Package 'rLandsat'

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Type Package

Title Landsat Data Complete Download Process

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Description Easily acquire Landsat, a remote sensing satellite, data from R. Search for Landsat scenes and download the Landsat data using this library which uses API built by Development Seed and U.S. Geological Survey.

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URL https://github.com/socialcopsdev/rLandsat

BugReports https://github.com/socialcopsdev/rLandsat/issues

Encoding UTF-8

LazyData true

RoxygenNote 6.0.1

Depends R (>= 3.1.2)

Suggests testthat

Imports RCurl, svMisc, httr, jsonlite, dplyr, readr, stringr

NeedsCompilation no

R topics documented:

espa_cancel_order *Cancel Landst espa Orders*

Description

This will cancel the order placed earlier through espa_order

Usage

```
espa_cancel_order(order_id, host = "https://espa.cr.usgs.gov/api/v1/",
  username = NULL, password = NULL)
```

Arguments

order_id	vector of order ids to be cancelled
host	the api call host. Default set to espa v1 web api
username	default NULL, which fetches the username from the global environment. If defined otherwise, will run the api with the provided details
password	default NULL, which fetches the password from the global environment. If defined otherwise, will run the api with the provided details

Value

vector of order ids which could NOT be cancelled

Examples

```
# ==== NOT RUN ======
# input the credentials, if not defined earlier
# espa_creds("your_espaname", "secret_password")

# Cancel orders
# espa_cancel_order(order_id = c("your_order_id1", "your_order_id2"))
```

espa_creds *Input and Save esap-api Credentials*

Description

Save the ESPA login credentials as global environment to be used in other functions in rLandsat. This is a pre-requisite for running any of the other functions requiring espa-api

Usage

```
espa_creds(username, password)
```

Arguments

username	espa account's username
password	espa account's password corresponding to the username

Details

If you do not have an account with espa, please create one here: https://ers.cr.usgs.gov/register

Value

NULL. Just saves the username and password in .Reviron

Examples

```
espa_creds(username = "your_espaname", password = "secret_password")
```

---

espa_order *Places an Order for the Product IDs*

Description

Places an order in espa for the specified product ids and their products. All the products must be available for the product IDs mentioned for a successful order

Usage

```
espa_order(input_ids, product, file_format = "gtiff",
  resampling_method = "cc", order_note = "Order from R",
  projection = "lonlat", standard_parallel_1 = 29.5,
  central_meridian = -96, datum = "nad83", latitude_of_origin = 23,
  standard_parallel_2 = 45.5, false_northing = 0, false_easting = 0,
  host = "https://espa.cr.usgs.gov/api/v1/", username = NULL,
  password = NULL)
```

Arguments

input_ids	vector of product ids for which order needs to be places
product	vector of products required for the product ids mentioned. eg. c("sr", "toa", "sr_ndvi")
file_format	the required output format of the order. Default "gtiff". Generally available are: "hdf-eos2": "HDF-EOS2", "envi": "ENVI", "gtiff": "GeoTiff", "netcdf": "NetCDF"
resampling_method	the required resampling method for the order. Default "cc". Generally available are: "cc": "Cubic Convolution", "bil": "Bilinear Interpolation", "nn": "Nearest Neighbor"
order_note	the note (meta information) for the order
projection	the projection of the landsat data for which order is placed. Deafult "lonlat". Avaialble are: "aea" and "lonlat"

standard_parallel_1
: define numeric value if projection is "aea"

central_meridian
: define numeric value if projection is "aea"

datum
: define numeric value if projection is "aea"

latitude_of_origin
: define numeric value if projection is "aea"

standard_parallel_2
: define numeric value if projection is "aea"

false_northing
: define numeric value if projection is "aea"

false_easting
: define numeric value if projection is "aea"

host
: the api call host. Default set to espa v1 web api

username
: default NULL, which fetches the username from the global environment. If defined otherwise, will run the api with the provided details

password
: default NULL, which fetches the password from the global environment. If defined otherwise, will run the api with the provided details

Value

a list

order_details
: a list of order id and order status if the order was successful, else blank list

response
: the API response message

product_available
: dataframe with product ids and availability

query
: the json body sent in POST api

Examples

```
######## NOT RUN #######
## input the credentials, if not defined earlier
# espa_creds("your_espaname", "secret_password")
#
## saving the product ids as a vector
# product_ids = c("LC08_L1TP_148047_20180202_20180220_01_T1",
#                 "LC08_L1TP_134040_20180115_20180120_01_T1")
#
## saving the required products as a vector
# prod = c("sr", "sr_ndvi")
#
## placing the order
# result = espa_order(input_ids = product_ids, product = prod, projection = "lonlat")
# orderid = result$order_details$orderid # storing the order id for future reference
############################
```

espa_products *Check Available Products for given Product-IDs*

Description

For a set of product IDs, check which products (like, sr, toa, spectral indices) are available to download

Usage

```
espa_products(input_ids, host = "https://espa.cr.usgs.gov/api/v1/",
  username = NULL, password = NULL)
```

Arguments

input_ids	vector of product ids for which available products are needed
host	the api call host. Default set to espa v1 web api
username	default NULL, which fetches the username from the global environment. If defined otherwise, will run the api with the provided details
password	default NULL, which fetches the password from the global environment. If defined otherwise, will run the api with the provided details

Value

a list :

master	dataframe with product ids as one of the columns and a column for each product with 0 (not available) and 1 (available) values.
no_product	a vector of product_ids which are incorrect
sample_message	sample response from the espa-api

Returns NULL if the espa credentials are not incorrect or the api is unresponsive

Examples

```
######### NOT RUN #######
## input the credentials, if not defined earlier
# espa_creds("your_espaname", "secret_password")
#
## saving the product ids as a vector
# product_ids = c("LC08_L1TP_148047_20180202_20180220_01_T1",
#              "LC08_L1TP_134040_20180115_20180120_01_T1",
#               "invalid_id")
#
## running function to get the available products
# result = espa_products(input_ids = product_ids)
# result = result$master # saving the dataframe from the list
##########################
```

espa_status *Get Landsat Order Status and Download URL*

Description

For a successful order placed, get the status of each of the product ID requested in that order id. Once the order is complete, also get the corresponding URLs for the product IDs.

Usage

```
espa_status(order_id = NULL, min_date = NULL, max_date = NULL,
  getSize = FALSE, host = "https://espa.cr.usgs.gov/api/v1/",
  username = NULL, password = NULL)
```

Arguments

order_id	vector of order ids for which status and download url is needed
min_date	if order_id is NULL, define the starting date from which order ids need to be fetched
max_date	if order_id is NULL, define the ending date till which order ids need to be fetched
getSize	logical. if the status is completed for the entire order, then should the file size be calculated. (Output size in Bytes)
host	the api call host. Default set to espa v1 web api
username	default NULL, which fetches the username from the global environment. If defined otherwise, will run the api with the provided details
password	default NULL, which fetches the password from the global environment. If defined otherwise, will run the api with the provided details

Details

if order_id, min_date, max_date are NULL, then will run on all the order ids available till date

Value

a list

order_details	a dataframe with order status and download links
wrong_order_id	vector of order_ids for which the API failed

Examples

```
####### NOT RUN ########
## input the credentials, if not defined earlier
# espa_creds("your_espaname", "secret_password")
#
## getting all the orders' status
# result = espa_status()
# result = result$order_details # getting the dataframe from the list
########################
```

espa_user *Validate Espa Credentials*

Description

To check espa credentials and if espa-api is responding. Suggest to use espa_creds function to store your credentials before running this function

Usage

```
espa_user(host = "https://espa.cr.usgs.gov/api/v1/", username = NULL,
  password = NULL)
```

Arguments

host	the api call host. Default set to espa v1 web api
username	default NULL, which fetches the username from the global environment. If defined otherwise, will run the api with the provided details
password	default NULL, which fetches the password from the global environment. If defined otherwise, will run the api with the provided details

Value

logical. TRUE if user is active, FALSE if credentials are wrong or API is unresponsive

Examples

```
###### NOT RUN ######
## inputting the credentials
# espa_creds("your_espaname", "secret_password")
## checking if the user is valid
# espa_user() # returns FALSE
#####################
```

landsat_download *Downlaod Landsat Files from URL*

Description

Downlaod Landsat Files from URL

Usage

```
landsat_download(download_url, entity_id = NULL, folder_wise = FALSE,
  dest_file = NULL)
```

Arguments

download_url	vector of urls to be downloaded
entity_id	product id correspoding to the urls if the downloads need to be in folder wise for AWS links
folder_wise	if the downloads need to be in folder wise for AWS links
dest_file	the destination folder where the files are to be downloaded

Details

Caution: use entity_id and folder_wise ONLY in case of downloading the individual bands (like from AWS). Get the downlaod urls from espa functions in this library. View the demo

Value

vector of failed urls

Examples

```
landsat_download("https://edclpdsftp.cr.usgs.gov/orders/espa-order_id1.tar.gz", dest_file = getwd())
```

---

landsat_search *Search for Landsat8 Products IDs*

Description

Search for landsat8 product IDs for a geography (country name or row/path) and a specific time duration.

Usage

```
landsat_search(min_date = "2017-03-01", max_date = Sys.Date(),
  country = NULL, path_master = NULL, row_master = NULL,
  source = "sat-api")
```

Arguments

min_date	the start date of the products. Format should be %Y-%m-%d
max_date	the end date of the products. Format should be %Y-%m-%d
country	the country for which product ids is required. NULL if search is not on country. List of available countries are available at data(world_rowpath)
path_master	vector of path numbers
row_master	vector of row numbers corresponding to the path number. Check details
source	search source. Default and recommended is sat-api. Available options: "sat-api", "aws". For AWS it will return the Pre-Collection Scene IDs pre March 2017.

Details

for path_master and row_master input is in a pair. For example: If we want path/row of : (147,47) , (147,48) then path_master = c(147, 147), row_master = c(47,48)

Value

dataframe with the product ids and the meta information (cloud cover, path/row) along with it. If source is sat-api then raw value download links from all the sources (AWS, Google, ESPA) are also outputted

Examples

```
##### NOT RUN #####
# result = landsat_search(min_date = "2017-03-01", max_date = "2017-03-03", country = "India")
##################
```

`world_rowpath` *World - Country wise row path mapping*

Description

World - Country wise row path mapping

Usage

```
data("world_rowpath")
```

Format

An object of class dataframe

Examples

```
data("world_rowpath")
```

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