

# Package ‘rLandsat’

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**Type** Package

**Title** Landsat Data Complete Download Process

**Version** 0.1.0

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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 APIs built by Development Seed and ESPA.

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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

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espa_cancel_order	<i>Cancel Landst espa Orders</i>
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### 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"))
```

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espa_creds	<i>Input and Save esap-api Credentials</i>
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### 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")
```

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espa_order	<i>Places an Order for the Product IDs</i>
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**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

```
# 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**

```
# 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**

```
# 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*

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**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**

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

```
# inputting the credentials  
espa_creds("your_espaname", "secret_password")  
# checking if the user is valid  
espa_user() # returns FALSE
```

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`landsat_download`*Downlaod Landsat Files from URL*

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**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 corresponding 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 download urls from espa functions in this library. View the demo

**Value**

vector of failed urls

**Examples**

```
landsat_download("https://edc1pdsftp.cr.usgs.gov/orders/espa-order_id1.tar.gz", dest_file = getwd())
```

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landsat_search	<i>Search for Landsat8 Products IDs</i>
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**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**

```
result = landsat_search(min_date = "2017-03-01", max_date = "2017-03-03", country = "India")
```

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world_rowpath	<i>World - Country wise row path mapping</i>
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**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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