

# Package ‘cartogram’

July 22, 2025

**Title** Create Cartograms with R

**Version** 0.3.0

**Description** Construct continuous and non-contiguous area cartograms.

**URL** <https://github.com/sjewo/cartogram>

**BugReports** <https://github.com/sjewo/cartogram/issues>

**Imports** methods, sf, packcircles

**License** GPL-3

**Encoding** UTF-8

**RoxygenNote** 7.2.3

**NeedsCompilation** no

**Author** Sebastian Jeworutzki [aut, cre] (ORCID:

<<https://orcid.org/0000-0002-2671-5253>>),

Timothee Giraud [ctb],

Nicolas Lambert [ctb],

Roger Bivand [cph],

Edzer Pebesma [cph],

Jakub Nowosad [ctb] (ORCID: <<https://orcid.org/0000-0002-1057-3721>>)

**Maintainer** Sebastian Jeworutzki <sebastian.jeworutzki@ruhr-uni-bochum.de>

**Repository** CRAN

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## Contents

|                             |   |
|-----------------------------|---|
| cartogram_cont . . . . .    | 2 |
| cartogram_dorling . . . . . | 3 |
| cartogram_ncont . . . . .   | 5 |

|              |          |
|--------------|----------|
| <b>Index</b> | <b>7</b> |
|--------------|----------|

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|----------------|--------------------------------------------------|
| cartogram_cont | <i>Calculate Contiguous Cartogram Boundaries</i> |
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## Description

Construct a continuous area cartogram by a rubber sheet distortion algorithm (Dougenik et al. 1985)

## Usage

```
cartogram_cont(
  x,
  weight,
  itermax = 15,
  maxSizeError = 1.0001,
  prepare = "adjust",
  threshold = 0.05,
  verbose = FALSE
)

## S3 method for class 'SpatialPolygonsDataFrame'
cartogram_cont(
  x,
  weight,
  itermax = 15,
  maxSizeError = 1.0001,
  prepare = "adjust",
  threshold = 0.05,
  verbose = FALSE
)

## S3 method for class 'sf'
cartogram_cont(
  x,
  weight,
  itermax = 15,
  maxSizeError = 1.0001,
  prepare = "adjust",
  threshold = 0.05,
  verbose = FALSE
)
```

## Arguments

|         |                                                                                      |
|---------|--------------------------------------------------------------------------------------|
| x       | a polygon or multipolygon sf object                                                  |
| weight  | Name of the weighting variable in x                                                  |
| itermax | Maximum iterations for the cartogram transformation, if maxSizeError ist not reached |

|              |                                                                                                                                                                                                                                                                                                                          |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| maxSizeError | Stop if meanSizeError is smaller than maxSizeError                                                                                                                                                                                                                                                                       |
| prepare      | Weighting values are adjusted to reach convergence much earlier. Possible methods are "adjust", adjust values to restrict the mass vector to the quantiles defined by threshold and 1-threshold (default), "remove", remove features with values lower than quantile at threshold, "none", don't adjust weighting values |
| threshold    | Define threshold for data preparation                                                                                                                                                                                                                                                                                    |
| verbose      | print meanSizeError on each iteration                                                                                                                                                                                                                                                                                    |

### Value

An object of the same class as x

### References

Dougenik, J. A., Chrisman, N. R., & Niemeyer, D. R. (1985). An Algorithm To Construct Continuous Area Cartograms. In *The Professional Geographer*, 37(1), 75-81.

### Examples

```
library(sf)
library(cartogram)

nc = st_read(system.file("shape/nc.shp", package="sf"), quiet = TRUE)

# transform to NAD83 / UTM zone 16N
nc_utm <- st_transform(nc, 26916)

# Create cartogram
nc_utm_carto <- cartogram_cont(nc_utm, weight = "BIR74", itermax = 5)

# Plot
par(mfrow=c(2,1))
plot(nc[, "BIR74"], main="original", key.pos = NULL, reset = FALSE)
plot(nc_utm_carto[, "BIR74"], main="distorted", key.pos = NULL, reset = FALSE)
```

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|                   |                                                    |
|-------------------|----------------------------------------------------|
| cartogram_dorling | <i>Calculate Non-Overlapping Circles Cartogram</i> |
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### Description

Construct a cartogram which represents each geographic region as non-overlapping circles (Dorling 1996).

**Usage**

```

cartogram_dorling(x, weight, k = 5, m_weight = 1, itermax = 1000)

## S3 method for class 'sf'
cartogram_dorling(x, weight, k = 5, m_weight = 1, itermax = 1000)

## S3 method for class 'SpatialPolygonsDataFrame'
cartogram_dorling(x, weight, k = 5, m_weight = 1, itermax = 1000)

```

**Arguments**

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>x</code>        | a polygon or multipolygon sf object                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>weight</code>   | Name of the weighting variable in <code>x</code>                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <code>k</code>        | Share of the bounding box of <code>x</code> filled by the larger circle                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>m_weight</code> | Circles' movements weights. An optional vector of numeric weights (0 to 1 inclusive) to apply to the distance each circle moves during pair-repulsion. A weight of 0 prevents any movement. A weight of 1 gives the default movement distance. A single value can be supplied for uniform weights. A vector with length less than the number of circles will be silently extended by repeating the final value. Any values outside the range [0, 1] will be clamped to 0 or 1. |
| <code>itermax</code>  | Maximum iterations for the cartogram transformation.                                                                                                                                                                                                                                                                                                                                                                                                                           |

**Value**

Non overlapping proportional circles of the same class as `x`.

**References**

Dorling, D. (1996). Area Cartograms: Their Use and Creation. In Concepts and Techniques in Modern Geography (CATMOG), 59.

**Examples**

```

library(sf)
library(cartogram)

nc = st_read(system.file("shape/nc.shp", package="sf"), quiet = TRUE)

# transform to NAD83 / UTM zone 16N
nc_utm <- st_transform(nc, 26916)

# Create cartogram
nc_utm_carto <- cartogram_dorling(nc_utm, weight = "BIR74")

# Plot
par(mfrow=c(2,1))
plot(nc[, "BIR74"], main="original", key.pos = NULL, reset = FALSE)
plot(nc_utm_carto[, "BIR74"], main="distorted", key.pos = NULL, reset = FALSE)

```

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|                 |                                                      |
|-----------------|------------------------------------------------------|
| cartogram_ncont | <i>Calculate Non-Contiguous Cartogram Boundaries</i> |
|-----------------|------------------------------------------------------|

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**Description**

Construct a non-contiguous area cartogram (Olson 1976).

**Usage**

```
cartogram_ncont(x, weight, k = 1, inplace = TRUE)

## S3 method for class 'SpatialPolygonsDataFrame'
cartogram_ncont(x, weight, k = 1, inplace = TRUE)

## S3 method for class 'sf'
cartogram_ncont(x, weight, k = 1, inplace = TRUE)
```

**Arguments**

|         |                                                                                                                         |
|---------|-------------------------------------------------------------------------------------------------------------------------|
| x       | a polygon or multipolygon sf object                                                                                     |
| weight  | Name of the weighting variable in x                                                                                     |
| k       | Factor expansion for the unit with the greater value                                                                    |
| inplace | If TRUE, each polygon is modified in its original place, if FALSE multi-polygons are centered on their initial centroid |

**Value**

An object of the same class as x with resized polygon boundaries

**References**

Olson, J. M. (1976). Noncontiguous Area Cartograms. In *The Professional Geographer*, 28(4), 371-380.

**Examples**

```
library(sf)
library(cartogram)

nc = st_read(system.file("shape/nc.shp", package="sf"), quiet = TRUE)

# transform to NAD83 / UTM zone 16N
nc_utm <- st_transform(nc, 26916)

# Create cartogram
nc_utm_carto <- cartogram_ncont(nc_utm, weight = "BIR74")

# Plot
```

```
par(mfrow=c(2,1))  
plot(nc,"BIR74", main="original", key.pos = NULL, reset = FALSE)  
plot(st_geometry(nc_utm), main="distorted", reset = FALSE)  
plot(nc_utm_carto,"BIR74", add =TRUE)
```

# Index

cartogram\_cont, [2](#)  
cartogram\_dorling, [3](#)  
cartogram\_ncont, [5](#)