Creating an Environment

ECOSTRESS Tutorials

This tutorial will show you how to create an Environment on MacOS.

Table of Contents

[What is Homebrew? 1](#_Toc172812863)

[How to Install Homebrew 2](#_Toc172812864)

[What is Conda and Mamba? 4](#_Toc172812865)

[How to install Conda and Mamba 5](#_Toc172812866)

[What is an Environment? 6](#_Toc172812867)

[How to Create an Environment 7](#_Toc172812868)

# What is Homebrew?

Homebrew is a package manager that helps with the installation of software. It is open-source and free to users. Homebrew allows us to install the software we need all in the terminal.

## How to Install Homebrew

1. Start by going to <https://brew.sh/> or by searching the web for Homebrew. On the webpage you will see a line of code under **Install Homebrew**. Click the clipboard icon next to the line of code to **copy** it.

Graphical user interface

Description automatically generated

1. Now let’s open a terminal window. You can do this by selecting the **magnifying glass search icon** on the top right of your computer, searching for **Terminal**, and pressing enter.



1. In the new terminal window, press **Command + V** to paste the copied code from Homebrew. Run it by pressing **Return**. You may be prompted to enter a passcode or PIN for your computer to continue. Type it in and press **Return**. Note that the terminal does not show characters as you type for security purposes.

Graphical user interface, text, email

Description automatically generated

1. After entering your password, the code will run for a bit more before asking you to press **RETURN/ENTER** to continue. Press **Return** on your keyboard.

Text

Description automatically generated

1. Let it run a bit more, and then it will ask you to enter your passcode or pin one more time. Type it in and press **Return**.



1. You will know that the installation is complete when you get to this screen with the **Installation successful!** message.

Graphical user interface, text, application, email

Description automatically generated

# What is Conda and Mamba?

Conda is a package management system used to install and manage software. We can use it to create environments for different projects. Mamba is a new version of Conda that works even faster to manage environments. We will use Homebrew to install both Conda and Mamba.

## How to install Conda and Mamba

1. Go to <https://formulae.brew.sh/cask/mambaforge> or search the web for Homebrew Mambaforge. Next to **Install command:** you will see a line of code. Click the clipboard icon next to the line of code to copy it.

Graphical user interface, logo

Description automatically generated

1. Navigate back to the terminal window and paste the copied line of code in it. Run the code. This code will install both **Conda** and **Mamba**.

Graphical user interface, text

Description automatically generated

1. You will know it has been installed successfully when you get the line that says **mambaforge was successfully installed!**

Graphical user interface, text, application

Description automatically generated

# What is an Environment?

An environment is a separate place on your computer where you can install software and libraries specific to the project you are working on. This allows you to have multiple projects all with their unique requirements. We need to create an environment that has all the tools we need to work with ECOSTRESS data.

## How to Create an Environment

1. Now that Conda and Mamba are installed, let’s create an environment that contains the python packages we need for geospatial analysis. Open a terminal window and type **mamba create -y -n ECOSTRESS -c conda-forge python=3.11 jupyter rioxarray hvplot** and run it. Here is an explanation of each part of that command:
   1. **mamba create** is the command to make the environment.
   2. **-y** confirms changes being made.
   3. **-n ECOSTRESS** is used to name our environment. In this case the environment is being named **ECOSTRESS** but if you would like a different name, you can change it. Just make sure to keep the **-n** and not use spaces or special characters in your name.
   4. **-c conda-forge** sets the channel where mamba will pull the packages from.
   5. For the end of the command, we list all of the packages we want. Here is a description of each one we will use in our tutorial:
      1. **python=3.12** connects to python, in this case setting it to version 3.12.
      2. **jupyter** allows us to use jupyter notebooks.
      3. **rioxarray** lets us open rasters.
      4. **hvplot** will allow us to create maps.

Graphical user interface, text

Description automatically generated

1. The code may run for a little bit. You will know that your environment has been **successfully** created when you get instructions on how to **activate** and **deactivate** your environment.

Graphical user interface, text

Description automatically generated with medium confidence

1. Before we can activate the environment, we need to initialize mamba so that we can use it to run commands. In the terminal, type **sudo mamba init** and press **enter** to run it.

Graphical user interface, text, application, email

Description automatically generated

1. It will then prompt you to enter your **password** or **PIN**. Remember, as you type it in, the characters will not show up for security reasons. Once you have typed it in, press **Return**.

Graphical user interface, text, application, email

Description automatically generated

1. Once you get to this screen, you will know that mamba has been initialized. **Close** **the terminal** to save this change.

Graphical user interface, text

Description automatically generated

1. Now, to activate the environment, open the terminal again and type **mamba activate ECOSTRESS** into the terminal and run it.

Graphical user interface, text, application

Description automatically generated

1. You will know that your new environment has been activated when you see the environment name, in this case **ECOSTRESS**, in parentheses before your line of code instead of (base).

Graphical user interface, text, application, email

Description automatically generated

Now you have an environment set up to run your code with!