Package 'spCEH'

January 11, 2024

crs_Ire . crs_lonlat . crs_OSGB . getData . getRasterTemplate . getSpatRasterTemplate . get_r_alt . get_r_Csoil . get_r_lcm . get_r_twi . maskByCountry . projIre . projOSGB .	Title Spati	al utility functions and data
Depends R (>= 3.2.0), terra, sf License MIT + file LICENSE LazyData true Suggests testthat, knitr, rmarkdown, covr VignetteBuilder knitr, rmarkdown Imports terra, sf RoxygenNote 7.2.3 BugReports https://github.com/NERC-CEH/spCEH/issues R topics documented: spCEH-package crs_Ire crs_lonlat crs_OSGB getData getData getRasterTemplate getSpatRasterTemplate get_r_alt get_r_coil get_r_lcm get_r_lcm get_r_twi maskByCountry projlre projlonGB	Version 0.	4.1
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spCEH-package

Spatial functions and data from CEH.

Description

spCEH provides spatial utility functions and data.

Author(s)

Maintainer: Peter Levy <plevy@ceh.ac.uk> (ORCID) [copyright holder]

See Also

Useful links:

• Report bugs at https://github.com/NERC-CEH/spCEH/issues

crs_Ire

CRS object for the TM75 Irish Grid projection.

Description

A Coordinate Reference System object for the Transverse Mercator projection used by the Ordnance Survey in Ireland (TM75 / EPSG:29903)

Usage

crs_Ire

Format

A terra CRS object

Source

crs_lonlat 3

crs_lonlat

CRS object for null projection (longitude-latitude).

Description

A Coordinate Reference System object for the WGS84 lon-lat coordinate system / EPSG:4326

Usage

 ${\tt crs_lonlat}$

Format

A terra CRS object

Source

https://spatialreference.org/

crs_OSGB

CRS object for the OSGB projection.

Description

A Coordinate Reference System object for the Transverse Mercator projection used by the Ordnance Survey in Great Britain (OSGB / EPSG:27700)

Usage

crs_OSGB

Format

A terra CRS object

Source

4 getRasterTemplate

getData	Function to load data distributed with the spCEH package. Data are retrived from tif files stored in extdata. getData masks the equivalent function in raster package, so use raster::getData or spCEH::getData
	to be explicit. For small-medium sized files, this function is not necessary; the four rasters below can be saved as .rda files. However, this will be needed for anything larger than 100 MB.

Description

Function to load data distributed with the spCEH package. Data are retrived from tif files stored in extdata. getData masks the equivalent function in raster package, so use raster::getData or spCEH::getData to be explicit. For small-medium sized files, this function is not necessary; the four rasters below can be saved as .rda files. However, this will be needed for anything larger than 100 MB.

Usage

```
getData(name_var = c("alt", "Csoil", "lcm", "twi"), res = 1000)
```

Arguments

name_var A variable name, one of "alt", "Csoil", "lcm", "twi".

res Resolution of the raster grid produced. Defaults to 1000 m. Higher values

produce coarser grids by aggregation (e.g. 5000 gives a 5-km grid).

Value

A SpatRasterLayer containing the named variable at the specified resolution.

getRasterTemplate	Alternatively-named function to initialise an empty SpatRaster for the UK or a sub-region, with original name for back-compatability

Description

Alternatively-named function to initialise an empty SpatRaster for the UK or a sub-region, with original name for back-compatability

Usage

```
getRasterTemplate(domain = "UK", res = 100, proj = NULL)
```

Arguments

domain	Domain of the output raster: "UK", "Scotland" etc.
res	Resolution of the output raster in metres (for OSGB) or decimal degrees (WGS84). For the 'UK_NAME' domain, the res is pre-specified.
proj	CRS (coordinate reference system) of the output raster: "OSGB" or "WGS84".

getSpatRasterTemplate 5

Value

An empty SpatRaster (from the terra package) object covering the domain.

Examples

```
r <- getRasterTemplate(domain = "UK", res = 10000, proj = 'OSGB')</pre>
```

getSpatRasterTemplate Function to initialise an empty SpatRaster for the UK or a sub-region

Description

Function to initialise an empty SpatRaster for the UK or a sub-region

Usage

```
getSpatRasterTemplate(domain = "UK", res = 100, proj = NULL)
```

Arguments

domain	Domain of the output raster: "UK", "Scotland" etc.
res	Resolution of the output raster in metres (for OSGB) or decimal degrees (WGS84). For the 'UK_NAME' domain, the res is pre-specified.
proj	CRS (coordinate reference system) of the output raster: "OSGB" or "WGS84".

Value

An empty SpatRaster (from the terra package) object covering the domain.

Examples

```
r <- getSpatRasterTemplate(domain = "UK", res = 10000, proj = 'OSGB')
r <- getSpatRasterTemplate(domain = "Scotland", res = 10000, proj = 'OSGB')
r <- getSpatRasterTemplate(domain = "NT_10km", res = 1000, proj = 'OSGB')
r <- getSpatRasterTemplate(domain = "UK", res = 10000, proj = 'OSGB')
r <- getSpatRasterTemplate(domain = "UK", res = 0.1, proj = 'WGS84')
r <- getSpatRasterTemplate(domain = "UK_NAME", proj = 'WGS84')
r <- getSpatRasterTemplate(domain = "UK_NAME", proj = 'WGS84')</pre>
```

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get_r_alt

Function to export UK altitude

Description

A raster layer of altitude in the UK

Usage

```
get_r_alt()
```

Format

A SpatRaster (Raster) object from the terra package. Units: metres above mean sea level. CRS: EPSG 27700 (British National Grid)

Source

https://SRTMspaceshuttleterrainmissionIthink/

Examples

```
r_alt <- get_r_alt()
```

get_r_Csoil

Function to export UK soil carbon

Description

A raster layer of soil carbon in the UK

Usage

```
get_r_Csoil()
```

Format

A SpatRaster object from the terra package. Units: $kg\ C\ /\ m2$. CRS: EPSG 27700 (British National Grid)

Source

https://Bradleyetal2005/

Examples

```
r_Csoil <- get_r_Csoil()
```

get_r_lcm 7

get_r_lcm

Function to export UK Land Cover Map classes

Description

A raster layer of UK Land Cover Map classes.

Usage

```
get_r_lcm()
```

Format

A SpatRaster object from the terra package. Units: integers representing land cover classes. CRS: EPSG 27700 (British National Grid)

Source

```
https://EIDC/
```

Examples

```
r_lcm <- get_r_lcm()
```

get_r_twi

Function to export UK Topographic Wetness Index

Description

A raster layer of Topographic Wetness Index in the UK.

Usage

```
get_r_twi()
```

Format

A SpatRaster object from the terra package. Units: dimensionless ratio. CRS: EPSG 27700 (British National Grid)

Source

```
https://DerivedfromOSDEMdatabyPL/
```

Examples

```
r_twi <- get_r_twi()
```

projIre projIre

maskByCountry Function to mask out cells outwith polygons defining a country within the UK		Function to mask out cells outwith polygons defining a country within the UK
--	--	--

Description

Function to mask out cells outwith polygons defining a country within the UK

Usage

```
maskByCountry(r, countryName)
```

Arguments

```
r A RasterLayer.

countryName The name of a country within the UK ("Scotland", "Northern Ireland", "England" or "Wales").
```

Value

A RasterLayer masked to the named country.

Examples

```
 r \leftarrow getSpatRasterTemplate(domain = "UK", res = 10000, proj = 'OSGB') \\ r[] \leftarrow 1 \\ r\_masked \leftarrow maskByCountry(r, c("England", "Wales")) \\ plot(r\_masked)
```

projIre

CRS object for the TM75 Irish Grid projection.

Description

A Coordinate Reference System object for the Transverse Mercator projection used by the Ordnance Survey in Ireland (TM75 / EPSG:29903)

Usage

projIre

Format

A text string

Source

```
https://spatialreference.org/
```

projlonlat 9

projlonlat

CRS object for null projection (longitude-latitude).

Description

A Coordinate Reference System object for the WGS84 lon-lat coordinate system / EPSG:4326

Usage

projlonlat

Format

A text string

Source

https://spatialreference.org/

proj0SGB

CRS object for the OSGB projection.

Description

A Coordinate Reference System object for the Transverse Mercator projection used by the Ordnance Survey in Great Britain (OSGB / EPSG:27700)

Usage

projOSGB

Format

A text string

Source

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sfdf_uk

UK coastline

Description

A SimpleFeaturesDataFrame of the UK coastline and borders

Usage

sfdf_uk

Format

A SimpleFeaturesDataFrame object from the sf package

Source

```
https://spatialreference.org/
```

spgdf_uk

UK coastline

Description

A SpatialPolygonsDataFrame of the UK coastline and borders

Usage

spgdf_uk

Format

A SimpleFeaturesDataFrame object from the sf package - included for backwards compatability.

Source

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