**ENV859 Final Project Workflow**

**Elephant Satellite Collar Tracking**

**Fall 2024**

Note: This is meant to be a living document with editable scripts/info. Add date, name, and email to updates section as needed.

**Created:** 11-22-2024

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Updated by:

**Requirements:**

1. Excel files to be used in tools should be pre-processed using R scripts found on the Bass Connection Project's GitHub created by Maia Griffith, Vicky Fong, and Mishka Malinowski
   1. Link to (private) repository: <https://github.com/ham-duke/BassConnections_Eles_Drones.git>
2. Ensure desired datasets are saved as **.xlsx** format.
3. ArcGIS Pro must be downloaded on the computer being used.

*The following steps should be completed within ArcGIS Pro unless otherwise specified.*

**Workflow Overview:**

1. Start with **Tool 1** (single dataset) or **Tool 2** (multiple datasets)
   1. Select desired .xlsx file(s)
   2. Set desired Scratch workspace and Geodatabase to be used for saving files
   3. In Tool 2, a "Unique Suffix" is required to ensure user can identify it
2. Once point and line files have been generated (by Tool 1 or Tool 2), add them to the map
   1. Point file should be saved to the Scratch workspace that was set manually

Name: "XXX\_Points.shp" (Note: might be slightly different based on suffix and projection needs)

* 1. Line file should be saved to the Geodatabase that was set manually

Name: "XXX\_Lines"

1. Explore the points and lines and make note of any obvious or potential outliers
   1. Might be when collar was getting tested or moved somewhere, or when coordinates were not saved
   2. Think about what bounds/extent might be best to select only the points you want to include in analysis
2. Open **Tool 3** (HS and MCP)
   1. Choose the same Scratch and Geodatabase as with Tool 1 or 2
   2. Select the point file (.shp) you added to the map in previously (output of Tool 1 or Tool 2)
   3. Using the map view (MAKE SURE the LOCATION UNITS at the bottom center of map are set to DECIMAL DEGREES)
      1. Move the cursor to find the desired bounds/extent.
      2. If latitudes are in the Southern Hemisphere, they should be NEGATIVE (ex. 16.3 deg S = -16.3)
      3. If longitudes are East of the Prime Meridian, they should be POSITIVE (ex. 25.9 deg E = 25.9)

Example Bounds for Orphaned Elephants:

**Upper Latitude = -15.55**

**Lower Latitude = -26.00**

**Left Longitude = 25.75**

**Right Longitude = 26.15**

1. Add the HS and MCP layers (saved in selected geodatabase) to the map
   1. Adjust symbology as needed. Recommendations included in Tool 3 Metadata.
2. Open **Tool 4** (KDE)
   1. Choose same Geodatabase as used previously
   2. Choose a points file that has had **outliers removed** (should include “Select” in the name), located in the Scratch folder chosen in Tool 3
   3. Choose a “Unique Suffix” to identify each new run of the tool (will likely run more than once as you change the cell size and search radius)
   4. Choose a **proper cell size and search radius** (recommendations in tool metadata and parameter descriptions)
   5. Once run, adjust symbology as recommended in metadata (Stretch, Standard Deviation, Masking)
3. The VS Code used to create the tools are found in Maia’s GitHub as well as in the project folder “Scripts”
   1. Link to (public) repository: <https://github.com/maia-g/EleHotspotHomerange.git>
4. Next steps in this analysis could include creating contour lines from the KDE and extracting core use areas and comparing those zones with the initial hotspot created from point counts. Then work could be done to analyze the habitat types elephants are utilizing the most. The lines could be used to understand tortuosity, daily movement patterns, and seasonal movement patterns.