., Sale, T. (2017). Mechanism for Detecting NAPL Using Electrical Resistivity Imaging. Journal of Contaminant Hydrology. Journal of Contaminant Hydrology. 205: 57-69.

Sale, T., Mahler, N., Smith, T. (2016). Reply to Lago et al. Comment on "Use of Single-Well Tracer Dilution Tests to Evaluate LNAPL Flux at Seven Field Sites and Measurement of LNAPL Flux Using Single-Well Intermittent Mixing Traces Dilution Tests". Journal of Groundwater, 54(5), 624.

Kiaalhosseini S., R. L. Johnson, R. C. Rogers, M. Irianni Renno, M. Lyverse, and T. C. Sale. (2016) Cryogenic Core Collection (C3) from Unconsolidated Subsurface Media, Journal of Groundwater Monitoring and Remediation, 10.1111/gwmr.12186.

Olson, M. and T. Sale (2015). Implications of Soil Mixing for NAPL Source Zone Remediation: Column Studies and Modeling of Field-Scale Systems. Journal of Contaminant Hydrology. 177–178: 206-219.

McCoy, K., J. Zimbron, T. Sale, and M. Lyverse (2014). Measurement of Natural Losses of LNAPL Using CO2 Traps. Journal of Groundwater. DOI: 10.1111/gwat.12240.

Olson, M. R., J. Blotevogel, T. Borch, T.C. Sale, M.A. Petersen, and R.A. Royer. (2014). Long-Term Potential of In Situ Chemical Reduction for Treatment of Polychlorinated Biphenyls in Soils, Chemosphere 114:144-9.

Zeman, N., M. Irianni Renno, M. Olson, T. Sale, and S. De Long (2014). Temperature Impacts on Anaerobic Biotransformation of LNAPL and Concurrent Shifts in Microbial Community Structure. Journal of Biodegradation, Vol. 25, Issue 4, P569-674.

Mahler, N., T. Sale, and M. Lyverse, (2012), A Mass Balance Approach to Resolving LNAPL Stability, Journal of Ground Water.

Olson , Mitchell R.; Thomas C. Sale;, Charles D. Shackelford, Chris Bozzini, and Jessica Skeean. (2012), DNAPL Source Zone Remediation at Camp Lejeune via ZVI-Clay Soil Mixing: One-Year Results, Journal of Groundwater Monitoring and Remediation.

Smith, T., T. Sale, and M. Lyverse, (2012), Measurement of LNAPL Flux Using Single- Well Intermittent Mixing Tracer Dilution Test, Journal of Ground Water.

Mahler, N; T. Sale; T. Smith; and M. Lyverse, (2012), Use of Single-Well Tracer Dilution Tests to Evaluate LNAPL Flux at Seven Field Sites, Submitted to the Journal of Ground Water.

Castlebaum, D; M. Olson, T. Sle; and C. Shackelford, (2011) Laboratory Apparatus and Proceedures for Preparing Test Specimens of Slurry Mixed Soils, Geotechnical Testing Journal (GTJ), Volume 34, Issue 1 (January 2011)

Blotevogel, J.; Mayeno, A.N.; Sale, T.C.; Borch, T. (2011): Prediction of contaminant persistence in aqueous phase: A quantum chemical approach. Environmental Science & Technology.

Shackelford, C.D, and T.C. Sale, (2011), Using the ZVI-Clay Technology for Source Zone Remediation, American Society of Civil Engineers, GeoStrata , No. 2 , Vol. 15 pp. 36-42.

Blotevogel, J.; Borch, T.; Desyaterik, Y.; Mayeno, A.N.; Sale, T.C. (2010): Quantum chemical prediction of redox reactivity and degradation pathways for aqueous phase contaminants: An example with HMPA. *Environmental Science & Technology, 44 (15), 5868-5874.