

Lab 2: Working with vector data

In this lab, you will practice some of the operations for processing vector data using Geopandas package.

Data:

You will work with two shapefiles:

- A point shapefile representing the location of field sites
- A polygon shapefile representing the general area of the sites

Import packages:

Start by importing relevant packages as below:

```
import geopandas as gpd
```

```
import matplotlib.pyplot as plt
```

Read shapefile

To import shapefiles you use the geopandas function `read_file()`. Notice that you call the `read_file()` function using `gpd.read_file()` to tell python to look for the function within the geopandas library.

```
sites = gpd.read_file("data/SJER_plot_centroids.shp")
```

You can view the attribute table associated with the GeoDataFrame *trees* by `.head(3)` to only display the first 3 rows of the attribute table. The number in the `.head()` function represents the total number of rows that will be returned by the function.

```
sites.head(3)
```

You can check the number of records and attributes using:

```
sites.shape
```

Note that “shape” here does not refer to the shape in shapefile or anything related to geometry. “shape” refers to the shape of the data frame. You should see (18, 6) which means the shapefile has 18 rows and 6 columns.

Please complete the following tasks in Jupyter Notebook:

1. What is the coordinate reference system of “*SJER_plot_centroids.shp*”? (10 pts)
2. How many records are there in “*SJER_crop.shp*”? (10 pts)
3. Create a map showing both “*SJER_plot_centroids.shp*” and “*SJER_crop.shp*”. (10 pts)
4. Create a buffer on “*SJER_plot_centroids.shp*” with the buffer distance as 150 meters and show the map. (10 pts)
5. Use overlay difference operation between “*SJER_crop.shp*” and the buffered “*SJER_plot_centroids.shp*” layer to get the area NOT within 150 meters of the sites. (10 pts)

Please submit your Jupyter notebook (A full working notebook will give you 50 pts; one mistake will result in 10 pts deducted):

- Lab2_FirstName_LastName.ipynb