# Artificial Surfaces Mapping From Remotely Sensed Imagery

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This code is to map artificial surfaces by fusing Landsat-8 imagery and NPP-VIIRS nighttime data.

**Python Environment:**

Arcpy(10.4), Anaconda(2.7, download for *https://www.anaconda.com/download/*).

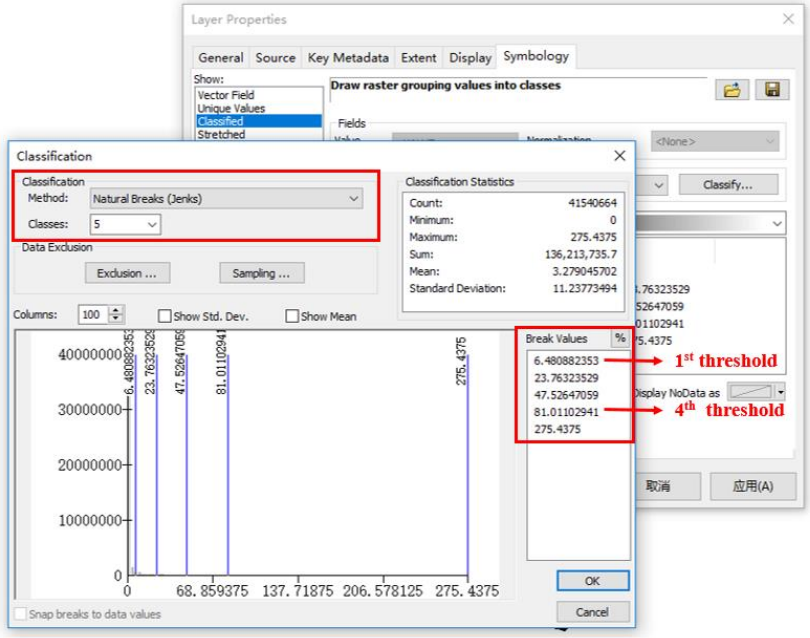
**Python Pip:**

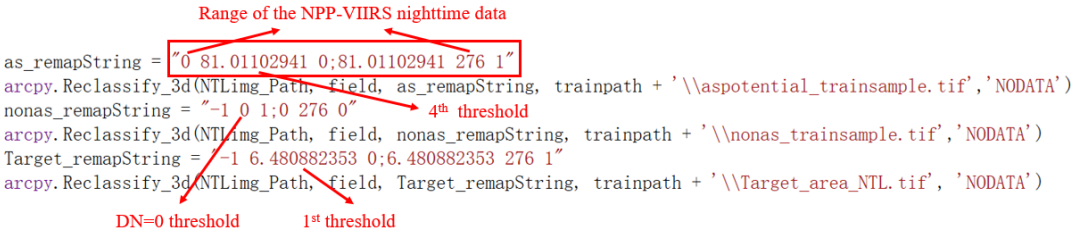
Arcpy- os, math, shutil, sys.

Anaconda- os, shutil, sys, numpy(1.15.1), skimage(0.14.0), gdal(2.2.2).

**Attention:**

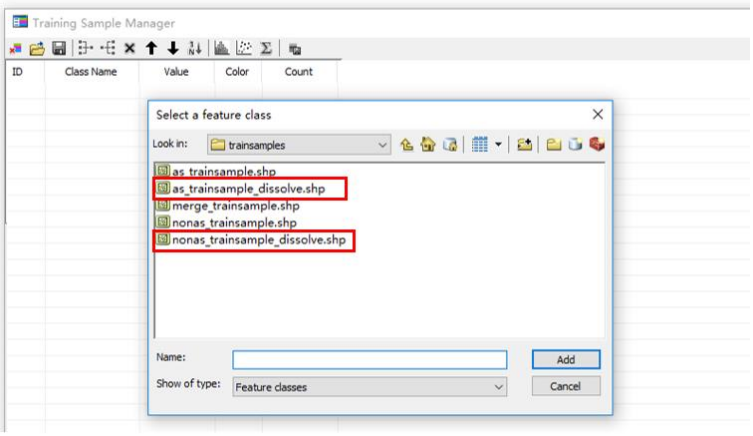
1. This code has 7 steps. All the steps run with Arcpy environment except the 5$^{th}$ step. The 5$^{th}$ step runs with anaconda environment.
2. Put the Landsat-8 imagery into the 'predata' file and click run step by step.
3. In the 6$^{th}$ step, you need to get the classification thresholds by using the Arcmap(10.4). Change the classification intervals in the code manually. Set the nighttime data DN=0 as the threshold to get the non-artificial surfaces training samples.

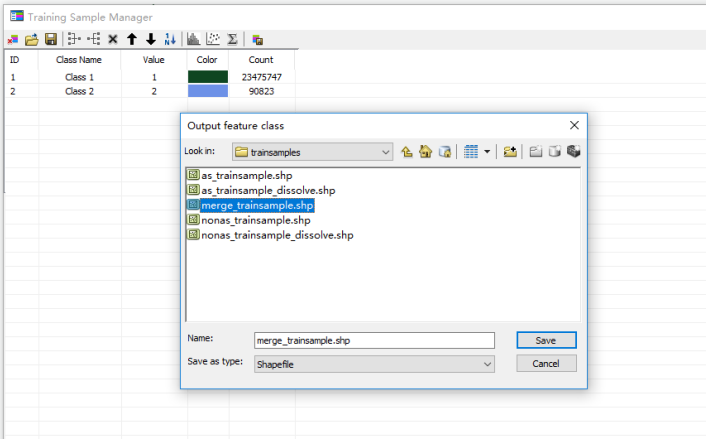



4. Before running the 7nd step, you need to create the training features manually in Arcmap, they can not create in python automatically.

   Add the 'nonas_trainsample_dissolve.shp' and 'as_trainsample_dissolve.shp' respectively into the training sample manager. Then save these feature classes as 'merge_trainsample.shp' in the 'trainsamples' file.






5. In the ‘result’ file, you will get the final mapping result of artificial surfaces- ‘result_artificial_surface.tif’.