

SAMUEL DAVID HODGES

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EDUCATION

Ph.D. Civil Engineering	2023	University of Arkansas
M.S. Engineering-Civil	2019	LeTourneau University
B.S. Engineering-Civil	2016	LeTourneau University

HONORS AND AWARDS

Arkansas Water Resources Center: USGS 104b grant FY2021	2021
American Water Works Association: American Water Scholarship	2020
University of Arkansas: Doctoral Academy Fellowship	2019
LeTourneau University: Deans Award for Staff Excellence	2018
LeTourneau University: Presidential Scholarship	2012

SKILLS

AQUASIM	Arc GIS	Arc SWAT	AutoCAD Civil 3D
COMSOL	EPA Net	Experimental Design	HEC-HMS
HEC-RAS	Intermediate Spanish	KY Pipe	Lab Management
Leadership	Machining	Microsoft Office	R Studio
Safety Enforcement	SolidWorks	Tutoring/Teaching	UV Spectroscopy
Welding	Wood Construction	PFAS Research	Student Mentoring

RELATED EXPERIENCE

Engineer in Training II-Water Resources, Buchart Horn, Memphis, TN **Jan 2025 – Present**
40-hours/week

- Review and approval of drainage submittals for the City of Memphis

Assistant Professor, Christian Brothers University, Memphis, TN **Jan 2024 – Dec 2024**
40-hours/week

- Courses Taught
 - CBU 101 Orientation to CBU
 - CE 110 Introduction to Civil Engineering
 - CE 299 Hydraulics
 - CE 299L Hydraulics Lab
 - CE 313 Hydrology
 - CE 329 Environmental Engineering I & II
 - CE 431 Senior Project I & II
 - CE 489 Licensing and Certification in Civil Engineering

Assistant/Associate Engineer, Olsson, Fayetteville, AR (Remote)

Feb 2024 – Dec 2024

20-hours/month

- Advised regarding issues with a grit and scum unit on a new WWTP construction
- Prepared plans and specs for replacement of water lines in a development
- Conducted a small capacity study on the lift station pumps for a city master plan

Graduate Research, University of Arkansas, Fayetteville, AR

Aug 2019 – Dec 2023

40-hours/week

- Dissertation Title: - Diffusive Gradients in Thin-Films Passive Samplers for Quantitation of Per- and Polyfluoroalkyl Substances in Water: Kinetic Modeling, Experimental Methods, and Outlook for Regulatory Monitoring
- Coordinated sample collection and testing related to chloronitramide anion study including ion chromatography and UV spectroscopy.
- Lead laboratory investigator for the development of a diffusive gradients in thin-films passive sampling methodology for per- and polyfluoroalkyl (**PFAS**) substances in water, funded by SERDP Project ER20-1363
 - Designed and validated a custom diffusion cell for the measurement of organic diffusion coefficients through hydrogels
 - Developed a finite difference model to represent linear diffusion in the diffusion cell
 - Measured the diffusion coefficients of a suite of PFAS compounds
 - Tested uptake and extraction efficiencies of weak anion exchange (**WAX**) resin targeting PFAS compounds
 - Supervised ECO-REU student research
- Pilot scale biofilters for trihalomethane precursor removal
 - Sampled and analyzed influent and effluent data including, dissolved organic carbon (DOC), UV Spectrum, and total trihalomethanes (TTHM)

Relevant academic communications:

Published

- **Hodges, S. D.**; Wahman, D. G.; Hauptert, L. M.; Pham, H. T.; Bozarth, M. K.; Howland, M. B.; Fairey, J. L. "Non-Steady-State Fickian Diffusion Models Decrease the Estimated Gel Layer Diffusion Coefficient Uncertainty for Diffusive Gradients in Thin-Films Passive Samplers". *Environmental Science & Technology* 2023, 57 (26), 9793-9801. DOI: 10.1021/acs.est.3c01861.
- Fairey J. L.; Laszakovits J.; Pham, H. T.; Do, T. D.; **Hodges, S. D.**; McNeill, C.; Wahman, D. G. "Chloronitramide anion is a decomposition product of inorganic chloramines". *Science* 386, 882–887 (2024). DOI: 10.1126/science.adk6749

In Preparation

- **Hodges, S. D.**; Wahman, D. G.; Hauptert, L. M.; Pham, H. T.; Fairey J. L. "PFAS Agarose Gel Diffusion Coefficient Estimates for use in Diffusive Gradients in Thin-Films Passive Samplers"

Conference Papers

- Gladstone, J.; **Hodges, S.**; Tixier, J.; Van Gaalen, N. "Engineering Education in Developing Nations: Status Update on the School of Engineering at Northrise University in Ndola, Zambia." In *Proceedings: 2024 Christian Engineering Conference*, Newberg, OR.

Conference Presentations

- **Hodges, S. D.**, Pham, H. T., Wahman, D. G., Hauptert, L. M., Fairey, J. L. (2022) "Advancing the Diffusive Gradients in Thin-Films Passive Sampling Device for Monitoring PFAS in Drinking Water Systems." Accepted: 2022 AWWA Water Quality Technology Conference, Cincinnati, OH.

Poster Presentations

- **Hodges, S. D.**, Pham, H. T., Fairey, J. L. "Development of a Diffusive Gradients in Thin-Films Passive Sampling Device for PFAS (ER20-1363)" 2023 SERDP & ESTCP PFAS Project Meeting, Jul 2023, Portland, OR.

- **Hodges, S. D.**, Howland, M. B., Pham, H. T., Fairey, J. L. “Development of a Diffusive Gradients in Thin-Films Passive Sampling Device for PFAS (ER20-1363)” 2022 SERDP & ESTCP and OE-Innovation Symposium, Nov 2022, Arlington, VA.
- **Hodges, S. D.**, Pham, H. T., Fairey, J. L. “Development of a Diffusive Gradients in Thin-Films Passive Sampling Device for PFAS (ER20-1363)” 2022 SERDP & ESTCP PFAS Project Meeting, Jul 2022, Long Beach, CA.
- **Hodges, S. D.**, Nepomuceno, S. U., Panda, D., Fairey, J. L. “Development of a Diffusive Gradients in Thin-Films Passive Sampling Device for PFAS (ER20-1363)” 2021 SERDP & ESTCP PFAS Project Meeting, Jul 2021, San Pedro, CA.

Graduate Instructor/Assistant, University of Arkansas, Fayetteville, AR **Aug 2019 – May 2022**

30-hours/week

- SP-2022: Environmental Engineering Design – CVEG 4243
 - Implemented course improvements including a historical overview of water and wastewater treatment, a design oriented hydraulic profile assignment, hybrid assessment, and group quizzes.
 - Student Comments:
- FA-2021: Environmental Engineering Design – CVEG 4243
 - Designed lecture material based on a newly selected textbook
 - Conducted synchronous lectures to accommodate COVID-19 related needs
- SP-2021: Environmental Engineering – CVEG 3243
 - Navigated remote, synchronous, and on campus teaching due to COVID-19 as a first-time instructor
 - Student Comments:
- FA-2020: CVEG 3223–Hydrology and CVEG 4243–Environmental Engineering Design
 - Provided fully remote drills and homework assistance for two courses
- SP-2020: CVEG 3243–Environmental Engineering
 - Navigated a mid-semester transition to online instruction
- FA-2019: CVEG 3213–Hydraulics
 - Performed weekly drills and review sessions

Engineering Intern, Olsson, Fayetteville, AR **May 2019 – Nov 2019**

40-hours/week

- Master plan clearwell study and finished water line, Lowell, AR
 - Conducted a clearwell study for the master plan update of a 140 MGD water treatment facility assessing existing capacity and future requirements
 - Conducted a pipe material comparison and a GIS based survey of soil profiles to estimate the cost for the installation of 8 miles of dual 60-inch pipe for finished water distribution
- Raw water pump upgrade, Holiday Island, AR
 - Led drafting and specifications for a raw water pump upgrade for a 24 MGD water treatment facility
- Creek bed restoration, Elkins, AR
 - Supported bidding and oversaw on-site construction of designed improvements

Engineering Lab Technician, LeTourneau University, Longview, TX **Sept 2016 – May 2019**

40-hours/week

- Supervised and maintained over 30,000 sq-ft of labs and classrooms spanning three buildings containing engineering instruments and research projects throughout
- Co-instructor of record for the lab portion of Geotechnical Engineering – CEGR 3913
- Led lab renovation and improvement projects
- Supervised undergraduate lab experimentation for civil engineering courses
 - Introduction to Civil Engineering-CEGR 1523, Civil Engineering Materials-CEGR 2013, Environmental Engineering-EVGR 3113, Geotechnical Engineering-CEGR 3913, Hydraulic Design-CEGR 4224, Senior Design I & II-ENGR 4813 & 4823

Masters Research, LeTourneau University, Longview, TX**Jan 2017 – May 2019**

20-hours/week

Inaugural civil engineering master's student under the advising of Dr. Darryl Low

- Surveyed existing technologies related to low- and middle-income country water treatment systems and identified promising designs for in-depth study
- Modeled a convective chlorination system in COMSOL multiphysics software to establish the theoretical behavior of chlorine tablet dissolution
- Validated dosage control through bench and pilot scale experiments

Relevant academic communications:

- **Hodges, S. D.**, 2019, 'Effects of Contact Surface Area and Tangential Velocity on the Dissolution of Tableted Calcium Hypochlorite', Master's thesis, LeTourneau University, Longview

Engineering Intern, WPEC, Longview, TX**Aug 2016 – Sept 2016**

20-hours/week

- Distribution network mapping and modeling, East Mountain, TX
 - Collected plans of record into a CAD map and assessed proposed expansion in a KY Pipe hydraulic model

Community Development Intern Lead, Reach Beyond, Shell, Ecuador**May 2016 – Aug 2016**

40-hours/week

- Led engineering interns in engineering design and construction of spring capture projects
 - Organized trips and weekend events
 - Designed various components of gravity fed distribution networks
 - Organized and led 3–5 day trips to remote jungle and mountain regions
- Lead translator for technical components of a spring capture project in Kawa, Ecuador

Engineering Intern, WPEC, Longview, TX**Nov 2015 – May 2016**

10-hours/week

- Assisted various projects through drafting, GIS, and data analysis

Community Development Intern, Reach Beyond, Shell, Ecuador**May 2014 – Aug 2014**

40-hours/week

- Participated in several remote spring capture projects in jungle and mountain regions
- Assessed and organized materials list for projects
- Worked alongside the communities in efforts to build tanks, dig trenches, and lay pipe for remote sites

Undergraduate Research, LeTourneau University, Longview, TX**Aug 2014 – May 2016**

10-hours/week

- Senior Design Research: Frack Water Reclamation:
 - Investigated aeration and volatilization of contaminants for gaseous detection.
- Junior Design Research: Thickening Agent Synthesis: 5-hours/week/2 semesters
 - Analyzed bacterial cultures at varying temperatures to determine ideal growth conditions
 - Performed culturing, plate counting, and UV spectroscopy

COMMITTEES AND VOLUNTEER WORK

Adjunct Faculty, Northrise University, Ndola, Zambia **Oct 2023 – Present**
4-hours/month

- Adjunct faculty in support of the engineering school development. Advisory role.

Engineering Advisory Board Member, Northrise University, Ndola, Zambia **Apr 2023–Present**
4-hours/month

- Bi-weekly meetings with the head of department to advise strategic growth in the school of engineering

Curriculum Committee Member, Northrise University, Ndola, Zambia **Aug 2018–Aug 2023**
4-hours/month

- Participated in weekly meetings to aid ongoing development
- Developed course contents for the Civil Engineering curriculum
 - ENG204-Introduction to Surveying, ENG402-Environmental Engineering, ENG408-Soil Mechanics and Geotechnical Engineering, ENG504-Hydraulic Design, ENG506-Water and Wastewater Design
- Represented LeTourneau to the leadership of Northrise on a scouting trip

Praire Grove First Baptist Church, Prairie Grove, AR **Jul 2020 – Nov 2023**
6-hours/week

- Deacon:
 - Supervised building maintenance and projects
 - Implemented a ticket system for managing work requests
 - Supported new member connection and care
 - Organized training and reorganization effort for the deacon group
- Community Group Co-leader:
 - Co-launched a community group for young adults
 - Organized and led bi-monthly discussion
 - Authored and distributed discussion questions for community groups church wide
- Children's Ministry Volunteer:
 - Provided monthly childcare service
 - Co-led weekly lessons for childrens church

Teen Challenge Adventure Ranch, Morrow, AR **Oct 2021 – May 2022**
2-hours/week

- Led student workouts for boys enrolled in the center's rehab program

Samaritan's Purse, Houston, TX **Oct 2017**

- Volunteered with Samaritan's Purse's relief effort in a Houston suburb
- Co-lead a group of university students in relief efforts of mold remediation and cleanup

The Church at West Mountain, Winnie, TX **Sept 2017**

- Volunteered with a local church to assist a hurricane affected church in Winnie, TX in remediation and cleanup efforts

Well Drilling Technology Application, St Louis, Senegal **May 2017 – June 2017**

- Implemented a well drilling technology previously designed by senior engineering students
- Partnered with a local village to provide wells for agriculture and domestic used
- Drilled a well bore of 30 meters using slurry powered drilling technique