

Package ‘rnaturalearth’

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Title World Map Data from Natural Earth

Version 1.1.0

Description Facilitates mapping by making natural earth map data from <https://www.naturalearthdata.com/> more easily available to R users.

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<https://github.com/ropensci/rnaturalearth>,
<https://docs.ropensci.org/rnaturalearthhires/>

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Author Philippe Massicotte [aut, cre] (ORCID:
<https://orcid.org/0000-0002-5919-4116>),
Andy South [aut],
Koen Hufkens [ctb] (ORCID: <https://orcid.org/0000-0002-5070-8109>)

Maintainer Philippe Massicotte <pmassicotte@hotmail.com>

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check_data_exist	<i>check whether the requested data exist on Natural Earth</i>
------------------	--

Description

checks from a list dependent on type, category and scale. If it returns FALSE the data may still exist on the website. Doesn't yet do checking on raster names because I found the naming convention too tricky.

Usage

```
check_data_exist(  
  type,  
  scale = 110L,  
  category = c("cultural", "physical", "raster")  
)
```

Arguments

type	type of natural earth file to download one of 'countries', 'map_units', 'map_subunits', 'sovereignty', 'states' OR the portion of any natural earth vector url after the scale and before the . e.g. for 'ne_50m_urban_areas.zip' this would be 'urban_areas' OR the raster filename e.g. for 'MSR_50M.zip' this would be 'MSR_50M'
scale	The scale of map to return, one of '110', '50', '10' or 'small', 'medium', 'large'.
category	one of natural earth categories : 'cultural', 'physical', 'raster'

Details

Note that the filename of the requested object will be returned if 'load = FALSE'.

If the data is to be loaded into memory ('load = TRUE'), the download will be handled using the GDAL virtual file system, allowing direct access to the data without writing it to disk.

Value

TRUE or FALSE

See Also

[ne_load](#), pre-downloaded data are available using [ne_countries](#), [ne_states](#). Other geographic data are available in the raster package : [getData](#).

Examples

```
check_data_exist(type = "countries", scale = 110, category = "cultural")

# Type not in list for this category
check_data_exist(type = "airports", scale = 110, category = "physical")

# Type in list but scale shows FALSE
check_data_exist(type = "airports", scale = 110, category = "cultural")
```

```
check_rnaturalearthdata
```

Check whether to install rnaturalearthdata and install if necessary

Description

If the rnaturalearthdata package is not installed, install it from GitHub using devtools. If it is not up to date, reinstall it.

Usage

```
check_rnaturalearthdata()
```

`check_rnaturalearth hires`*Check whether to install rnaturalearth hires and install if necessary*

Description

If the rnaturalearth hires package is not installed, install it from GitHub using devtools. If it is not up to date, reinstall it.

Usage`check_rnaturalearth hires()`

`check_scale`*check that this scale is present in Natural Earth*

Description

check name or numeric scale representations, return numeric one

Usage`check_scale(x)`**Arguments**

`x` scale of map to return, one of 110, 50, 10 or 'small', 'medium', 'large'

Value

integer scale of map

 convert_spatial_class *Convert from/to sf/sv objects*

Description

returns downloaded data as a spatial object or the filename if load=FALSE. if destdir is specified the data can be reloaded in a later R session using [ne_load](#) with the same arguments.

Usage

```
convert_spatial_class(x, returnclass = c("sf", "sv"))
```

Arguments

x	Object to be converted
returnclass	A string determining the spatial object to return. Either "sf" for for simple feature (from 'sf', the default) or "sv" for a 'SpatVector' (from 'terra').

Details

Note that the filename of the requested object will be returned if 'load = FALSE'.

If the data is to be loaded into memory ('load = TRUE'), the download will be handled using the GDAL virtual file system, allowing direct access to the data without writing it to disk.

Value

Object of class "sf" or "sv"

See Also

[ne_load](#), pre-downloaded data are available using [ne_countries](#), [ne_states](#). Other geographic data are available in the raster package : [getData](#).

Examples

```
## Not run:
spdf_world <- ne_download(scale = 110, type = "countries")

plot(spdf_world)
plot(ne_download(type = "populated_places"))

# reloading from the saved file in the same session with same arguments

spdf_world2 <- ne_load(scale = 110, type = "countries")

# download followed by load from specified directory will work across sessions
spdf_world <- ne_download(scale = 110, type = "countries", destdir = getwd())
spdf_world2 <- ne_load(scale = 110, type = "countries", destdir = getwd())
```

```
# for raster, here an example with Manual Shaded Relief (MSR) download & load

rst <- ne_download(scale = 50, type = "MSR_50M", category = "raster", destdir = getwd())

# load after having downloaded
rst <- ne_load(
  scale = 50, type = "MSR_50M", category = "raster", destdir = getwd()
)

# plot
library(terra)
terra::plot(rst)
# end dontrun

## End(Not run)
```

countries

world country polygons from Natural Earth

Description

at 1:110m scale (small). Other data and resolutions are in the packages `rnaturalearthdata` and `rnaturalearthhires`.

Usage

```
countries110
```

Format

A `sf` object.

An object of class `sf` (inherits from `data.frame`) with 177 rows and 169 columns.

Slots

`data` A data frame with country attributes.

Source

https://naciscdn.org/naturalearth/10m/cultural/ne_10m_admin_0_countries.zip

df_layers_cultural	<i>list of cultural layers available from Natural Earth</i>
--------------------	---

Description

list of cultural layers available from Natural Earth

Usage

```
df_layers_cultural
```

Format

A DataFrame

An object of class `data.frame` with 43 rows and 4 columns.

df_layers_physical	<i>list of physical layers available from Natural Earth</i>
--------------------	---

Description

list of physical layers available from Natural Earth

Usage

```
df_layers_physical
```

Format

A DataFrame

An object of class `data.frame` with 29 rows and 4 columns.

get_data

Get data from within the package

Description

returns world country polygons at a specified scale, used by `ne_countries()`

Usage

```
get_data(
  scale = 110L,
  type = c("countries", "map_units", "sovereignty", "tiny_countries")
)
```

Arguments

scale	The scale of map to return, one of '110', '50', '10' or 'small', 'medium', 'large'.
type	country type, one of 'countries', 'map_units', 'sovereignty', 'tiny_countries'

Details

Note that the filename of the requested object will be returned if 'load = FALSE'.

If the data is to be loaded into memory ('load = TRUE'), the download will be handled using the GDAL virtual file system, allowing direct access to the data without writing it to disk.

Value

A sf object.

See Also

[ne_load](#), pre-downloaded data are available using [ne_countries](#), [ne_states](#). Other geographic data are available in the raster package : [getData](#).

Examples

```
## Not run:
spdf_world <- ne_download(scale = 110, type = "countries")

plot(spdf_world)
plot(ne_download(type = "populated_places"))

# reloading from the saved file in the same session with same arguments

spdf_world2 <- ne_load(scale = 110, type = "countries")

# download followed by load from specified directory will work across sessions
spdf_world <- ne_download(scale = 110, type = "countries", destdir = getwd())
```



```
spdf_world2 <- ne_load(scale = 110, type = "countries", destdir = getwd())

# for raster, here an example with Manual Shaded Relief (MSR) download & load

rst <- ne_download(scale = 50, type = "MSR_50M", category = "raster", destdir = getwd())

# load after having downloaded
rst <- ne_load(
  scale = 50, type = "MSR_50M", category = "raster", destdir = getwd()
)

# plot
library(terra)
terra::plot(rst)
# end dontrun

## End(Not run)
```

```
install_rnaturalearthdata
```

Install the naturalearthdata package after checking with the user

Description

Install the naturalearthdata package after checking with the user

Usage

```
install_rnaturalearthdata()
```

```
install_rnaturalearth hires
```

Install the naturalearth hires package after checking with the user

Description

Install the naturalearth hires package after checking with the user

Usage

```
install_rnaturalearth hires()
```

layer_name	<i>Generate the layer name for a Natural Earth dataset</i>
------------	--

Description

Generate the layer name for a Natural Earth dataset

Usage

```
layer_name(type, scale)
```

Arguments

type	type of natural earth file to download one of 'countries', 'map_units', 'map_subunits', 'sovereignty', 'states' OR the portion of any natural earth vector url after the scale and before the . e.g. for 'ne_50m_urban_areas.zip' this would be 'urban_areas' OR the raster filename e.g. for 'MSR_50M.zip' this would be 'MSR_50M'
scale	The scale of map to return, one of '110', '50', '10' or 'small', 'medium', 'large'.

Value

A string representing the dataset layer name.

make_dest_path	<i>Create Destination File Path</i>
----------------	-------------------------------------

Description

Creates a destination file path by combining the directory path with a formatted filename based on the GDAL URL and category.

Usage

```
make_dest_path(gdal_url, category, destdir)
```

Arguments

gdal_url	A character string representing the GDAL URL
category	A character string specifying the data category ("raster" or other)
destdir	A character string specifying the destination directory

Value

A character string representing the complete destination file path

ne_coastline	<i>Get natural earth world coastline</i>
--------------	--

Description

returns world coastline at specified scale

Usage

```
ne_coastline(scale = 110L, returnclass = c("sf", "sv"))
```

Arguments

scale	The scale of map to return, one of '110', '50', '10' or 'small', 'medium', 'large'.
returnclass	A string determining the spatial object to return. Either "sf" for for simple feature (from 'sf', the default) or "sv" for a 'SpatVector' (from 'terra').

Details

Note that the filename of the requested object will be returned if 'load = FALSE'.

If the data is to be loaded into memory ('load = TRUE'), the download will be handled using the GDAL virtual file system, allowing direct access to the data without writing it to disk.

Value

An object of class 'sf' for simple feature (from 'sf', the default) or 'SpatVector' (from 'terra').

See Also

[ne_load](#), pre-downloaded data are available using [ne_countries](#), [ne_states](#). Other geographic data are available in the raster package : [getData](#).

Examples

```
if (requireNamespace("rnaturalearthdata")) {
  coast <- ne_coastline()
  plot(coast)
}
```

ne_countries

Get natural earth world country polygons

Description

returns world country polygons at a specified scale, or points of tiny_countries

Usage

```
ne_countries(
  scale = 110L,
  type = "countries",
  continent = NULL,
  country = NULL,
  geounit = NULL,
  sovereignty = NULL,
  returnclass = c("sf", "sv")
)
```

Arguments

scale	The scale of map to return, one of '110', '50', '10' or 'small', 'medium', 'large'.
type	country type, one of 'countries', 'map_units', 'sovereignty', 'tiny_countries'
continent	a character vector of continent names to get countries from.
country	a character vector of country names.
geounit	a character vector of geounit names.
sovereignty	a character vector of sovereignty names.
returnclass	A string determining the spatial object to return. Either "sf" for for simple feature (from 'sf', the default) or "sv" for a 'SpatVector' (from 'terra').

Details

Note that the filename of the requested object will be returned if 'load = FALSE'.

If the data is to be loaded into memory ('load = TRUE'), the download will be handled using the GDAL virtual file system, allowing direct access to the data without writing it to disk.

Value

An object of class 'sf' for simple feature (from 'sf', the default) or 'SpatVector' (from 'terra').

See Also

[ne_load](#), pre-downloaded data are available using [ne_countries](#), [ne_states](#). Other geographic data are available in the raster package : [getData](#).

Examples

```
world <- ne_countries()
africa <- ne_countries(continent = "africa")
france <- ne_countries(country = "france")

plot(world$geometry)
plot(africa$geometry)
plot(france$geometry)

# get as SpatVector
world <- ne_countries(returnclass = "sv")
terra::plot(world)

tiny_countries <- ne_countries(type = "tiny_countries", scale = 50)
plot(tiny_countries)
```

ne_download

Download data from Natural Earth and (optionally) read into R

Description

returns downloaded data as a spatial object or the filename if load=FALSE. if destdir is specified the data can be reloaded in a later R session using [ne_load](#) with the same arguments.

Usage

```
ne_download(
  scale = 110L,
  type = "countries",
  category = c("cultural", "physical", "raster"),
  destdir = tempdir(),
  load = TRUE,
  returnclass = c("sf", "sv")
)
```

Arguments

scale	The scale of map to return, one of '110', '50', '10' or 'small', 'medium', 'large'.
type	type of natural earth file to download one of 'countries', 'map_units', 'map_subunits', 'sovereignty', 'states' OR the portion of any natural earth vector url after the scale and before the . e.g. for 'ne_50m_urban_areas.zip' this would be 'urban_areas'. See Details. OR the raster filename e.g. for 'MSR_50M.zip' this would be 'MSR_50M'
category	one of natural earth categories : 'cultural', 'physical', 'raster'
destdir	where to save files, defaults to tempdir(), getwd() is also possible.

load	'TRUE' to load the spatial object into R, 'FALSE' to return the filename of the downloaded object. If the requested object is a vector, it will be saved as a GPKG file. If a raster is requested, it will be saved as a GeoTIFF file.
returnclass	A string determining the spatial object to return. Either "sf" for for simple feature (from 'sf', the default) or "sv" for a 'SpatVector' (from 'terra').

Details

Note that the filename of the requested object will be returned if 'load = FALSE'.

If the data is to be loaded into memory ('load = TRUE'), the download will be handled using the GDAL virtual file system, allowing direct access to the data without writing it to disk.

Value

An object of class 'sf' for simple feature (from 'sf', the default) or 'SpatVector' (from 'terra').

See Also

[ne_load](#), pre-downloaded data are available using [ne_countries](#), [ne_states](#). Other geographic data are available in the raster package : [getData](#).

Examples

```
## Not run:
spdf_world <- ne_download(scale = 110, type = "countries")

plot(spdf_world)
plot(ne_download(type = "populated_places"))

# reloading from the saved file in the same session with same arguments

spdf_world2 <- ne_load(scale = 110, type = "countries")

# download followed by load from specified directory will work across sessions
spdf_world <- ne_download(scale = 110, type = "countries", destdir = getwd())
spdf_world2 <- ne_load(scale = 110, type = "countries", destdir = getwd())

# for raster, here an example with Manual Shaded Relief (MSR) download & load

rst <- ne_download(scale = 50, type = "MSR_50M", category = "raster", destdir = getwd())

# load after having downloaded
rst <- ne_load(
  scale = 50, type = "MSR_50M", category = "raster", destdir = getwd()
)

# plot
library(terra)
terra::plot(rst)
# end dontrun
```

```
## End(Not run)
```

ne_file_name	<i>return a natural earth filename based on arguments</i>
--------------	---

Description

returns a string that can then be used to download the file.

Usage

```
ne_file_name(
  scale = 110L,
  type = "countries",
  category = c("cultural", "physical", "raster")
)
```

Arguments

scale	The scale of map to return, one of '110', '50', '10' or 'small', 'medium', 'large'.
type	type of natural earth file to download one of 'countries', 'map_units', 'map_subunits', 'sovereignty', 'states' OR the portion of any natural earth vector url after the scale and before the . e.g. for 'ne_50m_urban_areas.zip' this would be 'urban_areas' OR the raster filename e.g. for 'MSR_50M.zip' this would be 'MSR_50M'
category	one of natural earth categories : 'cultural', 'physical', 'raster'

Details

Note that the filename of the requested object will be returned if 'load = FALSE'.

If the data is to be loaded into memory ('load = TRUE'), the download will be handled using the GDAL virtual file system, allowing direct access to the data without writing it to disk.

Value

string

See Also

[ne_load](#), pre-downloaded data are available using [ne_countries](#), [ne_states](#). Other geographic data are available in the raster package : [getData](#).

Examples

```
ne_url <- ne_file_name(scale = 110, type = "countries")
```

ne_find_vector_data *Return a dataframe of available vector layers on Natural Earth*

Description

Checks the Natural Earth Github repository for current vector layers and provides the file name required in the type argument of ne_download.

Usage

```
ne_find_vector_data(
  scale = 110L,
  category = c("cultural", "physical"),
  getmeta = FALSE
)
```

Arguments

scale	The scale of map to return, one of '110', '50', '10' or 'small', 'medium', 'large'.
category	one of natural earth categories : 'cultural', 'physical'
getmeta	whether to get url of the metadata for each layer

Details

Note that the filename of the requested object will be returned if 'load = FALSE'.

If the data is to be loaded into memory ('load = TRUE'), the download will be handled using the GDAL virtual file system, allowing direct access to the data without writing it to disk.

Value

dataframe with two variables: layer and metadata

See Also

[ne_load](#), pre-downloaded data are available using [ne_countries](#), [ne_states](#). Other geographic data are available in the raster package : [getData](#).

Examples

```
## Not run:
ne_find_vector_data(scale = 10, category = "physical")

## End(Not run)
```

ne_load	<i>load a Natural Earth vector that has already been downloaded to R using ne_download</i>
---------	--

Description

returns loaded data as a spatial object.

Usage

```
ne_load(
  scale = 110L,
  type = "countries",
  category = c("cultural", "physical", "raster"),
  destdir = tempdir(),
  file_name = NULL,
  returnclass = c("sf", "sv")
)
```

Arguments

scale	The scale of map to return, one of '110', '50', '10' or 'small', 'medium', 'large'.
type	type of natural earth file one of 'countries', 'map_units', 'map_subunits', 'sovereignty', 'states' OR the portion of any natural earth vector url after the scale and before the . e.g. for 'ne_50m_urban_areas.zip' this would be 'urban_areas' OR the raster filename e.g. for 'MSR_50M.zip' this would be 'MSR_50M'
category	one of natural earth categories : 'cultural', 'physical', 'raster'
destdir	folder to load files from, default = tempdir()
file_name	OPTIONAL name of file (excluding path) instead of natural earth attributes
returnclass	A string determining the spatial object to return. Either "sf" for for simple feature (from 'sf', the default) or "sv" for a 'SpatVector' (from 'terra').

Details

This function should be used after first downloading the data with `ne_download(load = FALSE)`. The downloaded file can then be loaded using this function.

Value

An object of class 'sf' for simple feature (from 'sf', the default) or 'SpatVector' (from 'terra').

See Also

[ne_download](#)

Examples

```
## Not run:
# download followed by load from tempdir() works in same R session
spdf_world <- ne_download(
  scale = 110,
  type = "countries"
)
spdf_world2 <- ne_load(
  scale = 110,
  type = "countries"
)

# download followed by load from specified directory works between R sessions
spdf_world <- ne_download(
  scale = 110,
  type = "countries",
  destdir = getwd()
)
spdf_world2 <- ne_load(
  scale = 110,
  type = "countries",
  destdir = getwd()
)

# for raster download & load
rst <- ne_download(
  scale = 50,
  type = "OB_50M",
  category = "raster",
  destdir = getwd(),
  load = FALSE
)

# load after having downloaded
rst <- ne_load(
  scale = 50,
  type = "OB_50M",
  category = "raster",
  destdir = getwd()
)

# plot
library(terra)
plot(rst)
# end dontrun

## End(Not run)
```

Description

returns state polygons (administrative level 1) for specified countries

Usage

```
ne_states(
  country = NULL,
  geounit = NULL,
  iso_a2 = NULL,
  spat_object = NULL,
  returnclass = c("sf", "sv")
)
```

Arguments

country	a character vector of country names.
geounit	a character vector of geounit names.
iso_a2	a character vector of iso_a2 country codes
spat_object	an optional alternative states map
returnclass	A string determining the spatial object to return. Either "sf" for for simple feature (from 'sf', the default) or "sv" for a 'SpatVector' (from 'terra').

Details

By default, this function uses the scale = 10 data from the `rnaturalearthhires` package. While data at scales 50 and 110 exist, they are not used as defaults because they contain fewer countries (e.g. scale 50 only includes Australia, Brazil, Canada and United States of America). For finer control, use [ne_download](#).

```
ne_download( scale = 10L, type = "states", category = "cultural")
ne_download( scale = 50L, type = "states", category = "cultural")
ne_download( scale = 110L, type = "states", category = "cultural")
```

Value

An object of class 'sf' for simple feature (from 'sf', the default) or 'SpatVector' (from 'terra').

See Also

[ne_load](#), pre-downloaded data are available using [ne_countries](#), [ne_states](#). Other geographic data are available in the raster package : [getData](#).

Examples

```
# comparing using country and geounit to filter
if (requireNamespace("rnaturalearthhires")) {
  spdf_france_country <- ne_states(country = "france")
  spdf_france_geounit <- ne_states(geounit = "france")
}
```

```

plot(spdf_france_country)
plot(spdf_france_geounit)

plot(ne_states(country = "united kingdom"))
plot(ne_states(geounit = "england"))
}

```

normalize_type

Normalize the type argument for Natural Earth datasets

Description

This function standardizes the ‘type’ argument by mapping common names to their respective Natural Earth dataset names.

Usage

```
normalize_type(type)
```

Arguments

type	type of natural earth file to download one of ‘countries’, ‘map_units’, ‘map_subunits’, ‘sovereignty’, ‘states’ OR the portion of any natural earth vector url after the scale and before the . e.g. for ‘ne_50m_urban_areas.zip’ this would be ‘urban_areas’ OR the raster filename e.g. for ‘MSR_50M.zip’ this would be ‘MSR_50M’
------	---

Value

A string representing the normalized dataset type.

read_spatial_vector

Read Spatial Vector

Description

This function reads a spatial vector file and returns either an ‘sf’ object or a ‘sv’ object.

Usage

```
read_spatial_vector(x, layer, returnclass = c("sf", "sv"))
```

Arguments

x	A character string specifying the path to the spatial vector file.
layer	A character string specifying the layer to read in case there are more than one in the zip file.
returnclass	A character string specifying the class of object to return. Options are "sf" for sf object and "sv" for sv object.

Value

Either an 'sf' object or a 'sv' object.

sanitize_gdal_url	<i>Extracts the http URL from a VSZIP URL</i>
-------------------	---

Description

This function takes a VSZIP URL and extracts the http URL from it

Usage

```
sanitize_gdal_url(url)
```

Arguments

url	A character string representing the VSZIP URL
-----	---

Value

A character string representing the http URL extracted from the VSZIP URL

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