

# MICHIGAN STATE UNIVERSITY

Dr. X  
Chair  
Department of X  
University of X

X, 2016

Dear Dr. X and members of the search committee,

Please accept this letter and the accompanying materials as my application for the file clerk position that is currently advertised on Craigslist. I am enthusiastic to explore the possibility of joining the faculty at your amazing university because there is lots of nice stuff to say about you if I do my homework. I am a quantitative population and community ecologist based in the Department of Integrative Biology at Michigan State University and the Kellogg Biological Station Long-Term Ecological Research Site. I have a strong publication record, teaching and supervision experience, a wide network of collaborators, and a rapidly developing independent research program. My research and teaching program is united by a central goal: to develop ways to improve scientific inference from observational data, and the application of these improvements to problems in ecology and environmental science. My current research, focussing on developing computational and data science methods to study the long-term functional dynamics of populations and communities in response to global change, is highly fundable, and my interests and skills in data manipulation, insuring data integrity, and analysis would provide me numerous teaching and collaboration opportunities within your organization and the broader community.



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Communities of organisms often contain multiple members with similar functionality. In my work, I study how these communities maintain function and diversity in response to disturbances such as invasions, and environmental and land use change using data science and modelling approaches. Much of my research uses existing, long term data, or data compiled from disparate sources, providing a natural path to collaboration. Analytically, I have a strong interest in understanding drivers of change in naturally variable and dynamic systems. As an applied ecologist, I focus on species of economic or conservation concern in my work, ensuring my findings have direct relevance to both basic science and sustainability. For example, in my work with the Kellogg Biological Station, I recently developed an information-theoretic tool for unbiased detection of regime shifts in naturally variable populations- allowing for better detection and understanding of ecological tipping points. I applied this model to an agricultural predator-pest insect system and uncovered landscape-level, multi-trophic effects associated with changing agricultural management strategies in a recent paper published in Ecological Applications. In my current work, I am using this approach, combined with citizen science observations, to identify drivers of change in declining monarch butterfly populations.

In addition to my work in North American agricultural landscapes, I maintain a diverse and active research program through collaboration and student mentorship. Via work led by students under my supervision, I contributed to research examining plant and insect responses to oak savanna management strategies in collaboration with The Nature Conservancy, and studied the bee community responses to

grasslands invaded by non-native weeds. I also served as a data analyst and student mentor on a multidisciplinary USAID project designed to improve wheat yields in food-insecure Central Asia. I was recently part of a working group that used remotely sensed vegetation data and trait databases to test the relationship between trait diversity and recovery after a catastrophic event. Our findings (2016, Global Change Biology) represent the first direct evidence that increasing trait diversity imparts greater resilience at large spatial scales.

I am an experienced and versatile instructor at both the undergraduate and graduate levels, with class sizes of 6-125, and in traditional classroom and online learning settings. In addition to experience as instructor of record for several offerings of ecology and applied ecology courses, I developed a popular quantitative research methods course for graduate students while holding a fellowship from the Mozilla Foundation in the 2015-16 academic year. I believe that the effective use of technology in training and mentorship is a key factor in broadening the participation in the sciences. I am a well-known member of the open science and reproducible research community, and have a leadership role in numerous outreach and teaching activities associated with reproducible data management and analysis. I am a certified Software Carpentry (<http://software-carpentry.org/>) instructor, and played a major role in directing and developing core curriculum for Data Carpentry, a related group which focusses on teaching data-management skills to early-career biologists.

My career goal is to develop an internationally respected research and teaching program focusing on population and community ecology in human-managed systems, with particular focus on developing an understanding of how communities of functionally important organisms respond to disturbance. X is a respected research institution which would provide me with an ideal situation for achieving my career goals. As indicated by my history of department and society service, I am eager to contribute to a collaborative and vibrant working environment at your institution.

I have attached my Curriculum Vitae, a statement of research interests, a teaching statement, and the names of several references to this letter. Please do not hesitate to contact me if you have any questions about my experience or would like to request any other materials. I thank you for your consideration, and look forward to hearing from you.

Best regards,

Christie Bahlai  
Department of Integrative Biology  
Michigan State University