

Climate Change Affects on Bird Migration since 1990

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Abstract

Our group “The Climate Quackers”, studied the arrival time of three bird species since 1990. These include the American robin, the red winged black bird, and the turkey vulture. All three of these birds are migratory birds who move south to avoid the winters. We researched through EBird to see the first day these birds were spotted in St. Lawrence county. We set out to see whether warming temperatures due to climate change are causing birds to begin to migrate earlier each year. We also had days in the field, where each group member walked around separately looking for our three bird species at two different places and dates. We recorded the general weather of the morning, and then we tallied how many of each of the birds in our study that we saw and recorded their activities.

Introduction

Our project investigates the effect of climate change on avian migration patterns. Climate change influences food availability as well as the timing of mating season and of migration for bird communities. (Charmantier 2013). We focused on three species: the American Robin; the Red-Winged Blackbird; and the Turkey Vulture. These species are known migratory birds in the North Country and are relatively well studied. We gathered data from several online sources, mainly Cornell’s E-Bird, and we ventured outdoors and studied these species firsthand at two local St. Lawrence County sites: the village of Potsdam’s Munter trail and SUNY Potsdam’s Lehman Park.

We aimed to test one hypothesis; if the climate continues to change and warm, then avian migration times will move earlier, impacting local ecosystems. Many migratory birds exhibit a high degree of ecological and evolutionary adaptability, but studies suggest rapid adjustment by birds may not be able to keep pace with climate change. (Bates, 2022)

Methodology

We used two methods of data collection. First, we accessed past collected data from EBird which is run and funded by Cornell University. This website has many uses; you upload your own observations, discover new species in your area, or in our case, study when these three specific species showed up each year based on citizen science observations. We looked at each of these birds' recorded arrival dates every year from 1990-2025. We graphed our findings and then ran a regression test for each species.

Secondly, to gain field experience we took binoculars and notebooks out to our sites: Lehman Park and The Munter Trail in Potsdam, NY. We wrote down the date, current weather, and for each of our 3 species, we wrote down how many there were and what they were doing. We each split up in different ways, walked around quietly, and recorded what we saw.



The Climate Quackers searching far and wide for migratory birds.



Darbi Dean at Lehman Park.

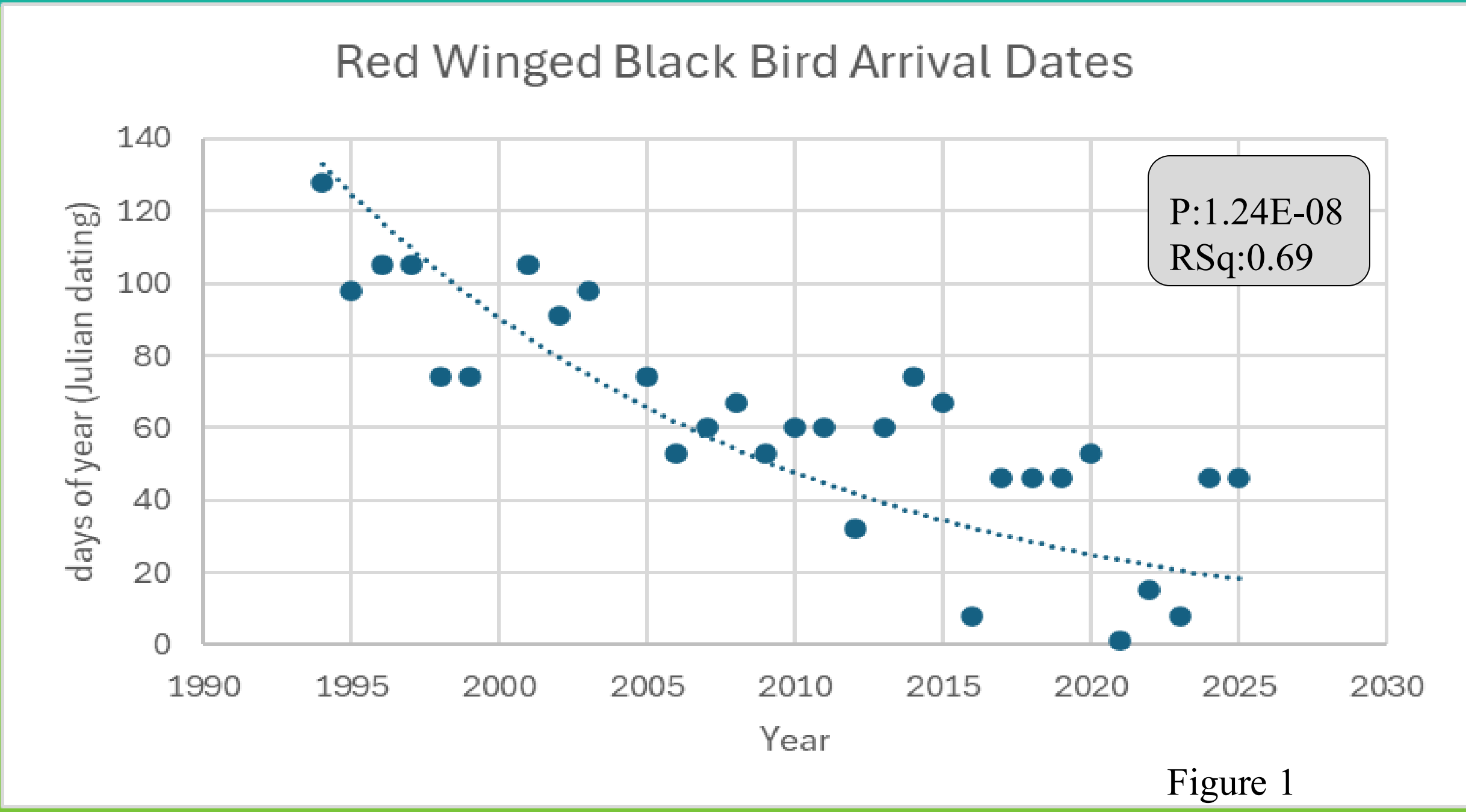


Figure 1

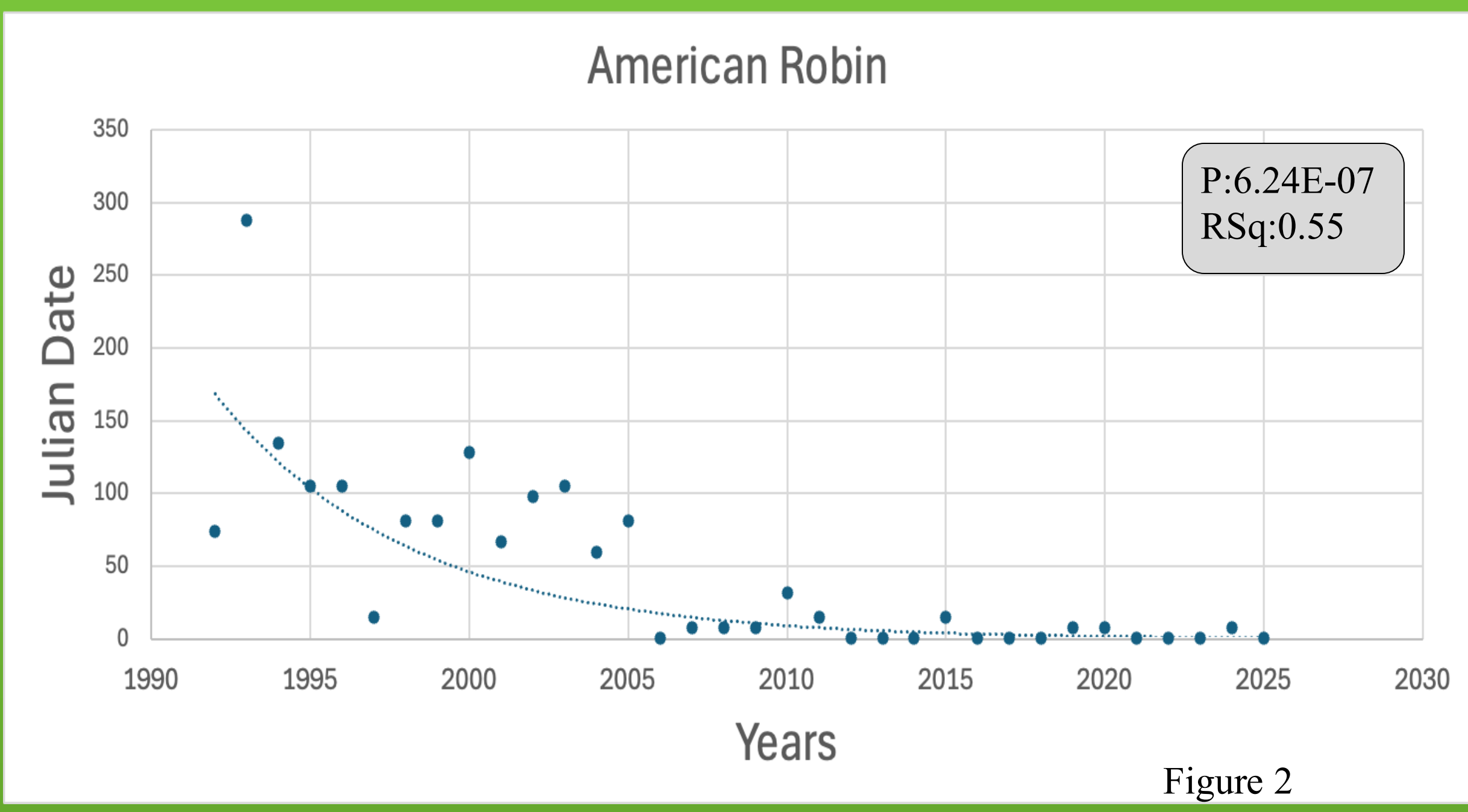


Figure 2

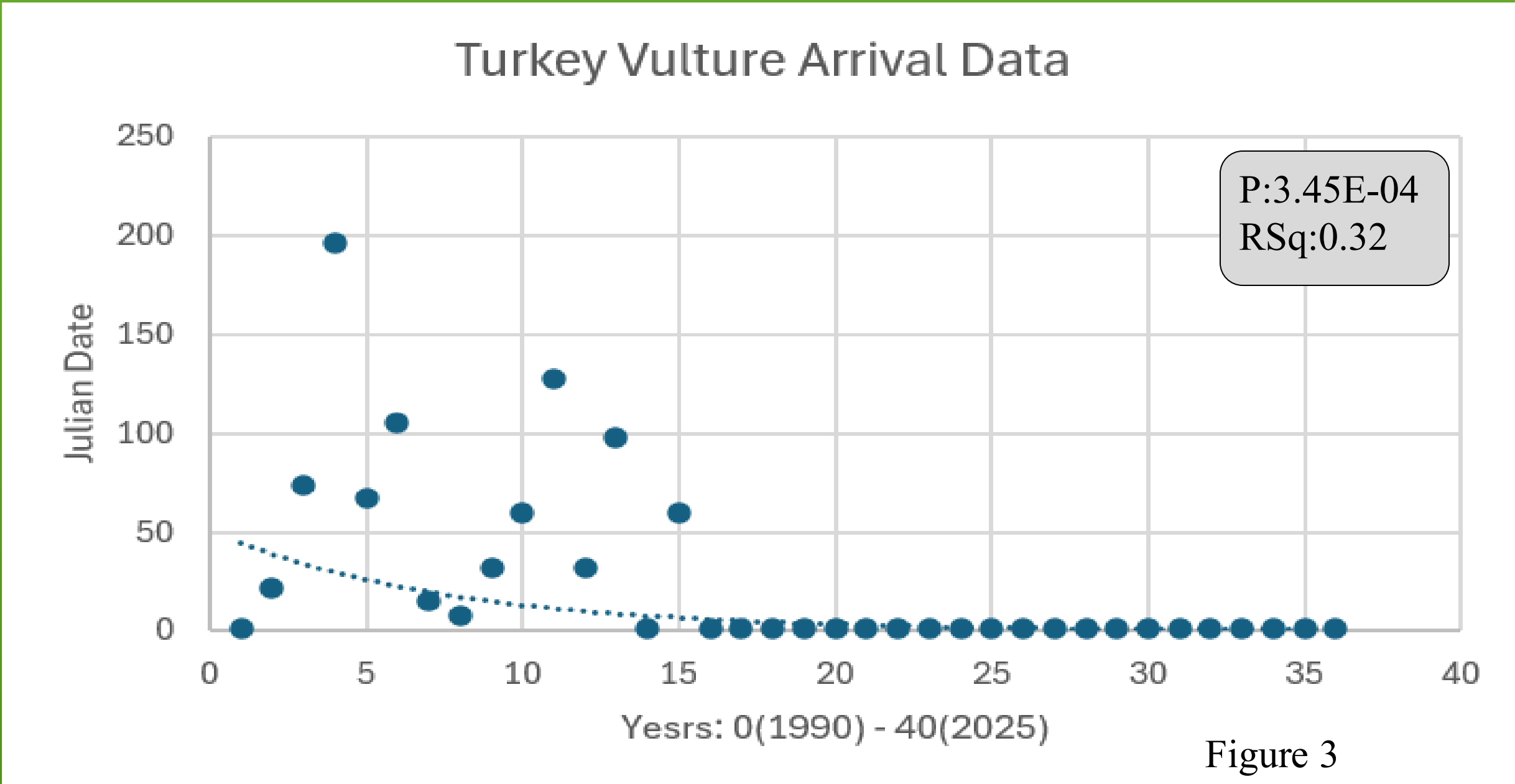


Figure 3

Results

-At our first site, Lehman Park on April 1st, with cold weather and hard grounds, we saw 3 robins.
-At our second site, the Munter Trail on April 8th, the weather was cloudy and chilly, and we recorded 2 Turkey Vultures, 13 American Robins, and 3 Red-Winged Blackbirds.

The red winged black bird had 29 years of recorded data between 1990-2025 on EBird. (Figure 1)

The American Robin had 33 years of recorded data between 1990-2025 on EBird. (Figure 2)

The Turkey Vulture had 35 years of recorded data between 1990-2025 on EBird. (Figure 3)

Our regression test results showed that all three birds came significantly earlier each year, with all P-values being less than 0.001.

With the E-bird app, the information is recorded by bird watching citizens. With this can come human error. On top of that, as technology and interest for bird tracking grew, the data became more and more reliable over the years.

Conclusion

We found that there was an exponential decline from 1990 to now in the arrival dates of each of our species, and the relationship between year and arrival date was significant. This supports our hypothesis that climate change has affected arrival times of migratory birds. With the weather warming sooner, the birds continue to arrive earlier and earlier each year; with some becoming year-round inhabitants.

Food availability, weather and ground temperatures, and mating seasons all seem to have been affected by climate change and is now causing these species to forcefully adapt to them. We found many studies that supported our hypothesis and findings. These studies include the many changes that can happen because of climate change, such as their time of migration, their clutch size, time of reproduction, incubation times, and even the body sizes of birds are changing due to climate change (Mollar, 2010). With much recorded evidence and through our study, we can confidently say our hypothesis is supported.

References

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