

R Notebook

Code ▾

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```
library(tidyverse)
library(Stat2Data)
library(maps)
library(RColorBrewer)
library(USAboundaries)
library(sf)# Simple features standard.library
```

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```
#require(devtools)
#devtools::install_github("ropensci/USAboundariesData")
```

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```
head(map_data("county", "new york"))
```

	long <dbl>	lat <dbl>	group <dbl>	order <int>	region <chr>	subregion <chr>
1	-73.78550	42.46763	1	1	new york	albany
2	-74.25533	42.41034	1	2	new york	albany
3	-74.25533	42.41034	1	3	new york	albany
4	-74.27252	42.41607	1	4	new york	albany
5	-74.24960	42.46763	1	5	new york	albany
6	-74.22668	42.50774	1	6	new york	albany

6 rows

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```
md_counties <- map_data("county", "new york") %>% select(lon = long, lat, group, id = subregion)
md_counties
```

	lon <dbl>	lat <dbl>	group <dbl>	id <chr>
1	-73.78550	42.46763	1	albany
2	-74.25533	42.41034	1	albany
3	-74.25533	42.41034	1	albany
4	-74.27252	42.41607	1	albany

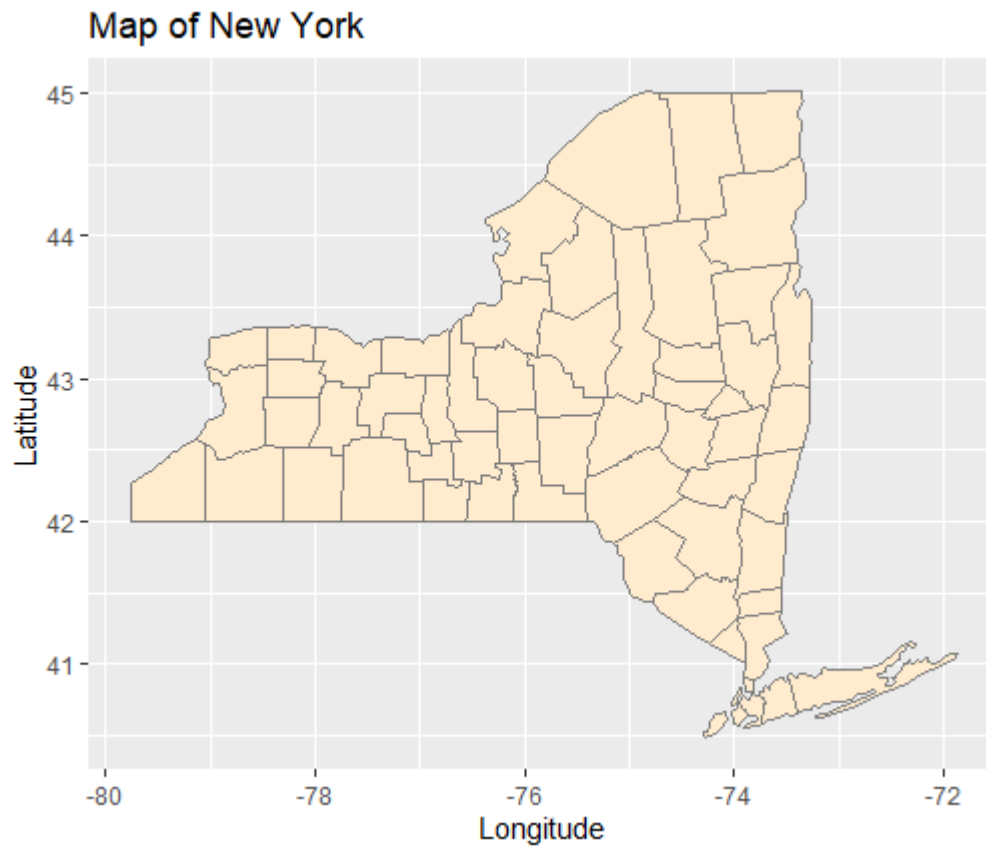
	lon <dbl>	lat <dbl>	group	id <dbl> <chr>
5	-74.24960	42.46763	1	albany
6	-74.22668	42.50774	1	albany
7	-74.23241	42.56504	1	albany
8	-74.20950	42.58796	1	albany
9	-74.19230	42.62233	1	albany
10	-74.16939	42.67390	1	albany

1-10 of 1,922 rows

Previous 1 2 3 4 5 6 ... 100 Next

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```
ggplot(md_counties, aes(lon, lat))+geom_polygon(aes(group = group), fill = "blanchedalmond", color = "gray50")+coord_quickmap()+xlab("Longitude")+ylab("Latitude")+ggtitle("Map of New York")
```



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#This is a map of New York state and its different counties. The Y axis is the latitude and the X axis is the longitude.

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```
states.covid <- read.csv(file.choose())
states.covid
```

<b>date</b> <chr>	<b>state</b> <chr>	<b>fips</b> <int>	<b>cases</b> <int>	<b>deaths</b> <int>
2020-01-21	Washington	53	1	0
2020-01-22	Washington	53	1	0
2020-01-23	Washington	53	1	0
2020-01-24	Illinois	17	1	0
2020-01-24	Washington	53	1	0
2020-01-25	California	6	1	0
2020-01-25	Illinois	17	1	0
2020-01-25	Washington	53	1	0
2020-01-26	Arizona	4	1	0
2020-01-26	California	6	2	0
1-10 of 22,289 rows		Previous	1	2
			3	4
			5	6
			...	100
			Next	

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```
states.covid.0301<-states.covid %>% filter(date == "2020-03-01")
states.covid.0301
```

<b>date</b> <chr>	<b>state</b> <chr>	<b>fips</b> <int>	<b>cases</b> <int>	<b>deaths</b> <int>
2020-03-01	Arizona	4	1	0
2020-03-01	California	6	33	0
2020-03-01	Florida	12	2	0
2020-03-01	Illinois	17	3	0
2020-03-01	Massachusetts	25	1	0
2020-03-01	Nebraska	31	13	0
2020-03-01	New York	36	1	0
2020-03-01	Oregon	41	2	0
2020-03-01	Rhode Island	44	2	0
2020-03-01	Texas	48	11	0
1-10 of 13 rows		Previous	1	2
			Next	

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```
states.covid.0315<-states.covid %>% filter(date == "2020-03-15")
states.covid.0315
```

date <chr>	state <chr>	fips <int>	cases <int>	deaths <int>					
2020-03-15	Alabama	1	23	0					
2020-03-15	Alaska	2	1	0					
2020-03-15	Arizona	4	13	0					
2020-03-15	Arkansas	5	16	0					
2020-03-15	California	6	478	6					
2020-03-15	Colorado	8	136	2					
2020-03-15	Connecticut	9	26	0					
2020-03-15	Delaware	10	7	0					
2020-03-15	District of Columbia	11	17	0					
2020-03-15	Florida	12	109	3					
1-10 of 53 rows		Previous	1	2	3	4	5	6	Next

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```
states.covid.twoweeks <- states.covid.0315
states.covid.twoweeks$new <- states.covid.twoweeks$cases -states.covid.0301$cases
```

longer object length is not a multiple of shorter object length

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```
states.covid.twoweeks
```

date <chr>	state <chr>	fips <int>	cases <int>	deaths <int>	new <int>
2020-03-15	Alabama	1	23	0	22
2020-03-15	Alaska	2	1	0	-32
2020-03-15	Arizona	4	13	0	11
2020-03-15	Arkansas	5	16	0	13
2020-03-15	California	6	478	6	477
2020-03-15	Colorado	8	136	2	123

date <chr>	state <chr>	fips <int>	cases <int>	deaths <int>	new <int>				
2020-03-15	Connecticut	9	26	0	25				
2020-03-15	Delaware	10	7	0	5				
2020-03-15	District of Columbia	11	17	0	15				
2020-03-15	Florida	12	109	3	98				
1-10 of 53 rows		Previous	1	2	3	4	5	6	Next

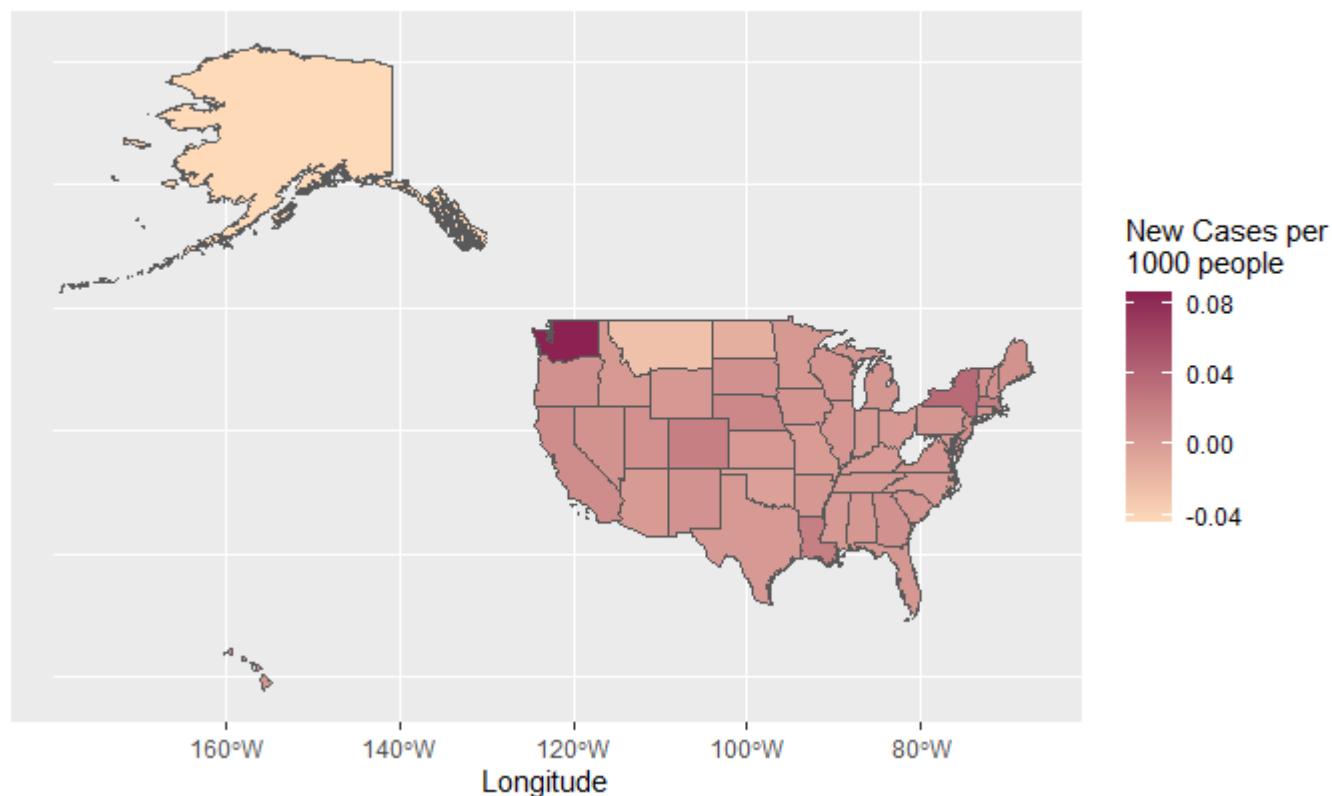
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```
states.covid.twoweeks <- merge(states.covid.twoweeks, populations, by.x = "state", by.y = "NAME"
)
states.covid.twoweeks <- states.covid.twoweeks %>% mutate(rel_covid = new/POPESTIMATE2019*1000)
```

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```
covidmap <- merge(states98, states.covid.twoweeks, by.x = "state_name", by.y = "state")
ggplot(covidmap)+geom_sf(mapping = aes(fill = rel_covid))+ coord_sf(crs = st_crs(4269))+scale_fi
ll_gradient(low = "peachpuff", high = "violetred4") + labs(fill = "New Cases per \n1000 people")
+xlab("Longitude")+ggtitle("New COVID-19 cases from 3/1/2020 to 3/15/2020")
```

## New COVID-19 cases from 3/1/2020 to 3/15/2020



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```
#This is a graph showing the COVID-19 cases between the dates of 3/1/2020 and 3/15/2020. This graph shows that Washington saw the greatest growth in COVID-19 cases between the dates of 3/1/2020 and 3/15/2020
```

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```
TeenPregnancy$CivilWar
```

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```
teenmap <- merge(states98, TeenPregnancy, by.x = "state_abbr", by.y = "State")  
teenmap
```

Simple feature collection with 50 features and 21 fields

Geometry type: MULTIPOLYGON

Dimension: XY

Bounding box: xmin: -179.1294 ymin: 18.91228 xmax: -66.94993 ymax: 71.38961

Geodetic CRS: WGS 84

First 10 features:

	state_abbr	id_num	name	id	version	start_date	end_date
1	AK	3	Alaska	ak_state	1	1959-01-03	2000-12-31
2	AL	7	Alabama	al_state	3	1820-12-19	2000-12-31
3	AR	11	Arkansas	ar_state	2	1840-05-21	2000-12-31
4	AZ	15	Arizona	az_state	1	1912-02-14	2000-12-31
5	CA	19	California	ca_state	2	1959-12-31	2000-12-31
6	CO	20	Colorado	co_state	1	1876-08-01	2000-12-31
7	CT	25	Connecticut	ct_state	4	1804-12-31	2000-12-31
8	DE	28	Delaware	de_state	1	1783-09-03	2000-12-31
9	FL	39	Florida	fl_state	1	1845-03-03	2000-12-31
10	GA	44	Georgia	ga_state	3	1802-04-24	2000-12-31

change

1  
The state of Alaska was created from Alaska Territory by Presidential proclamation; Alaska Territory eliminated.

2  
MARION's overlap of the state of Mississippi and TUSCALOOSA's overlap of the state of Mississippi ended.

3  
Survey of boundary between the Republic of Texas and the United States began. MILLER (original) officially became extinct and LAFAYETTE was eliminated from Texas when Texas claims to the area were upheld.

4  
The state of Arizona was created from Arizona Territory; Arizona Territory eliminated.  
5 Between 1949 and 1959 (precise date unknown) SAN FRANCISCO gained a small area of the Alameda Naval Air Station when landfill expansion extended westward over the county line between SAN FRANCISCO and ALAMEDA in San Francisco Bay.

6  
The state of Colorado was created from Colorado Territory; Colorado Territory eliminated.

7  
HARTFORD lost part of the town of Southwick (the "Southwick Jog") to HAMPSHIRE (Mass.) when the state boundary was adjusted.

8  
The three Lower Counties, of KENT, NEW CASTLE, and SUSSEX became an independent state on 4 July 1776. The name Delaware was formally adopted on 20 September 1776. The map depicts state boundaries as of 3 September 1783.

9  
The state of Florida was created from Florida Territory, with boundaries the same as those set in 1822; Florida Territory eliminated.

10  
Georgia ceded to the United States much of present Mississippi and Alabama. This area became unorganized federal territory and Georgia Western Lands were eliminated.

citation

1  
(Swindler, 1:208-225; Van Zandt, 165)

2  
(Ala. Acts 1820, 2d sess., secs. 1, 9/pp. 90, 92)

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3
(U.S. Stat., vol. 5, ch. 75 [1844]/p. 674; Marshall, 235-236)
4 (U.S. Stat., vol. 34, pt. 1, ch. 3335[1906]/pp. 267-285; U.S. Stat., vol. 36, pt. 1, ch. 310
[1910]/pp. 557-579; U.S. Stat., vol. 37, pt. 1, res. 8[1911]/pp. 39-43; pt. 2[1912]/pp. 1728-172
9)
5
(U.S.G.S., 7.5 Minute Series, Oakland West Quadrangle, ";Edition of 1949"; and ";Edition of 195
9");)
6
(Van Zandt, 141; U.S. Stat., vol. 18, part 3 [1876], p. 474)
7
(Hooker, 25-26; Van Zandt, 69)
8
(Declaration of Independence; Swindler, 2:197)
9
(Swindler, 2:332; U.S. Stat., vol. 5, ch. 48 [1845], secs. 1, 5/pp. 742-743)
10
(Paullin, 83; Van Zandt, 100; Terr. Papers U.S., 5:142-143)

```

	start_n	end_n	area_sqmi	terr_type	full_name	abbr_name	name_start
1	19590103	20001231	575301	State	Alaska	AK	Alaska (1959-01-03)
2	18201219	20001231	51656	State	Alabama	AL	Alabama (1820-12-19)
3	18400521	20001231	53179	State	Arkansas	AR	Arkansas (1840-05-21)
4	19120214	20001231	113999	State	Arizona	AZ	Arizona (1912-02-14)
5	19591231	20001231	158097	State	California	CA	California (1959-12-31)
6	18760801	20001231	104093	State	Colorado	CO	Colorado (1876-08-01)
7	18041231	20001231	4975	State	Connecticut	CT	Connecticut (1804-12-31)
8	17830903	20001231	2013	State	Delaware	DE	Delaware (1783-09-03)
9	18450303	20001231	56618	State	Florida	FL	Florida (1845-03-03)
10	18020424	20001231	58781	State	Georgia	GA	Georgia (1802-04-24)

	state_name	state_code	CivilWar	Church	Teen	geometry
1	Alaska	02	O	26	64	MULTIPOLYGON (((-179.0575 5...
2	Alabama	01	C	46	62	MULTIPOLYGON (((-88.07462 3...
3	Arkansas	05	C	45	73	MULTIPOLYGON (((-91.67235 3...
4	Arizona	04	O	33	60	MULTIPOLYGON (((-110.7507 3...
5	California	06	U	28	59	MULTIPOLYGON (((-117.2326 3...
6	Colorado	08	O	25	50	MULTIPOLYGON (((-106.0794 4...
7	Connecticut	09	U	25	44	MULTIPOLYGON (((-73.5055 41...
8	Delaware	10	U	35	67	MULTIPOLYGON (((-75.07024 3...
9	Florida	12	C	32	60	MULTIPOLYGON (((-81.74982 2...
10	Georgia	13	C	39	64	MULTIPOLYGON (((-81.50318 3...

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```
teenmap$CivilWar
```

```

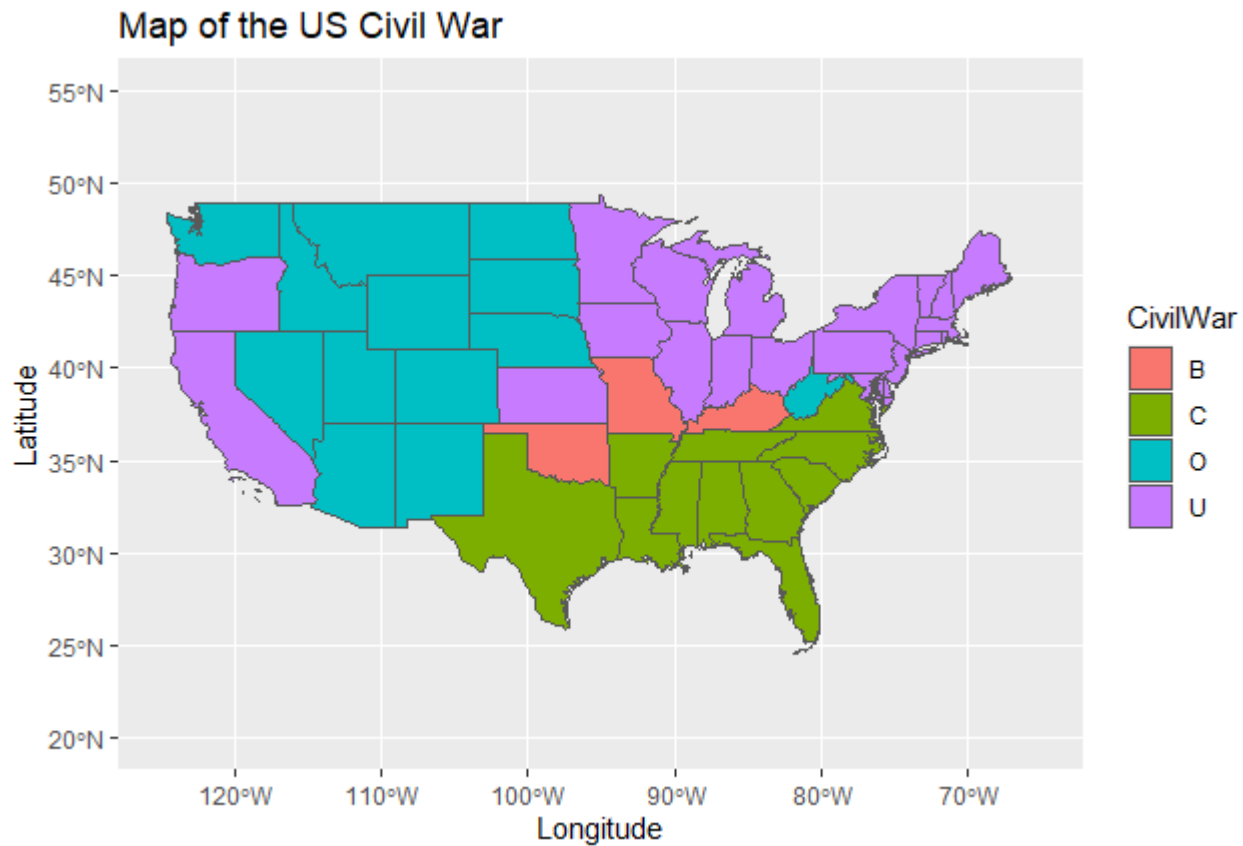
[1] O C C O U O U U C C O U O U U U B C U U U U U B C O C O O U U O O U U B U U U C O C
[43] C O C U O U O O
Levels: B C O U

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```
ggplot(teenmap)+geom_sf(mapping = aes(fill = CivilWar))+ coord_sf(xlim = c(-125, -65), ylim = c(
20,55), crs = st_crs(4269))+xlab("Longitude")+ylab("Latitude")+ggtitle("Map of the US Civil War"
)
```



Code

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#This is a graph showing the sides that each US state took during the Civil War. This graph shows that states that joined the Confederacy tended to be in the Southern-Eastern part of America. The graph also shows that the Northern-Eastern part of the country tended to be part of the Union.