Computer Set Up Instructions for NEODAAS & FSF Training Course

These instructions require downloading various software packages, some of which are quite large. Before starting make sure you have a good internet connection at least 10 GB of free hard drive space and ideally admin permissions on your machine. Depending on the speed of your internet connection and machine it is expected to take 1 - 2 hours to install all the software.

After each step read the outputs very carefully for error messages before proceeding to the next step. Note sometimes there are errors when copy and pasting the commands from this document into the terminal, if you encounter problems then try typing the command out.

Python Software

Many of the tutorials will be using Python, for these we'll install Anaconda from: https://www.anaconda.com/products/individual

For details of how to install, view the following video: Installing Anaconda (username neodaas-fsf, password are neodaas-fsf-2021)

As there are a lot of different packages to install, we'll be using different 'environments' for each of them. For an overview on setting up environments see this video on Anaconda Environments, please note that this video was produced for another course so you don't have to install the packages specified in the video.

You will need to set up the following environments:

Airborne Processing Software (hyperspectral practical)

1. Create an environment called 'airborne'
2. Within this environment, installed the required packages using:

```
conda install -c https://data.neodaas.ac.uk/files/conda/ apl

conda install -c https://data.neodaas.ac.uk/files/conda/ arsf_tools

conda install -c conda-forge tuiview
```

Check the tools have been installed correctly by typing:

aplmask -help

Into the command window which should print out information about how to use the aplmask command then next type:

tuiview

Which should open the tuiview window.

Note that the apl package for mapping airborne data are only available on Windows and Linux, if you are using macOS install arsf_tools and tuiview and follow the instructions for 'Running APL using Docker'.

Py6S (atmospheric correction practical)

1. Create an environment called Py6S
2. Within this environment, install the required packages using

```
conda install -c conda-forge py6s jupyterlab git matplotlib
```

```
conda install -c https://data.neodaas.ac.uk/files/conda/ pyspectra
```

ARCSI (atmospheric correction practical)

1. Create an environment called 'arcsi'
2. Within this environment, install the required packages using

```
conda install -c conda-forge arcsi python=3.8
```

This will likely take a while to install as it needs to download and unpack a lot of packages. Once the install has finished check by typing:

```
arcsi.py
```

This should print information about ARCSI and some help, if there are warning or error messages this means it has not been installed correctly so please contact the course instructors for advice.

FSF (Day 3 Practical)

1. Create a python environment called 'specdal'
2. Within this environment, install the required packages using:

```
conda install -c conda-forge pandas matplotlib numpy scipy git pathlib jupyterlab
```

```
conda install -c https://data.neodaas.ac.uk/files/conda/ specdal
```

3. We will also be using ESA's scientific toolbox, SNAP, for analysing multispectral data. Download SNAP from https://step.esa.int/main/download/snap-download/ and install by following Installing SNAP video

ACOLITE (Atmospheric correction practical, optional)

Download ACOLITE from https://odnature.naturalsciences.be/remsem/software-and-data/acolite and install following the Installing ACOLITE video.

Note, if you download ACOLITE as a tar.gz file this is a compressed file (like zip) but Windows won't automatically open it. To extract open the 'Command Prompt' program, navigate to where you downloaded ACOLITE to (e.g., Downloads) by typing:

```
cd Downloads
```

Extract the tar.gz file by typing:

```
tar -xvf acolite_py_win_20210802.0.tar.gz
```

And then if you go into the acolite_py_win folder in your downloads you should be able to click on the 'acolite' icon to open it.

If you run into problems installing ACOLITE following the instructions in the video (macOS users have previously had problems) then you can install ACOLITE in an anaconda environment instead, see the last post in this page on the ACOLITE forum. Note that in this post the link to download the source is broken, the correct one is: https://github.com/acolite/acolite/archive/refs/tags/20210802.0.zip

Installing APL using Docker (macOS users only)

For macOS users there are two options for the hyperspectral practical as APL doesn't run natively on macOS.

1) Run APL using Docker, which will run within a Linux 'container'
2) Download output files from APL from https://data.neodaas.ac.uk/files/training_november_2021/files/apl_outputs.zip and follow through the non-APL parts of the tutorial.

To run using APL:

Download and install the Docker desktop from: https://www.docker.com/products/docker-desktop if you haven't already got Docker installed.

Pull the docker container containing aplsuite from a terminal Window using:

```
sudo docker pull mageosupport/aplsuite:latest
```

Note, docker commands are runs as root so you need to enter your password to run using sudo. This command will take a while to download the container.

Then start the container, mapping where you have downloaded data for the hyperspectral practical (in this example ~/Documents/Temp/hyperspectral_practical) using:

```
sudo docker run -i -t -v
~/Documents/Temp/hyperspectral_practical:/hyperspectral_practical
mageosupport/aplsuite:latest /bin/bash
```

Test the image works correctly by typing `aplmask -help`

When running through the practical it is recommended you have a terminal open with the APL docker image and another with the airborne Python environment.

It is also possible to run ARCSI using docker, see https://remotesensing.info/