

# Package ‘usmap’

September 16, 2018

**Version** 0.4.0

**Title** US Maps Including Alaska and Hawaii

**Description** Obtain United States map data frames of varying region types (e.g. county, state). The map data frames include Alaska and Hawaii conveniently placed to the bottom left, as they appear in most maps of the US. Convenience functions for plotting choropleths and working with FIPS codes are also provided.

**Depends** R (>= 3.2.0)

**License** GPL-3 | file LICENSE

**Encoding** UTF-8

**LazyData** true

**URL** <https://dilorenzo.pl/pkgs/usmap>

**BugReports** <https://github.com/pdil/usmap/issues>

**Imports** utils

**Suggests** ggplot2, knitr, proto, rmarkdown, scales, stringr, testthat

**RoxygenNote** 6.1.0

**VignetteBuilder** knitr

**NeedsCompilation** no

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`.east_north_central` *East North Central census division*

---

### **Description**

US Census Bureau regional division containing Illinois, Indiana, Michigan, Ohio, and Wisconsin.

### **Usage**

```
.east_north_central
```

### **Format**

An object of class character of length 5.

### **Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

### **Examples**

```
plot_usmap(include = .east_north_central, labels = TRUE)
```

---

.east\_south\_central     *East South Central census division*

---

**Description**

US Census Bureau regional division containing Alabama, Kentucky, Mississippi, and Tennessee.

**Usage**

.east\_south\_central

**Format**

An object of class character of length 4.

**Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

**Examples**

```
plot_usmap(include = .east_south_central, labels = TRUE)
```

---

.midwest\_region     *Midwest census region*

---

**Description**

US Census Bureau region containing the East North Central and West North Central divisions. This region was designated as "North Central Region" prior to June 1984.

**Usage**

.midwest\_region

**Format**

An object of class character of length 12.

**Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

**Examples**

```
plot_usmap(include = .midwest_region, labels = TRUE)
```

---

.mid_atlantic	<i>Mid-Atlantic census division</i>
---------------	-------------------------------------

---

**Description**

US Census Bureau regional division containing New Jersey, New York, and Pennsylvania.

**Usage**

```
.mid_atlantic
```

**Format**

An object of class character of length 3.

**Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

**Examples**

```
plot_usmap(include = .mid_atlantic, labels = TRUE)
```

---

.mountain	<i>Mountain census division</i>
-----------	---------------------------------

---

**Description**

US Census Bureau regional division containing Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

**Usage**

```
.mountain
```

**Format**

An object of class character of length 8.

**Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

**Examples**

```
plot_usmap(include = .mountain, labels = TRUE)
```

---

.new\_england                      *New England census division*

---

**Description**

US Census Bureau regional division containing Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

**Usage**

```
.new_england
```

**Format**

An object of class character of length 6.

**Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

**Examples**

```
plot_usmap(include = .new_england, labels = TRUE)
```

---

.northeast\_region                      *Northeast census region*

---

**Description**

US Census Bureau region containing the New England and Mid-Atlantic divisions.

**Usage**

```
.northeast_region
```

**Format**

An object of class character of length 9.

**Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

**Examples**

```
plot_usmap(include = .northeast_region, labels = TRUE)
```

---

`.north_central_region` *North-Central census region*

---

**Description**

Former US Census Bureau region containing the East North Central and West North Central divisions. This region has been designated as "Midwest" since June 1984.

**Usage**

`.north_central_region`

**Format**

An object of class character of length 12.

**Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

**Examples**

```
plot_usmap(include = .north_central_region, labels = TRUE)
```

---

`.pacific` *Pacific census division*

---

**Description**

US Census Bureau regional division containing Alaska, California, Hawaii, Oregon, and Washington.

**Usage**

`.pacific`

**Format**

An object of class character of length 5.

**Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

**Examples**

```
plot_usmap(include = .pacific, labels = TRUE)
```

---

.south\_atlantic      *South Atlantic census division*

---

### Description

US Census Bureau regional division containing Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, District of Columbia, and West Virginia.

### Usage

```
.south_atlantic
```

### Format

An object of class character of length 9.

### Details

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

### Examples

```
plot_usmap(include = .south_atlantic, labels = TRUE)
```

---

.south\_region      *South census region*

---

### Description

US Census Bureau region containing the South Atlantic, East South Central, and West South Central divisions.

### Usage

```
.south_region
```

### Format

An object of class character of length 17.

### Details

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

### Examples

```
plot_usmap(include = .midwest_region, labels = TRUE)
```

---

.west\_north\_central     *West North Central census division*

---

**Description**

US Census Bureau regional division containing Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.

**Usage**

```
.west_north_central
```

**Format**

An object of class character of length 7.

**Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

**Examples**

```
plot_usmap(include = .west_north_central, labels = TRUE)
```

---

.west\_region     *West census region*

---

**Description**

US Census Bureau region containing the Mountain and Pacific divisions.

**Usage**

```
.west_region
```

**Format**

An object of class character of length 13.

**Details**

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

**Examples**

```
plot_usmap(include = .midwest_region, labels = TRUE)
```



---

.west\_south\_central     *West South Central census division*

---

### Description

US Census Bureau regional division containing Arkansas, Louisiana, Oklahoma, and Texas.

### Usage

```
.west_south_central
```

### Format

An object of class character of length 4.

### Details

See [https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us\\_regdiv.pdf](https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf)

### Examples

```
plot_usmap(include = .west_south_central, labels = TRUE)
```

---

countypop     *Population estimates (2015), county level*

---

### Description

US census population estimates by county for 2015.

The data is formatted for easy merging with output from [us\\_map](#).

### Usage

```
data(countypop)
```

### Format

A data frame with 3142 rows and 4 variables.

### Details

- fips The 5-digit FIPS code corresponding to the county.
- abbr The 2-letter state abbreviation.
- county The full county name.
- pop\_2015 The 2015 population estimate (in number of people) for the corresponding county.

**References**

- <http://www.census.gov/programs-surveys/popest.html>
- <https://www.ers.usda.gov/data-products/county-level-data-sets/>

---

`countypov`*Poverty percentage estimates (2014), county level*

---

**Description**

US census poverty percentage estimates by county for 2014.

The data is formatted for easy merging with output from [us\\_map](#).

**Usage**

```
data(countypov)
```

**Format**

A data frame with 3142 rows and 4 variables.

**Details**

- `fips` The 5-digit FIPS code corresponding to the county.
- `abbr` The 2-letter state abbreviation.
- `county` The full county name.
- `pct_pov_2014` The 2014 poverty estimate (in percent of county population) for the corresponding county.

**References**

- <https://www.census.gov/topics/income-poverty/poverty.html>
- <https://www.ers.usda.gov/data-products/county-level-data-sets/>

---

`fips`*Retrieve FIPS code for either a US state or county*

---

### Description

Each US state and county has a unique FIPS (Federal Information Processing Standards) code. Use this function to obtain the FIPS code for a state or county.

### Usage

```
fips(state, county = c())
```

### Arguments

<code>state</code>	The state(s) for which to obtain a FIPS code(s). Can be entered as either a state abbreviation or full name (case-insensitive).  'state' can be entered as either a single state or a vector of states. If 'state' is a vector, 'county' must be omitted.
<code>county</code>	The county for which to obtain a FIPS code. Can be entered with or without "county" (case-insensitive).

### Details

State and county FIPS (Federal Information Processing Standards) are two and five digit codes, respectively. They uniquely identify all states and counties within the United States. The first two digits of the five digit county codes correspond to the state that the county belongs to. FIPS codes also exist for US territories and minor outlying islands, though this package only provides information for the 50 US states (and their associated counties and census designated areas).

### Value

The FIPS code(s) of given state or county.

If only states are entered, a vector of length equal to the number of states is returned. If any states are not found or are invalid, 'NA' is returned in their place.

If a state and county are entered, a single value with the FIPS code for the given county is returned. If the county is invalid for the given state, an error is thrown.

### Note

A state must be included when searching for county, otherwise multiple results may be returned for duplicate county names.

**Examples**

```
fips("NJ")
fips("California")

fips(c("AK", "CA", "UT"))

fips("CA", county = "orange")
fips(state = "AL", county = "autauga")
fips(state = "Alabama", county = "Autauga County")
```

---

fips\_info

*Retrieve states or counties using FIPS codes*


---

**Description**

Retrieve states or counties using FIPS codes

**Usage**

```
fips_info(fips)

## S3 method for class 'numeric'
fips_info(fips)

## S3 method for class 'character'
fips_info(fips)
```

**Arguments**

**fips** A one to five digit, either numeric or character, vector of FIPS codes for which to look up states or counties. States have a two digit FIPS code and counties have a five digit FIPS code (where the first 2 numbers pertain to the state).

**Value**

A data frame with the states or counties and the associated FIPS codes.

**Examples**

```
fips_info(2)
fips_info("2")
fips_info(c("02", "03", "04"))

fips_info(2016)
fips_info(c("02016", "02017"))
```

---

map_with_data	<i>Join county or state level data to US map data</i>
---------------	---

---

### Description

Join county or state level data to US map data

### Usage

```
map_with_data(data, values = "values", include = c(), na = NA)
```

### Arguments

data	The data that should be joined to a US map. This parameter should be a data frame consisting of two columns, a fips code (2 characters for state, 5 characters for county) and the value that should be associated with that region. The columns of data <i>must</i> be fips or state and the value of the 'values' parameter. If both fips and state are provided, this function uses the fips.
values	The name of the column that contains the values to be associated with a given region. The default is "values".
include	The regions to include in the output data frame. If regions is "states"/"state", the value can be either a state name, abbreviation or FIPS code. For counties, the FIPS must be provided as there can be multiple counties with the same name.
na	The value to be inserted for states or counties that don't have a value in data. This value must be of the same type as the value column of data.

### Value

A data frame composed of the map data frame (from [us\\_map](#)) except an extra column containing the values in data is included.

The result can be plotted using `ggplot2`. See [us\\_map](#) for more details.

### Examples

```
state_data <- data.frame(fips = c("01", "02", "04"), values = c(1, 5, 8))
df <- map_with_data(state_data, na = 0)

state_data <- data.frame(state = c("AK", "CA", "Utah"), values = c(6, 9, 3))
df <- map_with_data(state_data, na = 0)
```

---

plot_usmap	<i>Conveniently plot basic US map</i>
------------	---------------------------------------

---

### Description

Conveniently plot basic US map

### Usage

```
plot_usmap(regions = c("states", "state", "counties", "county"),
  include = c(), data = data.frame(), values = "values",
  theme = theme_map(), lines = "black", labels = FALSE,
  label_color = "black")
```

### Arguments

regions	The region breakdown for the map, can be one of ("states", "state", "counties", "county"). The default is "states".
include	The regions to include in the output data frame. If regions is "states"/"state", the value can be either a state name, abbreviation or FIPS code. For counties, the FIPS must be provided as there can be multiple counties with the same name. If states are provided in the county map, only counties in the included states will be returned.
data	A data frame containing values to plot on the map. This parameter should be a data frame consisting of two columns, a fips code (2 characters for state, 5 characters for county) and the value that should be associated with that region. The columns of data <i>must</i> be fips or state and the value of the 'values' parameter.
values	The name of the column that contains the values to be associated with a given region. The default is "value".
theme	The theme that should be used for plotting the map. The default is <a href="#">theme_map</a> .
lines	The line color to be used in the map. Corresponds to the colour option in the <a href="#">aes</a> mapping. The default is "black". <a href="#">Click here</a> for more color options.
labels	Whether or not to display labels on the map. Labels are not displayed by default. For now, labels only work for state maps. County labels may be added in the future.
label_color	The color of the labels to display. Corresponds to the colour option in the <a href="#">aes</a> mapping. The default is "black". <a href="#">Click here</a> for more color options.

### Value

A [ggplot](#) object that contains a basic US map with the described parameters. Since the result is a ggplot object, it can be extended with more geom layers, scales, labels, themes, etc.

### See Also

[usmap](#), [theme](#)

## Examples

```
plot_usmap()
plot_usmap(regions = "states")
plot_usmap(regions = "counties")
plot_usmap(regions = "state")
plot_usmap(regions = "county")

# Output is ggplot object so it can be extended
# with any number of ggplot layers
library(ggplot2)
plot_usmap(include = c("CA", "NV", "ID", "OR", "WA")) +
  labs(title = "Western States")

# Color maps with data
plot_usmap(data = statepop, values = "pop_2015")

# Include labels on map (e.g. state abbreviations)
plot_usmap(data = statepop, values = "pop_2015", labels = TRUE)
# Choose color for labels
plot_usmap(data = statepop, values = "pop_2015", labels = TRUE, label_color = "white")
```

---

statepop

*Population estimates (2015), state level*

---

## Description

US census population estimates by state for 2015.

The data is formatted for easy merging with output from [us\\_map](#).

## Usage

```
data(statepop)
```

## Format

A data frame with 51 rows and 4 variables.

## Details

- `fips` The 2-digit FIPS code corresponding to the state.
- `abbr` The 2-letter state abbreviation.
- `full` The full state name.
- `pop_2015` The 2015 population estimate (in number of people) for the corresponding state.

## References

- <http://www.census.gov/programs-surveys/popest.html>
- <https://www.ers.usda.gov/data-products/county-level-data-sets/>

---

statepov

*Poverty percentage estimates (2014), state level*

---

## Description

US census poverty percentage estimates by state for 2014.

The data is formatted for easy merging with output from [us\\_map](#).

## Usage

```
data(statepov)
```

## Format

A data frame with 51 rows and 4 variables.

## Details

- `fips` The 2-digit FIPS code corresponding to the state.
- `abbr` The 2-letter state abbreviation.
- `full` The full state name.
- `pct_pov_2014` The 2014 poverty estimate (in percent of state population) for the corresponding state

## References

- <https://www.census.gov/topics/income-poverty/poverty.html>
- <https://www.ers.usda.gov/data-products/county-level-data-sets/>



---

usmap

*usmap: US maps including Alaska and Hawaii*

---

## Description

It is usually difficult or inconvenient to create US maps that include both Alaska and Hawaii in a convenient spot. All map data frames produced by this package use the Albers's Equal Area projection.

## Map data frames

Alaska and Hawaii have been manually moved to a new location so that their new coordinates place them to the bottom-left corner of the map. These maps can be accessed by using the `usmap` function.

The function provides the ability to retrieve maps with either state borders or county borders using the `regions` parameter for convenience.

States (or counties) can be included such that all other states (or counties) are excluded using the `include` parameter.

## FIPS lookup tools

Several functions have been included to lookup the US state or county pertaining to a FIPS code.

Likewise a reverse lookup can be done where a FIPS code can be used to retrieve the associated state(s) or county(ies). This can be useful when preparing data to be merged with the map data frame.

## Plot US map data

A convenience function `plot_usmap` has been included which takes similar parameters to `us_map` and returns a **ggplot2** object. Since the output is a ggplot object, other layers can be added such as scales, themes, and labels. Including data in the function call will color the map according to the values in the data, creating a choropleth.

## Author(s)

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- Twitter: <http://twitter.com/dilorenzopl>
- Github: <http://www.github.com/pdil/>

## References

Rudis, Bob. "Moving The Earth (well, Alaska & Hawaii) With R." Blog post. Rud.is., 16 Nov. 2014. Web. 10 Aug. 2015. <<https://rud.is/b/2014/11/16/moving-the-earth-well-alaska-hawaii-with-r/>>.

**See Also**

Helpful links:

- FIPS code information  
[http://en.wikipedia.org/wiki/FIPS\\_county\\_code](http://en.wikipedia.org/wiki/FIPS_county_code) [http://en.wikipedia.org/wiki/FIPS\\_state\\_code](http://en.wikipedia.org/wiki/FIPS_state_code)
- US Census Shapefiles  
<https://www.census.gov/geo/maps-data/data/tiger-cart-boundary.html>
- Map Features  
[https://en.wikipedia.org/wiki/Map\\_projection](https://en.wikipedia.org/wiki/Map_projection) [https://en.wikipedia.org/wiki/Albers\\_projection](https://en.wikipedia.org/wiki/Albers_projection) <https://en.wikipedia.org/wiki/Choropleth>

---

us\_map

*Retrieve US map data*

---

**Description**

Retrieve US map data

**Usage**

```
us_map(regions = c("states", "state", "counties", "county"),
       include = c())
```

**Arguments**

regions	The region breakdown for the map, can be one of ("states", "state", "counties", "county"). The default is "states".
include	The regions to include in the output data frame. If regions is "states"/"state", the value can be either a state name, abbreviation or FIPS code. For counties, the FIPS must be provided as there can be multiple counties with the same name. If states are provided in the county map, only counties in the included states will be returned.

**Value**

A data frame of US map coordinates divided by the desired regions.

**Examples**

```
str(us_map())

df <- us_map(regions = "counties")
west_coast <- us_map(include = c("CA", "OR", "WA"))
```

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