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UNIVERSITÀ DEGLI STUDI FIRENZE
DISPAA
DIPARTIMENTO DI SCIENZE DELLE PRODUZIONI AGROALIMENTARI E DELL'AMBIENTE

UNIVERSITÄT FÜR BODENKULTUR WIEN
BOKU
DEPARTMENT FÜR WASSER-ATMOSPHÄRE UMWELT

EUROPEAN COMMISSION
Horizon 2020
EUROPEAN UNION FUNDING FOR RESEARCH & INNOVATION

Workshop 2018

European Centre for Medium range Weather Forecast public datasets, availability and use

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The European Centre for Medium-Range Weather Forecasts (ECMWF) is an independent intergovernmental organization supported by 34 states, based in Reading, UK. It was established in 1975.

ECMWF is both a research institute and a 24/7 operational service, producing and disseminating numerical weather predictions to its Member States. This data is fully available to the national meteorological services in the Member States. The Centre also offers a catalogue of forecast data that can be purchased by businesses worldwide and other commercial customers.

A big amount of public datasets is provided on ECMWF web pages, work on adding more data and forecasts from different origins is in progress. Access to these datasets is provided free of charge. Terms and conditions may apply for individual dataset

Public datasets cover

- global reanalysis
- regional reanalysis
- multi model seasonal forecast
- multi model medium range forecast
- archived data
- observation feedback

Data are in GRIB and NetCDF format.

GRIB (**GRI**dded **B**inary) concise data format commonly used in meteorology.

NetCDF (**Net**work **C**ommon **D**ata **F**orm) - and self-describing, machine-independent data formats that support the creation, access, and sharing of array-oriented scientific data.

Instructions and manuals are easy to follow on the web site
http://apps.ecmwf.int/datasets/

The Meteorological Archival and Retrieval System (MARS) is the main repository of meteorological data at ECMWF. It contains petabytes of operational and research data, as well as data from Special Projects.

Users can browse the archive catalogue describing archive data that ECMWF can distribute.

Before you start...

You have to register as a public user.

Python has to be installed on your PC for simple writing of requirements and downloading data.

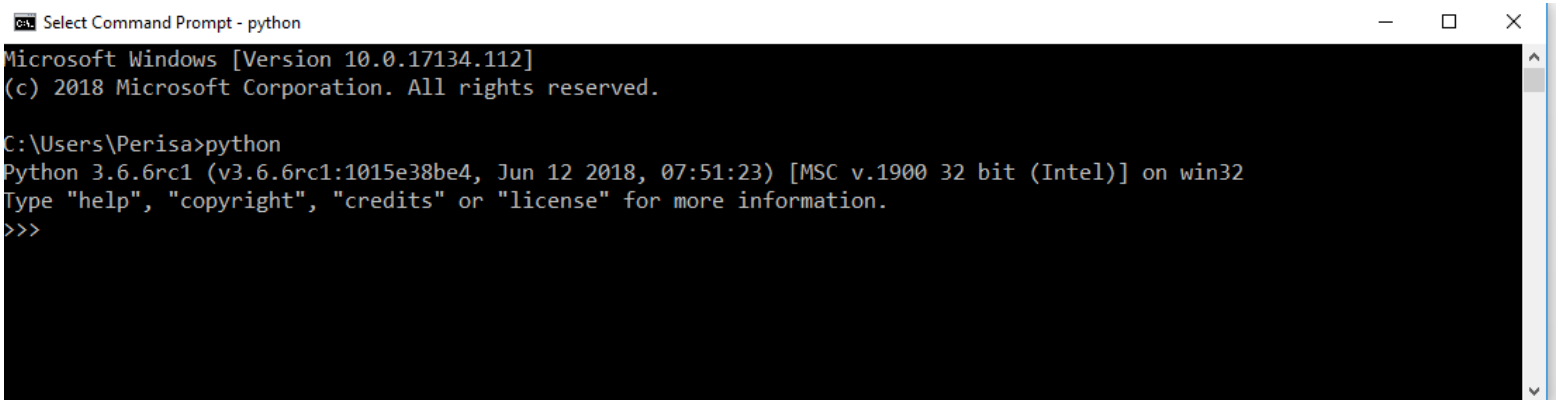
Add Python to the PATH Environmental Variable

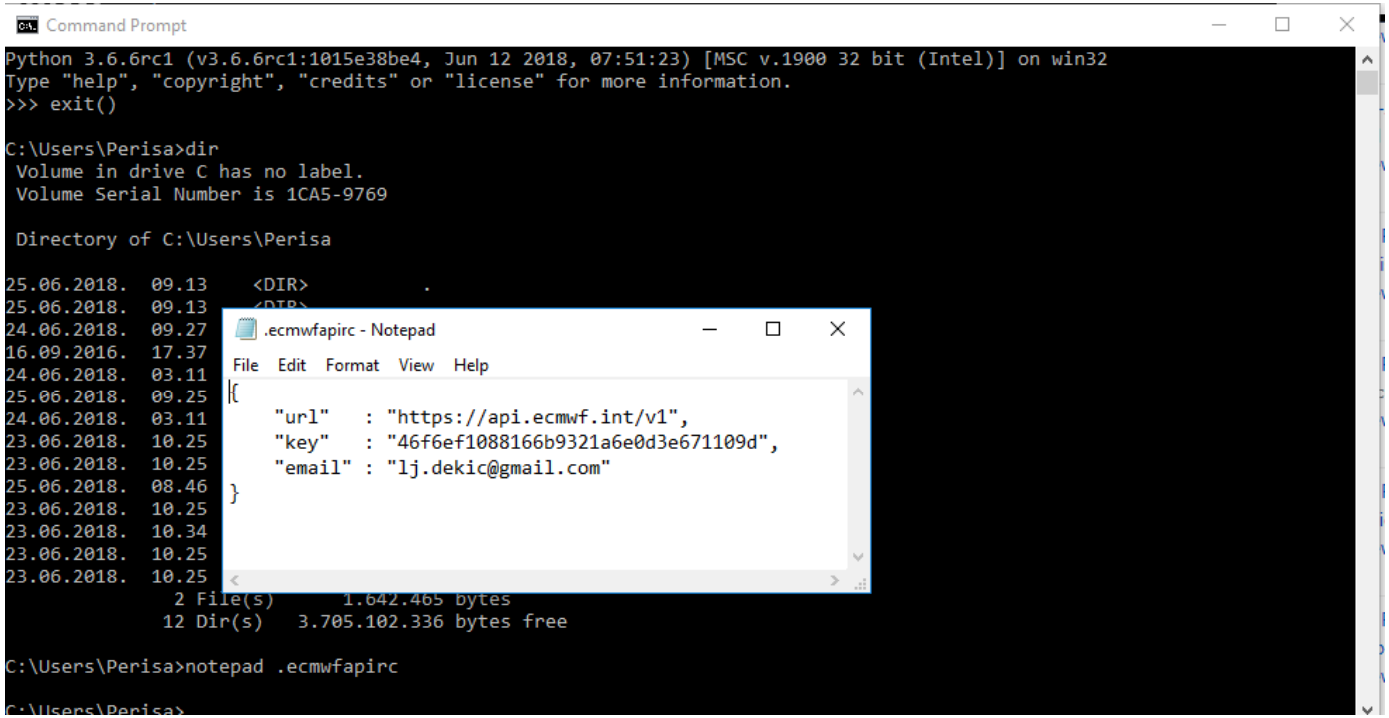
Install pip.

Download get-pip.py and run from command prompt *python get-pip.py*

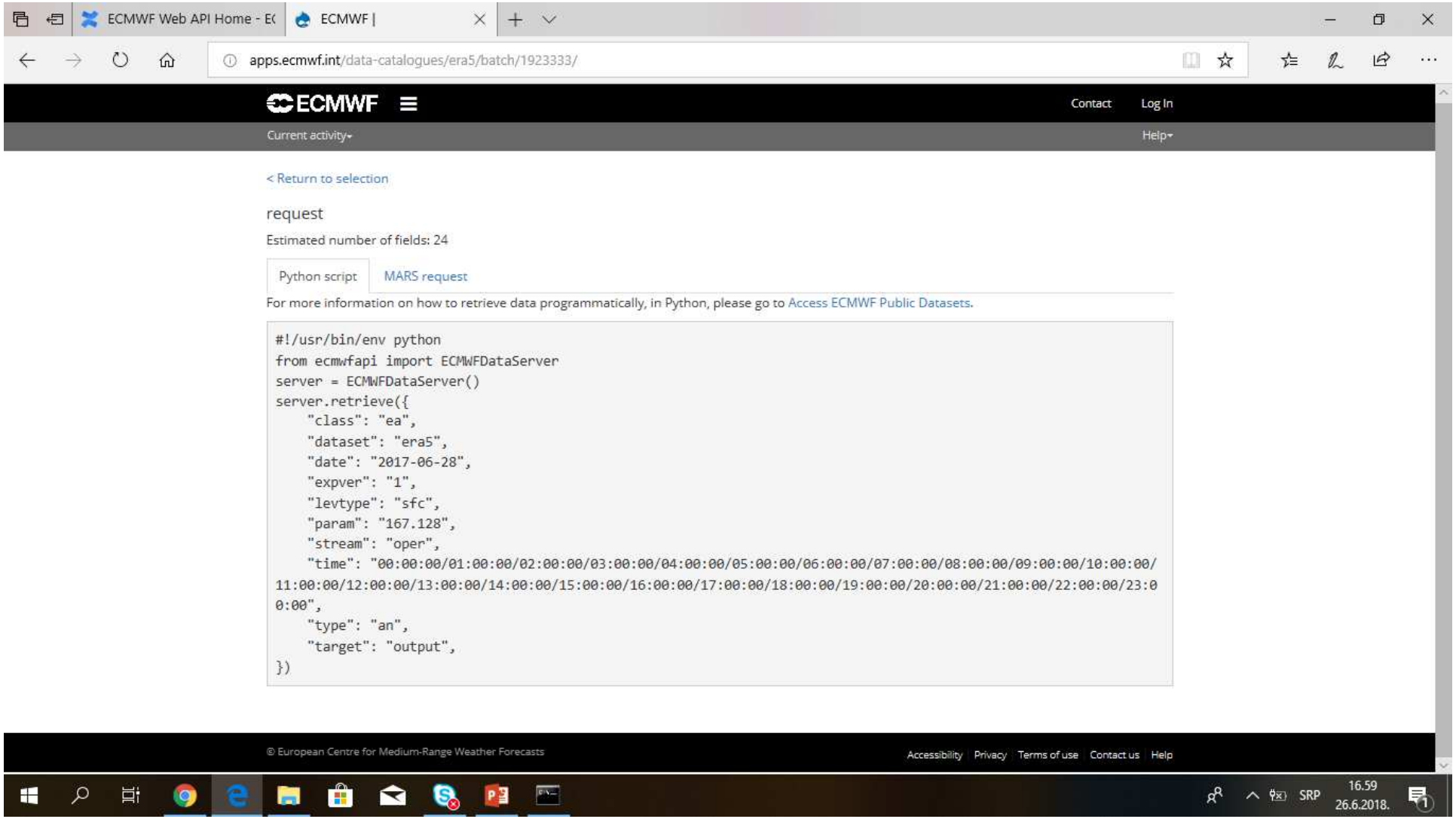
How to retrieve data from MARS? By using ECMWF WebAPI.

https://software.ecmwf.int/wiki/display/WEBAPI/ECMWF+Web+API+Home


Select Command Prompt - python
Microsoft Windows [Version 10.0.17134.112]
(c) 2018 Microsoft Corporation. All rights reserved.
C:\Users\Perisa>python
Python 3.6.6rc1 (v3.6.6rc1:1015e38be4, Jun 12 2018, 07:51:23) [MSC v.1900 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>


Command Prompt
Python 3.6.6rc1 (v3.6.6rc1:1015e38be4, Jun 12 2018, 07:51:23) [MSC v.1900 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> exit()
C:\Users\Perisa>dir
Volume in drive C has no label.
Volume Serial Number is 1CA5-9769
Directory of C:\Users\Perisa
25.06.2018. 09.13 <DIR> .
24.06.2018. 09.27
16.09.2016. 17.37
24.06.2018. 03.11
25.06.2018. 09.25
24.06.2018. 03.11
23.06.2018. 10.25
23.06.2018. 10.25
25.06.2018. 08.46
23.06.2018. 10.25
23.06.2018. 10.34
23.06.2018. 10.25
23.06.2018. 10.25
2 File(s) 1.642.465 bytes
12 Dir(s) 3.705.102.336 bytes free
C:\Users\Perisa>notepad .ecmwfapirc
.ecmwfapirc - Notepad
File Edit Format View Help
{
"url" : "https://api.ecmwf.int/v1",
"key" : "46f6ef1088166b9321a6e0d3e671109d",
"email" : "lj.dekic@gmail.com"
}

```
C:\Users\Perisa>notepad .ecmwfapirc

C:\Users\Perisa>pip install https://software.ecmwf.int/wiki/download/attachments/56664858/ecmwf-api-client-python.tgz
Collecting https://software.ecmwf.int/wiki/download/attachments/56664858/ecmwf-api-client-python.tgz
  Using cached https://software.ecmwf.int/wiki/download/attachments/56664858/ecmwf-api-client-python.tgz
Requirement already satisfied (use --upgrade to upgrade): ecmwf-api-client==1.5.0 from https://software.ecmwf.int/wiki/d
ownload/attachments/56664858/ecmwf-api-client-python.tgz in c:\users\perisa\appdata\local\programs\python\python36-32\li
b\site-packages
Building wheels for collected packages: ecmwf-api-client
  Running setup.py bdist_wheel for ecmwf-api-client ... done
  Stored in directory: C:\Users\Perisa\AppData\Local\pip\Cache\wheels\bb\37\91\4fff76aca1464c04d6ae48e52c71d90c618dbb3e2
91b962485
Successfully built ecmwf-api-client

C:\Users\Perisa>
```


ECMWF Web API Home - EC
ECMWF |
apps.ecmwf.int/data-catalogues/era5/batch/1923333/
ECMWF
Contact
Log In
Current activity
Help
< Return to selection
request
Estimated number of fields: 24
Python script
MARS request
For more information on how to retrieve data programmatically, in Python, please go to Access ECMWF Public Datasets.
#!/usr/bin/env python
from ecmwfapi import ECMWFDataServer
server = ECMWFDataServer()
server.retrieve({
"class": "ea",
"dataset": "era5",
"date": "2017-06-28",
"expver": "1",
"levtype": "sfc",
"param": "167.128",
"stream": "oper",
"time": "00:00:00/01:00:00/02:00:00/03:00:00/04:00:00/05:00:00/06:00:00/07:00:00/08:00:00/09:00:00/10:00:00/11:00:00/12:00:00/13:00:00/14:00:00/15:00:00/16:00:00/17:00:00/18:00:00/19:00:00/20:00:00/21:00:00/22:00:00/23:00:00",
"type": "an",
"target": "output",
})
© European Centre for Medium-Range Weather Forecasts
Accessibility
Privacy
Terms of use
Contact us
Help
SRP
16.59
26.6.2018.

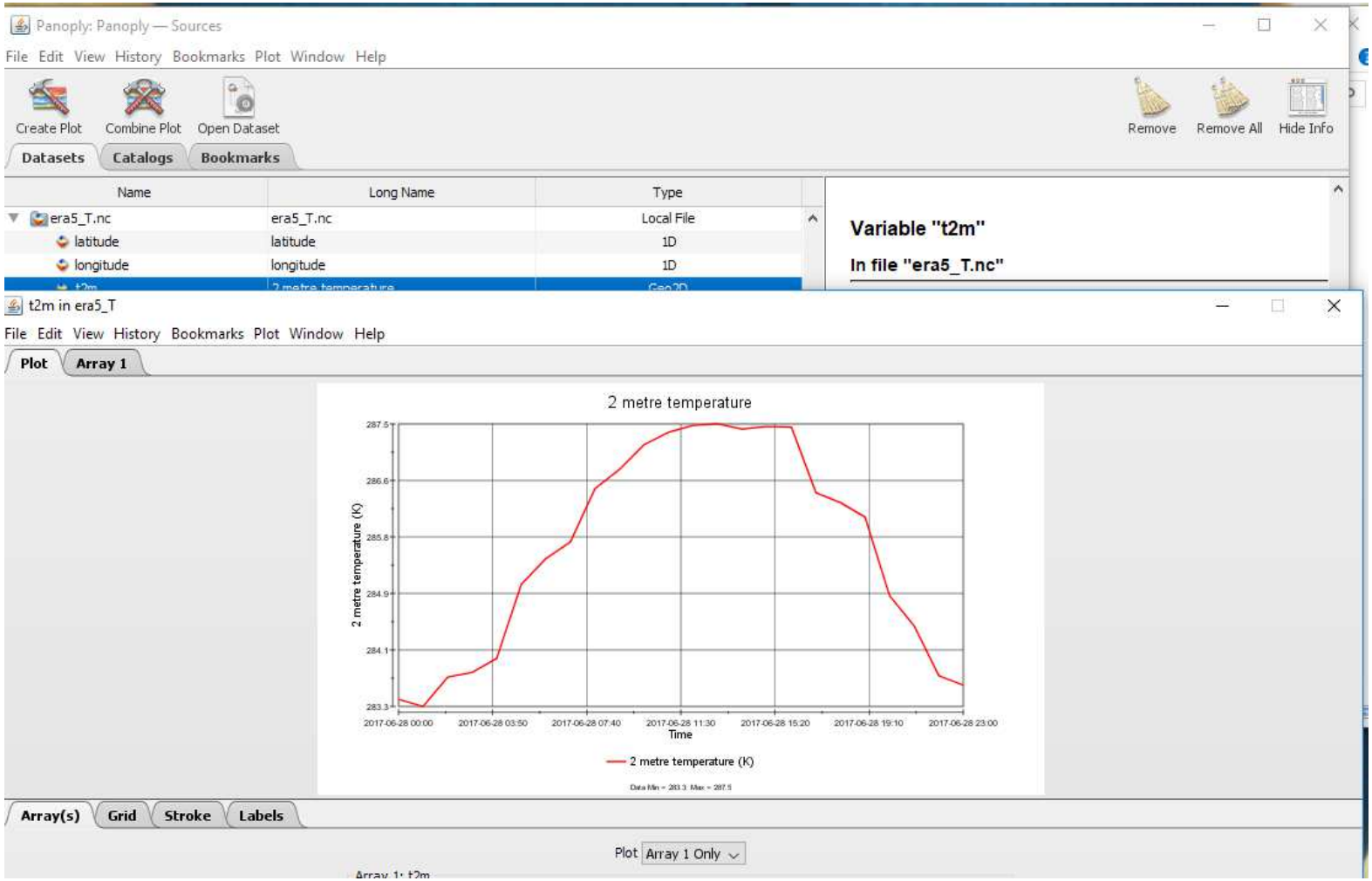
getera5 - Notepad

File Edit Format View Help

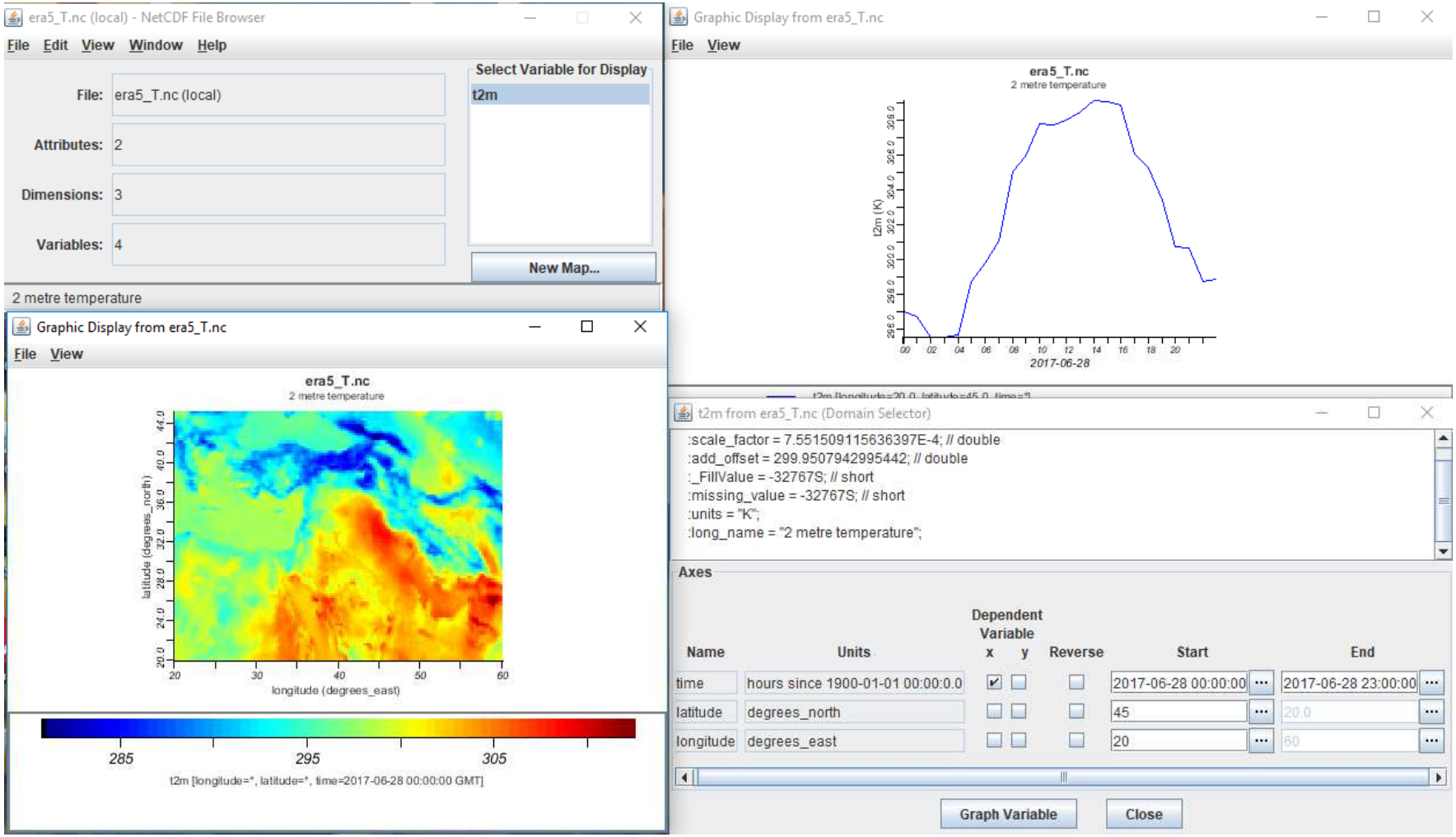
```
#!/usr/bin/env python
from ecmwfapi import ECMWFDataServer

server = ECMWFDataServer()
server.retrieve({
    "class": "ea",
    "dataset": "era5",
    "expver": "1",
    "stream": "oper",
    "type": "an",
    "levtype": "sfc",
    "param": "167.128",
    "date": "2017-06-28",
    "time": "00:00:00/01:00:00/02:00:00/03:00:00/04:00:00/05:00:00/06:00:00/07
    "step": "0",
    "grid": "0.25/0.25",
    "area": "60/-20/20/60",
    "format": "netcdf",
    "target": "era5_T.nc"
})
```

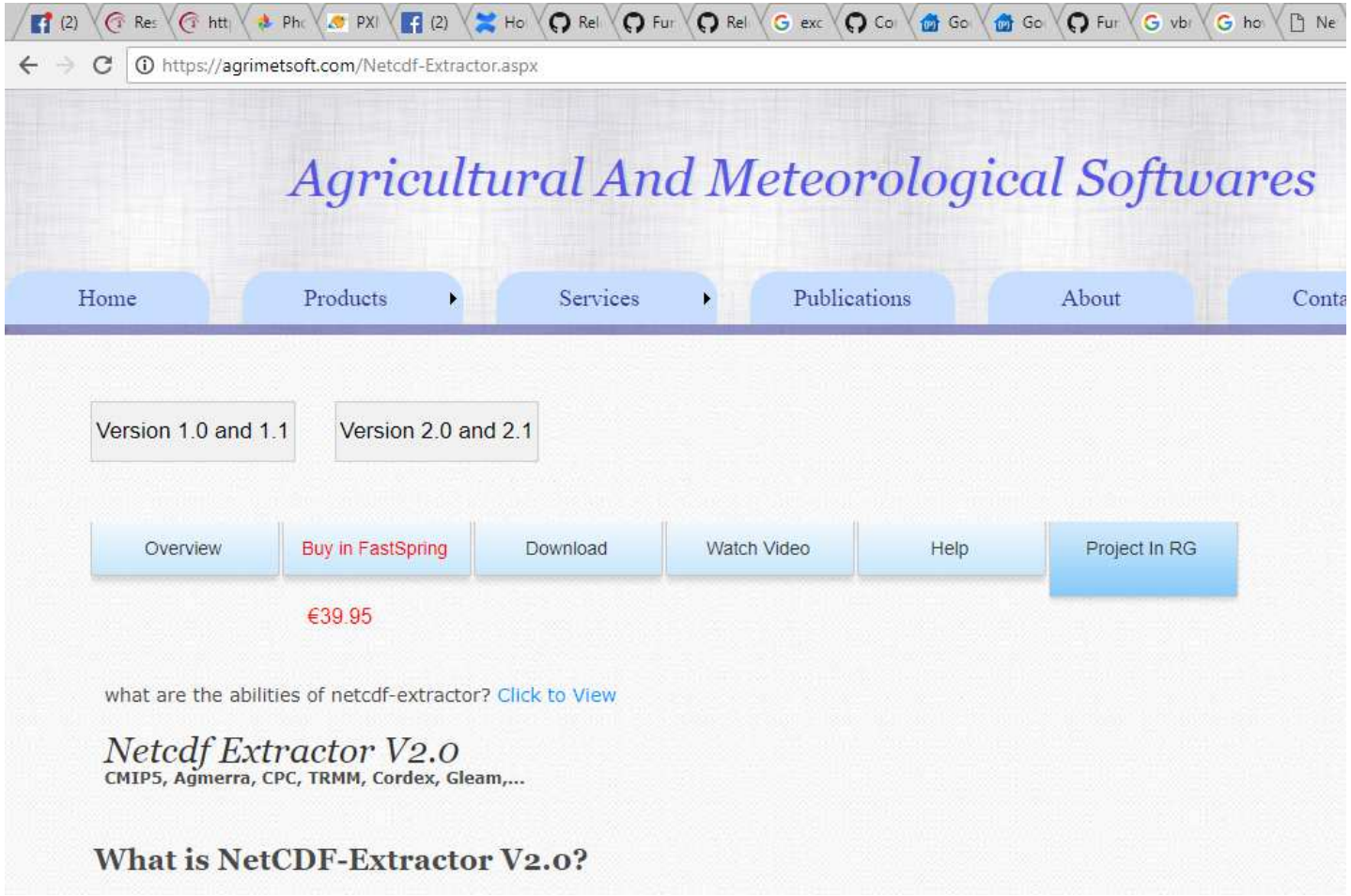
Run this script - python requirements.py
NetCDF data will be in target file on your PC.

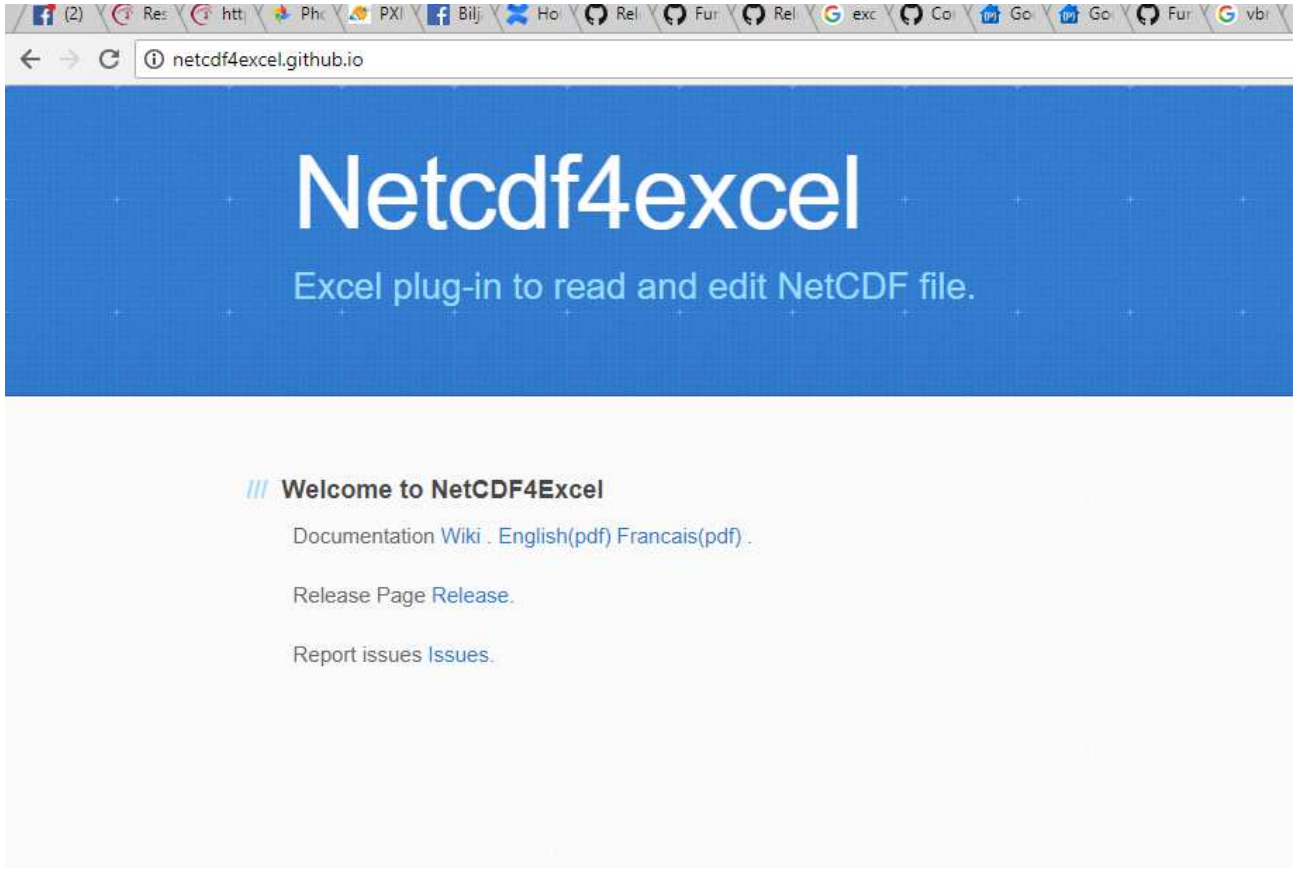
Panoply


Panoply: Panoply — Sources
File Edit View History Bookmarks Plot Window Help
Create Plot
Combine Plot
Open Dataset
Remove
Remove All
Hide Info
Datasets
Catalogs
Bookmarks
Name
Long Name
Type
era5_T.nc
era5_T.nc
Local File
latitude
latitude
1D
longitude
longitude
1D
Variable "t2m"
In file "era5_T.nc"
t2m in era5_T
File Edit View History Bookmarks Plot Window Help
Plot
Array 1
2 metre temperature
2 metre temperature (K)
Time
2 metre temperature (K)
Array(s)
Grid
Stroke
Labels
Plot
Array 1 Only

ncBrowse


era5_T.nc (local) - NetCDF File Browser
File Edit View Window Help
File: era5_T.nc (local)
Attributes: 2
Dimensions: 3
Variables: 4
Select Variable for Display
t2m
New Map...
2 metre temperature
Graphic Display from era5_T.nc
File View
era5_T.nc
2 metre temperature
latitude (degrees_north)
longitude (degrees_east)
285
295
305
t2m [longitude=*, latitude=*, time=2017-06-28 00:00:00 GMT]
Graphic Display from era5_T.nc
File View
era5_T.nc
2 metre temperature
t2m (K)
2017-06-28
t2m from era5_T.nc (Domain Selector)
:scale_factor = 7.551509115636397E-4; // double
:add_offset = 299.9507942995442; // double
:_FillValue = -32767S; // short
:missing_value = -32767S; // short
:units = "K";
:long_name = "2 metre temperature";
Axes
Name
Units
Dependent Variable x
y
Reverse
Start
End
time
hours since 1900-01-01 00:00:0.0
2017-06-28 00:00:00
2017-06-28 23:00:00
latitude
degrees_north
45
20.0
longitude
degrees_east
20
60
Graph Variable
Close


https://agrimetsoft.com/Netcdf-Extractor.aspx
Agricultural And Meteorological Softwares
Home
Products
Services
Publications
About
Version 1.0 and 1.1
Version 2.0 and 2.1
Overview
Buy in FastSpring
Download
Watch Video
Help
Project In RG
€39.95
what are the abilities of netcdf-extractor? Click to View
Netcdf Extractor V2.0
CMIP5, Agmerra, CPC, TRMM, Cordex, Gleam,...
What is NetCDF-Extractor V2.0?


netcdf4excel.github.io
Netcdf4excel
Excel plug-in to read and edit NetCDF file.
Welcome to NetCDF4Excel
Documentation Wiki . English(pdf) Francais(pdf) .
Release Page Release.
Report issues Issues.

ERA5

combines vast amounts od historical observations into global estimates using advanced modelling and data assimilation systems.

- so far covers the period 2008-present will cover the period January 1950 to near real time.

- was produced using 4D-Var data assimilation of ECMWF's Integrated Forecast System (IFS)

- Atmospheric data are available on 137 model levels; also interpolated to 37 pressure, 16 potential temperature and 1 potential vorticity level(s).

- Surface level data are also available, containing 2D parameters such as precipitation, 2m temperature, top of atmosphere radiation and vertical integrals over the entire atmosphere.

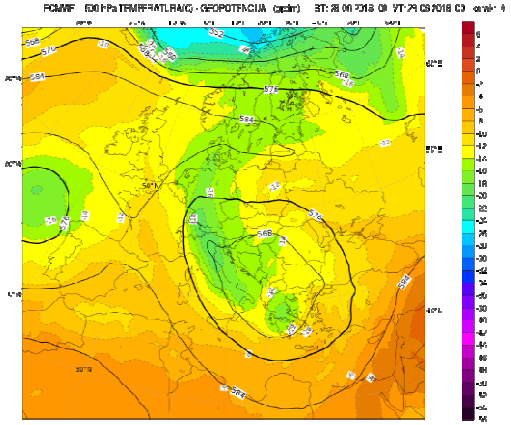
- The IFS is coupled to a soil model, the parameters of which are also designated as surface parameters, and an ocean wave model.

- The ERA5 dataset contains one (31 km) high resolution realisation (HRES) and a reduced resolution ten member ensemble (EDA).

http://apps.ecmwf.int/data-catalogues/era5/?class=ea

Copernicus is the European Union's Earth Observation Programme, looking at our planet and its environment for the ultimate benefit of all European citizens. It offers information services based on **satellite Earth Observation and in situ (non-space) data**.

https://cds.climate.copernicus.eu/cdsapp#!/home



Instead of Thank you

ECMWF 10 days forecast