RESOLUTION & SCALE

1) How does the scale of our analysis dictate our desired resolution?

2) How can data resolution limit the scale of our analysis?

RESOLUTION & SCALE

We want to work with high resolution data because: ↑ resolution = ↓ generalization = ↓ uncertainty

- In reality, this isn't always practical or possible.
- We must try to strike a balance.

THINGS TO CONSIDER

What is the "lowest" acceptable resolution?

- Smaller scale analysis won't need the same level of detail.
- Looking at national immigration patterns, maybe you only need provincial level data?

THINGS TO CONSIDER

Change the scope of our analysis?

- If you need a high resolution analysis, work at a larger scale and focus on a small area.
- If you need to analyze a large area, work at small scales and accept the uncertainty that comes with coarser resolution.

COMPARING DATA MODELS

RASTER

Usually **continuous fields**

- Grid of cells (pixels) with continuous coverage
- Each cell has **one** value per band (layer)
- One raster image can have **many** bands

VECTOR

Usually **discrete objects**

- Points, Lines, and/or Polygons
- Each object can have **many** attributes
- Objects may overlap, have gaps, or be continuous

ADVANTAGES

RASTER

- Good for continuous variables: in space **and** time
- Simple data structure makes overlay is easy and efficient

VECTOR

- Compact data structure
- Good for discrete objects
- Easy to query and select by attributes

DISADVANTAGES

RASTER

- Mixed pixel problem
- One attribute per cell
- Large data volumes

VECTOR

- Complex data structure
- Overlay can be computationally expensive
- No variability within polygons

WHICH DATA MODEL IS "BEST"?

Neither data model is suitable for all types of data or analysis.

- You will frequently use both the raster and vector models.
- It is possible to convert back and forth between models.
  - This can introduce error, only do when necessary.