Create Base Script

Time Allocated: 9 hours – Time Taken: 5 hours

This set was the 'guts' of the project. It involved creating the Base Script which all further progress is based on (see Appendix 2). While this was not the final copy of the script used, it provided a Python script that, when run, would provide a resultant buffer and information about the process post-running. The results can be seen in Table 3.

Table 1. Base Script accuracy

	Base Script
areaIncrease (Ha)	832
percentIncrease (%)	19

Test / Break / Improve Base Script

Time Allocated: 2 hours – Time Taken: 5 hours

In this step, I worked to improve the Base Script. This involved making general changes to the script to make it more streamlined, manageable, and concise. The resultant code can be seen in Appendix 3. The major changes made to the Base Script are detailed below:

1. Move process to a function with specified parameters

This allowed the process to be more easily tested under different inputs. Additionally, it allowed it the transition to Processing Tool to be more easily implemented.

2. Allow for different compounds to be calculate

Allowing the user to input different compounds allows this tool to finally be used for all of Nitrogen, Phosphorus, and Potassium, as per the client's request.

3. Put repeat buffer in while loop

Pushing the repetitive process into a while loop not only made the while script more manageable, but also made it easier to make any necessary changes throughout the script further. Only 1 change had to be made when previously it was 3 changes. Finally, this change also allowed for a theoretically unlimited number of iterations.

4. Increase segments of area buffers

This was only a small change, and arbitrary in the change made to the number. Each quarter section of a circle was now broken into 10 segments instead of the default 5. This change increased the area covered, to one comparable to the process done manually on ArcGIS Pro.

Table 2. Improved Script accuracy

	Improved Script
areaIncrease (Ha)	892
percentIncrease (%)	21