

# Climate Data Collection and Analysis: Computer Setup

During this workshop, we will use a few open-source tools to process data and create visualizations. To try to make this as painless as possible, we are providing a short document detailing how to install each piece of software.

All software we will work with is **free** and **open-source**. It will also work on all computer platforms (Mac, Windows, Linux), and does not take up too much space on your computer.

## Python Setup

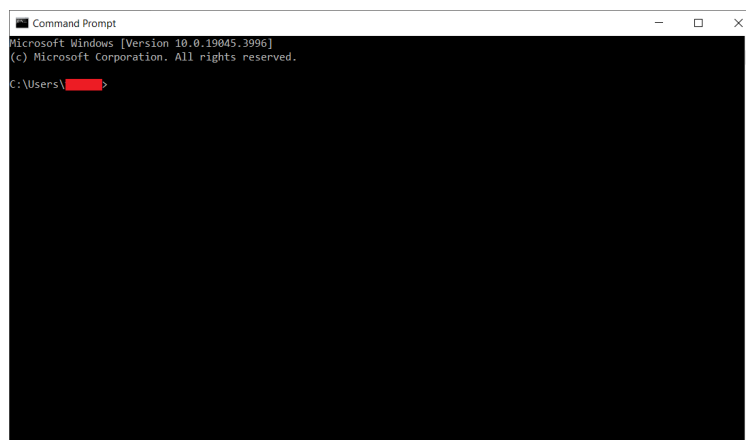
The main program we will use is [Python](#), which is a powerful multi-purpose computer program. Within Python, we will use a few additional *modules* which provide extra functionality for data processing, creating graphics, and performing regular tasks on your computer like moving data.

To install python, you can follow the instructions at <https://www.python.org/downloads/release/python-3122/>, which has downloads for each different operating system.

It is also possible to use *conda* to install all modules. Documentation for this can be found here: <https://docs.anaconda.com/free/miniconda/index.html>

## Further Python Setup

Once you have installed python, we need to install a couple of extra modules. To do so, you need to open up your Python command line, which should be available once you have it installed. The exact location of this program will vary depending on your operating system, but will usually look like this:



You can now install modules using *pip*, which is a built-in program to add python *modules*. During this course, we will use several modules, which can all be installed at once via the command:

```
pip3 install matplotlib numpy pandas earthengine-api jupyter-notebook  
pip3 install ipyleaflet shapely scipy geopandas geemap cartopy rasterio
```

This will download and install all of the required modules for this course.

If you have chosen to use *conda* instead, the commands are:

```
conda install -c conda-forge matplotlib numpy pandas earthengine-api jupyter-notebook
conda install -c conda-forge ipyleaflet shapely scipy geopandas geemap cartopy rasterio
```

## Linking your Google Earth Engine Account

We will make extensive use of the [Google Earth Engine](https://code.earthengine.google.com/) platform, which allows us to access very large data sets and computational power for free. Registration as a non-commercial user can be found here: <https://code.earthengine.google.com/register>, which requires a Google account. Account activation usually goes quickly, but can sometimes take a few days! Hopefully everyone has managed to register an account before the workshop has started.

## Launching Jupyter Notebook or Google Colab

During this workshop, we will provide *Jupyter Notebooks*, which are an easy way to distribute both code and commentary, and which can be run in a web browser. More details can be found [here](#). If you prefer, the codes that we provide can also be run via [Google Colab](#), which you can also register for. This is another way to access Google Earth Engine without installing any software. For more details, see [here](#).

To launch a notebook on your computer, navigate to where you have saved the *.ipynb* files we have provided. Then, copy the file path (e.g., C:/Users/.../Climate Data for Specific Locations.ipynb) and type:

```
jupyter notebook C:/Users/.../Climate Data for Specific Locations.ipynb
```

This will launch the web-based platform where we will run our analysis and create visualizations.

Within each of the exercises we provide, there are more details and specifics about which Python modules we will use.

## QGIS

While QGIS will not be the main focus of the workshop, it is useful for looking at some of the outputs of our analysis. For example, it is quick and easy to open an image file that represents elevations, rainfall patterns, or temperatures and to modify the color scales for interpretation. This program is not necessary to follow along with the exercises, but can be useful to have!

It can be downloaded from: <https://qgis.org/en/site/forusers/download.html>