Package ‘mapcan’

October 13, 2022

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’.
License MIT + file LICENSE
Encoding UTF-8
LazyData true
Depends R (>= 2.10)
RoxygenNote 6.1.1
Imports dplyr, ggplot2, magrittr
Suggests knitr
VignetteBuilder knitr
NeedsCompilation no
Author Andrew McCormack [aut, cre],
Aaron Erlich [aut]
Repository CRAN
Date/Publication 2019-05-09 14:30:03 UTC

R topics documented:
census_divisions_2016 ...................................................... 2
census_divisions_2016_carto .............................................. 3
census_divisions_2016_noterr_carto .................................... 4
census_pop2016 ............................................................. 5
federal_election_results .................................................. 6
federal_ridings ............................................................. 7
federal_riding_bins ....................................................... 8
### census_divisions_2016

<table>
<thead>
<tr>
<th>Description</th>
<th>A data set with geographic information for Canadian census divisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usage</td>
<td><code>census_divisions_2016</code></td>
</tr>
<tr>
<td>Format</td>
<td>A data.frame with 91430 rows and 13 variables:</td>
</tr>
<tr>
<td></td>
<td><code>long</code> Longitude</td>
</tr>
<tr>
<td></td>
<td><code>lat</code> Latitude</td>
</tr>
<tr>
<td></td>
<td><code>order</code> Order of layers</td>
</tr>
<tr>
<td></td>
<td><code>hole</code> Polygon hole (TRUE or FALSE)</td>
</tr>
<tr>
<td></td>
<td><code>piece</code> Piece</td>
</tr>
<tr>
<td></td>
<td><code>id</code> Uniquely identifies a census division (composed of the 2-digit province/territory unique identifier followed by the 2-digit census division code).</td>
</tr>
<tr>
<td></td>
<td><code>group</code> Group</td>
</tr>
<tr>
<td></td>
<td><code>census_division_name</code> Census division name</td>
</tr>
<tr>
<td></td>
<td><code>census_division_type</code> Census division type</td>
</tr>
<tr>
<td></td>
<td><code>pr_alpha</code> Province or territory 2-letter identifier</td>
</tr>
<tr>
<td></td>
<td><code>pr_sgc_code</code> Province Standard Geographical Classification (SGC) code.</td>
</tr>
<tr>
<td></td>
<td><code>pr_english</code> Province name (English)</td>
</tr>
<tr>
<td></td>
<td><code>pr_french</code> Province name (French)</td>
</tr>
</tbody>
</table>

---

**Index**

<table>
<thead>
<tr>
<th>Index</th>
<th>18</th>
</tr>
</thead>
</table>

---

**Description**

A data set with geographic information for Canadian census divisions

**Usage**

`census_divisions_2016`

**Format**

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

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

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 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**

federal_ridings

Federal ridings

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
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).

---

mapcan  

*Canadian maps function*

Description

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

Usage

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

mapcan(boundaries = census, type = standard)
provinces_noterr_carto

Provinces and territories cartogram data (territories excluded)

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
**Quebec provincial results**

*Quebec provincial election results data*

**Description**

A data set with information on 2018 Quebec provincial election results

**Usage**

quebec_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)

**Quebec provincial ridings2018**

*Quebec provincial ridings geographic data*

**Description**

A data set with geographic information for Quebec provincial ridings

**Usage**

quebec_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

---

riding_binplot  
*Canadian federal ridings tile plot function*

---

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

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)
theme_mapcan

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
Index

* datasets
  census_divisions_2016, 2
  census_divisions_2016_carto, 3
  census_divisions_2016_noterr_carto, 4
  census_pop2016, 5
  federal_election_results, 6
  federal_riding_bins, 8
  federal_riding_hexagons, 8
  federal_ridings, 7
  province_pop_annual, 12
  provinces_noterr_carto, 10
  provinces_territories, 11
  provinces_territories_carto, 11
  quebec_prov_ridings2018, 13
  quebec_provincial_results, 13
  quebec_riding_bins, 14
  quebec_riding_hexagons, 14
  riding_info, 16

  census_divisions_2016, 2
  census_divisions_2016_carto, 3
  census_divisions_2016_noterr_carto, 4
  census_pop2016, 5

  federal_election_results, 6
  federal_riding_bins, 8
  federal_riding_hexagons, 8
  federal_ridings, 7

  mapcan, 9

  province_pop_annual, 12
  provinces_noterr_carto, 10
  provinces_territories, 11
  provinces_territories_carto, 11

  quebec_prov_ridings2018, 13
  quebec_provincial_results, 13
  quebec_riding_bins, 14
  quebec_riding_hexagons, 14

  riding_binplot, 15
  riding_info, 16
  theme_mapcan, 17