Jeffrey M. Sadler

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Education

University of Virginia — Charlottesville, Virginia
Ph.D. in Civil and Environmental Engineering — *expected May 2019*

Brigham Young University — Provo, Utah
M.S. in Civil and Environmental Engineering — *April 2015*
B.S. in Civil and Environmental Engineering — *April 2013*

Research Experience

Doctoral Research — *July 2015 – present*
Advisor: *Dr. Jonathan Goodall*

- Focused 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.

Masters Research — *August 2013 – April 2015*
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.

Publications and Presentations

Peer-Reviewed Journal Publications

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

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.

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.

Morsy, M. M., Goodall, J. L., Castronova, A. M., Dash, P., Merwade, V., **Sadler, J. M.**, Rajib, M.A., Horsburg, 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.

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.

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.

In progress

Sadler, J. S., Goodall, J. L., Behl, M., Morsy, M. M., Culver, T. B., Leveraging Open Source Software and Parallel Computing for Model Predictive Control Simulation of Urban Drainage Systems using EPA-SWMM5. Submitted to *Environmental Modelling & Software*.

Sadler, J. S., Goodall, J. L., Morsy, M. M., Shen Y., Behl, M., Spencer, K., Assessing Utility of Active Stormwater Controls in Coastal Cities with Sea Level Rise. Submitted to *Journal of Hydrology*.

Essawy, B. T., Goodall, J. L., Voce, D., Choi, Y., Morsy, M. M., **Sadler, J. M.**, Malik, T., From Repeatability to Reproducibility in Hydrological Computational Workflows: Applying the Structure for Unifying Multiple Modeling Alternatives (SUMMA) as a Use Case. In preparation for submission to *Environmental Modelling & Software*.

Bowes, B. D., Goodall, J. L., **Sadler, J.S.**, Morsy, M. M., Behl, M., Forecasting Groundwater Table in a Flood Prone Coastal City Using Long Short-1term Memory and Recurrent Neural Networks. In preparation for submission to the *Journal of Hydrology*.

Peer-Reviewed Conference Papers

Sadler, J.S., 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

Invited Conference Presentations

Sadler, J. M., Goodall, J.L., Essawy, B.T., Tarboton, D.G. (2018) Illustrating Hydroshare's Functionality for Supporting FAIR Data Principles through an Example Use Case and Reproducibility Workshop. American Geophysical Union Fall Meeting, December 10-14, Washington DC, USA.

Conference Presentations

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.S., 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.

Awards and Honors

- 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.

Teaching Experience

Instructor of Record for Water Resources Engineering Course *Spring 2018*
- Developed new material for introducing Python and ArcGIS into course material.

Tutor for Center for Diversity in Engineering *Fall 2016 - Spring 2017*

Teaching Assistant for Water Resources Engineering Course *Spring 2017*

Summer Enrichment Program Instructor *Summer 2016*

Instructor RWater Teacher's Workshop at Purdue University *July 2014*

Professional Service

Journals reviewed for
Journal of Hydrology, *Environmental Modelling and Software*

Professional Affiliations

Member of American Geophysical Union