

Madeleine Anne Becker

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EDUCATION

Ph.D. Student in Biosciences, George Mason University 2020-2025
Concentration in Biocomplexity and Evolutionary Biology
Dissertation research conducted at Smithsonian Conservation Biology Institute
Dissertation topic: Channel Island *Peromyscus* Evolutionary Genomics
Advisors: Cody Edwards & Jesús Maldonado

B.S. in Biological Sciences, *cum laude*, University of Southern California 2015-2019
Minor in Classics

RESEARCH EXPERIENCE

Mammal Diversity Database Student Research Assistant 2020-Present
American Society of Mammalogists; Team Lead: Nate Upham

- Update, validate, and organize mammalian taxonomy entries, focusing on synonymies.
- Code in R and Excel to automate the collection and formatting of taxonomic data.

Graduate Student Researcher in Metagenomics 2020-2021
George Mason University; Lab Rotation Advisors: Haw Chuan Lim, Patrick Gillevet

- Assembled cecal metagenomes of the greater sage-grouse and sharp-tailed grouse.
- Implemented pipeline to analyze metagenomic bin abundance and taxonomy.

Undergraduate Researcher in Genomics 2017-2019
University of Southern California; Principal Investigator: Suzanne Edmands

- Processed island fox scat bacterial reads for quality, uniqueness; assigned taxonomy.
- Extracted bacterial DNA from fox scat samples, quantified DNA concentration, performed PCR, ran gel electrophoreses, used Ampure bead chromatography.
- Ran quality checks, trimmed, mapped exome capture reads from 96 fox individuals.

Curatorial Volunteer in Mammalogy 2018-2019
Natural History Museum of Los Angeles County; Supervisors: Kayce Bell, Jim Dines

- Paired, assembled, and aligned 69 chipmunk (*Tamias*) mitochondrial genomes and generated phylogenetic trees.
- Took tissue samples and prepared pelts, skeletons, and study skins for scientific use.

NSF National History Research Experiences (REU) Intern 2019
National Museum of Natural History, Smithsonian Institution; Mentor: Michael McGowen

- Assembled 87 mitochondrial genomes and aligned, annotated, and partitioned ~400 more from GenBank to reconstruct phylogenetic relationships among delphinine dolphins, with emphasis on the position of *Delphinus delphis* morphotypes.

Undergraduate Research Assistant 2015-2016
University of Southern California; Principal Investigator: Joseph Landolph

- Performed cytotoxicity assays determining concentrations at which cysteine and chromium (VI) are most toxic to mouse embryo cells, and which induce transformations.

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PUBLICATIONS

Adams NE, **Becker MA**, and Edmands S. (2021) Effect of Geography and Captivity on Scat Bacterial Communities in the Imperiled Channel Island Fox. *Front. Microbiol.* 12:748323. doi: 10.3389/fmicb.2021.748323

Adams NE, **Becker MA**, and Edmands S. (In preparation) Host Genetic Diversity Influences Bacterial Composition in the Island Fox, *Urocyon littoralis*.

DATASETS

Mammal Diversity Database. (2022). Mammal Diversity Database (1.8) [Data set]. Zenodo. doi: 10.5281/zenodo.5945626

GRANTS AND FELLOWSHIPS

Smithsonian-Mason School of Conservation Fellowship , \$125,000	2020-2025
American Wildlife Conservation Foundation Grant , \$2,450	2022
Cosmos Scholar Grant , \$4,489	2022
LACM Natural History Museum Student Collections Study Award , \$599	2021
George Mason University Graduate Student Travel Fund Award , \$100	2021
Summer Institute in Statistical Genetics Travel Scholarship , \$900	2020
University of Southern California Trustee Scholarship , \$213,000	2015-2019
University of Southern California University Scholarship , \$8,000	2015-2019
ASLO Multicultural Program , \$1000	2019
NSF Research Experiences for Undergraduates , \$6,000	2019
USC Women in Science & Engineering Fellowship , \$500	2019
Wattis Dumke Undergraduate Research Fellowship , \$2,000	2018

AWARDS

University of Southern California Biological Sciences SCynergy Award	2020
Award for most outstanding graduating senior pursuing biological sciences	
University of Southern California Discovery Scholar Distinction	2020
Award recognizing graduating seniors who have excelled academically while making meaningful contribution to their field of study	

CONFERENCE PRESENTATIONS

Becker MA, Vardhan D, Drovetski SV, Lim HC. Cecal Metagenomics of the Greater Sage-Grouse, Sharp-Tailed Grouse & Prairie Chicken. **American Genetics Association** President's Symposium on Conservation Genomics (hybrid virtual/Snowbird, UT, 2021)

Becker MA, Murphy KR, Charles Potter CW, Ndong I, Keith-Diagne LW, McGowen MR. Using mitogenomics to infer common dolphin taxonomy, phylogeography, and population structure. **Smithsonian Emerging Scientists' Symposium** (virtual, 2021)

Becker MA, Murphy KR, Charles Potter CW, Ndong I, Keith-Diagne LW, McGowen MR. Complete mitochondrial genomes of Delphinus show weak geographic structure and no support for long-beaked clade. 100th Annual Meeting of the **American Society of Mammalogists** (virtual, 2021)

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CONFERENCE POSTERS

Becker MA & Lim HC. Metagenomics of the Greater Sage-Grouse Cecum. **The Mason Graduate Interdisciplinary Conference** (Fairfax, VA, 2021)

Becker MA, Murphy KR, Charles Potter CW, Ndong I, Keith-Diagne LW, McGowen MR. Global Phylogeography of Delphinine Dolphins Using Mitogenomics. **The Ocean Sciences Meeting** (San Diego, CA, 2020)

Becker MA, Adams NE, Edmands S. Fecal microbial communities differ by intrinsic and extrinsic variables in *Urocyon littoralis*. 99th Annual Meeting of the **American Society of Mammalogists** (Washington, D.C., 2019)

Becker MA, Adams NE, Edmands S. Environmental Impact on Gut Microbiome Diversity in *Urocyon littoralis*. 20th **University of Southern California Undergraduate Symposium for Scholarly and Creative Work** (Los Angeles, CA, 2018)

SERVICE, LEADERSHIP & TEACHING

Student Leader & Co-Moderator, George Mason 17 Rooms Initiative 2021-Present

- Recruited and led team of faculty, alumni, and students in discussions focused on tackling UN Sustainable Development Goals for Room 15: Life on Land.
- Designed and presented Room 15 project plan at 17 Rooms Summit.
- Wrote seed-funding grant for project: a new GMU conservation class for non-majors.

Community Partner, Brambleton & Stone Hill Middle Schools 2021-Present

- Deliver interactive presentations on taxonomy to Latin II classes, teaching students about scientific Latin names and their use in biology, especially museum collections.

Reviewer, Journal of Emerging Investigators 2021-Present

- Have reviewed 10 scientific manuscripts by middle and high school student authors.

Conference Volunteer, American Society of Mammalogists 2019

- Facilitated run-for-research and mammalian genomes workshop.

Administrative Director, USC Women & Youth Supporting Each Other 2017-2019

- Mentored middle school girls, led discussions on topics such as personal identity, body positivity, social media, bullying, race, and gender.
- Organized, managed mentor attendance and performance; wrote weekly newsletter.

9th grade Latin teacher, USC Neighborhood Academic Initiative 2019

- Created lesson plans, course material with the Cambridge Latin course to teach a class of 18 local, underserved students an extracurricular Latin class on a bi-weekly basis.

OUTREACH

Secretary, Young Women in Bio: Capital Region 2021-Present

Letters to a Pre-Scientist 2021-Present

Mentor, Yes! Teen Internship Program, National Museum of Natural History 2019

The Expert is In, Outreach Day, National Museum of Natural History 2019

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WORKSHOPS AND PROGRAMS ATTENDED

Summer Institute of Statistical Genetics

University of Washington (Virtual, 2020)

Multicultural Program

Association for the Sciences of Limnology & Oceanography (San Diego, CA, 2020)

A Roadmap to the De Novo Assembly of Mammalian Genomes

American Society of Mammalogists (Washington, D.C. 2019)

Genome Annotation Workshop

National Museum of Natural History (Washington, D.C. 2019)

PROFESSIONAL ORGANIZATIONS

American Society of Mammalogists (Biodiversity Committee)	2019-Present
American Genetic Association	2021-Present
Society for the Study of Evolution	2021-Present
The Wildlife Society	2021-Present
Association for the Sciences of Limnology and Oceanography	2020-2021