Post-fire Regeneration Tool for Chaparral Shrublands

Instructions for setting up and running the tool in Jupyter Notebooks

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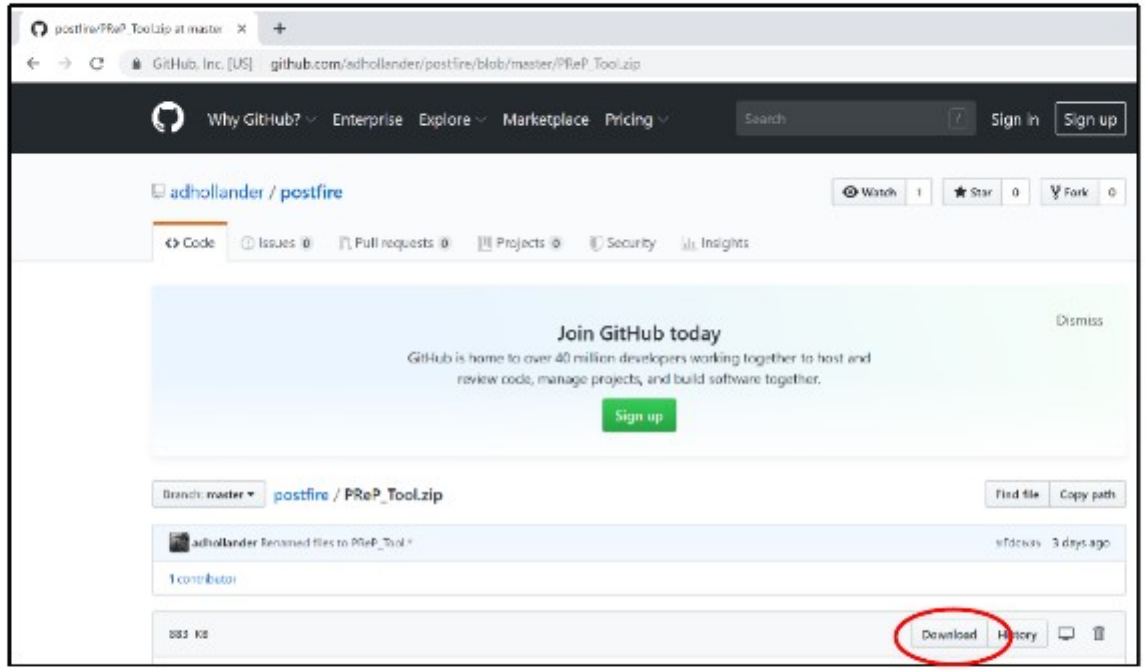
Step 1. To run the Post-fire Restoration Prioritization (PReP) Tool download the zipped file from GitHub that includes the Jupyter notebook file (.ipynb). This zipped file includes example datasets for the Copper fire: https://github.com/adhollander/postfire/blob/master/PReP_Tool.zip

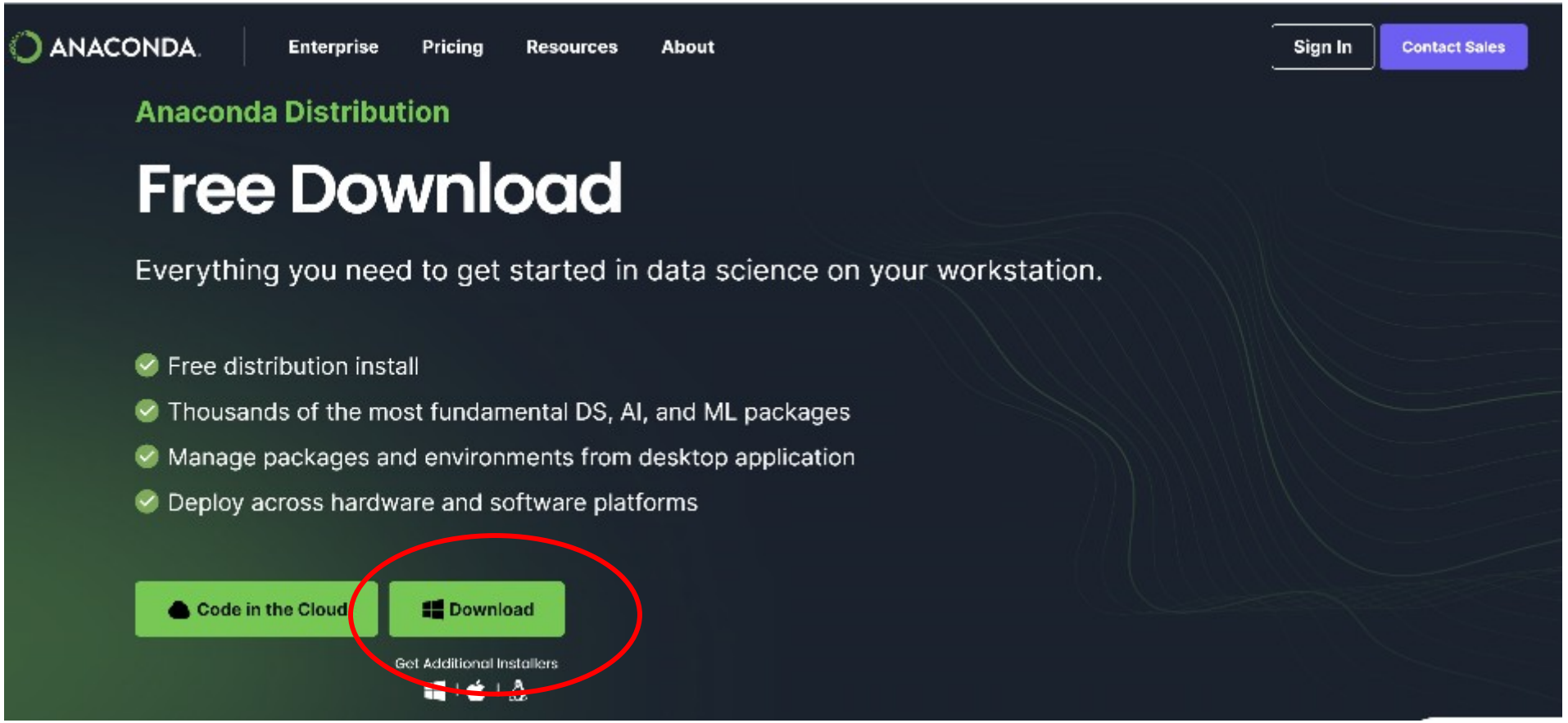


Once unzipped, the directory will contain 2 items:

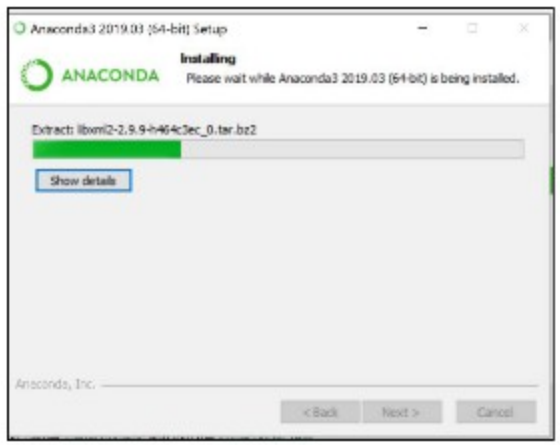
- /Datasets with 6 tif files for the Copper fire
- The PReP_Tool.ipynb file to run the Jupyter notebook

Step 2. To open up the Jupyternotebook file, it is necessary to download and install the Anaconda program from:

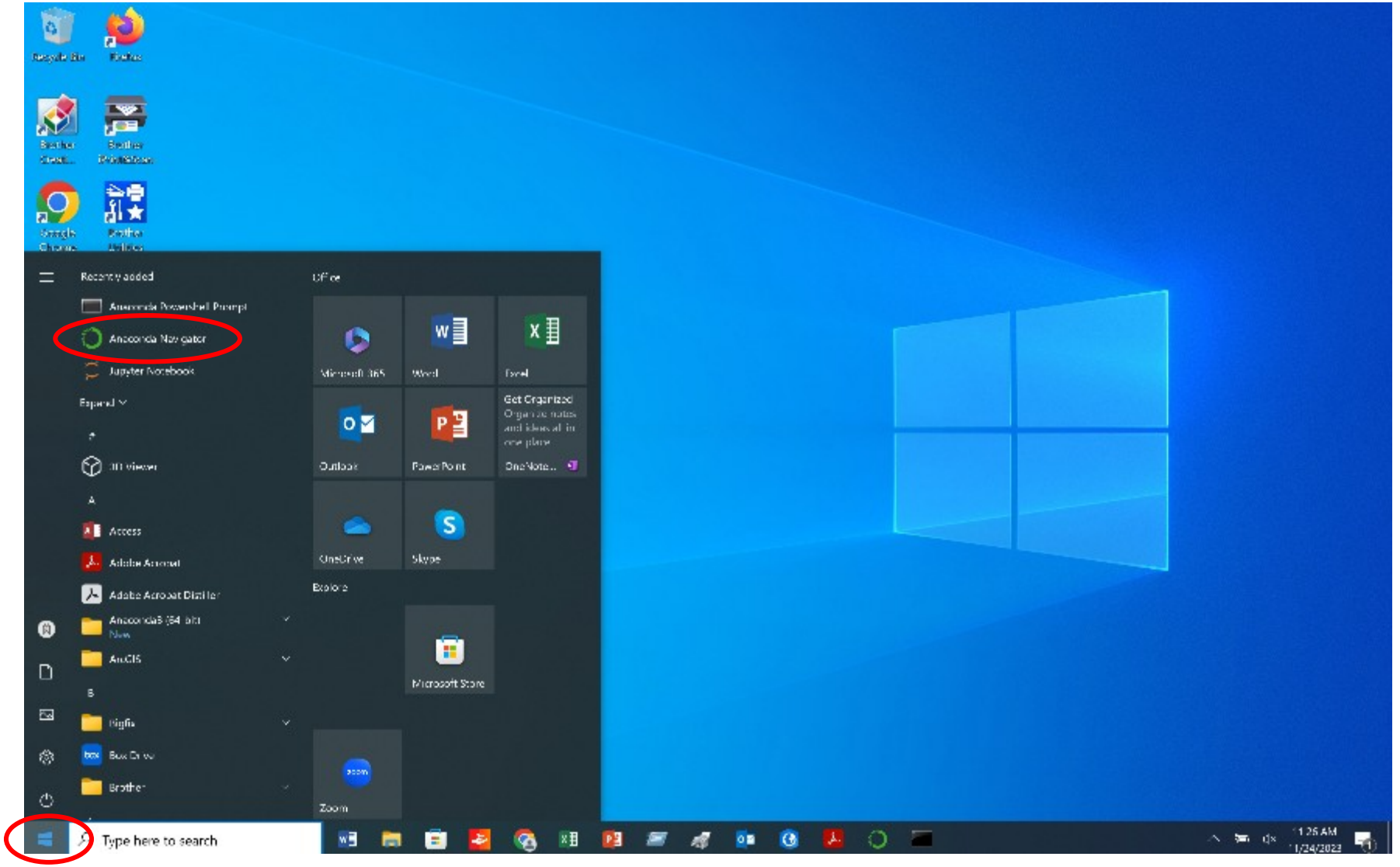
https://www.anaconda.com/download



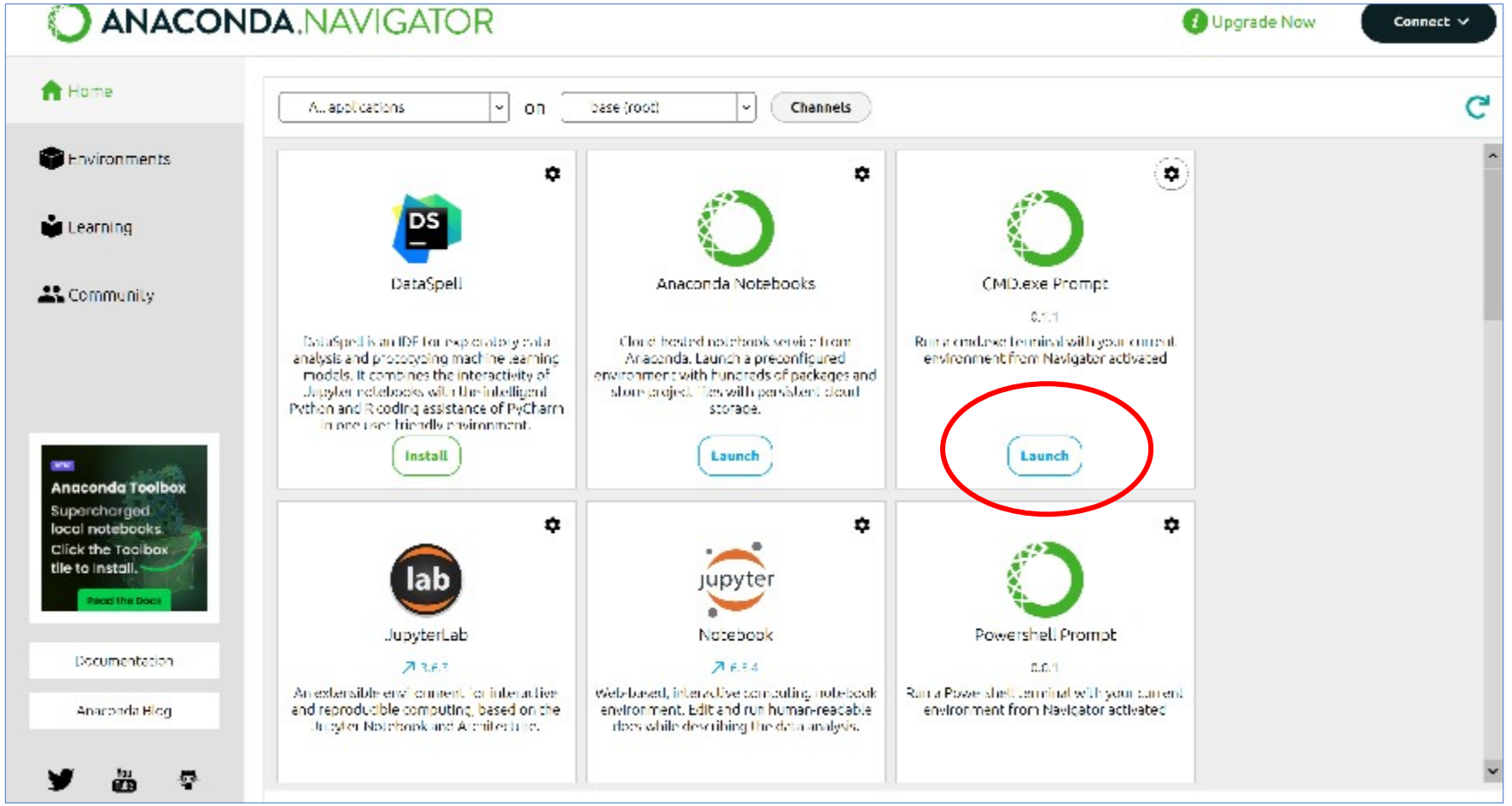
Step 3. Once Anaconda has downloaded, double click on the application to install it, using the default parameters



Step 4. Under the Windows start menu (put mouse on square in lower right), click on "Anaconda Navigator"

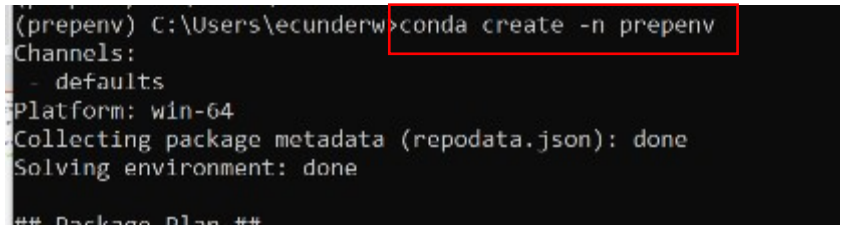


Step 5. On Anaconda Navigator interface select top right tile to launch “CMD.exe Prompt”



Step 6. When the command window has opened, create a new local environment for execution (named prepenv here).

conda create -n prepenv



Step 7. Activate the prepenv environment by writing at the command line:

conda activate prepenv

Step 8. Now install mamba into the new environment. We do this using the conda-forge repository:

conda install -c conda-forge -y mamba

Step 9. We now use mamba to install all the needed PReP libraries. Write each line one at a time into the command line:

mamba install -c conda-forge -y rioxarray
mamba install -c conda-forge -y ipywidgets
mamba install -c conda-forge -y pyproj
mamba install -c conda-forge -y gdal
mamba install -c conda-forge -y rasterio
mamba install -c conda-forge -y matplotlib

It should take less than 10 minutes to install the six libraries

Step 10. We then need to get the Jupyter notebook libraries installed into this environment. Write at command line:

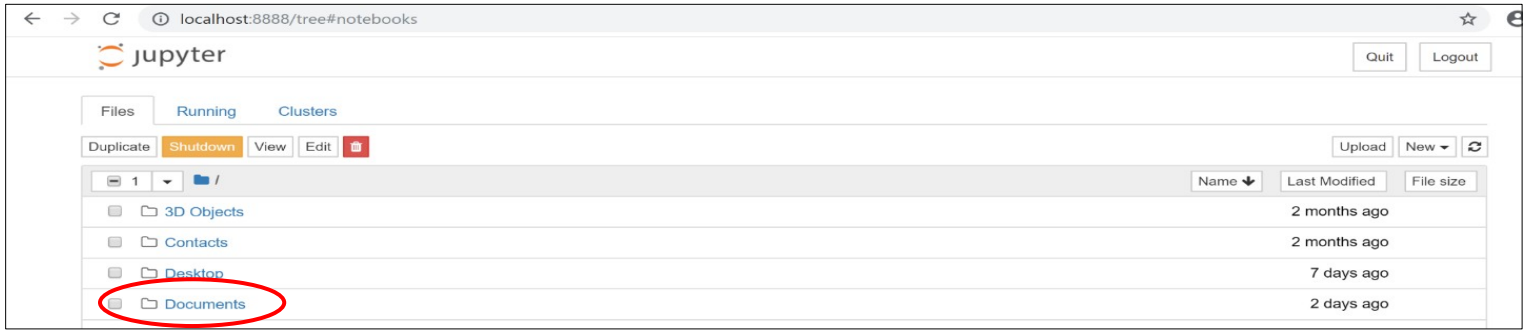
mamba install -c conda-forge -y nbclassic

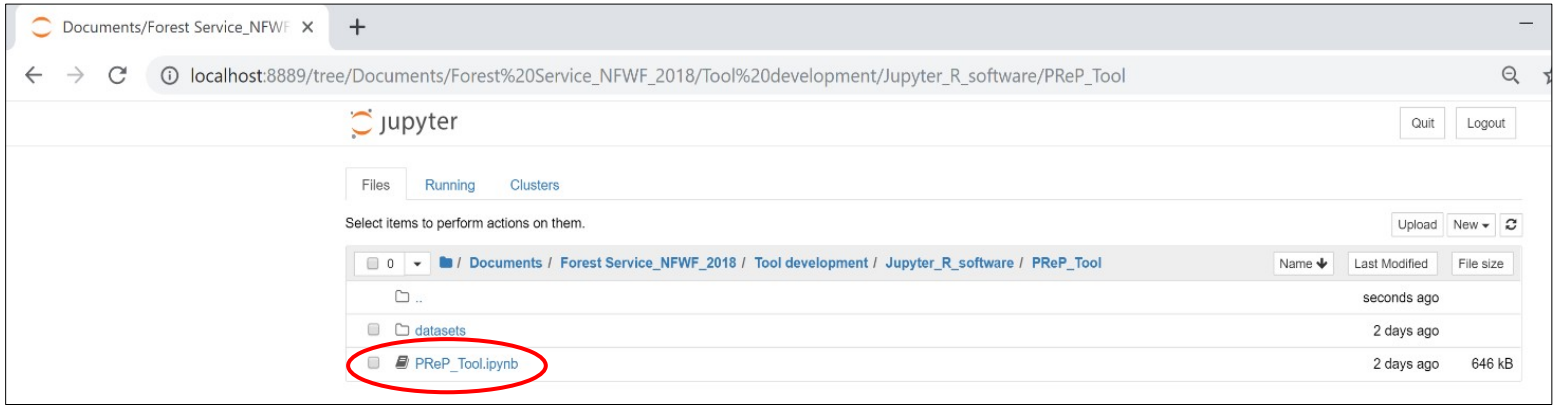
Step 11. You then need to launch the Jupyter Notebook file by typing:

jupyter nbclassic

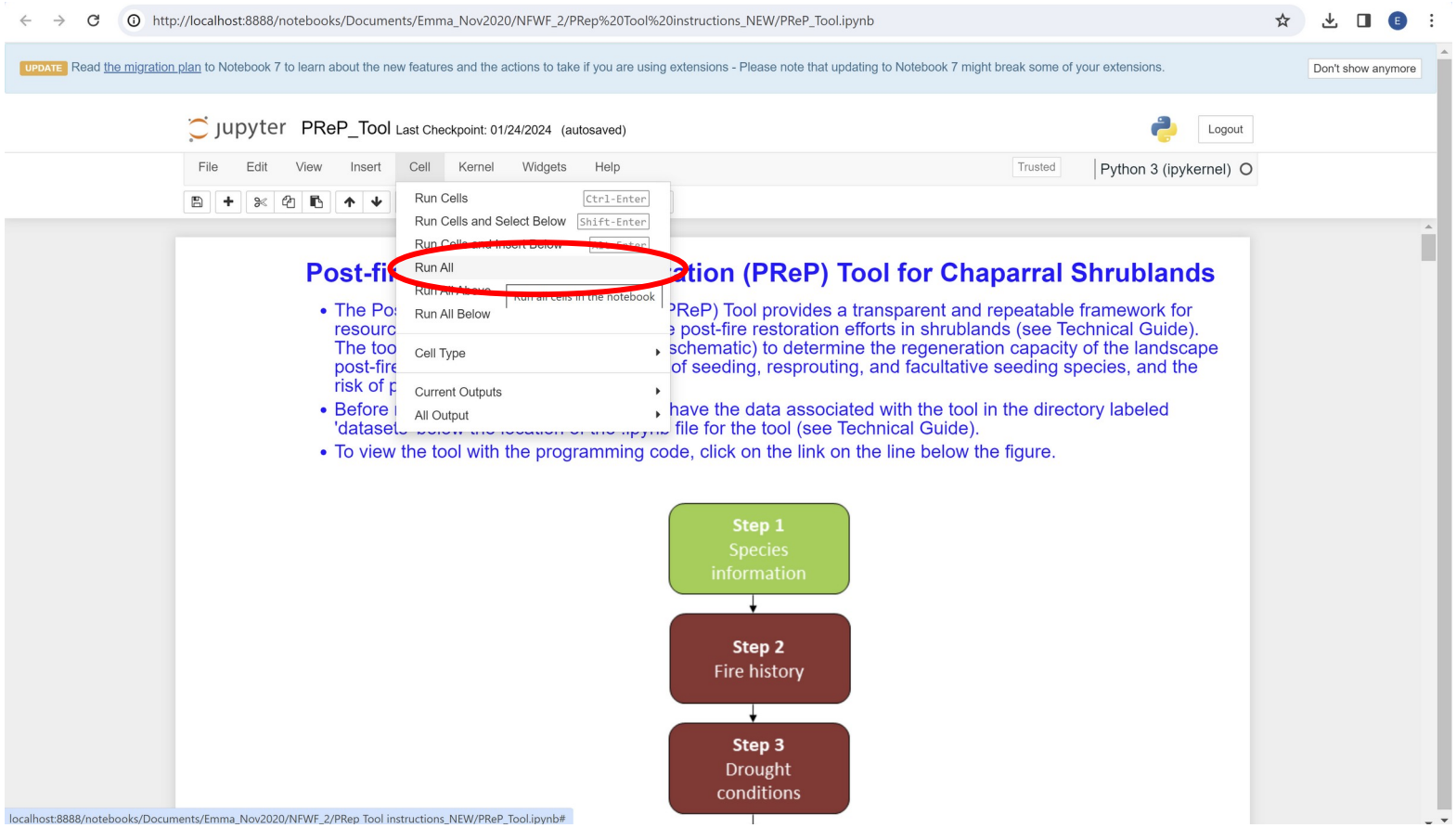
This launches a window where you can path to the PrepTool ipynb file that was downloaded (using single clicks).

Note: there are 2 versions: PReP_Tool.ipynb if an erosion raster for the target fire is prepared in the datasets directory or PReP_Tool_noerosion.ipynb if no erosion raster is available.

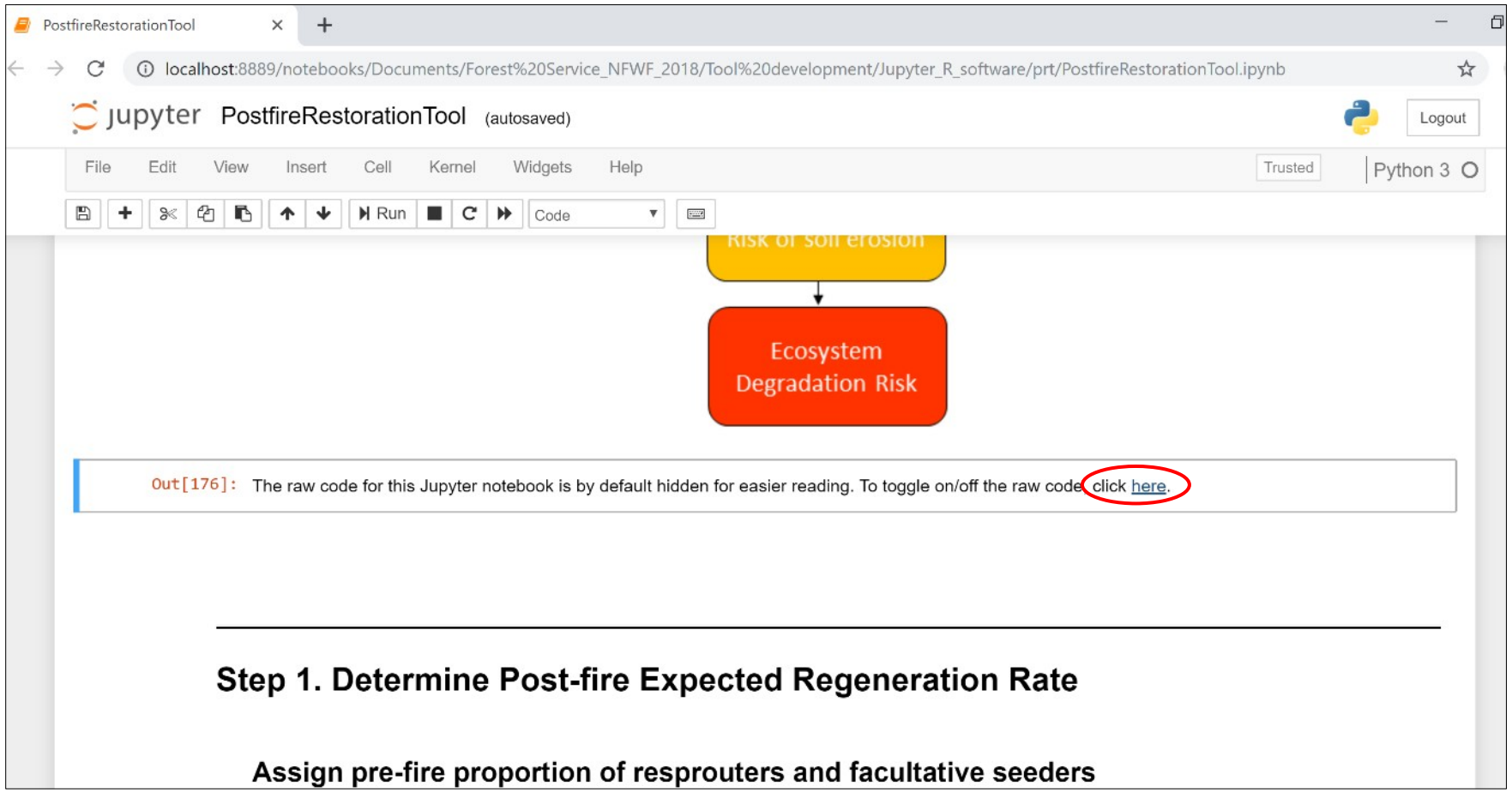




Step 12. This will launch the tool interface. When the tool opens click the ‘Cell’ tab and select ‘Run All’. (If this is not run, the notebook may contain an error message that a ‘jupyter widget could not be displayed…’)

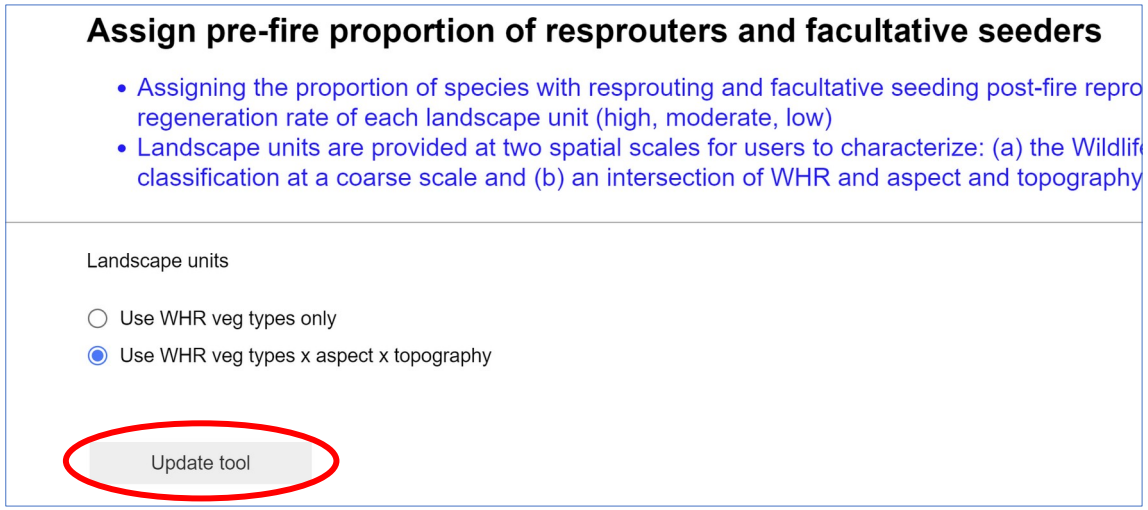


Step 13. To toggle between formats of seeing the code and hiding the code, click the button where indicated below

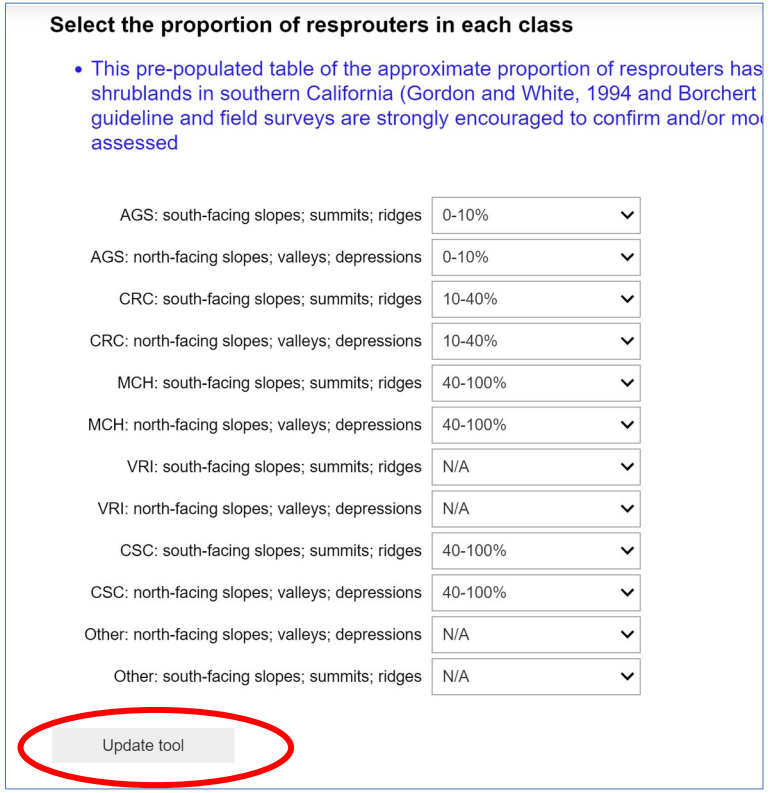


Step 14. When you run the PReP tool there are 6 options for the user to select options or change the default options (which relate to the Copper Fire, in southern California). f these options/values are changed from the default ones, then the 'Update tool' button associated with each needs to be clicked to propagate these changes in the rest of the tool and output maps (do not use 'Cell' and 'Run All' as changes will be lost).
See Technical Guide for more details on each option.

1.



2. Choices associated with selection chosen in (1)



Options continued

3.

Task A. Specify drought or non-drought conditions pre-fire

- Drought conditions pre-fire can affect the regeneration capacity of **resprouting** species post-fire.
- Here we link to data for the South Coast Ecoregion on the Palmer Drought Severity Index and determine how many months out of the growing season (November to May) prior to the start of the fire were 'severe' or 'extreme' drought

Link to: NOAA Palmer Drought Severity Index website and enter the 'start month' (November before the fire start data) and the 'end year' and 'end month' (May before the fire start date). Record the number of months that the South Coast ecoregion is shown as 'severe' (<-3PDSI)or 'extreme' (<-4 PDSI). Where this is four or more months during the growing season then the score of pixels dominated by resprouting species is reduced.

Number of months in previous growing s… 4

4.

Task B. Specify drought or non-drought conditions post-fire

- Drought conditions post-fire can affect the ability of seeds to germinate, the survival of seedlings, and the regeneration of resprouter species.
- Again, we link to data for the South Coast Ecoregion on the Palmer Drought Severity Index and determine how many months out of the growing season after the start of the fire were 'severe' or 'extreme' drought
- The tool is able to consider drought conditions for up to 2 years post-fire, but the tool can still be run if there are only data on one year post-fire

Link to: NOAA Palmer Drought Severity Index website and enter the 'start year' and 'start month' (the first November after the fire start date) and the 'end year' and 'end month' (following May). Record the number of months that the South Coast ecoregion is shown as 'severe' (<-3PDSI)or 'extreme' (<-4 PDSI). Repeat this query for post-fire year 2

No. of years post-fire drought da… 2

Post-fire year 1: Number of months 3

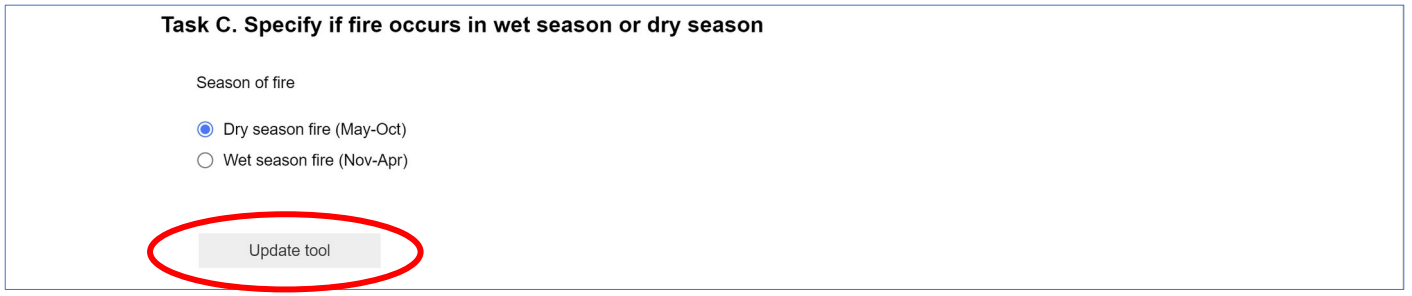
Post-fire year 2: Number of months 1

Update tool

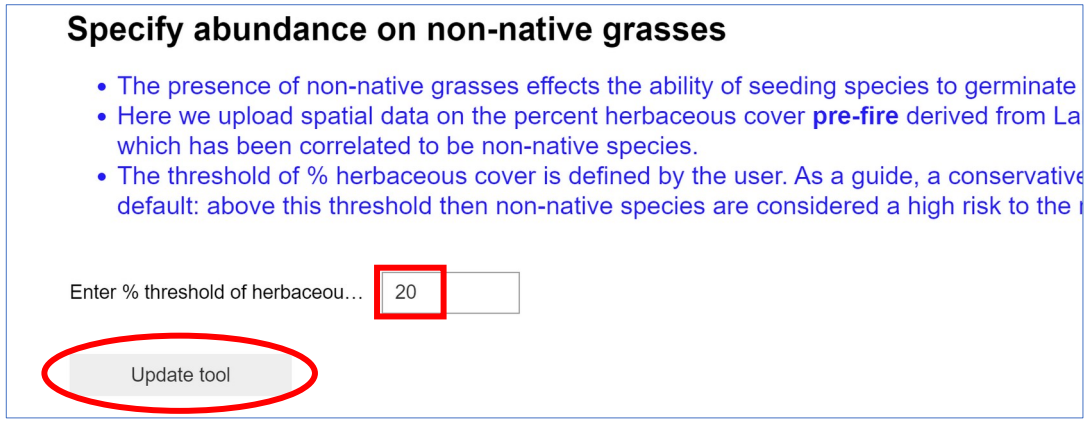
This updates both Task A and Task B options

Options continued

5.



6.



Step 15. Viewing output maps

The five Output Maps from the PReP Tool can be downloaded in Geotiff format, which can then be opened in Arc or other GIS software. Downloaded rasters will have geographic information associated with them.

Using ‘symbology’ and ‘unique values’ will allow shading of attribute values to be changed. In the case of the example below, Output map 3, an attribute value of 5 correlates to areas of high regeneration capacity and 1 with lowest.