Package ‘mapcan’

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Type Package

Title Tools for Plotting Canadian Choropleth Maps and Choropleth Alternatives

Version 0.0.1

Maintainer Andrew McCormack <mccormack.andy@gmail.com>

Description A variety of functions that make it easy to plot standard choropleth maps as well as choropleth alternatives in ‘ggplot2’.

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Encoding UTF-8

LazyData true

Depends R (>= 2.10)

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Imports dplyr, ggplot2, magrittr

Suggests knitr

VignetteBuilder knitr

NeedsCompilation no

Author Andrew McCormack [aut, cre],
Aaron Erlich [aut]

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census_divisions_2016

A data frame with 91430 rows and 13 variables:

- long Longitude
- lat Latitude
- order Order of layers
- hole Polygon hole (TRUE or FALSE)
- piece Piece
- id Uniquely identifies a census division (composed of the 2-digit province/territory unique identifier followed by the 2-digit census division code).
- group Group
- census_division_name Census division name
- census_division_type Census division type
- pr_alpha Province or territory 2-letter identifier
- pr_sgc_code Province Standard Geographical Classification (SGC) code.
- pr_english Province name (English)
- pr_french Province name (French)
census_divisions_2016_carto

Source


census_divisions_2016_carto

Census divisions cartogram data frame (territories included) (2016)

Description

A data set with geographic information for Canadian census divisions, census boundary divisions distorted by population size, territories included

Usage

census_divisions_2016_carto

Format

A data.frame with 57513 rows and 18 variables:

- **long** Longitude
- **lat** Latitude
- **order** Order of layers
- **hole** Polygon hole (TRUE or FALSE)
- **piece** Piece
- **census_code** Uniquely identifies a census division (composed of the 2-digit province/territory unique identifier followed by the 2-digit census division code).
- **group** Group
- **census_division_name** Census division name
- **census_division_type** Census division type
- **pr_sgc_code** Province Standard Geographical Classification (SGC) code.
- **population_2016** Population of census division in 2016
- **population_density_2016** Population density (individuals per square kilometer) in 2016
- **land_area_2016** Land area of census division
- **population_2011** Population of census division in 2011
- **pr_alpha** Province or territory 2-letter identifier
- **pr_english** Province name (English)
- **pr_french** Province name (French)

Source

Description

A data set with geographic information for Canadian census divisions, census boundary divisions distorted by population size, territories excluded

Usage

census_divisions_2016_noterr_carto

Format

A data.frame with 35410 rows and 18 variables:

- **long** Longitude
- **lat** Latitude
- **order** Order of layers
- **hole** Polygon hole (TRUE or FALSE)
- **piece** Piece
- **census_code** Uniquely identifies a census division (composed of the 2-digit province/territory unique identifier followed by the 2-digit census division code).
- **group** Group
- **census_division_name** Census division name
- **census_division_type** Census division type
- **pr_sgc_code** Province Standard Geographical Classification (SGC) code.
- **population_2016** Population of census division in 2016
- **population_2016_density** Population density (individuals per square kilometer) in 2016
- **land_area_2016** Land area of census division
- **population_2011** Population of census division in 2011
- **pr_alpha** Province or territory 2-letter identifier
- **pr_english** Province name (English)
- **pr_french** Province name (French)

Source

Description

A data set with population data at the census level for 2011 and 2016

Usage

census_pop2016

Format

A data.frame with 293 rows and 11 variables:

- **census_division_code**  Uniquely identifies a census division (composed of the 2-digit province/territory unique identifier followed by the 2-digit census division code).
- **census_division_name**  Census division name
- **census_divison_type**  Census division type
- **pr_sgc_code**  Province Standard Geographical Classification (SGC) code.
- **pr_english**  Province or territory name (English).
- **population_2016**  2016 Population of Province
- **population_density_2016**  Population density (individuals per square kilometer) in 2016
- **land_area_2016**  Land area of census division
- **population_2011**  2011 Population of Province
- **pr_alpha**  Province or territory 2-letter identifier
- **pr_french**  Province or territory name (French).

Source

federal_election_results

Canadian federal election results data

Description

A data set with information on Canadian federal election results, dating back to 1997

Usage

federal_election_results

Format

A data.frame with 37111 rows and 12 variables:

- **riding_name_english**: Federal electoral district name in English.
- **riding_name_french**: Federal electoral district name in French.
- **riding_code**: Uniquely identifies a federal electoral district (composed of the 2-digit province/territory unique identifier followed by the 3-digit federal electoral district code).
- **pr**: Province or territory name (English and French).
- **population**: Population of federal riding.
- **voter_turnout**: Voter turnout
- **candidate**: Name of winning candidate
- **party**: Winning party in riding
- **pr_alpha**: Province or territory 2-letter identifier
- **pr_french**: Province or territory name (French).
- **pr_english**: Province or territory name (English).
- **pr_sgc_code**: Province Standard Geographical Classification (SGC) code.

Source

**Description**

A data set with geographic information for Canadian federal ridings (2013 representation order)

**Usage**

federal_ridings

**Format**

A data.frame with 46830 rows and 15 variables:

- **long** Longitude
- **lat** Latitude
- **order** Order of layers
- **hole** Polygon hole (TRUE or FALSE)
- **piece** Piece
- **riding_code** Uniquely identifies a federal electoral district (composed of the 2-digit province/territory unique identifier followed by the 3-digit federal electoral district code).
- **group** Group
- **riding_name_english** Federal electoral district name in English.
- **riding_name_french** Federal electoral district name in French.
- **province_sgc_code** Province Standard Geographical Classification (SGC) code
- **pr_english** Province name (English)
- **pr_french** Province name (French)
- **pr_alpha** Province or territory 2-letter identifier

**Source**

federal_riding_bins  Canadian federal riding bins (used for tile plots)

Description
A data set with coordinates for the mapcan::riding_binplot() function.

Usage
federal_riding_bins

Format
A data.frame with 944 rows and 8 variables:

y  y-axis of riding bins (corresponds to longitude)
x  x-axis of riding bins (corresponds to latitude)
pr_alpha  Province or territory 2-letter identifier
representation_order  Representation order. Specifies boundaries/number of seats for a given election (e.g. the 2015 election used the 2013 representation order, with 338 seats).
pr_french  Province or territory name (French).
pr_english  Province or territory name (English).
pr_sgc_code  Province Standard Geographical Classification (SGC) code.
riding_code  Uniquely identifies a federal electoral district (composed of the 2-digit province/territory unique identifier followed by the 3-digit federal electoral district code).

federal_riding_hexagons
Canadian federal riding hexagons (used for hexagonal tile plots)

Description
A data set with coordinates for the mapcan::riding_binplot() function.

Usage
federal_riding_hexagons
mapcan

Format

A data.frame with 6629 rows and 15 variables:

- **long**: y-axis of riding hexagons
- **lat**: x-axis of riding hexagons
- **order**: Order of layers
- **hole**: Polygon hole (TRUE or FALSE)
- **piece**: Piece
- **group**: Group
- **representation_order**: Representation order. Specifies boundaries/seats for a given election (e.g. the 2015 election used the 2013 representation order, with 338 seats).
- **pr_french**: Province or territory name (French).
- **pr_english**: Province or territory name (English).
- **pr_sgc_code**: Province Standard Geographical Classification (SGC) code.
- **riding_code**: Uniquely identifies a federal electoral district (composed of the 2-digit province/territory unique identifier followed by the 3-digit federal electoral district code).

Description

A function that returns a data frame with map data, for use in ggplot.

Usage

```r
mapcan(boundaries, type, province = all, territories = TRUE)
```

Arguments

- **boundaries**: Unquoted expression specifying boundary divisions. Options are province, census, and ridings.
- **type**: Unquoted expression specifying type of map. Options are standard (for a standard geographic map), cartogram (for a map that alters the geography of the map based on population size at the province or census division level), and bins (for a binned map of federal electoral districts).
- **province**: An unquoted expression specifying province to plot. Acceptable input is French or English province names, or two-letter provincial abbreviations. Default is to plot all provinces.
- **territories**: A logical value indicating whether or not to include territories in the the returned data frame, default is FALSE

Examples

```r
mapcan(boundaries = census, type = standard)
```
Description

A data set with geographic information for Canadian provinces and territories, boundary divisions distorted by population size. Territories excluded.

Usage

`provinces_noterr_carto`

Format

A data.frame with 16797 rows and 11 variables:

- `long` Longitude
- `lat` Latitude
- `order` Order of layers
- `hole` Polygon hole (TRUE or FALSE)
- `piece` Piece
- `pr_english` Province or territory name (English).
- `group` Group
- `population` 2016 Population of Province
- `pr_alpha` Province or territory 2-letter identifier
- `pr_french` Province or territory name (French).
- `province_sgc_code` Province Standard Geographical Classification (SGC) code

Source

**provinces_territories**  
*Provinces and territories standard geographic data*

**Description**
A data set with geographic information for Canadian provinces and territories

**Usage**
provinces_territories

**Format**
A data.frame with 37111 rows and 10 variables:
- **long** Longitude
- **lat** Latitude
- **order** Order of layers
- **hole** Polygon hole (TRUE or FALSE)
- **piece** Piece
- **province_sgc_code** Province Standard Geographical Classification (SGC) code
- **group** Group
- **pr_english** Province or territory name (English).
- **pr_french** Province or territory name (French).
- **pr_alpha** Province or territory 2-letter identifier

**Source**

---

**provinces_territories_carto**  
*Provinces and territories cartogram data (territories included)*

**Description**
A data set with geographic information for Canadian provinces and territories, boundary divisions distorted by population size. Territories included.

**Usage**
provinces_territories_carto
province_pop_annual

Format

A data.frame with 40064 rows and 12 variables:

long Longitude
lat Latitude
order Order of layers
hole Polygon hole (TRUE or FALSE)
piece Piece
pr_english Province or territory name (English).
group Group
population 2016 Population of Province
pr_alpha Province or territory 2-letter identifier
pr_french Province or territory name (French).
province_sgc_code Province Standard Geographical Classification (SGC) code

Source


province_pop_annual Annual provincial populations data frame dating back to 1971

Description

A data set with annual information on provincial and territorial populations dating back to 1971.

Usage

province_pop_annual

Format

A data.frame with 638 rows and 3 variables:

province English name of province
population Population of province
year Year
queue provincial results

Description
A data set with information on 2018 Quebec provincial election results

Usage
queue_provincial_results

Format
A data.frame with 125 rows and 6 variables:

- **party** Winning party of riding.
- **vote_share** Percentage of vote won by winning candidate.
- **riding_code** Uniquely identifies a provincial electoral district
- **riding_name** Riding name (lowercase)
- **riding_name** Riding name (uppercase)

queue_prov_ridings2018

Description
A data set with geographic information for Quebec provincial ridings

Usage
queue_prov_ridings2018

Format
A data.frame with 23995 rows and 11 variables:

- **long** y-axis of riding hexagons
- **lat** x-axis of riding hexagons
- **order** Order of layers
- **hole** Polygon hole (TRUE or FALSE)
- **piece** Piece
**quebec_riding_hexagons**

- **riding_code**: Uniquely identifies a provincial electoral district
- **group**: Group
- **riding_name**: Riding name (lowercase)
- **riding_name**: Riding name (uppercase)
- **centroid_long**: Longitude for riding centroids (useful for labeling)
- **centroid_lat**: Latitude for riding centroids (useful for labeling)

---

**quebec_riding_bins**  
*Quebec provincial riding bins (used for tile plots)*

**Description**

A data set with coordinates for the `mapcan::riding_binplot()` function.

**Usage**

`quebec_riding_bins`

**Format**

A data frame with 125 rows and 6 variables:

- `y`: y-axis of riding bins (corresponds to longitude)
- `x`: x-axis of riding bins (corresponds to latitude)
- `riding_code`: Riding code
- `region`: Region
- `riding_simplified`: Simplified riding name
- `riding_name`: Riding name

---

**quebec_riding_hexagons**  
*Quebec provincial riding hexagons (used for hexagonal tile plots)*

**Description**

A data set with coordinates for the `mapcan::riding_binplot()` function.

**Usage**

`quebec_riding_hexagons`
riding_binplot

Format

A data.frame with 6629 rows and 15 variables:

- **long**: y-axis of riding hexagons
- **lat**: x-axis of riding hexagons
- **order**: Order of layers
- **hole**: Polygon hole (TRUE or FALSE)
- **piece**: Piece
- **group**: Group
- **y**: y-axis of riding hexagon center
- **x**: x-axis of riding hexagon center
- **region**: Region
- **riding_simplified**: Simplified riding name
- **riding_name**: Riding name
- **riding_code**: Riding code

Description

A function that returns a data frame with map data, for use in ggplot.

Usage

```r
riding_binplot(riding_data, riding_col = riding_code, value_col, continuous = TRUE, arrange = FALSE, riding_border_col = "white", year = 2015, riding_border_size = 1, provincial = FALSE, shape = "square", province, legend_name = "default")
```

Arguments

- **riding_data**: A dataframe with a continuous or categorical riding-level characteristic and a riding code variable.
- **riding_col**: An unquoted character expression specifying the riding code variable from the dataframe provided in riding_data.
- **value_col**: An unquoted character expression specifying the column or categorical riding level characteristic you would like to visualize.
- **continuous**: logical. Specify as FALSE if the variable is categorical (e.g. for winning party) and TRUE if the variable is continuous.
**arrange**

Logical. Specify as TRUE if variable should be ranked according to value within provinces and FALSE to plot values according to riding coordinates. Because the binned ridings are only a rough approximation of their actual location, arrange = TRUE is often preferable.

**riding_border_col**

To ensure the appearance of stand alone tiles, set ‘riding_border_col’ to be the same as the background colour of the plot. Default is “white”.

**year**

Election year. Options are 1997, 2000, 2004, 2006, 2008, 2011 and 2015. This will change the number of tiles to correspond to the number of ridings in the election of the specified year. Default is 2015

**riding_border_size**

Change the size of tiles. Larger values make smaller tiles. Default is 1.

**provincial**

Logical. Specify as FALSE for provincial (not federal) ridings of a single province. If provincial = TRUE, specify a 2-letter provincial abbreviation for the province in the province argument. Default is FALSE (i.e. the default is to provide federal electoral boundaries). (Note: this argument is still in development, only Quebec provincial boundaries are available at the moment.)

**shape**

Unquoted character expression specifying shape of tiles. Options are square and hexagon, default is square.

**province**

An unquoted character expression specifying the 2-letter provincial abbreviation of the province for which provincial electoral boundaries are desired. (Note: this argument is still in development, only Quebec provincial boundaries are available at the moment.)

**legend_name**

Quoted character expression specifying the title of the legend. The variable name will be used as a default if no value is supplied.

**Examples**

```r
election_2015 <- federal_election_results[federal_election_results$election_year == 2015, ]

riding_binplot(riding_data = election_2015, riding_col = riding_code, value_col = party, continuous = FALSE, arrange = TRUE)
```

---

**riding_info**

*Canadian federal riding population information*

**Description**

A data set with information on Canadian federal election results, dating back to 1997

**Usage**

`riding_info`
Format

A data.frame with 37111 rows and 12 variables:

- **party**: Winning party in riding
- **riding_code**: Riding code
- **population_2011**: Population of riding in 2011
- **population_2016**: Population of riding in 2016

Source


**theme_mapcan**

*Mapcan theme*

Description

A ggplot theme that removes unnecessary components of map plots. Builds on theme_bw().

Usage

```
theme_mapcan(legend_position = "bottom", base_size = 12,
             base_family = "")
```

Arguments

- **legend_position**
  - Position of legend, default is "bottom"
- **base_size**
  - Base font size (default is 12)
- **base_family**
  - Base font family
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