Package 'populR'

August 9, 2022

Type Package

Title Population Downscaling

Version 0.1.6

Author Marios Batsaris

Maintainer Marios Batsaris <m.batsaris@aegean.gr>

Description Downscaling of population data obtained
by census surveys using areal interpolation. Given a
set of source zone polygons such as
census tracts or city blocks alongside with population counts and a
target zone of incogruent yet superimposed polygon features (such as
individual buildings) populR transforms population counts from the
former to the latter using Areal Weighting and Volume Weighting
Interpolation methods.

License GPL-3

URL https://github.com/mbatsaris/populR/

BugReports https://github.com/mbatsaris/populR/issues/

Encoding UTF-8

LazyData true

Imports sf, rlang, Metrics, usethis, areal, microbenchmark

Depends R (>= 3.3.0)

RoxygenNote 7.1.2

Suggests rmarkdown, knitr, testthat (>= 3.0.0)

Config/testthat/edition 3

VignetteBuilder knitr

NeedsCompilation no

Repository CRAN

Date/Publication 2022-08-09 21:50:02 UTC

R topics documented:

`pp_compare` *Comparison to Other Data*

Description

Comparison to Other Data

Usage

```
pp_compare(x, estimated, actual, title)
```

Arguments

`x`	An object of class `sf` including estimated and actual values
`estimated`	Population estimates using pp_estimate function
`actual`	Actual population values
`title`	Scatterplot title `string`

Value

A list including rmse, mae, linear model details and correlation coefficient

Examples

```
# read lib data
data('src')
data('trg')

# areal weighting interpolation - awi
awi <- pp_estimate(trg, src, sid = sid, spop = pop,
    method = awi)

# volume weighting interpolation - vwi
vwi <- pp_estimate(trg, src, sid = sid, spop = pop,
    method = vwi, volume = floors)

# awi - rmse
pp_compare(awi, estimated = pp_est, actual = rf,
    title ='awi')
```

```
# vwi - rmse
pp_compare(vwi, estimated = pp_est, actual = rf,
    title ='vwi')
```

---

pp_estimate *Areal Interpolation of Population Data*

Description

Areal Interpolation of Population Data

Usage

```
pp_estimate(target, source, sid, spop, volume = NULL, point = FALSE, method)
```

Arguments

target	An object of class sf that is used to interpolate data to. Usually, target may include polygon features representing building units
source	An object of class sf including data to be interpolated. Source may be a set of coarse polygon features such as city blocks or census tracts
sid	Source identification number
spop	Source population values to be interpolated
volume	Target feature volume information (height or number of floors). Required when method=vwi
point	Whether to return point geometries (FALSE by default)
method	Two methods provided: awi (areal weighting interpolation) and vwi (volume weighting interpolation). awi proportionately interpolates the population values based on areal weights calculated by the area of intersection between the source and target zones. vwi proportionately interpolates the population values based on areal weights calculated by the area of intersection between the source and target zones multipled by the volume information (height or number of floors).

Value

An object of class sf including estimated population counts for target features using either awi or vwi methods. The estimated population counts are stored in a new column called pp_est.

Examples

```
# read lib data
data('src')
data('trg')

# areal weighted interpolation - awi
pp_estimate(trg, src, sid = sid, spop = pop,
    method = awi)

# areal weighted interpolation - awi using point geometries
pp_estimate(trg, src, sid = sid, spop = pop,
    method = awi, point = TRUE)

# volume weighted interpolation - vwi
pp_estimate(trg, src, sid = sid, spop = pop,
    method = vwi, volume = floors)

# volume weighted interpolation - vwi using point geometries
pp_estimate(trg, src, sid = sid, spop = pop,
    method = vwi, volume = floors, point = TRUE)
```

---

pp_round *Rounding Function*

Description

Rounding Function

Usage

```
pp_round(x, tpop, spop, sid)
```

Arguments

x	An object of class sf obtained by the pp_estimate function
tpop	Target population estimates obtained by the pp_estimate function
spop	Initial source population values (included after the implementation of the pp_estimate function)
sid	Source identification number

Value

An object of class sf including rounded population counts stored in a new column called pp_int

Examples

```
# read lib data
data('src')
data('trg')

# areal weighted interpolation - awi
awi <- pp_estimate(trg, src, sid = sid, spop = pop,
    method = awi)

# volume weighted interpolation - vwi
vwi <- pp_estimate(trg, src, sid = sid, spop = pop,
    method = vwi, volume = floors)

# awi - round
pp_round(awi, tpop = pp_est, spop = pop, sid = sid)

# vwi - round
pp_round(vwi, tpop = pp_est, spop = pop, sid = sid)
```

`src` *Source (src)*

Description

object of `sf` class representing the blocks of a fictional area

Usage

```
src
```

Format

object of `sf` class with 9 rows and 3 columns:

`sid` Source identification number

`pop` Source population values to be interpolated

`geometry` Geometry

Source

http://www.mbatsaris.gr/

trg *Target (trg)*

Description

An object of sf class representing the buildings of a subset area of the city of Mytilini, Greece. The data set contains 179 building units along with the number of floors and residential use in binary format where 0 for non-residential floors and 1 for residential floors.

Usage

```
trg
```

Format

object of sf class with 179 rows and 12 columns:

tid Target identification number

floors Number of floors

rf Reference population estimates

geometry Geometry

Source

http://mbatsaris.gr/

Index