Technology Review

Ocean's 4

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Overview

How does air quality measure (as a proxy for wildfire events) interact with bird sightings in Oregon?

Use Cases:

- Research to better understand Avian behavior & geography
  - Species Presence/Absence
  - Relocations and migratory shifts
- Visualization tool for birders, citizen scientists, and Audubon societies
  - Shifting birding behavior and observational tendencies

eBird

AQI
AIR QUALITY INDEX

Requirements and Technologies Considered

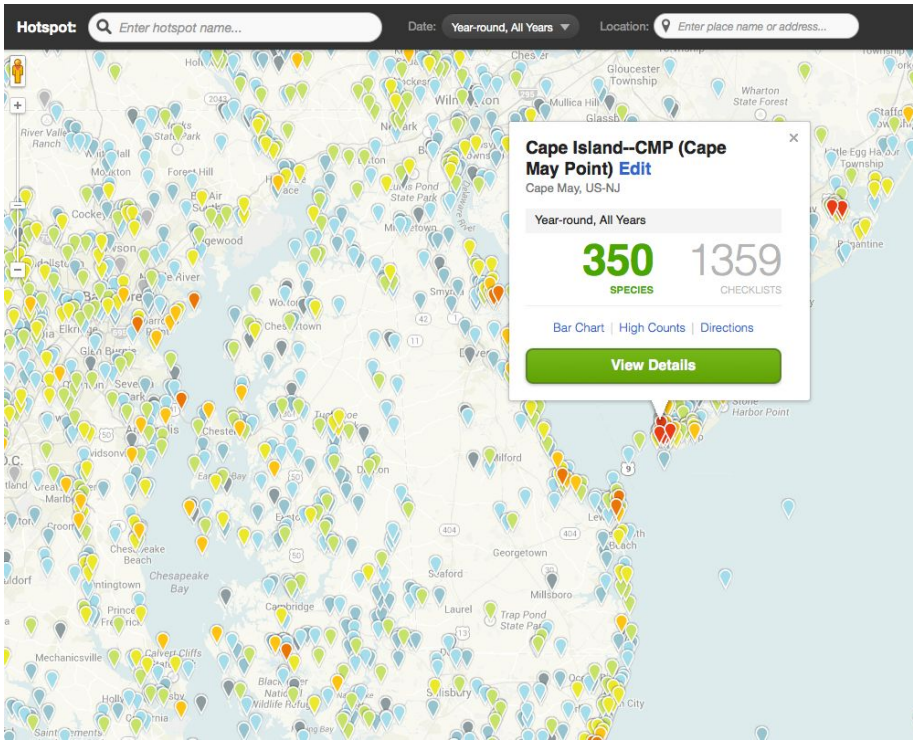
Powerful, reliable analysis and visualization tools necessary to work with a high resolution dataset on a statewide scale

Data Cleaning & Analysis

- R (starting with the auk package)
- Altair

Visualizations & Mapping

- Folium
- Plotly



Map of sightings hotspots in eBird

auk (R package)

Pros:

- Facilitates filtering/reading eBird data
- Built-in functions for taxonomic resolution

Cons:

- Functions only work for eBird data
- Requires use of R
- Taxonomy only updated to August

**ebird-api compatible with Python*

Altair

Pros:

- Variety of statistical visualizations available
- Based around pandas dataframe
- Handles data from outside sources
- Can aggregate data within graph code
- Easy to export or embed graphs

Cons:

- Not common among target users
- Graph specifications are stored in notebook

Providing Data Products to Non-Researchers

Folium

Pros:

- Mapping tools
- Many different built-in map layouts
- Map layouts are similar to google maps and other maps users are familiar with
- Works well with Altair

Cons:

- Few options for interactive maps
- All visualization options involve maps

plotly

Pros:

- Different visualization types
- Many options for interactive plots and maps
- Plotly also exists for R, allowing easy transition for ecologists unwilling to work in python
- Can create apps that are easily embedded in a webpage

Cons:

- Not great for sophisticated statistical analyses
- No direct link to Altair

Conclusions

- For statistical analyses and communicate findings to fellow researchers:

- To create interactive plots and maps to be shared with birders, citizen scientists, and Audubon societies: