

# **GEOG3600. Geographical Information Systems**

## **Lab 2. Introduction to ArcGIS Software**

### **Objectives**

This exercise is designed to introduce the basic concepts of spatial data and geographical information systems (GIS) to students. ArcGIS software, which was used for the subject GEOG1150: “Cartography”, is also used for this subject. This exercise will allow students to “refresh” their memory on how to use the GIS software. For those who have no pre-experience on GIS software, this lab also serves as the introductory exercise.

### **Login to the Windows NT computer and find your working area**

1. With the help of your tutor, locate yourself to the directory allocated for you, which will be your working area on the Windows NT computer. There are some data files that we are going to use for this exercise.

### **Start ArcGIS and Create a View of GIS Data Base**

2. With the help of your tutor, locate the ArcGIS programs. Identify three basic ArcGIS software modules, namely, *ArcMap*, *ArcCatalog* and *ArcToolbox*. What do they do?
3. Start ArcMap and create a map. Start ArcMap by clicking on “Start” then “Programs” then “ArcGIS” then “ArcMap”. To present this sequence, we are going to use the expressions below in all our later exercises.

Start → Programs → ArcGIS → ArcMap

After ArcMap has been launched, you are prompted to select among choices of a new empty map, template or an existing map. Let’s select a new empty map at the moment.

4. Creating a map. To start your project, you need to create a new map. To do this, you need to add data to your map first. Click “Add Data” button, or File → Add Data. You should then enter the location of the database that covers a study area located in central Australia called “Pooncarie”. The database has already been copied to your own working area. Select all coverages (here each coverage is defined as a *layer* or *data set*) in that directory.
5. Adjust properties of your map. To produce a well-presented map is essential for cartographic output. To make a good view, you need:
  - Organise the layers of themes by dragging themes up and down. Generally you should put point and line themes above the polygon themes.
  - Adjust symbols and colours and link maps to an attribute field using legend editor by double click left mouse button on the theme.
  - Change colours and symbols using colour (or symbol) palettes.

- Turn on or off particular themes for the view by ticking (i.e. click left mouse button on the small button on the left of a theme name) the given theme. Single click of left mouse button on a theme name will make it the 'active' theme.

6. The required the map of Pooncarie database should contain the following:

- **Land systems** (coverage "landsys" with attribute "feature") as the background with the colour specification as follows:

<u>Feature</u>	<u>Colour</u>
Alluvial Plains	Green
Dunefields	Orange
Hills and Footslopes	Light brown
Playas and Basins	Light purple
Sandplains	Light yellow
(outlines)	Light grey

- **Property boundaries** (coverage "property" with no attribute specified) using grey colour and thin line style.
- **Roads** (coverage "roads" with attribute "roads-id") with the colour and style specifications as follows:

Roads-id	Colour	Line style
1	none	none
2	black	thick
3	red	medium

- **Symbols of land systems** (coverage "landsys" with attribute "unit") using red colour, 8 point Arial font.
7. You may save the map by selecting "File" then "Save As...". Note you need to specify your working area (e.g. C:\Working\GIS) as the place for storing the project file. Without specifying the directory, you may get the error message saying that you do not have the privilege to write into the default area.

## Query the GIS Database

8. Now you can query the data base to find the answers to the following questions:

What is the name of land system at the location 690,000E and 6,265,000N?

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*Hint:* Make sure that you are in "information" mode. Click left mouse button at the location to pop up the information window.

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What is the area of that region in square kilometres?

How many regions are classified as land system "MANDLEMAN"? (Display these regions on your map)

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*Hint:* Make the layer active then press the “Table” button on the tool bar.

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What is the approximate (straight line) distance in kilometres between two major highways in the area (i.e. roads-id = 2)?

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*Hint:* Press the ruler icon on the tool bar

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9. Remove the property boundary from the map and add information on tertiary landscape (coverage “tert\_topo” attribute “spot”) to the view. Select a colour range reflecting the elevation change (e.g. “Colour Ramp” from green to brown as shown on a topographic map).

## **Quit ArcMap**

10. Quit ArcMap by selecting “File” then “Exit” (File → Exit). Do not save the project this time.