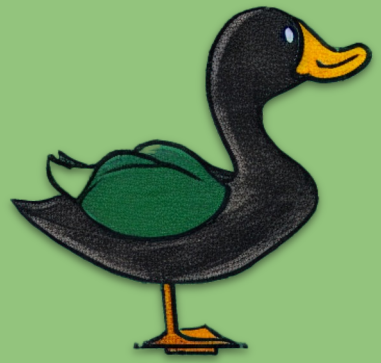
Birds of Hampton Roads



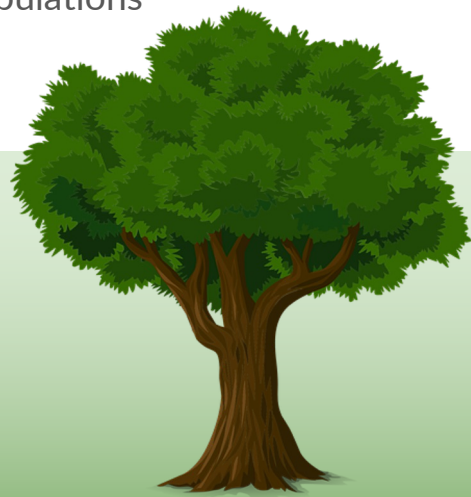
An Exploration Tool for Bird Conservation in Hampton Roads

Team Mallard (formerly Team NoVA/Norfolk)
| Sept. 16, 2022

THE PROBLEM

- Trends in bird population and environmental health can be **difficult to diagnose**
    - According to FeederWatch, downward trends for 2-3 years may reflect changes in weather or food supply, not necessarily population decline

Diverse species of native trees and plants allow complex structure, including canopy layers, gaps in canopy, and downed woody material to support healthy bird populations



THE PROBLEM

- Hampton Roads takes up **7% of the landmass** of Virginia
  - It contains ~3,000 sq. miles (1.9M acres). Approximately 25% larger than Delaware
  - It consists of rural, urban, and heavily trafficked areas; notably, Norfolk, Newport News, and Virginia Beach
- The area has over **20% of the population** of Virginia
  - Virginia Beach is Virginia's most populous city with ~450,000 people
  - According to Virginia Beach, over 7.1M tourists visit annually

DATA SOURCES

- Project FeederWatch
  - Collaborative project with the Cornell Lab of Ornithology and Birds Canada.
  - 30+ year survey conducted between November and April encouraging citizen scientists to collect and share data on birds in their area.
  - Over 280,000 data points in the Hampton Roads region, covering 156 unique species.
  - feederwatch.org
- Virginia Society of Ornithology
  - Official list of “native” birds of Virginia and its offshore waters
  - virginiabirds.org

DATA SOURCES

iNaturalist

- A joint initiative by the California Academy of Sciences and National Geographic
- Encouraging curious minds of all ages and backgrounds to explore, record, and understand nature

- Millions of quality data points spread across a 10+ year span
- Integrated data into a web application
  - Changes in population over time
  - Filtering by species type, conservation status, native status.
  - Single source information box on the status of a species in the region and its change over time.
  - Add conservation score to provide more regional information on species conservation.

BIRDS MAPPED IN HAMPTON ROADS….

We’ve built a **React web app** that shows regional bird species over time. The app highlights several trends directly relating to the region’s bird population. From these data, we can subsequently infer much about the biodiversity and overall health of the local ecosystem.

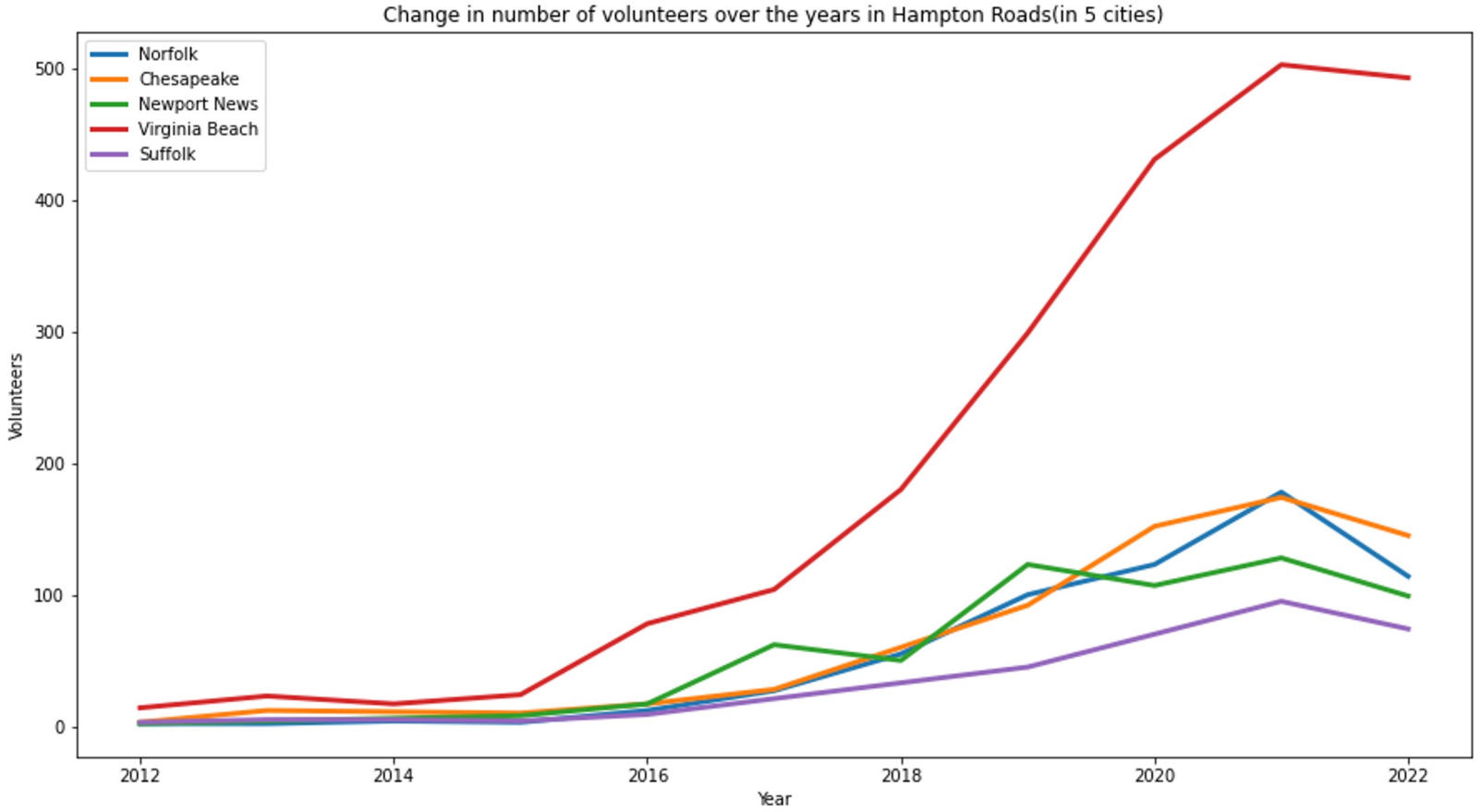
DEMONSTRATION

http://hampton-roads-hackathon-2022.s3-website.us-east-2.amazonaws.com

HAMPTON ROADS COULD BENEFIT FROM….

- **Encouraging citizen scientists** to continue:
  - Data gathering, exploring, and reporting
  - Promoting these services and sharing data in areas of concern
- **Consolidating and modernizing resources** to lower the barrier of entry for the general public. Make participating in the improvement of the natural environment a rewarding experience.
- **Establishing more grassroots efforts** to bring together community members and volunteers to protect, enrich, and expand knowledge about species and habitats in Hampton Roads.

Unique iNaturalist volunteers have skyrocketed since 2016, with a 5-fold increase in users in the Virginia Beach area over the past 5 years



WHY BIRDS?

- Bird **data is plentiful** and the **quality, consistent**, thanks to birdwatchers
- Birds play a vital role in the Hampton Roads ecosystem, serving important roles in all parts of the biological life cycle -- from **pollinating** plants, to **hunting**, to **scavenging**
- Higher density of birds corresponds to a **healthier environment**
  - An imbalance in the local ecosystem
  - Less healthy forests, plants and gardens
- Sparse bird sightings on projects like FeederWatch and iNaturalist mean:
  - **Less volunteers available** to report data
  - **Lack of education** or resources to report certain species types
  - Lack of forests/canopies for **bird habitat**
  - Disease or other causes of reductions in bird population

REFERENCES

GitHub: https://github.com/engineerchange/biodiversity-hack

- Data Sources
  - https://feederwatch.org/explore/raw-dataset-requests/
  - https://www.fia.fs.usda.gov/ and https://github.com/hunter-stanke/rFIA
  - https://www.virginiabirds.org/offical-state-checklist
  - https://api.inaturalist.org/v1/docs/
- Sources
  - https://www.hrchamber.com/page/hampton-roads
  - https://www.vbgov.com/government/departments/cvb/Pages/default.aspx
  - https://www.iucnredlist.org/
  - https://feederwatch.org/about/project-overview/
  - https://ny.audubon.org/conservation/basics-forest-management-birds
  - https://www.audubon.org/news/6-unexpected-ways-birds-are-important-environment-and-people
- Tools
  - https://kepler.gl/ (open source React framework)
  - https://reactjs.org/ (JavaScript library for making UIs)