

# Data Visualization of Longitudinal Waterfowl Abundance in Escambia, Santa Rosa, and Baldwin Counties

Nicholas O Brown-Duncan<sup>1</sup>, Samantha R. Seals<sup>2</sup>

Departments of Computer Science<sup>1</sup> and Mathematics & Statistics<sup>2</sup>,  
Hal Marcus College of Science and Engineering, University of West Florida



## INTRODUCTION

It is known that waterfowl cannot thrive in northern regions of the US during winter and migrate to warmer climates. While migration patterns have been studied, there has been limited research specifically in the Florida Panhandle area. Since 2014, UWF and U.S. Fish and Wildlife Service researchers have collected data during migration season, approximately between October and April. This project continues ongoing research using waterfowl abundance data in the Florida Panhandle area. Overall, the research team is interested in determining predictors of waterfowl abundance in the Florida Panhandle area, but this project focused on data management and data visualization.

## WATERFOWL OF INTEREST



Fig. 1: Waterfowl of interest, from left to right: Bufflehead, Redhead, and Lesser Scaup

## METHODS

To collect data, the researchers visited several locations throughout the Florida Panhandle area, including locations in Escambia and Santa Rosa Counties in Florida and Baldwin County in Alabama. Upon arriving at the locations, the researchers counted the number of waterfowl, observed weather and water conditions, and any possible disturbances to waterfowl (e.g., eagles, dogs, humans).

R was used for data management and graph construction. First, the data had to be merged and organized from the larger database. Then, small specialized datasets to handle specific graphs and analyses were constructed. Graphs were created using the ggplot2 and ggmap packages, animated using the gganimate package, and made interactive with the plotly package. The final report was written using R Markdown and is hosted on GitHub.

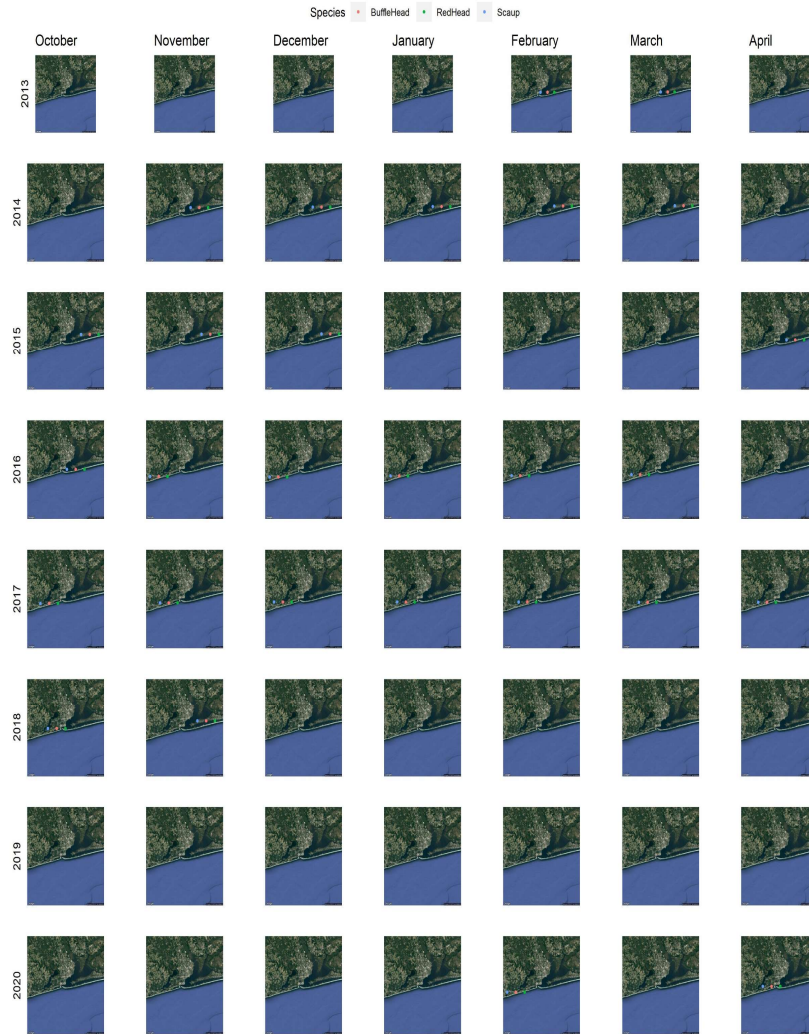


Fig. 2: Still image for the migration movement for a given month and year of the Bufflehead, Redhead, and Scaup species relative to one another.

## WHAT I'VE LEARNED

Through this research project, I have gained and refined many soft and hard skills. These skills have allowed me to successfully reach my personal goals and finish the group goals ahead of time.

For soft skills, I have refined communication and organization. Through our consistent meetings and goal planning, I better communicate thoughts and ideas, along with respond to and provide feedback. Through continual goal progression, I learned better methods to organize documents into separate folders and subfolders.

For hard skills, I have learned how to properly utilize R to analyze, visualize, and report data, along with beginning to learn linear regression and modeling.

## WEBSITE

The following QR code and link will take you to a website that presents our findings in a user-friendly method. This website allows the viewer to get more specific data, as each scatterplot graph is interactive, and allows the user to gain specific information by hovering over or clicking onto a data point.



## ACKNOWLEDGEMENTS

The authors would like to thank OUR and the Hal Marcus College of Science and Engineering for the lead author's funding. The authors would also like to thank Dr. Philip Darby and Cody Nash from the UWF Department of Biology and Rob Holbrook at the U.S. Fish and Wildlife Service for providing the data used in this project, and the Pensacola and Perdido Bays Estuary Program for funding the original data collection.