

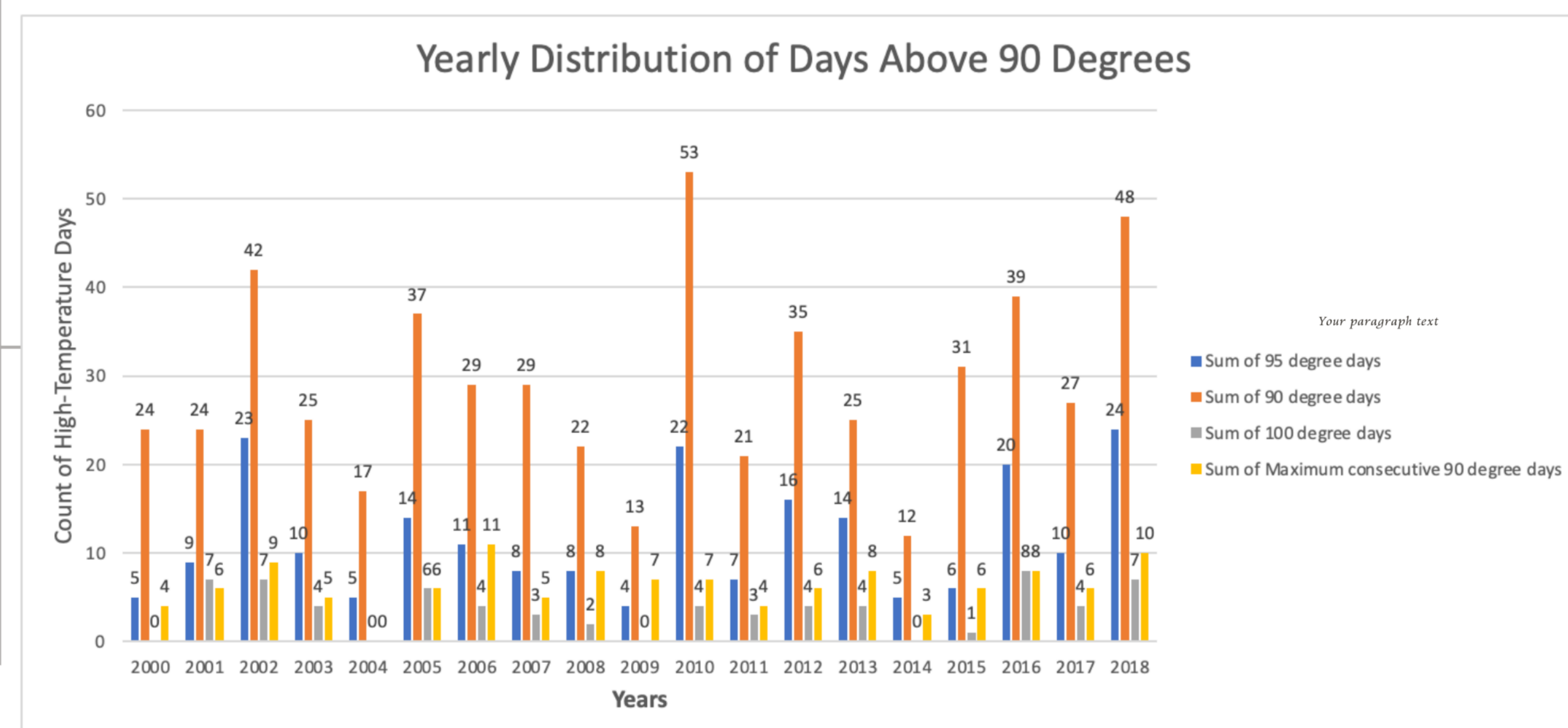
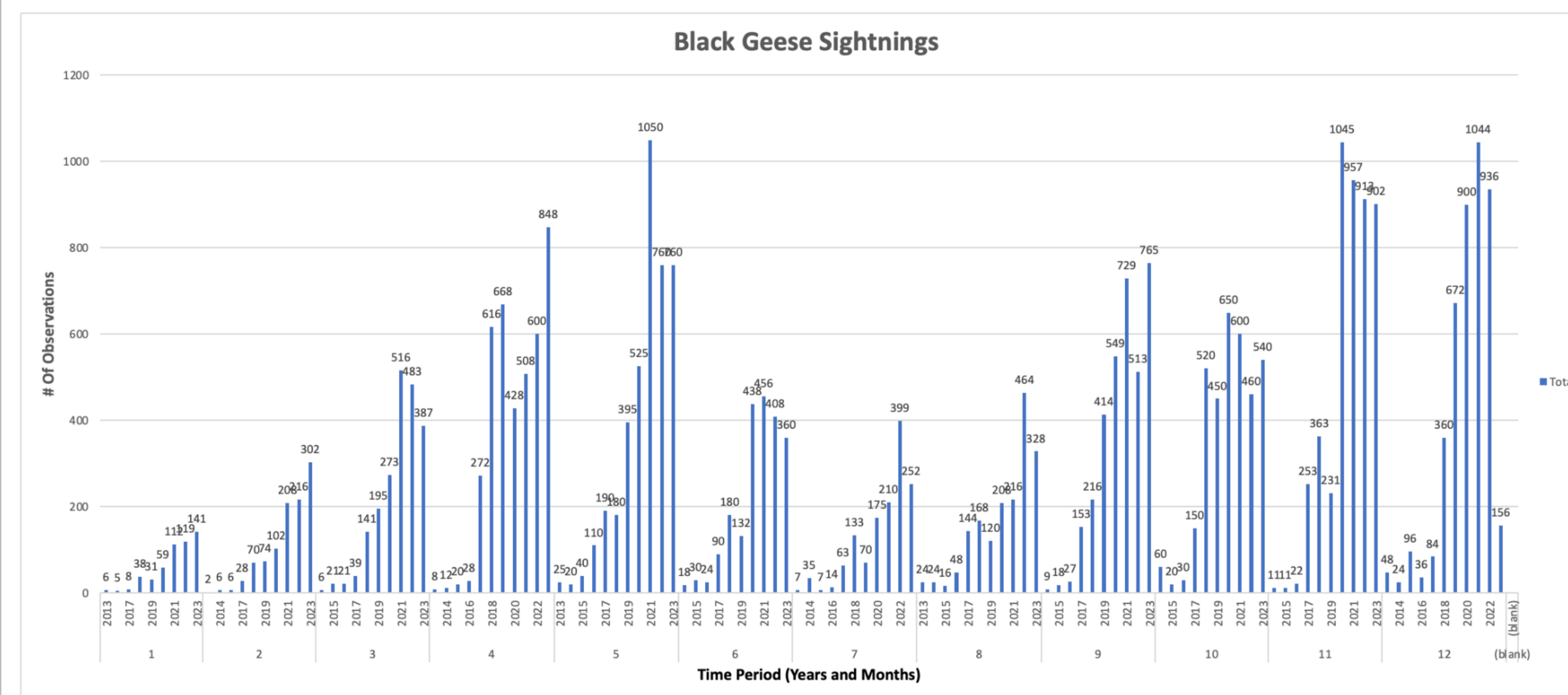
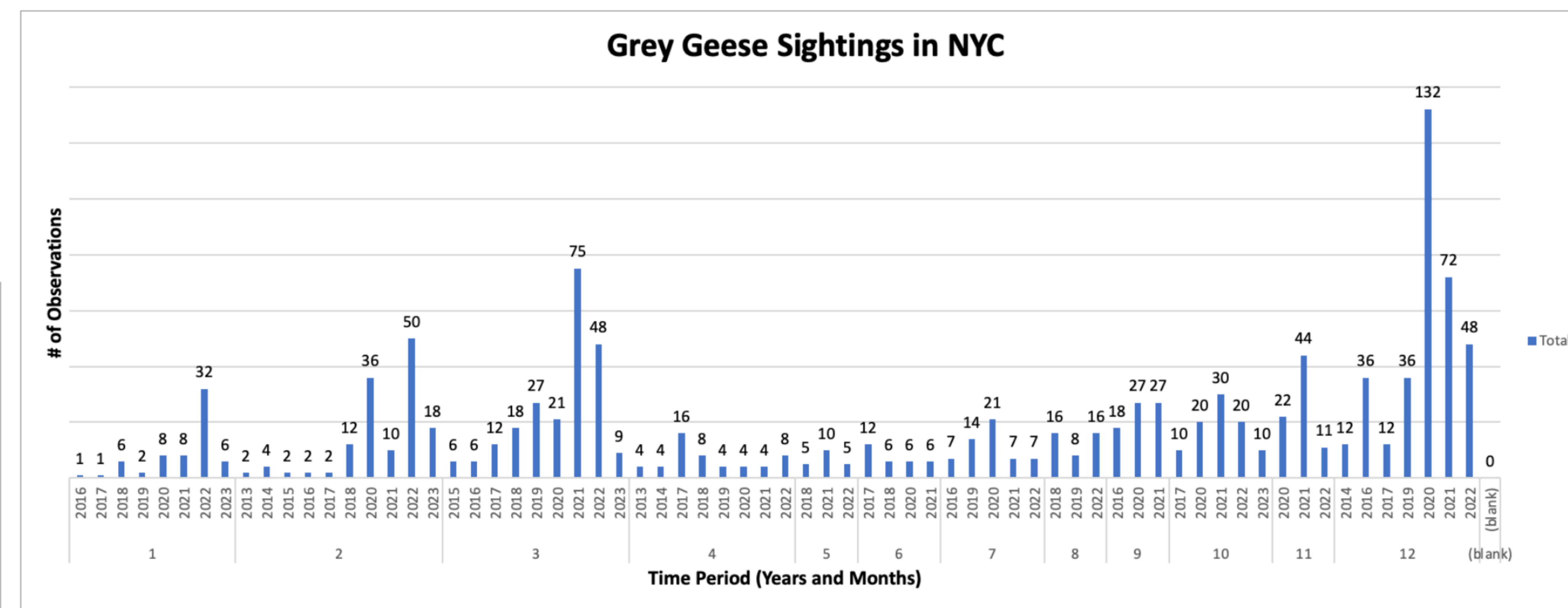
# Impact of Temperature Changes on Geese Migration Patterns

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## 04. Analysis



## 05. Conclusion

The information gathered from the charts points to a link between the delayed migration of geese and rising temperatures in New York City.

The rising frequency of 90+ degree days suggests that NYC is getting hotter annually. This increase in temperature could mean that typically colder months are becoming hotter, allowing for geese to stay longer which thus, corresponds to delayed migration patterns. The figures exhibit that more black and grey geese sightings are made during typically cooler months.

Although these observations alone cannot demonstrate causal causation, the concurrent trends suggest that rising temperatures may affect geese migration patterns.

Therefore our focus of increasing warming trends, which is proven to have a direct correlation with longer seasons, is a valid rationale for changes in their seasonal migration patterns.

## 06. Discussion

The disruption in the traditional migration schedule of geese, as shown by the patterns seen in New York City, highlights the impact of urban climate on wildlife behavior, hence calling for additional observance of how these changes can impact the wider dynamics of ecosystems and prompt future instability. The connection between the geese's delayed departure and the city's rising temperatures shows the insistence of effective urban climate adaptation strategies as these changes may be early signs of how wildlife is adjusting to our changing surroundings - a looming ambiguity for the future

## 07. Works Cited



## 01. Introduction & Hypothesis

As society has progressed, through the ages, human treatment of our planet has regrettably taken a toll on the environment, leading to detrimental consequences. Among these consequences climate change stands out as a notable effect of this issue. One notable aspect of this influence lies in the migratory pattern of birds, particularly the Geese. This research project aims to find a connection between temperature changes and the migratory pattern in New York City.

Our hypothesis posits that as the temperature fluctuates over the years, the migration patterns of the Geese population in New York City experience delays.

## 02. Methodology

To find the correlation between temperature and migratory patterns of Black and Grey Geese, we researched our two variables:

- 1) Temperature/weather extracted from analysis of heating events in the New York City area
- 2) Geese migration patterns in the New York City area.

We used data sets from 2000 in INaturalist BioBlitz data that detail the population numbers of Black and Grey Geese in New York City during their typical migratory and non-migratory season.

We analyzed temperature data sets in the NYC Open Data website, which details the daily and monthly temperatures in every Brough of New York. We used data ranging back to the year 2000 as well.

## 03. Results/Findings

- A consistent rise in the number of days exceeding 90 degrees in New York City over 18 years exhibits an increase in the frequency of heat waves which suggests a warming trend.
- In our research of grey and black geese, there seems to be a trend of geese delaying their migration and staying longer during colder months, especially during December.
  - Taking consideration of the recent years which reported higher temperatures (e.g. 2022, 2023), we can infer that since it is getting warmer, there is less of an urgency for geese to migrate to temperate environments.
- However, the highest number of geese sightings did not always coincide with the warmest years, indicating that other factors may influence its migratory patterns.