Trevor Charles Osorno

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CURRENT POSITION

Senior Hydrogeologist 2020 – Present
Ozark Underground Laboratory
1572 Aley Lane
Protem, MO 65733
(417) 785-4289

EDUCATION

Doctor of Philosophy (Ph.D.) in Geology (Expected 2021)
The University of Kansas, Lawrence, Kansas Cumulative GPA: 4.00
Ph.D. Thesis: "Re-examination of Contaminant Transport Processes Using Direct Groundwater Velocity Measurements"

Master of Science in Geology (2016)
The University of Kansas, Lawrence, Kansas Cumulative GPA: 3.92
M.S. Thesis: "Development of a Point Velocity Probe for In-well Use"

Bachelor of Science in Geology (2014)
Saint Norbert College, De Pere, Wisconsin Cumulative GPA: 3.44
Senior Thesis: "Modeling of Groundwater-Induced Flooding, Spring Green, Wisconsin"

HONORS AND AWARDS

- Erasmus Haworth Honors Award – The University of Kansas 2021
- Midwest Section Student Scholarship – Air and Water Management Association 2021
- Environmental Security Technology Certification Program (ESTCP) Project of the Year – United States Department of Defense 2020
- Stelbar Oil Geology Graduate Student Scholarship – The University of Kansas 2020
- Midwest Section Student Scholarship – Air and Water Management Association 2020
- Lee C. Gerhard and Darcy Gerhard Student Prize for Field Research in Geology – The University of Kansas 2019
- Leo M. and Robert M. Orth Water Resources Award – The University of Kansas 2018
- Sean S. Thomson Service Scholarship – Association of Women Geoscientist 2017
- Patterson Scholarship – The University of Kansas 2014
- Field Geologist Award – St. Norbert College Geology Club 2013

ACTIVITIES AND PROFESSIONAL ASSOCIATIONS

- AGU Groundwater Technical Committee Member 2016 – 2021
- American Geophysical Union 2016 – Present
- National Groundwater Association 2015 – Present
- Geological Society of America 2013 – Present

RELEVANT JOB EXPERIENCE

Senior Hydrogeologist 2020 – Present
Ozark Underground Laboratory

- Design and conduct site characterization studies using both conventional dye tracer studies and Point Velocity Probe tools
- Provides direct training for Point Velocity Probes suite of tools

Graduate Research Assistant
The University of Kansas 2014 – 2016 & 2018 – 2021

- Design and test Point Velocity Probes (PVPs) for *in-situ* groundwater measurements
- Project lead for large-scale multi-year international consulting projects, including a summer research appointment in France
- Manage 3-D printer and provide advice and design consultation

Graduate Teaching Assistant
The University of Kansas July 2019

- Assisted in the development of course materials and instruction of hydrogeology field school
- Taught undergraduate and graduate students fundamental hydrological field skills such as: water level measurement, monitoring well installation, soil logging, aquifer testing and characterization, and direct groundwater velocity measurement techniques

Graduate Teaching Assistant
The University of Kansas August 2016 – 2018

- Assisted in a range of undergraduate and graduate level geology courses (5 semesters in total)
- Lead instructor for three full semesters of oceanography
- Responsibilities included: weekly tutorials; one-on-one student support; generation of new assignments, marking schemes and solutions; managed online class management system; graded assignment

Summer Research Assistant
Kansas Geological Survey May 2015 – August 2015

- Field sampling of surface water and groundwater for chemical and isotopic analyses
- Constructed computer models of groundwater-surface water interactions

Intern and Part-Time Environmental Consultant
AECOM July 2013 – May 2014

- Assisted in drafting permit applications and annual reports submitted to the EPA
- Drafted remedial alternative analysis documents, piezometric surface maps, and conceptual site models
- Performed aquifer tests and statistical trend analyses

SUMMARY OF EXPERIENCE

1. Groundwater flow characterization study of a refinery in the upper Midwest to determine the effectiveness of groundwater flow barriers.
2. Groundwater-surface water interaction study of Unnamed Lake at the United States Geological Survey Bemidji Crude-oil Research Site, MN.
3. Mass flux investigation of a heterogeneous alluvial aquifer near the southwest of France using a transect of Point Velocity Probes equipped with multi-level water samplers.
4. Groundwater flow investigation of a fractured rock aquifer using the In-Well Point Velocity Probe at the Edwards Air Force Base, CA.
5. Designed and tested a device for measurement of flow rates and residence time of water within a Horizontal Reactive Media Treatment Well (HRX Well®) for the passive treatment of a chlorinated solvent plume at the Vandenberg Air Force Base, CA.
6. Summer research appointment in France to research and develop innovative probes and sensors for *in-situ* mass flux and address current challenges of characterization and dynamic monitoring of contaminated groundwater.
7. Designed and led a groundwater flow investigation of a petroleum hydrocarbon plume emanating from a former refinery using the In-Well Point Velocity Probe in Neodesha, KS.
8. Geostatistical analysis of a high-resolution transect of direct groundwater velocity measurements to determine aquifer structure and develop insights into the mechanisms that drive plume spreading at the C.F.B. Borden Study Site.
9. Assessment of bed hydraulics and metal loading of a passive vertical flow bioreactor system for remediation of acid mine drainage in Commerce, OK.
10. Groundwater flow investigation, including a comparison of techniques for mass flux estimation, of a chlorinated solvents plume using Point Velocity Probes in Skuldelev, Denmark.
11. Developed and tested a new device for the measurement of groundwater velocity within monitoring wells, the In-Well Point Velocity Probe, that has now been used across the world in porous media and fractured rock settings.

PUBLICATIONS

1. Heyer, B.R., ***Osorno, T.C.***, Devlin, J.F. (In Review). Laboratory testing of real-time flux measurements in fractured media. Submitted to Journal of Hydrology.
2. ***Osorno, T.C.***, Devlin, J.F., and Bohling, G.C., (In Review). Geostatistics of the Borden Aquifer: High-Resolution Characterization using Direct Groundwater Velocity Measurements. Water Resources Research.
3. Cormican, A., Devlin, J.F., ***Osorno, T.C.***, Divine, C., 2021. Design, testing, and implementation of a real-time system for monitoring flow in horizontal wells. Journal of Contaminant Hydrology 238, 103772. https://doi.org/10.1016/j.jconhyd.2021.103772
4. Ducastel, B., Nief, N., Segues, B., Ramade, N., ***Osorno, T.C.***, Devlin, J.F., Jordana, S., Bayer-Raich, M., Tudela, J., Credoz, A. 2020. R&D Report CADYLACQ DEMONSTRATOR, TOTAL SA EP/SCR/RD/PERL/ENV (France), 149 pp.
5. ***Osorno, T.C.,*** Devlin, J.F., Cormican, A., Heyer, B., Jones, M. 2020. Progress Update Report on IWPVP and PVP Data Analysis for Neodesha, KS, November 2019. Addendum to the Biosparge Pilot Test and Amendment Injection Workplan submitted by Sovereign Consulting Inc. to the Kansas Department of Health and Environment, May, 11 pp.
6. Divine, C.E., Wright, J., Crimi, M., Devlin, J.F., Lubrecht, M., Wang, J., McDonough, J., Kladias, M., Hinkle, J., Cormican, A., ***Osorno, T.***, Nzeribe, B.N., Laramay, F., Ombalski,

D., Gerber, K., Anderson, H., 2020. Field Demonstration of the Horizontal Treatment Well (HRX Well®) for Passive In Situ Remediation. Groundwater Monitoring and Remediation 40, 42–54. https://doi.org/10.1111/gwmr.12407

7. Cremeans, M.M., Devlin, J.F., ***Osorno, T.C.***, McKnight, U.S., Bjerg, P.L., 2020. A Comparison of Tools and Methods for Estimating Groundwater-Surface Water Exchange. Groundwater Monitoring & Remediation 40, 24–34. https://doi.org/10.1111/gwmr.12362
8. Cremeans, M.M., Devlin, J.F., ***Osorno, T.C.***, Nairn, R.W., 2019. Assessment of Bed Hydraulics and Metal Loadings in a Passive Vertical Flow Bioreactor in Commerce, Oklahoma. Groundwater Monitoring & Remediation 39, 40–47. https://doi.org/10.1111/gwmr.12337
9. ***Osorno, T.C.***, Devlin, J.F., Firdous, R., 2018. An In-Well Point Velocity Probe for the rapid determination of groundwater velocity at the centimeter-scale. Journal of Hydrology 557, 539–546. https://doi.org/10.1016/j.jhydrol.2017.12.033

Conference Presentations

Recognition of the potential utility of directly measuring groundwater velocities has resulted in me authoring over 35 presentations including academic conferences, consortiums, webinars, and invited talks. These talks have been given in locations including New Orleans, San Francisco, Washington D.C., Canada, France, Germany, Spain, Belgium and Abu Dhabi and webinars to international consulting firms, state agencies, and fortune 500 companies. A full list of authored presentations is available upon request.