Map Outlines Lab

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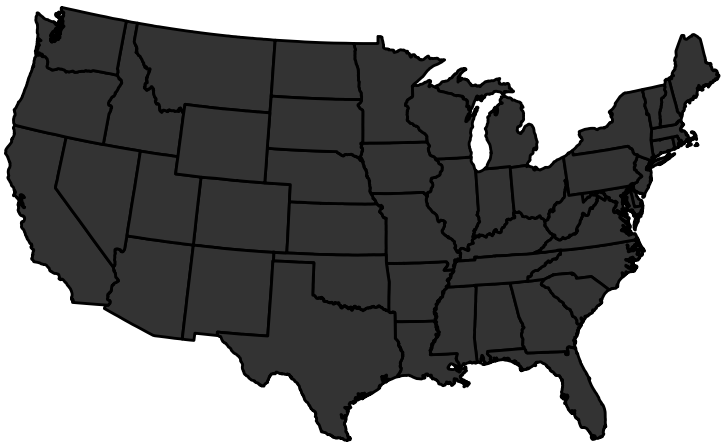
Map Packages

```
# States
states = map_data("state")
head(states)
```

```
##        long      lat group order  region subregion
## 1 -87.46201 30.38968     1     1 alabama      <NA>
## 2 -87.48493 30.37249     1     2 alabama      <NA>
## 3 -87.52503 30.37249     1     3 alabama      <NA>
## 4 -87.53076 30.33239     1     4 alabama      <NA>
## 5 -87.57087 30.32665     1     5 alabama      <NA>
## 6 -87.58806 30.32665     1     6 alabama      <NA>
```

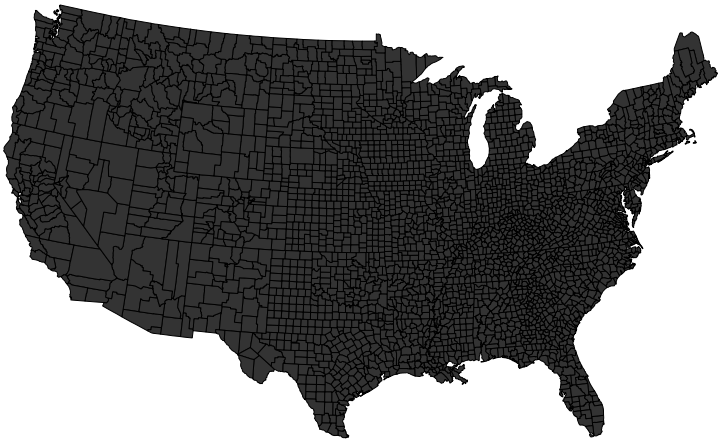
```
gf_polygon(lat~long,data=states,group=~group, color="black",size=0.5) %>%
  gf_refine(coord_map("conic",lat0=30))
```



```
# Counties
county = map_data("county")
head(county)
```

```
##        long      lat group order  region subregion
## 1 -86.50517 32.34920     1     1 alabama   autauga
## 2 -86.53382 32.35493     1     2 alabama   autauga
## 3 -86.54527 32.36639     1     3 alabama   autauga
## 4 -86.55673 32.37785     1     4 alabama   autauga
## 5 -86.57966 32.38357     1     5 alabama   autauga
## 6 -86.59111 32.37785     1     6 alabama   autauga
```

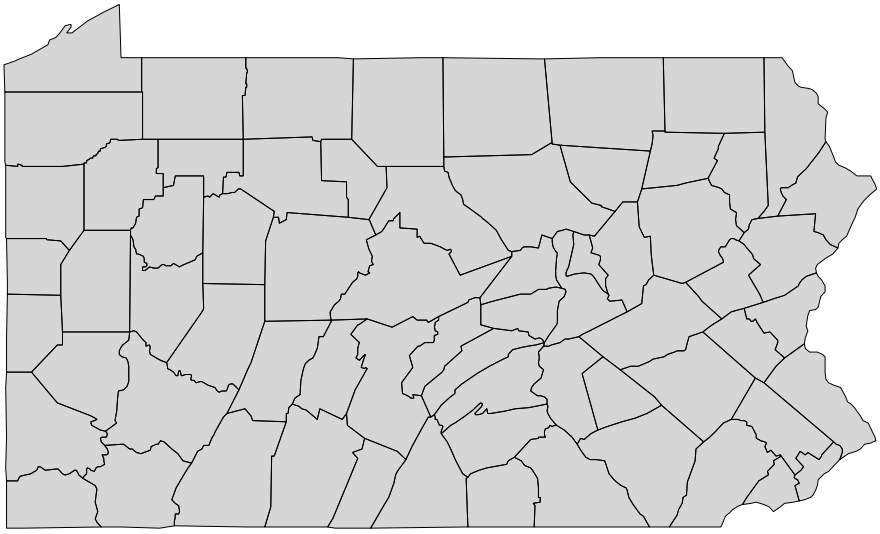
```
gf_polygon(lat~long,data=county,group=~group, color="black",size=0.05) %>%
  gf_refine(coord_map("conic",lat0=30))
```



```
# Subset Pennsylvania
penn = map_data("county","pennsylvania")
head(penn)
```

```
##        long      lat group order       region subregion
## 1 -77.44670 39.96954     1     1 pennsylvania     adams
## 2 -77.42952 39.98672     1     2 pennsylvania     adams
## 3 -77.37222 40.00391     1     3 pennsylvania     adams
## 4 -77.32065 40.01537     1     4 pennsylvania     adams
## 5 -77.23471 40.02683     1     5 pennsylvania     adams
## 6 -77.18887 40.03256     1     6 pennsylvania     adams
```

```
gf_polygon(lat~long,data=penn,group=~group,
            color="black",size=0.05,alpha=0.2)
```



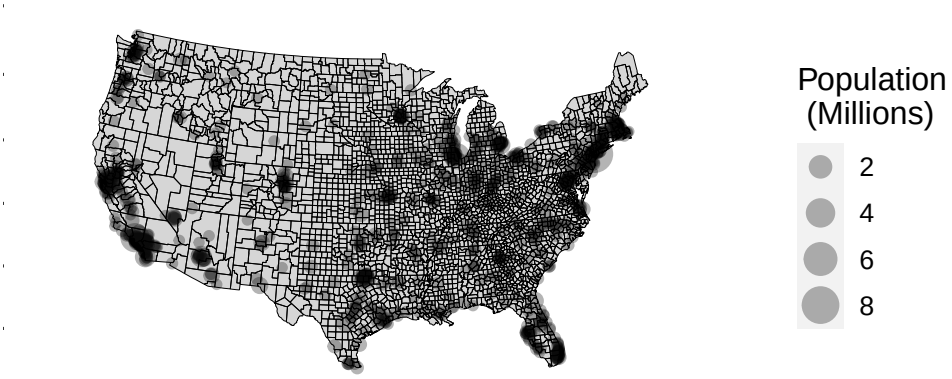
```
# US Cities
data("us.cities")
head(us.cities)
```

```
##         name country.etc    pop   lat    long capital
## 1 Abilene TX          TX 113888 32.45  -99.74       0
```

```
## 2   Akron OH          OH 206634 41.08  -81.52       0
## 3 Alameda CA          CA  70069 37.77 -122.26       0
## 4  Albany GA          GA  75510 31.58  -84.18       0
## 5  Albany NY          NY  93576 42.67  -73.80       2
## 6  Albany OR          OR  45535 44.62 -123.09       0
```

```
# Population Map of US Cities
gf_point(lat~long,data=subset(us.cities, country.etc!= "HI" & country.etc != "AK")
         ,alpha=0.3,size=~pop/1000000) %>%
  gf_polygon(lat~long,data=county,group=~group,
             color="black",size=0.05,alpha=0.2) %>%
  gf_refine(coord_map("conic",lat0=30)) %>%
  gf_labs(size="Population\n (Millions)",
          title="The North East and California are Heavily Populated")
```

The North East and California are Heavily Populated




```
# Overlay US Cities w/ State Labsls
cities = read.csv("https://raw.githubusercontent.com/plotly/datasets/master/us-cities-top-1k.csv")
head(cities)
```

```
##         City          State Population      lat        lon
## 1 Marysville     Washington      63269 48.05176 -122.17708
## 2     Perris     California      72326 33.78252 -117.22865
## 3  Cleveland           Ohio     390113 41.49932  -81.69436
## 4  Worcester  Massachusetts     182544 42.26259  -71.80229
## 5   Columbia South Carolina     133358 34.00071  -81.03481
## 6  Waterbury    Connecticut     109676 41.55815  -73.05150
```

```
penn_cities = data=subset(cities, State == "Pennsylvania")
gf_point(lat~lon, data=penn_cities, size=~Population/1000000, alpha=0.4) %>%
  gf_polygon(lat~long,data=penn,group=~group,
             color="black",size=0.05,alpha=0.2) %>%
  gf_labs(size="Population\n (Millions)",
          title="\n Philadelphia is the Most Populated City in PA") +
  geom_text_repel(data = penn_cities, aes(label=City))
```

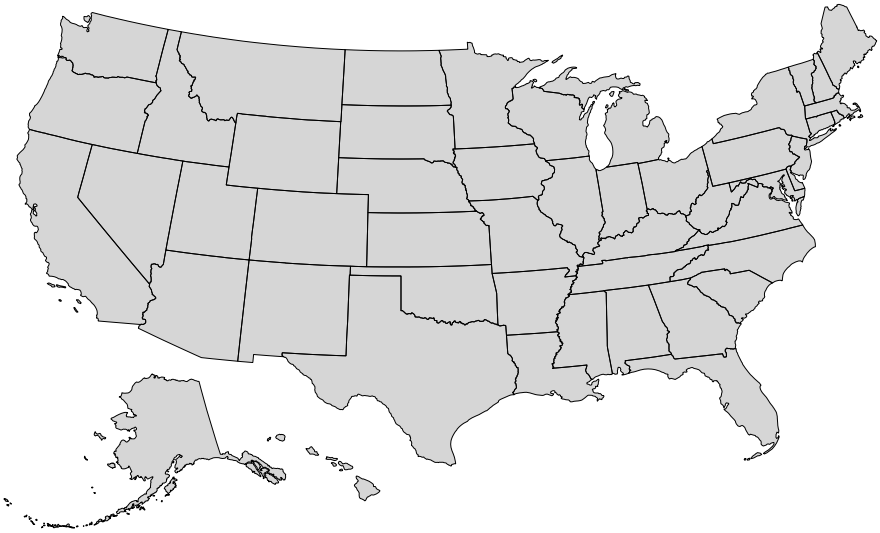
Philadelphia is the Most Populated City in PA

US Map Package

```
states2 = us_map(region = "states")
head(states2)
```

```
##         x        y order  hole piece group fips abbr    full
## 1 1091779 -1380695     1 FALSE     1  01.1   01   AL Alabama
## 2 1091268 -1376372     2 FALSE     1  01.1   01   AL Alabama
## 3 1091140 -1362998     3 FALSE     1  01.1   01   AL Alabama
## 4 1090940 -1343517     4 FALSE     1  01.1   01   AL Alabama
## 5 1090913 -1341006     5 FALSE     1  01.1   01   AL Alabama
## 6 1090796 -1334480     6 FALSE     1  01.1   01   AL Alabama
```

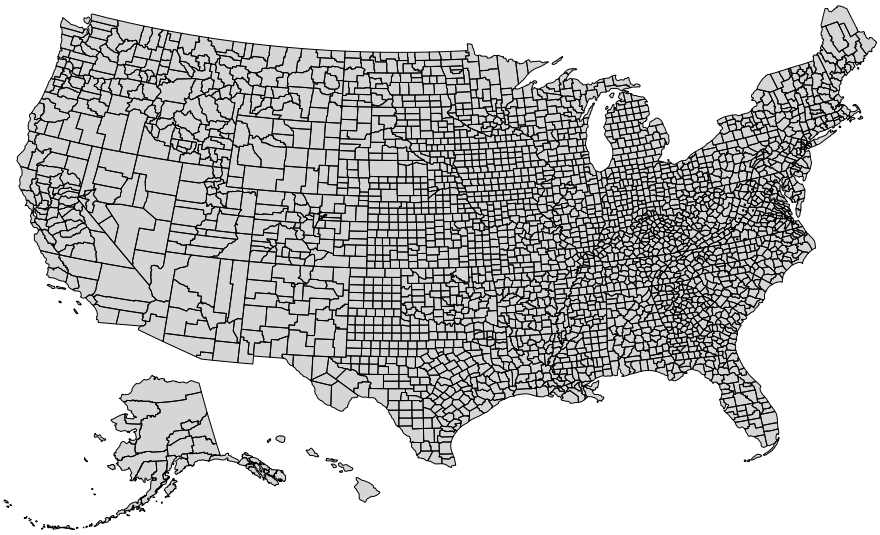
```
gf_polygon(y~x,data=states2,group=~group, color="black",size=0.05,alpha=0.2)
```



```
# Map by County
counties2 = us_map(region="county")
head(counties2)
```

```
##         x        y order  hole piece   group  fips abbr    full         county
## 1 1225889 -1275020     1 FALSE     1 01001.1 01001   AL Alabama Autauga County
## 2 1244873 -1272331     2 FALSE     1 01001.1 01001   AL Alabama Autauga County
## 3 1244129 -1267515     3 FALSE     1 01001.1 01001   AL Alabama Autauga County
## 4 1272010 -1262889     4 FALSE     1 01001.1 01001   AL Alabama Autauga County
## 5 1276797 -1295514     5 FALSE     1 01001.1 01001   AL Alabama Autauga County
## 6 1272367 -1296730     6 FALSE     1 01001.1 01001   AL Alabama Autauga County
```

```
gf_polygon(y~x,data=counties2,group=~group, color="black",size=0.05,alpha=0.2)
```



```
northeast_region = us_map(region="county",include = c(.northeast_region))


gf_polygon(y~x,data=northeast_region,group=~group, color="black",size=0.05,alpha=0.2)
```