

# Extract data from GRIB/NetCDF for a specific location and time

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Much of the data provided by the [Copernicus Atmosphere Monitoring Service \(CAMS\)](#), the [Copernicus Climate Change Service \(C3S\)](#), and by meteorological centres like [ECMWF](#) comes in GRIB or NetCDF format.

In this example we work with the [ERA5 dataset](#), hourly surface pressure (sp) for the month 2010-08, in GRIB or NetCDF format, as specified in this data retrieval CDS API script:

```
import cdsapi

c = cdsapi.Client()

c.retrieve(
    'reanalysis-era5-single-levels',
    {
        'product_type': 'reanalysis',
        'variable': 'surface_pressure',
        'year': '2010',
        'month': '08',
        'day': [
            '01', '02', '03',
            '04', '05', '06',
            '07', '08', '09',
            '10', '11', '12',
            '13', '14', '15',
            '16', '17', '18',
            '19', '20', '21',
            '22', '23', '24',
            '25', '26', '27',
            '28', '29', '30',
            '31'
        ],
        'time': [
            '00:00', '01:00', '02:00',
            '03:00', '04:00', '05:00',
            '06:00', '07:00', '08:00',
            '09:00', '10:00', '11:00',
            '12:00', '13:00', '14:00',
            '15:00', '16:00', '17:00',
            '18:00', '19:00', '20:00',
            '21:00', '22:00', '23:00'
        ]
    },
    # ----- For GRIB version, specify format and file name -----
    {
        'format': 'grib',
    },
    'e5-sp-201008xx.grib')

# ----- For NetCDF version, specify format and file name -----
{
    'format': 'netcdf',
},
'e5-sp-201008xx.nc')
```

This script retrieves a GRIB file 'e5-sp-201008xx.grib' or a NetCDF file 'e5-sp-201008xx.nc'.

See also: [How to download ERA5](#)

## Looking up data values in GRIB

We want to look up the surface pressure (sp) data value for 2010-08-05 00:00, at the model point closest to lon=7.36 lat=43.89.

Install [ECMWF ecCodes](#), then look up the data value with the `grib_ls` command:

```
grib_ls -l 43.89,7.36,1 -w dataDate=20100805,dataTime=0000 -p shortName e5-sp-201008xx.grib
```

Output:

```
...
shortName      value
sp             88510
...
Input Point: latitude=43.89 longitude=7.36
Grid Point chosen #3 index=84109 latitude=43.98 longitude=7.50 distance=15.11 (Km)
...
```

## Looking up data values in NetCDF

We want to look up the surface pressure (sp) data value for 2010-08-05 00:00, at the model point closest to lon=7.36 lat=43.89.

Install [CDO](#), then look up the data value:

```
cdo -outputtab,lon,lat,date,time,value -selyear,2010 -selmonth,08 -selday,05 -seltime,00:00 -remapnn,lon=7.36_lat=43.89 e5-sp-201008xx.nc
```

Output:

```
#   lon   lat   date   time   value
...
7.36 43.89 2010-08-05 00:00:00 88360.6
...
```

## Notes

The results from the GRIB and NetCDF versions are slightly different, because the GRIB data is in the original grid and resolution, while the NetCDF data was regridded.

*This document has been produced in the context of the Copernicus Atmosphere Monitoring Service (CAMS) and Copernicus Climate Change Service (C3S).*

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## Related articles

- [ECCODES ERROR : Wrong number of fields ... Try using the -T option](#)
- [ERA5: What is the spatial reference](#)
- [Extract data from GRIB/NetCDF for a specific location and time](#)
- [How to convert GRIB to CSV](#)
- [How to convert NetCDF to CSV](#)