

Wyatt Madden M.S.

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Department of Biostatistics & Bioinformatics
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EDUCATION	Emory University Ph.D. in Biostatistics & Bioinformatics	2021 – Present
	Montana State University M.S. in Statistics	2017 – 2019
	University of California, Santa Cruz Bachelor of Arts, Economics & Mathematics <i>With Honors</i> Bachelor of Arts, Film & Digital Media <i>With Honors</i>	2011 – 2015
RESEARCH INTERESTS	Bayesian computation, spatio-temporal statistics, probabilistic machine learning & deep learning, with applications in environmental health and infectious disease.	
PUBLICATIONS	<ol style="list-style-type: none">1. W. G. Madden, W. Jin, B. Lopman, A. Zufle, B. Dalziel, C. J. E. Metcalf, B. T. Grenfell, and M. S. Y. Lau, “Deep neural networks for endemic measles dynamics: Comparative analysis and integration with mechanistic models,” <i>PLoS Computational Biology</i>, vol. 20, no. 11, e1012616, Nov. 2024, Full Paper.2. J. Lagergren, M. Ruiz-Aravena, D. J. Becker, <i>et al.</i>, “Environmental and ecological signals predict periods of nutritional stress for eastern australian flying fox populations,” <i>bioRxiv</i>, 2023, Under Review.3. P. Eby, A. Peel, A. Hoegh, W. Madden, J. Giles, P. Hudson, and R. Plowright, “Pathogen spillover driven by rapid changes in bat ecology,” <i>Nature</i>, pp. 1–3, Nov. 2022, Full Paper.4. D. J. Becker, P. Eby, W. Madden, A. J. Peel, and R. K. Plowright, “Ecological conditions predict the intensity of hendra virus excretion over space and time from bat reservoir hosts,” <i>Ecology Letters</i>, Oct. 2022, Full Paper.5. M. S. Y. Lau, A. Becker, W. Madden, L. A. Waller, C. J. E. Metcalf, and B. T. Grenfell, “Comparing and linking machine learning and semi-mechanistic models for the predictability of endemic measles dynamics,” <i>PLOS Computational Biology</i>, vol. 18, no. 9, pp. 1–14, Sep. 2022, Full Paper.6. M. D. Cherne, A. B. Gentry, A. Nemudraia, <i>et al.</i>, “Severe acute respiratory syndrome coronavirus 2 is detected in the gastrointestinal tract of asymptomatic endoscopy patients but is unlikely to pose a significant risk to healthcare personnel,” <i>Gastro Hep Advances</i>, vol. 1, no. 5, pp. 844–852, 2022, Full Paper.7. A. Hoegh, A. Peel, W. Madden, M. Ruiz-Aravena, A. Morris, A. Washburne, and R. Plowright, “Estimating viral prevalence with data fusion for adaptive two-phase pooled sampling,” <i>Ecology and Evolution</i>, vol. 11, Sep. 2021, Full Paper.8. W. Rogers, M. Ruiz-Aravena, D. Hansen, <i>et al.</i>, “High-frequency screening combined with diagnostic testing for control of sars-cov-2 in high-density settings: An economic evaluation of resources allocation for public health benefit,” <i>medRxiv</i>, 2021, Under Review.	
INVITED PRESENTATIONS	Mechanism-Integrated Machine Learning for Infectious Disease Dynamics Prediction High Meadows Environmental Institute Workshop On the Accuracy (and Niceness) of Prediction: from Epidemics to Climate and Weather Princeton, NJ	Oct 2024
	Machine Learning Approaches for Epidemic Modeling Princeton Serology Conference Princeton, NJ	Mar 2023
	Compartmental Models: Deterministic & Bayesian Approaches Rocky Mountain Data Science Bozeman, MT	Nov 2020

	R Studio in Action - DataFest Montana ASA Chapter Meeting Bozeman, MT	Oct 2018
CONTRIBUTED TALKS & POSTERS	Neural Network Reveals Gravitational Coupling of Endemic Measles Dynamics Epidemics9 [Poster] Bologna, Italy	Dec 2023
	Bias-Correcting Daily Satellite-Retrieved AOD for Air Quality Research EnviBayes Workshop [Poster] Fort Collins, CO	Sep 2023
INVITED PANELS	Machine Learning Panel CIDMATH Retreat Atlanta, GA	Mar 2024
PROFESSIONAL EXPERIENCE	Los Alamos National Laboratory Applied Machine Learning Research Fellow <ul style="list-style-type: none"> Developed deep learning methods for high energy density experiments. Designed and implemented PyTorch model fitting pipelines for use on high performance computing clusters. Bozeman Disease Ecology Lab Statistician <ul style="list-style-type: none"> Researched spatio-temporal data integration techniques for viral surveillance and prediction. Provided statistics & machine learning consulting for international team of scientists. Developed R packages to automate routine statistical analysis, visualization, and wrangling. Designed and implemented SQL database and data pipelines, ensuring data quality and access. Weyerhaeuser Statistics Intern <ul style="list-style-type: none"> Implemented machine learning models aimed at lowering defects in industrial processes, after diagnosing issues through exploratory visualization and analyses. Formulated mixed-model experimental designs. Developed Shiny web applications to automate data cleaning/wrangling workflows. Accenture Analyst <ul style="list-style-type: none"> Improved loan approval processes through analysis of credit profiles. 	Los Alamos, NM May 2024 – Aug 2024 Bozeman, MT Jan 2019 – Jul 2021 Seattle, WA May 2018 – Aug 2018 Sacramento, CA Jul 2016 – Apr 2017
CONSULTING & COLLABORATION EXPERIENCE	Collaborator Statistical Consulting And Research Services (SCRS) Department of Mathematical Sciences, Montana State University Volunteer Statistics Without Borders (SWB) Under direction of Dr. Nicole Carnegie, Montana State University	Aug 2018 – Dec 2018 Jan 2018 – Apr 2018
TEACHING	Teaching Assistant Introduction to Machine Learning for ID Modeling Summer Institute in Statistics and Modeling in Infectious Diseases, Emory University Instructor, Creator Neural Networks with PyTorch Tutorial	Summer 2024 Spring 2023 – Fall 2024

	Department of Biostatistics and Bioinformatics, Emory University	
	Teaching Assistant	<i>Fall 2022 – Spring 2024</i>
	INFO 534 - Applied Machine Learning	
	Department of Biostatistics and Bioinformatics, Emory University	
	Instructor	<i>Fall 2017 – Fall 2018</i>
	MATH 105 - Contemporary Mathematics	
	Department of Mathematical Sciences, Montana State University	
AWARDS	Patel-Naik Award (2 nd Place), Emory University	<i>Dec 2023</i>
	Outstanding Graduate Student Award, Montana State University	<i>May 2019</i>
	Excellence in Data Visualization, ASA Data Fest - Montana State University	<i>Apr 2018</i>
SERVICE	Emory BIOS Student Council, Pre-quals Representative	<i>Spring 2022 – Present</i>
	Georgia Statistics Day 2024 , Student Volunteer	<i>Oct 25th, 2024</i>
	Georgia Statistics Day 2021 , Student Volunteer	<i>Oct 11th, 2021</i>
	Bozeman Environmental Statistics Group, Member	<i>2019 – 2021</i>
	American Statistical Association Student Chapter at Montana State, Treasurer	<i>2018 – 2019</i>
MEMBERSHIP	American Statistical Association	