

Carl Stenoien

A results-driven and collaborative scientist committed to making a positive impact on humanity and our planet. Adept at engaging diverse stakeholders and leveraging knowledge of ecology, environmental science, climate change mitigation and adaptation strategies to generate new insights and solutions for a sustainable future.

EDUCATION

Ph.D., University of Minnesota, Ecology, Evolution, and Behavior Graduate Program. St. Paul, MN.

B.A., Gustavus Adolphus College, Biology, *summa cum laude*. Minor: Neuroscience. St. Peter, MN.

PROFESSIONAL EXPERIENCE

Climate Change Research Scientist, *Minnesota Pollution Control Agency* *September 2023 - Present*

- Develop and conduct a research program to support greenhouse gas mitigation planning work of the agency and other state agencies, with a special focus on natural and working lands.
- Develop greenhouse gas emissions and sequestration estimation improvement activities, tools, and methods to inform agency and state policy initiatives.
- Provide climate and greenhouse gas guidance and technical assistance to other MPCA divisions, other state agencies, and interested parties.

Senior Research Analysis Specialist, *Minnesota Pollution Control Agency* *April 2021 – September 2023*

- Collect, transform, visualize, analyze, model, and communicate data using data science tools. Design and execute complex analyses to provide high-level decision support to program staff and senior agency management for statewide, regulatory, environmental, and organizational performance evaluation and improvement.
- Build analytical capacity across the agency by increasing adoption of innovative, rigorous data analysis tools and methodologies within agency programs. Identify and advance data integration opportunities in agency programs.
- Bring my expertise, talent, and energy to special projects and committees, including the MPCA Climate Adaptation Team, MDH-MPCA Interagency PFAS Team, PFAS Lateral Team, Watershed GIS Lateral Team, and Sustainability Team
- Select accomplishments include:
 - Partnered with the University of Minnesota and MNDNR to gain access to downscaled climate projections and historic climate data. Developed an interactive tool to enhance agency-wide climate adaptation efforts
 - Developed multiple public-facing interactive map and data visualization platforms for air emissions
 - Provided constructive peer review of public-facing GHG Emissions workbook on Tableau Public
 - Created an internal tool to assess the environmental risks of tanks based on location and characteristics
 - Four Voyageur Award nominations for development of public-facing Climate Change and Surface Waters Dashboard, leadership of an agency-wide R software training, leadership of internal sustainability initiatives, and data analysis and tool development for the feedlots program
 - Completion of the MPCA's 2021 Leadership Academy

Research Analysis Specialist, *Minnesota Pollution Control Agency* *April 2020 – April 2021*

- Led and facilitated complex, broad-based, and agency-wide program evaluation, data management, and data analysis projects with an emphasis on the development, execution, and communication of statistical and visual data analysis.
- Select accomplishments include:
 - Partnership with the Surface Water Monitoring Section to create a comprehensive, innovative, public-facing data tool showing the varied effects of climate change on Minnesota's surface waters
 - Creation of a streamlined, public-facing data visualization tool for the GreenStep Cities Program
 - Development of an intuitive data dashboard for the commissioner's office and MPCA legal team regarding high-profile public information requests
 - Collaboration with MNIT@MPCA to create or improve portions of multiple enterprise databases
 - Implementation and analysis of program plan surveys

Postdoctoral Research Associate, *University of Minnesota, Dept. of Entomology* *March 2018 – April 2020*

- Conceived of, designed, and carried out lab and field studies to elucidate the overwintering ecology of parasitic wasps, which attack a major agricultural pest, the soybean aphid. The knowledge generated allows for better management of these beneficial insects and helps to reduce insecticide applications and greenhouse gas emissions.
- Awarded Rapid Agricultural Response Fund (co-authored with George Heimpe), ~\$1,200,000.

Research Scientist, *Monarch Joint Venture*

October 2017 – March 2018

- Leveraged my skills as a data scientist and knowledge of monarch butterfly biology to collaborate on various research projects and conservation efforts related to conservation and land management.

Contract Scientist, *The Environmental Defense Fund & Environmental Incentives* December 2015 – May 2017

- Provided consultation and expertise in the development of a habitat quantification tool for use in an incentives-based exchange program to create, maintain, and restore monarch butterfly habitat across Eastern North America.
- Led the Monarch Lab efforts to build the ecological model, co-authored several documents, field tested the habitat quantification tool, and worked with external reviewers to create the best possible products.

Graduate Research Fellow, *University of Minnesota, Dept. of Ecology, Evolution & Behavior* September 2012 – July 2017

- Utilized field and lab-based experiments to study the ecology, evolution, and behavior of host-parasitoid interactions to gain a better understanding of multiple factors in the evolution of parasitoid host range.
- Employed citizen science data and statistical modeling to study the conservation of monarch butterflies, especially regarding current agricultural technologies and practices including GMOs and pesticides.
- Awarded University of Minnesota Doctoral Dissertation Fellowship, \$36,000.
- Awarded National Science Foundation Graduate Research Fellowship, \$145,000.

Lecturer and Teaching Assistant, *University of Minnesota & University of St. Thomas* September 2012 – May 2016

- Instructed five undergraduate courses, twice as the instructor of record. Presented twelve guest lectures for various undergraduate and K-12 science teacher courses on topics including agricultural biotechnology, and citizen science.

Field Crew Member, *AmeriCorps: Conservation Corps Minnesota* June 2011– November 2011

- Contracted with various NGOs and governmental agencies to perform habitat restoration and wildland management.

RELEVANT EXPERIENCE AND SKILLS

- Extensive experience working and collaborating on large and complex datasets originating from internal MPCA databases including TEMPO, EQuIS, and CORE_WU as well as publicly available repositories, citizen science projects, and various ecological field and lab experiments.
- Extensive data management, analysis, and visualization experience using SQL, Tableau, R and RStudio (data management, statistical methods, and data visualization using *ggplot2*), Microsoft Office Suite, including Excel (VLOOKUP, pivot tables, data visualization).
- Significant experience using SQL, Snap Surveys, Microsoft Access, ArcMap, and ArcGIS Pro, and ArcGIS Online.
- Statistical expertise in generalized-linear models, generalized linear mixed models, and non-parametric methods.
- Skilled verbal and written communicator of science with diverse internal and external audiences of varied expertise.
- Consistently able to leverage interpersonal, organizational, and priority management skills to maximize collaborations, quickly gain understanding of the MPCA's scope of work and processes, and provide relevant, clear, and concise reporting tools.

SELECTED PUBLICATIONS (12 peer-reviewed publications)

- Stenoien CM, Christianson L, Welch K, Dregni J, Hopper KR, Heimpel GE (*In press*). Cold tolerance and overwintering survival of *Aphelinus certus* (Hymenoptera: Aphelinidae), a parasitoid of the soybean aphid (Hemiptera: Aphididae) in North America. *Bulletin of Entomological Research*.
- Stenoien CM, Nail KR, Meyer RM, Zalucki MP, Oberhauser KS (2019). Does chemistry make a difference? Milkweed butterfly sequestered cardenolides as a defense against parasitoid wasps. *Arthropod-Plant Interactions*. doi: 10.1007/s11829-019-09719-7
- Stenoien CM, Nail KR, Zalucki J, Perry H, Oberhauser KS, Zalucki M (2018) Monarchs in Decline: A Collateral Landscape Level Effect of Modern Agriculture. *Insect Science*. doi: 10.1111/1744-7917.12404

SELECTED PRESENTATIONS (>50 presentations at scientific symposia, conferences, and internal events)

- Stenoien CM, Gorton, A. The future climate of Minnesota: Overview of climate projection data and draft of new tool. MPCA Climate Adaptation Team Meeting. April 19, 2023.
- Stenoien CM. The impacts of climate change are reflected in Minnesota's surface waters. Water and Watersheds Conference. January 26, 2022.
- Stenoien CM, Christianson LDE, Welch K, Hopper K, Heimpel GE. Investigations of the ecology and physiology of the overwintering biology of *Aphelinus certus*, an adventive parasitoid of soybean aphid in North America. Sixth International Entomophagous Insects Conference, Perugia, Italy. September 13, 2019.
- Stenoien CM, Pleasants J, Nail KR, Zalucki M, Oberhauser KS. Herbicide tolerant crops implicated in declining monarch butterfly population. Symposium titled "Genetically Modified Crops and Conservation" at the International and European Congresses for Conservation Biology. Montpellier, France. August 4, 2015.

REFERENCES

Paul Pestano, Former Supervisor - Supervisor of the Technical Services Unit, Remediation Division, Minnesota Pollution Control Agency

Dr. George Heimpel, Post-Doctoral Advisor – Distinguished McKnight University Professor, University of Minnesota. 612-624-3480, heimp001@umn.edu

Dr. Karen Oberhauser, PhD Advisor – Professor and Director of the UW- Arboretum. University of Wisconsin-Madison. 608-262-2748. koberhauser@wisc.edu