1. **Download our satellite machine learning Python code from Github**
   1. Participants can clone this Github repository to download our Python code and all the libraries and functions by running the following commands from either their terminal (on Linux/MacOSx), or from the Anaconda Prompt on Windows.
      1. On a **Mac/Linux,** open your Terminal
         1. To open Terminal on a Mac: You can find Terminal in the Applications folder under Utilities, or you can use Spotlight Search (Cmd + Space) to search for "Terminal".
      2. On **Windows**: You should be able to find/open your Anaconda Prompt from your start menu (or dock, or via running the Anaconda Navigator).
         1. Search “Anaconda Prompt” in your start menu
      3. Once you have opened a terminal/prompt, you should navigate to the directory where you want to put the code.
         1. Your Terminal/prompt may look something like this
            1. (base) C:\Users\username>
            2. Type “cd Documents” and press ENTER if you want to navigate into your “Documents” folder and save everything there, for example
            3. “cd” means change directory, so you can use the “cd” command to change folders
            4. You can say “cd Desktop” instead, if you want to save it to your Desktop
            5. You can say “cd Documents\Seagrass” if you have a folder called Seagrass inside your Documents folder
            6. Keep in mind Mac and Linux file paths use “/” instead of “\”
      4. Once you are in the correct directory of your choice, you should run the following command by copying and pasting it into the Terminal or Anaconda Prompt and pressing ENTER (it is all one line)
         1. git clone --recurse-submodules --remote-submodules <https://github.com/mmcoffer/Seagrass_Classification.git>
         2. It may take a while for the code to be installed
         3. If you receive an error with the above line, you may try cloning the code using this line and pressing ENTER (it is all one line)
            1. git clone <https://github.com/mmcoffer/Seagrass_Classification.git>
         4. Now type “cd Seagrass\_Classification” to enter the folder you just downloaded
   2. Now activate the virtual environment
      1. For **Windows and Mac**: copy and paste the following line and then press ENTER
         1. conda install -n base conda-libmamba-solver
         2. Follow the prompts in the Terminal or Anaconda Prompt
         3. It may ask “Proceed ([y]/n)?”
            1. Type “y” then hit ENTER
         4. It may also take a while for this code to install
         5. Now navigate into the Python code folder that you just cloned from our github website by typing the following command and hitting ENTER
            1. cd Seagrass\_Satellite\_Classification
            2. This will take you into the actual folder
         6. Now copy and paste the following command and hit ENTER (it is all one line)
            1. conda env create -f satellite\_seagrass\_environment.yml --solver=libmamba
            2. This will create a Python environment called satellite\_seagrass\_enironment. The environment won't be activated by default.
            3. Now open Anaconda Navigator on your computer if using a **Windows** or a **Mac:** At the top where it says “base (root)” with a drop down arrow, click on the arrow and select “satellite\_seagrass\_environment”
            4. Then scroll down on the main page of Anaconda until you find “Jupyter Notebook”, then click “Launch”. This will open a Jupyter Notebook directory in your internet browser window.
            5. Find the folder where you are storing all of your seagrass data and the python code you just cloned. Once within the file directory, double click on the “Satellite\_Seagrass\_Classification.ipynb” you just cloned from Github, it will open in a new internet browser window or tab.
      2. For a **Linux**,
         1. Open your Ubuntu or other terminal
         2. Navigate to the directory where your cloned seagrass Python files are located
         3. Type the following code and press ENTER, but make sure you update “path\_to\_virtualenv” to your real path first
            1. source path\_to\_virtualenv/bin/activate
         4. Once the satellite\_seagrass\_environment virtual environment is activated, you should see its name in your terminal prompt, indicating that you are now working within the virtual environment
         5. Start Jupyter Notebook by simply typing “jupyter notebook” into you terminal and press ENTER
         6. This command will launch Jupyter Notebook in your default web browser.
         7. To deactivate the virtual environment and return to the global Python environment, simply type “deactivate” in your terminal

1. **Download and install the correct version of GDAL wheel file**
   1. Open Anaconda Navigator on your computer
   2. At the top where it says “base (root)” with a drop down arrow, click on the arrow and select “satellite\_seagrass\_environment”
   3. Then scroll down on the main page until you find “Jupyter Notebook”, then click “Launch”. This will open a Jupyter Notebook directory in your internet browser window.
   4. Find the folder where you are storing all of your seagrass data and the python code you just cloned. Once within the file directory, click on the “Satellite\_Seagrass\_Classification.ipynb” you just cloned from Github, it will open in a new internet browser window or tab.
   5. Click on the first box or cell and hit the “Run” button on the top with the triangle, or hit “Ctrl+Enter” on a Windows computer, or hit “Command+Enter” on a Mac
   6. *Box 1* will read “print(sys.version)”. Go ahead and click on this box and run it. It will print something like
      1. '3.11.5 | packaged by Anaconda, Inc. | (main, Sep 11 2023, 13:26:23) [MSC v.1916 64 bit (AMD64)]'
      2. You will need to remember the number it prints out
   7. Go to the following website to download the gdal wheel file if you are using a **Windows compute**r:  <https://www.lfd.uci.edu/~gohlke/pythonlibs/#gdal>
      1. The file you download will look something like this: GDAL-3.4.3-cp311-cp311-win\_amd64.whl
      2. But make sure the number after “cp” matches the number that the “print(sys.version)” in your Jupyter Notebook printed. For example, my “print(sys.version)” printed out “3.11.5”, so on the gdal website, I looked for the gdal that said cp“311”.
      3. Additionally, make sure the number after “amd” matches the bit operating system of your computer. I have a 64-bit computer, so I downloaded the gdal file that says amd“64”
         1. If you are unsure what your operating system is, do the following
            1. **Windows**:

Open the Control Panel.

Navigate to "System and Security"  then click "System".

Look for the "System type" information. It will indicate whether your system is running a 32-bit or 64-bit version of Windows

* + 1. Download the wheel file and store it in the same folder as your python code
    2. Now go back into your Jupyter Notebook code and edit *Box 2* where it says

!pip install "C:/Users/fishr/Satellite Seagrass/Python\_library/GDAL-3.4.3-cp311-cp311-win\_amd64.whl" to change the file path to match where you stored the new gdal wheel file and update the gdal wheel file name.

1. Once you update the file path, run this line of code to install the gdal file
2. If you have **a Mac computer,** to download your gdal wheel file, you will first need to install a package called HomeBrew onto your computer
   1. To install Homebrew on macOS, you can follow these steps:
      1. Open Terminal: You can find Terminal in the Applications folder under Utilities, or you can use Spotlight Search (Cmd + Space) to search for "Terminal".
      2. Paste the following command into the Terminal window and press Enter (it is all one line):
         1. /bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh)"
      3. Follow the Installation Instructions: The command will prompt you to continue with the installation. Follow the on-screen instructions to complete the installation process.
      4. Verify Installation: Once the installation is complete, you can verify that Homebrew was installed correctly by running the following command in Terminal:
         1. brew --version
      5. Then type the following code into the Terminal
         1. brew install gdal
      6. Now go back into your Jupyter Notebook code and edit *Box 2* where it says !pip install "C:/Users/fishr/Satellite Seagrass/Python\_library/GDAL-3.4.3-cp311-cp311-win\_amd64.whl" to change the file path to match where you stored the new gdal wheel file and update the gdal wheel file name.
      7. Once you update the file path, run this line of code to install the gdal file