

Agriculture Land Reserve Mapping

Final Report Template

Updated: 18 February 2016 – A.G. Green

Word maximum: 3000 words

Report submission: Save as a doc or docx. Submit to the course website with other materials.

The final report should include the following sections:

1. Title Page (AOI subsection name, student names, lab section, and date)
2. Table of Contents
3. Executive Summary (200 words max)
4. Introduction
 - a. Description of Project, Study Area, and Data (~300 words)
5. Body of Report: See the questions on the following pages, responses to these questions should be in paragraph format (~2000 words). Please use tables where appropriate. Each response should briefly mention the data and analysis methods used.
 - a. Overview
 - b. Biogeographical
 - c. Social
 - d. Summary
6. Error and Uncertainty (~500 words): a discussion of how error and uncertainty factored into your analyses.
7. Further Research/Recommendations (~300 words):
 - a. What data needs to be either created through research, maintained by the government, and/or released by the government to increase open scientific knowledge that can inform debates over the ALR?
8. Appendices (does not count towards word count)
 - a. References (please use APA format)
 - b. List of Data Sources
 - c. Maps
 - d. Flowchart of Analyses used for Final Shapefile
 - e. Review of Team Member Contributions

BODY OF REPORT QUESTIONS

The analysis of the ALR in your AOI subsection must include responses to the following questions. Your responses will result in text and maps which will be included in your final report. Your “original subsection shapefile” is the one your team was provided as an AOI. Your AOI subsections show only the ALR located within each federal 2011 census division. Census divisions share administrative boundaries with BC’s regional districts. Remember to project your data to EPSG: 3005 (BC Albers) before conducting analyses. It will be better if your maps reflect a consistent style throughout the report, so you might want to establish a map layout template and standard symbols for whatever layers you will show throughout the report.

Many of the standards and assumptions mentioned in the questions are drawn from the Ministry of Agriculture’s 2015 Guide for Bylaw Development in Farming Areas:

http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agricultural-land-and-environment/strengthening-farming/local-government-bylaw-standards/840000-1_guide_for_bylaw_development_in_farming_areas.pdf

OVERVIEW

1. How much ALR land is in the original shapefile for your AOI subsection? Report the total ALR land in hectares and as a percentage of the entire census division area. You will need to extract the census division.
2. Create a map of the ALR land in your census division and add it to the appendix as Map 1.

BIOGEOGRAPHICAL

1. What types of land cover and how much of each type (total ha and percentage) are in your AOI subsection? Data Hints: TRIM has some land classification. Open data sources you should explore include BTMI (<https://catalogue.data.gov.bc.ca/dataset/baseline-thematic-mapping-present-land-use-version-1-spatial-layer>) and LCC2000v which was collected in the late 1990s early 2000s from Landsat (30m res). http://ftp2.cits.rncan.gc.ca/pub/geobase/official/lcc2000v_csc2000v/shp_en/
2. Create a map of the above and add it to the appendix as Map 2.
3. Buffer water features (rivers and lakes) within the AOI subsection by 10 meters (10 meters on each side). Riparian areas are protected in BC. Riparian areas are usually judged by moisture level and other features. No general standards have been established for flood proofing in BC, so we assume that 10 meters distance would be

a conservative estimate of flood prone areas. Given that we are doing a broad spatial analysis, our working assumption here is that farming within 10 meters of any water feature should not be a sustainable or legal practice and that these areas should be set aside as riparian or water features. After you have buffered the area, determine how much of the land surface (total ha and percentage) is riparian/water in your original subsection? (Hint: TRIM is a good source for water features, but there might be more accurate data available from other sources in the province and in some cases OSM might be better and more up to date for small areas.)

4. What are the soil agricultural capability class types (total and percentage of each type) in your original subsection shapefile? See below for a link to this data. In the attribute table, there is a column called "CC1_CLASS". This shows the dominant soil class for each polygon. You can use CC1_CLASS to categorize your data and create labels for a map. I highly recommend reading the Readme_2015_09_23.rtf (found at the link) for these files so that you can understand the different classes and how organic and mineral soils are denoted in this data set.
 1. Get the data (either shapefile or geodatabase) and readme here:
http://www.env.gov.bc.ca/esd/distdata/ecosystems/Soil_Data/AgricultureCapability/
 2. Also read this: <http://www.alc.gov.bc.ca/alc/content/alr-maps/agricultural-land>
5. Create a map of the above and add it to the appendix as Map 3.
6. How much land is too steep for agriculture in your original subsection shapefile (our assumption is that > 30-degree slope is not suitable for agriculture – of course, one might argue that some animals could graze at this steep of a slope)? (Hint: <http://geogratis.gc.ca/site/eng/extraction?layers=cdem>)
7. Create a map of the steep slope areas in the ALR and add it to the appendix as Map 4.
8. Provide a summary and some general estimates of agricultural production in your census division and how these relate to soil quality, slope, and other natural features. This summary can include types and quantities of agricultural products produced. (Hint: 2011 Census of Agriculture or examine provincial data sources.)

SOCIAL

1. What type of and how many km of roads are in your original subsection shapefile (report km for each type of road)? Provide a rationale for your choice of road data set (TRIM, OSM, DMTI, etc.). Hint: TRIM is a good source for this, but we encourage you to compare TRIM to OSM, DMTI, and other road data sets to see what is best for your area of interest. We should be aware that some data sets allow us to see farm roads and access roads versus only major official roads.
2. Buffer roads 10 meters (10 meters on each side of the road). Our assumption is that conducting agriculture within 10m of a road is not a sustainable practice due road runoff. Using the buffered area, how much of the land surface (total ha and percentage) in your original AOI subsection shapefile is roads?
3. Create a map of the roads, road buffers, and ALR in your AOI subsection and add it to the appendix as Map 5.
4. How much land in your original subsection shapefile is in parks (report hectares and percentage for federal, provincial, regional, municipal or otherwise)?
 1. Provincial: <http://catalogue.data.gov.bc.ca/dataset/bc-parks-ecological-reserves-and-protected-areas/resource/2d022ea1-31f6-4749-bdf8-9d117ab4e847>
 2. Federal: <http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/9246a40d-8cca-5b55-9e89-9175e6490197.html#distribution>
 3. Municipal and other local data sets may be available from local governments.
5. How much land in your original subsection shapefile is in golf courses (in hectares and percentage)? Hint: Examine TRIM, OSM, DMTI, Baseline Thematic Mapping for BC, and possibly other datasets.
6. Create a map of the parks and golf courses in the ALR and add it to the appendix as Map 6.
7. How many people live in your original subsection shapefile? Describe how you estimated the population and what you would say about the accuracy of this estimate. Hint: Access open census data from Stats Canada or licensed data (via the UBC Library) and try to use census dissemination areas if possible. Note the constraints concerning some areas that may not gather census information, or why some dissemination areas are not reported by Stats Canada.
8. What are the demographic characteristics of the population in your entire census division (e.g. age, gender, family size, household income, and any other

characteristics you find interesting)? What do your findings in #7 and #8 tell us about the community and possible growth trends? Hint: You can use UBC Library or Stats Canada open data to find this information.

9. Based on your research, what do you think are the most common threats to the ALR in your census division? Hint: Find the permitted uses of the ALR under law and then do some research on your area for unique issues that may threaten ALR area (for example, oil wells, port development, transportation development, etc.): <http://bit.ly/1LVrez7>
10. Create one or more maps displaying the non-agricultural land uses you identified as relevant to your AOI subsection and add it to the appendix as Map 7 (or Map 7a, Map 7b, etc.).

SUMMARY

1. Extract (ERASE) areas that cannot be used for agriculture from the original AOI subsection shapefile. At a minimum, you should eliminate water buffers (lakes and rivers), all parks (federal, prov., or regional/municipal), road buffers, railways (buffered to ten meters on each side), buildings, and any other non-agricultural land use that you find (i.e. urban land, oil exploration, sawmills, etc.) from the original subsection shapefile. After extracting these areas, how much agricultural land is in your final processed shapefile for your AOI subsection of the ALR? Report the total agricultural land in hectares and percentage of agricultural land relative to the entire census division area.
2. Create a map of the above and add it to the appendix as Map 8.
3. Describe your final processed shapefile. In bullet points or a table, list what was eliminated from the original shapefile and how much each of these extractions measured (in hectares). Compare the original ALR amount before any processing to your estimated amount of land usable for agriculture in the ALR. Hint: In order to accurately calculate area you can no longer rely on the existing fields in your shapefile. You will have to create a new field. Like so:
<https://www.gislounge.com/calculating-polygon-area-in-arcmap/>
4. Based on your research, do you feel that the current estimates of hectares of agricultural land for your AOI subsection are accurate? Using your AOI subsection study area as experience, do you feel that the current estimates of hectares of agricultural land for BC are likely to be accurate? Explain why or why not? Hint: Below is a link to the current estimates for the province. Much of these official estimates are based off of work in 1970s

http://www.alc.gov.bc.ca/alc/DownloadAsset?assetId=C227F81DB48D410A8C8D5A71531B6147&filename=agriculture_capability_classification_in_bc_2013.pdf

SHAPEFILE UPLOAD (PROCESSED DATA)

Your final processed shapefile should represent your best estimate of the agricultural land in the ALR of your AOI subsection. You should eliminate (at a minimum) the following areas from your final shapefile.

- Areas you buffered around water features.
- Areas you buffered around roads.
- Areas you buffered around railways.
- Areas that are used for golf or reserved for recreation (parks).
- If wells, mining, or other impacts on surface agriculture are evident, these should be removed. If you are able to obtain building footprints, the areas around building should be removed. If you are able to identify other unique threats to the ALR in your AOI subsection, remove these too.

Using ArcCatalog, rename your final shapefile. The name of the shapefile must be "yoursubsection_final". If you use ArcCatalog to rename your shapefile, all the shapefile components inside the folder will automatically be renamed "yoursubsection_final". A shapefile includes several different files so it must be zipped to be uploaded (you can use a program like 7z to zip your files). The zip file name must be **yoursubsection_final.zip**. Your zipped shapefile should include eight files (as the original you downloaded did). For example, the AlberniClayoquot group would upload a zip file with these files inside it:

- AlberniClayoquot_final.CPG
- AlberniClayoquot_final.dbf
- AlberniClayoquot_final.prj
- AlberniClayoquot_final.sbn
- AlberniClayoquot_final.sbx
- AlberniClayoquot_final.shp
- AlberniClayoquot_final.shp.xml
- AlberniClayoquot_final.shx