US Maps

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11/6/2023

```
# Election Data
data("election")
head(election)
```

```
## # A tibble: 6 x 22
##   state      st     fips total_vote vote_margin winner party pct_margin r_points
##   <chr>      <chr> <dbl>      <dbl>       <dbl> <chr>  <chr>      <dbl>    <dbl>
## 1 Alabama    AL        1    2123372      588708 Trump  Repu~     0.277     27.7
## 2 Alaska     AK        2     318608       46933 Trump  Repu~     0.147     14.7
## 3 Arizona    AZ        4    2604657       91234 Trump  Repu~     0.035      3.5
## 4 Arkansas   AR        5    1130635      304378 Trump  Repu~     0.269     26.9
## 5 California CA        6   14237893     4269978 Clint~ Demo~     0.300    -30.0
## 6 Colorado   CO        8    2780247      136386 Clint~ Demo~     0.0491    -4.91
## # ... with 13 more variables: d_points <dbl>, pct_clinton <dbl>,
## #   pct_trump <dbl>, pct_johnson <dbl>, pct_other <dbl>, clinton_vote <dbl>,
## #   trump_vote <dbl>, johnson_vote <dbl>, other_vote <dbl>, ev_dem <dbl>,
## #   ev_rep <dbl>, ev_oth <dbl>, census <chr>
```

```
# State Data
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>
```

```
election$region = tolower(election$state)

FullData = left_join(States,election)
```

```
## Joining, by = "region"
```

```
head(FullData)
```

```
##        long      lat group order  region subregion   state st fips total_vote
## 1 -87.46201 30.38968     1     1 alabama      <NA> Alabama AL    1    2123372
## 2 -87.48493 30.37249     1     2 alabama      <NA> Alabama AL    1    2123372
## 3 -87.52503 30.37249     1     3 alabama      <NA> Alabama AL    1    2123372
## 4 -87.53076 30.33239     1     4 alabama      <NA> Alabama AL    1    2123372
## 5 -87.57087 30.32665     1     5 alabama      <NA> Alabama AL    1    2123372
## 6 -87.58806 30.32665     1     6 alabama      <NA> Alabama AL    1    2123372
```

```
##   vote_margin winner      party pct_margin r_points d_points pct_clinton
## 1      588708  Trump Republican     0.2773    27.72   -27.72       34.36
## 2      588708  Trump Republican     0.2773    27.72   -27.72       34.36
## 3      588708  Trump Republican     0.2773    27.72   -27.72       34.36
## 4      588708  Trump Republican     0.2773    27.72   -27.72       34.36
## 5      588708  Trump Republican     0.2773    27.72   -27.72       34.36
## 6      588708  Trump Republican     0.2773    27.72   -27.72       34.36
##   pct_trump pct_johnson pct_other clinton_vote trump_vote johnson_vote
## 1     62.08        2.09      1.46       729547    1318255        44467
## 2     62.08        2.09      1.46       729547    1318255        44467
## 3     62.08        2.09      1.46       729547    1318255        44467
## 4     62.08        2.09      1.46       729547    1318255        44467
## 5     62.08        2.09      1.46       729547    1318255        44467
## 6     62.08        2.09      1.46       729547    1318255        44467
##   other_vote ev_dem ev_rep ev_oth census
## 1      31103      0      9      0  South
## 2      31103      0      9      0  South
## 3      31103      0      9      0  South
## 4      31103      0      9      0  South
## 5      31103      0      9      0  South
## 6      31103      0      9      0  South
```

```
# County Data
head(county_map)
```

```
##      long      lat order  hole piece            group    id
## 1 1225889 -1275020     1 FALSE     1 0500000US01001.1 01001
## 2 1235324 -1274008     2 FALSE     1 0500000US01001.1 01001
## 3 1244873 -1272331     3 FALSE     1 0500000US01001.1 01001
## 4 1244129 -1267515     4 FALSE     1 0500000US01001.1 01001
## 5 1272010 -1262889     5 FALSE     1 0500000US01001.1 01001
## 6 1276797 -1295514     6 FALSE     1 0500000US01001.1 01001
```

```
head(county_data)
```

```
##      id           name state census_region      pop_dens   pop_dens4
## 1     0           <NA>  <NA>          <NA> [   50,  100) [ 45,  118)
## 2 01000              1    AL         South [   50,  100) [ 45,  118)
## 3 01001 Autauga County    AL         South [   50,  100) [ 45,  118)
## 4 01003 Baldwin County    AL         South [  100,  500) [118,71672]
## 5 01005 Barbour County    AL         South [   10,   50) [ 17,   45)
## 6 01007    Bibb County    AL         South [   10,   50) [ 17,   45)
##     pop_dens6   pct_black       pop female white black travel_time  land_area
## 1 [ 82,  215) [10.0,15.0) 318857056   50.8  77.7  13.2        25.5 3531905.43
## 2 [ 82,  215) [25.0,50.0)   4849377   51.5  69.8  26.6        24.2   50645.33
## 3 [ 82,  215) [15.0,25.0)     55395   51.5  78.1  18.4        26.2     594.44
## 4 [ 82,  215) [ 5.0,10.0)    200111   51.2  87.3   9.5        25.9    1589.78
## 5 [ 25,   45) [25.0,50.0)     26887   46.5  50.2  47.6        24.6     884.88
## 6 [ 25,   45) [15.0,25.0)     22506   46.0  76.3  22.1        27.6     622.58
##   hh_income su_gun4 su_gun6 fips votes_dem_2016 votes_gop_2016 total_votes_2016
## 1     53046    <NA>    <NA>    0             NA             NA               NA
## 2     43253    <NA>    <NA> 1000             NA             NA               NA
## 3     53682 [11,54] [10,12) 1001           5908          18110            24661
## 4     50221 [11,54] [10,12) 1003          18409          72780            94090
## 5     32911 [ 5, 8) [ 7, 8) 1005           4848           5431            10390
```

```
## 6     36447 [11,54] [10,12) 1007           1874           6733             8748
##   per_dem_2016 per_gop_2016 diff_2016 per_dem_2012 per_gop_2012 diff_2012
## 1           NA           NA        NA           NA           NA        NA
## 2           NA           NA        NA           NA           NA        NA
## 3    0.2395685    0.7343579     12202    0.2657577    0.7263374     11012
## 4    0.1956531    0.7735147     54371    0.2156657    0.7738975     47443
## 5    0.4666025    0.5227141       583    0.5125229    0.4833755       334
## 6    0.2142204    0.7696616      4859    0.2621857    0.7306638      3931
##   winner partywinner16 winner12 partywinner12 flipped
## 1   <NA>          <NA>     <NA>          <NA>    <NA>
## 2   <NA>          <NA>     <NA>          <NA>    <NA>
## 3  Trump    Republican   Romney    Republican      No
## 4  Trump    Republican   Romney    Republican      No
## 5  Trump    Republican    Obama      Democrat     Yes
## 6  Trump    Republican   Romney    Republican      No
```

```
all_county_data = left_join(county_map,county_data)
```

```
## Joining, by = "id"
```

```
# all_county_data = all_county_data %>%
#   group_by(state,group,name) %>%
#   mutate(StatePopulation = sum(pop))
head(all_county_data)
```

```
##      long      lat order  hole piece            group    id           name
## 1 1225889 -1275020     1 FALSE     1 0500000US01001.1 01001 Autauga County
## 2 1235324 -1274008     2 FALSE     1 0500000US01001.1 01001 Autauga County
## 3 1244873 -1272331     3 FALSE     1 0500000US01001.1 01001 Autauga County
## 4 1244129 -1267515     4 FALSE     1 0500000US01001.1 01001 Autauga County
## 5 1272010 -1262889     5 FALSE     1 0500000US01001.1 01001 Autauga County
## 6 1276797 -1295514     6 FALSE     1 0500000US01001.1 01001 Autauga County
##   state census_region      pop_dens   pop_dens4   pop_dens6   pct_black   pop
## 1    AL         South [   50,  100) [ 45,  118) [ 82,  215) [15.0,25.0) 55395
## 2    AL         South [   50,  100) [ 45,  118) [ 82,  215) [15.0,25.0) 55395
## 3    AL         South [   50,  100) [ 45,  118) [ 82,  215) [15.0,25.0) 55395
## 4    AL         South [   50,  100) [ 45,  118) [ 82,  215) [15.0,25.0) 55395
## 5    AL         South [   50,  100) [ 45,  118) [ 82,  215) [15.0,25.0) 55395
## 6    AL         South [   50,  100) [ 45,  118) [ 82,  215) [15.0,25.0) 55395
##   female white black travel_time land_area hh_income su_gun4 su_gun6 fips
## 1   51.5  78.1  18.4        26.2    594.44     53682 [11,54] [10,12) 1001
## 2   51.5  78.1  18.4        26.2    594.44     53682 [11,54] [10,12) 1001
## 3   51.5  78.1  18.4        26.2    594.44     53682 [11,54] [10,12) 1001
## 4   51.5  78.1  18.4        26.2    594.44     53682 [11,54] [10,12) 1001
## 5   51.5  78.1  18.4        26.2    594.44     53682 [11,54] [10,12) 1001
## 6   51.5  78.1  18.4        26.2    594.44     53682 [11,54] [10,12) 1001
##   votes_dem_2016 votes_gop_2016 total_votes_2016 per_dem_2016 per_gop_2016
## 1           5908          18110            24661    0.2395685    0.7343579
## 2           5908          18110            24661    0.2395685    0.7343579
## 3           5908          18110            24661    0.2395685    0.7343579
## 4           5908          18110            24661    0.2395685    0.7343579
## 5           5908          18110            24661    0.2395685    0.7343579
## 6           5908          18110            24661    0.2395685    0.7343579
##   diff_2016 per_dem_2012 per_gop_2012 diff_2012 winner partywinner16 winner12
## 1     12202    0.2657577    0.7263374     11012  Trump    Republican   Romney
```

```
## 2     12202    0.2657577    0.7263374     11012  Trump    Republican   Romney
## 3     12202    0.2657577    0.7263374     11012  Trump    Republican   Romney
## 4     12202    0.2657577    0.7263374     11012  Trump    Republican   Romney
## 5     12202    0.2657577    0.7263374     11012  Trump    Republican   Romney
## 6     12202    0.2657577    0.7263374     11012  Trump    Republican   Romney
##   partywinner12 flipped
## 1    Republican      No
## 2    Republican      No
## 3    Republican      No
## 4    Republican      No
## 5    Republican      No
## 6    Republican      No
```

```
poliSciDataset = read_csv("~/CSVs/PoliSciState.csv")
```

```
## New names:
## * `` -> ...1
```

```
## Rows: 50 Columns: 136
```

```
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr  (26): abort_rank3, cig_tax12_3, gun_rank3, obama_win12, pot_policy, rel...
## dbl (110): ...1, abortion_rank12, adv_or_more, ba_or_more, cig_tax12, conser...
```

```
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```
# Replace "RhodeIsland" with "Rhode Island" to fix error.
poliSciDataset[poliSciDataset == "RhodeIsland"] <- "Rhode Island"
head(poliSciDataset)
```

```
## # A tibble: 6 x 136
##    ...1 abort_rank3 abortion_rank12 adv_or_more ba_or_more cig_tax12 cig_tax12_3
##   <dbl> <chr>                <dbl>       <dbl>      <dbl>     <dbl> <chr>
## 1     1 Less restr              35          9         26.6     2     HiTax
## 2     2 Mid                     20          7.7       22       0.425 LoTax
## 3     3 More restr               4          6.1       18.9     1.15  MidTax
## 4     4 More restr               5          9.3       25.6     2     HiTax
## 5     5 Less restr              49         10.7       29.9     0.87  MidTax
## 6     6 Mid                     25         12.7       35.9     0.84  MidTax
## # ... with 129 more variables: conserv_advantage <dbl>, conserv_public <dbl>,
## #   dem_advantage <dbl>, govt_worker <dbl>, gun_rank3 <chr>, gun_rank11 <dbl>,
## #   gun_scale11 <dbl>, hr_cons_rank11 <dbl>, hr_conserv11 <dbl>,
## #   hr_lib_rank11 <dbl>, hr_liberal11 <dbl>, hs_or_more <dbl>, obama2012 <dbl>,
## #   obama_win12 <chr>, pop2000 <dbl>, pop2010 <dbl>, pop2010_hun_thou <dbl>,
## #   popchng0010 <dbl>, popchngpct <dbl>, pot_policy <chr>, prochoice <dbl>,
## #   prolife <dbl>, relig_cath <dbl>, relig_prot <dbl>, relig_high <dbl>, ...
```

```
# Graph 1
gf_polygon(lat~long,data=FullData,group=~group,fill=~vote_margin/100000,color="grey50",size=0.05) %>%
  gf_theme(theme_map()) %>%
  gf_refine(coord_equal())%>%
  gf_theme(legend.position="bottom") %>%
  gf_labs(fill="Votes (in hundred-thousands)", title="\n\tCalifornia Has the Highest Vote Margin in the
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
```

```
## width unknown for character 0x9

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
## width unknown for character 0x9

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
## width unknown for character 0x9

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## font width unknown for character 0x9
```

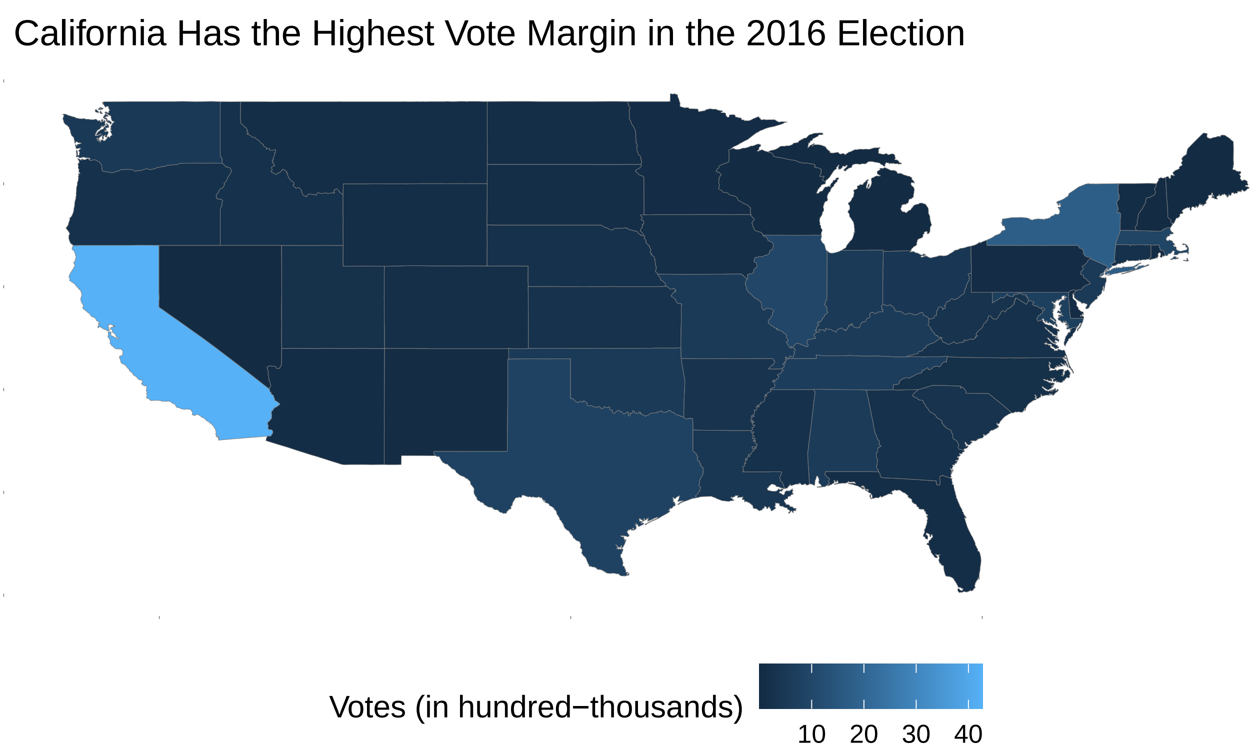


```
# Graph 2
gf_polygon(lat~long,data=FullData,group=~group,fill=~party,color="grey50",size=0.05) %>%
  gf_theme(theme_map()) %>%
  gf_refine(scale_fill_manual(values = c("royalblue","red")),coord_equal()) %>%
  gf_labs(fill="Party", title="\n\tThe South East Votes Primarily Republican")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
## width unknown for character 0x9
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
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## width unknown for character 0x9

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## font width unknown for character 0x9
```
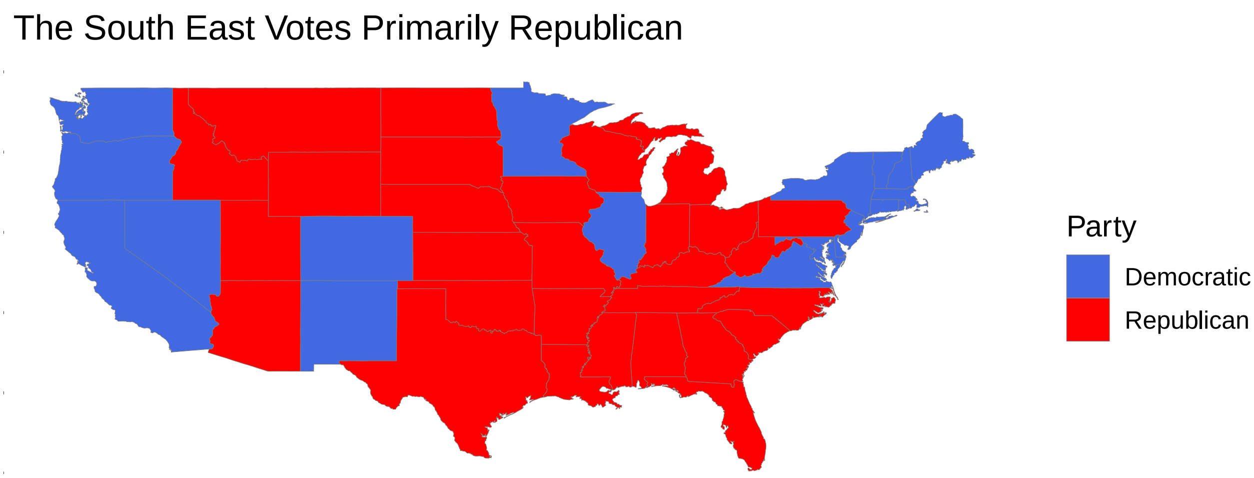
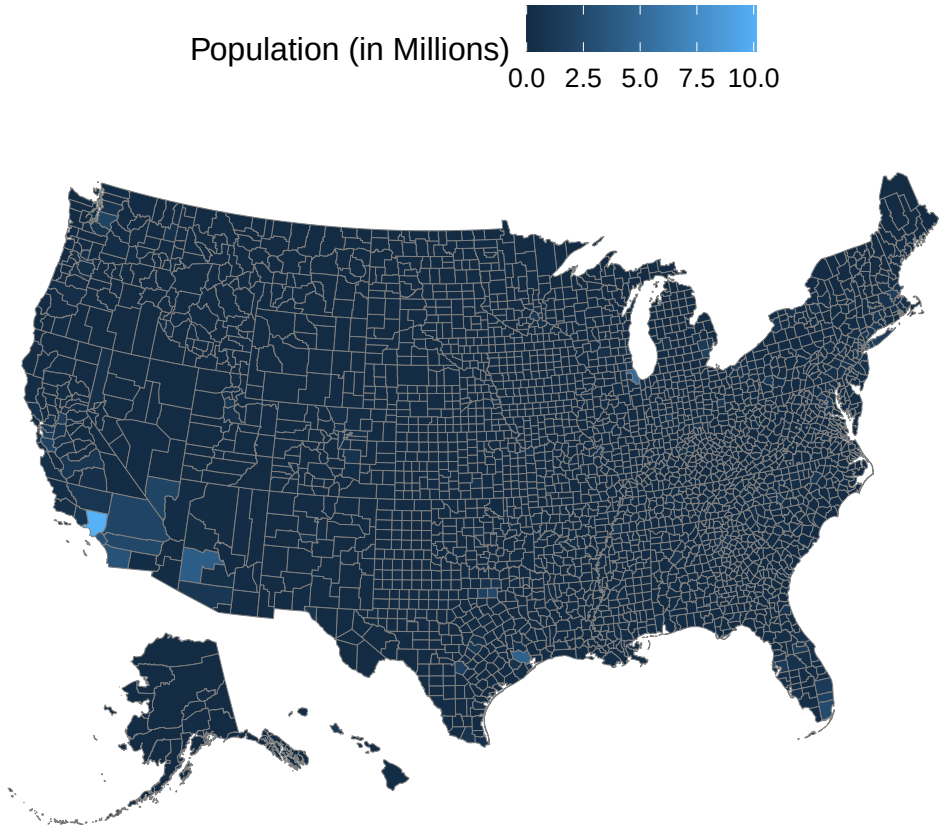



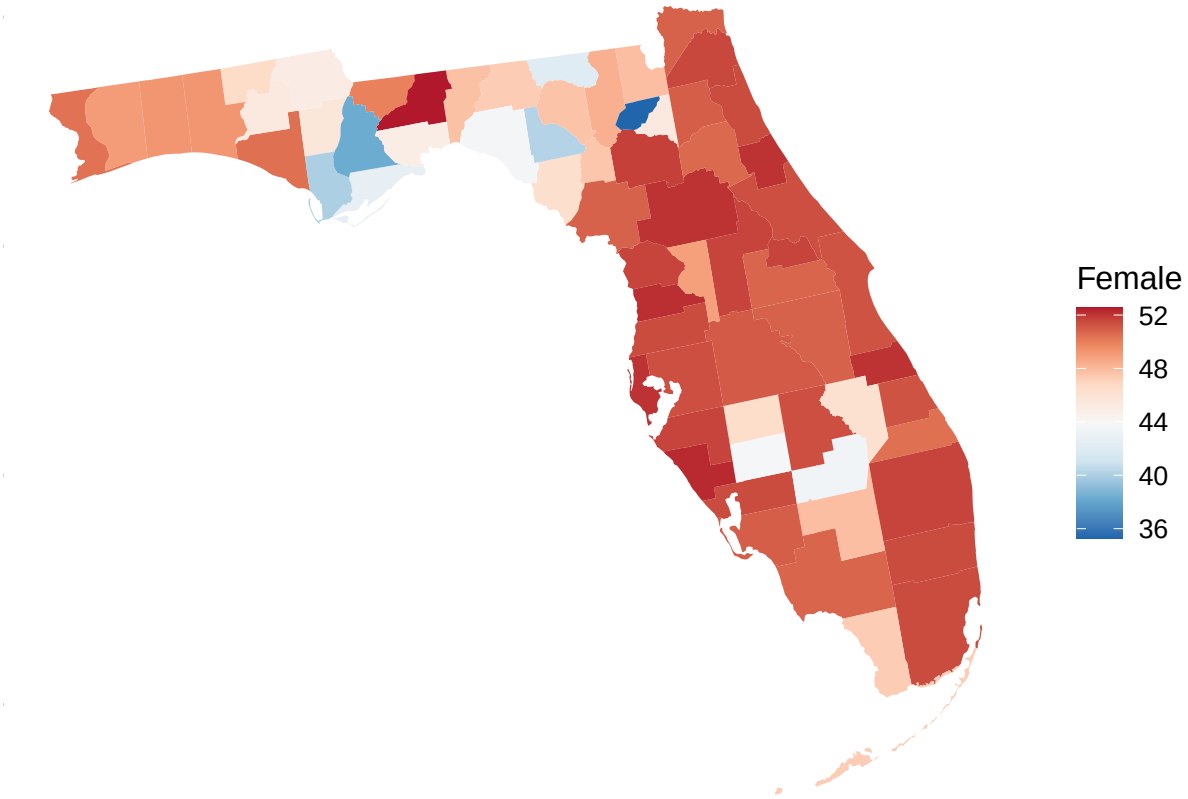

```
# Graph 3
gf_polygon(lat~long,data=all_county_data,group=~group,fill=~pop/1000000,color="grey50",size=0.05) %>%
  gf_refine(coord_equal()) %>%
  gf_theme(legend.position="top") %>%
  gf_labs(fill="Population (in Millions)",title="\nLA County has a Population of near 10 Million")
```

LA County has a Population of near 10 Million




```
# Graph 4
gf_polygon(lat~long,data=subset(all_county_data, state == "FL"), fill=~female, group=~group) %>%
  gf_refine(coord_equal(), scale_fill_distiller(palette = "RdBu")) %>%
  gf_labs(title="\nFloridia is Predominately Female", fill="Female")
```

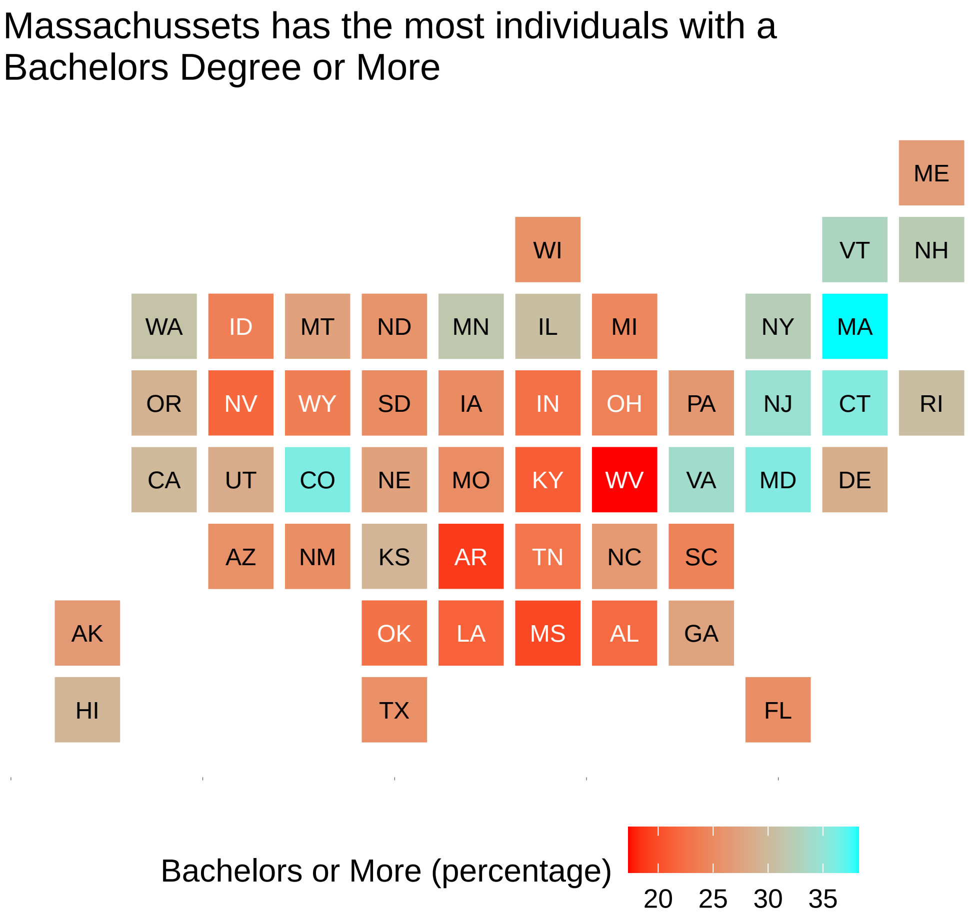
Floridia is Predominately Female




```
# Graph 5
statebins(poliSciDataset, state_col="state", value="ba_or_more") %>%
  gf_refine(coord_equal(), scale_fill_gradientn(colors = rainbow(2))) %>%
  gf_labs(title="\nMassachussets has the most individuals with a
Bachelors Degree or More",
          fill="Bachelors or More (percentage)") %>%
  gf_theme(legend.position="bottom")
```

```
## Coordinate system already present. Adding new coordinate system, which will replace the existing one
```

```
## Scale for 'fill' is already present. Adding another scale for 'fill', which
## will replace the existing scale.
```




```
# Graph 6
statebins(poliSciDataset, state_col="state", value="obama_win12",
          ggplot2_scale_function = scale_fill_discrete) %>%
  gf_labs(title="\tObama Wins in North East in the 2012 Election",
          fill="Obama State Wins in 2012")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
## width unknown for character 0x9

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, : font
## width unknown for character 0x9
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## font width unknown for character 0x9
```