**Executive Summary**

I propose to utilize the publicly available data at NOAA and the semi-public data at eBird to analyze the correlations between temperature and bird observations. Some research was found by Audubon documenting future impacts of climate change. More research was found studying links between breeding and climate change. I hope to find areas with more extreme changes in monthly surface temperature and look for changes in range of species observations over time.

**Motivation**

I think this project has the potential to show undocumented relationships between climate and bird observation. Birds are fascinating animals and many are very specialized to their habitats. There are publicly available observation data on birds and climate for the whole 20th century. These data will allow me the chance to learn more about birds, climate change, and analyzing data along a time axis and using location.

**Data Question(s)**

The primary question for this analysis is: How have the range of bird observations changed over the last 70 years in North America? I want to evaluate these changes in location along with documented changes in climate over the same time period and in the same areas.

Sub-Questions:

1. Are there locations where a species of bird is no longer sighted that also show a change in temperature?
2. Are there locations where a species of bird is no longer sighted that are temperature measurement independent?
3. In the last 70 years have bird ranges changed?
4. What species of bird have experienced the most change in range?
   1. What similarities exist between those species? Similar food (e.g. insects vs plants)? Similar predators? Similar habitat?
5. Are there any species that appear vulnerable? Species that seem sensitive to change with a low ability to adapt.

**Schedule (through 6/25/2020)**

1. Get the Data (5/15/2020)
2. Clean & Explore the Data (5/29/2020)
3. Create Presentation and Shiny App (6/12/2020)
4. Internal Demos (6/19/2020)
5. Demo Day (6//2020)

**Data Sources**

NOAA - <https://www.ncdc.noaa.gov/cdo-web/datasets>  
eBird - <https://ebird.org/data/download>

**Known Issues and Challenges**

I know that eBird’s data requires permission to download and use. However, I have requested and obtained permission to use the data. I know that making visualizations on maps with a time axis is currently outside of my experience and may require quite a bit of learning to create. I know that both the NOAA and eBird datasets will be large and it may be challenging to find interesting changes in observed bird sightings. Weather data is noisy and has seasonality, many birds are migratory and may forage in areas where they don’t fledge. I’m not an expert in birds nor climate so I expect to learn a lot during this project.

I plan to use Python to do much of the exploration and analysis and I have a lot to learn about python. The final presentation I plan to have in PowerBI. I’ve seen some very nice looking visualizations in other tools but my office has a license for PowerBI and I’m interested in expanding my skills in that tool. If I learn some ways to make maps with a time axis in python I may pivot to creating gifs from Python and using those in a PowerPoint presentation.

Feedback

Great job revisiting this Seibert. Good luck in this! I am excited to see what you come up with -TP

Good to go! Excited to see your work! ~UN