

Analyzing Spatial Data with R - exercises

Micha Silver

2025-06-03

Required packages

```
pkg_list <- c("terra", "sf", "CDSE", "knitr")
invisible(lapply(pkg_list, library, character.only = TRUE))

## terra 1.8.42
## Linking to GEOS 3.11.1, GDAL 3.6.2, PROJ 9.1.1; sf_use_s2() is TRUE
##
## Attaching package: 'knitr'
## The following object is masked from 'package:terra':
##
##      spin
```

Get CDSE credentials

and prepare OAuth token for API access

```
creds <- read.csv("credentials.csv")
tok <- CDSE::GetOAuthToken(id = creds$clientid, secret = creds$secret)
```

Set query parameters

- Dates
- AOI file
- Which “collection” (Sentinel-2 Level L2A)

```
aoi <- sf::st_read(file.path("GIS", "Fuenteduque_aoi.gpkg"))

## Reading layer `fuenteduque_aoi' from data source
##   `/home/micha/Studies/Conferences/eLTER Science Conference Finland 2025/Workshop/elter-2025-R-works
##   using driver `GPKG'
## Simple feature collection with 1 feature and 1 field
## Geometry type: POLYGON
## Dimension:      XY
## Bounding box:   xmin: -6.444668 ymin: 36.9485 xmax: -6.316082 ymax: 37.07155
## Geodetic CRS:   WGS 84

from_date <- "2025-02-01"
to_date <- "2025-04-20"
collection <- "sentinel-2-l2a"
max_cloud <- 15
```

Get list of available images

```
img_list <- CDSE::SearchCatalog(aoi = aoi,  
                                from = from_date,  
                                to = to_date,  
                                collection = collection,  
                                token = tok)  
  
# How many images available?  
message("Number of available images: ", nrow(img_list))
```

```
## Number of available images: 76
```

Remove images with high cloud cover

```
img_list <- img_list[img_list$tileCloudCover <= max_cloud,]  
message("Number of images after cloud filtering: ", nrow(img_list))
```

```
## Number of images after cloud filtering: 16
```

```
# Which dates?  
knitr::kable(img_list$acquisitionDate)
```

x
2025-03-31
2025-03-31
2025-03-31
2025-03-31
2025-03-26
2025-03-26
2025-03-26
2025-03-26
2025-02-14
2025-02-09
2025-02-09
2025-02-09
2025-02-04
2025-02-04
2025-02-04
2025-02-04