

MAPPING ANIMAL MOVEMENT

National Geographic maps have an iconic style for mapping the movements and distribution of animals. We will try to recreate this style of a soft, desaturated background with subtle colors and descriptive text. For this lab, use the instructions as a guideline and adjust as you see fit.

Tools: QGIS, AI, Photoshop

Location of Data: Movebank, Natural Earth

Output: Print

DIRECTIONS

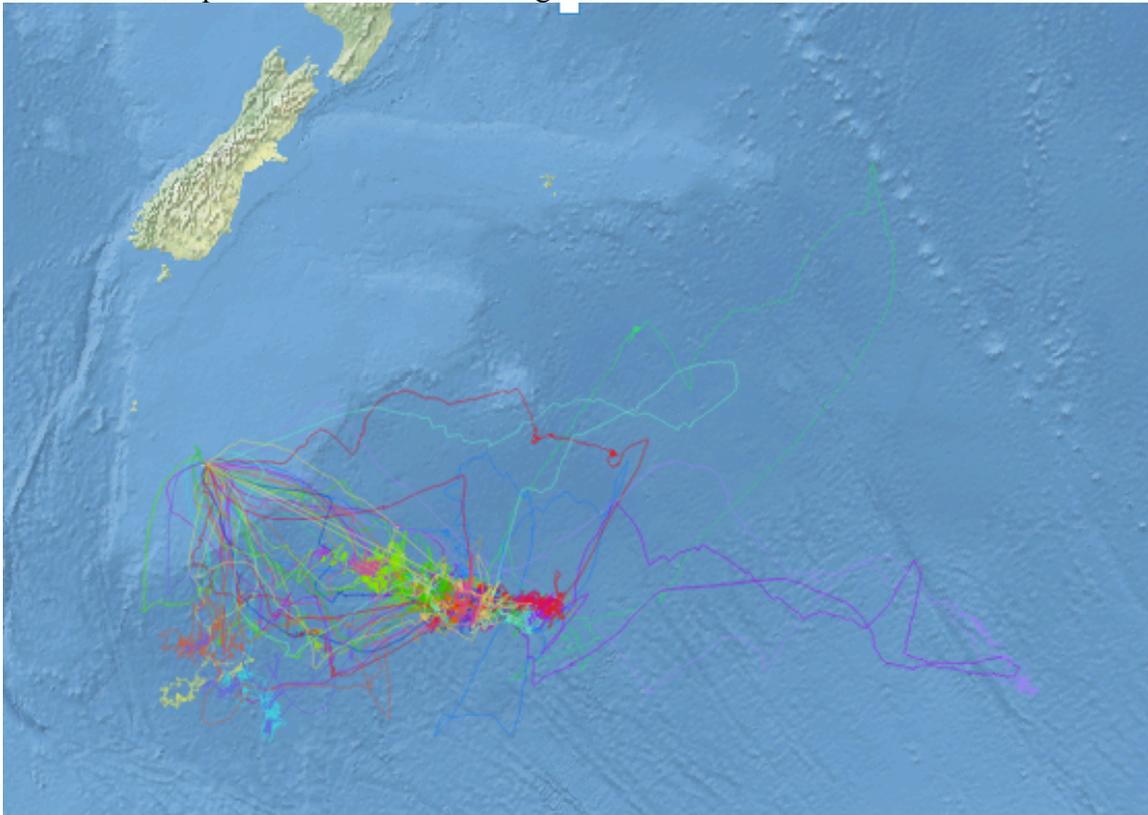
*****These direction detail how I made my map. With each process make sure you fiddle around with the parameters to make your map look how you like it. Sometimes a certain combinations of settings will work well for one map and look horrible on another based on things like underlying geography, distribution of points, color choice, scale, etc. Use these directions as a guideline but feel free to venture off in other directions. *****

1. Go to movebank.org and create an account.
2. Our goal is to find some animal GPS tracks. Movebank has good data but we have to move through about 5 screens in order to find the correct search menu for GIS data.
3. Click on any green dot and and select open studies page. On the left side of the studies page there is a dropdown menu. Select studies where I can download any data. This will bring up a list of species that have public data.
4. Scroll this list to select an animal. On the right side of the page this will bring up the study data. Select data to see on map. If you like how this looks then download the data as an ESRI shapefile.

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Process for QGIS. Adjust accordingly for ArcGIS

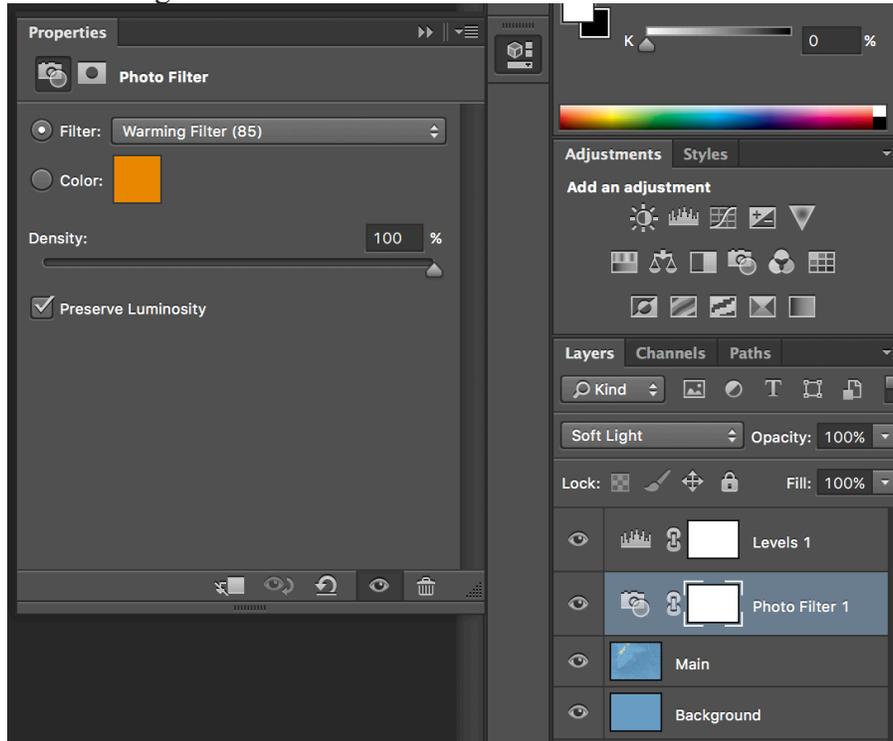
- a. Open Q and select *vector layer* and add the lines data.
- b. Change the projection by going to Project->Project Properties. Check the box to enable on the fly projections. Find the projected coordinate system that works best with your data.
- c. Double click the lines layer in the menu to open the layer properties. Under the style menu change the symbolization from single symbol to categorized. Change the symbolization of the correct field to make it so each animal tracked is a different color.

- d. We will use Natural Earth medium scale raster data (Natural Earth 2) as the base layer. Download this from here - <http://www.naturalearthdata.com/downloads/50m-raster-data/50m-natural-earth-2/>
- e. Load the natural earth data. This is a big dataset so move slowly to load it and get it to the extent you want.
- f. Go to Project->New Print Composer to create a map document. In map composer select add new map and draw a box on the blank page where your map will be. Your layers should automatically load into this map.
- g. Export as PDF. Open PDF in AI and remove clipping paths, save as AI file. Your export should look something like this

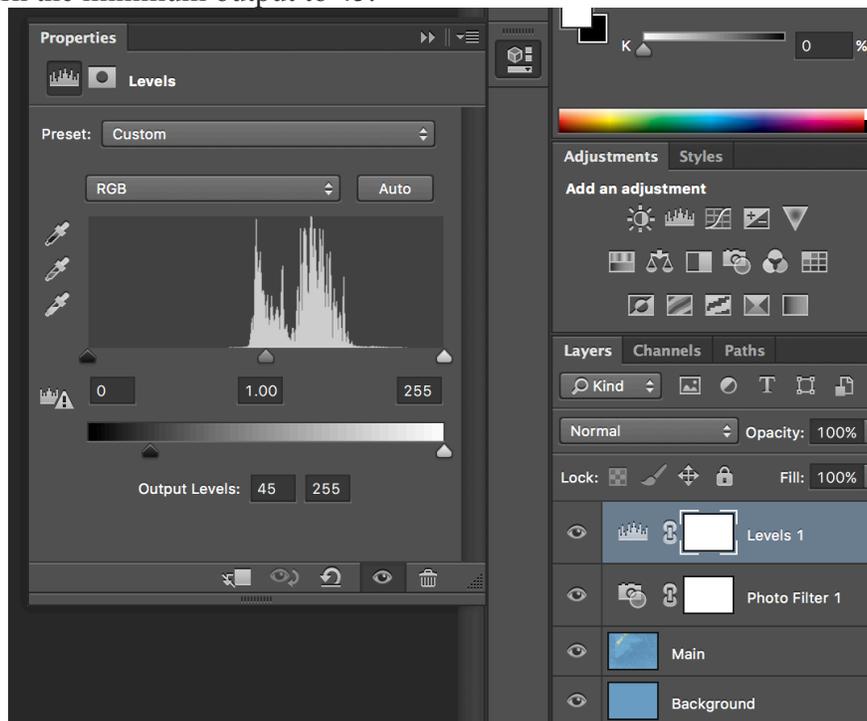


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1. Turn off the tracking data. Change the artboard to match the extent you want. Export your satellite background image as a .png 300 DPI, clipped by your artboard. Open this image in photoshop.
 2. Make copy. Call this layer main. Name the original background. Make sure main layer is on top. We are going to mute this image a bit to make it a better canvas for the animal tracks.
 3. Make an average filter (Filter->blur->average). Set the opacity on the top layer at 70%

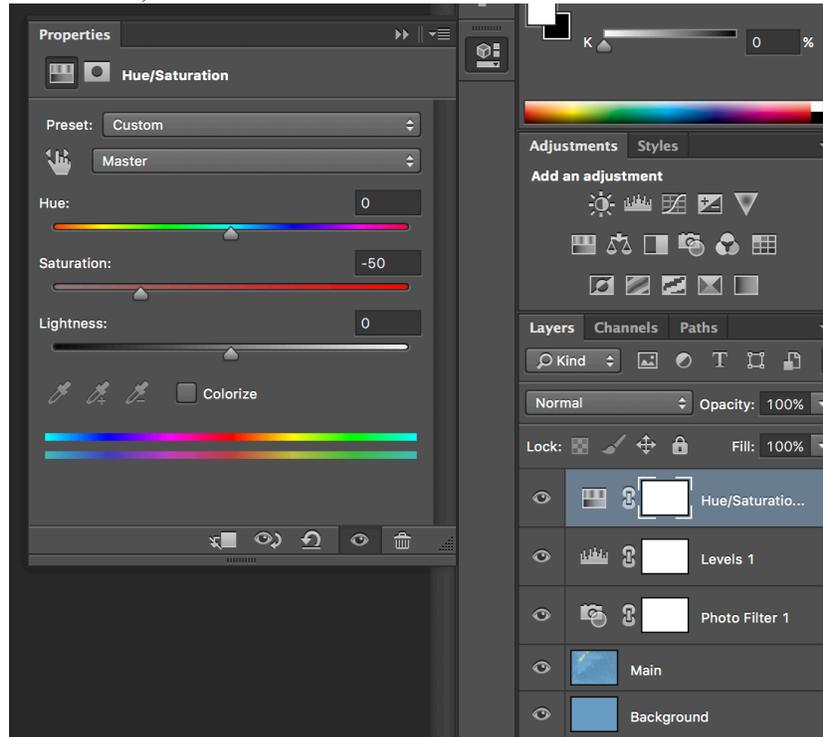
- Now create a new adjustment layer (layer->new adjustment layer-photo filter). Set the filter to warming filter, density 100%. Change the blending mode on the photo filter to soft light.



- Now create another new adjustment layer (layer->adjustment layers->levels). Turn the minimum output to 45.



6. Finally, add one more adjustment layer (Layer->Adjustment layer->hue/saturation). Set saturation to -50



7. Soften your main image with a noise reduction filter (Filter->noise->median). Set radius to 3
8. Save as background.psd and place .psd document in AI.
9. In AI, first adjust your animal tracks? Do you want them multi-hue or a dingle hue? Once you decide how the tracks are going to look, take a look at the distribution of the data to manually draw some ranges. My data is for the Campbell Island Colony of grey headed albatross. I am going to use the tracking data to interpolate their range and feeding area away from their nesting area.
10. For this I created a thick dotted line with a gradient moving from opaque on the outside to transparent on the inside. This is easiest to do by making an approximate range with the pen tool then simplifying (object->path->simplify) to create a nice boundary. Choose the apply gradient across stroke option to get the correct look.



11. Add a title, text, scale bar, labels, etc to finish the map off. Here is my final product

