Package: SELECTRdata (via r-universe)

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Type Package

Title Download and Format Spatially Explicit Load Enrichment Calculation Tool ('SELECT') Data

Version 0.1.0

Description Provides convienence functions for downloading raster and tabular data used by Spatially Explicit Load Enrichment Calculation Tool ('SELECT') to characterize landscape based pollutant sources (<https://tx.select.tamu.edu>). Methodology based on Teague et al. (2009) <doi:10.13031/2013.27788>.

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Encoding UTF-8

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Imports arcgislayers, arcgisutils, cli, curl, gdalraster, httr2, rlang, rnassqs, sf, terra

RoxygenNote 7.3.1

Suggests testthat (>= 3.0.0), withr

Config/testthat/edition 3

URL https://txwri.github.io/SELECTRdata/

Config/pak/sysreqs libgdal-dev gdal-bin libgeos-dev libicu-dev libxml2-dev libssl-dev libproj-dev libsqlite3-dev libudunits2-dev

Repository https://txwri.r-universe.dev

RemoteUrl https://github.com/TxWRI/SELECTRdata

RemoteRef HEAD

RemoteSha a6684d4cdbd3bbaef492138203055fe43b35e7c0

Contents

`download_buildings` *Download building footprints*

Description

Downloads building footprints and attribute data from FEMA's USA Structures dataset (https://fema.maps.arcgis.com/home/i

Usage

```
download_buildings(
  template,
  return = "SpatVector",
  output = tempfile(fileext = ".gpkg")
)
```

Arguments

`template`	A SpatRaster object. The extent of the returned object will match `template`.
`return`	A character object, either `SpatVector` or `sf`. Defaults to `SpatVector`.
`output`	A character file path specifying where the `SpatVector` file should be written. Defaults to a temporary file.

Value

A `SpatVector` or `sf` object with extents matching the `SpatRaster` object provided in the `template` argument. If API resources are not available an invisible `NULL` is returned.

Examples

```
## This example requires an internet connection to run
dem <- system.file("extdata", "thompsoncreek.tif", package = "SELECTRdata")
dem <- terra::rast(dem)

buildings <- download_buildings(template = dem)
```

`download_census_blocks` *Download U.S. Census block boundaries*

Description

Downloads U.S. Census block boundaries and associated information for blocks within the spatial extent of the template SpatRaster.

Usage

```
download_census_blocks(
  template,
  year = "2020",
  page_size = NULL,
  output = tempfile(fileext = ".gpkg")
)
```

Arguments

`template`	A SpatRaster object.
`year`	A character value. Any of the following values should work: `c("2000","2010","2020")`.
`page_size`	a numeric value passed to `arcgislayers::arcselect()`. Defaults to NULL. Useful when the requests returns a 500 error code.
`output`	A character file path specifying where the raster file should be stored. Defaults to a temporary file.

Value

A terra SpatVector object. If API resources are not available an invisible `NULL` is returned.

Examples

```
# example code

## This example requires an internet connection to run
dem <- system.file("extdata", "thompsoncreek.tif", package = "SELECTRdata")
dem <- terra::rast(dem)

blocks <- download_census_blocks(template = dem)
blocks
```

`download_counties` *Download TIGER county spatial data.*

Description

Shortcut function that downloads and extracts TIGER U.S. County boundaries and returns them as a terra SpatVector object.

Usage

```
download_counties(template, output = tempfile(fileext = ".gpkg"))
```

Arguments

`template`	A SpatRaster object.
`output`	A character file path specifying where the raster file should be stored. Defaults to a temporary file.

Value

A terra SpatVector object. If API resources are not available an invisible `NULL` is returned.

Examples

```
# example code

## This example requires an internet connection to run
dem <- system.file("extdata", "thompsoncreek.tif", package = "SELECTRdata")
dem <- terra::rast(dem)

counties <- download_counties(template = dem)
```

`download_nass_livestock`
Download county level total livestock

Description

Provides a wrapper to `rnassqs::nassqs()` with simplified arguments for making queries that return county level livestock estimates. This function requires an API key from USDA NASS Quickstats. See details for more information.

Usage

```
download_nass_livestock(
  state_alpha = NULL,
  county_name = NULL,
  year = "2022",
  ...
)
```

Arguments

state_alpha	Two letter character abbreviation for state.
county_name	Character, county name.
year	A character to filter the NASS Agriculture Census year. Expects one of: `c('2022', '2017', '2012', '2007', '2002', '1997')`.
...	Additional arguments passed to `rnassqs::nassqs()`

Details

This function requires an API key to make requests on the USDA NASS QuickStats service.

1. Obtain an API key from https://quickstats.nass.usda.gov/api/.
2. Set the `NASSQS_TOKEN` variable in your global environment. This can be done with `Sys.setenv('NASSQS_TOKEN' = <yo` or `usethis::edit_r_environment()`.
3. Restart your session.

Value

A dataframe.

Examples

```
download_nass_livestock(state_alpha = "TX", county_name = "Brazos", year = "2022")
```

---

download_nlcd *Download and write annual NLCD raster data to file.*

Description

Downloads and writes an NLCD SpatRaster to file with extents defined by `template`. This function downloads the annualized NLCD data products. See https://www.mrlc.gov/data/project/annual-nlcd for more information.

Usage

```
download_nlcd(
  template,
  year = "2021",
  dataset = "LndCov",
  landmass = "CU",
  output = tempfile(fileext = ".tiff"),
  overwrite = FALSE,
  verbose = FALSE,
  ...
)
```

Arguments

template	A SpatRaster object defining the spatial extent of the returned NLCD raster.
year	character, expects a value between 1986:2023.
dataset	Character. Expects c("LndCov","LndChg","LndCnf","FctImp","ImpDsc","SpcChg").
landmass	Character, one of: c("CU", "AK", "HI").
output	A character file path specifying where the raster file should be stored. Defaults to a temporary file.
overwrite	logical. If TRUE, filename is overwritten
verbose	Logical, if TRUE informative messages will be printed.
...	additional arguments for for writing files, see terra::writeRaster()

Value

A SpatRaster object with file written to output

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download_NPDES_permits

Download NPDES permits

Description

Downloads NPDES permits from EPA ECHO API services within the bounds of the SpatRast template.

Usage

```
download_NPDES_permits(
  template,
  permit_component = "POT",
  permit_status = "EFF",
  output = tempfile(fileext = ".gpkg")
)
```

Arguments

template	A SpatRaster object.
permit_component	A character vector with one or more of the following: PRE (pretreatment), CAF (CAFO), CSO (CSO), POT (Publicly Owned Treatment Works, the default), BIO (Biosolids), SWS (Stormwater Small MS4), SWM (Stormwater Medium/Large MS4), SWI (Stormwater Industrial), SWC (Stormwater Construction).
permit_status	A character vector with one or more of the following: EFF (effective, the default), EXP (expired), PND (pending), TRM (terminated), RET (retired), NON (not needed), ADC (administratively continued).
output	A character file path specifying where the raster file should be stored. Defaults to a temporary file.

Value

SpatVector object

Examples

```
dem <- system.file("extdata", "thompsoncreek.tif", package = "SELECTRdata")
dem <- terra::rast(dem)
download_NPDES_permits(dem)
```

---

download_urban_areas *Download U.S. Urban Areas*

Description

Downloads a U.S. Census designated urban areas intersecting the spatial extent of the template SpatRaster.

Usage

```
download_urban_areas(
  template,
  page_size = NULL,
  output = tempfile(fileext = ".gpkg")
)
```

Arguments

template	A SpatRaster object.
page_size	a numeric value passed to arcgislayers::arcselect(). Defaults to NULL. Useful when the requests returns a 500 error code.
output	A character file path specifying where the SpatVector output object should be written. Defaults to a temporary file.

Value

A terra SpatVector object. If API resources are not available an invisible NULL is returned.

Examples

```
# example code

## This example requires an internet connection to run
dem <- system.file("extdata", "thompsoncreek.tif", package = "SELECTRdata")
dem <- terra::rast(dem)

ua <- download_urban_areas(template = dem)
ua
```

---

has_nass_token *Is there a NASS token?*

Description

Checks if a NASS token has been set in the user environment.

Usage

```
has_nass_token()
```

Value

logical

Examples

```
has_nass_token()
```

---

set_gdal_config *Set GDAL configuration options*

Description

A convenience functions for simultaneously setting the GDAL runtime configuration options in both terra and gdalraster.

Usage

```
set_gdal_config(option, value)
```

Arguments

option	Character name of a configuration option.
value	Character value to set for the option. value = "" (empty string) will unset previously set values.

Value

No return value, called for side effects.

See Also

terra::setGDALconfig() and gdalraster::set_config_option()

Examples

```
set_gdal_config("GDAL_CACHEMAX", "10%")
## unset
set_gdal_config("GDAL_CACHEMAX", "")
```

---

thompson *Thompsons Creek Elevation Data*

Description

Elevation raster of the Thompsons Creek watershed outside of College Station, Texas. This data is obtained from the hydroreinforced digital elevation model (DEM) rasters that are part of the United States Geological Survey (USGS) and United States Environmental Protection Agency (EPA) National Hydrography Dataset Plus (NHDPlus).

See Also

https://nhdplus.com/NHDPlus/NHDPlusV2_home.php

Examples

```
thompson <- system.file("extdata", "thompsoncreek.tif", package = "SELECTRdata")
terra::rast(thompson)
```

wbd *Thompsons Creek Watershed Boundary*

Description

Polygon boundary of the Thompsons Creek watershed (Collecge Station, Texas). This watershed boundary was created using the hydroreinformced raster from the United States Geological Survey (USGS) and United States Environmental Protection Agency (EPA) National Hydrography Dataset Plus (NHDPlus) dataset.

See Also

thompson()

Examples

```
gpkg <- system.file("extdata", "thompsoncreek.gpkg", package = "SELECTRdata")
terra::vect(gpkg, layer = "wbd")
```

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