

ENERGY SYSTEM MODELLING (ESM)

November 13, 2025

Dear student,

In this module of the GEO4-2011 course, we will utilize Jupyter Notebooks. To ensure seamless interaction with all course materials, we kindly request that you install specific Python packages. It is highly recommended that you establish a new Anaconda environment for this purpose, as some packages may conflict with those already installed on your system. Creating a distinct environment ensures that the dependencies needed for this course remain isolated and do not disrupt your prior work.

INSTALLATION GUIDELINES

STEP 1

Open Anaconda Ver.2.6.6 on your Windows laptop.

Go to Environments, click on “*CREATE*” (*plus sign*) at the bottom left of the environment page.

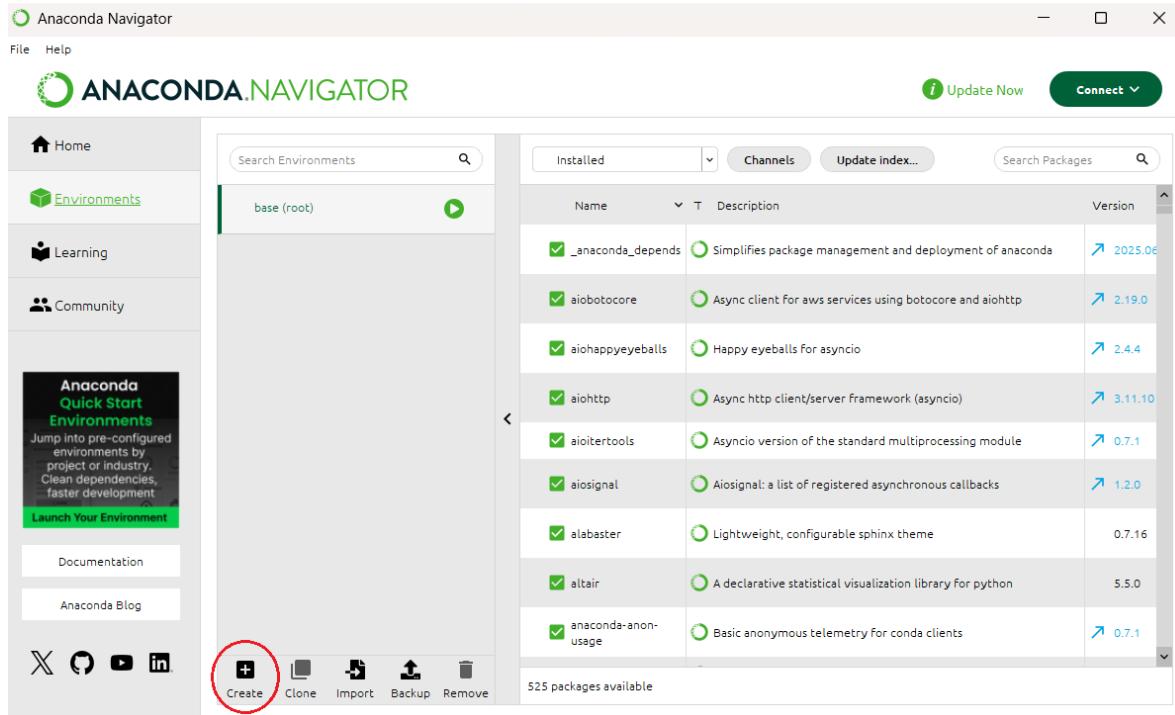


Figure 1: Creating an environment in Anaconda

On the pop-up window, as illustrated in Figure 2, enter the new environment name “**ESM**” (or your preferred alternative name).

Choose Python Ver. 3.13 and **do not choose R** for this step.

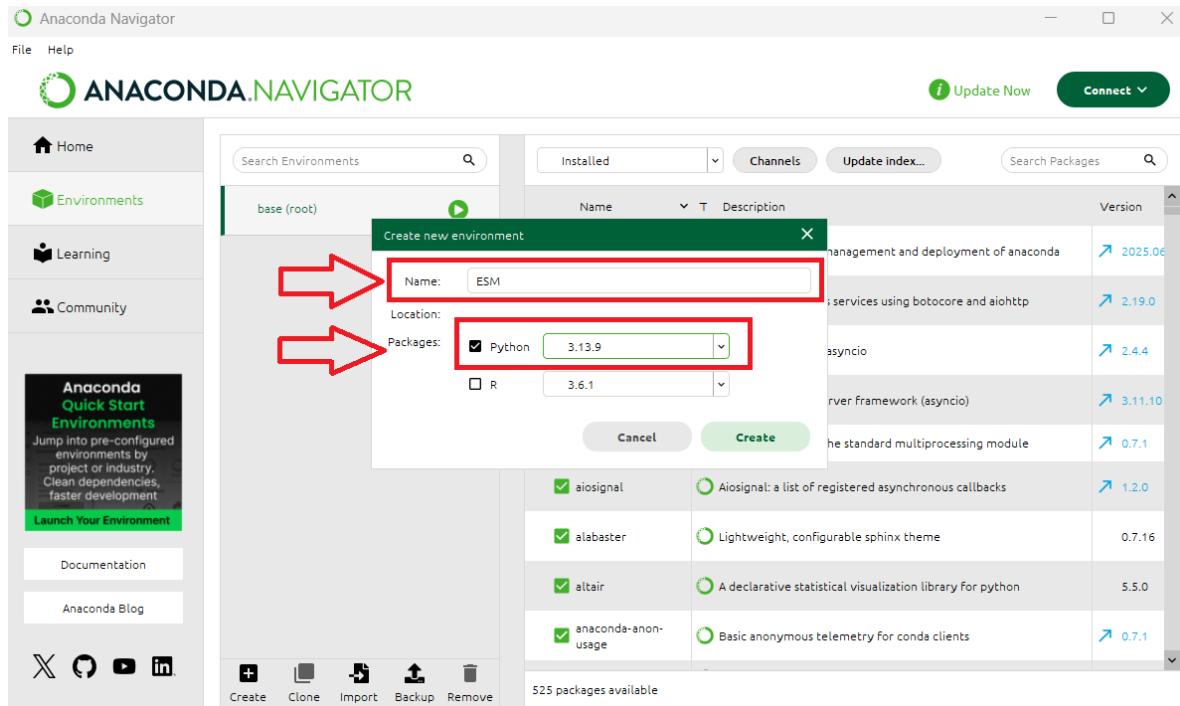


Figure 2: Renaming the Environment and Choosing the Python package

STEP 2

Click on the newly created environment (*titled ESM*) and Press **PLAY**. From the list of options, click ***Open Terminal***, and the command prompt appears as shown in Figure 3. Note that the environment name should appear in parentheses before the path, in this case (ESM).

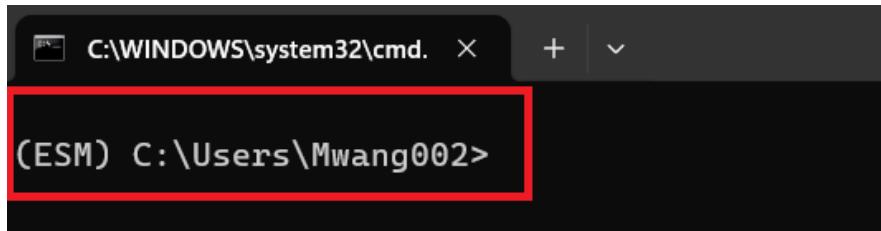


Figure 3: Open Terminal *cmd* prompt for the ESM environment

STEP 3

Let's install the necessary packages for this course. The list is extensive as it includes dependencies for the specific tools we'll be using. Let's initiate the installation of all packages available through the terminal in Figure 3.

NB:

When prompted, confirm the download by typing '**Y**' and pressing enter. Also, you may see this Error message during installations. Be patient, the environment resolves it in less than a minute as shown in Figure 4. If you see any other errors, please notify one of the instructors.

```
C:\WINDOWS\system32\cmd.exe - conda install cython h5py matplotlib pandas xarray netcdf4 h5netcdf scipy numpy - conda install... — □ ×

(ESM) C:\Users\Mwang002>conda install cython h5py matplotlib pandas xarray netcdf4 h5netcdf scipy numpy
Error while loading conda entry point: anaconda-cloud-auth (cannot import name 'ChannelAuthBase' from 'conda.plugins.types' (C:\Users\Mwang002\AppData\Local\anaconda3\Lib\site-packages\conda\plugins\types.py))
Error while loading conda entry point: anaconda-cloud-auth (cannot import name 'ChannelAuthBase' from 'conda.plugins.types' (C:\Users\Mwang002\AppData\Local\anaconda3\Lib\site-packages\conda\plugins\types.py))
Retrieving notices: ...working... done
Collecting package metadata (current_repodata.json): done
Solving environment: done
```

Figure 4: Anaconda Cloud Authentication Error during installation [disregard it]

STEP 3A

Install initial packages (*copy the whole line of code below and right click on the terminal; that automatically pastes it there. OR simply type it in*):

```
conda install cython h5py matplotlib pandas xarray netcdf4 h5netcdf scipy numpy
```

STEP 3B

Install the API needed to download weather data from the Copernicus database:

```
conda install conda-forge::cdsapi
```

OR

```
pip install --user cdsapi
```

STEP 3C

Install Rioxarray and Geopandas in the active environment:

```
pip install rioxarray
```

```
pip install --user geopandas
```

In case your Anaconda is outdated, you can run this command to update it:

```
conda update -n base -c defaults conda
```

CONCLUSION

Right now, all packages should be installed.

Go back to **HOME** and check if the active environment is correct as illustrated in Figure 5.

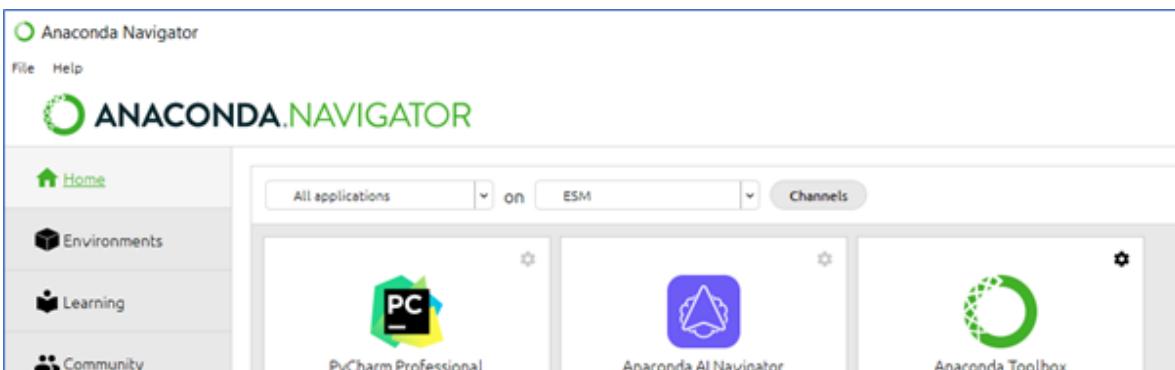


Figure 5: Checking that the active environment runs on the Home Page

In this active environment, go to Jupyter Notebooks and install. Once installed, use the launch button to open the Jupyter Notebook in your browser. Navigate to the folder on your laptop where you downloaded the tutorial notebooks from Blackboard and open the `.ipynb` file for a given tutorial in the browser.

All the best following this part of the course!

Prepared by the Energy Systems Modelling Teaching Team

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