Data Visualization and Maps II

HES 505 Fall 2023: Session 26

Carolyn Koehn

Objectives

By the end of today you should be able to:

- Generate complicated plot layouts without additional pre-processing
- Construct a map using `ggplot2` and `tmap`
- Combine vector and raster data in the same map

Building Choropleth Maps

`tidycensus` package

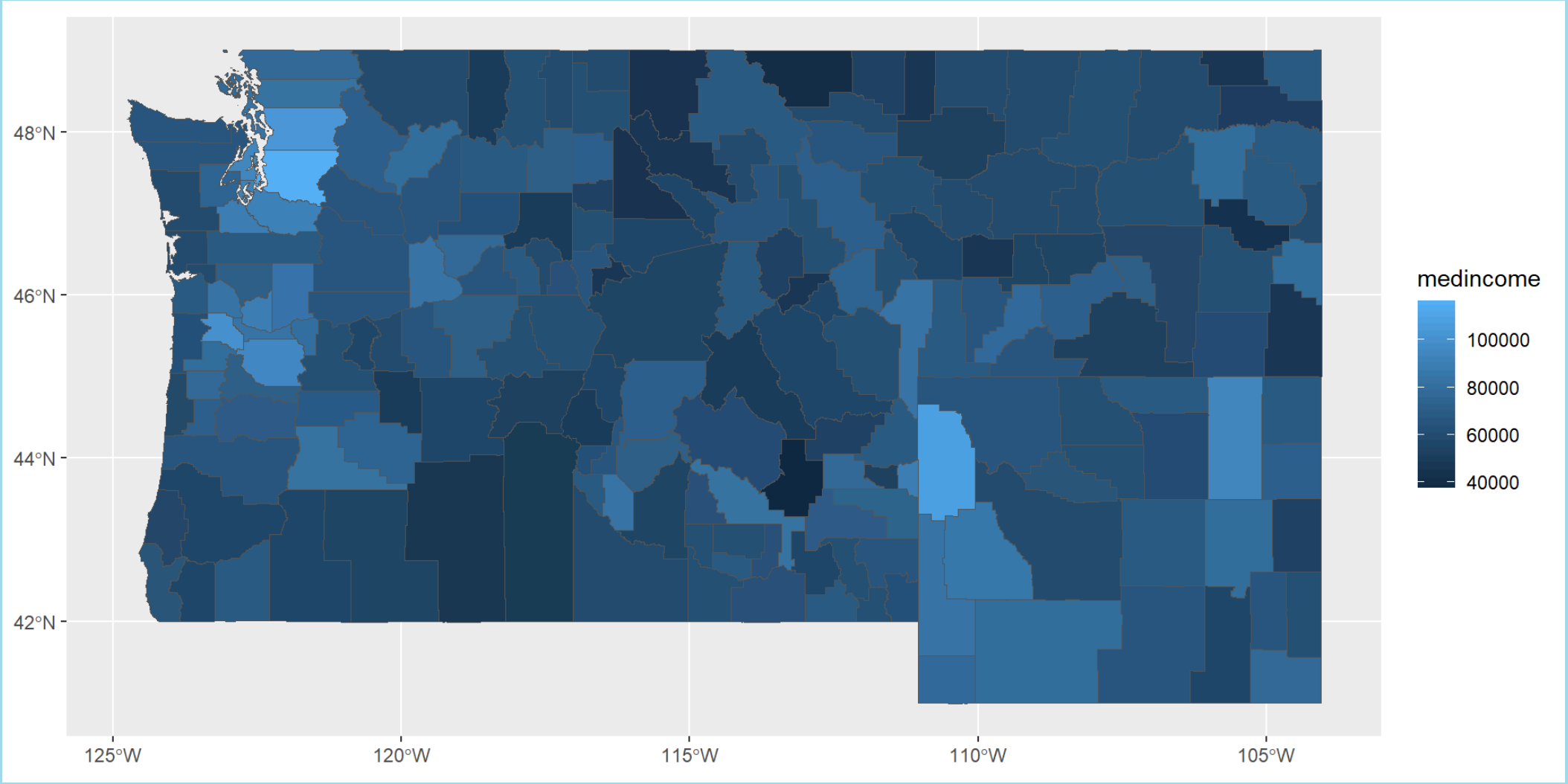
https://walker-data.com/tidycensus/articles/basic-usage.html

Using ggplot2

```
cty.info <- get_acs(geography = "county",
                        variables = c(pop="B01003_001",
                                      medincome = "B19013_001"),
                        survey="acs5",
                        state = c("WA", "OR", "ID", "MT", "WY"),
                        geometry = TRUE, key = censkey, progress_bar=FALSE) %
  select(., -moe) %>%
  pivot_wider(
    names_from = "variable",
    values_from = "estimate"
  )

p <- ggplot(data=cty.info) +
  geom_sf(mapping=aes(fill=medincome))
```

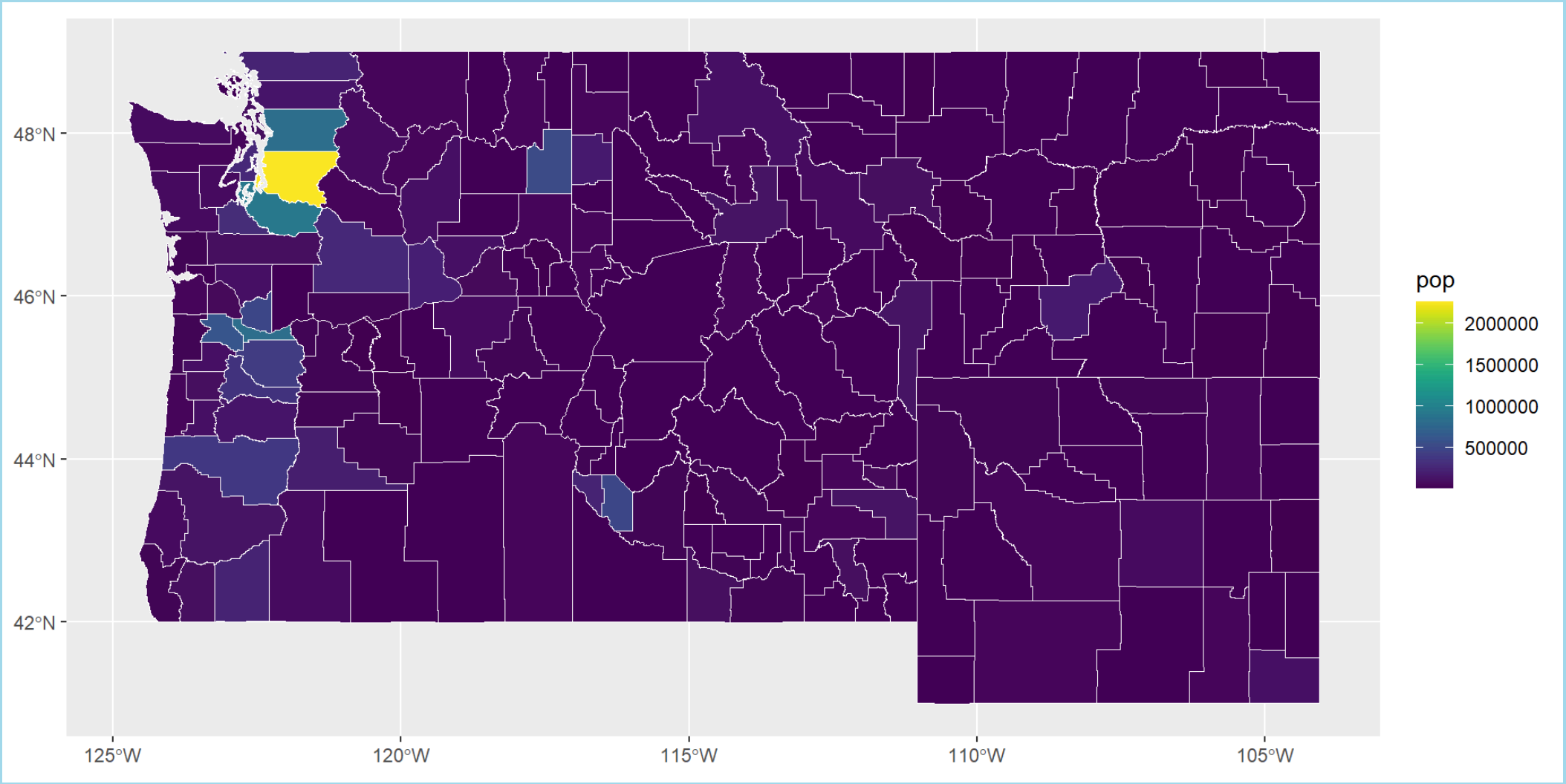
Static Maps with ggplot2



Changing aesthetics

```
p <- ggplot(data=cty.info) +
  geom_sf(mapping=aes(fill=pop), color="white") +
  scale_fill_viridis()
```

Changing aesthetics

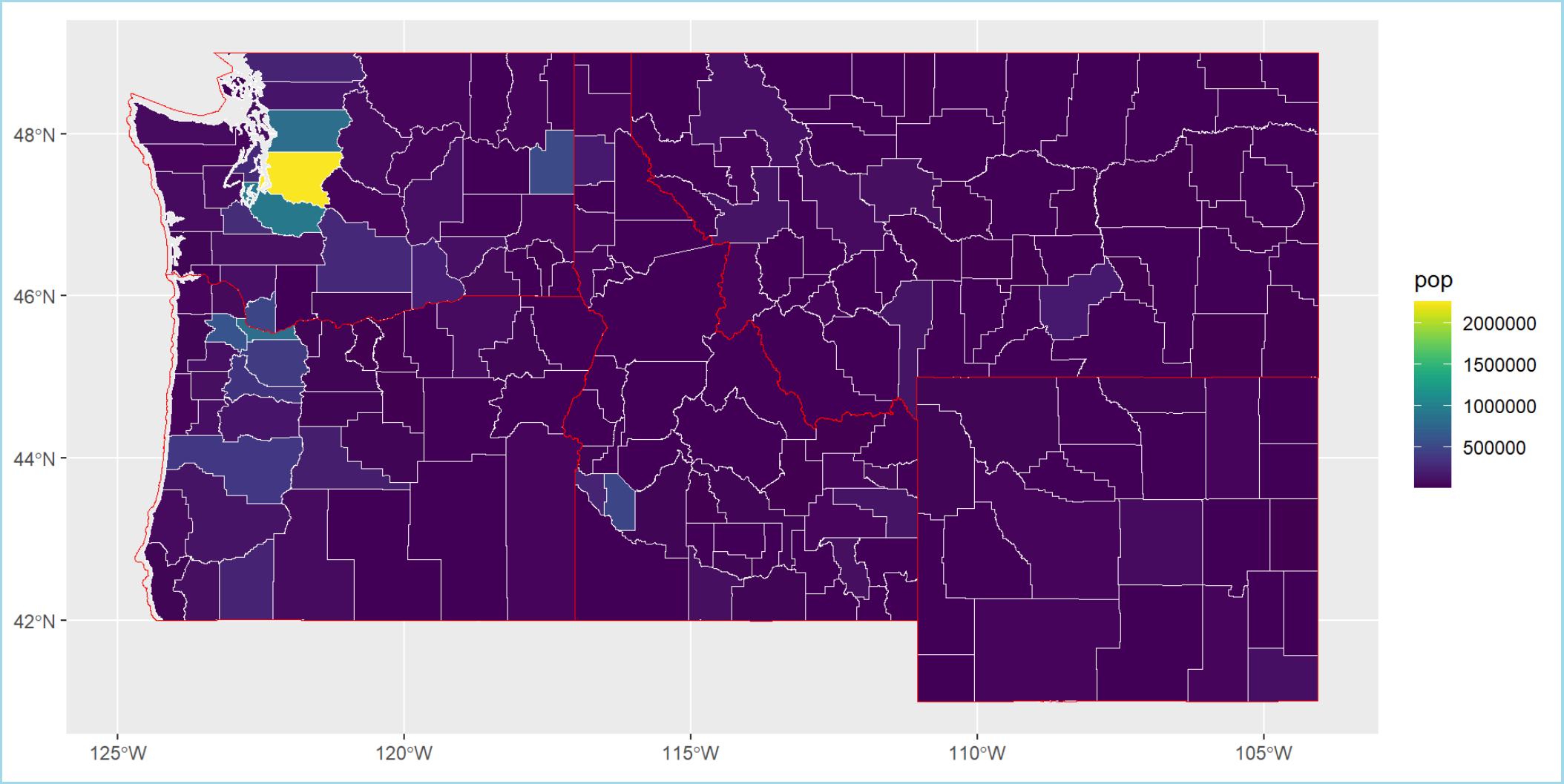


Adding layers

```
st <- tigris::states(progress_bar=FALSE) %>%
  filter(., STUSPS %in% c("WA", "OR", "ID", "MT", "WY"))

p <- ggplot(data=cty.info) +
  geom_sf(mapping=aes(fill=pop), color="white") +
  geom_sf(data=st, fill=NA, color="red") +
  scale_fill_viridis()
```

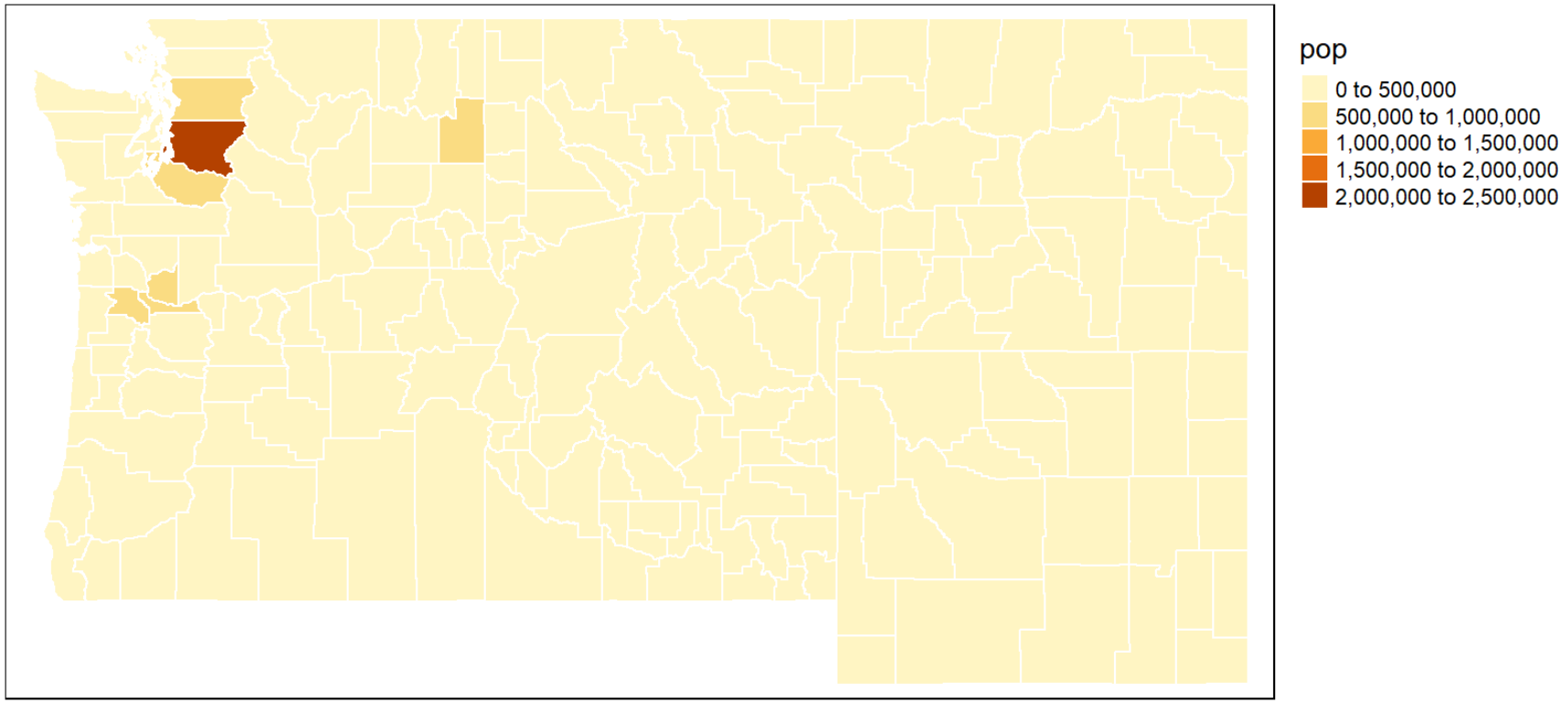
Adding layers



Using tmap

```
pt <- tm_shape(cty.info) +
  tm_polygons(col = "pop",
              border.col = "white") +
  tm_legend(outside = TRUE)
```

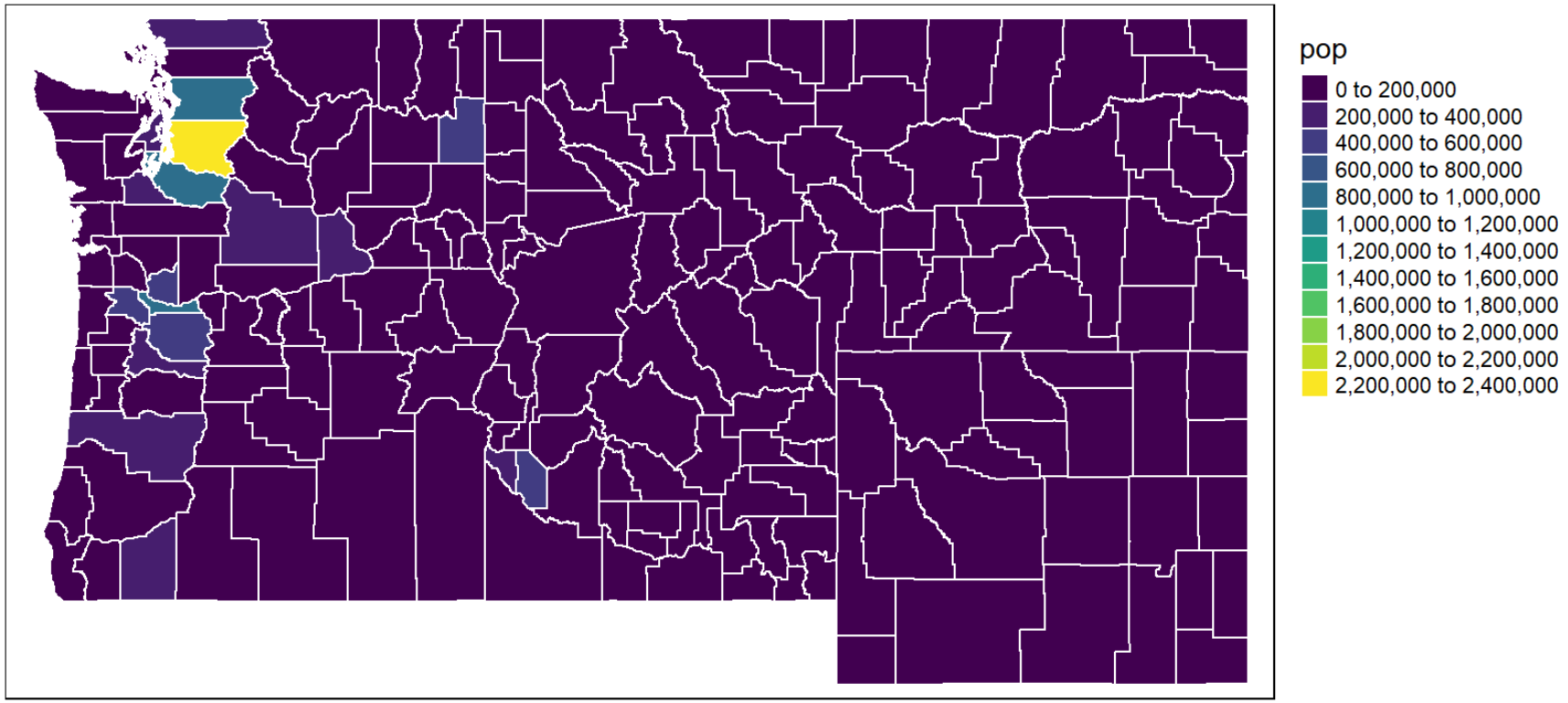
Using tmap


pop
0 to 500,000
500,000 to 1,000,000
1,000,000 to 1,500,000
1,500,000 to 2,000,000
2,000,000 to 2,500,000

Changing aesthetics

```
pt <- tm_shape(cty.info) +
  tm_polygons(col = "pop", n=10,palette=viridis(10),
              border.col = "white") +
  tm_legend(outside = TRUE)
```

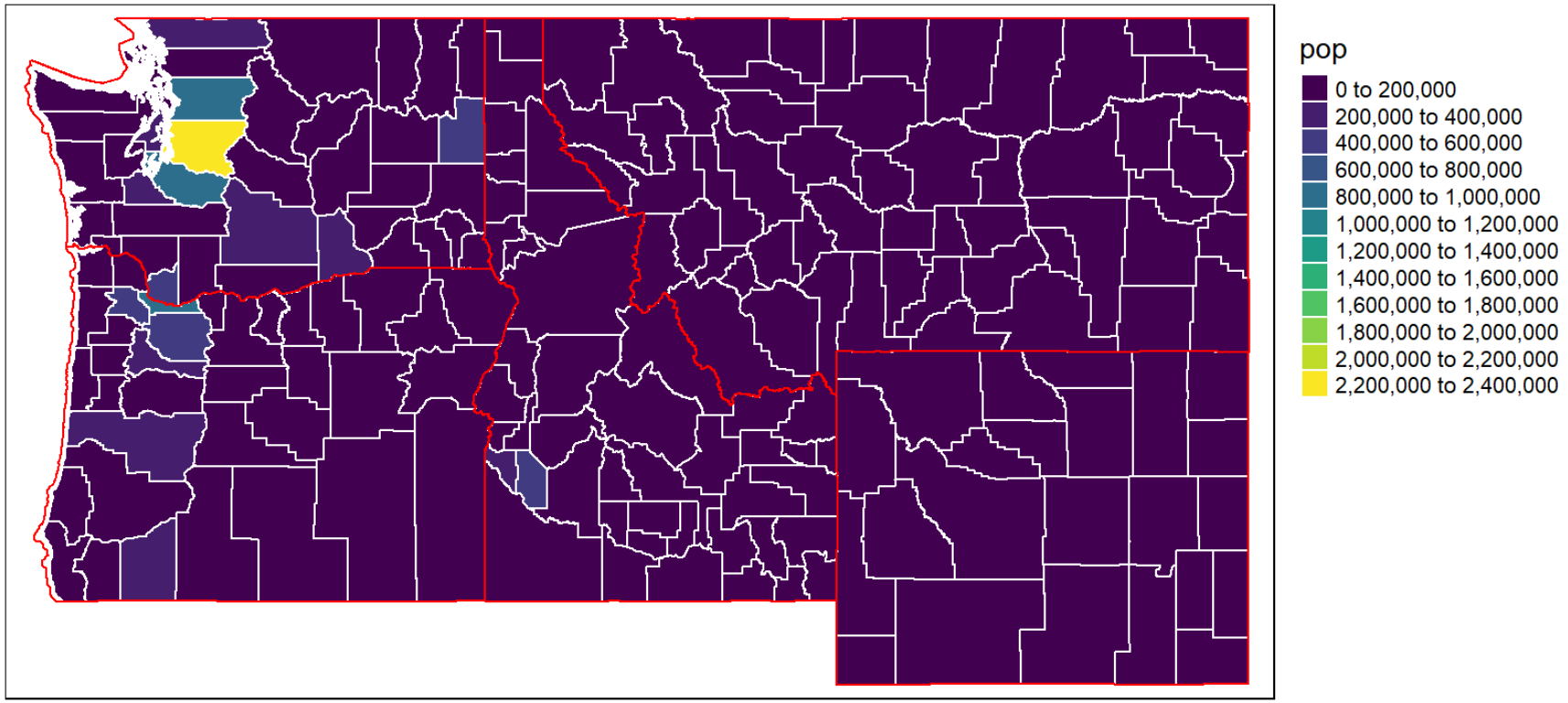
Changing aesthetics



Adding layers

```
pt <- tm_shape(cty.info) +
  tm_polygons(col = "pop", n=10,palette=viridis(10),
              border.col = "white") +
  tm_shape(st) +
  tm_borders("red") +
  tm_legend(outside = TRUE)
```

Adding layers



Themes and Axes

Rasters in `ggplot`

Layering rasters and vectors

Complicated layouts with `patchwork`