# SEASONAL CHANGES IN HABITAT PREFERENCES OF MIGRATORY BIRDS

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## Introduction

Birds have specific habitat requirements that vary across their annual cycle. Breeding habitats must offer suitable nesting sites and conditions for successful reproduction, while non-breeding habitats should provide abundant food resources and shelter from harsh weather. The goal of this study is to develop species distribution models (SDMs) for each season, focusing on factors affecting the species' occurrence.


## Methods

For model testing, golden-cheeked warbler (*Setophaga chrysoparia*) and corn bunting (*Emberiza calandra*) were chosen. Golden-cheeked warbler has distinct breeding and wintering ranges, allowing for clear seasonal separation of the records and assessment of seasonal changes in the environment. Corn bunting is partially migratory with overlapping breeding and wintering ranges and can be affected by current climate conditions.

### Presence/absence data

Data from 2018-2019
Golden-cheeked warbler: eBird
Corn bunting: eBird and Avif (CZ)
Records with no exact location excluded
Only one record from a 1 km radius and a 3-day time range was kept

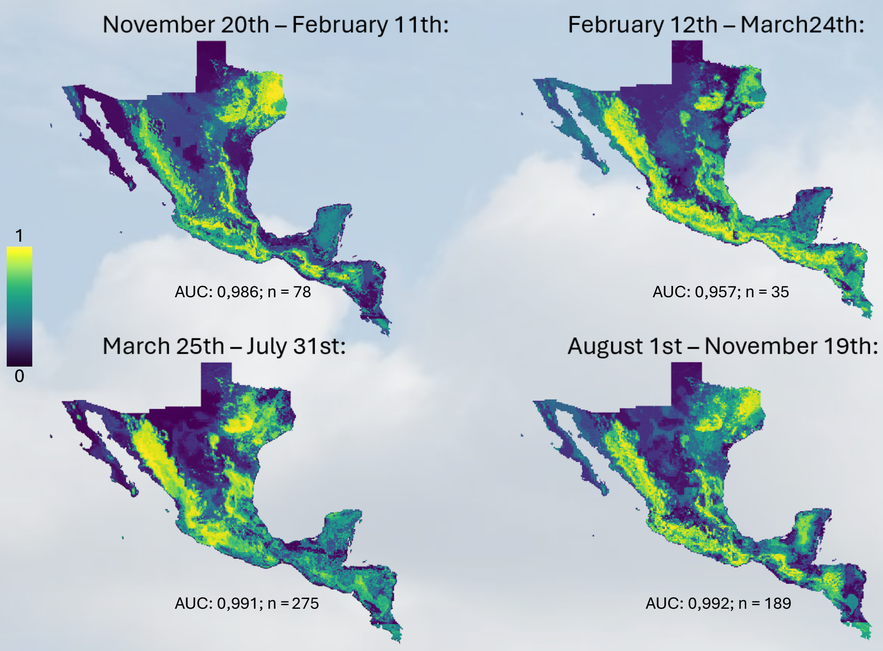

### Remote sensing environmental variables

Environmental data from Google Earth Engine (rgee and DynamicSDM libraries)
Satellite data: MODIS, Sentinel and GLDAS
Climate data: CHIRPS Daily package

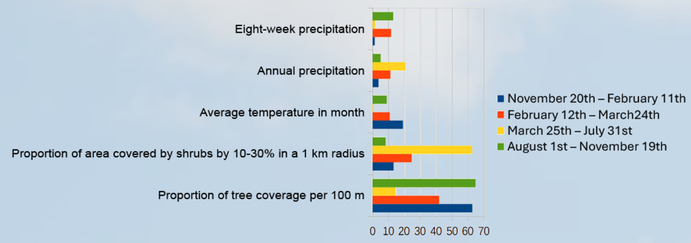
## Results

- Differences in the importance of the predictors of the SDMs are apparent throughout the year for both species
- The model supports the expected golden-cheeked warbler's preference for scrubland habitat on breeding grounds
- Despite the high AUC, the prediction does not match the known distribution of this species, probably due to other (historical) reasons
- Results for the corn bunting also show possible seasonal changes, but due to small sample size they are not statistically significant

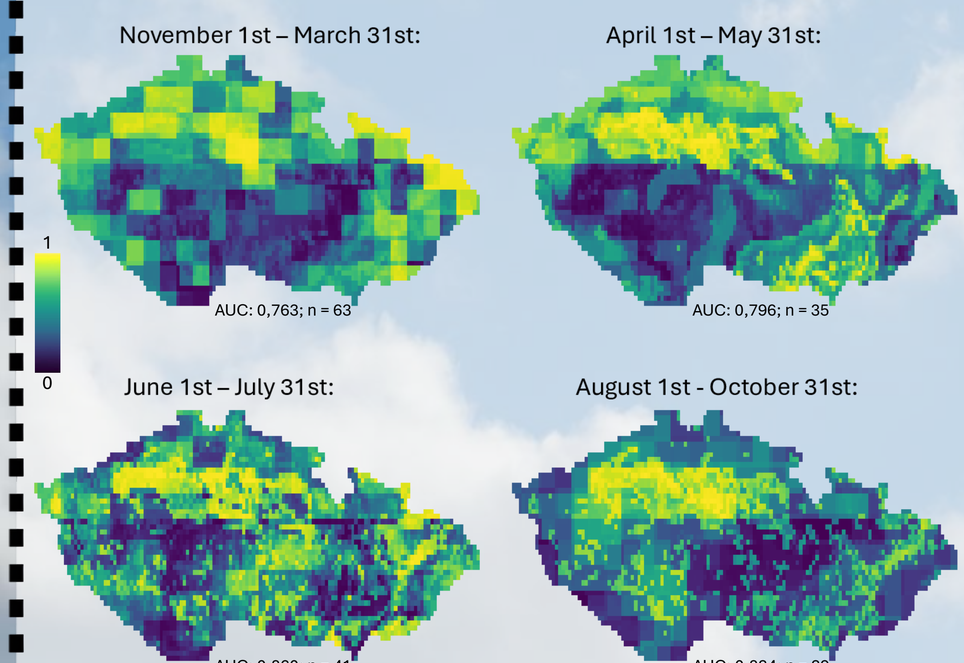
### Probability of occurrence of golden-cheeked warbler



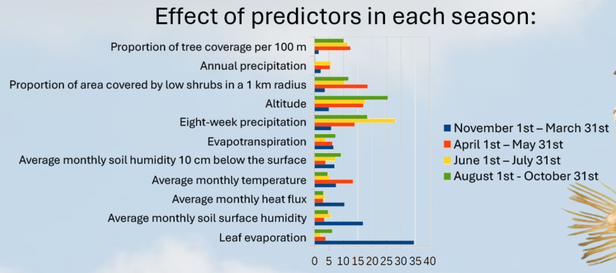

Effect of predictors in each season:




### Probability of occurrence of corn bunting




Effect of predictors in each season:




## What's next?

- The long-term goal is to develop a comprehensive algorithm mapping habitat preferences on breeding and wintering grounds for many species
- Balancing records by duration, length and abundance to improve the model
- The algorithm could be adapted to areas with limited data by using results from well-covered areas and accounting for the difference between them