

## EXERCISE 1

# Data preparation and using ArcMap to display shapefiles from a variety of sources

This exercise provides an example of using existing spatial data about a country (Fiji) and using ArcMap to display the different layers that are available. Fiji is a good example because it is bisected by the International Date Line and in most default map projections, the country is split with one part displaying on the rightmost border and the other at the leftmost border. The project coordinate system Fiji Map Grid is applied to display the islands together.

### Objectives:

1. Prepare spatial data consisting of different shapefiles of a selected country for use in a GIS
2. Setup ArcMap to display layers of spatial information
3. Display different layers from a variety of sources

### Requirements:

1. Software required include ArcMap Version 10 or better, Microsoft Excel and an Internet Browser (Firefox and Chrome are recommended)
2. Access to the Internet
3. Knowledge of ArcMap use

Expected time to finish: 1 Hour

### Downloading basemap data for a country

1. Go to the website <http://www.diva-gis.org/gData>
2. Select Fiji from the Country drop down menu
3. Click on OK to download the Administrative areas shapefile
4. Click on Download in the Spatial Data Download window
5. Save the .zip file to a Project Folder in your Desktop
6. Go back to the Download data by country page and repeat steps 3 to 5 for Roads, Elevation, Population and Gazetteer

### Downloading landcover data

1. The landcover database is available at <http://bioval.jrc.ec.europa.eu/products/glc2000/products.php>
2. Click on the Fiji link and download to your Project Folder as an ESRI shapefile
3. Make sure all downloaded files are in one folder

### Opening ArcMap

1. Select ArcGIS -> ArcMap from the Start Button.
2. Click on Blank Map when the initial ArcMap window appears.
3. Click on OK.

### Unzipping downloaded files and setting the projection in ArcMap

1. Unzip all downloaded files (select the zip file, right-mouse click and select "Extract All" from the menu)
2. Reopen the Arcmap window and right mouse click on the Layers icon in the Table of Contents
3. Select Properties at the very bottom
4. Click on the Coordinate System Tab
5. Select Predefined -> Projected Coordinate System -> National Grids -> Ocean>Fiji 1986 Fiji Map Grid
6. Click on Apply

## Adding Layers in ArcMap

When you add additional shapefiles or layers you will be asked to transform if the layer has a different coordinate system.

1. Add the downloaded layers by clicking on the + button and selecting all the layers
2. You should now have the following layers/data:
3. Roads (FJI\_roads) – Vector data Administrative (FJI\_adm0, FJI\_adm1 and FJI\_adm2) – Vector data
4. Altitude or elevation (FJI1\_alt) – Raster data
5. Landcover (FJI2\_alt) – Vector data Population (fji\_pop) - Raster data Gazetteer (FJI.dbf) – Database of addresses

## Reading location data from external files

The downloaded Gazetteer file contains all the names of identified features for the region. Processing the data in Excel is necessary so ArcMap can read the data properly

1. Open the Gazetteer file (FJI.dbf) file in Excel.
2. Select all the numbers in the Lat and Lon columns then click on the warning icon and select “Convert to number” and the text will be reformatted.
3. Save the FJI.dbf file as an Excel workbook “FJI.xlsx” (it’s easier to process)

## Exporting into a Shapefile the data from the Excel File

1. Go back to ArcMap
2. From the File Menu select Add Data-> Add XY Data
3. Look for the file “FJI.xlsx” and Click Add
4. The worksheets in the file appear; Select “FJI\$” and Click Add
5. The LONG and LAT Fields are shown
6. When you click on OK, a warning about missing Object\_ID is shown. Click on OK
7. Export the FJI\$ data by right-mouse clicking on the “FJI\$ Events” layer and select Export Data
8. Save the data as “FijiGaz.shp” with Save as type: Shapefile
9. Export All features in the window that results and output to the Project Folder (don’t add the Exported features to the Map when prompted)

## Defining the Projection of the exported Gazetteer shapefile

1. Define projection of the exported FijiGaz using the Arc Toolbox -> Data Management - Projections and Transformation
2. ->Define projection
3. Input Dataset or Feature “Fiji- Gaz”
4. Click on the Spatial Reference Properties button
5. Click on Geographic Coordinate Systems
6. Select World
7. Select WGS1984
8. Click on Add
9. Click on OK
10. Click on OK again
11. Save your ArcMap Project