

# Dr. July Pilowsky

## *Curriculum Vitae*



@ecomodeling  
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<https://github.com/japilo>

### DOCTORAL RESEARCH

#### “Revealing ecological processes of range dynamics through space and time”

In ecology, process-explicit models represent the dynamics of ecological systems as explicit functions of the mechanisms and drivers that produced them. Process-explicit models are therefore able to link observed ecological patterns, such as species spatial abundance patterns, directly to their causes, such as climate and environmental change. In my doctoral research, I showed how process-explicit models can be used to establish determinants of range collapses and extinction by unpacking complex interactions between ecological lifestyles, biological traits, climate change, and human-driven threats. By providing a more complete understanding of the ecological mechanisms that regulate species' responses to climate and environmental change, my research provides information needed to better predict vulnerability to future climate and environmental change.

### EDUCATION

2019 – 2022

THESIS SUBMITTED; DEFENSE PENDING

Biology

*University of Adelaide, Australia*

*University of Copenhagen, Denmark*

2013 – 2017

**Master of Science**

Biology

*Tufts University, Boston, USA*

2008 – 2012

**Bachelor of Arts**

Environmental Biology

*Columbia University, New York, USA*

### WORK EXPERIENCE

2023– (FT)

Cary Institute for Ecosystem Studies

**Postdoctoral Associate**

Working with Dr. Barbara Han to model transmission of disease between wildlife and humans.

2017 – 2018 (FT)

Max Planck Institute of Demographic Research

**Pre-Doctoral Fellow**

Worked with Prof. Johan Dahlgren to develop the `colorednoise` package for simulating populations with temporal autocorrelation.

2016 (PT)

Tufts University

**Research Technician**

I worked with Prof. Avery Cohn to collect, explore, and visualize data on coffee production in Central and South America in relation to changing climate.

### PUBLICATIONS

J. A. Pilowsky, A. Manica, S. Brown, C. Rahbek, and D. A. Fordham. Simulations of human migration into North America are more sensitive to demography than choice of palaeoclimate model. *Ecological Modelling*, 473(2022):110115, 2022.

J. A. Pilowsky, S. Haythorne, S. C. Brown, M. Krapp, E. Armstrong, B. W. Brook, C. Rahbek, and D. A. Fordham. Range and extinction dynamics of the steppe bison in Siberia: A pattern-oriented modelling approach. *Global Ecology and Biogeography*, 31(12):2483–2497, 2022.

J. A. Pilowsky, R. K. Colwell, C. Rahbek, and D. A. Fordham. Process-explicit models reveal the structure and dynamics of biodiversity patterns. *Science Advances*, 8(31):eabj2271, 2022.

D. A. Fordham, S. C. Brown, H. R. Akçakaya, B. W. Brook, S. Haythorne, A. Manica, K. T. Shoemaker, J. J. Austin, B. Blonder, J. A. Pilowsky, C. Rahbek, and D. Nogues-Bravo. Process-explicit models reveal pathway to extinction for woolly mammoth using pattern-oriented validation. *Ecology Letters*, 25(1):125–137, 2022.

D. A. Fordham, S. T. Jackson, S. C. Brown, B. Huntley, B. W. Brook, D. Dahl-Jensen, M. T. P. Gilbert, B. L. Otte-Bliesner, A. Svensson, S. Theodoridis, J. M. Wilmshurst, J. C. Buettel, E. Canteri, M. McDowell, L. Orlando, J. A. Pilowsky, C. Rahbek, and D. Nogues-Bravo. Using paleoarchives to safeguard biodiversity under climate change. *Science*, 369(6507):eabc5654, 2020.

J. A. Pilowsky and J. P. Dahlgren. Incorporating the temporal autocorrelation of demographic rates into structured population models. *Oikos*, 129(2):238–248, 2019.

J. A. Pilowsky and P. T. Starks. Displacement and replacement in real time: *Polistes dominula*'s impact on *P. fuscatus* in the northeastern U.S. *Biological Invasions*, 20(5):1161–1169, 2018.

S. Keen, C. D. Meliza, J. Pilowsky, and D. R. Rubenstein. Song in a social and sexual context: vocalizations signal identity and rank in both sexes of a cooperative breeder. *Frontiers in Ecology and Evolution*, 4:46, 2016.

N. Wilson-Rich, J. A. Pilowsky, B. Foo, T. Tien, F. Hester, and P. T. Starks. A test of the haploid susceptibility hypothesis using a species with naturally occurring variation in ploidy. *Insectes sociaux*, 61(2):163–169, 2014.

J. A. Pilowsky and D. R. Rubenstein. Social context and the lack of sexual dimorphism in song in an avian cooperative breeder. *Animal behaviour*, 85(4):709–714, 2013.

## TEACHING EXPERIENCE

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Osher Institute, Tufts University  
**Study Group Leader** 2014–2016

Created curricula with lectures, discussion, and activities for two classes on evolution for senior citizens. Taught curricula as month long courses for 30 senior students each year.

Department of Biology, Tufts University  
**Graduate Instructor** 2014–2015

Developed a new lab curriculum to complement a lecture course on biostatistics. Taught the lab course I developed for a class of 25 graduate and undergraduate students.

## PRESENTATIONS

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- 2021 Ecological Society of Australia  
"Simulating species range dynamics over long time scales."
- 2017 Ecological Society of America  
"The ecology of cooperation in *Polistes* wasps."

## COMPUTER SKILLS

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- LANGUAGES Developed two R / C++ packages on CRAN  
colorednoise has 33k downloads  
paleopop has 7k downloads
- GIS In my PhD I used 6TB of spatiotemporal data in  
raster and vector formats.
- WEB I code my own academic website with Ruby and CSS.

## AWARDS

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- 2021 **Ingenuity Communications Award, Runner-Up**  
*University of Adelaide*
- 2014 **Graduate Research Competition Winner**  
*Tufts University*
- 2013 **Graduate Research Fellowship**  
*National Science Foundation*

## LANGUAGES

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- CONVERSATIONAL Danish
- PROFICIENT French
- FLUENT English, Spanish