Data Accuracy and Precision

Some terms that talk to data quality are:

Precision
Accuracy
Resolution

Accuracy:

- Spatial - is the data where it is supposed to be
- Attribute - does the data properly describe the feature

Geog 300 Definition (Wheate)

A. Positional accuracy (in spatial data)
This can be measured in Root Mean Square Error or 'RMS' = a measure of the average distance between the true and estimated location, or the error (e) in x and y. RMS is calculated as the square root of the sum of the squared errors in x and y (distance between the true and the calculated locations)

B. Attribute accuracy
Classification and measurement may be rated in terms of % correct.
On a map and database, items such as forest types are grouped and placed within a boundary. In reality, there is likely no solid boundary where only pine trees grow on one side and only spruce on the other. For example, if we look at what is mapped as 'mature pine', how much really is?
The standard given when using satellite imagery to classify vegetation is 80%. In all likelihood, it may not be much higher in ground surveying due to the uncertain nature of vegetation boundaries (unless modified by human use). In addition, attributes may change over time, or be measured by different standards.

Geog 204 - Our perspective

Spatial - Is a feature delineating an area, such as enumeration area polygons, in the proper location. We have seen discrepancies between other spatial layers and EA layers for instance providing slivers of information.

Attribute - Are the values for fields describing features correct?

Is data suppression and rounding are artificial measures that diminish EA or DA accuracy (or is this more of a matter of precision)?

Precision:

- The closeness with which the measurements agree with each other
- refers to the level of measurement and exactness of description in a GIS database. Univ of Colorado (lecture)

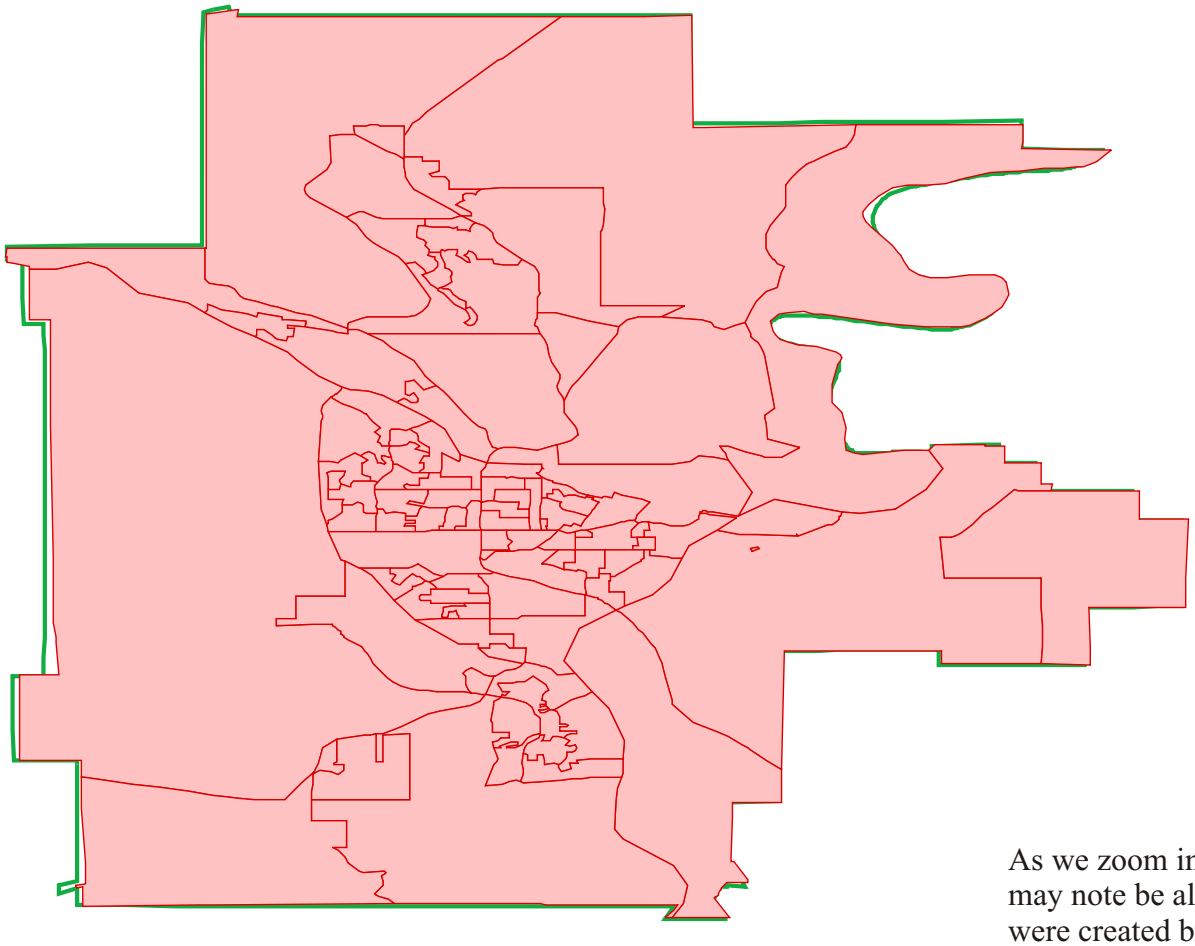
Geog 204 - Our perspective

Spatial: - How well the data was collected in creating spatial features. The data we use may be derived from differing techniques and input. For instance vectors created from air photos can be more precise than those from satellite images. You may be able to see individual trees in an air photo (1-2 metres in diameters),with having the ability to delineate vectors on 25 metre intervals with satellite imagery (TM landsat).

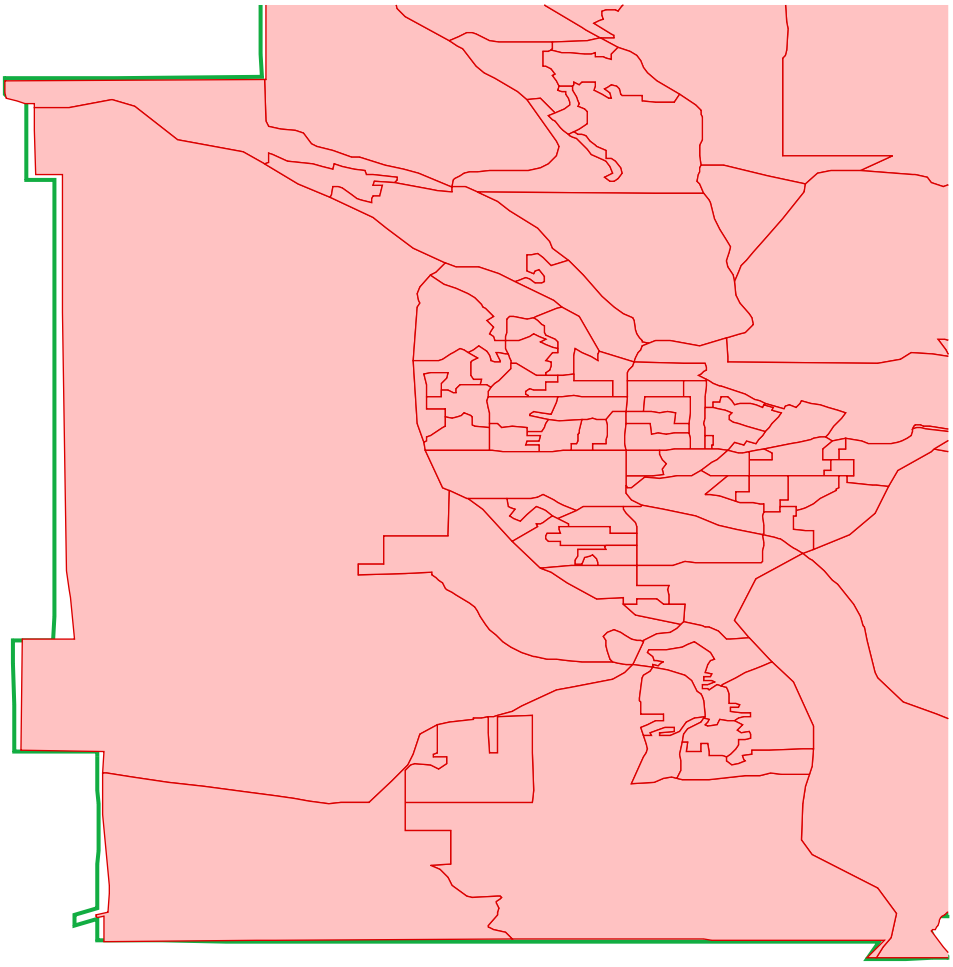
This talks to many other mapping concepts like scale, resolution that will be discussed in labs and next lecture.

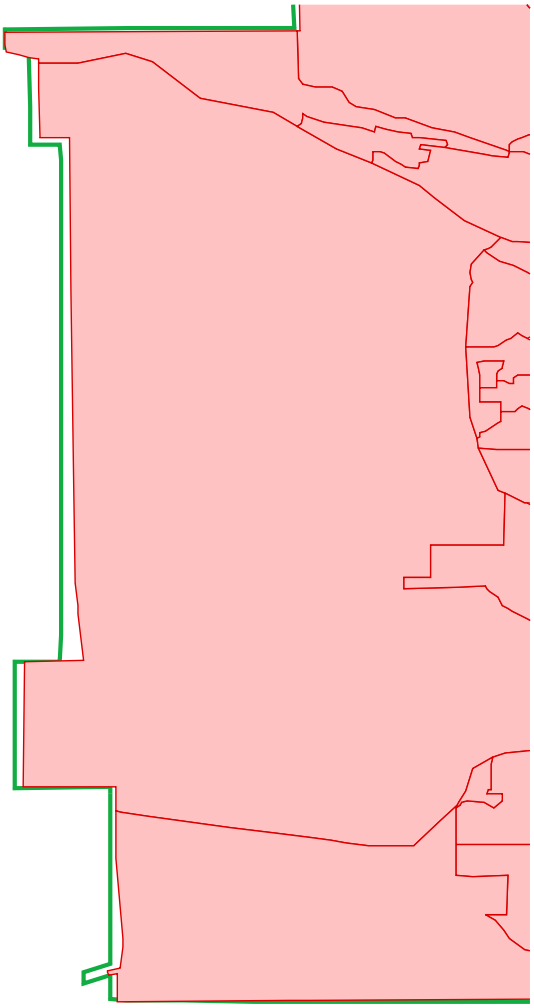
Some general rules we may experience are:
- the smaller the polygon the higher the resolution
- the more the curve changes direction - the more resolute

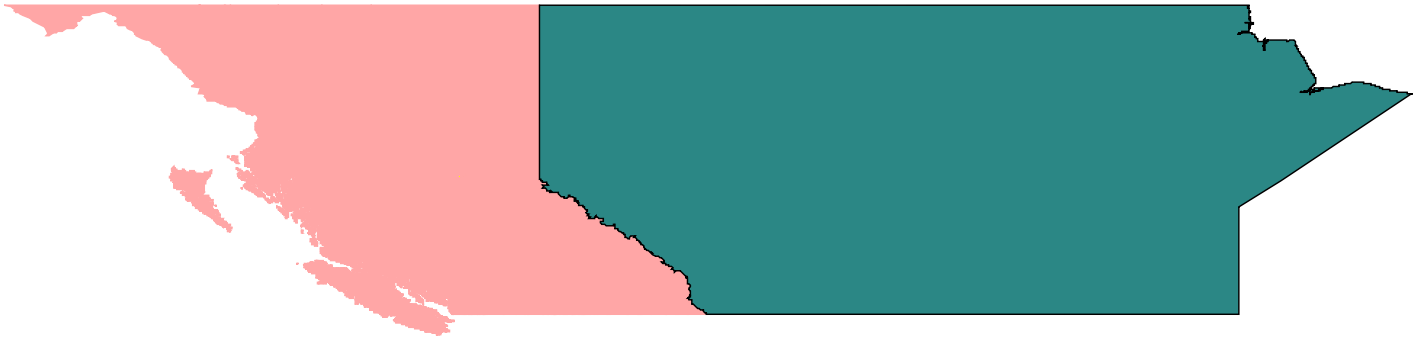
BE CAREFUL of enforcing these rules to all data.

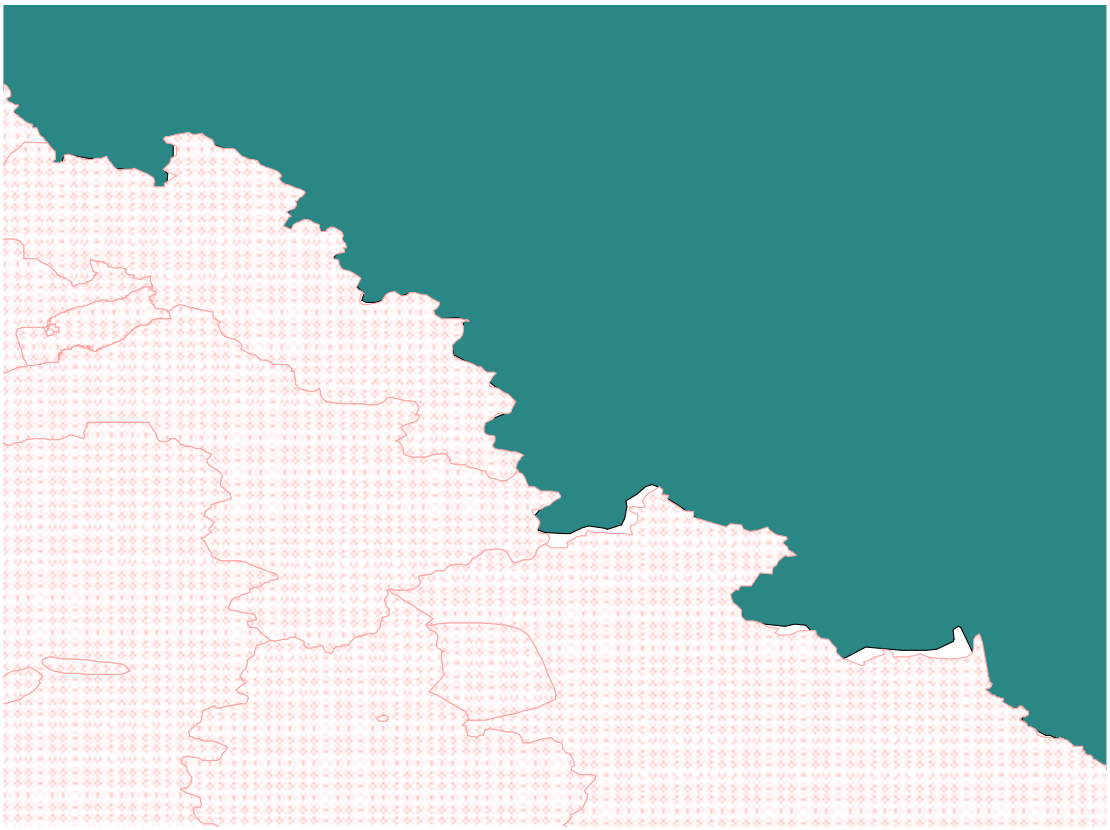


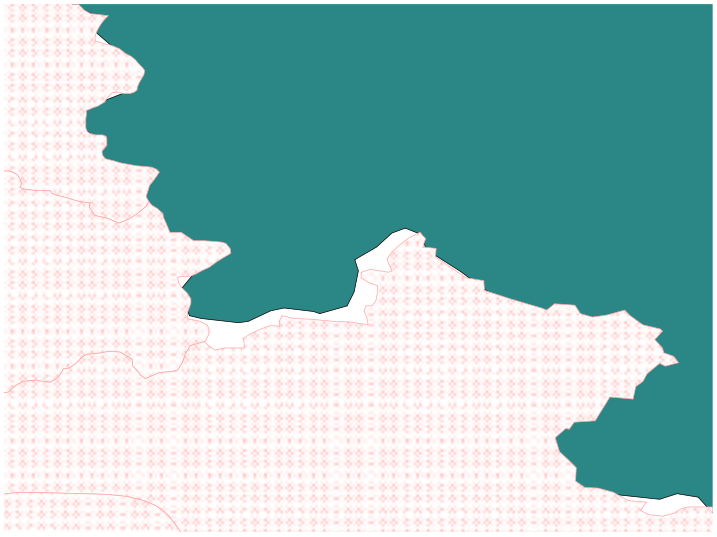
As we zoom in we can see that the data may note be all that accurate as slivers were created by clipping with other layers











As we zoom in we can see the data delineates the the common boundary well but that some layers seem to describe the changes along the boundary better than others - higher precision of data.

LINKS

NOAA on Precision and GIS

Canadian Spatial Reference System

Wikipedia

GIS Lounge