**Short Report: Data Analysis in QGIS**

**Introduction**

This is your first piece of written assessment for the unit. It tests the skills and knowledge that you have acquired in the unit within weeks 1-4. You have been introduced to the functionality of QGIS and this first assignment provides a test of your basic spatial analysis and cartography skills.

**Requirements**

• Overall word limit: 1200 words maximum

• Submission format: Word or PDF format only

• Your word count will not include any words included in tables presenting numeric outputs.

**Assignment brief**

Based on the work completed in Weeks 2 to 4 you are to compile a short Report on Tree Canopy Cover within the Perth Metropolitan Region. This is a short report, and you will need to be both precise and concise in reporting your findings.

1. **Background**

Based on course reading materials, together with further independent reading, provide a background section covering the importance and benefits of urban vegetation whilst identifying the characteristics of the urban environment that can influence urban vegetation. Based on the brief provided here under points 2 to 4 briefly outline the aims and objectives of this report (250 to 300 words).

1. **Tree Canopy by Land-use**

Based on the brief provided to you in Week 3 provide an analysis of the dynamics of tree canopy cover by land-use in your SA2 in comparison to tree canopy by land-use across the whole Greater Perth Region.

In class you were shown the steps required to compile tree canopy data using the landuse field called monitorcat as a land-use descriptor. For this assignment exercise you will need to complete the requisite steps to generate similar information using the field MB\_cat16 as the descriptor of land-use.

To complete this exercise, you will need to generate layers that provide:

1. Measures of tree canopy cover and land area for your whole SA2;
2. Measures of tree canopy cover and land area by land-use (use the mb\_cat16 field) for your SA2;
3. Measures of tree canopy cover and area for the region-as-a-whole; and
4. Measures of tree canopy cover and land area by land-use for the region-as-a-whole (use the mb\_cat16 field) for your SA2;

--------Allocated SA2 MAINCODE: 504011045

--------Allocated SA2 NAME: Bayswater - Embleton - Bedford

**Submit:**

2.1 A one-page map layout with multiple map frames that focuses on tree canopy ­cover and land-use for your SA2. Look to highlight overall tree canopy in your SA2 in comparison to other SA2s across the region as well as the detail of tree canopy cover and land-use in your SA2. Provide your SA2 with good spatial context and provide mapped information that you consider to be informative to your reader.

2.2 Provide a short, written analysis and discussion (300 to 400 words) comparing tree canopy cover and land-use in your SA2 area compared to the region-as-a-whole.

1. Consider the region as a whole and identify the important land-uses across the region in terms of land area and in terms of tree canopy cover.

2. Highlight and discuss tree canopy cover and land-use characteristics of your SA2 in comparison to the region as-a-whole.

3. Look to identify where your SA2 ranks in comparison to other SA2s in terms of overall tree canopy cover and look for trends in your land-use, socio-economic and density data that can be used to explain the tree canopy characteristics of your SA2.

4. Support your discussion by providing relevant graphs and tabular outputs for both your SA2 and the region as a whole, including:

i. Land area by land-use (in hectares and as a percentage split)\*;

ii. tree canopy cover (percentage) by land-use\*; and

iii. tree canopy cover area/non-canopy cover area (ha) by land-use\*. (\* make sure you include measures for the whole SA2/region).

1. **Dwelling Density Layer Creation**

As specified in section 7.2 of Lab Delta, create a layer that includes a variable that provides a measure of dwelling density in dwellings per sqkm and join the newly created layer to UF\_SEIFA\_SA2\_2016\_GPER\_v2 to make a new layer.

**Submit:**

3.1 A flow chart that describes the steps that you took to build an SA2 level layer measuring dwelling density in Dwellings per sqkm using the inputs described above – make sure that you also include the steps used to join that layer to UF\_SEIFA\_SA2\_2016\_GPER\_v2.

1. **Determinants of Tree Canopy Cover in the Perth Metropolitan Region**

Also based on the work completed in Week 4 together with the inclusion of the additional variable specified in section 3 above conduct an SA2 level statistical analysis using the following independent variables that potentially explain percentage tree canopy cover:

Independent Variables: IRSD\_Score; IRSAD\_Score; IEO\_Score; IER\_Score); population density (PopDensity\_ppSQKM); and dwelling density (in dwellings per sqkm)

Dependent Variable: TrCover\_pc

**Submit:**

* 1. **Bivariate Statistical Analysis**

**Include：**

• A short introduction to the section providing relevant context.

• A Pearson’s Correlation Table incorporating all independent variables and the dependent variable.

• Calculate p-values and R-squared values for all independent variables against the dependent variable.

• Consider covariance between independent variables.

• Provide scatter plots for all independent variables against the dependent variable. • Identify the number of SA2s that contribute to the bivariate analysis.

Provide a summary and interpretation of the outputs of your statistical analysis (150 to 200 words).

* 1. **Recommendations:**

Use the outcomes of the above analysis to **recommend** which of the potential explanatory variables best explain tree canopy cover at an SA2 level within the study area and that may be useful for a future broader evaluation of the determinants of tree canopy cover. When compiling your recommendations **draw on relevant literature** to validate your evaluation and to identify which additional independent variables you may wish include for further analysis (250 to 300 words).

* 1. **Tree Canopy Statistic Summary** **Table** - Provide the required information to populate the table below (report percentage tree canopy to 1 decimal place).

|  |  |
| --- | --- |
| **Tree Canopy Statistics** | **Answer** |
| 1. Overall percentage tree canopy cover in SA2s included in the analysis. |  |
| 2. The mean percentage tree canopy cover across all SA2s included in the analysis. |  |
| 3. The name of the SA2 closest to the mean value (include. |  |
| 4. The median percentage tree canopy cover by SA2. |  |
| 5. The name of the SA2 closest to the median value. |  |
| 6. The standard deviation for percentage tree canopy cover by SA2. |  |
| 7. The number of SA2s within +/- 1 standard deviation of the mean. |  |
| 8. The number of SA2s within +/- 0.5 standard deviations of the mean. |  |
| 9. The name and z-score of the SA2 with the highest percentage tree canopy cover in the study area. |  |
| 10. The name and z-score of the SA2 with the lowest percentage tree canopy cover in the study area. |  |

1. **Appendix 1: Map submissions from Weeks 2 and 4.**

Maps compiled in Week 2 should be submitted and appropriately numbered.

5.1 Submission of thematic map as compiled in Lab Beta.

5.2 A map of tree canopy cover represented as a Z-Score as specified in Section 4.1.3 of Lab Delta.

5.3 A map of dwelling density – mapped at a Mesh Block level - for the Greater Perth Region.

5.4 A map of dwelling density – mapped at an SA2 level - for Western Australia.

1. **Reference list** - using the American Psychological Association (APA) citation style – (this is not included in your word count).

**Presentation, written expression and grammar** – 5% of your mark is set aside to reflect the quality of your submission in terms of presentation, written expression and grammar.

Your report needs to be professionally written and presented. **Do not include a table of contents or any appendices other than those specifically requested for your Lab Alpha and Beta Submissions.** Only include visual material which is relevant for communicating your findings effectively. Do not include maps, images or diagrams created by third parties. Remember, this is your opportunity to highlight your mapping and analytical skills as well as articulating that you understand the processes undertaken and your ability to put the analysis into an applied context. Any graphs and tables submitted should be appropriately formatted, with appropriate titles and labels. Do not use screen dumps to add content to your report.