Cloning your ArcPro environment and installing other packages

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1 Intro

This document outlines methods for duplicating your ArcGIS Pro Python installation (known as an "environment"). Cloning an environment creates a copy of it in a new location on your computer. This is useful when you want to install external Python packages, as ArcGIS Pro prevents modifications to its default environment ('arcgispro-py3').

2 Cloning your Environment

While ArcGIS Pro offers a built-in cloning feature (Project tab→ Package Manager → Cog-wheel next to Active Environment → Clone Environment Icon on the top right), it's not the most reliable method. I've encountered inconsistencies with this approach in the past and suggest alternative options.

This document details my two preferred methods:

- Manual Cloning and Installation: This involves using command-line instructions to create the environment and install each package individually.

- YAML-Based Cloning: This method utilizes a YAML file to define the environment and its dependencies, enabling simultaneous cloning and package installation.

2.1 Manual Cloning and Installation of packages

Click on Windows Start and open Python command prompt. See icon below

Type the command below to create an ArcPro cloned environment named `myenv-py3`. You can change to whatever name you want.

```
conda create -n  myenv-py3 --clone arcgispro-py3
```

Pay attention to the single and double hyphens. Conda will record all Python files into your user directory path below

```
C:\Users\YourUserName\AppData\Local\ESRI\conda\envs
```

You will need more than **1.3 GB** of available space in your drive to be safe.

Once it's finished copying the files, you will need to activate your clone. Type the following on the prompt `activate myenv-py3`

Finally, you have to change to the cloned environment in ArcPro as well. Open an ArcPro project, Project tab → Package Manager → Active Environment drop down menu; and select your cloned environment. Restart ArcPro.

2.1.1 Installing Packages

You can install individual packages in three different ways. I will not explain the first method using wheels files since it seems to have been fallen from grace and no longer being supported by the community. The two other methods consist of `pip install package_name` and `conda install package_name`.

The package `pip` already comes with ArcGIS Pro. If you have another Python installation that does not contain pip, then you have to first open the Python command prompt, activate your cloned environment, and then type `conda install pip`. This is how you could use conda to install any package (assuming your installation is either Anaconda or Miniconda). Similarly, to install any package using pip, just type `pip install package_name`. I usually try first with conda install and, if that doesn't work, I use pip install.

3 Cloning an Environment and Installing Packages using a yaml file

Open your Python command prompt, change directory to a folder of your preference, for example `cd C:/Users/YourUserName/Documents`. Next, create a yaml file by typing on the prompt `conda env export > env.yaml`. This file contains all the packages that come with the arcpy installation. Open this file with Notepad (right-click the file) and change the following: `name: myenv-py3` and add `conda-forge` to the channels. Next, add the other packages you would like. I do not recommend deleting packages from this list since some might contain important dependencies. In the example below, I added `cartopy`. The file should look something like (the ellipsis show packages omitted for space sake).

```
name: myenv-py3
channels:
   - esri
   - defaults
   - conda-forge
dependencies:
   - annotated-types=0.6.0=py_2
   - anyio=3.5.0=py311haa95532_0
   - anywidget=0.9.13=py_1
   - appdirs=1.4.4=pyhd3eb1b0_0
   - ...
   - cartopy
   - ...
prefix: C:\Program Files\ArcGIS\Pro\bin\Python\envs\arcgispro-py3
```

The 'name' is the name of your cloned environment, here 'myenv-py3'. The 'channel' is where Python will look for packages, followed by the packages to be installed and dependencies (i.e. version of the package).

Save this file.

Next, type `conda env create --file env.yaml`. It should clone and install all listed packages. Once it is completed, type `activate myenv-py3` to activate your cloned environment.

Change your ArcGIS Pro active environment as well as explained above.