Mariel Wynne de Vries Jones

Saint Anthony Fall Laboratory, University of Minnesota, Twin Cities
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PRINCIPAL INTERESTS

Statistical hydrology; Stochastic and predictive modeling of atmospheric and hydrological drivers; mathematical biology and ecology; environmental data science; network analysis; dynamical systems; and land surface modelling

ACADEMIC BACKGROUND

Ph.D. Water Resources Science (Hydrology) 2025
University of Minnesota, Twin Cities, MN
Ph.D. research in the convergence 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

Self Motivated Learning Continuous
Cornell University CS4780 Machine Learning and Intelligent Systems and MAE 5790 Nonlinear Dynamics and Chaos; MIT Opencourseware 6.006 Introduction to Algorithms and 18.217 Graph Theory and Additive Combinatorics

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.

SPECIAL ACHIEVEMENTS

- 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 - 2025) NSF Hydrological Sciences Grant #2153802 *Forest, Frost, and Flow: Snow Hydrology of Spatially Heterogeneous and Hydrologically Connected Peatland Catchments*, $505,165, Supporting personnel under PIs Drs. Xue Feng (UMN-TC) and Salli Dymond (UMN-D, NAU).
- (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

JOURNAL ARTICLES

See also my google scholar page.

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*, 2022, in review.

CONFERENCE PRESENTATIONS

Oral Presentations

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 2022 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_4 Emissions at the Marcell Experimental Forest, *Department of Energy Environmental System Science PI Meeting*, Saint Paul, MN, July 2021 (Virtual)

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*

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*

OTHER 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*

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, serve 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, worked together with Dr. Xue Feng. CEGE 4501 is a core undergraduate class on the fundamentals of hydrologic analysis and an introduction to ecohydrology, stormwater engineering, and spatial analysis.