Data Visualisation using RShiny: Day 2

*2.1 - 2.3 Worksheet*

2.1   Recap Day 1 and intro to mapping in R

2.1a   Load libraries and data, prepare for mapping

Navigate to Day 2/worksheets, and copy **dat2\_leaflet\_intro.R** to create a personal version of this R script to edit. This script has some code to help you get started.

There are various bits of code in here that we’ll invite you to edit as we move through the slides together. Feel free to add in any code from the slides and to try out other functions in the packages we’ll work with that we don’t have time to cover.

Open your version and follow the code to load libraries and data required. Then, follow code to create to:   
1) create a new column/variable ‘species type’ (Human, Domestic or Wildlife)   
2) create map\_data — a dataframe consisting of 2014 data only

2.2   Build a leaflet map in R

2.2a   Try some options for provider tiles

Within your version of **day2\_leaflet\_intro.R**, initialise map using leaflet() with datapoints added using addCircles(). Try some options for provider tiles using addProviderTiles(providers$\_\_\_).

Hint: use tab completion to access list of options (some options require registration etc. so won’t be instantly available).

2.2b   Add circles coloured by species with legend and scale bar

Within your version of **day2\_leaflet\_intro.R**, navigate to *“Your turn 2.2b”* and adapt the example code.

The aim is to produce a map with:   
1) tiles showing topography   
2) circles coloured by species (instead of species type)   
3) a colour legend   
4) a scale bar showing distance in kilometers

Hint: ?addScaleBar

2.2c   Colour points by density using a continuous colour scale

Within your version of **day2\_leaflet\_intro.R**, navigate to *“Your turn 2.2c”* and adapt the example code.

Adapt the example code there to produce a map with:   
1) Circles coloured by population density using the *viridis* palette   
2) a legend and scale bar

2.2d   Build choropleth with circles for point data

Within your version of **day2\_leaflet\_intro.R**, navigate to *“Your turn 2.2d”* and adapt the example code.

The aim is to adapt the code for plotting a choropleth with:   
1) colorQuantile() instead of colorNumeric() for the choropleth   
2) and with circles coloured by date for human cases within map\_data.

Hint: to colour circles by date, create myPal2 using colorNumeric()

2.2e   Build map showing raster and shape data

Within your version of **day2\_leaflet\_intro.R**, navigate to *“Your turn 2.2e”* and adapt the example code.

The aim is to produce a version of the map showing the raster data for human population density with an additional layer showing region borders. When the cursor hovers over a region on the map, labels should show up and the region’s border should appear highlighted.

Hint: Could addPolygons()’s fillOpacity = argument help visualisation of the raster layer?

2.3   Build an interactive map

2.3a   Colouring points by a selected variable

Please navigate to the **Apps/Day 2 - map\_1** folder and open up the **ui.R** and **server.R** scripts in R Studio.

This is an app that displays a leaflet map with a background tile, the region shapefile, and the locations of our data points.

There is only 1 widget - selectInput() - to show a Dropdown menu that selects a variable by which the data points should be coloured.

Please take a moment to have a look at the server and ui scripts, then run the app.

**Questions:**

1. What does the selected="species" argument in the selectInput() function do?
2. What differences do you see in the map legends displayed for species and date. What is the reason for these differences?

**Activity: Add age and sex as options to colour the points by.**  
*Hints:*

* *You will need to change both files*
* *Think about what type of variables age and sex are. Are they factors or numeric?*
* *The operators | or %in% will help you make the necessary changes to the server*

2.3b   Displaying a subset of points using pickerInput

Please navigate to the **Apps/Day 2 - map\_2** folder and open up the **ui.R** and **server.R** scripts in R Studio.   
  
This is the same map app as before, but with a new pickerInput menu for selecting which species to display on the map.   
  
Please take a moment to have a look at the server and ui scripts, then run the app. Try out the new pickerInput menu.

**Questions:**

1. What other widgets could we have used to allow selection of the species to display?
2. When do you think the live-search and Select All/Deselect All abilities of pickerInput would be particularly useful?
3. In the previous version of the app, popUpInfo was created in the section above the server. Why does it now need to be a reactive function within the server?

**Activity: Change the app so that pickerInput subsets the points based on region instead of species**

*Hint: You will need to change both files*

2.3c   Selectable map layers

Please navigate to the **Apps/Day 2 - map\_3** folder and open up the **ui.R** and **server.R** scripts in R Studio.

This map app has a new third widget; a checkbox that allows the user to select whether to display the region shapefile.

Please take a moment to have a look at the server and ui scripts, then run the app.

**Questions:**

Have a look at the checkboxInput() code. Compare with the checkboxGroupInput() code from Day 1.

1. What arguments do the two functions share?
2. By which arguments do they differ?

**Activity: Change the checkboxInput widget to a checkboxGroupInput widget, with selectable region and protected areas shapefiles**  
*Hints:*

* *You will need to change both files*
* *The protected areas shapefile can be found in the app’s ‘data’ folder - you will need to read it into the server*
* *Remember that the server input from checkboxGroupInput is a vector of choices, not a logical value*
* *You will need to add an extra if() statement to the leaflet code*

2.3d   Adding a slider to choose the date range of points

Please navigate to the **Apps/Day 2 - map\_4** folder and open up the **ui.R** and **server.R** scripts in R Studio.

This map app includes all the features we have already developed.

Now it’s your turn to add a new widget!

**Activity: Add a sliderInput that subsets the points to a selected date range.**

*Hints:*

* *You will need to change both files*
* *You can use ?sliderInput or your code from the Day 1 task 1.4f to help you identify the arguments needed by the sliderInputfunction*
* *In the server, the points are already being subsetted by species - try adding your code for subsetting by date to the same section*