

UNIVERSITY *of* WASHINGTON

# BASA Model Sensitivity App

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## Problem Statement

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- > Working with a BASA (Bayesian age-structured assessment) model that predicts herring stock
- > Model requires an input parameter for mortality
- > How sensitive is the model to a change in the mortality value?
- > Goal: create an app where a variety of users can explore the BASA base model and its sensitivity



# Users and Use Cases

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- > Primary user and technician: CL Roberts
  - Will use the app to inform his dissertation work
  - Interested in generating residual values and statistics between the base model and mortality-adjusted model
- > Secondary users: Ecosystem researchers
  - May want to extend the app's relevancy to their own population work
- > Tertiary users: Board members for agency
  - Want to evaluate the BASA model's quality and advocate for fishing interests



## Technologies Used: Overview

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- > Built the app using Shiny for Python
- > Created the UI components using Shiny
- > Created technical components, along with corresponding tests, in Python modules
  - Run the BASA model using the set mortality value
  - Change the mortality parameter
  - Plot both base and adjusted model outputs for biomass
  - Calculate percentage error between the models' biomass outputs
  - Plot the percentage error values



# Technologies Used: Shiny App

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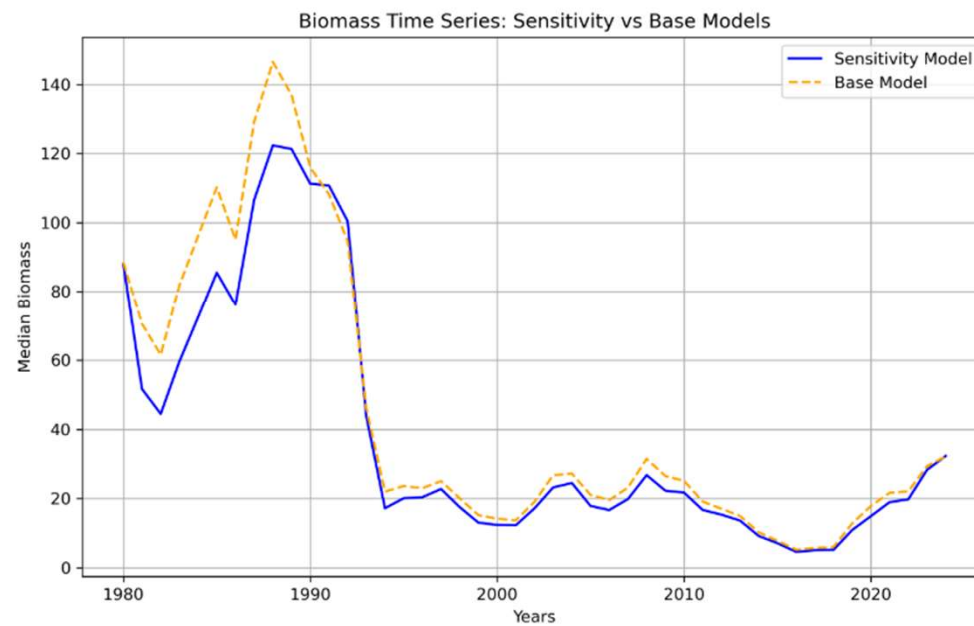
Natural Mortality

0 0.25 0.5

Run Model

Welcome

Comparison to base model biomass



# Technologies Used: Shiny App

Natural Mortality

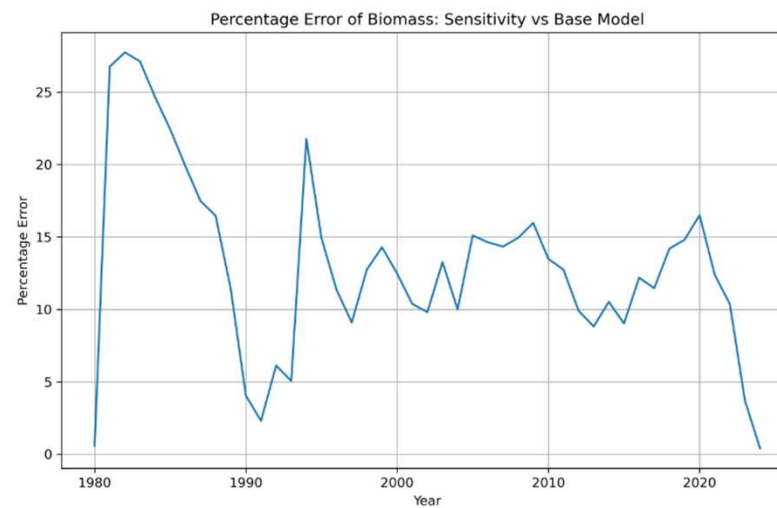
0

0.25

0.5

Run Model

## Error analysis



Mean  
Percent Error  
**13.06%**

Min Percent  
Error  
**0.4%**

Max Percent  
Error  
**27.75%**





## Major Challenges

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- > Learning how to use git pull, stash, and merge for successful simultaneous group coding
- > Connecting the component modules to each other
- > Calling on functions from the component modules within our test modules
- > Using the component modules in the Shiny app
- > Finding a way to run the Shiny app on computers other than the main user's laptop





## Next Steps

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- > Building a virtual environment, rather than just providing information on dependencies and necessary steps to run the app in the README
- > Expanding on the test modules to add more complexity, especially more edge tests
- > Work on the app so that users can have different tabs open for different sensitivity runs of the model
- > Add different parameters for other sensitivity considerations







## Where to Access

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- > GitHub Repository:
  - <https://github.com/cl-roberts/pws-herring-basa/tree/sensitivity/sensitivity>

