Dr. Ramon Aravena

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Dr. Aravena is a Professor Emeritus with more than 25 years experience in the application of isotope techniques in hydrogeology and groundwater geochemistry. He has been involved in numerous groundwater studies in Latin America, Canada and the U.S. related to evaluation of groundwater resources and groundwater protection.

His current research focus on groundwater contamination caused by agricultural, industrial and urban activities using environmental isotopes as tracers to provide information about sources and processes that affect nitrate and organic compounds in groundwater.

Research Areas of Interest

- Isotope techniques to trace groundwater contamination
- Agricultural, industrial and urban pollution of groundwater
- Degradation of nitrate and organic compounds in water

In addition to being a member of the University Consortium for Field-Focused Groundwater Contamination Research, Dr. Aravena is also a reviewer for several journals, sits on the editorial board of the Journal for Contaminant Hydrology, and is a member of the experts group of the International Atomic Energy Agency in the field of Isotope Hydrology, along with service in many other professional associations.

Selected Papers

BenIsrael, M., Wanner, P., Fernandes, J., Burken, J.G., Aravena, R., Parker, B.L., Haack, E.A., Tsao, D.T., Dunfield, K. (2020). Quantification of toluene phytoextraction rates and microbial biodegradation functional profiles at a fractured bedrock phytoremediation site. Science of the Total Environment, 707, pp. 135890.

BenIsrael, M., Wanner, P., Aravena, R., Parker, B.L., Haack, E.A., Tsao, D.T., Dunfield, K.E. (2019). Toluene biodegradation in the vadose zone of a poplar phytoremediation system identified using metagenomics and toluene-specific stable carbon isotope analysis. International Journal of Phytoremediation, 21(1), pp. 60-69.

Columbani, N., Mastrocicco, M., Castaldelli, G., Aravena, R. (2019). Contrasting biogeochemical processes revealed by stable isotopes of N2O, N, C, and S in shallow aquifers underlying agricultural lowlands. Science of the Total Environment, 691, pp. 1282-1296.

Freitas, J.G., Furquim, S.A.C., Aravena, R., Cardoso, E.L. (2019). Interaction between lakes' surface water and groundwater in the Pantanal wetland, Brazil. Environmental Earth Sciences, 78(5), pp. 139.

Suhogusoff, A.V., Hirata, R., Aravena, R., Robertson, W.D., Ferrari, L.C.K.M., Stimson, J., Blowes, D.W. (2019). Dynamics of nitrate degradation along an alternative latrine improved by a sawdust permeable reactive barrier (PRB) installed in an irregular settlement in the municipality of Sao Paulo (Brazil). Ecological Engineering, 138, pp. 310-322.

Spalding, R.F., Hirsh, A.J., Exner, M.E., Stange, M., Aravena, R. (2019). Integrated deep soil N and groundwater isotope investigation of N sources captured by municipal wells. Groundwater Monitoring & Remediation, 39(2), pp. 22-31.

Wanner, P., Aravena, R., Fernandes, J., BenIsrael, M., Haack, E.A., Tsao, D.T., Dunfield, K.E., Parker, B.L. (2019). Assessing toluene biodegradation under temporally varying redox conditions in a fractured bedrock aquifer using stable isotope methods. Water Research, 165, pp. 114986

Bouchard, D., Hunkeler, D., Madsen, E.L., Buscheck, T., Daniels, E., Kolhaltar, R., DeRito, C.M., Aravena, R., Thomson, N. 2018. Application of diagnostic tools to evaluate remediation performance at petroleum hydrocarbon sites. Groundwater Monitoring and Remediation, 38 (44): 88-98.

Mahsa, S., Thomson, N.R., Aravena, R., Barker, J.F., Madsen, E.L., Marchesi, M., DeRito, C.M., Bouchard, D., Buscheck, T., Kolhatkar, R., and Daniels, E.J. 2018. Integrated Plume Treatment Using Persulfate Coupled with Microbial Sulfate Reduction. Groundwater Monitoring and Remediation, 38 (44): 45-61.

Solano, F.M., Marchesi, M., Thomson, N.R., Bouchard, D., Aravena, R. 2018. Carbon and Hydrogen Isotope Fractionation of Benzene, Toluene and o-Xylene during Chemical Oxidation by Persulfate. Groundwater Monitoring and Remediation 38 (44): 62-72.

Wei, Y. et al. (2018). Infiltration of sulfate to enhance sulfate-reducing biodegradation of petroleum hydrocarbons. Groundwater Monitoring & Remediation, 38(4), 73-87.

Sbarbati, C., Colombani, N., Mastrocicco, M., Petitta, M., Aravena, R. (2018). Reactive and Mixing Processes Governing Ammonium and Nitrate Coexistence in a Polluted Coastal Aquifer. Geosciences, 8(6), pp. 210.

Pierce, A.A., Chapman, S.W., Zimmerman, L.K., Hurley, J.C., Aravena, R., Cherry, J.A Parker, B.L. (2018). DFN-M field characterization of sandstone for a process-based site conceptual model and numerical simulations of TCE transport with degradation. Journal of Contaminant Hydrology, 212, pp. 96-114.

Marchesi, M. et al. (2018). 37Cl-compound specific isotope analysis and assessment of functional genes for monitoring monochlorobenzene (MCB) biodegradation under aerobic conditions. Science of the Total Environment, 619, pp. 784-793.

Gomez, L., Canizo, B., Lana, B., Zalazar, G., Wuilloud, R., Aravena, R. (2018). Hydrochemical processes, variability and natural background levels of arsenic in groundwater of northeastern Mendoza, Argentina. Journal of Iberian Geology, pp. 1-18.

Fernandez, E., Grilli, A., Alvarez, D., Aravena, R. (2017). Evaluation of nitrate levels in groundwater under agricultural fields in two pilot areas in central Chile: A hydrogeological and geochemical approach. Hydrological Processes, 31(6), pp. 1206–1224.

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Palau, J. et al. (2017). Hydrogen Isotope Fractionation during the Biodegradation of 1, 2-Dichloroethane: Potential for Pathway Identification Using a Multi-element (C, Cl, and H) Isotope Approach. Environmental Science & Technology, 51(18), pp. 10526-10535.

Shayan, M. et al. (2017). Integrated plume treatment using persulfate coupled with microbial sulfate reduction. Groundwater Monitoring & Remediation, 38(4), pp.45-61.