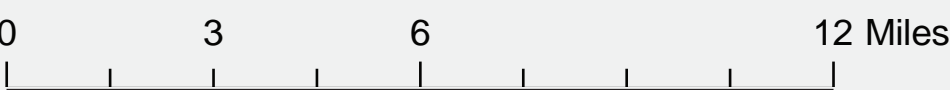
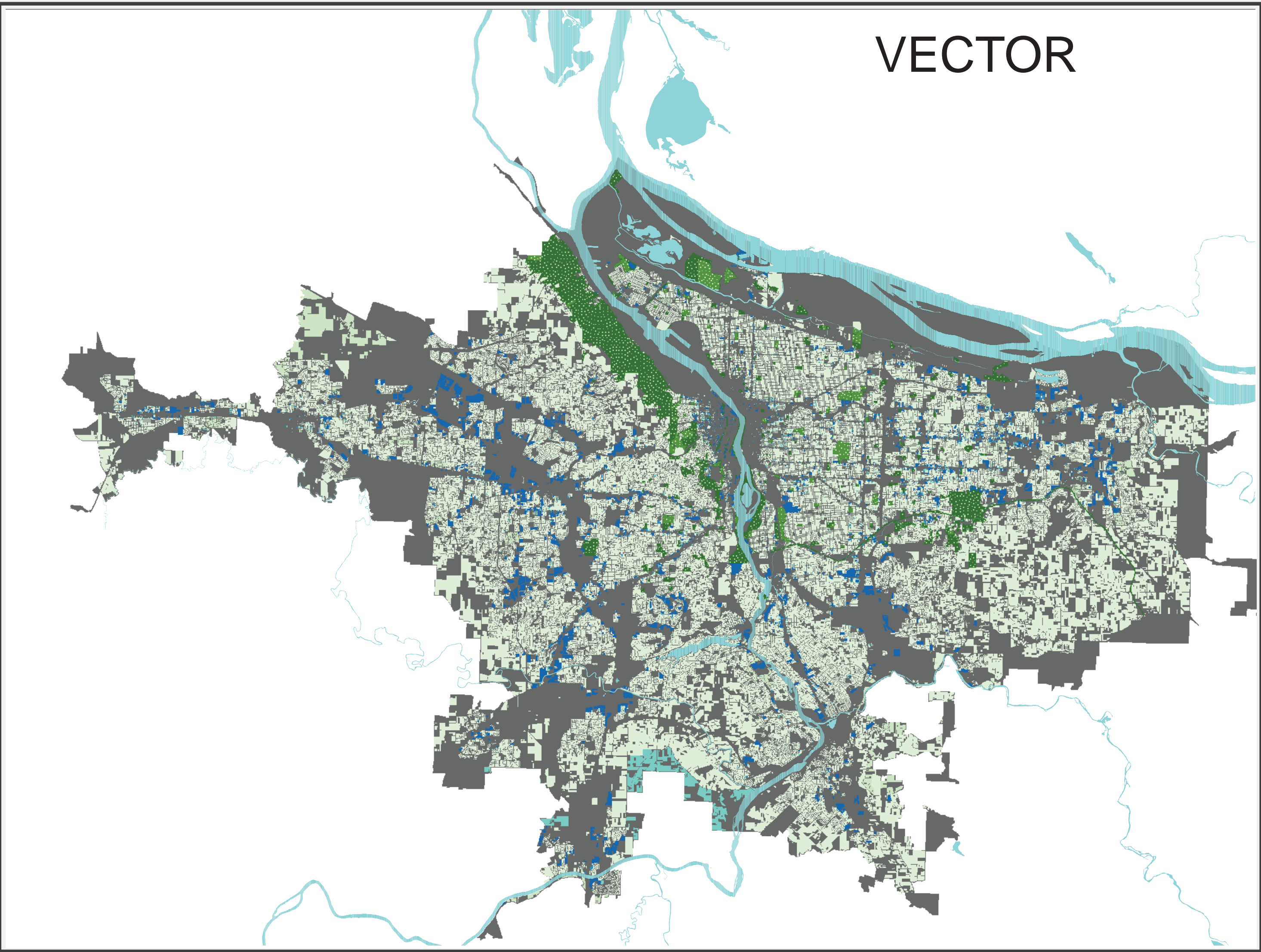


A Better Method for Disaggregating Population: Comparing Dasymetric Methods Using Housing Data and Land Coverage

What is dasymetric mapping? A method of areal interpolation which disaggregates and redistributes population density by using secondary data.

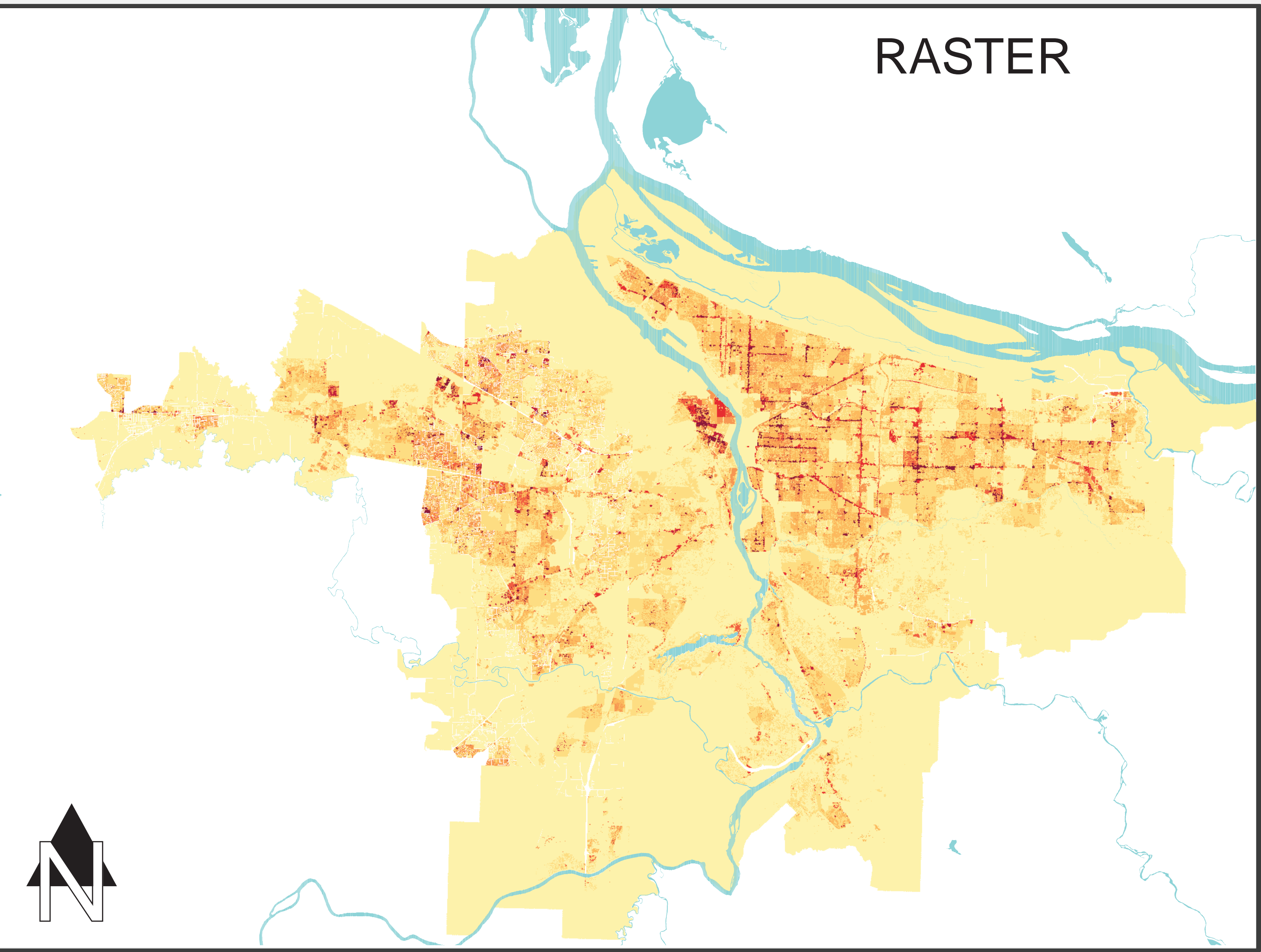
Sources: ESRI, HERE, DeLorme, TomTom, Intermap, increment P Corp., Gebco, USGS, FAO, NPS, NRCAN, MRLC, Census, Fact Finder, RLIS, GeoBase, OpenStreetMapcontributors, and the GIS User Community



PERSONS PER PLACE OF RESIDENCE

- Below 4
- 4 - 10
- 10.1 - 30
- 30.1 - 50
- Above 50
- Non-residential

- Parks
- River
- Arterials

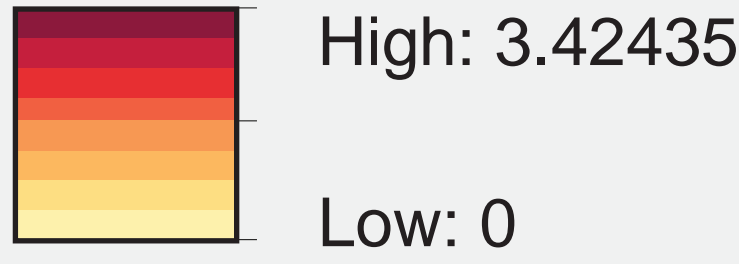


L A N D C O V E R
C L A S S E S

RELATIVE DENSITY

- LOW 10
- MEDIUM 17
- HIGH RESIDENTIAL 49
- RURAL 4
- DEV. OPEN SPACE 12
- OTHER 7

POPULATION PER CELL

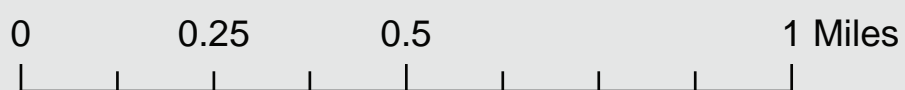
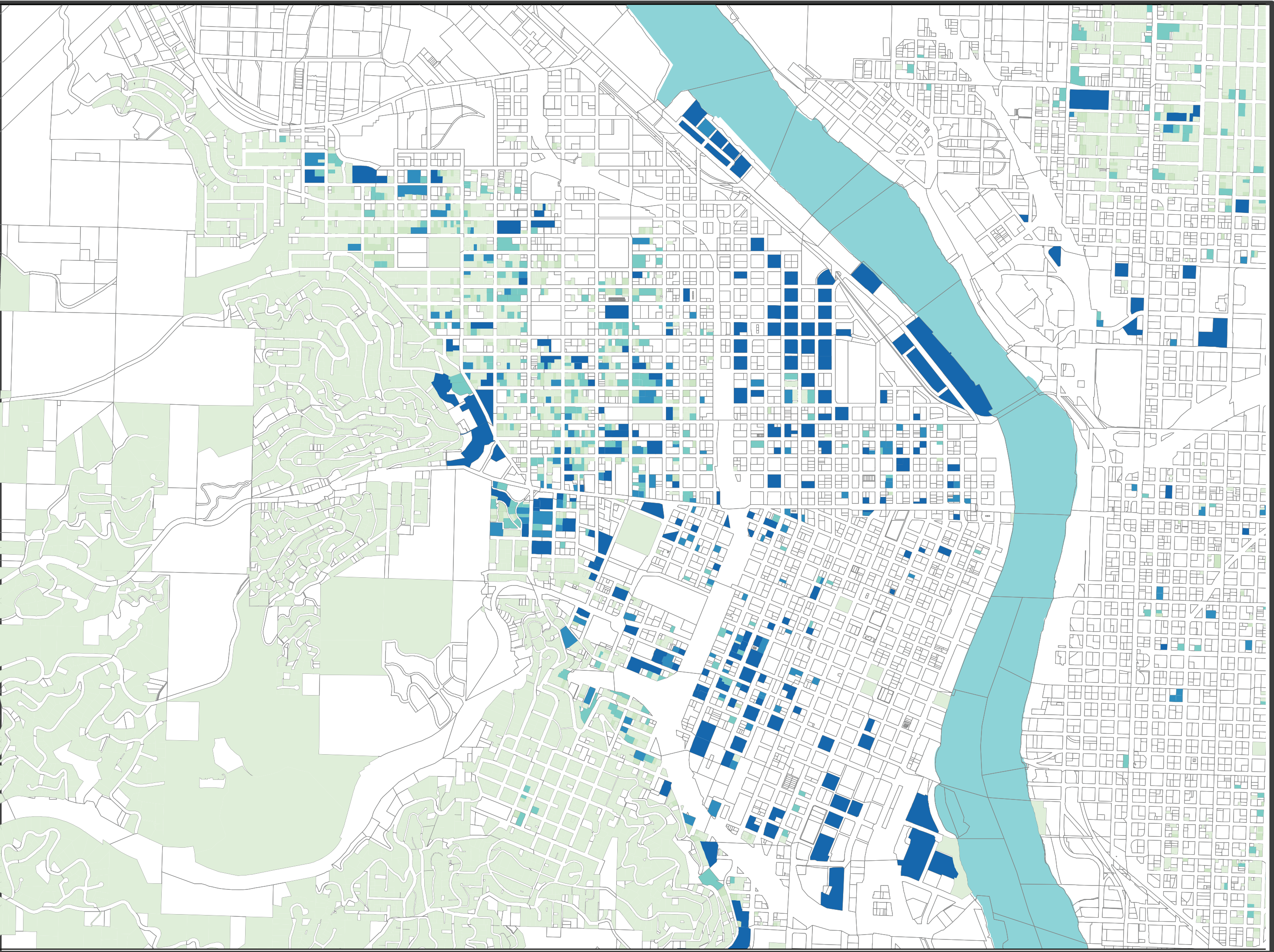


FORMULA FOR DASYMETRIC MAP BY HOUSING DATA (TAXLOT)

$$\frac{(\text{Total Household pop}_{sf,mf})}{(\text{Total housing units}_{sf,mf})} * (\text{Occupancy Rate}) * \# \text{ of Housing Units} * \frac{(\text{total household population})}{(\sum \text{ estimated pop per residence})}$$

- Average population per housing unit by housing structure (single/multifamily residence) for each census block group
- Percentage of total housing units by housing structure that are occupied for each census block group
- Number of housing units for each individual MF and SF residence (Population research center and RLIS)
- Control. Total household population of a census block group divided by the estimated total household population.

Population of Downtown Portland



Our dasymetric method utilizing vector data (housing) is better for disaggregating population. Why?

- (1) Because it estimates population values of residential units where people actually live, whereas traditional methods disaggregate those values continuously over space.
- (2) Our method produced a more accurate population estimate of neighborhoods than the raster estimate.

DOWNTOWN AREA

Old Chinatown, Pearl and Downtown Neighborhoods

AREA	POPULATION	ERROR
CENSUS	22,720 (actual)	N/A
NLCD (raster)	17,263 (estimate)	22%
HOUSING (vector)	18,426 (estimate)	19%

We expected there to be some degree of error in our population estimates due to the relatively small size of our enumeration unit (Downtown Portland neighborhoods). However, the results indicate that our dasymetric method, which utilized vector data, produced a more accurate population estimate, with a smaller error, than the traditional raster method.

FORMULA FOR DASYMETRIC MAP BY LAND COVERAGE DATA

$$\frac{\text{Relative Density} * \text{Total Household Pop} * \text{Cell Size Area}}{[\sum (\text{Area of Land Coverage}_{1,2,3,4,5,6} / \text{Total area}_{\text{block group}})] * \text{Relative Density}_{1,2,3,4,5,6}} * \text{Total Area}_{\text{block group}}$$

- Relative density of low (1), medium (2), high residential areas (3), rural (4), developed open space (5), and other (6)
- Total household population based on 2013 5 year estimates by census block group
- Cell size= 30 x 30 ft
- Control. Expected population of the census block group * Total area of the census block group