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Climate, Competition, and Cavity-nesters, oh my!

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Climate, Competition, and Cavity-nesters, oh my! The Impact of Climate on the Breeding Success of Cavity-nesting Songbirds in California



Introduction

Background:

- Fluctuations in climate variables, such as temperature and precipitation, have the ability to negatively influence the breeding success of birds (Dreitz et al. 2012; Scholl and Hill 2020)

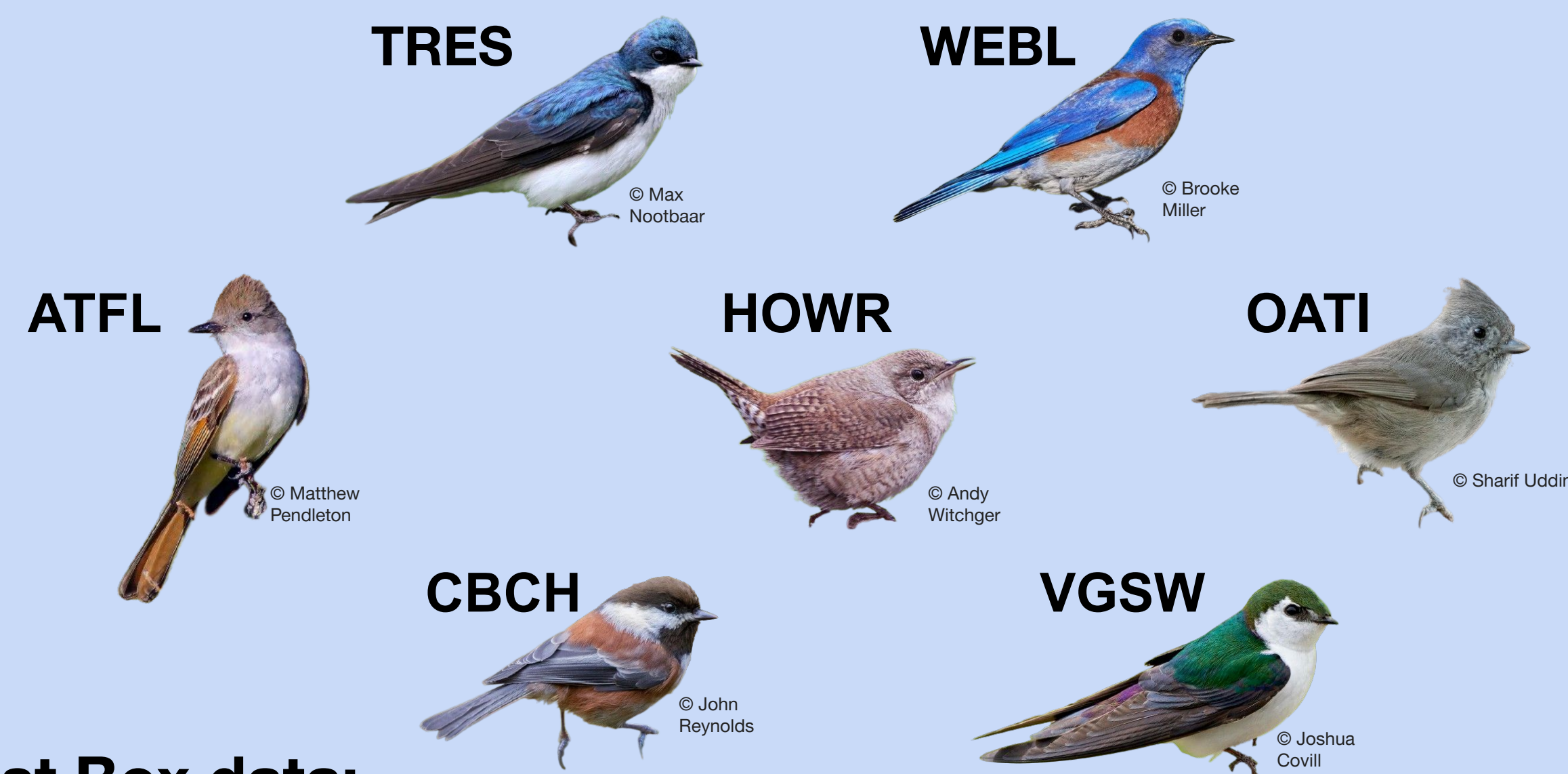
Question:

- How does climate change impact the breeding success of cavity-nesting songbirds?

Prediction:

- If climate change is impacting the breeding success of cavity-nesting songbirds, then I expect to see lower numbers of successful fledglings as temperature increases and precipitation decreases.

Methods



Nest Box data:

- California Bluebird Recovery Program (CBRP)
 - Number of fledglings per available nest box
 - Number of fledglings per nest attempt

Climate Data:

- National Oceanic Atmospheric Administration (NOAA) National Centers for Environmental Information
 - Average maximum daily temperature
 - Total breeding season precipitation
 - Total winter precipitation

Statistical Modeling:

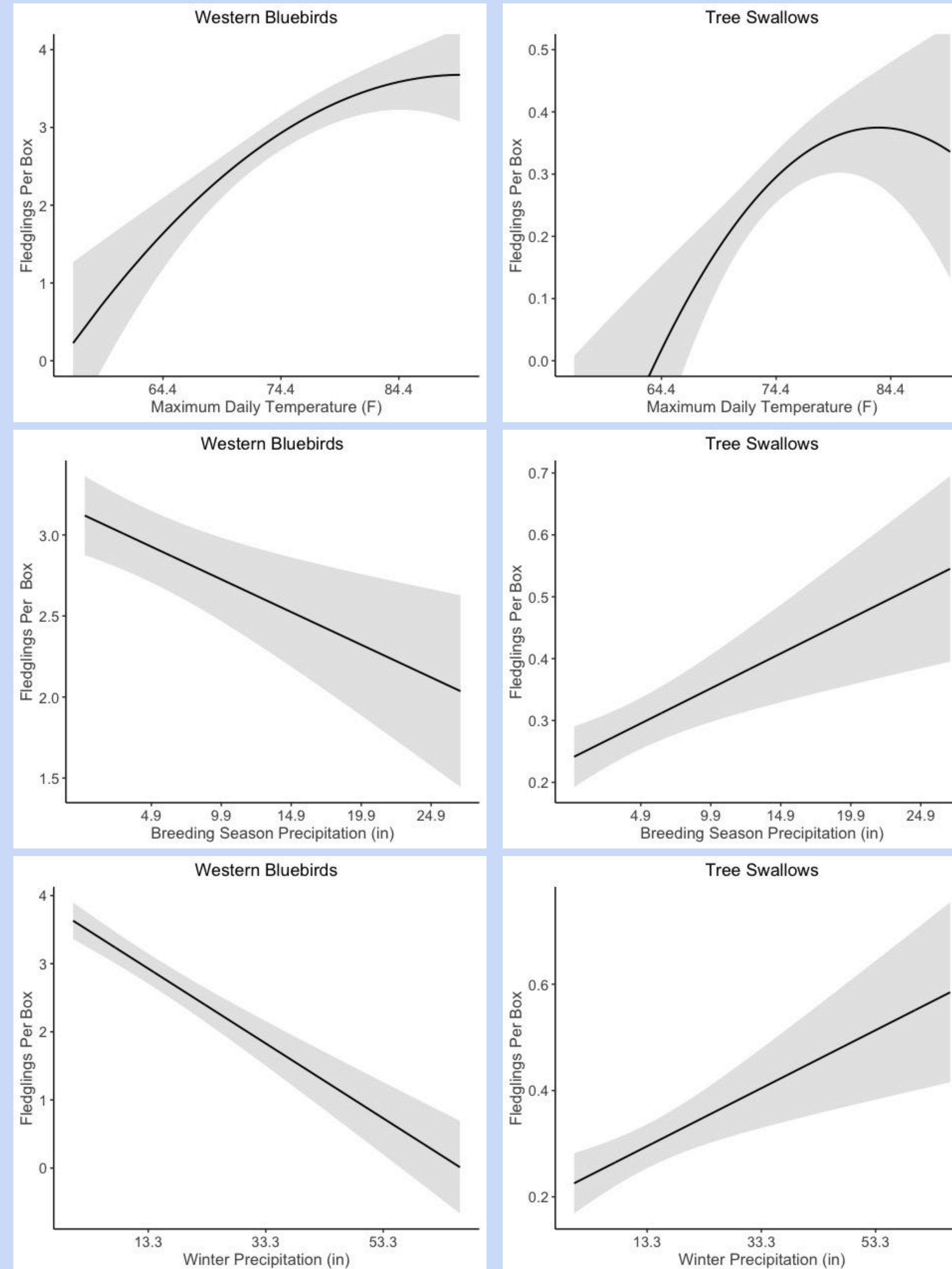
- Mixed linear model in R
 - Random effects included for year and individual nest box site

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Results



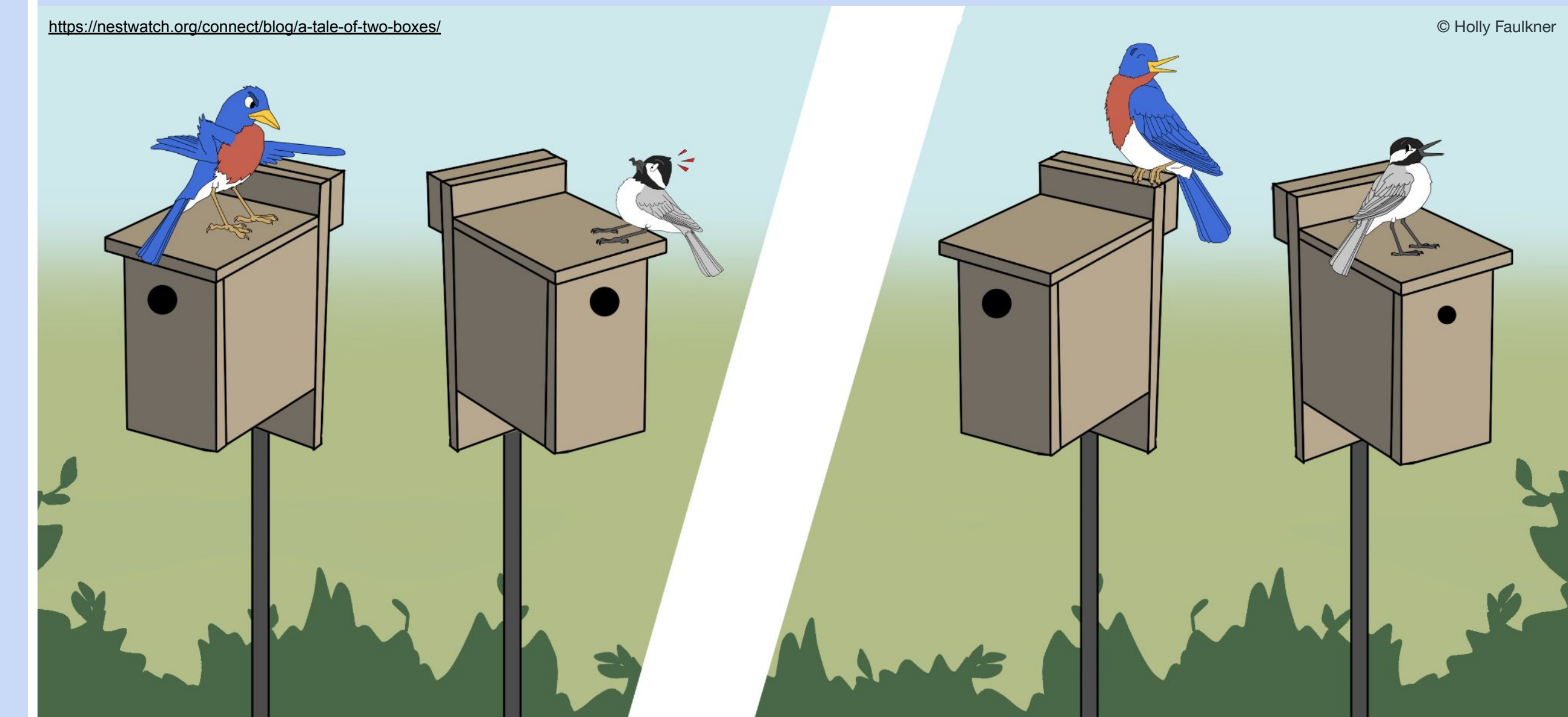
Discussion

Results:

- All species had some level of significance with the climate variables at the fledglings per box level.
- Only 2 species (VGSW, WEBL) had significant relationships with one climate variable (temperature) at the fledglings per nest level.

Discussion:

- This suggests that competition for nest box sites, rather than ability to produce offspring, is what's being impacted by periods of environmental stress.



Management Implications:

- Conservation of passerine species may require a greater number of available nest box sites or natural tree cavities for successful reproduction due to future projected climate change trends.

Literature Cited

- Dreitz, V. J., R. Y. Conrey, and S. K. Skagen. 2012. Drought and cooler temperatures are associated with higher nest survival in mountain plovers. *Avian Conservation and Ecology* 7:1-13.
- Scholl, E. M., and S. M. Hill. 2020. Heavy and persistent rainfall leads to brood reduction and nest failure in a passerine bird. *Journal of Avian Biology* 51:1-11.

Link to Full Paper



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Acknowledgments

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