

Lab2: Data Structure and Database Workshop

I. Introduction

There are two major IDRISI data types; *Raster* and *Vector*. In this lab, these two data structures will be reviewed extensively. You will understand how IDRISI data are composed of and how they are linked together. In addition, vector data frames and attribute tables will be examined using Database Workshop in the latter part of the lab.

There are various data formats for your future projects or GIS analyses. In the assignment section, you will learn how to convert ESRI data into IDRISI raster data.

You are recommended to read this lab handout completely before you start the tutorial and the assignment section. You may have to download tutorial data into your local drive before starting the tutorial section and create a project by selecting *New Project Ins* from *IDRISI Explorer*.

After finishing your tutorial section, download data from *S:\Geog 355\Lab2* folder into *D:\Temp\Lab2* folder and create a project on that folder.

2. Tutorial Instruction

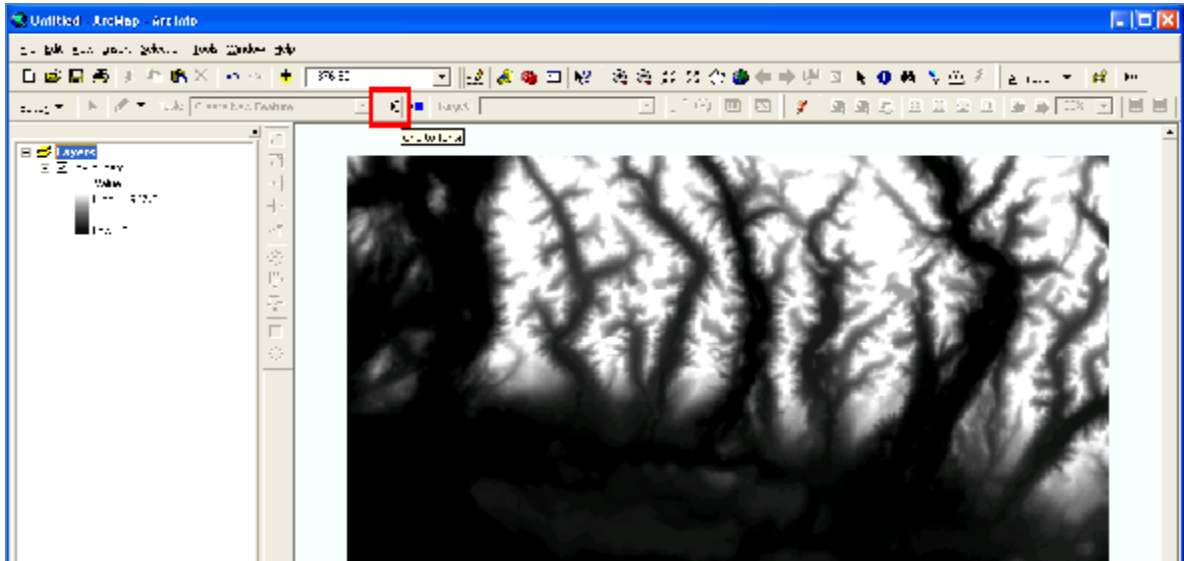
- 1) Work through IDRISI Andes *Exercise 1-8 [Data Structure and Scaling]*
- 2) Work through IDRISI Andes *Exercise 1-9 [Database Workshop: Working with Vector Layers]*
- 3) Work through IDRISI Andes *Exercise 1-10 [Database Workshop: Analysis and SQL]*

3. Assignments Instruction [Total: 25 marks]

1) One of the most time-consuming processes that you may encounter during your GIS project will be a GIS data acquisition process. In addition, even though you get the data you want, the data type could not be compatible to other existing datasets. [Total: 7 Marks]

- a) For the assignment, you have to convert *BC_DEM (ESRI GRID)* data into *GVRD_DEM.rst* file (16 bit) using ESRI ArcGIS Desktop ArcMap9.2. Launch ArcGIS Desktop 9.2 ArcMap and add *BC_DEM (ESRI GRID)* format). Right click on *BC_DEM* layer and click *Properties*. Under the *Source* tab examine the Metadata. What is the value of the DEM's *Spatial Reference*? (1 mark) Converting the grid to Idrisi format requires a plugin created by www.terracs.de called grid2Idrisi. If you are working outside the lab you may need to install it from their website. Close the *Properties* window and click *GRID to IDRISI* button shown in the figure below. NOTE: If you

have any spaces in the names of the folders in which your data is contained
Grid2Idrisi will not work! Save the output IDRISI raster file (*GVRD_DEMID.rst*) into
your IDRISI project folder.



- b) Open the *GVRD_DEM.rst* file with *IDRISI Display launcher*. Notice the Metadata of the converted data. What is the value of *Ref. system*? (1 mark) Modify the value of the reference system to something appropriate and click the save button. What value did you enter? (1 mark)
What is the approximate geographical range (min X, max X, min Y and max Y) of the City of Burnaby? You may need to add the *GVRD_muni* vector layer using *Add Layer* button to help you find Burnaby. (1 mark)

Ref. units	Meters
Unit dist.	1
Min. X	468600.000000
Max. X	544590.000000
Min. Y	5427660.000000
Max. Y	5491200.000000
Pos'n error	Unknown
Y Resolution	30
X Resolution	30

- c) Clip *GVRD_DEM.rst* to cover the city of Burnaby using the *Window* module (Under the *Reformat* menu). Use *Geographical Position* for the *Window specified by* option and enter the Min and Max values of X and Y coordinates that you specified in step b). Save the output image name as *Burnaby_DEM*.
- d) Using *DISPLAY Launcher* open *Burnaby_DEM.rst* file. Open the *Map properties* window and add *Title, North Arrow, and Scale Bar*. Change the text *Font, color, and size* if they needed. Create a new text file, and add two or three lines to describe the (1) spatial resolution, (2) coverage area (3) and the maximum elevation of the image. You can insert other important information of the image in the text file. Save the text file as *Lab2_1.txt*. Select *Text Insert* tab from the *Map properties* window and insert the *Lab2_1.txt* file. Move or adjust the size of the text box in order that all map properties match together. (4 marks)

2) Open the *Burnaby_DEM.rst* file with *IDRISI Display Launcher*. [Total: 8 marks]

- a) Find X, Y UTM Coordinates of the highest elevation cell. (1 mark)

- b) When you display the *Burnaby_DEM* file with 8bit (0~255), what value would be assigned to each cell whose elevation is 0m, 368m, 170m and 350m. (3 marks)
- c) Create a palette file and name it as *Burnaby_dem.smp*. Assign black color for 0 and white color for 255. Blend color between two ends. Assign dark blue (0/0/160) for 170m elevation, and light blue (210/210/255) for 250 m elevation and blend between two ends. Copy the *Symbol Workshop* window with *Windows Print Screen* and paste it in your answer sheet. (2 marks)
- d) Open the *Burnaby_DEM.rst* file with "*Burnaby_dem.smp*" symbol file you just created in step c). Insert map properties such as *Title, Legend, Map Scale, North Arrow* and a text file. The text file should explain the raster image and the symbol effectively. Copy the final window with *Windows Print Screen* and paste it in your answer sheet. (2 marks)
- 3) What is the difference between a data type and a file type in IDRISI? (3 marks)
- 4) Open the *GVRD_Muni.vct* file with *IDRISI Display launcher*. Notice that it has only spatial frame; it doesn't have attribute (data) table. Open a *Windows Explorer* and move into your working project folder and notice that there is *GVRD_Muni.mdb* file (data table). [Total: 7 marks]
- a) Why can't you see the data table in IDRISI Explorer? (1 mark)
- b) Create a vector link file which will link between *GVRD_Muni.vct* spatial frame and *GVRD.mdb* data table using the *Database Workshop* module. You may need to use *Establish Display Link* function in the module. Select *IDR_ID* as the *Link Field Name* option. The link file *GVRD_Muni.vlx* will be saved automatically. Create a new vector file containing POP2001 data and call it POP2001. If it does not display automatically open it using *Display Launcher*. Add map properties such as *Title, Legend, North Arrow, and Map Scale*. Save the map and paste it in your answer sheet. (3 marks)
- c) Open the *GVRD_Muni.mdb* data table with *Database Workshop* module. Add a field and name it *DWELL_SQKM*. The data type should be real. Using *Calculate Field Value* function, fill in the *DWELL_SQKM* field. Its value should be calculated as $DWELL2001 / Are_SQKM$. Create a new vector file showing *DWELL_SQKM* for the *GVRD* and close the *Database Workshop* window. Open the *DWELL_SQKM* vector layer with *Display Launcher*. Add map properties such as *Title, Legend, North Arrow, and Map Scale*. Copy the output image with *Window Print Screen* and paste it in your answer sheet. (3 marks)

Due Date: At the beginning of next lab