Package 'geobr'

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Type Package

Title Download Official Spatial Data Sets of Brazil

Version 2.1.0

URL https://ipea.github.io/geobr/, https://github.com/ipea/geobr

BugReports https://github.com/ipea/geobr/issues

Description Easy access to official spatial data sets of Brazil. The package offers a wide range of spatial data sets available at various geographic scales and for various years with harmonized attributes, projection and fixed topology. All functions allow for seamless integration sf, DuckDB and Arrow.

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Encoding UTF-8

LazyData TRUE

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`cep_to_state` *Determine the state of a given CEP postal code*

Description

Zips codes in Brazil are known as CEP, the abbreviation for postal code address. CEPs in Brazil are 8 digits long, with the format `'xxxxx-xxx'`.

Usage

```
cep_to_state(cep)
```

Arguments

`cep`	A character string with 8 digits in the format `"xxxxxxxx"`, or with the format `'xxxxx-xxx'`.

Value

A character string with a state abbreviation.

Examples

```
uf <- cep_to_state(cep = '69900-000')

# Or:
uf <- cep_to_state(cep = '69900000')
```

grid_state_correspondence_table

A correspondence table indicating what quadrants of IBGE's statistical grid intersect with each Brazilian state

Description

Built-in dataset

- `name_state`: Title-case name of state (character)
- `abbrev_state`: Two-letter uppercase abbreviation of a state
- `code_grid`: Unique code of each quadrant of IBGE's statistical grid

Usage

```
data(grid_state_correspondence_table)
```

Format

A data frame sf with 139 rows and 3 columns

Details

correspondence table indicating what quadrants of IBGE's statistical grid intersect with each Brazilian state

Note

Last updated 2021-o3-21

list_geobr

List all data sets available in the geobr package

Description

Returns a data frame with all data sets available in the geobr package

Usage

```
list_geobr(wide = TRUE)
```

Arguments

`wide`	Whether the the output data frame should come in wide (`TRUE`) or long format (`FALSE`).

Value

A data.frame

Examples

```
df <- list_geobr()
```

---

lookup_muni *Look up municipality codes and names*

Description

Input a municipality **name** *or* **code** and get the names and codes of the municipality.

Usage

```
lookup_muni(year, name_muni = NULL, code_muni = NULL)
```

Arguments

year	Numeric. Year of the data in YYYY format.
name_muni	The municipality name to be looked up.
code_muni	The municipality code to be looked up.

Details

Only available from 2010 Census data so far

Value

A data.frame with 13 columns identifying the geographies information of that municipality.

A data.frame

Examples

```
# Look for municipality Rio de Janeiro
mun <- lookup_muni(
  name_muni = "Rio de Janeiro",
  year = 2022
  )

# Look for a given municipality code
mun <- lookup_muni(
  code_muni = 3304557,
  year = 2022
  )
```

```
# Get the lookup table for all municipalities
mun_all <- lookup_muni(
  name_muni = "all",
  year = 2022
  )

# Or:
mun_all <- lookup_muni(
  code_muni = "all",
  year = 2022
  )
```

`read_addresses` *Download geolocated data of addresses in Brazil*

Description

This function reads the data of the National Registry of Addresses for Statistical Purposes (Cadastro Nacional de Enderecos para Fins Estatisticos, CNEFE), organized by the Brazilian Institute of Geography and Statistics (IBGE). The data brings the geographical coordinates (lat lon) of every address surveyed in the Population Census, along with the census tract and municipality each address belongs to, its postal code (CEP), the type of building (`cod_especie`) and the precision level of its coordinates (`nv_geo_coord`). More information available at https://www.ibge.gov.br/estatisticas/sociais/populacao/38734-cadastro-nacional-de-enderecos-para-fins-estatisticos.html.

Note this is a very large data set: the 2022 CNEFE covers roughly 111 million addresses in a single 1.2 GB file. The file is downloaded in full and only then filtered by `code_muni`, so the first call in an R session takes a long time even when a single municipality is requested. Subsequent calls reuse the cached file. Passing `output = "duckdb"` avoids loading the result into memory.

Usage

```
read_addresses(
  year,
  code_muni,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

`year`	Numeric. Year of the data in `YYYY` format.

code_muni	The 7-digit code of a municipality. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. `33` or `"RJ"`), all data of that state are downloaded. Passing `code_muni = "all"` downloads the addresses of the whole country. Municipality codes can be consulted with the `geobr::lookup_muni()` function. Unlike in most `geobr` functions, this argument is **required and has no default**: reading the addresses of the whole country may exhaust memory, so the choice is left explicitly to the user.
output	String. Type of object returned by the function. Defaults to `"sf"`, which loads the data into memory as an sf object. Alternatively, `"duckdb"` returns a lazy spatial table backed by DuckDB via the duckspatial package, and `"arrow"` returns an Arrow dataset. Both `"duckdb"` and `"arrow"` support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to `TRUE` display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to `cache = TRUE`. By default, `geobr` stores data files in a temporary directory that exists only within each R session. If `cache = FALSE`, the function will download the data again and overwrite the local file.
verbose	A logical. If `TRUE` (the default), the function prints informative messages and shows download progress bar. If `FALSE`, the function is silent.

Value

An `"sf"` `"data.frame"` OR an `ArrowObject`

Examples

```
# Read all addresses in a given municipality
add <- read_addresses(
  year = 2022,
  code_muni = 3304557
  )

# Read all addresses in a given state, without loading them into memory
add_rj <- read_addresses(
  year = 2022,
  code_muni = "RJ",
  output = "duckdb"
  )
```

`read_amazon` *Download spatial data of Brazil's Legal Amazon*

Description

This data set covers the whole of Brazil's Legal Amazon as defined in the federal law n. 12.651/2012). The original data comes from the Brazilian Ministry of Environment (MMA) and can be found at "http://mapas.mma.gov.br/i3geo/datadownload.htm".

Usage

```
read_amazon(
  year,
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read Brazilian Legal Amazon
a <- read_amazon(year = 2024)
```

read_biomes *Download spatial data of Brazilian biomes*

Description

This data set includes polygons of all biomes present in the Brazilian territory and coastal area. Data comes from IBGE. More information at https://www.ibge.gov.br/geociencias/cartas-e-mapas/informacoes-ambientais/15842-biomas.html

Usage

```
read_biomes(
  year,
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read biomes
b <- read_biomes(year = 2025)
```

`read_capitals` *Download data of state capitals*

Description

This function downloads either a spatial `sf` object with the location of the municipal seats (sede dos municipios) of state capitals, or a `data.frame` with the names and codes of state capitals. Data downloaded for year 2010.

Usage

```
read_capitals(output = "sf", showProgress = TRUE, cache = TRUE, verbose = TRUE)
```

Arguments

`output`	String. Type of object returned by the function. Defaults to `"sf"`, which loads the data into memory as an sf object. Alternatively, `"duckdb"` returns a lazy spatial table backed by DuckDB via the duckspatial package, and `"arrow"` returns an Arrow dataset. Both `"duckdb"` and `"arrow"` support out-of-memory processing of large data sets.
`showProgress`	Logical. Defaults to `TRUE` display progress bar.
`cache`	Logical. Whether the function should read the data cached locally, which is faster. Defaults to `cache = TRUE`. By default, `geobr` stores data files in a temporary directory that exists only within each R session. If `cache = FALSE`, the function will download the data again and overwrite the local file.
`verbose`	A logical. If `TRUE` (the default), the function prints informative messages and shows download progress bar. If `FALSE`, the function is silent.

Value

An `"sf"` `"data.frame"` OR an `ArrowObject`

Examples

```
# Read spatial data with the  municipal seats of state capitals
capitals_sf <- read_capitals(output = "sf")
```

read_census_tract *Download spatial data of census tracts*

Description

Data of census tracts (setores censitários) of the Brazilian Population Census

Usage

```
read_census_tract(
  year,
  code_tract,
  zone = "urban",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_tract	The 7-digit code of a municipality. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. 33 or "RJ"), all census tracts of that state are downloaded. Passing code_tract = "all" downloads all census tracts of the country. Municipality codes can be consulted with the geobr::lookup_muni() function. Unlike in most geobr functions, this argument is **required and has no default**: loading all census tracts of the country takes a long time and may exhaust memory, so the choice is left explicitly to the user.
zone	For census tracts before 2010, 'urban' and 'rural' census tracts are separate data sets.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.

cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read all census tracts of a state at a given year
c <- read_census_tract(year = 2022, code_tract = "DF")

# Read all census tracts of a municipality at a given year
c <- read_census_tract(year = 2022, code_tract = 5201108)

# Read all census tracts of the country at a given year
c <- read_census_tract(year = 2022, code_tract = "all")

# Read rural census tracts for years before 2007
c <- read_census_tract(
  year = 2000,
  code_tract = 5201108,
  zone = "rural"
  )
```

---

read_comparable_areas *Download spatial data of historically comparable municipalities*

Description

This function downloads the shape file of minimum comparable area of municipalities, known in Portuguese as 'Areas minimas comparaveis (AMCs)'. The data is available for any combination of census years between 1872-2010. These data sets are generated based on the Stata code originally developed by Ehrl (2017) doi:10.1590/0101416147182phe, and translated into R by the geobr team.

Usage

```
read_comparable_areas(
  start_year = 1970,
  end_year = 2010,
  simplified = TRUE,
  showProgress = TRUE,
```

```
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

start_year	Numeric. Start year to the period in the YYYY format. Defaults TO 1970.
end_year	Numeric. End year to the period in the YYYY format. Defaults to 2010.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Details

These data sets are generated based on the original Stata code developed by Philipp Ehrl. If you use these data, please cite:

- Ehrl, P. (2017). Minimum comparable areas for the period 1872-2010: an aggregation of Brazilian municipalities. Estudos Econômicos (São Paulo), 47(1), 215-229. https://doi.org/10.1590/0101-416147182phe

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
amc <- read_comparable_areas(start_year=1970, end_year=2010)
```

---

read_conservation_units

Download spatial data of Brazilian environmental conservation units

---

Description

This data set covers the whole of Brazil and it includes the polygons of all conservation units present in Brazilian territory. The original data and data dictionary can be found comes from MMA and can be found at "https://dados.mma.gov.br/dataset/unidadesdeconservacao".

Usage

```
read_conservation_units(
  date,
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

date	Numeric. Date of the data in YYYYMM format.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read conservation_units
uc <- read_conservation_units(date = 202503)
```

read_country *Download spatial data of Brazil's national borders*

Description

National borders

Usage

```
read_country(
  year,
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read specific year
br_1872 <- read_country(year = 1872)

br_2025 <- read_country(year = 2025)
```

`read_disaster_risk_area`

Download spatial data of disaster risk areas

Description

This function reads the the official data of disaster risk areas in Brazil (currently only available for 2010). It specifically focuses on geodynamic and hydro-meteorological disasters capable of triggering landslides and floods. The data set covers the whole country. Each risk area polygon (known as 'BATER') has unique code id (column 'geo_bater'). The data set brings information on the extent to which the risk area polygons overlap with census tracts and block faces (column "acuracia") and number of ris areas within each risk area (column 'num'). Original data were generated by IBGE and CEMADEN. For more information about the methodology, see deails at https://www.ibge.gov.br/geociencias/organizacao-do-territorio/tipologias-do-territorio/21538-populacao-em-areas-de-r html

Usage

```
read_disaster_risk_area(
  year,
  code_muni = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

`year`	Numeric. Year of the data in `YYYY` format.
`code_muni`	The 7-digit code of a municipality. If `code_muni = "all"` (Default), the function downloads all the data available in the country. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. `33` or `"RJ"`), all data of that state are downloaded. Municipality codes can be consulted with the `geobr::lookup_muni()` function.
`simplified`	Logic `FALSE` or `TRUE`, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to `TRUE`. For spatial analysis and statistics users should set `simplified = FALSE`. Borders have been simplified by removing vertices of borders using `st_simplify{sf}` preserving topology with a `dTolerance` of 100.

output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read all disaster risk areas in an specific year
d <- read_disaster_risk_area(year = 2010)

# Read disaster risk areas in a given municipality
d <- read_disaster_risk_area(year = 2010, code_muni = 2927408)

# Read disaster risk areas in a given state
d <- read_disaster_risk_area(year = 2010, code_muni = "AC")
```

---

read_favela *Download spatial data of favelas and urban communities*

Description

This function reads the official data on favelas and urban communities (favelas e comunidades urbanas) of Brazil. Original data from the Institute of Geography and Statistics (IBGE) For more information about the methodology, see details at https://biblioteca.ibge.gov.br/visualizacao/livros/liv102134.pdf

Usage

```
read_favela(
  year,
  code_muni = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
```

```
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_muni	The 7-digit code of a municipality. If code_muni = "all" (Default), the function downloads all the data available in the country. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. 33 or "RJ"), all data of that state are downloaded. Municipality codes can be consulted with the geobr::lookup_muni() function.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read all favelas of Brazil
n <- read_favela(year = 2022)

# Read all favelas of a given municipality
n <- read_favela(year = 2022, code_muni = 2927408)

# Read all favelas of a given state
n <- read_favela(year = 2022, code_muni = "RJ")
```

`read_health_facilities` *Download geolocated data of health facilities*

Description

Data comes from the National Registry of Health Facilities (Cadastro Nacional de Estabelecimentos de Saude - CNES), originally collected by the Brazilian Ministry of Health. The spatial coordinates used in geobr are a combination of the coordinates produced by the original data producer and the coordinates found via geocoding with the geocodebr package https://CRAN.R-project.org/package=geocodebr. Whenever the distance between the coordinates from both sources is smaller than 800 meters, geobr uses coordinates from the data producer. When the distance between the two sources is greater than 800 meters and the results from geocodebr have a precision level finer than 800 meters, geobr uses the coordinates from geocodebr. When the coordinates from the original source are missing, geobr also uses geocodebr coordinates, regardless of precision level. The source of the spatial coordinates used in each observation is registered in the data in a specific column `coords_source`. Additional columns indicating the precision level of geocodebr geocoding are also included in the data.

Usage

```
read_health_facilities(
  date,
  code_muni = "all",
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

`date`	Numeric. Date of the data in `YYYYMM` format.
`code_muni`	The 7-digit code of a municipality. If `code_muni = "all"` (Default), the function downloads all the data available in the country. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. `33` or `"RJ"`), all data of that state are downloaded. Municipality codes can be consulted with the `geobr::lookup_muni()` function.
`output`	String. Type of object returned by the function. Defaults to `"sf"`, which loads the data into memory as an sf object. Alternatively, `"duckdb"` returns a lazy spatial table backed by DuckDB via the duckspatial package, and `"arrow"` returns an Arrow dataset. Both `"duckdb"` and `"arrow"` support out-of-memory processing of large data sets.
`showProgress`	Logical. Defaults to `TRUE` display progress bar.

cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read health facilities of a given state
h <- read_health_facilities(
  date = 202601,
  code_muni = "PA"
  )

# Read all health facilities of the whole country
h <- read_health_facilities(date = 202601)
```

---

read_health_region *Download spatial data of Brazilian health regions and health macro regions*

Description

Health regions are used to guide the the regional and state planning of health services. Macro health regions, in particular, are used to guide the planning of high complexity #' health services. These services involve larger economics of scale and are concentrated in few municipalities because they are generally more technology intensive, costly and face shortages of specialized professionals. A macro region comprises one or more health regions.

Usage

```
read_health_region(
  year,
  code_state = "all",
  geometry_level = "municipality",
  macro = NULL,
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_state	The two-digit code of a state or a two-letter uppercase abbreviation (e.g. 33 or "RJ"). If code_state="all" (the default), the function downloads all states.
geometry_level	String. Spatial level of the output geometries. Use "municipality" to return municipal geometries (default), "micro" to aggregate geometries by health region, or "macro" to aggregate geometries by health macroregion.
macro	The argument macro has been deprecated.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read municipalities with info on health regions
health_muni <- read_health_region(year = 2024)

# Read the geometries of micro regions
health_micro <- read_health_region(
  year = 2024,
  geometry_level = "micro"
  )

# Read the geometries of macro regions
health_macro <- read_health_region(
  year = 2024,
  geometry_level = "macro"
)
```

`read_immediate_region` *Download spatial data of Brazil's Immediate Geographic Areas*

Description

The Immediate Geographic Areas are part of the geographic division of Brazil created after 2017 by IBGE. These regions were created to replace the "Micro Regions" division. Data at scale 1:250,000.

Usage

```
read_immediate_region(
  year,
  code_immediate = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

`year`	Numeric. Year of the data in `YYYY` format.
`code_immediate`	6-digit code of an immediate region. If the two-digit code or a two-letter uppercase abbreviation of a state is passed, (e.g. 33 or "RJ") the function will load all immediate regions of that state. If `code_immediate="all"` (Default), the function downloads all immediate regions of the country.
`simplified`	Logic `FALSE` or `TRUE`, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to `TRUE`. For spatial analysis and statistics users should set `simplified = FALSE`. Borders have been simplified by removing vertices of borders using `st_simplify{sf}` preserving topology with a `dTolerance` of 100.
`output`	String. Type of object returned by the function. Defaults to `"sf"`, which loads the data into memory as an sf object. Alternatively, `"duckdb"` returns a lazy spatial table backed by DuckDB via the duckspatial package, and `"arrow"` returns an Arrow dataset. Both `"duckdb"` and `"arrow"` support out-of-memory processing of large data sets.
`showProgress`	Logical. Defaults to `TRUE` display progress bar.
`cache`	Logical. Whether the function should read the data cached locally, which is faster. Defaults to `cache = TRUE`. By default, `geobr` stores data files in a temporary directory that exists only within each R session. If `cache = FALSE`, the function will download the data again and overwrite the local file.
`verbose`	A logical. If `TRUE` (the default), the function prints informative messages and shows download progress bar. If `FALSE`, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read an specific immediate region
im <- read_immediate_region(code_immediate = 110006, year = 2024)

# Read immediate regions of a state
im <- read_immediate_region(code_immediate = "AM", year = 2024)
im <- read_immediate_region(code_immediate = 12, year = 2024)

# Read all immediate regions of the country
im <- read_immediate_region(code_immediate = "all", year = 2024)
```

---

read_indigenous_land *Download spatial data of indigenous lands in Brazil*

Description

The data set covers the whole of Brazil and it includes indigenous lands from all ethnic groups and at different stages of demarcation. The original data comes from the National Indian Foundation (FUNAI) and can be found at https://www.gov.br/funai/pt-br/atuacao/terras-indigenas/geoprocessamento-e-mapas. Although original data is updated monthly, the geobr package will only keep the data for a few months per year.

Usage

```
read_indigenous_land(
  year,
  code_state = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_state	The two-digit code of a state or a two-letter uppercase abbreviation (e.g. 33 or "RJ"). If code_state="all" (the default), the function downloads all states.

simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read all indigenous land in an specific year
i <- read_indigenous_land(year = 2025)
```

`read_intermediate_region`

Download spatial data of Brazil's Intermediate Geographic Areas

---

Description

The intermediate Geographic Areas are part of the geographic division of Brazil created after 2017 by IBGE. These regions were created to replace the "Meso Regions" division. Data at scale 1:250,000.

Usage

```
read_intermediate_region(
  year,
  code_intermediate = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
```

```
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_intermediate	4-digit code of an intermediate region. If the two-digit code or a two-letter uppercase abbreviation of a state is passed, (e.g. 33 or "RJ") the function will load all intermediate regions of that state. If code_intermediate="all" (Default), the function downloads all intermediate regions of the country.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read an specific intermediate region
inter <- read_intermediate_region(code_intermediate = 1202, year = 2024)

# Read intermediate regions of a state
inter <- read_intermediate_region(code_intermediate = "AM", year = 2024)
inter <- read_intermediate_region(code_intermediate = 12, year = 2024)

# Read all intermediate regions of the country
inter <- read_intermediate_region(code_intermediate = "all", year = 2024)
```

`read_meso_region` *Download spatial data of meso regions*

Description

Data at scale 1:250,000, using Geodetic reference system "SIRGAS2000" and CRS(4674)

Usage

```
read_meso_region(
  year,
  code_meso = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

`year`	Numeric. Year of the data in `YYYY` format.
`code_meso`	The 4-digit code of a meso region. If the two-digit code or a two-letter uppercase abbreviation of a state is passed, (e.g. 33 or "RJ") the function will load all meso regions of that state. If `code_meso="all"` (Default), the function downloads all meso regions of the country.
`simplified`	Logic `FALSE` or `TRUE`, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to `TRUE`. For spatial analysis and statistics users should set `simplified = FALSE`. Borders have been simplified by removing vertices of borders using `st_simplify{sf}` preserving topology with a `dTolerance` of 100.
`output`	String. Type of object returned by the function. Defaults to `"sf"`, which loads the data into memory as an sf object. Alternatively, `"duckdb"` returns a lazy spatial table backed by DuckDB via the duckspatial package, and `"arrow"` returns an Arrow dataset. Both `"duckdb"` and `"arrow"` support out-of-memory processing of large data sets.
`showProgress`	Logical. Defaults to `TRUE` display progress bar.
`cache`	Logical. Whether the function should read the data cached locally, which is faster. Defaults to `cache = TRUE`. By default, `geobr` stores data files in a temporary directory that exists only within each R session. If `cache = FALSE`, the function will download the data again and overwrite the local file.
`verbose`	A logical. If `TRUE` (the default), the function prints informative messages and shows download progress bar. If `FALSE`, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read specific meso region at a given year
meso <- read_meso_region(code_meso=3301, year = 2018)

# Read all meso regions of a state at a given year
meso <- read_meso_region(code_meso="AM", year = 2018)
meso <- read_meso_region(code_meso=12, year = 2018)

# Read all meso regions of the country at a given year
meso <- read_meso_region(code_meso="all", year = 2018)
```

---

read_metro_area *Download spatial data of official metropolitan areas in Brazil*

Description

The function returns the shapes of municipalities grouped by their respective metro areas. Metropolitan areas are created by each state in Brazil. The data set includes the municipalities that belong to all metropolitan areas in the country according to state legislation in each year. Original data were generated by the Brazilian Institute of Geography and Statistics (IBGE). Data at scale 1:250,000, using Geodetic reference system "SIRGAS2000" and CRS(4674).

Usage

```
read_metro_area(
  year,
  code_state = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_state	The two-digit code of a state or a two-letter uppercase abbreviation (e.g. 33 or "RJ"). If code_state="all" (the default), the function downloads all states.

simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read all official metropolitan areas for a given year
m <- read_metro_area(year = 1970)

m <- read_metro_area(
  year = 2024,
  code_state = "RJ"
  )
```

---

read_micro_region *Download spatial data of micro regions*

Description

Data at scale 1:250,000, using Geodetic reference system "SIRGAS2000" and CRS(4674)

Usage

```
read_micro_region(
  year,
  code_micro = "all",
  simplified = TRUE,
  output = "sf",
```

```
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_micro	5-digit code of a micro region. If the two-digit code or a two-letter uppercase abbreviation of a state is passed, (e.g. 33 or "RJ") the function will load all micro regions of that state. If code_micro="all" (Default), the function downloads all micro regions of the country.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read an specific micro region a given year
micro <- read_micro_region(code_micro=11008, year=2018)

# Read micro regions of a state at a given year
micro <- read_micro_region(code_micro="AM", year=2018)
micro <- read_micro_region(code_micro=12, year=2018)

# Read all micro regions at a given year
 micro <- read_micro_region(code_micro="all", year=2018)
```

`read_municipality` *Download spatial data of Brazilian municipalities*

Description

Brazilian municipalities

Usage

```
read_municipality(
  year,
  code_muni = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE,
  keep_areas_operacionais = FALSE
)
```

Arguments

`year`	Numeric. Year of the data in `YYYY` format.
`code_muni`	The 7-digit code of a municipality. If `code_muni = "all"` (Default), the function downloads all the data available in the country. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. `33` or `"RJ"`), all data of that state are downloaded. Municipality codes can be consulted with the `geobr::lookup_muni()` function.
`simplified`	Logic `FALSE` or `TRUE`, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to `TRUE`. For spatial analysis and statistics users should set `simplified = FALSE`. Borders have been simplified by removing vertices of borders using `st_simplify{sf}` preserving topology with a `dTolerance` of 100.
`output`	String. Type of object returned by the function. Defaults to `"sf"`, which loads the data into memory as an sf object. Alternatively, `"duckdb"` returns a lazy spatial table backed by DuckDB via the duckspatial package, and `"arrow"` returns an Arrow dataset. Both `"duckdb"` and `"arrow"` support out-of-memory processing of large data sets.
`showProgress`	Logical. Defaults to `TRUE` display progress bar.
`cache`	Logical. Whether the function should read the data cached locally, which is faster. Defaults to `cache = TRUE`. By default, `geobr` stores data files in a temporary directory that exists only within each R session. If `cache = FALSE`, the function will download the data again and overwrite the local file.
`verbose`	A logical. If `TRUE` (the default), the function prints informative messages and shows download progress bar. If `FALSE`, the function is silent.

keep_areas_operacionais
: Logic. Whether the function should keep the polygons of Lagoas dos Patos and Lagoa Mirim in the State of Rio Grande do Sul (considered as areas estaduais operacionais). Defaults to FALSE.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read specific municipality at a given year
mun <- read_municipality(code_muni = 1200179, year = 2017)

# Read all municipalities of a state at a given year
mun <- read_municipality(code_muni = 33, year = 2010)
mun <- read_municipality(code_muni = "RJ", year = 2010)

# Read all municipalities of the country at a given year
mun <- read_municipality(code_muni = "all", year = 2018)
```

---

read_municipal_seat *Download spatial data of municipal seats (sede dos municipios) of Brazil*

Description

This function reads the official data on the municipal seats (sede dos municipios) of Brazil. The data brings the geographical coordinates (lat lon) of municipal seats for various years since 1872. Original data by the Brazilian Institute of Geography and Statistics (IBGE).

Usage

```
read_municipal_seat(
  year,
  code_muni = "all",
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year
: Numeric. Year of the data in YYYY format.

code_muni	The 7-digit code of a municipality. If code_muni = "all" (Default), the function downloads all the data available in the country. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. 33 or "RJ"), all data of that state are downloaded. Municipality codes can be consulted with the geobr::lookup_muni() function.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read municipal seats in an specific year
m <- read_municipal_seat(year = 2022)
```

---

read_neighborhood *Download spatial data of neighborhood limits of Brazilian municipalities*

Description

This data set includes the neighborhood limits of Brazilian municipalities. The data is only available for those municipalities where neighborhood information was collected in the population census. The data set is based on aggregations of the census tracts from the Brazilian census.

Usage

```
read_neighborhood(
  year,
  code_muni = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_muni	The 7-digit code of a municipality. If code_muni = "all" (Default), the function downloads all the data available in the country. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. 33 or "RJ"), all data of that state are downloaded. Municipality codes can be consulted with the geobr::lookup_muni() function.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read neighborhoods of Brazilian municipalities
n <- read_neighborhood(year = 2022)

# Read neighborhoods of two municipalities, Recife and Porto Alegre in this example
r <- read_neighborhood(
  year = 2022,
  code_muni = c(2611606, 4314902)
  )
```

`read_polling_places` *Download geolocated data of polling places*

Description

Data comes from the Superior Electoral Court (TSE). The spatial coordinates used in geobr are a combination of the coordinates created by the original data producer and the coordinates found via geocoding with the geocodebr package https://CRAN.R-project.org/package=geocodebr. Whenever the distance between the coordinates from both sources is smaller than 800 meters, geobr uses coordinates from the data producer. When the distance between the two sources is greater than 800 meters and the results from geocodebr have a precision level finer than 800 meters, geobr uses the coordinates from geocodebr. The original data producer (TSE) assigned coordinates of `c(-1, -1)` to a all polling places located outside of Brazil. When the coordinates from the original source are missing, geobr also uses geocodebr coordinates, regardless of precision level. The source of the spatial coordinates used in each observation is registered in the data in a specific column `coords_source`. Additional columns indicating the precision level of geocodebr geocoding are also included in the data.

Usage

```
read_polling_places(
  year,
  code_muni = "all",
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

`year`	Numeric. Year of the data in `YYYY` format.
`code_muni`	The 7-digit code of a municipality. If `code_muni = "all"` (Default), the function downloads all the data available in the country. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. `33` or `"RJ"`), all data of that state are downloaded. Municipality codes can be consulted with the `geobr::lookup_muni()` function.
`output`	String. Type of object returned by the function. Defaults to `"sf"`, which loads the data into memory as an sf object. Alternatively, `"duckdb"` returns a lazy spatial table backed by DuckDB via the duckspatial package, and `"arrow"` returns an Arrow dataset. Both `"duckdb"` and `"arrow"` support out-of-memory processing of large data sets.
`showProgress`	Logical. Defaults to `TRUE` display progress bar.
`cache`	Logical. Whether the function should read the data cached locally, which is faster. Defaults to `cache = TRUE`. By default, `geobr` stores data files in a temporary directory that exists only within each R session. If `cache = FALSE`, the function will download the data again and overwrite the local file.

verbose A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read health facilities of a given municipality
h <- read_polling_places(
  year = 2022,
  code_muni = 2800308
  )

# Read health facilities of a given state
h <- read_polling_places(
  year = 2022,
  code_muni = "SE"
  )

# Read all health facilities of the whole country
h <- read_polling_places(year = 2022)
```

---

read_pop_arrangements *Download population arrangements in Brazil*

Description

This function reads the official data on the population arrangements (Arranjos Populacionais) in Brazil. Original data by the Brazilian Institute of Geography and Statistics (IBGE). More information about the methodology at https://www.ibge.gov.br/geociencias/organizacao-do-territorio/divisao-regional/15782-arranjos-populacionais-e-concentracoes-urbanas-do-brasil.html

Usage

```
read_pop_arrangements(
  year,
  code_state = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_state	The two-digit code of a state or a two-letter uppercase abbreviation (e.g. 33 or "RJ"). If code_state="all" (the default), the function downloads all states.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read population arrangements in an specific year
pa <- read_pop_arrangements(year = 2010)
```

---

read_quilombola_land *Download spatial data of quilombola lands in Brazil*

Description

Read data of quilombola areas officialy recognized by the Instituto Nacional de Colonização e Reforma Agrária - INCRA. The date refers to the date when the data was downloaded, and captures the quilombola lands recognized on that date. More info at https://dados.gov.br/dados/conjuntos-dados/comunidades-quilombolas-certificadas.

Usage

```
read_quilombola_land(
  date,
  code_state = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

date	Numeric. Date of the data in YYYYMM format.
code_state	The two-digit code of a state or a two-letter uppercase abbreviation (e.g. 33 or "RJ"). If code_state="all" (the default), the function downloads all states.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Data dictionary

- code_quilombo - Código da Comunidade Quilombola (para controle interno)
- name_quilombo - Nome da Comunidade Quilombola
- code_sr - Código da Superintendência Regional
- n_process - Número do processo de titulação de terras, junto ao Instituto Nacional de Colonização e Reforma Agrária - INCRA
- name_muni - Nome do Município em que está localizada

- abbrev_state - Sigla da Unidade Federativa em que está localizada
- code_state - Código da Unidade Federativa em que está localizada
- date_recog - Data de publicação da portaria de reconhecimento pelo presidente do INCRA
- date_decree_pr - Decreto da presidência da República para fins de desapropriação, por interesse social
- date_decree - Data decreto de regularização do território
- date_titulacao - Data da titulação das terras
- code_sipra - Código no Sistema de Informações de Projetos de Reforma Agrária - SIPRA
- n_family - Número de famílias
- perimeter - Perímetro calculado depois da medição/demarcação (georreferenciamento) para fins de certificação
- area_ha - Área em hectares
- geo_scale - Escala utilizada para mapeamento
- stage - Fase do processo
- gov_level - Nível da esfera administrativa responsável
- responsible_unit - Órgão responsável

Examples

```
# Read all quilombola areas in an specific date
q <- read_quilombola_land(date = 202605)

# Read the quilombola areas in an given state
ba <- read_quilombola_land(date = 202605, code_state = "BA")
```

---

read_region *Download spatial data of Brazil Regions*

Description

Brazil macro regions

Usage

```
read_region(
  year,
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read specific year
reg <- read_region(year = 2023)
```

---

read_schools *Download geolocated data of schools*

Description

Data comes from the School Census and Catalogue of Schools, organized by the National Institute for Educational Studies and Research Anisio Teixeira (INEP). More information available at https://www.gov.br/inep/pt-br/acesso-a-informacao/dados-abertos/inep-data/catalogo-de-escolas/. The spatial coordinates used in geobr are a combination of the coordinates produced by the original data producer and the coordinates found via geocoding with the geocodebr package https://CRAN.R-project.org/package=geocodebr. Whenever the distance between the coordinates from both sources is smaller than 800 meters, geobr uses coordinates from the data producer. When the distance between the two sources is greater than 800 meters and the results from geocodebr have a precision level finer than 800 meters, geobr uses the coordinates from geocodebr. When the coordinates from the original source are missing, geobr also uses geocodebr coordinates, regardless

of precision level. The source of the spatial coordinates used in each observation is registered in the data in a specific column `coords_source`. Additional columns indicating the precision level of geocodebr geocoding are also included in the data.

Usage

```
read_schools(
  year,
  code_muni = "all",
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

`year`	Numeric. Year of the data in `YYYY` format.
`code_muni`	The 7-digit code of a municipality. If `code_muni = "all"` (Default), the function downloads all the data available in the country. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. `33` or `"RJ"`), all data of that state are downloaded. Municipality codes can be consulted with the `geobr::lookup_muni()` function.
`output`	String. Type of object returned by the function. Defaults to `"sf"`, which loads the data into memory as an sf object. Alternatively, `"duckdb"` returns a lazy spatial table backed by DuckDB via the duckspatial package, and `"arrow"` returns an Arrow dataset. Both `"duckdb"` and `"arrow"` support out-of-memory processing of large data sets.
`showProgress`	Logical. Defaults to `TRUE` display progress bar.
`cache`	Logical. Whether the function should read the data cached locally, which is faster. Defaults to `cache = TRUE`. By default, `geobr` stores data files in a temporary directory that exists only within each R session. If `cache = FALSE`, the function will download the data again and overwrite the local file.
`verbose`	A logical. If `TRUE` (the default), the function prints informative messages and shows download progress bar. If `FALSE`, the function is silent.

Value

An `"sf" "data.frame"` OR an `ArrowObject`

Examples

```
# Read all schools in the country
s <- read_schools(year = 2020)

# Read all schools in a given state
s <- read_schools(
  year = 2020,
```

```
  code_muni = "AC"
  )

# Read all schools in a given municipality
s <- read_schools(
  year = 2020,
  code_muni = 1200401
  )
```

`read_semiarid` *Download spatial data of the Brazilian Semiarid region*

Description

This data set returns all the municipalities which are legally included in the Brazilian Semiarid, following changes in the national legislation. The original data comes from the Brazilian Institute of Geography and Statistics (IBGE) and can be found at https://www.ibge.gov.br/geociencias/cartas-e-mapas/mapas-regionais/15974-semiarido-brasileiro.html

Usage

```
read_semiarid(
  year,
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

`year`	Numeric. Year of the data in `YYYY` format.
`simplified`	Logic `FALSE` or `TRUE`, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to `TRUE`. For spatial analysis and statistics users should set `simplified = FALSE`. Borders have been simplified by removing vertices of borders using `st_simplify{sf}` preserving topology with a `dTolerance` of 100.
`output`	String. Type of object returned by the function. Defaults to `"sf"`, which loads the data into memory as an sf object. Alternatively, `"duckdb"` returns a lazy spatial table backed by DuckDB via the duckspatial package, and `"arrow"` returns an Arrow dataset. Both `"duckdb"` and `"arrow"` support out-of-memory processing of large data sets.
`showProgress`	Logical. Defaults to `TRUE` display progress bar.

cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# read Brazilian semiarid
sa <- read_semiarid(year = 2022)
```

---

read_state *Download spatial data of Brazilian states*

Description

Brazilian states

Usage

```
read_state(
  year,
  code_state = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_state	The two-digit code of a state or a two-letter uppercase abbreviation (e.g. 33 or "RJ"). If code_state="all" (the default), the function downloads all states.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.

output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read all states at a given year
ufs <- read_state(code_state="all", year = 2025)

# Read specific state at a given year
uf <- read_state(code_state="SC", year = 2025)

# Read specific state at a given year
uf <- read_state(code_state=12, year = 2025)
```

---

read_statistical_grid *Download spatial data of IBGE's statistical grid*

Description

Official gridded population estimate of Brazil.

Usage

```
read_statistical_grid(
  year,
  code_muni,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_muni	The 7-digit code of a municipality. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. 33 or "RJ"), all data of that state are downloaded. Passing code_muni = "all" downloads the grid for the whole country. Municipality codes can be consulted with the geobr::lookup_muni() function. Unlike in most geobr functions, this argument is **required and has no default**: loading the grid for the whole country takes a long time and may exhaust memory, so the choice is left explicitly to the user.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read the grid covering a given state at a given year
grid_rio <- read_statistical_grid(
  year = 2022,
  code_muni = "RJ"
  )

# Read the grid covering a given municipality at a given year
grid_ssalvador <- read_statistical_grid(
  year = 2022,
  code_muni = 2927408
  )
```

read_urban_area *Download spatial data of urbanized areas in Brazil*

Description

This function reads the official data on the urban footprint of Brazilian cities. Original data by the Brazilian Institute of Geography and Statistics (IBGE) For more information about the methodology, see details at https://biblioteca.ibge.gov.br/visualizacao/livros/liv100639.pdf

Usage

```
read_urban_area(
  year,
  code_muni = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_muni	The 7-digit code of a municipality. If code_muni = "all" (Default), the function downloads all the data available in the country. Alternatively, if a two-digit state code or a two-letter uppercase abbreviation of a state is passed (e.g. 33 or "RJ"), all data of that state are downloaded. Municipality codes can be consulted with the geobr::lookup_muni() function.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read urban footprint of Brazilian cities in an specific year
d <- read_urban_area(year = 2015)
```

---

read_urban_concentrations

Download urban concentration areas in Brazil

Description

This function reads the official data on the urban concentration areas (Áreas de Concentração de População) in Brazil. Original data by the Brazilian Institute of Geography and Statistics (IBGE). More information about the methodology at https://www.ibge.gov.br/geociencias/organizacao-do-territorio/divisao-regional/15782-arranjos-populacionais-e-concentracoes-urbanas-do-
html

Usage

```
read_urban_concentrations(
  year,
  code_state = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_state	The two-digit code of a state or a two-letter uppercase abbreviation (e.g. 33 or "RJ"). If code_state="all" (the default), the function downloads all states.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.

output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read urban concentration areas in an specific year
uc <- read_urban_concentrations(year = 2010)
```

---

read_weighting_area *Download spatial data of census weighting areas*

Description

Data of Census Weighting Areas (area de ponderação) of the Brazilian Population Census

Usage

```
read_weighting_area(
  year,
  code_weighting = "all",
  simplified = TRUE,
  output = "sf",
  showProgress = TRUE,
  cache = TRUE,
  verbose = TRUE
)
```

Arguments

year	Numeric. Year of the data in YYYY format.
code_weighting	The 7-digit code of a Municipality. If the two-digit code or a two-letter uppercase abbreviation of a state is passed, (e.g. 33 or "RJ") the function will load all weighting areas of that state. If code_weighting="all" (the default), all weighting areas of the country are loaded.
simplified	Logic FALSE or TRUE, indicating whether the function should return the data set with 'original' spatial resolution or a data set with 'simplified' geometry. Defaults to TRUE. For spatial analysis and statistics users should set simplified = FALSE. Borders have been simplified by removing vertices of borders using st_simplify{sf} preserving topology with a dTolerance of 100.
output	String. Type of object returned by the function. Defaults to "sf", which loads the data into memory as an sf object. Alternatively, "duckdb" returns a lazy spatial table backed by DuckDB via the duckspatial package, and "arrow" returns an Arrow dataset. Both "duckdb" and "arrow" support out-of-memory processing of large data sets.
showProgress	Logical. Defaults to TRUE display progress bar.
cache	Logical. Whether the function should read the data cached locally, which is faster. Defaults to cache = TRUE. By default, geobr stores data files in a temporary directory that exists only within each R session. If cache = FALSE, the function will download the data again and overwrite the local file.
verbose	A logical. If TRUE (the default), the function prints informative messages and shows download progress bar. If FALSE, the function is silent.

Value

An "sf" "data.frame" OR an ArrowObject

Examples

```
# Read specific weighting area at a given year
w <- read_weighting_area(
  code_weighting = 5201108005004,
  year = 2010
  )

# Read all weighting areas of a state at a given year
w <- read_weighting_area(
  code_weighting = "DF",
  year = 2010
  )

# Read all weighting areas of a municipality at a given year
w <- read_weighting_area(
  code_weighting = 5201108,
  year = 2010
  )
```

```
# Read all weighting areas of the country at a given year
w <- read_weighting_area(
  code_weighting = "all",
  year = 2010
  )
```

`remove_islands` *Remove islands from Brazil*

Description

Removes Brazilian islands that are approximately more than 20 km from the mainland coast. This is useful when analyses or data visualization should focus on the continental territory of Brazil and exclude distant oceanic islands.

Usage

```
remove_islands(x)
```

Arguments

`x`	An 'sf' object with CRS EPSG:4674. Usually an object returned from other geobr functions, such as `read_country()`, `read_states()`, `read_municipality()`, or similar functions.

Value

An `sf` data frame with the same attributes as `x`, but with distant islands removed from the geometry.

Examples

```
library(geobr)
library(sf)

br <- read_country(year = 1991)

br_no_islands <- remove_islands(br)

plot(br)
```

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