

# JACOB WITTMAN

I am a quantitative invasion entomologist specializing in experimental design, statistical inference, communication, and teaching. I am seeking a data scientist role which makes use of my experience managing complex ecological projects, collaborating across disciplines with varied stakeholders, and connecting my analysis to practical management outcomes.

## PROJECTS

Current  
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2019

- **Evaluating anisotropy in the spread of emerald ash borer (PhD)**  
University of Minnesota  Saint Paul, MN

- Modeled the spread of emerald ash borer across North America using generalized additive models and simultaneous autoregressive models.
- Model predictions will be used by managers in North America to assess when emerald ash borer will spread to their communities and plan management tactics accordingly.

2021  
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2018

- **Estimating the range of attraction of a sex-pheromone used in traps to detect emerald ash borer (PhD)**  
University of Minnesota  Saint Paul, MN

- Designed experiments using novel trapping arrangement and analyzed data with non-linear Bayesian regression to determine the attraction radius of a sex pheromone was 90 feet.
- Communicated results at two international conferences, one of which was awarded a President's Prize for best graduate student presentation, and in a peer-reviewed journal article.
- Results are used by invasive species managers to deploy efficient trapping networks in ports and cities globally.

2020  
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2018

- **Forecasting overwintering mortality of a biological control agent in North America (PhD)**  
University of Minnesota  Saint Paul, MN

- Assessed the cold tolerance of a parasitic wasp used via laboratory and field experiments.
- Forecasts of overwintering mortality of this wasp across the USA and Canada using generalized estimating equations will be used for targeting effective release locations.

2018  
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2016

- **Determining the efficacy of regulatory requirements on limiting the spread of *Lymantria dispar* (MS)**  
University of Minnesota  Saint Paul, MN

- Evaluated the efficacy of regulatory requirements in lumber yards designed to reduce the spread of the invasive moth *Lymantria dispar* through careful experimentation.
- Demonstrated evidence from generalized linear regression and Monte Carlo simulations to regulatory bodies that current requirements were sufficient to reduce inadvertent movement of this insect.

## EDUCATION

Current  
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2018

- **PhD, Entomology (graduate minor Biostatistics)**  
University of Minnesota  Saint Paul, MN

- Dissertation: Addressing outstanding questions related to the management of emerald ash borer *Agrilus planipennis* (Coleoptera: Buprestidae)
- Relevant coursework: Biostatistical Inference, Statistical Methods for Correlated Data, Biostatistical Modeling and Methods, Statistical Learning and Data Mining, Data Management for Biologists, Introduction to Bayesian Analysis, Spatial Biostatistics

## CONTACT

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-  [github.com/wittja01](https://github.com/wittja01)
-  [linkedin.com/in/wittja01](https://linkedin.com/in/wittja01)
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-  [wittja01](https://twitter.com/wittja01)

## SKILLS

- R
- R Shiny Dashboards
- git
- Machine learning
- Experimental design and inference
- Bayesian and Frequentist statistical methods
- High Performance Computing
- Basic Python
- Basic SQL

Made with the R packages  
[pagedown](#) and [datadrivencv](#).

Last updated on 2022-01-13.

2018  
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2016

● **MS, Entomology**  
University of Minnesota

📍 Saint Paul, MN

- Thesis: Effects of host type and food deprivation on the movement behavior of late-instar larvae of gypsy moth *Lymantria dispar* (Lepidoptera: Erebidae)
- Relevant coursework: R for Natural Resource Sciences, Advanced R Programming, Statistics for Ecologists, Spatial and Temporal Analyses

2012  
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2008

● **BS, Biology, Environmental Studies (minor Secondary Education)**  
Luther College

📍 Decorah, IA

## ≡ PUBLICATIONS

2021

● **Forecasting overwintering mortality of *Spathius galinae* in North America**

*Biological Control* 160: 104694

J. Wittman, B. Aukema, J. Duan, and R. Venette

2021

● **Optimizing early detection strategies: defining the effective attraction radius of attractants for emerald ash borer *Agrilus planipennis* Fairmaire**

*Agricultural and Forest Entomology* 23(4): 527 – 535.

J. Wittman, P. Silk, K. Parker, and B. Aukema

2020

● **A guide and toolbox to replicability and open science in entomology.**

*Journal of Insect Science* 20(3): 1 – 9.

J. Wittman and B. Aukema

2020

● **Rail transport as a vector of emerald ash borer**

*Agricultural and Forest Entomology* 22(1): 92 – 97.

M. Short, K. Chase, T. Feely, A. Kees, J. Wittman, and B. Aukema

2020

● **Factors associated with diversity and distribution of buprestid prey captured by foraging *Cerceris fumipennis* (Hymenoptera: Crabronidae)**

*Environmental Entomology* 49(6): 1363 - 1373.

M. Hallinen, J. Wittman, and B. Aukema

2019

● **Foliage type and deprivation alters the movement behavior of late instar European gypsy moth *Lymantria dispar* (Lepidoptera: Erebidae)**

*Journal of Insect Behavior* 32(1): 25 – 37.

J. Wittman and B. Aukema

2019

● **A comparison of adult butterfly communities on remnant and planted prairies in northeast Iowa**

*Journal of the Lepidopterists' Society* 73(4).

E. Stivers, J. Wittman, and K. Larsen

2019

● **Characterizing and simulating the movement of late-instar gypsy moth (Lepidoptera: Erebidae) to evaluate the effectiveness of regulatory practices**

*Environmental Entomology* 48(3): 496 - 606.

J. Wittman, R. Nicoll, S. Myers, P. Chaloux, and B. Aukema

2017

● **Butterfly surveys are impacted by time of day**

*Journal of the Lepidopterists' Society* 71(2): 125 – 129.

J. Wittman, E. Stivers, and K. Larsen

2013

- Evaluation of land use and water quality in an agricultural watershed in the USA indicates multiple sources of bacterial impairment  
*Environmental Monitoring and Assessment* 185(12): 10395 – 10420.  
J. Wittman, A. Weckwerth, C. Weiss, S. Heyer, J. Seibert, B. Kuennen, C. Ingels, L. Seigley, K. Larsen, J. Enos-Berlage

## INVITED PRESENTATIONS

2019

- What You Eat Affects How You Move: Links Between Caterpillar Behavior and Gypsy Moth Management.  
Annual Gypsy Moth Review
  - J. Wittman, R. Nicoll, S. Myers, P. Chaloux, and B. Aukema
  - Seattle, WA, USA

2016

- Evaluating the effectiveness of buffer zone practices in preventing the spread of gypsy moth (*Lymantria dispar*)  
Gypsy Moth Program Advisory Committee Meeting
  - J. Wittman, P. Chaloux, D. Lance, and B. Aukema
  - Saint Paul, MN, USA

2016

- I Would Walk 500 Miles: Orientation and Movement Potential of Gypsy Moth Larvae in a Simulated Lumber Yard  
Annual Gypsy Moth Review
  - J. Wittman, P. Chaloux, D. Lance, and B. Aukema
  - Cleveland, OH, USA

## CONTRIBUTED PRESENTATIONS

2021

- Forecasting overwintering mortality of *Spathius galinae* in North America  
North American Forest Insect Working Conference
  - J. Wittman, B. Aukema, J. Duan, and R. Venette
  - Virtual

2020

- Cold tolerance and overwintering mortality of *Spathius galinae* in Minnesota  
Upper Midwest Invasive Species Conference
  - J. Wittman, R. Venette, J. Duan, and B. Aukema
  - Virtual

2020

- Estimating the effective attraction radius of a short-range sex pheromone of emerald ash borer (*Agrilus planipennis*) in baited traps  
Entomological Society of America National Meeting
  - J. Wittman, K. Parker, P. Silk, and B. Aukema
  - Virtual

2019

- Using Bayesian statistical methods to estimate the effective attraction radius of a short-range sex pheromone of emerald ash borer in baited traps  
Entomological Society of America National Meeting
  - J. Wittman, K. Parker, K. Ryall, P. Silk, and B. Aukema
  - St. Louis, MO, USA

- 2019 ● **Replicability and open science in entomology**  
Department of Entomology Seminar, University of Minnesota  
• J. Wittman  
• Saint Paul, MN, USA
- 2019 ● **Effect of cooling rate on survival of *Spathius galinae* when exposed to sub-zero temperatures**  
North Central Forest Pest Workshop  
• J. Wittman, J. Duan, R. Venette, and B. Aukema  
• Lisle, IL
- 2018 ● **Effects of host foliage on the movement behavior of larvae of gypsy moth (*Lymantria dispar*)**  
Entomological Society of America National Meeting  
• J. Wittman, P. Chaloux, S. Myers, and B. Aukema  
• Vancouver, BC, Canada
- 2018 ● **Keeping gypsy moth where they are: Investigating how far gypsy moth larvae can move**  
Western Forest Insect Work Conference  
• J. Wittman, P. Chaloux, S. Myers, and B. Aukema  
• Denver, CO, USA
- 2017 ● **Evaluating gypsy moth (*Lymantria dispar*) larval movement potential and effective barriers limiting their movement**  
Entomological Society of America National Meeting  
• J. Wittman, S. Myers, P. Chaloux, and B. Aukema  
• Denver, CO, USA
- 2017 ● **Supporting policy with science: Are buffer zones around wood products effective at preventing the spread of gypsy moth (*Lymantria dispar*)**  
International Union of Forest Research Organizations - Forest Insects and Pathogens in a Changing Environment  
• J. Wittman, S. Myers, P. Chaloux, and B. Aukema  
• Thessaloniki, Greece
- 2016 ● **Do buffer zones prevent the spread of gypsy moth (*Lymantria dispar*)**  
Upper Midwest Invasive Species Conference  
• R. Nicoll, J. Wittman, S. Myers, D. Lance, and B. Aukema  
• La Crosse, WI, USA
- 2016 ● **Bees, butterflies, and beetles: a comparison of remnant and planted prairies in Northeast Iowa**  
Day of Insects - Iowa State University  
• J. Wittman, E. Stivers, and K. Larsen  
• Ames, IA, USA

## ■ POSTER PRESENTATIONS

- 2019 ● **Prey diversity of foraging *Cerceris fumipennis* Say (Hymenoptera: Crabronidae) and factors influencing buprestid diversity and species distributions in Minnesota**  
Entomological Society of America National Meeting  
• M. Hallinen, J. Wittman, and B. Aukema  
• St. Louis, MO, USA

- 2018
- **Developing science to support practice: Determining distances required to protect log decks from wandering gypsy moth larvae**  
United States Department of Agriculture Interagency Forum on Invasive Species
    - J. Wittman, P. Chaloux, S. Myers, and B. Aukema
    - Annapolis, MD, USA
- 2015
- **A comparison of adult butterfly communities on remnant and planted prairies in northeast Iowa**  
Entomological Society of America National Meeting
    - E. Stivers, J. Wittman, and K. Larsen
    - Minneapolis, MN, USA
- 2012
- **Exploring the Dry Run Creek watershed: molecules, microbes, and macroinvertebrates**  
Iowa Water Conference
    - J. Wittman, A. Weckwerth, J. Enos- Berlage
    - Ames, IA, USA

## TEACHING EXPERIENCE

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|----------------------|--|
| Current<br> <br>2018 | <ul style="list-style-type: none"> <li>● <b>Private R and Statistics Tutor</b><br/>Online <span style="float: right;">📍 Wyzant Tutoring</span> <ul style="list-style-type: none"> <li>• Provide individualized R and/or statistics tutoring sessions to students ranging from high school to graduate school.</li> </ul> </li> </ul>   |
| 2021<br> <br>2019    | <ul style="list-style-type: none"> <li>● <b>Guest Lecturer</b><br/>Various Locations           <ul style="list-style-type: none"> <li>• R Programming for Technology Applications (DIGA 645A), Saint Mary's University of Minnesota</li> <li>• Forest Entomology (ENT 4251), University of Minnesota</li> </ul> </li> </ul>  |
| 2020<br> <br>2019    | <ul style="list-style-type: none"> <li>● <b>Certificate: Preparing Future Faculty</b><br/>University of Minnesota <span style="float: right;">📍 Saint Paul, MN</span> <ul style="list-style-type: none"> <li>• Completed a certificate program provided by the University of Minnesota to graduate students to prepare them for teaching in higher education.</li> <li>• Used best practices in pedagogy to design instructional activities for a graduate level statistics course in which I guest taught.</li> </ul> </li> </ul>   |
| 2020                 | <ul style="list-style-type: none"> <li>● <b>Spatial and Temporal Analyses (ENT 5126)</b><br/>University of Minnesota <span style="float: right;">📍 Saint Paul, MN</span> <ul style="list-style-type: none"> <li>• Developed and delivered lectures on linear regression to graduate students. Assessed learning with brief formative and summative assessments. Assisted students with lab activities including writing R code and interpreting statistical analyses.</li> <li>• Course covered appropriate ways to analyse data with temporal or spatial structure in R.</li> </ul> </li> </ul> |
| 2018                 | <ul style="list-style-type: none"> <li>● <b>Insect Biology (ENT 1005)</b><br/>University of Minnesota <span style="float: right;">📍 Saint Paul, MN</span> <ul style="list-style-type: none"> <li>• Led one lab section of undergraduate students. Delivered lectures on topics in insect biology. Co-developed lab activities and assessments to meet course learning objectives.</li> </ul> </li> </ul>   |

Being a teacher made me a better communicator. I learned effective strategies for delivering technical material to non-technical audiences. Working with diverse groups of students over my teaching career helped me understand the importance of empathy to build constructive learning communities.

2016  
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2014

● **Science Teacher (7 - 12 grade)**

DREAM Technical Academy

📍 Willmar, MN

- Developed project-based learning curriculum which aligned student projects and interests with state learning targets and outcomes.
- Participated in faculty-led administrative structure. Served as chair of Technology Committee (2014 - 2016). Served on Personnel Committee (2014) and Facilities Committee (2015).
- Held position as 'Convener Teacher' in 2015 - 2016 school year where I led all-staff meetings, attended district and state level meetings, and monitored and reported on school progress toward state goals.



## GRANTS, HONORS, AND AWARDS

2021  
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2020

● **Doctoral Dissertation Fellowship (\$25000)**

University of Minnesota

📍 Saint Paul, MN

- Competitive university wide fellowship awarded to students in the final year of their doctoral program.

2020

● **Marion Brooks Wallace Award (\$2000)**

Department of Entomology, University of Minnesota

📍 Saint Paul, MN

- Competitive award for a PhD student conducting basic research in entomology.

2020

● **President's Prize (\$100)**

Entomological Society of America

- Award for placing first in the graduate student presentation competition.

2019

● **Council of Graduate Student Travel Grants (\$205)**

Council of Graduate Students, University of Minnesota

📍 Saint Paul, MN

- Competitive travel grant available to graduate students at the University of Minnesota.

2017  
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2016

● **McLaughlin Gormley King Fellowship (\$20000)**

Department of Entomology, University of Minnesota

📍 Saint Paul, MN

- Competitive department fellowship to support outstanding students carrying out research in the area of integrated pest management.

2013  
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2012

● **Howard Hughes Medical Institute Teacher Scientist Fellowship**

Luther College

📍 Decorah, IA

- Competitive fellowship to fund a fifth year of post-undergraduate education to complete coursework and practicum experience required for a teaching license.