

Package ‘mapSpain’

April 25, 2021

Type Package

Title Administrative Boundaries of Spain

Version 0.2.3

Description Administrative Boundaries of Spain at several levels (CCAA, Provinces, Municipalities) based on the GISCO Eurostat database <<https://ec.europa.eu/eurostat/web/gisco>> and 'CartoBase SIANE' from 'Instituto Geografico Nacional' <<https://www.ign.es/>>. It also provides a 'leaflet' plugin and the ability of downloading and processing static tiles.

License GPL-3

Encoding UTF-8

LazyData true

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BugReports <https://github.com/rOpenSpain/mapSpain/issues>

URL <https://ropenspain.github.io/mapSpain/>,
<https://github.com/rOpenSpain/mapSpain>

Depends R (>= 3.6.0)

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Suggests tmap (>= 3.0.0), rgdal, tinytest, tibble

NeedsCompilation no

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mapSpain-package	<i>mapSpain package</i>
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Description

This package provides Administrative Boundaries of Spain based on the GISCO (Geographic Information System of the Commission) Eurostat database and CartoBase SIANE from Instituto Geográfico Nacional.

Details

Package	mapSpain
Type	Package
Version	See sessionInfo() or DESCRIPTION file
Date	2021
License	GPL-3
LazyLoad	yes

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This package uses data from CartoBase SIANE, provided by Instituto Geografico Nacional (IGN):
Atlas Nacional de España (ANE) [CC BY 4.0 ign.es](#)

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Author(s)

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

Source

[GISCO webpage](#)

References

See citation("mapSpain").

See Also

Useful links:

- <https://ropenspain.github.io/mapSpain/>
- <https://github.com/rOpenSpain/mapSpain>
- Report bugs at <https://github.com/rOpenSpain/mapSpain/issues>

addProviderEspTiles *Leaflet plugin - Spanish providers*

Description

Add tiles of <https://dieghernan.github.io/leaflet-providersESP/> to a R `leaflet::leaflet()` map.

Usage

```
addProviderEspTiles(
  map,
  provider,
  layerId = NULL,
  group = NULL,
  options = providerEspTileOptions()
)

providerEspTileOptions(...)
```

Arguments

map	a map widget object created from <code>leaflet()</code>
provider	Name of the provider, see <code>leaflet.providersESP.df</code> .
layerId	the layer id
group	The name of the group the newly created layers should belong to. See <code>leaflet::addTiles()</code>
options	a list of extra options for tile layers, popups, paths (circles, rectangles, polygons, ...), or other map elements
...	Arguments passed on to <code>leaflet::providerTileOptions</code>
errorTileUrl	the tile layer options; see https://leafletjs.com/reference-1.3.4.html#tilelayer
noWrap	the tile layer options; see https://leafletjs.com/reference-1.3.4.html#tilelayer
opacity	the tile layer options; see https://leafletjs.com/reference-1.3.4.html#tilelayer
zIndex	the tile layer options; see https://leafletjs.com/reference-1.3.4.html#tilelayer
updateWhenIdle	the tile layer options; see https://leafletjs.com/reference-1.3.4.html#tilelayer
detectRetina	the tile layer options; see https://leafletjs.com/reference-1.3.4.html#tilelayer

Details

Wrapper of `leaflet::providerTileOptions()`

Value

Modified map object.

Author(s)

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

Source

<https://dieghernan.github.io/leaflet-providersESP/> leaflet plugin, **v1.2.0**.

See Also

[leaflet.providersESP.df](#), [esp_getTiles\(\)](#), [leaflet::addTiles\(\)](#)
[leaflet::providerTileOptions\(\)](#), [leaflet::tileOptions\(\)](#)

Examples

```
library(leaflet)
PuertadelSol <-
  leaflet() %>%
  setView(
    lat = 40.4166,
    lng = -3.7038400,
    zoom = 18
  ) %>%
  addProviderEspTiles(provider = "IGNBase.Gris") %>%
  addProviderEspTiles(provider = "RedTransporte.Carreteras")

PuertadelSol
```

esp_codelist

Spanish Code Translation Data Frame

Description

A data frame used internally for translating codes and names of the different subdivisions of Spain. The data frame provides the hierarchy of the subdivisions including NUTS1 level, Autonomous Communities (equivalent to NUTS2), Provinces and NUTS3 level. See Note.

Format

data frame with codes as columns

- **nuts*.code**: NUTS code of each subdivision.
- **nuts*.name**: NUTS name of each subdivision.
- **codauto**: INE code of each autonomous community.

- **iso2.*.code**: ISO2 code of each autonomous community and province.
- **ine.*.name**: INE name of each autonomous community and province.
- **iso2.*.name.(lang)**: ISO2 name of each autonomous community and province. Several languages available.
- **cldr.*.name.(lang)**: CLDR name of each autonomous community and province. Several languages available.
- **ccaa.short.***: Short (common) name of each autonomous community. Several languages available.
- **cpro**: INE code of each province.
- **prov.shortname.***: Short (common) name of each province. Several languages available.

Note

Languages available are:

- "en": English
- "es": Spanish
- "ca": Catalan
- "ga": Galician
- "eu": Basque

Although NUTS2 matches the first subdivision level of Spain (CCAA - Autonomous Communities), it should be noted that NUTS3 does not match the second subdivision level of Spain (Provinces). NUTS3 provides a dedicated code for major islands whereas the Provinces doesn't.

Ceuta and Melilla has an specific status (Autonomous Cities) but are considered as communities with a single province (as Madrid, Asturias or Murcia) on this dataset.

Source

- INE: Instituto Nacional de Estadística: <https://www.ine.es/>
- Eurostat (NUTS): <https://ec.europa.eu/eurostat/web/nuts/background>
- ISO: <https://www.iso.org/obp/ui/#iso:code:3166:ES>
- CLDR: <https://unicode-org.github.io/cldr-staging/charts/38/index.html>

Examples

```
library(tibble)

glimpse(as_tibble(esp_codelist))
```

esp_dict_region_code *Convert and translate Subdivision Names*

Description

Converts long subdivision names into different coding schemes and languages.

Usage

```
esp_dict_region_code(sourcevar, origin = "text", destination = "text")
```

```
esp_dict_translate(sourcevar, lang = "en", all = FALSE)
```

Arguments

sourcevar	Vector which contains the subdivision names to be converted.
origin, destination	One of "text", "nuts", "iso2", "codauto" and "cpro".
lang	Language of translation. Available languages are: <ul style="list-style-type: none">• "es": Spanish• "en": English• "ca": Catalan• "ga": Galician• "eu": Basque
all	Logical. Should the function return all names or not? On FALSE it returns a character vector. See Value

Details

If no match is found for any value, the function displays a warning and returns NA for those values.

Note that mixing names of different administrative levels (e.g. "Catalonia" and "Barcelona") may return empty values, depending on the destination values.

Value

esp_dict_region_code returns a vector of characters.

esp_dict_translate returns a character vector or a named list with each of the possible names of each sourcevar on the required language lang.

Author(s)

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

Examples

```

vals <- c("Errioxa", "Coruna", "Gerona", "Madrid")

esp_dict_region_code(vals)
esp_dict_region_code(vals, destination = "nuts")
esp_dict_region_code(vals, destination = "cpro")
esp_dict_region_code(vals, destination = "iso2")

# From ISO2 to another codes

iso2vals <- c("ES-M", "ES-S", "ES-SG")
esp_dict_region_code(iso2vals, origin = "iso2")
esp_dict_region_code(iso2vals,
  origin = "iso2",
  destination = "nuts"
)
esp_dict_region_code(iso2vals,
  origin = "iso2",
  destination = "cpro"
)

# Mixing levels
valsmix <- c("Centro", "Andalucia", "Seville", "Menorca")
esp_dict_region_code(valsmix, destination = "nuts")
## Not run:

# Warning

esp_dict_region_code(valsmix, destination = "codauto")
esp_dict_region_code(valsmix, destination = "iso2")

## End(Not run)

vals <- c(
  "La Rioja", "Sevilla", "Madrid",
  "Jaen", "Orense", "Balears"
)
esp_dict_translate(vals)
esp_dict_translate(vals, lang = "es")
esp_dict_translate(vals, lang = "ca")
esp_dict_translate(vals, lang = "eu")
esp_dict_translate(vals, lang = "ga")

esp_dict_translate(vals, lang = "ga", all = TRUE)

```


Description

Get static map tiles based on a spatial object. Maps can be fetched from various open map servers. This function is a implementation of the javascript plugin [leaflet-providersESP v1.2.0](#).

Usage

```
esp_getTiles(
  x,
  type = "IDerioja",
  zoom = NULL,
  crop = TRUE,
  res = 512,
  bbox_expand = 0.05,
  transparent = TRUE,
  mask = FALSE,
  update_cache = FALSE,
  cache_dir = NULL,
  verbose = FALSE
)
```

Arguments

x	An sf object.
type	Name of the provider. See leaflet.providersESP.df .
zoom	Zoom level. If NULL, it is determined automatically. Only valid for WMTS.
crop	TRUE if results should be cropped to the specified x extent, FALSE otherwise. If x is an sf object with one POINT, crop is set to FALSE.
res	Resolution (in pixels) of the final tile. Only valid for WMS.
bbox_expand	A numeric value that indicates the expansion percentage of the bounding box of x.
transparent	Logical. Provides transparent background, if supported. Depends on the selected provider on type.
mask	TRUE if the result should be masked to x.
update_cache	A logical whether to update cache. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none"> • <code>options(mapSpain_cache_dir = "path/to/dir")</code>. See Details on esp_get_nuts() .
verbose	Display information. Useful for debugging, default is FALSE.

Details

Zoom levels are described on the OpenStreetMap wiki: https://wiki.openstreetmap.org/wiki/Zoom_levels.

Results of `esp_getTiles` could be plotted using `raster::plotRGB()`, `tmap::tm_rgb()`, etc.

For a complete list of providers see `leaflet.providersESP.df`.

Most WMS/WMTS providers provide tiles on EPSG:3857. In case that the tile looks deformed, try projecting first x:

```
x <-sf::st_transform(x, 3857)
```

Tiles are cached under the path `cache_dir/[type]`.

Value

A RasterBrick is returned, with 3 (RGB) or 4 (RGBA) layers, depending on the provider. .

Author(s)

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

Source

<https://dieghernan.github.io/leaflet-providersESP/> leaflet plugin, **v1.2.0**.

See Also

`leaflet.providersESP.df`, `addProviderEspTiles()`, `raster::plotRGB()`, `tmap::tm_rgb()`

Examples

```
## Not run:
# This script downloads tiles to your local machine
# Run only if you are online

library(sf)

Murcia <- esp_get_ccaa("Murcia")
Murcia <- st_transform(Murcia, 3857)

Tile <- esp_getTiles(Murcia)

library(tmap)

tm_shape(Tile, raster.downsample = FALSE) +
  tm_rgb(interpolate = FALSE) +
  tm_shape(Murcia) +
  tm_borders()

## End(Not run)
```

esp_get_can_box	<i>Get complementary lines when plotting Canary Islands.</i>
-----------------	--

Description

When plotting Spain, it is usual to represent the Canary Islands as an inset (see `moveCAN` on [esp_get_nuts\(\)](#)). These functions provides complementary borders when Canary Islands are displaced.

`esp_get_can_box` is used to draw lines around the displaced Canary Islands.

`esp_get_can_provinces` is used to draw a separator line between the two provinces of the Canary Islands.

Usage

```
esp_get_can_box(style = "right", moveCAN = TRUE, epsg = "4258")
```

```
esp_get_can_provinces(moveCAN = TRUE, epsg = "4258")
```

Arguments

<code>style</code>	Style of line around Canary Islands. Four options available: "left", "right", "box" or "poly".
<code>moveCAN</code>	A logical TRUE/FALSE or a vector of coordinates <code>c(lat, lon)</code> . It places the Canary Islands close to Spain's mainland. Initial position can be adjusted using the vector of coordinates.
<code>epsg</code>	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none">• "4258": ETRS89• "4326": WGS84• "3035": ETRS89 / ETRS-LAEA• "3857": Pseudo-Mercator

Value

A LINESTRING or POLYGON object if `style = "poly"`.

`esp_get_can_provinces` returns a LINESTRING object.

Author(s)

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

Source

`esp_get_can_provinces` extracted from CartoBase ANE, `se89_mult_admin_provcan_1.shp` file.

See Also

[esp_get_nuts\(\)](#), [esp_get_ccaa\(\)](#).

Examples

```
Provs <- esp_get_prov()
Box <- esp_get_can_box()
Line <- esp_get_can_provinces()

# Plot

library(tmap)

tm_shape(Provs) +
  tm_polygons() +
  tm_shape(Box) +
  tm_lines() +
  tm_shape(Line) +
  tm_lines()

# Displacing Canary

Provs_D <- esp_get_prov(moveCAN = c(15, 0))
Box_D <- esp_get_can_box(style = "left", moveCAN = c(15, 0))
Line_D <- esp_get_can_provinces(moveCAN = c(15, 0))

tm_shape(Provs_D) +
  tm_polygons() +
  tm_shape(Box_D) +
  tm_lines() +
  tm_shape(Line_D) +
  tm_lines()

# Example with poly option

# Get countries with giscoR

library(giscoR)

# Low resolution map
res <- "20"

Countries <-
  gisco_get_countries(
    res = res,
    epsg = "4326",
    country = c("France", "Portugal", "Andorra", "Morocco", "Argelia")
  )
```

```

CANbox <-
  esp_get_can_box(
    style = "poly",
    epsg = "4326",
    moveCAN = c(12.5, 0)
  )

CCAA <- esp_get_ccaa(
  res = res,
  epsg = "4326",
  moveCAN = c(12.5, 0) # Same displacement factor)
)

# Plot

tm_shape(Countries, bbox = c(-10, 34.6, 4.3, 44)) +
  tm_polygons(col = "#DFDFDF") +
  tm_shape(CANbox) +
  tm_polygons(col = "#C7E7FB") +
  tm_shape(CANbox) +
  tm_borders(lwd = 2) +
  tm_shape(CCAA) +
  tm_polygons("#FDFBEA") +
  tm_graticules(lines = FALSE) +
  tm_layout(bg.color = "#C7E7FB", frame.double.line = TRUE)

```

 esp_get_capimun

Get the location of municipalities of Spain

Description

Get the location of the political powers for each municipality (possibly the center of the municipality).

Note that this differs of the centroid of the boundaries of the municipality, returned by [esp_get_munic\(\)](#).

Usage

```

esp_get_capimun(
  year = Sys.Date(),
  epsg = "4258",
  cache = TRUE,
  update_cache = FALSE,
  cache_dir = NULL,
  verbose = FALSE,
  region = NULL,
  munic = NULL,
  moveCAN = TRUE,
  rawcols = FALSE
)

```

Arguments

year	Release year. See Details for years available.
epsg	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> • "4258": ETRS89 • "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none"> • options(mapSpain_cache_dir = "path/to/dir"). See Details on esp_get_nuts() .
verbose	Display information. Useful for debugging, default is FALSE.
region	Optional. A vector of region names, NUTS or ISO codes (see esp_dict_region_code()).
munic	A name or regex expression with the names of the required municipalities. NULL would not produce any filtering.
moveCAN	A logical TRUE/FALSE or a vector of coordinates c(lat,lon). It places the Canary Islands close to Spain's mainland. Initial position can be adjusted using the vector of coordinates.
rawcols	Logical. Setting this to TRUE would add the raw columns of the dataset provided by IGN.

Details

year could be passed as a single year ("YYYY" format, as end of year) or as a specific date ("YYYY-MM-DD" format). Historical information starts as of 2005.

When using region you can use and mix names and NUTS codes (levels 1, 2 or 3), ISO codes (corresponding to level 2 or 3) or cpro.

When calling a superior level (Province, Autonomous Community or NUTS1), all the municipalities of that level would be added.

Value

A POINT object.

Note

While moveCAN is useful for visualization, it would alter the actual geographical position of the Canary Islands.

Author(s)

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

Source

IGN data via a custom CDN (see <https://github.com/rOpenSpain/mapSpain/tree/sianedata>).

See Also

[esp_get_munic\(\)](#), [esp_munic.sf](#), [esp_codelist](#)

Examples

```
## Not run:
# This code compares centroid of municipalities against esp_get_capimun
# It also download tiles, make sure you are online

library(sf)

# Get shape
area <- esp_get_munic_siane(munic = "Valladolid", epsg = 3857)

# Area in km2
print(paste0(round(as.double(st_area(area)) / 1000000, 2), " km2"))

# Extract centroid
centroid <- st_centroid(area)

# Compare with capimun
capimun <- esp_get_capimun(munic = "Valladolid", epsg = 3857)

# Get a tile to check
tile <- esp_getTiles(area)

# Check on plot
library(tmap)

tm_shape(tile, raster.downsample = FALSE) +
  tm_rgb() +
  tm_shape(area) +
  tm_borders(col = "grey40") +
  tm_shape(centroid) +
  tm_symbols(col = "red", alpha = 0.4, shape = 19) +
  tm_shape(capimun) +
  tm_symbols(col = "blue", alpha = 0.4, shape = 19)

# Blue dot is located onto the actual city while red dot is located
# in the centroid of the boundaries

## End(Not run)
```

 esp_get_ccaa

 Get Autonomous Communities boundaries of Spain

Description

Loads a simple feature (sf) object containing the autonomous communities boundaries of Spain.

esp_get_ccaa uses GISCO (Eurostat) as source

esp_get_ccaa_siane uses CartoBase ANE as source, provided by Instituto Geografico Nacional (IGN), <http://www.ign.es/web/ign/portal>.

Years available are 2005 up to today.

Usage

```
esp_get_ccaa(ccaa = NULL, ...)
```

```
esp_get_ccaa_siane(
  ccaa = NULL,
  year = Sys.Date(),
  epsg = "4258",
  cache = TRUE,
  update_cache = FALSE,
  cache_dir = NULL,
  verbose = FALSE,
  resolution = "3",
  moveCAN = TRUE,
  rawcols = FALSE
)
```

Arguments

ccaa	A vector of names and/or codes for autonomous communities or NULL to get all the autonomous communities. See Details.
...	Arguments passed on to esp_get_nuts
	spatialtype Type of geometry to be returned: <ul style="list-style-type: none"> • "RG": Regions - MULTIPOLYGON/POLYGON object. • "LB": Labels - POINT object.
year	Release year. See esp_get_nuts() for esp_get_ccaa and Details for esp_get_ccaa_siane
epsg	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> • "4258": ETRS89 • "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none"> • options(mapSpain_cache_dir = "path/to/dir"). See Details on esp_get_nuts() .
verbose	Display information. Useful for debugging, default is FALSE.
resolution	Resolution of the polygon. Values available are "3", "6.5" or "10".
moveCAN	A logical TRUE/FALSE or a vector of coordinates c(lat, lon). It places the Canary Islands close to Spain's mainland. Initial position can be adjusted using the vector of coordinates.
rawcols	Logical. Setting this to TRUE would add the raw columns of the dataset provided by IGN.

Details

When using ccaa you can use and mix names and NUTS codes (levels 1 or 2), ISO codes (corresponding to level 2) or codauto. Ceuta and Melilla are considered as Autonomous Communities on this dataset.

When calling a NUTS1 level, all the Autonomous Communities of that level would be added.

On esp_get_ccaa_siane, year could be passed as a single year ("YYYY" format, as end of year) or as a specific date ("YYYY-MM-DD" format). Historical information starts as of 2005.

Value

A POLYGON/POINT object.

Author(s)

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

Source

IGN data via a custom CDN (see <https://github.com/rOpenSpain/mapSpain/tree/sianedata>).

See Also

[esp_get_hex_ccaa\(\)](#), [esp_get_nuts\(\)](#), [esp_get_prov\(\)](#), [esp_get_munic\(\)](#), [esp_codelist](#)

Examples

```
# Random CCAA
Random <- esp_get_ccaa(ccaa = c(
  "Euskadi",
  "Catalunya",
  "ES-EX",
  "Canarias",
  "ES52",
  "01"
```

```
))

library(tmap)

tm_shape(Random) +
  tm_polygons(col = "codauto", legend.show = FALSE) +
  tm_shape(Random, point.per = "feature") +
  tm_text("codauto",
    auto.placement = TRUE,
    shadow = TRUE
  )

# All CCAA of a Zone plus an addition

Mix <-
  esp_get_ccaa(
    ccaa = c("La Rioja", "Noroeste"),
    resolution = "20"
  )

# Base plot
plot(
  Mix[, "nuts1.code"],
  pal = hcl.colors(2),
  key.pos = NULL,
  main = NULL,
  border = "white"
)

# Combine with giscoR to get countries

library(giscoR)
library(sf)

res <- 20 # Set same resolution

europe <- gisco_get_countries(resolution = res)
ccaa <- esp_get_ccaa(moveCAN = FALSE, resolution = res)

# Transform to same CRS
europe <- st_transform(europe, 3035)
ccaa <- st_transform(ccaa, 3035)

tm_shape(europe, bbox = c(23, 14, 74, 55) * 10e4) +
  tm_polygons("#DFDFDF", border.col = "#656565") +
  tm_shape(ccaa) +
  tm_polygons("#FDFBEA", border.col = "#656565") +
  tm_layout(bg.color = "#C7E7FB")
```

esp_get_country	<i>Get boundaries of Spain</i>
-----------------	--------------------------------

Description

Loads a single sf object containing the boundaries of Spain.

Usage

```
esp_get_country(...)
```

Arguments

... Arguments passed on to [esp_get_nuts](#)

year Release year. One of "2003", "2006", "2010", "2013", "2016" or "2021".

epsg projection of the map: 4-digit **EPSG code**. One of:

- "4258": ETRS89
- "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.

cache_dir A path to a cache directory. The directory can also be set globally with:

- `options(mapSpain_cache_dir = "path/to/dir")`.

See Details on [esp_get_nuts\(\)](#).

verbose Display information. Useful for debugging, default is FALSE.

resolution Resolution of the geospatial data. One of

- "60": 1:60million
- "20": 1:20million
- "10": 1:10million
- "03": 1:3million
- "01": 1:1million

spatialtype Type of geometry to be returned:

- "RG": Regions - MULTIPOLYGON/POLYGON object.
- "LB": Labels - POINT object.

moveCAN A logical TRUE/FALSE or a vector of coordinates `c(lat,lon)`. It places the Canary Islands close to Spain's mainland. Initial position can be adjusted using the vector of coordinates.

Value

A MULTIPOLYGON/MULTIPOINT object.

Author(s)

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

See Also

[esp_get_nuts\(\)](#)

Examples

```
library(sf)

OriginalCan <- esp_get_country(moveCAN = FALSE)

plot(OriginalCan$geometry, col = "grey70")

MovedCan <- esp_get_country(moveCAN = TRUE)

plot(MovedCan$geometry, col = "grey70")
```

esp_get_hex_prov

Get an hexbin or a map of squares of Spain

Description

Loads a hexbin map (sf object) or a map of squares with the boundaries of the provinces or autonomous communities of Spain.

Usage

```
esp_get_hex_prov(prov = NULL)

esp_get_hex_ccaa(ccaa = NULL)

esp_get_grid_prov(prov = NULL)

esp_get_grid_ccaa(ccaa = NULL)
```

Arguments

prov	A vector of names and/or codes for provinces or NULL to get all the provinces. See Details.
ccaa	A vector of names and/or codes for autonomous communities or NULL to get all the autonomous communities. See Details.

Details

Hexbin or grid map has an advantage over usual choropleth maps. In choropleths, a large polygon data looks more emphasized just because of its size, what introduces a bias. Here with hexbin, each region is represented equally dismissing the bias.

Results are provided in **EPSG:4258**, use `sf::st_transform()` to change the projection.

See `esp_get_ccaa()`, `esp_get_prov()` for Details.

Value

A POLYGON object.

Author(s)

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

See Also

`esp_get_nuts()`, `esp_get_ccaa()`, `esp_get_prov()`, `esp_get_munic()`, `esp_codelist`

Examples

```
library(tmap)

esp <- esp_get_country()
hexccaa <- esp_get_hex_ccaa()

tm_shape(esp, bbox = c(-13.5, 32, 7, 45)) +
  tm_polygons() +
  tm_shape(hexccaa) +
  tm_polygons("codauto", alpha = 0.6, legend.show = FALSE) +
  tm_shape(hexccaa) +
  tm_text("label")

hexprov <- esp_get_hex_prov()

tm_shape(esp, bbox = c(-13.5, 32, 7, 45)) +
  tm_polygons() +
  tm_shape(hexprov) +
  tm_polygons("cpro", alpha = 0.6, legend.show = FALSE) +
  tm_shape(hexprov) +
  tm_text("label")

gridccaa <- esp_get_grid_ccaa()

tm_shape(esp, bbox = c(-13.5, 32, 7, 45)) +
  tm_polygons() +
```

```

tm_shape(gridccaa) +
tm_polygons("codauto", alpha = 0.6, legend.show = FALSE) +
tm_shape(gridccaa) +
tm_text("label")

gridprov <- esp_get_grid_prov()

tm_shape(esp, bbox = c(-13.5, 32, 7, 45)) +
tm_polygons() +
tm_shape(gridprov) +
tm_polygons("cpro", alpha = 0.6, legend.show = FALSE) +
tm_shape(gridprov) +
tm_text("label")

```

esp_get_hydrobasin *Get the drainage basin demarcations of Spain*

Description

Loads a simple feature (sf) object containing areas with the required hydrographic elements of Spain.

Usage

```

esp_get_hydrobasin(
  epsg = "4258",
  cache = TRUE,
  update_cache = FALSE,
  cache_dir = NULL,
  verbose = FALSE,
  resolution = "3",
  domain = "land"
)

```

Arguments

epsg	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> "4258": ETRS89 "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none"> options(mapSpain_cache_dir = "path/to/dir"). See Details on esp_get_nuts() .

verbose	Display information. Useful for debugging, default is FALSE.
resolution	Resolution of the polygon. Values available are "3", "6.5" or "10".
domain	Possible values are "land", that includes only the ground part or the ground or "landsea", that includes both the ground and the related sea waters of the basin

Details

Metadata available on <https://github.com/rOpenSpain/mapSpain/tree/sianedata/>.

Value

A POLYGON object.

Author(s)

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

Source

IGN data via a custom CDN (see <https://github.com/rOpenSpain/mapSpain/tree/sianedata/>).

Examples

```
all <- esp_get_prov(moveCAN = FALSE)
hydroland <- esp_get_hydrobasin(domain = "land")
hydrolandsea <- esp_get_hydrobasin(domain = "landsea")

library(tmap)

tm_shape(hydrolandsea, bbox = c(-9.5, 35, 4.5, 44)) +
  tm_fill("skyblue3") +
  tm_shape(all) +
  tm_polygons("grey90") +
  tm_shape(hydroland) +
  tm_polygons("skyblue", alpha = 0.7, border.col = "blue") +
  tm_layout(bg.color = "grey90")
```

esp_get_hypsobath

Get hypsometry and bathymetry of Spain

Description

Loads a simple feature (sf) object containing lines or areas with the hypsometry and bathymetry of Spain.

Usage

```
esp_get_hypsobath(  
  epsg = "4258",  
  cache = TRUE,  
  update_cache = FALSE,  
  cache_dir = NULL,  
  verbose = FALSE,  
  resolution = "3",  
  spatialtype = "area"  
)
```

Arguments

epsg	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none">• "4258": ETRS89• "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none">• options(mapSpain_cache_dir = "path/to/dir"). See Details on esp_get_nuts() .
verbose	Display information. Useful for debugging, default is FALSE.
resolution	Resolution of the shape. Values available are "3" or "6.5".
spatialtype	Spatial type of the output. Use "area" for POLYGONS or "line" for LINESTRING.

Details

Metadata available on <https://github.com/rOpenSpain/mapSpain/tree/sianedata/>.

Value

A POLYGON or LINESTRING object.

Author(s)

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

Source

IGN data via a custom CDN (see <https://github.com/rOpenSpain/mapSpain/tree/sianedata/>).

Examples

```

# This code would produce a nice plot - It will take a few seconds to run
library(tmap)

hypsobath <- esp_get_hypsobath()

# Tints from Wikipedia
# https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Maps/Conventions/Topographic_maps

bath_tints <- colorRampPalette(
  rev(
    c(
      "#D8F2FE", "#C6ECFF", "#B9E3FF",
      "#ACDBFB", "#A1D2F7", "#96C9F0",
      "#8DC1EA", "#84B9E3", "#79B2DE",
      "#71ABD8"
    )
  )
)

hyps_tints <- colorRampPalette(
  rev(
    c(
      "#F5F4F2", "#E0DED8", "#CAC3B8", "#BAAE9A",
      "#AC9A7C", "#AA8753", "#B9985A", "#C3A76B",
      "#CAB982", "#D3CA9D", "#DED6A3", "#E8E1B6",
      "#EFEBC0", "#E1E4B5", "#D1D7AB", "#BDCC96",
      "#A8C68F", "#94BF8B", "#ACD0A5"
    )
  )
)

levels <- sort(unique(hypsobath$val_inf))

# Create palette
br_bath <- length(levels[levels < 0])
br_terrain <- length(levels) - br_bath

bath_tints(br_bath)

pal <- c(bath_tints((br_bath)), hyps_tints((br_terrain)))

# Plot Canary Islands
tm_shape(hypsobath, bbox = c(-18.6, 27, -13, 29.5)) +
  tm_fill("val_inf",
    style = "cat",
    palette = pal,
    title = "Elevation",
    legend.is.portrait = FALSE
  ) +

```

```

tm_layout(
  legend.outside = TRUE,
  legend.outside.position = "bottom",
  legend.position = c("center", "bottom"),
  legend.text.size = 0.43
)

# Plot Mainland
tm_shape(hypsobath, bbox = c(-9.5, 35.8, 4.4, 44)) +
  tm_fill("val_inf",
    style = "cat",
    palette = pal,
    title = "Elevation",
    legend.reverse = TRUE
  ) +
  tm_layout(legend.outside = TRUE)

```

esp_get_munic

Get municipalities boundaries of Spain

Description

Loads a simple feature (sf) object containing the municipalities boundaries of Spain.

esp_get_munic uses GISCO (Eurostat) as source.

esp_get_munic_siane uses CartoBase ANE as source, provided by Instituto Geografico Nacional (IGN), <http://www.ign.es/web/ign/portal>. Years available are 2005 up to today.

Usage

```

esp_get_munic(
  year = "2019",
  epsg = "4258",
  cache = TRUE,
  update_cache = FALSE,
  cache_dir = NULL,
  verbose = FALSE,
  region = NULL,
  munic = NULL,
  moveCAN = TRUE
)

esp_get_munic_siane(
  year = Sys.Date(),
  epsg = "4258",
  cache = TRUE,
  update_cache = FALSE,

```

```

    cache_dir = NULL,
    verbose = FALSE,
    resolution = 3,
    region = NULL,
    munic = NULL,
    moveCAN = TRUE,
    rawcols = FALSE
)

```

Arguments

year	Release year. See Details for years available.
epsg	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> • "4258": ETRS89 • "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none"> • options(mapSpain_cache_dir = "path/to/dir"). See Details on esp_get_nuts() .
verbose	Display information. Useful for debugging, default is FALSE.
region	A vector of names and/or codes for provinces or NULL to get all the municipalities. See Details.
munic	A name or regex expression with the names of the required municipalities. NULL would not produce any filtering.
moveCAN	A logical TRUE/FALSE or a vector of coordinates c(lat,lon). It places the Canary Islands close to Spain's mainland. Initial position can be adjusted using the vector of coordinates.
resolution	Resolution of the polygon. Values available are "3", "6.5" or "10".
rawcols	Logical. Setting this to TRUE would add the raw columns of the dataset provided by IGN.

Details

When using `region` you can use and mix names and NUTS codes (levels 1, 2 or 3), ISO codes (corresponding to level 2 or 3) or `cpro`.

When calling a superior level (Province, Autonomous Community or NUTS1) , all the municipalities of that level would be added.

On `esp_get_munic` years available are: 2001, 2004, 2006, 2008, 2010, 2013 and any year between 2016 and 2019.

On `esp_get_munic_siane`, `year` could be passed as a single year ("YYYY" format, as end of year) or as a specific date ("YYYY-MM-DD" format). Historical information starts as of 2005.

Value

A POLYGON object.

Author(s)

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

Source

GISCO API

IGN data via a custom CDN (see <https://github.com/rOpenSpain/mapSpain/tree/sianedata>).

See Also

[esp_get_nuts\(\)](#), [esp_munic.sf](#), [esp_codelist](#).

Examples

```
Base <- esp_get_munic(region = c("Castilla y Leon"))
SAN <-
  esp_get_munic(
    region = c("Castilla y Leon"),
    munic = c("^San ", "^Santa ")
  )

library(tmap)
tm_shape(Base) +
  tm_polygons("#FDFBEA", border.col = "#656565", border.alpha = 0.3) +
  tm_shape(SAN) +
  tm_polygons("#C12838", border.col = "#656565") +
  tm_layout(
    main.title = paste0(
      "Municipalities named under Saints (San, Santa)",
      "\nCastilla y Leon, Spain"
    ),
    main.title.size = .8
  )
```

esp_get_nuts

Get NUTS boundaries of Spain

Description

Loads a simple feature (sf) object containing the NUTS boundaries of Spain.

Usage

```

esp_get_nuts(
  year = "2016",
  epsg = "4258",
  cache = TRUE,
  update_cache = FALSE,
  cache_dir = NULL,
  verbose = FALSE,
  resolution = "01",
  spatialtype = "RG",
  region = NULL,
  nuts_level = "all",
  moveCAN = TRUE
)

```

Arguments

year	Release year. One of "2003", "2006", "2010", "2013", "2016" or "2021".
epsg	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> • "4258": ETRS89 • "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none"> • options(mapSpain_cache_dir = "path/to/dir"). See Details on esp_get_nuts() .
verbose	Display information. Useful for debugging, default is FALSE.
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 • "01": 1:1million
spatialtype	Type of geometry to be returned: <ul style="list-style-type: none"> • "RG": Regions - MULTIPOLYGON/POLYGON object. • "LB": Labels - POINT object.
region	Optional. A vector of region names, NUTS or ISO codes (see esp_dict_region_code()).
nuts_level	NUTS level. One of "0" (Country-level), "1", "2" or "3". See https://ec.europa.eu/eurostat/web/nuts/background .
moveCAN	A logical TRUE/FALSE or a vector of coordinates c(lat, lon). It places the Canary Islands close to Spain's mainland. Initial position can be adjusted using the vector of coordinates.

Details

cache_dir = NULL (default) uses and creates /mapSpain directory in the temporary directory `tempdir()`. The directory can also be set via options with `options(mapSpain_cache_dir = "path/to/dir")` or `options(gisco_cache_dir = "path/to/dir")` (See `giscoR::gisco_get()`)

Sometimes cached files may be corrupt. On that case, try redownloading the data using `update_cache = TRUE`.

Value

A POLYGON/POINT object.

Note

Please check the download and usage provisions on `giscoR::gisco_attributions()`

While moveCAN is useful for visualization, it would alter the actual geographical position of the Canary Islands. When using the output for spatial analysis or using tiles (`esp_getTiles()` or `addProviderEspTiles()`) this option should be set to FALSE in order to get the actual coordinates.

Author(s)

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

Source

GISCO API

See Also

`esp_nuts.sf`, `esp_dict_region_code()`, `esp_codelist`, `giscoR::gisco_get()`.

Examples

```
library(sf)

pal <- hcl.colors(5, palette = "Lisbon")

NUTS1 <- esp_get_nuts(nuts_level = 1, moveCAN = TRUE)
plot(st_geometry(NUTS1), col = pal)

NUTS1_alt <- esp_get_nuts(nuts_level = 1, moveCAN = c(15, 0))
plot(st_geometry(NUTS1_alt), col = pal)

NUTS1_orig <- esp_get_nuts(nuts_level = 1, moveCAN = FALSE)
plot(st_geometry(NUTS1_orig), col = pal)

AndOriental <-
  esp_get_nuts(region = c("Almeria", "Granada", "Jaen", "Malaga"))
plot(st_geometry(AndOriental), col = pal)
```

```

RandomRegions <- esp_get_nuts(region = c("ES1", "ES300", "ES51"))
plot(st_geometry(RandomRegions), col = pal)

MixingCodes <- esp_get_nuts(region = c("ES4", "ES-PV", "Valencia"))
plot(st_geometry(MixingCodes), col = pal)

```

esp_get_prov

Get Provinces boundaries of Spain

Description

Loads a simple feature (sf) object containing the province boundaries of Spain.

esp_get_prov uses GISCO (Eurostat) as source

esp_get_prov_siane use CartoBase ANE as source, provided by Instituto Geografico Nacional (IGN), <http://www.ign.es/web/ign/portal>. Years available are 2005 up to today.

Usage

```
esp_get_prov(prov = NULL, ...)
```

```

esp_get_prov_siane(
  prov = NULL,
  year = Sys.Date(),
  epsg = "4258",
  cache = TRUE,
  update_cache = FALSE,
  cache_dir = NULL,
  verbose = FALSE,
  resolution = "3",
  moveCAN = TRUE,
  rawcols = FALSE
)

```

Arguments

prov	A vector of names and/or codes for provinces or NULL to get all the provinces. See Details.
...	Arguments passed on to esp_get_nuts
spatialtype	Type of geometry to be returned: <ul style="list-style-type: none"> "RG": Regions - MULTIPOLYGON/POLYGON object. "LB": Labels - POINT object.
year	Release year. See esp_get_nuts() for esp_get_prov and Details for esp_get_prov_siane
epsg	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> "4258": ETRS89 "4326": WGS84

	<ul style="list-style-type: none"> • "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none"> • options(mapSpain_cache_dir = "path/to/dir"). See Details on esp_get_nuts() .
verbose	Display information. Useful for debugging, default is FALSE.
resolution	Resolution of the polygon. Values available are "3", "6.5" or "10".
moveCAN	A logical TRUE/FALSE or a vector of coordinates c(lat, lon). It places the Canary Islands close to Spain's mainland. Initial position can be adjusted using the vector of coordinates.
rawcols	Logical. Setting this to TRUE would add the raw columns of the dataset provided by IGN.

Details

When using prov you can use and mix names and NUTS codes (levels 1, 2 or 3), ISO codes (corresponding to level 2 or 3) or cpro.

Ceuta and Melilla are considered as provinces on this dataset.

When calling a superior level (Autonomous Community or NUTS1), all the provinces of that level would be added.

On esp_get_prov_siane, year could be passed as a single year ("YYYY" format, as end of year) or as a specific date ("YYYY-MM-DD" format). Historical information starts as of 2005.

Value

A POLYGON/POINT object.

Author(s)

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

Source

IGN data via a custom CDN (see <https://github.com/rOpenSpain/mapSpain/tree/sianedata>).

See Also

[esp_get_hex_prov\(\)](#), [esp_get_nuts\(\)](#), [esp_get_ccaa\(\)](#), [esp_get_munic\(\)](#), [esp_codelist](#).

Examples

```
library(sf)

# Random Provinces

Random <-
  esp_get_prov(prov = c(
    "Zamora",
    "Palencia",
    "ES-GR",
    "ES521",
    "01"
  ))
plot(st_geometry(Random), col = hcl.colors(6))

# All Provinces of a Zone plus an addition
# Low resolution (20M)

Mix <-
  esp_get_prov(
    prov = c(
      "Noroeste",
      "Castilla y Leon", "La Rioja"
    ),
    resolution = "20"
  )
plot(
  Mix[, "nuts1.code"],
  pal = hcl.colors(3),
  key.pos = NULL,
  main = NULL,
  border = "white"
)
# ISO codes available

allprovs <- esp_get_prov()

library(tmap)

tmap_style("cobalt")

tm_shape(allprovs, point.per = "feature") +
  tm_polygons() +
  tm_text("iso2.prov.code", remove.overlap = TRUE)

tmap_options_reset()
```

Description

Extract nodes and railways of mainland Spain and the Balearic Islands.

Usage

```
esp_get_railway(
  year = Sys.Date(),
  epsg = "4258",
  cache = TRUE,
  update_cache = FALSE,
  cache_dir = NULL,
  verbose = FALSE,
  spatialtype = "line"
)
```

Arguments

year	Release year.
epsg	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> • "4258": ETRS89 • "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none"> • options(mapSpain_cache_dir = "path/to/dir"). See Details on esp_get_nuts() .
verbose	Display information. Useful for debugging, default is FALSE.
spatialtype	Spatial type of the output. Use "line" for extracting the railway and "point" for the stations.

Details

Details on caching can be found on [esp_get_nuts\(\)](#)

Value

A MULTILINESTRING or POINT object.

Author(s)

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

Source

IGN data via a custom CDN (see <https://github.com/rOpenSpain/mapSpain/tree/sianedata>).

See Also

[esp_get_roads\(\)](#)

Examples

```
provs <- esp_get_prov()
ccaa <- esp_get_ccaa()

# Railways
rails <- esp_get_railway()

# Stations
stations <- esp_get_railway(spatialtype = "point")

# Map

library(tmap)

tm_shape(provs, bbox = c(-7.5, 38, -2.5, 41)) +
  tm_polygons(col = "grey90", border.col = "grey50") +
  tm_shape(ccaa) +
  tm_borders("black") +
  tm_shape(rails) +
  tm_lines("tipo",
    legend.col.show = FALSE, lwd = 2,
    palette = "Dark2"
  ) +
  tm_shape(stations) +
  tm_symbols("red", size = .3)
```

esp_get_rivers

Get rivers, channels, reservoirs and other wetlands of Spain

Description

Loads a simple feature (sf) object containing lines or areas with the required hydrographic elements of Spain.

Usage

```

esp_get_rivers(
  epsg = "4258",
  cache = TRUE,
  update_cache = FALSE,
  cache_dir = NULL,
  verbose = FALSE,
  resolution = "3",
  spatialtype = "line",
  name = NULL
)

```

Arguments

epsg	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> • "4258": ETRS89 • "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none"> • options(mapSpain_cache_dir = "path/to/dir"). See Details on esp_get_nuts() .
verbose	Display information. Useful for debugging, default is FALSE.
resolution	Resolution of the polygon. Values available are "3", "6.5" or "10".
spatialtype	Spatial type of the output. Use "area" for POLYGONS or "line" for LINESTRING.
name	Optional. A character or regex expression with the name of the element to be extracted. See Details

Details

Metadata available on <https://github.com/rOpenSpain/mapSpain/tree/sianedata/>.

name admits regex expressions. See help("regex", package = "base") for more information.

Value

A POLYGON or LINESTRING object.

Author(s)

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

Source

IGN data via a custom CDN (see <https://github.com/rOpenSpain/mapSpain/tree/sianedata>).

Examples

```
# This code would produce a nice plot - It will take a few seconds to run
library(sf)

# Use of regex

regex1 <- esp_get_rivers(name = "Tajo|Segura")
unique(regex1$rotulo)

regex2 <- esp_get_rivers(name = "Tajo$| Segura")
unique(regex2$rotulo)

# Rivers in Spain
shapeEsp <- esp_get_country(moveCAN = FALSE)

MainRivers <-
  esp_get_rivers(name = "Tajo$|Ebro$|Ebre$|Duero|Guadiana$|Guadalquivir")

opar <- par(no.readonly = TRUE)
par(mar = c(0, 0, 0, 0))

plot(st_geometry(MainRivers), col = "skyblue", lwd = 1.5)
plot(st_geometry(shapeEsp), col = NA, add = TRUE)

# All wetlands

Wetlands <- esp_get_rivers(spatialtype = "area")
plot(st_geometry(Wetlands), col = "skyblue", border = NA)
plot(st_geometry(shapeEsp), col = NA, add = TRUE)

par(opar)
```

esp_get_roads

Get the roads of Spain

Description

Get roads of Spain

Usage

```
esp_get_roads(
  year = Sys.Date(),
```

```

    epsg = "4258",
    cache = TRUE,
    update_cache = FALSE,
    cache_dir = NULL,
    verbose = FALSE,
    moveCAN = TRUE
  )

```

Arguments

year	Release year. See Details for years available.
epsg	projection of the map: 4-digit EPSG code . One of: <ul style="list-style-type: none"> • "4258": ETRS89 • "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. Default is FALSE. When set to TRUE it would force a fresh download of the source .geojson file.
cache_dir	A path to a cache directory. The directory can also be set globally with: <ul style="list-style-type: none"> • options(mapSpain_cache_dir = "path/to/dir"). See Details on esp_get_nuts() .
verbose	Display information. Useful for debugging, default is FALSE.
moveCAN	A logical TRUE/FALSE or a vector of coordinates c(lat,lon). It places the Canary Islands close to Spain's mainland. Initial position can be adjusted using the vector of coordinates.

Details

year could be passed as a single year ("YYYY" format, as end of year) or as a specific date ("YYYY-MM-DD" format).

Details on caching can be found on [esp_get_nuts\(\)](#)

Value

A LINESTRING\MULTILINESTRING object.

Note

While moveCAN is useful for visualization, it would alter the actual geographical position of the Canary Islands.

Author(s)

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

Source

IGN data via a custom CDN (see <https://github.com/rOpenSpain/mapSpain/tree/sianedata>).

See Also

[esp_get_munic\(\)](#), [esp_munic.sf](#), [esp_codelist](#)

Examples

```
library(sf)

CyL <- esp_get_prov("Castilla y Leon")
Roads <- esp_get_roads()

# Intersect roads
CyL_Roads <- st_intersection(CyL, Roads)

library(tmap)

tm_shape(CyL) +
  tm_polygons(col = "grey80", border.col = "grey50", lwd = 0.4) +
  tm_shape(CyL_Roads) +
  tm_lines("tipo",
    palette = c("#003399", "#003399", "#ff0000", "#ffff00")
  ) +
  tm_layout(legend.outside = TRUE, legend.outside.position = "bottom")
```

esp_munic.sf

All Municipalities POLYGON object of Spain

Description

A sf object including all municipalities of Spain as provided by GISCO (2019 version).

Format

A POLYGON data frame (resolution: 1:1million, EPSG:4258) object:

- codauto: INE code of each autonomous community.
- ine.ccaa.name: INE name of each autonomous community.
- cpro: INE code of each province.
- ine.prov.name: INE name of each province.
- cmun: INE code of each municipality.
- name: Name of the municipality.
- LAU_CODE: LAU Code (GISCO) of the municipality.
- geometry: geometry field.

Source

<https://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/>, LAU 2019 data.

See Also

[esp_get_munic\(\)](#)

Examples

```
data("esp_munic.sf")
data("esp_nuts.sf")

Teruel.cpro <- esp_dict_region_code("Teruel", destination = "cpro")
Teruel.NUTS <- esp_dict_region_code(Teruel.cpro,
  origin = "cpro",
  destination = "nuts"
)

Teruel.sf <- esp_munic.sf[esp_munic.sf$cpro == Teruel.cpro, ]
Teruel.city <- Teruel.sf[Teruel.sf$name == "Teruel", ]

# Extract CCAA
CCAA <- esp_get_prov()

library(tmap)

tm_shape(CCAA, bbox = Teruel.sf) +
  tm_polygons("#DFDFDF") +
  tm_shape(Teruel.sf) +
  tm_polygons("#FDFBEA") +
  tm_shape(Teruel.city) +
  tm_fill("#C12838") +
  tm_layout(main.title = "Municipalities of Teruel")
```

esp_nuts.sf

All NUTS POLYGON object of Spain

Description

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

Format

A POLYGON data frame (resolution: 1:1million, EPSG:4258) object with 86 rows and fields:

- COAST_TYPE: COAST_TYPE
- FID: FID

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

Source

<https://gisco-services.ec.europa.eu/distribution/v2/nuts/>, file NUTS_RG_20M_2016_4326.geojson.

See Also

[esp_get_nuts\(\)](#)

Examples

```
nuts <- esp_nuts.sf

# Select NUTS 3
nuts3 <- esp_nuts.sf[esp_nuts.sf$LEVL_CODE == 3, ]

# Combine with full shape
spain <- esp_get_country(moveCAN = FALSE)

library(tmap)

tm_shape(nuts3) +
  tm_fill(
    "URBN_TYPE",
    style = "cat",
    title = "Urban Type",
    palette = hcl.colors(3, "Teal")
  ) +
  tm_shape(spain) +
  tm_borders(col = "black") +
  tm_graticules(lines = FALSE) +
  tm_layout(
    main.title = "NUTS3 levels of Spain",
    legend.outside = TRUE
  )
```

leaflet.providersESP.df

Public WMS and WMTS of Spain

Description

A data frame containing information of different public WMS and WMTS providers of Spain

This function is a implementation of the javascript plugin [leaflet-providersESP v1.2.0](#).

Format

A data frame object with a list of the required parameters for calling the service:

- provider: Provider name.
- field: Description of value.
- value: INE code of each province.

Details

Providers available to be passed to type are:

- **IDerioja:** "IDerioja"
- **IGNBase:** "IGNBase.TODO", "IGNBase.Gris", "IGNBase.TODONoFondo", "IGNBase.Orto"
- **MDT:** "MDT.Elevaciones", "MDT.Relieve", "MDT.CurvasNivel"
- **PNOA:** "PNOA.MaximaActualidad", "PNOA.Mosaico"
- **OcupacionSuelo:** "OcupacionSuelo.Ocupacion", "OcupacionSuelo.Usos"
- **LiDAR:** "LiDAR"
- **MTN:** "MTN"
- **Geofisica:** "Geofisica.Terremotos10dias", "Geofisica.Terremotos30dias", "Geofisica.Terremotos365dias", "Geofisica.VigilanciaVolcanica"
- **CaminoDeSantiago:** "CaminoDeSantiago.CaminoFrances", "CaminoDeSantiago.CaminosTuronensis", "CaminoDeSantiago.CaminosGalicia", "CaminoDeSantiago.CaminosDelNorte", "CaminoDeSantiago.CaminosAndaluces", "CaminoDeSantiago.CaminosCentro", "CaminoDeSantiago.CaminosEste", "CaminoDeSantiago.CaminosCatalanes", "CaminoDeSantiago.CaminosSureste", "CaminoDeSantiago.CaminosInsulares", "CaminoDeSantiago.CaminosPiemonts", "CaminoDeSantiago.CaminosTolosana", "CaminoDeSantiago.CaminosPortugueses"
- **Catastro:** "Catastro.Catastro", "Catastro.Parcela", "Catastro.CadastralParcel", "Catastro.CadastralZoning", "Catastro.Address", "Catastro.Building"
- **RedTransporte:** "RedTransporte.Carreteras", "RedTransporte.Ferroviano", "RedTransporte.Aerodromo", "RedTransporte.AreaServicio", "RedTransporte.EstacionesFerroviario", "RedTransporte.Puertos"
- **Cartociudad:** "Cartociudad.CodigosPostales", "Cartociudad.Direcciones"
- **NombresGeograficos:** "NombresGeograficos"
- **UnidadesAdm:** "UnidadesAdm.Limites", "UnidadesAdm.Unidades"

- **Hidrografia:** "Hidrografia.MasaAgua", "Hidrografia.Cuencas", "Hidrografia.Subcuencas", "Hidrografia.POI", "Hidrografia.ManMade", "Hidrografia.LineaCosta", "Hidrografia.Rios", "Hidrografia.Humedales"
- **Militar:** "Militar.CEGET1M", "Militar.CEGETM7814", "Militar.CEGETM7815", "Militar.CEGETM682", "Militar.CECAFI1M"
- **ADIF:** "ADIF.Vias", "ADIF.Nodos", "ADIF.Estaciones"
- **LimitesMaritimos:** "LimitesMaritimos.LimitesMaritimos", "LimitesMaritimos.LineasBase"
- **Copernicus:** "Copernicus.LandCover", "Copernicus.Forest", "Copernicus.ForestLeaf", "Copernicus.WaterWet", "Copernicus.SoilSeal", "Copernicus.GrassLand", "Copernicus.Local", "Copernicus.RiparianGreen", "Copernicus.RiparianLandCover", "Copernicus.Natura2k", "Copernicus.UrbanAtlas"
- **ParquesNaturales:** "ParquesNaturales.Limites", "ParquesNaturales.ZonasPerifericas"

Source

<https://dieghernan.github.io/leaflet-providersESP/> leaflet plugin, v1.2.0.

See Also

[esp_getTiles\(\)](#), [addProviderEspTiles\(\)](#).

pobmun19

Population by municipality (2019)

Description

A data frame with 8131 rows containing the population data by municipality in Spain (2019).

Source

INE: Instituto Nacional de Estadística <https://www.ine.es/>

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