
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

PROVO, UTAH

April 2015

B.S. in Civil and Environmental Engineering

April 2013

Research Experience

Mendenhall Postdoctoral Research Fellow

Aug 2019 – Present

United States Geological Survey, Middleton, WI

Advisor: *Dr. Jordan Read*

- Developed cloud-based workflows Deep Learning model training
- Used innovative approach to train Deep Learning models for predicting streamflow and stream temperature taking advantage of river segment connectivity and
- Studied the integration of physical knowledge and Deep Learning for more accurate environmental variable prediction

Postdoctoral Research Associate

May 2019 – Jul 2019

University of Virginia, Charlottesville, VA

Advisor: *Dr. Jonathan Goodall*

- Researched the effect of climate change on bridge and culvert design for Virginia Department of Transportation (VDOT)

Graduate Research Assistant

Jul 2015 – May 2019

University of Virginia, Charlottesville, VA

Advisor: *Dr. Jonathan Goodall*

- Studied smart stormwater systems for mitigating urban flooding.
- Worked closely with interdisciplinary team including computer science, transportation, and social science faculty on NSF-funded project
- Used machine learning algorithm, Random Forest, to predict street flood severity in coastal city, Norfolk, Virginia, USA.
- Helped develop and implement metadata framework to describe and store environmental models in NSF-funded, web-based system [HydroShare](#).
- Participated in writing multiple NSF grant proposals including funded \$2.5 million CRISP project award.

Graduate Research Assistant

Aug 2013 – Apr 2015

Brigham Young University, Provo, UT

Advisor: *Dr. Daniel Ames*

- Designed Web API to stream environmental data from open-hardware data-loggers to standards-based, open-source data system, [CUASHI HIS](#).
 - Developed web service link from existing data sources to the community research repository [HydroShare](#).
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Publications and Presentations

In Preparation

Sadler, J. M., Jia, X. J., Appling, A. P., Oiver, S. O., Zwart, J., Read, J. R., Kumar, V. The value of joint modeling of interdependent environmental variables, streamflow and stream temperature, with deep learning.

In Review

Morsy, M. M., Lerma, N. R., Goodall, J. L., Shen, Y., Huxley, C., **Sadler, J. M.**, Voce, D., O'Neil, G., Maghami, I., Zahura, F., Improving 2D Hydrodynamic Flood Forecasting Model with Data Enhancement: A Case Study. Submitted to *Journal of Hydrologic Engineering*.

In Revision

Zahura, F. T., Goodall, J. L., **Sadler, J. M.**, Yawen Shen, Morsy, M. M., and Behl, M. 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*.

Choi, Y., Goodall, J. L., **Sadler, J. M.**, Castronova, A. M., Bennett A., Li, Z., Nijssen B., Wang S., Clark, M. P., Tarboton, D. G., Toward Open and Reproducible Environmental Modeling by Integrating Online Data Repositories, Computational Environments, and Model Application Programming Interfaces. *Environmental Modelling & Software*.

In Press

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*. DOI: <https://doi.org/10.1016/j.jhydrol.2020.124571>

Essawy, B. T., Goodall, J. L., Voce, D., Morsy, M. M., **Sadler, J. M.**, Choi, Y., Tarboton, D. G., Malik, T. (2020) A taxonomy for reproducible and replicable research in environmental modelling. *Environmental Modelling & Software*. DOI:<https://doi.org/10.1016/j.envsoft.2020.104753>

Sadler, J. M., Goodall, J. L., Behl, M., Morsy, M. M., Culver, T. B. (2019) Leveraging Open Source Software and Parallel Computing for Model Predictive Control Simulation of Urban Drainage Systems using EPA-SWMM5. *Environmental Modelling & Software* 120, 104484. DOI:[10.1016/j.envsoft.2019.07.009](https://doi.org/10.1016/j.envsoft.2019.07.009)

Bowes, B. D., Goodall, J. L., **Sadler, J. M.**, Morsy, M. M., Behl, M. (2019) Forecasting Groundwater Table in a Flood Prone Coastal City Using Long Short-term Memory and Recurrent Neural Networks. *Water* 11(5), 1098. [10.3390/w11051098](https://doi.org/10.3390/w11051098)

Sadler, J.M., Goodall, J.L., Morsy, M.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. DOI: [10.1016/J.JHYDROL.2018.01.044](https://doi.org/10.1016/J.JHYDROL.2018.01.044)

Morsy M.M., Goodall, J.L., O'Neil, G., **Sadler, J.M.**, Voce, D., Hassan, G., Huxley, C. (2018) A Cloud-Based Decision Support System for Real-time Warning of Flooding Impacts to Transportation Infrastructure in Coastal Virginia. *Environmental Modelling and Software*. 107, 231-244. DOI: <https://doi.org/10.1016/j.envsoft.2018.05.007>

Essawy, B.T., Goodall, J.L., Zell, W., Voce, D., Morsy, M.M., **Sadler, J.M.**, & Malik, T. (2018) Integrating Scientific Cyberinfrastructure to Improve Reproducibility in Computational Hydrology: Example for HydroShare and GeoTrust. *Environmental Modelling and Software*. 105, 217-229. DOI: <https://doi.org/10.1016/j.envsoft.2018.03.025>

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(4), 05017006, DOI: [10.1061/\(ASCE\)IS.1943-555X.0000397](https://doi.org/10.1061/(ASCE)IS.1943-555X.0000397).

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(9), 04017036; DOI: [10.1061/\(ASCE\)HE.1943-5584.0001563](https://doi.org/10.1061/(ASCE)HE.1943-5584.0001563).

Morsy, M. M., Goodall, J. L., Castronova, A. M., Dash, P., Merwade, V., **Sadler, J. M.**, Rajib, M.A., Horskburg, J.H. & Tarboton, D. G. (2017). Design of a metadata framework for environmental models with an example hydrologic application in HydroShare. *Environmental Modelling & Software*, 93, 13-28; DOI: [10.1016/j.envsoft.2017.02.028](https://doi.org/10.1016/j.envsoft.2017.02.028).

Sadler, J. M., Ames, D. P., & Livingston, S. J. (2016). Extending HydroShare to enable hydrologic time series data as social media. *Journal of Hydroinformatics*, 18(2), 198-209; DOI: [10.2166/hydro.2015.331](https://doi.org/10.2166/hydro.2015.331).

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 (2) 185-197; DOI: [10.2166/hydro.2015.092](https://doi.org/10.2166/hydro.2015.092).

Peer-Reviewed Conference Papers

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. Proceedings of the 11th International Conference on Urban Drainage Modelling, Sept. 23-26, Palermo, Italy.

Sadler, J., Ames, D., Khattar, R. (2014). Open-Hardware Meets Open Software for Environmental Monitoring. In: Ames, D.P., Quinn, N.W.T., Rizzoli, A.E. (Eds.), Proceedings of the 7th International Congress on

Environmental Modelling and Software, June 15-19, San Diego, California, USA. ISBN: 978-88-9035-744-2

Conference Presentations

Sadler, J. M., Read J., Appling A., Oliver S., Zwart J. (2020) Does Machine Learning obsolete process understanding? American Water Resources Virtual Geospatial Water Technology Conference. August 6-14.

Sadler, J. M., Jia X., Appling A., Oliver S., Read J., Kumar V., Nearing G., Kratzert F., Hamman J., Signell R. (2020) Streamflow Prediction Using Network-aware Deep Learning in the Cloud. SciPy: Scientific Computing with Python Virtual Conference. July 6-12.

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, December 10-14, Washington DC, USA.

Essawy, B.T., Goodall, J.L., Voce, D., Choi, Y., Morsy, M.M., **Sadler, J. M.**, Yuan, Z., Malik, T. (2018) Leveraging Scientific Cyberinfrastructures to Achieve Computational Hydrologic Model Reproducibility. American Geophysical Union Fall Meeting, December 10-14, Washington DC, USA.

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. Proceedings of the 11th International Conference on Urban Drainage Modelling, Sept. 23-26, Palermo, Italy.

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, December 11-15, New Orleans, Louisiana, USA.

Sadler, J. M., Morsy, M.M., Castronova, A., Essawy, B., Goodall, J.L., & Tarboton, D.G. (2017) Demonstrating Scientific Workflow Reproducibility through HydroShare. Presented at the CUAHSI HydroInformatics Conference, July 25-27, Tuscaloosa, Alabama, USA.

Goodall, J. L., **Sadler, J. M.**, Hassan, A., Rowlands, C., Wang, G., Morsy, M. M., Whitehouse, K., Johnson C. G. (2016) Stormwater Management in Virginia Beach Using Real-time Sensing, Modeling, and Control. Presented at World Environmental & Water Resources Congress, May 22-26, West Palm Beach, Florida, USA.

Sadler, J., Ames, D., Khattar, R., (2014). Open-Hardware Meets Open Software for Environmental Monitoring. 7th International Congress on Environmental Modelling and Software, June 15-19, San Diego, California, USA.

Sadler, J., Ames, D. (2014). Open-Hardware Meets Open Software for Environmental Monitoring. Presented at the American Water Resources Association GIS and Water Resources Conference, May 12-14, Snowbird, Utah, USA.

Teaching Experience

Instructor of Record for Water Resources Engineering Course	<i>Spring 2018</i>
• Developed new material for introducing Python and ArcGIS into course material.	
Tutor for Center for Diversity in Engineering	<i>Fall 2016 - Spring 2017</i>
Teaching Assistant for Water Resources Engineering Course	<i>Spring 2017</i>
Summer Enrichment Program Instructor	<i>Summer 2016</i>
Instructor RWater Teacher's Workshop at Purdue University	<i>July 2014</i>

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.
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Invited Talks

- 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.

Professional Service

Manuscripts reviewed for

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