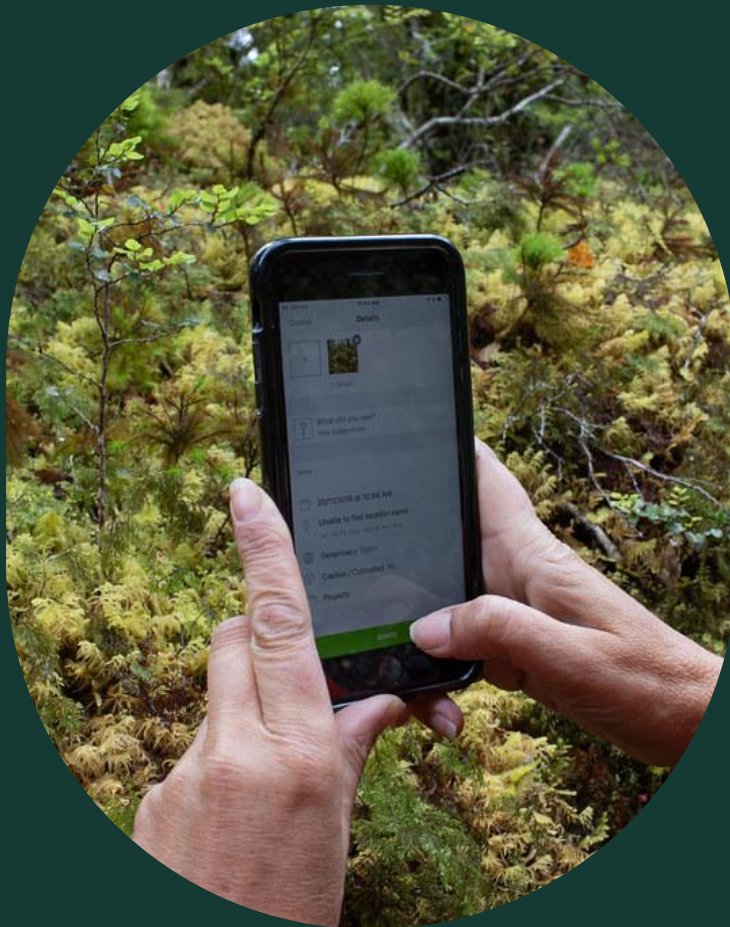


iNaturalist Evaluation

By Amber Dindorf





YOU RESIGHTED A SPECIES!



Giant California Sea Cucumber


You first observed it on:
Feb 25, 2023


[VIEW SPECIES](#)


[Back to Camera](#)


[←](#) **Edit Observation** [⋮](#)





 **giant California sea cucumber** [×](#)
Apostichopus californicus


 Name what you saw if you can, even if that's just "insect" or "bird," or just leave this blank. Others may help you identify it!
[GOT IT!](#)

 **Notes**

 **Feb 25, 2023** **01:33 PM PST**

 **Bellingham, WA 98229, USA**
Lat: 48.6938397148... Lon: -122.49596972... Acc. 23

 **Location Visibility: Open**

 **It is captive or cultivated** ☐

How effective is the citizen science application, iNaturalist in showing climate related changes?



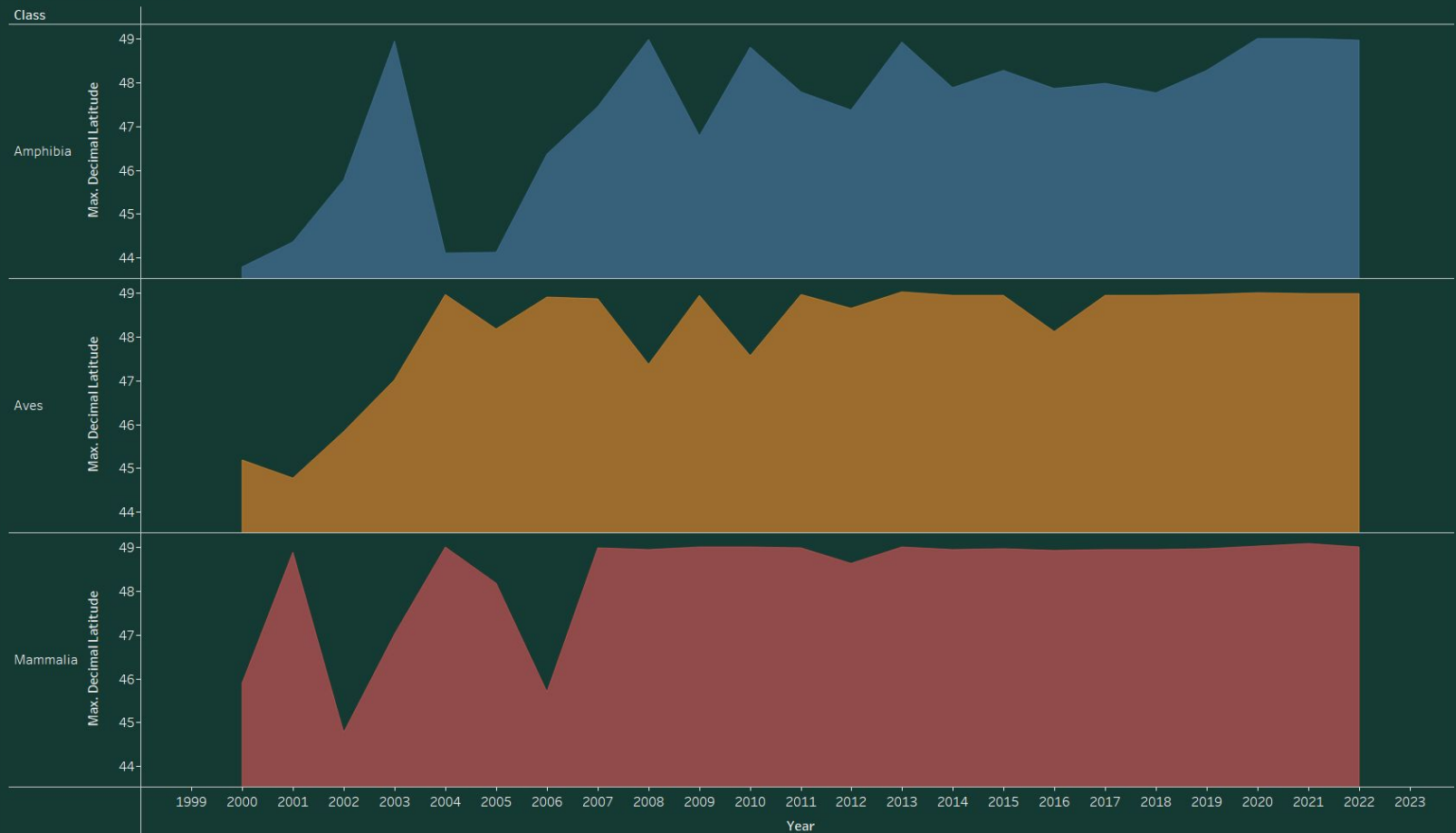
01

Shifting Ranges

According to an [article from the Nature Conservancy](#), species have shifted their range an average of 11 miles north over the past 10 years. How well does iNaturalist data show this range shift?



Latitude by Class



I would expect to see a very gradual linear increase in maximum latitude overtime. Instead the data shows large amounts of variability, making it difficult to use the data to track range shifts.

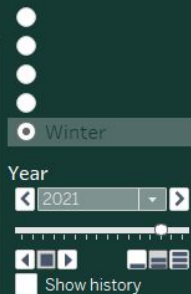


02

Behavioral Shifts

American Black Bears are found throughout the Appalachian Mountain Range and they are known to hibernate during the winter months. Black bear's hibernation patterns are impacted by warmer and shorter winters. Using a count of bear observations in the winter months, how well does the data show a behavioral shift?

Bear Observations By Season



There are increased observations of Black Bears in the winter months showing a behavioral shift.

Winter Black Bear observations



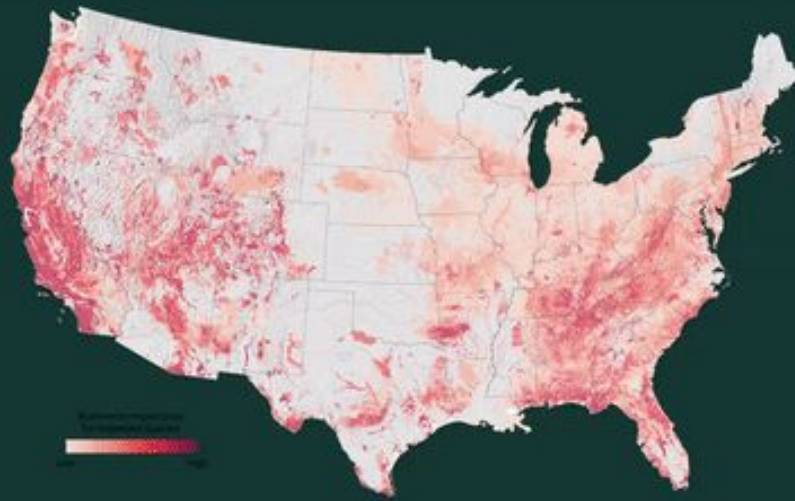
03

Biodiversity

According to [States of the Union: Ranking America's Biodiversity](#), Alabama, Georgia, North Carolina, Virginia, and Tennessee are the top 5 most biodiverse states in the Appalachian Mountain Chain. Using a count of species grouped by state, how well does the iNaturalist data match these rankings?

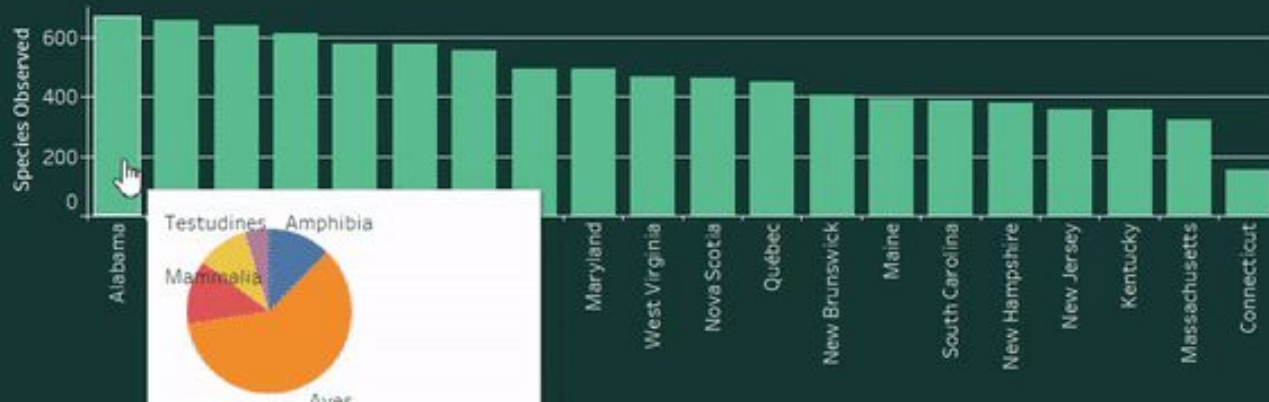


1. Alabama
2. Georgia
3. North Carolina
4. Virginia
5. Tennessee



The data shows the same top states with some variability in rank. You can also see that the distribution of species for all states is heavily skewed towards birds. Birding is a major hobby and accounts for a large portion of observations.

Species Observed by State





04

Population Changes

According to the U.S. Geological Survey, amphibians have been declining at a rate of 3.79% every year. Using a count of amphibian observations, how well does iNaturalist data show this population decline?

We would expect to see linear decline, but instead the data shows exponential growth. More people are making observations, but the data does not reliably show populations and population declines.

Amphibian Observations by Year



This trend is consistent when drilling down into the data to examine amphibians who rely on vernal pools, a climate sensitive habitat.

Vernal Pool Case Study



Recommendations



App Updates

Include a range map for each species and a notification if a species is spotted outside of its typical range. In addition, a notification encouraging users to document all instances of a species they see could help improve data reliability.



Data Collection

Create internships and partnerships that survey underrepresented classes in the data like insects, amphibians, reptiles, and mammals.



Education

Educational dashboards about all observations of a species collected in Tableau. This could be added to the species page on the iNaturalist website.

References

- <https://www.natureserve.org/sites/default/files/publications/files/stateofunions.pdf>
- <https://nca2014.globalchange.gov/report/regions/southeast>
- <https://www.nature.org/en-us/about-us/where-we-work/priority-landscapes/appalachians/>
- <https://www.usgs.gov/faqs/why-are-amphibian-populations-declining>
- https://www.fs.usda.gov/ne/newtown_square/publications/other_publishers/OCR/ne_2004brooks01.pdf
- <https://www.fs.usda.gov/ccrc/topics/effects-climate-change-mammals>
- <https://www.fs.usda.gov/ccrc/topics/effects-climate-change-terrestrial-birds-north-america>
- <https://ny.audubon.org/newsroom/press-rooms/snow-birds-new-york-s-winter-bird-population>
- <https://www.fs.usda.gov/ccrc/topics/assisted-migration>
- <https://www.nature.org/en-us/magazine/magazine-articles/resilient-lands-road-map-to-refuge/>
- https://www.audubon.org/climate/survivalbydegrees?gclid=Cj0KCQiAorKfBhC0ARIsAHDzslsmXE5Q_57hlvQZ5QM0Dm_v4pVIKL7arv05NOxS5vwoVJ5lqN9iObUaAsrcEALw_wcB
- <https://maps.tnc.org/migrations-in-motion/#4/19.00/-78.00>
- GBIF.org (17 February 2023) GBIF Occurrence Download <https://doi.org/10.15468/dl.bbgrbu>
- <https://www.nature.org/en-us/what-we-do/our-priorities/protect-water-and-land/land-and-water-stories/appalachian-climate-escape-route/>