

Package ‘PL94171’

August 6, 2021

Type Package

Title Tabulate P.L. 94-171 Redistricting Data Summary Files

Version 0.3.2

Maintainer Cory McCartan <cmccartan@g.harvard.edu>

Description Tools to process legacy format summary redistricting data files produced by the United States Census Bureau pursuant to P.L. 94-171. These files are generally available earlier but are difficult to work with as-is.

Depends R (>= 4.0.0)

Imports stringr, readr, dplyr (>= 1.0.0), tigris, sf, withr, httr

Suggests testthat (>= 3.0.0), lifecycle, knitr, rmarkdown, ggplot2

License MIT + file LICENSE

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

URL <https://corymccartan.github.io/PL94171/>,
<https://github.com/CoryMcCartan/PL94171/>

BugReports <https://github.com/CoryMcCartan/PL94171/issues>

Config/testthat/edition 3

VignetteBuilder knitr

NeedsCompilation no

Author Cory McCartan [aut, cre],
Christopher T. Kenny [aut]

Repository CRAN

Date/Publication 2021-08-06 19:20:02 UTC

R topics documented:

pl_crosswalk	2
pl_ex	3
pl_geog_levels	3
pl_get_baf	4
pl_get_prototype	4
pl_get_vtd	6
pl_read	6
pl_really	7
pl_select_standard	8
pl_subset	9
pl_tidy_shp	10
pl_url	10

Index	12
--------------	-----------

pl_crosswalk	<i>Download Block Crosswalk Files</i>
--------------	---------------------------------------

Description

Downloads crosswalks from <https://www.census.gov/geographies/reference-files/time-series/geo/relationship-files.html>. Adjusts land overlap area to ensure weights sum to 1.

Usage

```
pl_crosswalk(abbr, from_year = 2010L, to_year = from_year + 10L)
```

Arguments

abbr	the state to download the crosswalk for.
from_year	the year with the blocks that the data is currently tabulated with respect to.
to_year	the year with the blocks that the data should be tabulated into.

Value

A tibble, with two sets of GEOIDs and overlap information.

Examples

```
# Takes a bit of time to run
pl_crosswalk("RI", 2010, 2020)
```

pl_ex

PL Example File

Description

This data contains a subset of the 2020 prototype PL data

Usage

```
data("pl_ex")
```

Format

list of tibbles containing the four PL files.

00001 Tables P1 and P2

00002 Tables P3, P4, and H1

00003 Table P5

geo geographic header file

Examples

```
data(pl_ex)
```

pl_geog_levels

List of Summary Levels and Official Descriptions

Description

This dataset is tibble version of the descriptions of (potentially) available summary levels within the P.L. 94-171 data, as described in the 2018 Redistricting Data Prototype (Public Law 94-171) Summary File documentation.

Usage

```
pl_geog_levels
```

Format

a tibble with two columns:

SUMLEV The three character summary level code

SUMLEV_description The summary level description

 pl_get_baf

Download 2020 Block Assignment Files for a State

Description

[Experimental] From the Census: "The Block Assignment Files (BAFs) are among the geographic products that the Census Bureau provides to states and other data users containing the small area census data necessary for legislative redistricting. The BAFs contain Census tabulation block codes and geographic area codes for a specific geographic entity type."

Usage

```
pl_get_baf(abbr, geographies = NULL, cache_to = NULL, refresh = FALSE)
```

Arguments

abbr	the state abbreviation to get the BAF for
geographies	the geographies to get. Defaults to all available.
cache_to	the file name, if any, to cache the results to (as an RDS). If a file exists and refresh=FALSE, will read BAF from this file.
refresh	if TRUE, force a re-download of the BAF data.

Value

A list of [tibbles](#), one for each available BAF geography.

Examples

```
pl_get_baf("RI")
pl_get_baf("RI", "VTD")
```

 pl_get_prototype

Download TIGER Prototype shapefiles

Description

[Experimental] These prototype shapefiles correspond to the Rhode Island end-to-end Census test and the accompanying prototype P.L. 94-171 data. This function is unlikely to be useful for working with any actual decennial Census data. The corresponding `tigris` functions should be used instead.

Usage

```
pl_get_prototype(  
  geog,  
  year = 2020,  
  full_state = TRUE,  
  cache_to = NULL,  
  clean_names = TRUE,  
  refresh = FALSE  
)
```

Arguments

geog	Geography to download data for. See details for full list.
year	year, either 2010 or 2020
full_state	whether to return the full state (TRUE) or the single county subset (FALSE)
cache_to	the file name, if any, to cache the results to (as an RDS). If a file exists and refresh=FALSE, will read from this file.
clean_names	whether to clean and rename columns
refresh	if TRUE, force a re-download of the data.

Details

Current acceptable arguments to geog include:

- block: block
- block_group: block group
- tract: tract
- county: county
- state: state
- sld_low: state legislative district lower house
- sld_up: state legislative district upper house
- congressional_district: federal congressional district
- place: Census place
- voting_district: voting tabulation district

Value

An sf object containing the blocks.

Examples

```
shp <- pl_get_prototype("block")
```

pl_get_vtd

Download 2020 Voting District Shapefiles

Description

[Experimental] A (likely temporary) function to download TIGER shapefiles for 2020 voting tabulation districts (VTDs).

Usage

```
pl_get_vtd(abbr, cache_to = NULL, refresh = FALSE)
```

Arguments

abbr	Geography to download data for. See details for full list.
cache_to	the file name, if any, to cache the results to (as an RDS). If a file exists and refresh=FALSE, will read from this file.
refresh	if TRUE, force a re-download of the data.

Value

An sf object containing the VTDs.

Examples

```
shp <- pl_get_vtd("RI")
```

pl_read

Read a set of PL Files

Description

PL files come in one of four types and are pipe-delimited with no header row. This function speedily reads in the files and assigns the appropriate column names and types.

Usage

```
pl_read(path, ...)
```

```
read_pl(path, ...)
```

Arguments

path a path to a folder containing PL files. Can also be path or a URL for a ZIP file, which will be downloaded and unzipped.

... passed on to `readr::read_delim()`

Value

A list of data frames containing the four PL files.

Examples

```
pl_ex_path <- system.file('extdata/ri2018_2020Style.pl', package = 'PL94171')
pl <- pl_read(pl_ex_path)
# or try `pl_read(pl_url("RI", 2010))`
```

pl_really *Approximately re-tally Census data under new block boundaries*

Description

Applies a block crosswalk to a table of block data using areal interpolation. That is, the fraction of land area in the overlapping region between old and new blocks is used to divide the population of the old blocks into the new.

Usage

```
pl_really(d_from, crosswalk)
```

Arguments

d_from The data frame to process. All numeric columns will be re-tallied. Integer columns will be re-tallied with rounding. Character columns will be preserved if constant across new block geometries.

crosswalk The crosswalk data frame, from `pl_crosswalk()`

Details

All numeric columns will be re-tallied. Integer columns will be re-tallied with rounding. Character columns will be preserved if constant across new block geometries.

Blocks from other states will be ignored.

Value

A new data frame, like `d_from`, except with the geometry column dropped, if one exists. New geometry should be loaded, perhaps with `tigris::blocks()`.

Examples

```
crosswalk = pl_crosswalk("RI", 2010, 2020)
RI_2010 = pl_tidy_shp("RI", pl_url("RI", 2010), 2010)
pl_retally(RI_2010, crosswalk)
```

pl_select_standard *Select the Standard Redistricting Columns*

Description

Selects the standard set of basic population groups and VAP groups. Optionally renames them from the PXXXXYYYY naming convention (where XXX is the table and YYYY is the variable) to more human readable names. pop_* is the total population, from tables 1 and 2, while vap_* is the 18+ population (voting age population).

Usage

```
pl_select_standard(pl, clean_names = TRUE)
```

Arguments

pl A list of PL tables, as read in by [pl_read\(\)](#)
clean_names whether to clean names

Details

If clean_names=TRUE, then the variables extracted are as follows:

- *_hispanic: Hispanic or Latino (of any race)
- *_white: White alone, not Hispanic or Latino
- *_black: Black or African American alone, not Hispanic or Latino
- *_aian: American Indian and Alaska Native alone, not Hispanic or Latino
- *_asian: Asian alone, not Hispanic or Latino
- *_nhpi: Native Hawaiian and Other Pacific Islander alone, not Hispanic or Latino
- *_other: Some Other Race alone, not Hispanic or Latino
- *_two: Population of two or more races, not Hispanic or Latino

where * is pop or vap.

Value

A [tibble](#) with the selected and optionally renamed columns

Examples

```
pl_ex_path <- system.file('extdata/ri2018_2020Style.pl', package = 'PL94171')
pl <- pl_read(pl_ex_path)
pl <- pl_select_standard(pl)
```

pl_subset

Subset to a Summary Level

Description

This subsets a pl table to a desired summary level. Typical choices include:

- '750': block
- '150': block group
- '630': voting district
- '050': county

Usage

```
pl_subset(pl, sumlev = "750")
```

Arguments

pl	A list of PL tables, as read in by pl_read()
sumlev	the summary level to filter to. A 3 character SUMLEV code. Default is '750' for blocks.

Details

All summary levels are listed in [pl_geog_levels](#).

Value

tibble

Examples

```
pl_ex_path <- system.file('extdata/ri2018_2020Style.pl', package = 'PL94171')
pl <- pl_read(pl_ex_path)
pl <- pl_subset(pl)
```

 pl_tidy_shp

All-in-one Shapefile Function

Description

Downloads block geography and merges with the cleaned PL 94-171 file.

Usage

```
pl_tidy_shp(abbr, path, year = 2020, type = c("blocks", "vtds"), ...)
```

Arguments

abbr	The state to make the shapefile for
path	The path to the PL files, as in <code>pl_read()</code>
year	The year to download the block geography for. Should match the year of the PL files.
type	If "blocks", make a Census block shapefile; if "vtds" make a VTD shapefile.
...	passed on to <code>dplyr::filter()</code> ; use to subset to a certain county, for example.

Value

an sf object with demographic and shapefile information for the state.

Examples

```
pl_ex_path <- system.file("extdata/ri2018_2020Style.pl", package = "PL94171")
pl_tidy_shp("RI", pl_ex_path)
```

 pl_url

Get the URL for PL files for a particular state and year

Description

Get the URL for PL files for a particular state and year

Usage

```
pl_url(abbr, year = 2010)
```

Arguments

abbr	The state to download the PL files for
year	The year of PL file to download. Supported years: 2000, 2010, 2020 (after release). 2000 files are in a different format. Earlier years available on tape or CD-ROM only.

Value

a character vector containing the URL to a ZIP containing the PL files.

Examples

```
pl_url("RI", 2010)
```

Index

* advanced

- pl_crosswalk, 2
- pl_get_baf, 4
- pl_get_prototype, 4
- pl_retally, 7

* basic

- pl_get_vtd, 6
- pl_read, 6
- pl_select_standard, 8
- pl_subset, 9
- pl_tidy_shp, 10
- pl_url, 10

* datasets

- pl_geog_levels, 3

* data

- pl_ex, 3
- pl_geog_levels, 3

dplyr::filter(), 10

- pl_crosswalk, 2
- pl_crosswalk(), 7
- pl_ex, 3
- pl_geog_levels, 3, 9
- pl_get_baf, 4
- pl_get_prototype, 4
- pl_get_vtd, 6
- pl_read, 6
- pl_read(), 8–10
- pl_retally, 7
- pl_select_standard, 8
- pl_subset, 9
- pl_tidy_shp, 10
- pl_url, 10

- read_pl (pl_read), 6
- readr::read_delim(), 7

- tibble, 4, 8
- tigris::blocks(), 7