Module 1 - Basic introduction to using GIS software

Unit 04 - Thematic Maps and labels

1 Learning outcomes

- To develop an appreciation for thematic data maps and their creation
- To develop necessary skills to be able to create and edit a variety of thematic maps types in ArcView
- To be able to design and create and a thematic map to communicate a subject to an target audience
- To be able interpret thematic and explain patterns to an audience

2 Activities and exercises

2.1 GIS and technical concepts introduced

- Measurement types and the impact of measurement type - nominal, ordinal, ratio, and interval on type of thematic mapping
- Thematic map types
- Statistical techniques – frequency distributions, means and central tendency
- Data classification techniques - equal area, equal interval, natural breaks and quantiles and standard deviation

2.2 GIS functions taught

- Single symbol maps
- Creating and editing unique value maps for point, line and polygon themes
- Creating and editing graduated color maps for line and polygon themes
- Creating and editing graduated symbol maps for point themes
- Creating and editing chart maps for point and polygon themes
- Normalizing data values
- Data classification techniques
- Labeling theme features (auto and manual labeling techniques)

2.3 Teaching activities

- Demonstration of how to use specific buttons and menu items related to function detailed above, using the instructors computer linked to video projector
- Repetition of the acview functions by students using Lao national geographic data sets
- Conducting exercises specified below
- Provision of one on one tuition during the completion of student exercises

3 Exercises

Exercise 1 Creating a simple unique value map

- Create a unique value map for Province theme using Pcode field
- Discussion of utility of this map - What does it show? IS it useful? Etc.
- Add field to province theme table (region)
- assign value north, central and south to records (use the select polygons in view and use table/field/calculate function to assign values to region field
- Create unique value map using the region value
- Create a unique value map using district theme DCODE field
• Discuss utility of this map. What does it show? IS it useful? Etc.
• What are the problems with the map (too many data values – unique value map is appropriate for mapping fields with a maximum of 5 data values)

Exercise 2 Create a graduated color map
• Load all the Lao geo-data
• Import the census98.dbf
• Join census98 table to district theme using Dcode field
• Create a number of graduate color maps using numeric field values
• Create maps based on different classification techniques - discuss results map display, reasons for it and implications in terms of interpretation and communication
• Select the

Exercise 3 Create a unique value map for schools
• Load the lao geo-data
• Load the village.dbf file and the sample school data file school.dbf
• Create a event theme for the village.dbf file
• Join school.dbf to village.dbf using Vcode field
• Create a unique value map using school status (complete and incomplete)
• Display this map with province boundaries roads and rivers and discuss the patterns that can be seen
• Discuss correlation between accessibility and school status

Exercise 4 Create a graduated symbol map for schools
• Hold class discussion to identify data items in the school table that may show distinct spatial patterns (e.g. teacher/pupil ratio, class-size, number of classroom).
• Students work independently to create maps of each variable identified investigate patterns and a report back at the end of the afternoon

Exercise 5 Create a chart map for provincial education indicator data
• Load province and district themes
• Add the school.dbf file
• Summarize the file by district using the following field sum of grade1 - 5 male female and total students
• Join the summary table to the district theme and create a chart map showing male female ratio for each grade and 3 chart maps showing male, female and total students by district by grade
• Discuss results and possible interpretation of the patterns

Exercise 6 Departmental data mapping
• The objective of this exercise is to create thematic maps based on data brought the training session by participants, that was cleaned and geo-coded in unit 3.
• Data should be joined to province and district themes and a series of thematic maps made to explore patterns

4 Q and A
• All of the questions posed in this unit should challenge the student to think about what patterns the data maps are showing and the interpretation of the these patterns. It should be stressed that maps are produced in an attempt to answer specific questions where are the low pupil/teacher ratios etc. These discussions can be linked to later discussions about the type of data maps that are useful for education planning
• Specific questions are posed in the context of exercises 1-5 above
5 Summary and review of concepts and s/w functions
- Review of morning session at the start of the afternoon session
- Review of the days session including problems/issues identified in the afternoon session at the end of the afternoon
- The main discussion theme for this unit is the use of different classification techniques to portray data values. Students should be engaged in discussion on appropriateness of different thematic mapping techniques according to the data type, range etc as well as lengthy discussion on the maps resulting from the use of different classification techniques. Attention should be drawn to the fact that the very different displays are based on the same underlying data values and all of them are correct.

6 Materials and data
Materials
- Video projector
- White board
- Student handout – Unit 1 Module 04 thematic maps and labels

Exercise 1 data
Province.shp and District.shp from C:\0training\0lao\WGS84

Exercise 2 data
Lao geo-data from C:\0training\0lao\WGS84
C:\0training\DBF\Census98.dbf

Exercise 3 data
Lao geo-data from C:\0training\0lao\WGS84
C:\0training\DBF\Village.dbf
C:\0training\DBF\School.dbf

Exercise 4 data
Lao geo-data from C:\0training\0lao\WGS84
C:\0training\DBF\Village.dbf
C:\0training\DBF\School.dbf

Exercise 5 data
Province.shp and District.shp from C:\0training\0lao\WGS84
C:\0training\DBF\School.dbf

Exercise 6 data
Lao geo-data from C:\0training\0lao\WGS84
Departmental data created in unit 03 stored in C:\0training\DBF\School.dbf

7 Sequence and timing
- To be delivered after unit 03
- 3 hours of class time for instructor-lead teaching session
- 3-4 hours in the afternoon, to complete exercises, explore arcview more deeply and review morning instruction. Thematic mapping tends to be time consuming as student get
side-tracked making pretty pictures. Instructors must be strict with timing of the different exercise to ensure completion. Thematic mapping is extensively reviewed in the final exercise of the training course in unit 7 of the course.

- Morning session used for instructor led teaching of functions and student practice of taught functions and command.
- Afternoons session are used to provided:
  - time to review morning session functions to cover material not covered during the morning session
  - independent student practice to complete exercise – supervised by two instructor offering one on one tuition