

# SAMUEL DAVID HODGES

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Texas EIT No. 62971

## EDUCATION

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|-------------------------|------|------------------------|
| 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

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|--|------|
| 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

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|--------------------|----------------------|---------------------|------------------|
| 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    |                     |                  |

## RELATED EXPERIENCE

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

- Courses Taught
  - CE 299 Hydraulics
  - CE 299L Hydraulics Lab
  - CE 329 Environmental Engineering I
  - CE 431 Senior Project I
  - CE 489 Licensing and Certification in Civil Engineering

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

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

**Graduate Research, University of Arkansas, Fayetteville, AR** **Aug 2019 – Dec 2023**  
40-hours/week

- 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.

*In Review*

- Fairey J. L.; Laszakovits J.; Pham, H. T.; Do, T. D.; **Hodges, S. D.**; McNeill, C.; Wahman, D. G. "Revealing the Unidentified Product of Chloramine Decomposition"

*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"
- **Hodges, S. D.**; Wahman, D. G.; Hauptert, L. M.; Pham, H. T.; Fairey J. L. "Diffusive Gradients in Thin-Films Sampling for PFAS: Low-level Detection and Step Changes for 32 PFAS in Aqueous Deployments"

*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:
    - "I enjoyed the information that the class provided, and the understanding of the teacher."
    - "I like the group quizzes and how we can use our notes to help. Memorizing notes is difficult, so this is very helpful."
- 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

- *“The conceptual discussion of the class was very strong. I like how Professor Hodges would open with relevant news in the water treatment world.”*
- **SP-2021: Environmental Engineering – CVEG 3243**
  - Navigated remote, synchronous, and on campus teaching due to COVID-19 as a first-time instructor
  - Student Comments:
    - *“I like that you take student’s feedback and apply it to your course. It really makes me as a student [feel] that I am listened to and that my professor actually cares about teaching me.”*
- **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**

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**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
- Advised the design and construction of the engineering building

**Praire Grove First Baptist Church, Prairie Grove, AR** **Jul 2020 – Present**

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

**Marriage and Family Conference, Cerro Azul, Peru**

**June 2018**

- Volunteered at a girls orphanage supporting their work
- Led a marriage and family conference session

**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