

MISSION CE CLIMATE TRAINING V:

# Copernicus platform workshop

part 2

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# Copernicus data access

- Applications – simple, limited
  - Climate atlas - <https://atlas.climate.copernicus.eu/>
- CDS Datasets – all data, for use in other software  
<https://cds.climate.copernicus.eu>
- CDS API – automated access

# Simple data visualization

- Panoply: <https://www.giss.nasa.gov/tools/panoply/>
  - Requires Java: <https://adoptium.net/temurin/releases/>
- Example: Heatwaves and cold spells in Europe derived from climate projections  
<https://cds.climate.copernicus.eu/cdsapp#!/dataset/sis-heat-and-cold-spells>

# Dataset access in other software

- Python

- netCDF4 package

- Tutorial: <https://www.javatpoint.com/reading-netcdf-data-using-python>
    - Documentation: <https://unidata.github.io/netcdf4-python/>
    - CAMS Example: <https://gist.github.com/erget/467dba7082d31d73b20f3b5e90e740af>

- R

- ncdf4 package

- Tutorial: <https://pjbartlein.github.io/REarthSysSci/netCDF.html>
    - Documentation: <https://cran.r-project.org/web/packages/ncdf4/index.html>

- ArcGIS, QGIS

# Climate Data Store API

- Automated access to any dataset
- Tutorial in Python:  
<https://ecmwf-projects.github.io/copernicus-training-c3s/cds-tutorial.html>

```
#!/usr/bin/env python
import cdsapi
c = cdsapi.Client()
c.retrieve("reanalysis-era5-pressure-levels",
          {
            "variable": "temperature",
            "pressure_level": "1000",
            "product_type": "reanalysis",
            "year": "2008",
            "month": "01",
            "day": "01",
            "time": "12:00",
            "format": "grib"
          }, "download_grib")
```