Package 'dsmSearch'

January 10, 2025

Type Package

Title DSM and LiDAR downloader

Version 1.1.1

Description A collection of functions to search and donwload
DSM (Digital Surface Model) and LiDAR (Light Detection and Ranging) data via APIs,
including 'OpenTopography' <https://portal.opentopography.org/apidocs/> and
'TNMAccess' <https://apps.nationalmap.gov/tnmaccess/#/>.

Depends R (>= 4.1)

License GPL-3

Encoding UTF-8

RoxygenNote 7.3.1

Language en-US

Suggests testthat (>= 3.0.0), knitr, rmarkdown

VignetteBuilder knitr, rmarkdown

Imports dplyr, sf, sp, terra, lidR, httr2, imager

NeedsCompilation no

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Repository CRAN

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get_dsm_30 *get_dsm_30*

Description

Search for and download ALOS Global Digital Surface Model (AW3D30) and USGS DEM raster datasets via OpenTopography API 1.0.0 based on coordinates of a spatial point with a given distance or bounding box. The AW3D30 raster resolution is 30 meter. The resolutions of USGS datasets are 10m and 1m.

Usage

```
get_dsm_30(x, y, r, epsg, bbox, global = TRUE, datatype = "AW3D30", key = "")
```

Arguments

x	numeric, indicating Longtitude degree of the center point.
y	numeric, indicating latitude degree of the center point.
r	numeric, indicating search distance (meter or feet) for LiDAR data.
epsg	numeric, the EPSG code specifying the coordinate reference system.
bbox	vector, a bounding box defining the geographical area for downloading data.
global	logic, if true, AW3D30 data will be downloaded.
datatype	character, dataset names including "AW3D30", "USGS1m", "USGS10m".
key	character, API key of OpenTopography.

Details

To request an API key of OpenTopography, online registeration is needed.

Value

raster

Examples

```
## Not run:
data <- dsmSearch::get_dsm_30(bbox = c(-83.783557,42.241833,-83.696525,42.310420),
                              key = "API key")
data <- dsmSearch::get_dsm_30(x = -83.741289,
                              y = 42.270146,
                              r = 1000,
                              epsg = 2253,
                              key = "API key")

## End(Not run)
```

get_lidar *get_lidar*

Description

Search for and download LiDAR data based on coordinates of a spatial point with a given distance or a bounding box. The maximum distance is 1000m. Different dataset could be found and the function automatically downloads the latest dataset. To get more details of data on a larger scale, please use viewscape::lidar_search.

Usage

```
get_lidar(x, y, r, epsg, bbox, max_return = 500, folder)
```

Arguments

x	numeric, indicating Longtitude degree of the center point.
y	numeric, indicating latitude degree of the center point.
r	numeric, indicating search distance for LiDAR data. The maximum distance is 1000m (3281ft). If r > 1000m, it will be reset to 1000m.
epsg	numeric, the EPSG code specifying the coordinate reference system.
bbox	vector, a bounding box defining the geographical area for downloading data.
max_return	numeric, indicating the maximum of returns.
folder	string (optional), indicating a path for downloading the LiDAR data

Value

lidR LAS object.

References

Jean-Romain Roussel and David Auty (2022). Airborne LiDAR Data Manipulation and Visualization for Forestry Applications. R package version 4.0.1. https://cran.r-project.org/package=lidR

See Also

lidar_search()

Examples

```
las <- dsmSearch::get_lidar(x = -83.741289, y = 42.270146, r = 1000, epsg = 2253)
las <- dsmSearch::get_lidar(bbox = c(-83.742282,42.273389,-83.733442,42.278724), epsg = 2253)
terra::plot(lidR::rasterize_canopy(las, 10, lidR::dsmtin()))
```

lidar_search *lidar_search*

Description

The lidar_search function is designed to facilitate the retrieval and exploration of LiDAR (Light Detection and Ranging) data within a specified bounding box (bbox). This function enables users to search for LiDAR data, preview available graphics, and optionally download LiDAR data files for further analysis.

Usage

```
lidar_search(bbox, max_return = 500, preview = FALSE, folder = "")
```

Arguments

bbox	vector, a bounding box defining the geographical area for the LiDAR data search.
max_return	numeric, indicating the maximum of returns.
preview	logical. If TRUE (default is FALSE), enable or disable previewing LiDAR graphics.
folder	string (optional), indicating an optional folder path where downloaded LiDAR data files will be saved.

Value

dataframe

Note

The lidar_search function simplifies the process of searching for and working with LiDAR data via the TNMAccess API: https://tnmaccess.nationalmap.gov/api/v1/docs.

Examples

```
bbox <- c(-83.742282,42.273389,-83.733442,42.278724)
search_result <- dsmSearch::lidar_search(bbox = bbox,
                                         max_return = 25,
                                         preview = FALSE)
```

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