Sara E. Hansen

Researcher and Data Professional

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I am a researcher and data professional specializing in the integration of multiple streams of data to generate insights and inform decisions. I have eight years of progressive experience managing databases, conducting data exploration and statistical analysis, coordinating cross-disciplinary projects, and communicating actionable results to diverse audiences of stakeholders through reports, visualizations, presentations, and more.

ACADEMIC PREPARATION

Ph.D. Earth and Ecosystem Science, Central Michigan University 2025

For the Dissertation: **Integrating data science into applied ecology for the conservation of biodiversity**

B.S. Ecology, Evolution, and Biodiversity (with Distinction), University of Michigan 2019

KEY SKILLS

Data collection, entry, cleaning, and processing
Addressing data requests via queries and professional reports
Statistical data analysis, including machine learning
Data visualization via tables, maps, graphs, and dashboards
Technical and non-technical presentations and publications
Project, grant, and budget management
Meeting and survey facilitation

KEY TECHNOLOGIES

R programming language
Structured Query Language (SQL)
Tableau
ESRI ArcGIS
GitHub
Microsoft Excel, Access, Word, and PowerPoint
Google Sheets, Docs, Slides, and Forms
Meeting and collaboration platforms (Zoom, Teams, WebEx)

PROFESSIONAL EXPERIENCE

Graduate Research Assistant, Central Michigan University 8/2020 – 5/2025

Research: I have been involved in the conceptualization, planning, and implementation of several multi-organizational research projects, which have resulted in published papers, data sets, code sets, and graphics. I facilitate meetings and maintain regular communication with collaborators via emails, reports, presentations, and surveys. I co-lead a collaborative, data-driven strategic planning project to inform on-the-ground conservation actions in southern Michigan.

Database Management: I designed and maintain several databases housing over 160,000 standardized relational records. I streamlined data and metadata collection and integration, including establishing a field data collection protocol that reduced pre-processing errors by 50%. I perform data entry and quality control, communicating with data providers and users to ensure data integrity and usability are maximized.

Data Analytics: I employ data queries, exploratory data analysis, and hypothesis testing techniques to transform data into information. I improved the efficiency and reproducibility of an annual analysis protocol, which has been applied and reported to local and federal agencies every year since 2021. I coordinate timelines across projects and teams to ensure information needs and deadlines are consistently met.
Machine Learning: I engineered a reproducible study that brought together diverse data sources and incorporated data exploration into machine learning to improve model interpretability. Several models in the study achieved greater than 90% Sensitivity and Specificity and less than 0.1 Mean Absolute Error (possible range = 0 – 1), demonstrating the strengths of conscientious, data-informed modeling pipelines.
Communication: I present my work at team workshops and international conferences, develop training and outreach materials, and prepare technical and non-technical reports. My goal is to make knowledge accessible for experts and learners alike, embracing a diversity of backgrounds, identities, and areas of expertise.

Entomology and Plant Disease Intern, Dow Gardens 5/2017 – 8/2017

Field Data Collection: I designed and executed a plant disease tracking project to inform integrated pest management and contribute to an existing pathogens database.
Public Engagement: I interfaced with community members of all ages through events, tours, and front desk customer support to share knowledge and ensure safety.

Research Assistant, University of Michigan 10/2016 – 5/2017

Data Quality Control: I aggregated, cleaned, and visualized publicly available nutrient data to inform watershed modeling. My work was showcased at the Undergraduate Research Opportunity Program's Annual Research Symposium in 2017.

CERTIFICATIONS AND PROFESSIONAL DEVELOPMENT

NASA Open Science 101 Training, Don't Use This Code 2025
Data Science Professional Certification, DataCamp 2024
Faculty Mentoring Network, Ecological Society of America
and Biodiversity Literacy in Undergraduate Education 2023
Advanced Geospatial Analysis, Institute for Modeling Collaboration and Innovation 2021
Open Standards for the Practice of Conservation, Center for Wildlife Studies 2020

SELECTED WORKS

Hansen, S.E., R. Ewing, D.L. Linton, and A.K. Monfils. 2025. The Process of Science: Introduction to Ecosystems, Conservation, and Team Science (Version 1.0). Biodiversity Literacy in Undergraduate Education, QUBES Educational Resources. http://dx.doi.org/10.25334/B1EF-HM78 (327 total views; 130 total downloads)

Hansen, S.E., M.J. Monfils, R.A. Hackett, R.T. Goebel, and A.K. Monfils. 2024. Data-centric species distribution modeling: Impacts of modeler decisions in a case study of invasive European frog-bit. *Applications in Plant Sciences* 12: e11573. https://doi.org/10.1002/aps3.11573

Hansen, S.E., A.K. Monfils, and D.L. Linton. 2023. Building biodiversity datasets for invasive species. *Teaching Issues and Experiments in Ecology* 19: 3. https://tiee.esa.org/vol/v19/issues/data_sets/hansen/abstract.html

Hansen, S.E., B.C. Cahill, R.A. Hackett, M.J. Monfils, R.T. Goebel, J.A. Macklin, S. Asencio, and A.K. Monfils. 2022. Aggregated occurrence records of invasive European frog-bit (*Hydrocharis morsus-ranae* L.) across North America. *Biodiversity Data Journal* 10: e77492. https://doi.org/10.3897/BDJ.10.e77492

Hardisty, A., L. Ellwood, G. Nelson, B. Zimkus, J. Buschbom, W. Addink, R.K. Rabeler, J. Bates, A. Bentley, J. Fortes, **S.E. Hansen**, J. Macklin, A. Mast, J. Miller, A.K. Monfils, D.L. Paul, E. Wallis, and M. Webster. 2022. Digital Extended Specimens: Enabling an extensible network of biodiversity data records as integrated digital objects on the Internet. *BioScience*: biac060. https://doi.org/10.1093/biosci/biac060