

Package ‘giscoR’

September 28, 2020

Type Package

Title Download geospatial data from GISCO API - Eurostat

Version 0.1.0-9001

Description Tools to download data from the GISCO
(Geographic Information System of the COMmission) Eurostat database
<<https://ec.europa.eu/eurostat/web/gisco>>.
This package is in no way officially related to or endorsed by Eurostat.

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

BugReports <https://github.com/dieghernan/giscoR/issues>

Depends R (>= 3.3.0)

Imports sf (>= 0.9),
countrycode (>= 1.2.0)

Suggests cartography (>= 2.0.0),
colorspace,
eurostat,
ggplot2,
leaflet,
tmap,
tinytest

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giscoR-package	Download geospatial data from GISCO API - Eurostat
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Description

giscoR is a API package that helps to retrieve data from Eurostat - GISCO (the Geographic Information System of the COMmission)

Details

giscoR package

Package:	giscoR
Type:	Package
Version:	See sessionInfo() or DESCRIPTION file
Date:	2020
License:	GPL-3
LazyLoad:	yes

Note

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Author(s)

dieghernan, <https://github.com/dieghernan/>

Source

[GISCO webpage](#)

References

See citation("giscoR")

Examples

```
library(giscoR)
```

gisco_attributions	<i>Attribution when publishing GISCO data</i>
--------------------	---

Description

Get the legal text to be used along with the data downloaded with this package

Usage

```
gisco_attributions(lang = "en", copyright = TRUE)
```

Arguments

lang	Language (two-letter ISO_639-1 code). See details.
copyright	Boolean. Whether to display the copyright notice or not on the console.

Details

Current languages supported are "en" (English), "da" (Danish), "de" (German), "es" (Spanish), "fi" (Finnish), "fr" (French), "no" (Norwegian) and "sv" (Swedish).

Consider contributing if you spot any mistake or want to add a new language.

Value

A string with the attribution to be used.

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Examples

```
en <- gisco_attributions()
gisco_attributions(lang = "es", copyright = FALSE )
gisco_attributions(lang = "XXX")
```

```
gisco_coastallines_20M_2016
```

```
World coastal lines LINESTRING object
```

Description

A sf object including the coast lines as provided by GISCO (2016 version).

Format

A LINESTRING data frame (resolution: 1:20million, EPSG:4326) object with 8 variables:

EFTA_FLAG Coast belonging to EFTA countries

OTHR_FLAG Coast belonging to other countries

EU_FLAG Coast belonging to EU countries

COAS_FLAG Coast flag

CNTR_BN_ID CNTR_BN_ID

CC_FLAG Coast belonging to EU candidate countries

FID FID

geometry geometry field

Source

[GISCO .geojson source](#)

See Also

[gisco_get_countries](#)

gisco_countries_20M_2016

World countries POLYGON object

Description

A sf object including all countries as provided by GISCO (2016 version).

Format

A MULTIPOLYGON data frame (resolution: 1:20million, EPSG:4326) object with 257 rows and 7 variables:

id row ID

CNTR_NAME Official country name on local language

ISO3_CODE [ISO 3166-1 alpha-3 code](#) of each country, as provided by GISCO

CNTR_ID Country ID

NAME_ENGL Country name in English

FID FID

geometry geometry field

Source

[GISCO .geojson source](#)

See Also

[gisco_get_countries](#)

gisco_countrycode	<i>Dataframe including Eurostat and ISO2 and ISO3 codes for countries and world regions</i>
-------------------	---

Description

A dataframe containing conversions between different country codification systems (Eurostat/ISO2 and 3) as well as geographic regions as provided by the World Bank and the UN (M49).

Format

A data frame object with 249 rows and 12 variables:

CNTR_CODE Eurostat code of each country

iso2c ISO 3166-1 alpha-2 code of each country

ISO3_CODE ISO 3166-1 alpha-3 code of each country

iso.name.en ISO English short name

cldr.short.en English short name as provided by the [Unicode Common Locale Data Repository](#)

continent As provided by the World Bank

un.region.code Numeric region code UN (M49)

un.region.name Region name UN (M49)

un.regionintermediate.code Numeric intermediate Region code UN (M49)

un.regionintermediate.name Intermediate Region name UN (M49)

un.regionsub.code Numeric sub-region code UN (M49)

un.regionsub.name Sub-Region name UN (M49)

Source

odelist dataset from the countrycode v1.2.0 package.

See Also

[odelist](#)

`gisco_get_coastallines`*Download Coastal Lines from GISCO*

Description

Downloads a simple feature (sf) object.

Usage

```
gisco_get_coastallines(  
  resolution = "20",  
  year = "2016",  
  crs = "4326",  
  cache = TRUE,  
  update_cache = FALSE,  
  cache_dir = NULL  
)
```

Arguments

resolution	Resolution of the geospatial data. One of <ul style="list-style-type: none">• "60" (1:60million),• "20" (1:20million)• "10" (1:10million)• "03" (1:3million) or• "01" (1:1million).
year	Release year. One of "2006", "2010", "2013" or "2016"
crs	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none">• "4326" - WGS84• "3035" - ETRS89 / ETRS-LAEA• "3857" - Pseudo-Mercator
cache	a logical whether to do caching. Default is TRUE.
update_cache	a logical whether to update cache.
cache_dir	a path to a cache directory. The directory have to exist. The NULL (default) uses and creates /gisco directory in the temporary directory from tempdir . The directory can also be set with <code>options(gisco_cache_dir = <path>)</code> .

Value

a POLYGON object on sf format.

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Author(s)

dieghernan, <https://github.com/dieghernan/>

Source

GISCO Coastal Lines

Examples

```
library(sf)

coastlines <- gisco_get_coastallines(resolution = "60")
plot(st_geometry(coastlines), col = "red", border = "orange")

coastlinesrobin <- gisco_get_coastallines(crs = "3857")
coastlinesrobin <- st_transform(coastlinesrobin, "+proj=robin")
plot(st_geometry(coastlinesrobin), col = "black", bg = "grey", border = "white")
```

gisco_get_communes

Download Geospatial Communes Data from GISCO

Description

Downloads a simple feature (sf) object.

Usage

```
gisco_get_communes(
  year = "2016",
  crs = "4326",
  update_cache = FALSE,
  cache_dir = NULL,
  spatialtype = "RG",
  country = NULL
)
```

Arguments

year	Release year. One of "2001", "2004", "2006", "2008", "2010", "2013" or 2016
crs	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> • "4326" - WGS84 • "3035" - ETRS89 / ETRS-LAEA • "3857" - Pseudo-Mercator
update_cache	a logical whether to update cache.
cache_dir	a path to a cache directory. The directory have to exist. The NULL (default) uses and creates /gisco directory in the temporary directory from tempdir . The directory can also be set with options(<code>gisco_cache_dir = <path></code>).
spatialtype	Type of geometry to be returned: <ul style="list-style-type: none"> • RG: Regions - Multipolygon • LB: Labels - Point • BN: Boundaries - Multilines • COASTL: coastlines - Multilines • INLAND: inland boundaries - Multilines
country	Optional. A character vector of ISO-3 country codes. See Details.

Details

country only available when applicable.

Some spatialtype datasets (as Multilines data-types) may not have country-level identifies. If you experience any problem on download, try to download the file by any other method and set `cache_dir = <folder>`.

Value

a sf object.

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Author(s)

dieghernan, <https://github.com/dieghernan/>

Source

GISCO Communes

Examples

```
library(sf)
library(cartography)

communes <- gisco_get_communes(spatialtype = "COASTL")
world <- gisco_countries_20M_2016
opar <- par(no.readonly = TRUE)
par(mar = c(2, 2, 2, 2))
plot(
  st_geometry(world),
  axes = TRUE,
  xlim = c(-20, 40),
  ylim = c(40, 75),
  bg = "aliceblue",
  col = "antiquewhite"
)
box()
typoLayer(
  communes,
  var = "EFTA_FLAG",
  col = c(NA, "red"),
  legend.pos = "n",
  lwd = 2,
  add = TRUE
)
layoutLayer("EFTA Coastlines",
  col = "red",
  sources = gisco_attributions(copyright = FALSE))
```

`gisco_get_countries` *Download Geospatial Country Data from GISCO*

Description

Downloads a simple feature (sf) object.

Usage

```
gisco_get_countries(
  resolution = "20",
  year = "2016",
  crs = "4326",
  cache = TRUE,
  update_cache = FALSE,
  cache_dir = NULL,
  spatialtype = "RG",
  country = NULL,
  region = NULL
)
```

Arguments

<code>resolution</code>	Resolution of the geospatial data. One of <ul style="list-style-type: none"> "60" (1:60million), "20" (1:20million) "10" (1:10million) "03" (1:3million) or "01" (1:1million).
<code>year</code>	Release year. One of "2001", "2006", "2010", "2013", "2016" or "2020"
<code>crs</code>	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> "4326" - WGS84 "3035" - ETRS89 / ETRS-LAEA "3857" - Pseudo-Mercator
<code>cache</code>	a logical whether to do caching. Default is TRUE.
<code>update_cache</code>	a logical whether to update cache.
<code>cache_dir</code>	a path to a cache directory. The directory have to exist. The NULL (default) uses and creates /gisco directory in the temporary directory from <code>tempdir</code> . The directory can also be set with options(<code>gisco_cache_dir = <path></code>).
<code>spatialtype</code>	Type of geometry to be returned: <ul style="list-style-type: none"> RG: Regions - Multipolygon LB: Labels - Point BN: Boundaries - Multilines

	<ul style="list-style-type: none"> • COASTL: coastlines - Multilines • INLAND: inland boundaries - Multilines
country	Optional. A character vector of ISO-3 country codes. See Details
region	Optional. A character vector of UN M49 region codes. Possible values are "Africa", "Americas", "Asia", "Europe", "Oceania". See Details and gisco_countrycode

Details

country and region only available when applicable. Some spatialtype datasets (as Multilines data-types) may not have country-level identifies.

Value

a sf object.

Note

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Author(s)

dieghernan, <https://github.com/dieghernan/>

Source

[GISCO Countries](#)

See Also

[gisco_countrycode](#)

Examples

```
library(sf)

# Some data are already available for speed up the process
opar <- par(no.readonly = TRUE)
par(mar = c(2, 0, 0, 0))
africa2016 <- gisco_get_countries(region = "Africa")
angola_namibia <- gisco_get_countries(country = c("AGO", "NAM"))

plot(st_geometry(africa2016), bg = "#C6ECFF", col = NA)
plot(st_geometry(gisco_countries_20M_2016),
     col = "#E0E0E0",
     add = TRUE)
plot(st_geometry(africa2016), col = "#F6E1B9", add = TRUE)
plot(st_geometry(angola_namibia), col = "#FEFEE9", add = TRUE)

mtext(gisco_attributions(), side = 1, cex = 0.8)

# Change crs and resolution
cntries2020 <-
  gisco_get_countries(year = "2020",
                      crs = "3035",
                      resolution = "60")
plot(st_geometry(cntries2020), bg = "#C6ECFF", col = "#E0E0E0")
mtext(gisco_attributions(), side = 1, cex = 0.8)
par(opar)

# Several geometry types
coastl <-
  gisco_get_countries(spatialtype = "COASTL", resolution = "60")

inland <-
  gisco_get_countries(spatialtype = "INLAND", resolution = "60")
```

gisco_get_lau

Download Geospatial Local Administrative Units Data from GISCO

Description

Downloads a simple feature (sf) object.

Usage

```
gisco_get_lau(
  year = "2016",
  crs = "4326",
  update_cache = FALSE,
  cache_dir = NULL,
```

```

    country = NULL,
    gisco_id = NULL
  )

```

Arguments

year	Release year. One of "2016", "2017", "2018" or "2019"
crs	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> • "4326" - WGS84 • "3035" - ETRS89 / ETRS-LAEA • "3857" - Pseudo-Mercator
update_cache	a logical whether to update cache.
cache_dir	a path to a cache directory. The directory have to exist. The NULL (default) uses and creates /gisco directory in the temporary directory from tempdir . The directory can also be set with options(gisco_cache_dir = <path>).
country	Optional. A character vector of ISO-3 country codes. See Details.
gisco_id	Optional. A character vector of GISCO_ID LAU values.

Details

See <https://ec.europa.eu/eurostat/web/nuts/local-administrative-units> for more detail about LAUs.

If you experience any problem on download, try to download the file by any other method and set **cache_dir** = <folder>.

Value

a POLYGON object on sf format.

Note

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Author(s)

dieghernan, <https://github.com/dieghernan/>

Source

GISCO Local Administrative Units

Examples

```
lau <- gisco_get_lau(year = "2019")
```

gisco_get_nuts

Download Geospatial NUTS Data from GISCO

Description

Downloads a simple feature (sf) object.

Usage

```
gisco_get_nuts(
  resolution = "20",
  year = "2016",
  crs = "4326",
  nuts_level = "all",
  cache = TRUE,
  update_cache = FALSE,
  cache_dir = NULL,
  spatialtype = "RG",
  country = NULL,
  nuts_id = NULL
)
```

Arguments

resolution	Resolution of the geospatial data. One of <ul style="list-style-type: none"> "60" (1:60million), "20" (1:20million) "10" (1:10million) "03" (1:3million) or "01" (1:1million).
year	Release year. One of "2003", "2006", "2010", "2013", "2016" or "2021".
crs	projection of the map: 4-digit EPSG code. One of:

	<ul style="list-style-type: none"> • "4326" - WGS84 • "3035" - ETRS89 / ETRS-LAEA • "3857" - Pseudo-Mercator
nuts_level	NUTS level. One of "0" (Country-level), "1", "2" or "3". See https://ec.europa.eu/eurostat/web/nuts/background.#
cache	a logical whether to do caching. Default is TRUE.
update_cache	a logical whether to update cache.
cache_dir	a path to a cache directory. The directory have to exist. The NULL (default) uses and creates /gisco directory in the temporary directory from <code>tempdir</code> . The directory can also be set with options(<code>gisco_cache_dir = <path></code>).
spatialtype	Type of geometry to be returned: <ul style="list-style-type: none"> • RG: Regions - Multipolygon • LB: Labels - Point • BN: Boundaries - Multilines
country	Optional. A character vector of ISO-3 country codes. See Details
nuts_id	Optional. A character vector of NUTS IDs.

Details

country only available when applicable. Some spatialtype datasets (as Multilines data-types) may not have country-level identifies.

Value

a sf object.

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Author(s)

dieghernan, <https://github.com/dieghernan/>

Source**GISCO NUTS****See Also**[gisco_countrycode](#), [gisco_nuts_20M_2016](#)**Examples**

```
library(eurostat)
library(sf)
map <- gisco_get_nuts(year = "2016",
                      nuts_level = "2",
                      crs = "3035")

#For the borders only
brds <- gisco_get_nuts(
  year = "2016",
  spatialtype = "BN",
  nuts_level = "0",
  crs = "3035"
)

pps <- get_eurostat("tgs00026")
pps <- pps[grepl("2016", pps$time),]

map.join <- merge(map,
                  pps,
                  by.x = "NUTS_ID",
                  by.y = "geo",
                  all.x = TRUE)

library(cartography)
br <- getBreaks(map.join$values, method = "jenks")

library(colorspace)
pal <- sequential_hcl(n = (length(br) - 1),
                     pal = "Inferno",
                     rev = TRUE)

opar <- par(no.readonly = TRUE)
par(mar = c(1, 1, 1, 1))
plot(
  st_geometry(map.join),
  col = NA,
  bg = "aliceblue",
  xlim = c(2200000, 7150000),
  ylim = c(1380000, 5500000)
)
choroLayer(
  map.join,
  var = "values",
```

```

border = "grey60",
breaks = br,
col = pal,
add = TRUE,
legend.pos = "n"
)
plot(st_geometry(brds),
     col = "black",
     add = TRUE,
     lwd = 1.2)
att <- paste0("Data extracted from package eurostat \n",
             gisco_attributions(copyright = FALSE))

legendChoro(
  title.txt = NA,
  breaks = paste0(br / 1000, "K EUR"),
  col = pal
)
layoutLayer("Purchase Parity Power, NUTS 2 regions (2016)",
            col = pal[3],
            sources = att)
par(opar)

```

`gisco_get_urban_audit` *Download Geospatial Urban Audit Data from GISCO*

Description

Downloads a simple feature (sf) object.

Usage

```

gisco_get_urban_audit(
  year = "2018",
  crs = "4326",
  update_cache = FALSE,
  cache_dir = NULL,
  spatialtype = "RG",
  level = NULL,
  country = NULL
)

```

Arguments

<code>year</code>	Release year. One of "2014", "2018" or "2020"
<code>crs</code>	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> "4326" - WGS84

	<ul style="list-style-type: none"> • "3035" - ETRS89 / ETRS-LAEA • "3857" - Pseudo-Mercator
update_cache	a logical whether to update cache.
cache_dir	a path to a cache directory. The directory have to exist. The NULL (default) uses and creates /gisco directory in the temporary directory from <code>tempdir</code> . The directory can also be set with <code>options(gisco_cache_dir = <path>)</code> .
spatialtype	Type of geometry to be returned: <ul style="list-style-type: none"> • RG: Regions - Multipolygon • LB: Labels - Point
level	Level of Urban Audit. Possible values are 'CITIES', 'FUA', 'GREATER_CITIES' or NULL. See Details.
country	Optional. A character vector of ISO-3 country codes.

Details

level = NULL would download the whole dataset including all levels

Value

a sf object.

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Author(s)

dieghernan, <https://github.com/dieghernan/>

Source

GISCO Urban Audit

Examples

```

library(sf)
library(cartography)
europe <-
  gisco_get_countries(
    crs = 3857,
    year = "2020",
    region = "Europe",
    resolution = "03"
  )
cities <-
  gisco_get_urban_audit(
    year = 2020,
    crs = 3857,
    level = "GREATER_CITIES",
    country = "BEL"
  )

# Focus on Belgium
bbox <-
  st_bbox(c(
    xmin = 150000,
    xmax = 950000,
    ymax = 6900000,
    ymin = 6300000
  ),
  crs = st_crs(europe))
bbox <- st_bbox(cities)

# Plot
opar <- par(no.readonly = TRUE)
par(mar = c(1, 1, 1, 1))
plot(
  st_geometry(europe),
  xlim = bbox[c(1, 3)],
  ylim = bbox[c(2, 4)],
  col = "antiquewhite",
  graticule = TRUE
)
box()
plot(st_geometry(cities),
  col = "darkblue",
  border = "white",
  add = TRUE)

# Labels
labelLayer(
  st_crop(europe, bbox),
  txt = "NAME_ENGL",
  family = "serif",
  font = 3,

```

```

      cex = 0.8
    )
    labelLayer(
      cities,
      txt = "URAU_NAME",
      overlap = FALSE,
      col = "darkblue",
      halo = TRUE
    )
    layoutLayer(
      "Greater Cities of Belgium - Eurostat (2020)",
      col = "darkblue",
      sources = gisco_attributions(copyright = FALSE),
      horiz = FALSE,
      posscale = "bottomleft"
    )
  par(opar)

```

gisco_nuts_20M_2016 *All NUTS POLYGON object*

Description

A sf object including all NUTS levels as provided by GISCO (2016 version).

Format

A POLYGON data frame (resolution: 1:20million, EPSG:4326) object with 11 variables:

id row ID
COAST_TYPE COAST_TYPE
MOUNT_TYPE MOUNT_TYPE
NAME_LATN Name on Latin characters
CNTR_CODE Eurostat Country code
FID FID
NUTS_ID NUTS identifier
NUTS_NAME NUTS name on local alphabet
LEVL_CODE NUTS level code (0,1,2,3)
URBN_TYPE URBN_TYPE
geometry geometry field

Source

GISCO [.geojson source](#)

See Also[gisco_get_nuts](#)

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