

THE IMPORTANCE OF HUMANS IN NEOTROPICAL FOOD WEBS

A human-centered neotropical food web from published trophic interactions

Shane A. Scaggs^{*,1}, Andrew Shen², Sean S. Downey^{*,1,3,4}

*downey.205@osu.edu
*scaggs.32@osu.edu

The Human
Complexity
Lab

BACKGROUND

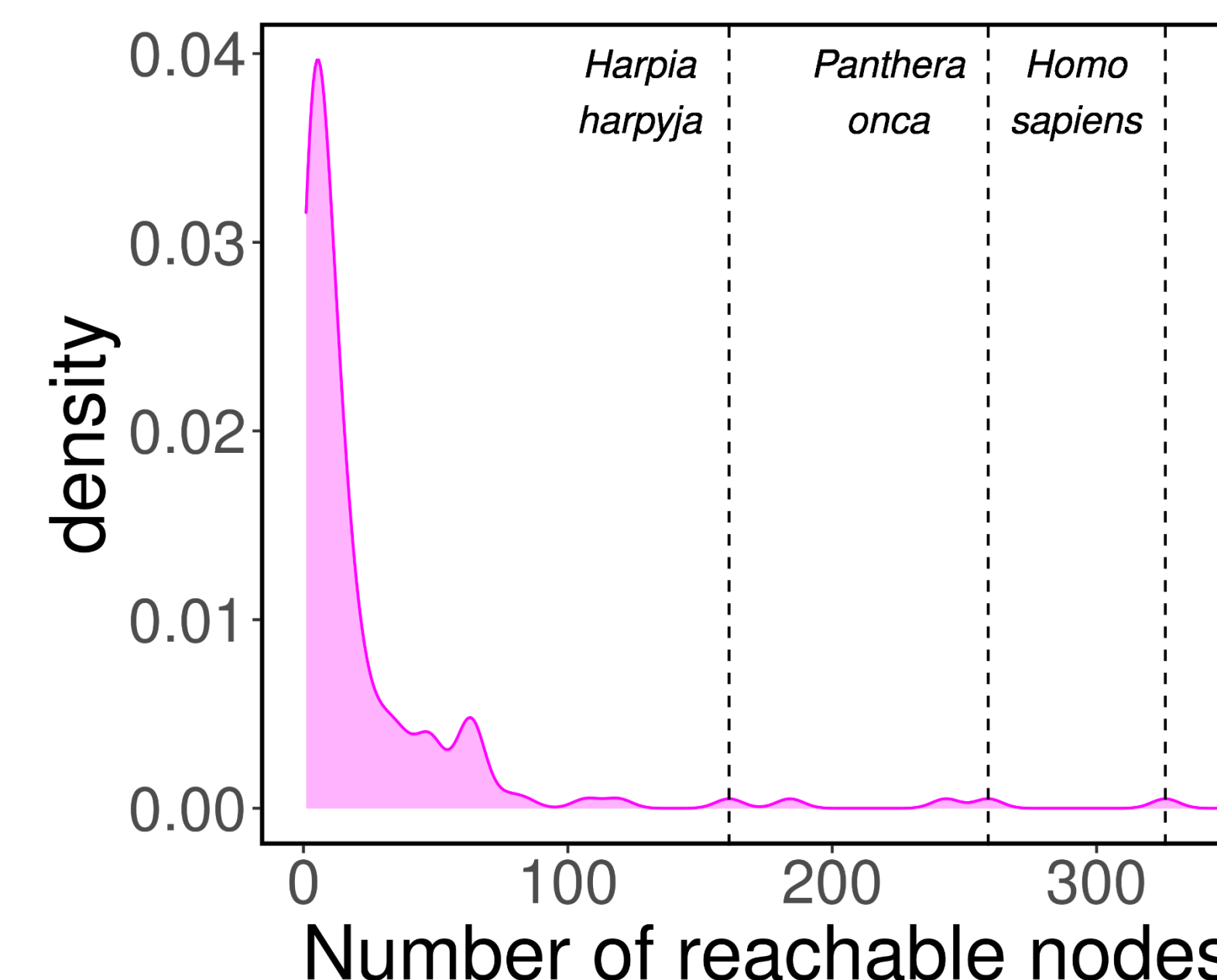
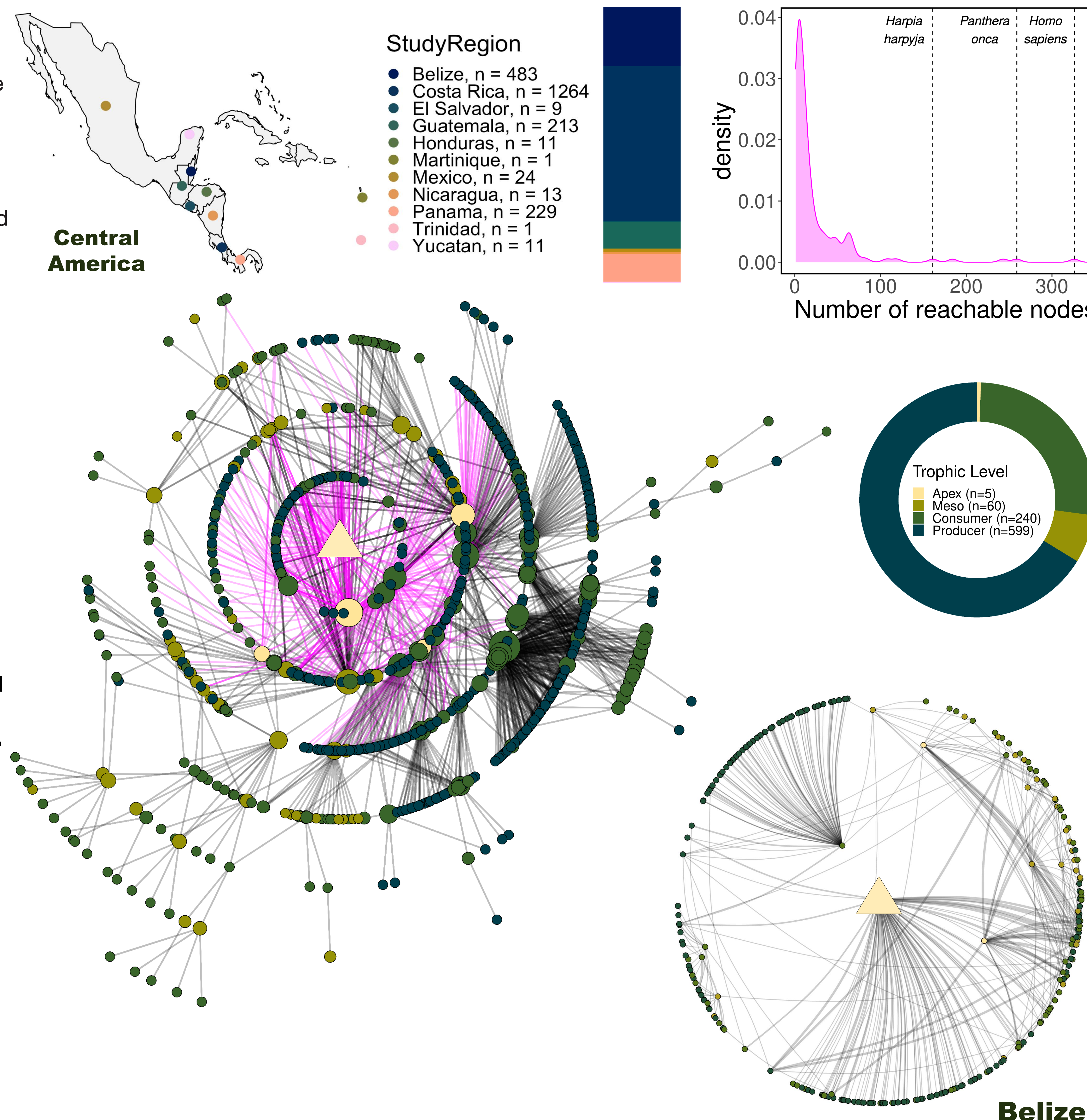
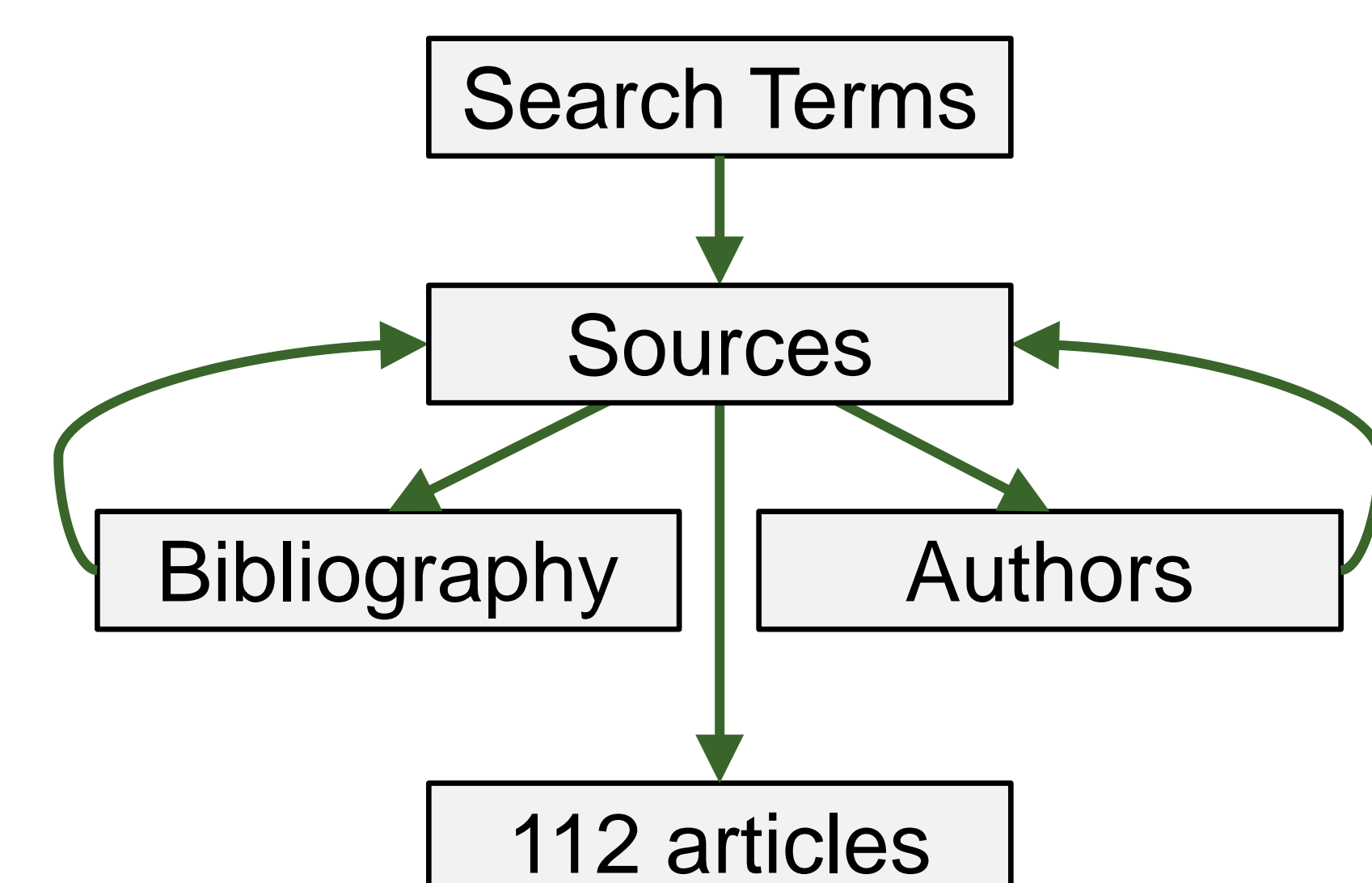
Humans are rarely included in food webs, but when they are they are assigned unique roles like superpredator¹, super generalist², or ecological engineer³. These roles signify the extraordinary indirect influences that human subsistence has on local ecosystems⁴⁻⁵; influences that have reached a global scale in the Anthropocene⁶.

RESEARCH QUESTION

We investigate the influence of Indigenous Q'eqchi' Maya subsistence on a neotropical Central American food web using published dietary studies.

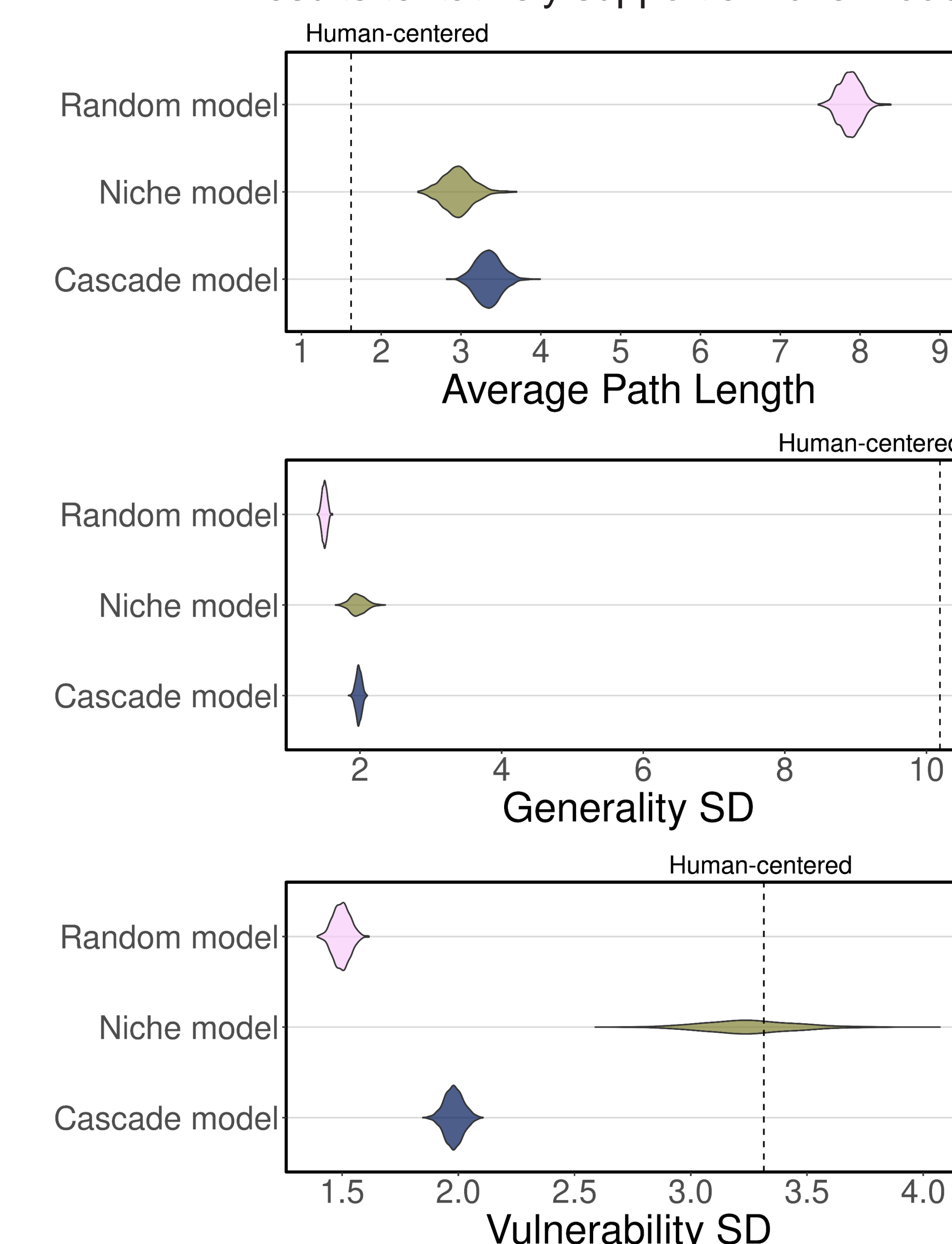
DATA COLLECTION

Inspired by the methodology of Crabtree et al.⁵ we started by compiling food items consumed by Indigenous Q'eqchi' Mayans in Belize⁶. From there, we branched out to cover as much published literature on neotropical trophic interactions as possible through the EBSCO and Web of Science databases, focusing on wildlife ecology studies located in neotropical rainforests. All predator and prey common names, taxa, trophic levels, interaction type, study region, type of data collection, and Bibtex labels were compiled into a database. The analyses here focus on Central America.



FOOD WEB SIMULATIONS

We used three generative models⁸⁻⁹ to simulate 3000 food webs and compared the structural properties of the simulated food webs to a human-centered food web from Central America. Simulation results tentatively support a niche model.



FUTURE PLANS

APPLICATIONS We are looking for collaborators to help design an interactive web application where people can explore and contribute to this project.

MODELING We want to incorporate body size to compare this food web to the allometric optimal diet breadth model¹⁰ and assess understudied species.

FORECASTING A food web is a useful tool for anticipating the effects of species loss or invasion, habitat change, and the trophic implications of land use and management decisions.



THE OHIO STATE UNIVERSITY
COLLEGE OF ARTS AND SCIENCES



THE OHIO STATE UNIVERSITY
TRANSLATIONAL DATA ANALYTICS INSTITUTE



Funding provided by the Sustainability Institute

SUSTAINABILITY
INSTITUTE
AT OHIO STATE

Packages

```
{igraph}{tidygraph}{ggraph}
{ggmap}{tidyverse}{maptools}
{raster}{statnet}
```

Scan QR Code

