

# Package ‘RCGLS’

September 16, 2020

**Title** Download and Open Data Provided by the Copernicus Global Land Service

**Version** 1.0.3

**Description** Download and open manifest files provided by the Copernicus Global Land Service data <<https://land.copernicus.eu/global/>>. The manifest files are available at: <<https://land.copernicus.vgt.vito.be/manifest/>>. Also see: <<https://land.copernicus.eu/global/access/>>. Before you can download the data, you will first need to register to create a username and password.

**License** MIT + file LICENSE

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.1.1

**Imports** RCurl, ncdf4, raster, sp

**Suggests** testthat

**NeedsCompilation** no

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download\_CGLS\_data      *Download CGLS data*

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### Description

Downloads manifest files of the Copernicus Global Land Service. Registration at <https://land.copernicus.eu/global/> is required.

### Usage

```
download_CGLS_data(username, password, timeframe, product, resolution, version)
```

### Arguments

username	Register at <a href="https://land.copernicus.eu/global/">https://land.copernicus.eu/global/</a>
password	Register at <a href="https://land.copernicus.eu/global/">https://land.copernicus.eu/global/</a>
timeframe	Time frame of interest, for example June 2019
product	Product name: fapar, fcover, lai, ndvi, ss, swi, lst, ...
resolution	1km, 300m or 100m
version	Version number: v1, v2, v3,...

### Details

Check <https://land.copernicus.eu/global/products/> for a product overview and product details. Check <https://land.copernicus.vgt.vito.be/manifest/> for an overview for data availability in the manifest.

### Value

CGLS data Data saved locally in chosen folder.

### Examples

```
## Not run:
#library(RCurl)
UN <- "Willemijn"
PW <- "Testthis"
TF <- seq(as.Date("2019-06-01"), as.Date("2019-06-15"), by="days")
PROD <- "fapar" #Product name: fapar, fcover, lai, ndvi, ss, swi, lst, ...
RES <- "1km" #1km, 300m or 100m
V <- "v1" #Version number: v1, v2, v3, ...

download_CGLS_data(username=UN, password=PW, timeframe=TF, product=PROD, resolution=RES, version=V)

## End(Not run)
```

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ncvar_get_CGSL	<i>Read netcdf CGLS data</i>
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## Description

Read single layers of Copernicus Global Land Service (CGLS) data and adjusts coordinates for R.

## Usage

```
ncvar_get_CGSL(date, product, resolution, version, variable)
```

## Arguments

date	Date of interest, for example for 13 june 2019: 2019-06-13
product	Product name: fapar, fcover, lai, ndvi, ss, swi, lst, ...
resolution	1km, 300m or 100m
version	Version number: v1, v2, v3,...
variable	FAPAR_ERR, FAPAR_QFLAG... Also see <a href="https://land.copernicus.eu/global/products/">https://land.copernicus.eu/global/products/</a>

## Details

Adjusting coordinates is a necessary step to use the data because Copernicus nc files have lat/long belonging to the centre of the pixel, and R uses upper/left corner. This function opens the data without any corrections.

## Value

CGLS data Large matrix of a specific variable in environment, coordinates adjusted.

## Examples

```
## Not run:
#' library(ncdf4)
DATE <- "2019-06-13" #Date of interest, for example for 13 june 2019: 2019-06-13
PROD <- "fapar" #Product name: fapar, fcover, lai, ndvi, ss, swi, lst, ...
RES <- "1km" #1km, 300m or 100m
V <- "v1" #Version number: v1, v2, v3, ...
VAR <- "FAPAR" #FAPAR_ERR, FAPAR_QFLAG... Also see https://land.copernicus.eu/global/products/

nc_data <- ncvar_get_CGSL (date=DATE, product=PROD, resolution=RES, version=V, variable=VAR)

## End(Not run)
```

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nc\_open\_CGLS                      *Open netcdf CGLS data*

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### Description

Opens single original data files/layers of Copernicus Global as netCDF filesLand Service as netCDF files without adjusting coordinates. Coordinate adjustment is necessary as R uses upper left corner as pixel reference and Copernicus uses pixel centre. Also see: <https://land.copernicus.eu/global/products/>.

### Usage

```
nc_open_CGLS(date, product, resolution, version)
```

### Arguments

date	Date of interest, for example for 13 june 2019: 2019-06-13
product	Product name: fapar, fcover, lai, ndvi, ss, swi, lst, ...
resolution	1km, 300m or 100m
version	Version number: v1, v2, v3,...

### Details

Adjusting coordinates is a necessary step to use the data because Copernicus nc files have lat/long belonging to the centre of the pixel, and R uses upper/left corner. This function opens the data without any corrections.

### Value

CGLS data Opens single netcdf file in environment

### Note

Coordinates are shifted and need to be adjusted, for example by: `if(resolution == "300m") lon <- lon - (1/336)/2 lat <- lat + (1/336)/2`  
`if(resolution == "1km") lon <- lon - (1/112)/2 lat <- lat + (1/112)/2`

### Examples

```
## Not run:
library(ncdf4)
DATE   <- "2019-06-13" #Date of interest, for example for 13 june 2019: 2019-06-13
PROD   <- "fapar" #Product name: fapar, fcover, lai, ndvi, ss, swi, lst, ...
RES    <- "1km" #1km, 300m or 100m
V      <- "v1" #Version number: v1, v2, v3, ...

nc     <- nc_open_CGLS (date=DATE, product=PROD, resolution=RES, version=V)

## End(Not run)
```

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stack_CGLS	<i>stack CGLS data</i>
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### Description

Read all downloaded files from Copernicus Global Land Service within a timeframe as Raster Stack and adjusts coordinates for R.

### Usage

```
stack_CGLS (timeframe, product, resolution, version, variable)
```

### Arguments

timeframe	Time frame of interest, for example June 2019
product	Product name: fapar, fcover, lai, ndvi, ss, swi, lst, ...
resolution	1km, 300m or 100m
version	Version number: v1, v2, v3,...
variable	Variable name: FAPAR_ERR, FAPAR_QFLAG... Also see <a href="https://land.copernicus.eu/global/products/">https://land.copernicus.eu/global/products/</a>

### Details

Adjusting coordinates is a necessary step to use the data because Copernicus nc files have lat/long belonging to the centre of the pixel, and R uses upper/left corner.

### Value

CGLS data Raster Stack

### Examples

```
## Not run:
library(raster)
TF <- seq(as.Date("2019-06-01"), as.Date("2019-06-31"), by="days")
PROD <- "fapar" #Product name: fapar, fcover, lai, ndvi, ss, swi, lst, ...
RES <- "1km" #1km, 300m or 100m
V <- "v1" #Version number: v1, v2, v3, ...
VAR <- "FAPAR" #FAPAR_ERR, FAPAR_QFLAG... Also see https://land.copernicus.eu/global/products/
data <- stack_CGLS(timeframe=TF, product=PROD, resolution=RES, version=V, variable=VAR)

## End(Not run)
```

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