Jeffrey M. Sadler, Ph.D.

jeffrey.sadler2@gmail.com • 801.231.5581 • jsadler2.github.io

Education	
University of Virginia Ph.D. in Civil and Environmental Engineering	Charlottesville, Virginia May 2019
Brigham Young University M.S. in Civil and Environmental Engineering B.S. in Civil and Environmental Engineering	Provo, Utaн April 2015 April 2013
Academic and Research Experience	
 Assistant Professor and Water Resources Extension Specialist Oklahoma State University Dept. of Biosystems and Agricultural Engineering Led extension activities on fundamental water education and the use of science for water-related decision- and policy-makers Taught course on modeling in Biosystems Engineering 	Jun 2022 – Present Stillwater, OK E data
 Mendenhall Postdoctoral Research Fellow United States Geological Survey Advisor: <i>Dr. Jordan Read</i> Led research on the effectiveness of using one deep learning model to proboth streamflow and water temperature Contributed to Process-guided Deep Learning (PGDL) PGDL model us predict stream temperature in support of reservoir release decision make Led research into cloud-based deep learning workflows 	Aug 2019 – Jun 2022 Madison, WI redict sed to rs
 Postdoctoral Research Associate University of Virginia Advisor: Dr. Jonathan Goodall Researched the effect of climate change on bridge and culvert design for Vir Department of Transportation (VDOT) 	<i>May 2019 – Jul 2019</i> Charlottesville, VA rginia
 Graduate Research Assistant University of Virginia Advisor: <i>Dr. Jonathan Goodall</i> Studied smart stormwater systems for mitigating urban flooding. Worked closely with interdisciplinary team including computer science, portation, and social science faculty on NSF-funded project Used machine learning algorithm, Random Forest, to predict street flood se in coastal city, Norfolk, Virginia, USA. Helped develop and implement metadata framework to describe and environmental models in NSF-funded, web-based system HydroShare. Participated in writing multiple NSF grant proposals including funded million CRISP project award. 	<i>Jul 2015 – May 2019</i> Charlottesville, VA trans- verity store 1 \$2.5
 Graduate Research Assistant Brigham Young University Advisor: Dr. Daniel Ames Designed Web API to stream environmental data from open-hardware loggers to standards-based, open-source data system, CUASHI HIS. Developed web service link from existing data sources to the communisearch repository HydroShare. 	<i>Aug 2013 – Apr 2015</i> Provo, UT data- ity re-

Publications and Presentations

In Revision

1. Topp, S. N., Barclay, J., Diaz, J., Sun, A. Y., Jia, X., Lu, D., **Sadler, J. M.**, & Appling, A. (n.d). Stream temperature prediction in a shifting environment: The influence of deep learning architecture. *Water Resources Research*.

CV

Published

- Appling, A. P., Oliver, S. K., Read, J. S., Sadler, J. M., & Zwart, J. A. (2022). Machine learning for understanding inland water quantity, quality, and ecology. In T. Mehner & K. Tockner (Eds.), *Encyclopedia of inland waters (second edition)* (Second Edition, pp. 585–606). Elsevier. https://doi.org/https://doi.org/10.1016/B978-0-12-819166-8.00121-3
- Sadler, J. M., Appling, A. P., Read, J. S., Oliver, S. K., Jia, X., Zwart, J. A., & Kumar, V. (2022). Multi-task deep learning of daily streamflow and water temperature. *Water Resources Research*, 58, e2021WR030138. https://doi.org/10.1029/2021WR030138
- Varadharajan, C., Appling, A. P., Arora, B., Christianson, D. S., Hendrix, V. C., Kumar, V., Lima, A. R., Müller, J., Oliver, S., Ombadi, M., Perciano, T., Sadler, J. M., Weierbach, H., Willard, J. D., Xu, Z., & Zwart, J. (2022). Can machine learning accelerate process understanding and decision-relevant predictions of river water quality? *Hydrological Processes*, 36, e14565. https://doi.org/10.1002/hyp.14565
- Zwart, J. A., Oliver, S. K., Watkins, W. D., Sadler, J. M., Appling, A. P., Corson-Dosch, H. R., Jia, X., Kumar, V., & Read, J. S. (2022). Near-term forecasts of stream temperature using deep learning and data assimilation in support of management decisions. *JAWRA Journal of the American Water Resources Association*. https://doi.org/https://doi.org/10.1111/1752-1688.13093
- Choi, Y. D., Goodall, J. L., Sadler, J. M., Castronova, A. M., Bennett, A., Li, Z., Nijssen, B., Wang, S., Clark, M. P., Ames, D. P., Horsburgh, J. S., Yi, H., Bandaragoda, C., Seul, M., Hooper, R., & Tarboton, D. G. (2021). Toward open and reproducible environmental modeling by integrating online data repositories, computational environments, and model application programming interfaces. *Environmental Modelling and Software*, 135. https://doi.org/10.1016/j.envsoft.2020.104888
- Morsy, M. M., Lerma, N. R., Shen, Y., Goodall, J. L., Huxley, C., Sadler, J. M., Voce, D., O'Neil, G. L., Maghami, I., & Zahura, F. T. (2021). Impact of geospatial data enhancements for regional-scale 2d hydrodynamic flood modeling: Case study for the coastal plain of virginia. *Journal of Hydrologic Engineering*, 26, 05021002. https://doi.org/10.1061/(asce)he.1943-5584.0002065
- Essawy, B. T., Goodall, J. L., Voce, D., Morsy, M. M., Sadler, J. M., Choi, Y. D., Tarboton, D. G., & Malik, T. (2020). A taxonomy for reproducible and replicable research in environmental modelling. *Environmental Modelling and Software*, 134, 104753. https://doi.org/10.1016/j.envsoft.2020.104753
- Sadler, J. M., Goodall, J. L., Behl, M., Bowes, B. D., & Morsy, M. M. (2020). Exploring real-time control of stormwater systems for mitigating flood risk due to sea level rise. *Journal of Hydrology*, 583, 124571. https://doi.org/10.1016/j.jhydrol.2020.124571
- Zahura, F. T., Goodall, J. L., Sadler, J. M., Shen, Y., Morsy, M. M., & Behl, M. (2020). Training machine learning surrogate models from a high-fidelity physics-based model: Application for real-time street-scale flood prediction in an urban coastal community. *Water Resources Research*, 56. https://doi.org/10.1029/ 2019WR027038
- Sadler, J. M., Goodall, J. L., Behl, M., Morsy, M. M., Culver, T. B., & Bowes, B. D. (2019). Leveraging open source software and parallel computing for model predictive control of urban drainage systems using epa-swmm5. *Environmental Modelling & Software*, 120, 104484. https://doi.org/10.1016/j.envsoft.2019.07.009
- Essawy, B. T., Goodall, J. L., Zell, W., Voce, D., Morsy, M. M., Sadler, J., Yuan, Z., & Malik, T. (2018). Integrating scientific cyberinfrastructures to improve reproducibility in computational hydrology: Example for hydroshare and geotrust. *Environmental Modelling and Software*, 105, 217–229. https://doi.org/10.1016/j. envsoft.2018.03.025
- Morsy, M. M., Goodall, J. L., O'Neil, G. L., Sadler, J. M., Voce, D., Hassan, G., & Huxley, C. (2018). A cloud-based flood warning system for forecasting impacts to transportation infrastructure systems. *Environmental Modelling and Software*, 107, 231–244. https://doi.org/10.1016/j.envsoft.2018.05.007
- Sadler, J., Goodall, J., Morsy, M., & Spencer, K. (2018). Modeling urban coastal flood severity from crowd-sourced flood reports using poisson regression and random forest. *Journal of Hydrology*, 559, 43–55. https://doi.org/10.1016/J.JHYDROL.2018.01.044
- Morsy, M. M., Goodall, J. L., Castronova, A. M., Dash, P., Merwade, V., Sadler, J. M., Rajib, M. A., Horsburgh, J. S., & Tarboton, D. G. (2017). Design of a metadata framework for environmental models with an example hydrologic application in hydroshare. *Environmental Modelling and Software*, 93, 13–28. https://doi.org/10.1016/j.envsoft.2017.02.028

- Sadler, J. M., Goodall, J. L., & Morsy, M. M. (2017). Effect of rain gauge proximity on rainfall estimation for problematic urban coastal watersheds in virginia beach, virginia. *Journal of Hydrologic Engineering*, 22, 04017036. https://doi.org/10.1061/(ASCE)HE.1943-5584.0001563
- Sadler, J. M., Haselden, N., Mellon, K., Hackel, A., Son, V., Mayfield, J., Blase, A., & Goodall, J. L. (2017). Impact of sea-level rise on roadway flooding in the hampton roads region, virginia. *Journal of Infrastructure Systems*, 23, 05017006. https://doi.org/10.1061/(ASCE)IS.1943-555X.0000397
- Sadler, J. M., Ames, D. P., & Khattar, R. (2016). A recipe for standards-based data sharing using open source software and low-cost electronics. *Journal of Hydroinformatics*, 18, jh2015092. https://doi.org/10. 2166/hydro.2015.092
- 18. Sadler, J., Ames, D., & Livingston, S. (2016). Extending hydroshare to enable hydrologic time series data as social media. *Journal of Hydroinformatics*, 18. https://doi.org/10.2166/hydro.2015.331

Peer-reviewed Conference Publications

- 1. Bao, T., Jia, X., Zwart, J., Sadler, J., Appling, A., Oliver, S., & Johnson, T. T. (2021). Partial differential equation driven dynamic graph networks for predicting stream water temperature. 2021 IEEE International Conference on Data Mining (ICDM), 11–20. https://doi.org/10.1109/ICDM51629.2021.00011
- Chen, S., Appling, A., Oliver, S., Corson-Dosch, H., Read, J., Sadler, J., Zwart, J., & Jia, X. (2021). Heterogeneous stream-reservoir graph networks with data assimilation. 2021 IEEE International Conference on Data Mining (ICDM), 1024–1029. https://doi.org/10.1109/ICDM51629.2021.00117
- 3. Jia, X., Lin, B., Zwart, J. A., **Sadler**, **J. M.**, Appling, A. P., Oliver, S. K., & Read, J. S. (2021). Graph-based reinforcement learning for active learning in real time: An application in modeling river networks. *SIAM International Conference on Data Mining*.
- Jia, X., Xie, Y., Li, S., Chen, S., Zwart, J., Sadler, J., Appling, A., Oliver, S., & Read, J. (2021). Physics-guided machine learning from simulation data: An application in modeling lake and river systems. 2021 IEEE International Conference on Data Mining (ICDM), 270–279. https://doi.org/10.1109/ICDM51629.2021.00037
- 5. Jia, X., Zwart, J. A., **Sadler**, **J. M.**, Appling, A. P., Oliver, S. K., Markstrom, S. L., Willard, J. D., Xu, S., Steinbach, M., Read, J. S., & Kumar, V. (2021). Physics-guided recurrent graph networks for predicting flow and temperature in river networks. *SIAM International Conference on Data Mining*.
- 6. Sadler, J. M., Goodall, J. L., Behl, M., & Morsy, M. M. (2018). Leveraging open source software and parallel computing for model predictive control simulation of urban drainage systems using epa-swmm5 and python. *International Conference on Urban Drainage Modelling*, 988–992.

Conference Presentations

- 1. **Sadler**, J. M., Jia, X., Appling, A. P., Oliver, S. K., Read, J. S., Kumar, V., Nearing, G. S., Kratzert, F., Hamman, J., & Signell, R. (2020). Streamflow prediction using network-aware deep learning in the cloud. *SciPy: Scientific Computing Conference*.
- 2. Sadler, J. M., Read, J. S., Appling, A. P., Oliver, S. K., & Zwart, J. A. (2020). Does machine learning obsolete process understanding? *American Water Resources Association Geospatial Water Techology Conference*.
- 3. Sadler, J. M., Goodall, J. L., Morsy, M. M., Horsburgh, J. S., Dash, P. K., & Tarboton, D. G. (2019). Userdefined metadata schemas for hydrologic models. *CUAHSI Conference on Hydroinformatics*.
- 4. Sadler, J. M., Goodall, J. L., Behl, M., & Morsy, M. M. (2018). Assessing current and future utility of predictive active stormwater controls for reducing flooding in coastal cities. *American Geophysical Union Fall Meeting*.
- 5. Sadler, J. M., Goodall, J. L., Morsy, M. M., & Spencer, K. (2017). Predicting coastal flood severity using random forest algorithm. *American Geophysical Union Fall Meeting*.
- Sadler, J. M., Morsy, M. M., Castronova, A. M., Essawy, B. T., Goodall, J. L., & Tarboton, D. G. (2017). Demonstrating scientific workflow reproducibility through hydroshare. *CUAHSI Conference on Hydroinformatics*.
- 7. Sadler, J. M., & Ames, D. P. (2014). Open-hardware meets open software for environmental monitoring. *American Water Resources Association GIS and Water Resources Conference*.

Teaching Experience

University Courses Taught

- Modeling in Biosystems Engineering
 - Sophomore-level Biosystems Engineering course required for all students.

- Co-instructed course of 26 students.
- Developed new material for introducing basic programming, data analysis, statistical modeling, and data visualization using Python
- Water Resources Engineering
 - Junior-level Civil and Environmental Engineering course required for students in environmental track.
 - Co-instructed course of 40 students.
 - Developed new material for introducing Python and ArcGIS into course material.

Other Teaching Experience

- Tutor for University of Virginia's Center for Diversity in Engineering
 - Tutored diverse and under-represented students in engineering science classes
- Teaching Assistant for Water Resources Engineering Course
 - Held office hours, graded homework assignments, guest lectured class
- Univerity of Virginia Summer Enrichment Program Instructor
 - Developed an 18-hour curriculum for middle school students on stormwater management and monitoring
 - Course was delivered in nine 2-hour blocks over a two week summer camp
- Instructor RWater Teacher's Workshop at Purdue University
 - Developed a 2-hour curriculum for middle school and high-school science teachers low-cost environmental monitoring

Awards and Honors

- 2019 Recipient of USGS Mendenhall Postdoctoral Fellowship.
- 2018 Recipient of CUAHSI Instrumentation Travel Grant.
- 2016 Mid-Atlantic Transportation Sustainability University Transportation Center Outstanding Student of the Year.
- 2014 Winner of the Utah AWRA Masters Level Student Paper Competition.

Invited Talks

- Benefits of modeling interdependent environmental variables, streamflow and stream temperature, with deep learning. American Geophysical Union Fall Meeting, December 10, 2020.
- Illustrating Hydroshare's Functionality for Supporting FAIR Data Principles through an Example Use Case and Reproducibility Workshop. American Geophysical Union Fall Meeting, December 14, 2018, Washington DC, USA.
- Hydroinformatics for Prediction and Mitigation of Urban Coastal Flooding. University of Michigan, December 5, 2018, Ann Arbor, MI, USA.
- Hydroinformatics for Prediction and Mitigation of Urban Coastal Flooding. US Army Corps of Engineers Coastal Hydraulics Laboratory, October 27, 2018, Vicksburg, MS, USA.

Service

Professional

Journals reviewed for

Journal of Hydrology, Environmental Modelling and Software, Water Resources Research, Environmental Science: Water Research & Technology, European Journal of Agronomy

Church Volunteer Experience

Full-time missionary, Southern Italy

2008-2010

- Immersive international experience where I learned a foreign language (Italian) and became accustomed to another culture
- Worked as a full-time volunteer teaching and performing community service

Youth service

- Led multiple groups of around 10 12-18 year old young men in weekly activities of learning, recreation, and service
- Led planning, preparation, and execution of multi-night outdoor adventure camping trip

CV

• Helped coordinate among other adult leaders and parents of youth