

Lab Introduction

Who I am

Scientist

My name is [Connor French](#) (call me Connor) and I'm a sixth year PhD candidate in Biology- Ecology, Evolution, and Behavior! I'm advised by [Dr. Mike Hickerson](#) and unofficially co-advised by [Dr. Ana Carnaval](#). Outside of my research I enjoy spending time outside with my dog, playing music, and film photography!

Science

I study how populations, species, and communities evolve in response to changing environments. My research has mainly centered around how population sizes and connectivity change in response to large historical climate shifts across the late Pleistocene and Holocene (~129,000 years ago to the present day) and what impact this has on species and communities. Most of my research is conducted on tropical reptiles and amphibians because they are what excite me the most, but I do work on other animals and in other areas- for instance, I recently published a paper [mapping the genetic diversity of insects across the globe](#). I consider my research important because it offers a glimpse into how species and communities made it to where they are now, it provides a baseline to predict where they may go in the future, and perhaps most critically, whether they will survive into the future.

I use a combination of field work, lab work, and computational work to answer the questions I'm interested in. Because fossils are few and far between, I sequence the DNA of lizards and frogs across their current geographic ranges to understand their pasts. DNA contains the history of an organism's ancestry, and even can tell us the history of entire populations- how a population may have shrank or expanded in the past and whether they exchanged migrants with other populations. After I have collected the organisms in the field and sequenced their DNA in the lab, I analyze the data on a computer. I use everything from my personal laptop to a super computer at the American Museum of Natural History to run my analyses. I use a combination of statistics, machine learning, and simulations to tease apart the potential ecological and evolutionary forces driving the patterns that I observe.



Figure 1: A photo of a waxy monkey tree frog I sampled in the field in the Brazilian Atlantic Forest.



Figure 2: Typical habitat that I conduct field work in. A fragment of tropical forest on the edge of agricultural land in the Brazilian Atlantic Forest.

Data

In addition to DNA sequences, I use ecological information to inform my analyses. I aggregate records of where the lizards or frogs I study

Purpose of the lab

(2) use exploration and experiential problem-solving to become familiar with how scientists ask questions, collect data, and analyze it to further knowledge; and 3) develop core technological skills in Microsoft Excel and the statistical programming language R to kick-start their success in future science courses and labs and research endeavors

Learning outcomes

Semester outline

How a lab will typically go

Excel introduction

What are the components of an experiment?

How do you form a quality hypothesis?