Jacob Gareis

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Education

Virginia Tech August 2025–December 2026
M.S. in Statistics, Jean D. Gibbons Fellow
GPA of 3.8, Gibbons Star Award Recipient

Winona State University 2022–2025
B.S. in Statistics, Minors: Data Science, Mathematics
GPA of 3.8, Distinguished Graduate

Professional Experience

Statistical Consultant, Statistical Applications & Innovations Group May 2026 – Present
- Served roughly ten clients in formal collaborations, plus recurring one-off consultations on study design and analysis questions, with contributions acknowledged in resulting publications.
- Developed a 2.5-hour short course on unsupervised learning methods, available in both R and Python and offered through SAIG both in-person and online.
- Partnered with the Occoquan Watershed Monitoring Laboratory to analyze chemical concentrations in water samples and design experiments that quantify sources of measurement variability.
- Built time-to-event models with a veterinary researcher to estimate when calves progress to disease requiring antibiotics, and identified additional diagnostics predictive of pneumonia onset and progression.

Solutions Analyst, Fastenal August 2024 – June 2025
- Built an LLM + machine learning pipeline that classified recurring ServiceNow ticket requests, adapted the template SQL scripts, and prompted the analyst to approve results before returning them through the ServiceNow API.
- Developed a stock-restock optimization algorithm that forecasts demand from historical trends, seasonality, and holiday effects to minimize downtime.
- Wrote SQL scripts to unify previously disparate databases and created Power BI dashboards to allow self-service of information frequently requested of my team.

Statistical Consultant, Semcac August 2023 – December 2024
- Coauthored Semcac's 2024 Community Needs Assessment, a 100-page report that helps set organizational strategy and resource allocation across a three-year planning cycle.
- Designed and administered a QuestionPro survey across the seven Minnesota counties Semcac serves, combining responses with American Community Survey data using R and Excel to build a picture of community need.
- Compared need against existing program coverage county by county, identifying where current programs offered aligned with demand and where needs were left unmet.

Data Analyst Intern, Marine Credit Union January 2024 – June 2024
- Assisted in developing a next-best-action system that used available member information at the time of in-branch service to recommend which product, service, or form of support a teller should offer.
- Modeled probability of default on loan payments to proactively identify individuals in need of additional support and built propensity models to identify members best positioned for additional product offerings.
- Built and maintained Power BI dashboards and internal reporting for the finance and human resources teams.

IT Analyst Intern, Marine Credit Union August 2023 – December 2023
- Supported fraud investigations by retrieving surveillance footage from the credit union's aging SecureGuard system, coordinated vendor technicians through recurring hardware and software failures, and served on the committee that selected a modern replacement.

- Audited internal password security using Haschcat and followed up directly with employees who had weak passwords to bring them into compliance.
- Coordinated a company-wide rollout of new photo identification badges, handling design, printing, and access credentialing for every employee.

Research Experience

Researcher, Virginia Tech Department of Statistics September 2025 – Present

- Lead research modeling human trafficking counts in the U.S., combining FBI NIBRS incident data, American Community Survey covariates, and Office of Refugee Resettlement unaccompanied children records.
- Developed Bayesian spatiotemporal models in R for quasi-sparse count data, using global-local shrinkage priors to detect localized hotspots without oversmoothing.
- Authored the transformations, compositional modeling, and model evaluation sections of a literature review on high-dimensional compositional data analysis..

Researcher, Winona State Biology Department September 2023 – Present

- Conducted the analysis and produced a manuscript identifying five unique bacterial community types across eleven Yamuna and Mississippi River sites through k-means clustering, using SIMPER to identify the 29 taxa that separate them.
- Correlated indicator data against eight land-cover classes at three nested spatial scales, controlling for false discovery rate, to establish that watershed-scale land cover drives community composition.
- Assisted in delineating upstream watersheds for 11 river sites in ArcGIS from HydroSHEDS elevation data and derived an eight-class Sentinel-2 land-cover composition at three nested buffer sizes.
- Assisted in statistical analysis and writing of a published manuscript comparing bacterial diversity across the two river systems, applying PCA, Shannon and Simpson diversity indices, and ANOVA with Tukey HSD.

Summer Researcher, Southern Methodist University Summer 2024

- Built a Python Dash application that narrows the search area for agricultural labor trafficking sites, converting a survivor's escape location, travel time, and reported crop into a map of candidate farms from CroplandCROS imagery and OpenStreetMap road data.
- Refined the tool iteratively based on feedback from contacts at the Texas Attorney General's Office and the Homeland Security North Texas Trafficking Task Force.
- Placed second among forty presenters at the program's summer symposium, with the application entering the SMU Human Trafficking Data Research team's software stack, where it remains in use.

Publications

Martinez, O., Bergen, S., & **Gareis, J.** (2024). *Comparison of Yamuna (India) and Mississippi River (United States of America) bacterial communities reveals greater diversity below the Yamunotri Glacier.*

Gareis, J., Keglovitz, C., Schwob, M., & Datta, J. (2026). *Open Problems in High-Dimensional Compositional Data Analysis.* (Manuscript submitted and awaiting review, preprint available on my website)

Gareis, J., Martinez, O., Bergen, S., Blumentritt, D., & Olsen, C. (2026). *Bacterial community fingerprints as bioindicators of watershed land cover.* (Manuscript submitted and awaiting review, preprint available on my website)

Cristadoro, K., Hooks, T., & **Gareis, J.** (2026). *Personality Trait–Driven Vulnerabilities to Anxiety and Social Media Addiction in Adolescent Females.* (Awaiting revisions from other authors)