This year, I have been on a quest to spot a platypus in the wild. When random riverside idling fails, I turn to computational models. Aided by observations from the Atlas of Living Australia and some nifty programming, I have developed a system to assess the suitability of any part of Australia to platypus habitation, and created a tool to find nearby rivers so that you too can search for Australia’s most elusive aquatic mammals.

What is ENM?

ENM (Environmental Niche Modeling), commonly referred to as Species Distribution Modelling (SDM) is the use of computational models to predict habitats that particular species may be found. These models are based off of a variety of approaches. I have selected to use BioClim, which inputs observation data of platypus, then finds key relations of presence and absence with a number of climatic variables. The model then gives each square on a grid map of Australia a score, whereby which higher values indicate more suitable climatic conditions, and lower values represent less suitable conditions.

BioClim is not the only approach to SDM. More complex methods, such as Generalized Linear Modelling, and less complex methods, such as Domain, are available. Additionally, alternative approaches exist, like Random Forests, which is based on decision trees.

For this project, BioClim is the most appropriate option, as it is designed not to predict new sightings, but to calculate the relative suitability of habitats.

Finding the Rivers

The next step is knowing where to look. I used \_\_\_ which provides a list of several thousand rivers across both Australia and New Zealand. The issue with rivers, is that they are long and stretch many kilometers. So extracting data in a way that I could view it was the next major step. That led me to the wrangling of ESRI shapefiles, where I ended up extracting several hundred points along the path of a river.

Using the Haversine Formula to accurately assess the distance of two points on a sphere, I wrote a function to input your own coordinates, and then output the suitability of your location to finding platypus, and the nearest river you may be able to do so!