

# Mariel Wynne de Vries Jones

---

Saint Anthony Fall Laboratory, University of Minnesota, Twin Cities  
jone3247@umn.edu

**PRINCIPAL INTERESTS** Statistical hydrology; Stochastic and predictive modeling of atmospheric and hydrologic drivers; Environmental data science; Mathematical ecology; Land surface modeling and reduced complexity modeling;

**ACADEMIC BACKGROUND** *Ph.D. Water Resources Science (Hydrology)* 2025  
[University of Minnesota](#), Twin Cities, MN

Ph.D. research in the assimilation of field and modelling techniques for representing peatland and winter climate dynamics to land surface models.

*Committee Members:* Drs. Xue Feng (UMN-TC, Advisor), G-H Crystal Ng (UMN-TC), Salli Dymond (UMN-D, NAU), Stephen Sebestyen (USFS), and Vaughan Voller (UMN-TC)

*B.Sc. General Engineering, Mathematics and Statistics* 2020  
[Smith College](#), Northampton, MA

Magna Cum Laude, 3.97 GPA

*Advisors:* Drs. Julianna Tymoczko (Math) and Kristen Dorsey (Engineering)

*Junior Year Abroad* 2019

[University College Dublin](#), Dublin, Ireland

**PUBLICATIONS** See also [my google scholar](#) page.

## *Journal Publications*

1. M. W. Jones, S. D. Sebestyen, S. F. Dymond, G-H. C. Ng, X. Feng, Frost Decouples Spring Streamflow from Snowmelt in Headwater Catchments, *Journal of Hydrology*, 2023. <https://doi.org/10.1016/j.jhydrol.2022.128801>

## *Data Publications*

2. S.D. Sebestyen, D.T. Roman, J.M. Burdick, R.L. Kyllander, N.K. Lany, M. Jones, and R.K. Kolka, *Marcell Experimental Forest 15-minute precipitation, 2010 - ongoing*, Environmental Data Initiative (EDI), July 2021  
[doi:10.6073/pasta/73672ec2acdce8355bf8db](https://doi.org/10.6073/pasta/73672ec2acdce8355bf8db)

1. S.D. Sebestyen, D.T. Roman, N.K. Lany, M.W. Jones, J.M. Burdick, R.K. Kolka, *Marcell Experimental Forest 30-minute resolution meteorological data, 2006 - ongoing*, Environmental Data Initiative (EDI), August 2021  
<https://doi.org/10.6073/pasta/998c6c53ee>

## *Conference Publications*

3. M. W. Jones, X. Feng, K. Hoffman, S. D. Sebestyen, S. Dymond (in prep) Snow, soil frost, and hydrologic connectivity in peatland watersheds. *Proceedings from the 90th Annual Western Snow Conference*
2. E. K. Akey, M. W. Jones, C. L. Ho, A. J. Rubin, (2022) Measuring Railroad Ballast Modulus of Elasticity Using Light Weight Deflectometer. In: Tutumluer, E., Nazarian, S., Al-Qadi, I., Qamhia, I.I. (eds) *Advances in Transportation Geotechnics IV*. Lecture Notes in Civil Engineering, vol 165. Springer, Cham.  
<https://doi.org/10.1007/978-3-030-77234-522>

1. M. W. Jones, E. K. Akey, C. L. Ho, A. J. Rubin, (2022) Repeatability of Minimum and Maximum Density Testing on Clean and Fouled Ballast. In: Tutumluer, E., Nazarian, S., Al-Qadi, I., Qamhia, I.I. (eds) *Advances in Transportation Geotechnics IV*. Lecture Notes in Civil Engineering, vol 165. Springer, Cham. <https://doi.org/10.1007/978-3-030-77234-521>

*General Audience Publications*

1. M. W. Jones (2021). Not so Renewable: Implications for continued peat mining in Minnesota. University of Minnesota Digital Conservancy, <https://hdl.handle.net/11299/229964>

**CONFERENCE** *Oral Presentations*

- PRESENTATIONS**
5. M. W. Jones, X. Feng, K. Hoffman, S. D. Sebestyen, S. Dymond, Snow, soil frost, and hydrologic connectivity in peatland watersheds, *Western Snow Conference 2023*, Flagstaff, AZ, April 2023
  4. M. W. Jones, H. Anurag, G-H. C. Ng, X. Feng, A new frost-centric snowmelt partitioning framework — with applications to northern Minnesota forests, *AGU 2022 Fall Meeting*, Chicago, IL, December 2022
  3. M. W. Jones, S. D. Sebestyen, S. Dymond, X. Feng, The Role of Precipitation, Vegetation, and Evapotranspiration in Lowland, Snow-dominated Headwater Catchments, *AGU 2021 Fall Meeting*, New Orleans, LA (Virtual), December 2021
  2. E. K. Akey, M. W. Jones, C. L. Ho, A. J. Rubin, Measuring Railroad Ballast Modulus of Elasticity Using Light Weight Deflectometer, *International Conference on Transportation Geotechnics*, Chicago, IL (Virtual), August 2021
  1. M. W. Jones, E. K. Akey, C. L. Ho, A. J. Rubin, Repeatability of Minimum and Maximum Density Testing on Clean and Fouled Ballast, *International Conference on Transportation Geotechnics*, Chicago, IL (Virtual), August 2021

*Poster Presentations*

2. M. W. Jones, X. Feng, Effects of Soil Frost on Streamflow Generation Processes in Minnesota Headwater Catchments, *Minnesota Water Resources Conference*, October 2022
1. X. Feng, M. W. Jones, G-H C. Ng, S. D. Sebestyen, Hydrology, Biogeochemistry & CH<sub>4</sub> Emissions at the Marcell Experimental Forest, *Department of Energy Environmental System Science PI Meeting*, Saint Paul, MN, July 2021 (Virtual)

**SPECIAL  
ACHIEVEMENTS**

- AGU Catchment Hydrology Visual Abstract Competition, Winner, 2023
- Adeline Devor Penberthy Memorial Prize to an undergraduate engineering major for academic excellence in engineering and outstanding contributions toward building a community of learners within the Picker Engineering Program, Awarded 2020
- Phi Beta Kappa, Elected 2020
- Tau Beta Kappa (Engineering Honor Society), Elected 2019
- Smith College Dean's List, 2016-2018, 2020

**GRANTS AND FELLOWSHIPS**

- (2022 - 2024) Watershed Innovations Grant (WINS) *Snow Hydrology in Minnesota Headwater Catchments*, \$10,000, with Dr. Xue Feng (UMN-TC)
- (Summer 2021) Environmental Data Initiative Fellowship with Marcell Experimental Forest, \$5,000
- (Summer 2019) Undergraduate Research Fellowship, *Characterizations of Connecticut Granite Ballast materials and implications to USA High Speed Rail Networks*, \$5,000, under Dr. Aaron Rubin (Smith)
- (2016 - 2018) STRIDE Undergraduate Research Scholarship, \$45,000, Awarded to 50 (6-7%) incoming Smith College students annually

**TECHNICAL SKILLS**

*Software and Programming* C, Python, Java, R, MATLAB, Mathematica, ArcGIS

*Language Abilities* French, Italian

**RESEARCH HISTORY**

*Research Assistant* 2020 - Present  
Saint Anthony Falls Laboratory, Minneapolis, MN

Current research involves tracking changes in snow season lengths and modelling spring hydrological connectivity in peatland dominated areas of Minnesota with hopes to expand to the Midwest area. Work done in conjunction with the Saint Anthony Falls Laboratory (SAFL) in Minneapolis, MN and the USFS Marcell Experimental Forest Station in Grand Rapids, MN.

*Research Assistant* 2019 - 2020  
Smith College Engineering Department, Northampton, MA

Joint research between Smith College and the University of Massachusetts, Amherst in geotechnical engineering. Work involved testing railroad ballast and fouling material at different densities to characterize the stability of the material over time. Tests were done using both Lightweight Deflectometer and Ground Penetrating Radar techniques.

*Research Assistant* 2016 - 2018  
Smith College Mathematics Department, Northampton, MA

A year-round group research project partnering with Professor Julianna Tymoczko, and graduate-level researchers to explore the mathematical concept of Splines, graphical arrays of labeling often used in engineering design and modeling. Work includes both group collaboration and individual research to discover and prove properties of Splines.

**EMPLOYMENT HISTORY**

*Environmental Data Initiative (EDI) Fellow* Summer 2021  
Marcell Experimental Forest, Grand Rapids, MN

Summer fellowship in collaboration with the Environmental Data Initiative (EDI) and the USFS Marcell Experimental Forest (MEF) to build data processing and publication knowledge within the ecological and environmental community. Participated in a weeklong training on data publication and worked for 8 weeks with the MEF site to process and publish long term meteorological and hydrological data.

*Design Clinic Engineer* 2019 - 2020  
Smith College Engineering Department, Northampton, MA

Extensive collaboration with students and professionals on a project sponsored by the US Fish and Wildlife Service and the US Geological Survey. Work was done to redesign entranceways to fish passages and increase both attraction and passage efficiencies from native fish species. 2 months were spent as Project Manager, and final deliverables were communicated to USFWS in the form of a design recommendation.

*Educational Technology Assistant* 2018 - 2019  
Smith College Campus School, Northampton, MA

Student teacher at the Smith College Campus School responsible for curriculum design and presentation to thirty 5th grade students. Material utilizes the Mindstorms LEGO Robotics kit to present fundamentals of coding, circuits and sensors as well as introducing the design process

*All-Abilities Transportation Network Intern* Summer 2018  
Ramsey County, MN

A summer planning and development opportunity with the Ramsey County Parks and Recreation Department to connect and implement new ADA compliancy standards. Daily interdepartmental work involved site analysis, geo-mapping and spatial analysis in ArcGIS, and developmental design work for major County and Regional parks and trails.

## LEADERSHIP

*Water Resources Science in Action Co-President* 2021 - 2022  
University of Minnesota, Minneapolis, MN

Student leadership position that helps to create and maintain a cohesive and friendly environment within an interdisciplinary program with students from colleges across both Twin Cities and Duluth campuses. Additionally, served as the student representative to the WRS Executive Committee.

*Picker Engineering Department Student-Faculty Liaison* 2019 - 2020  
Smith College, Northampton MA

Work done to help connect the department administration and student body by attending faculty meetings, hosting lunch talks for students and helping to guide new students through the engineering curriculum.

## TEACHING (at UMN)

- *CEGE 4501/5501 Hydrologic Design* Spring 2022  
Course development TA. CEGE 4501 is a core undergraduate class on the fundamentals of hydrologic analysis and an introduction to ecohydrology, stormwater engineering, and spatial analysis.

- *CEGE 3102 Uncertainty and Decision Analysis* Fall 2022  
Grading TA. This course is a sophomore level introduction to statistical analysis, probability theory, and their respective applications to uncertainty in design engineering.