Guidelines from NWP and Metar data to imagery

Introduction

This guide explains how to generate images from a selection of ECMWF NWP data and from METAR.

ECMWF NWP data is retrieved from different cloud archive sources and Metar data is downloaded from UNIDATA's THREDDS.

ECMWF NWP can be retrieved from 21 January 2022. Metar data from UNIDATA's THREDDS is available only from the last 7-10 days.

Generating Imagery

1. Open a terminal window, going to File->New->Terminal, like in the following image:
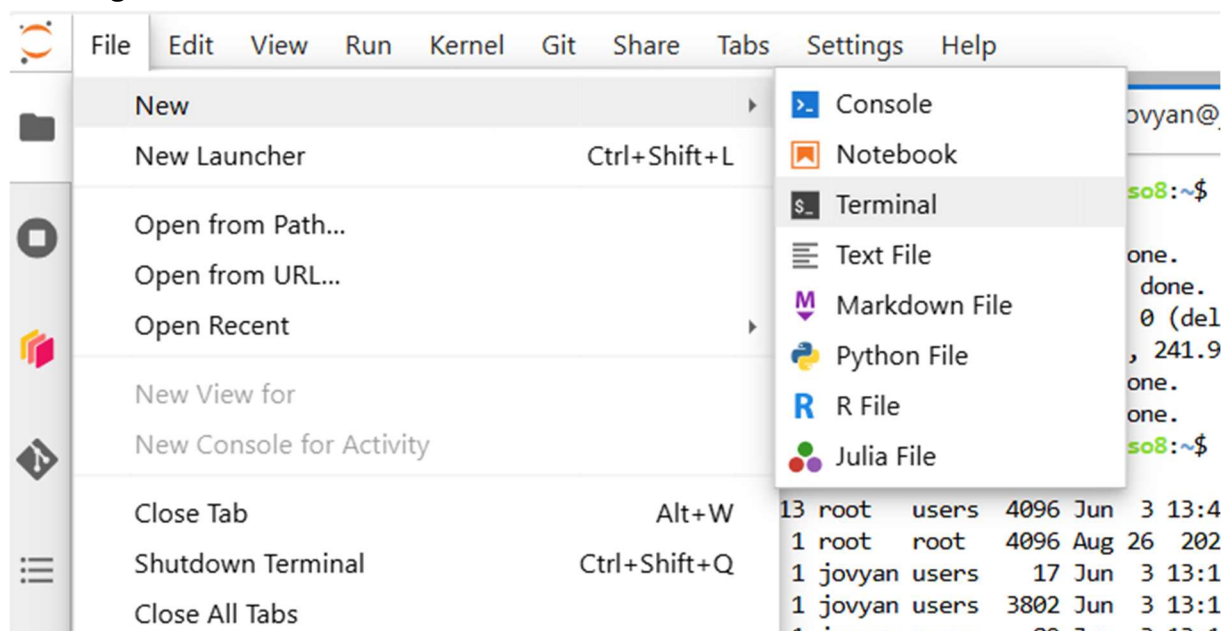
In the terminal window navigate to **$HOME/dataplotting/** folder:

```
cd $HOME/dataplotting/
```

Make sure you don't have any active environment:

```
conda deactivate
```

Activate **nwp** environment:

```
conda activate nwp
```

You can now edit the file **call.sh** (double clicking the file or you may want to use the vi editor in the command line), which contents look like:

```
DATE_NWP="2025-05-26 00:00"
#WEST SOUTH EAST NORTH
EXTENT="-20.0 -40.0 60.0 40.0"

python main_displ_geopot.py --date_nwp "$DATE_NWP" --extent $EXTENT
python main_displ_mslp.py --date_nwp "$DATE_NWP" --extent $EXTENT
python main_displ_humid.py --date_nwp "$DATE_NWP" --extent $EXTENT
python main_displ_windbarbs.py --date_nwp "$DATE_NWP" --extent $EXTENT
python main_displ_windspeed.py --date_nwp "$DATE_NWP" --extent $EXTENT
python main_displ_metar.py --date_metar "$DATE_NWP" --extent $EXTENT
```

You can change the variables **DATE_NWP** and **EXTENT. Please confirm you are using the correct format for these variables, i.e.:**

DATE_NWP="YYYY-MM-DD hh:00"

EXTENT=" WEST SOUTH EAST NORTH"

Please note you can select ECMWF NWP data since 2022.

If you leave the script as is, it will generate image displays for the following variables:

NWP variable (ECMWF)
geopotential height (500 hPa)
MSLP
Humidity (850hPa)
Winds (500 hPa)
Windspeed (500 hPa)

The last line in **call.sh** script is to generate **METAR** data display. Please note that the server from which this data is being downloaded is limited to the last 7 days (approximately) - UNIDATA's THREDDS TDS is designed primarily for real-time and recent data access, not long-term archiving. Historical METAR archives are not retained long-term on this server- ~7 days (rolling)

You can now run the script in the command line:

```
./call.sh
```

You should be able to find the output images inside the folder **$HOME/dataplotting /output/**

To copy these files to your local PC you may wish to compress them.

- Open a terminal window and copy & paste the following line commands:

```
cd $HOME/dataplotting /output/
```

```
tar -cvf images.tar *
```

```
bzip2 images.tar
```

You should find the file with bz2 extension under **$HOME/dataplotting /output/** folder.

On the navigation window click on the file and with the right-hand button of your mouse select download. The compressed file will be downloaded to your local computer.

Note: you may wish to make a copy of call.sh script so that you can modify it without losing the original file:

```
cd $HOME/dataplotting
cp call.sh mycall.sh
```

You can now modify your **mycall.sh** file as you wish.

References:

The dataplotting code package is using **Herbie** (Blaylock, B. K. (2023), a python package that downloads recent and archived numerical weather prediction (NWP) model output from different cloud archive sources:

`prioriy=`	Data source	Archive Duration
`"ecmwf"`	ECMWF Open Data Server	last 4 days
`"azure"`	Microsoft Azure	2022-01-21 to present
`"aws"`	Amazon Web Services	2023-01-18 to present

Herbie: Retrieve Numerical Weather Prediction Model Data (Version 2023.3.0)

Computer software: https://github.com/blaylockbk/Herbie