

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/>).

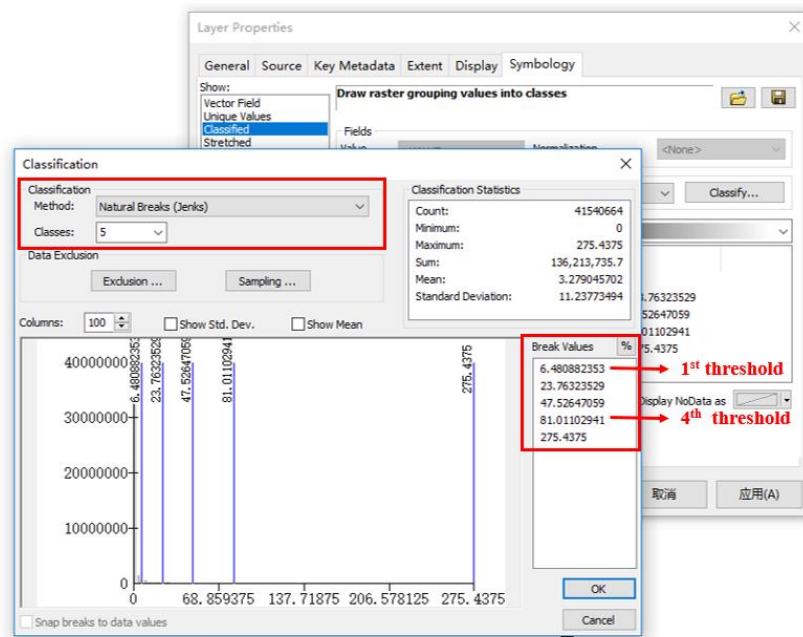
Python Pip:

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 5th step. The 5th step runs with anaconda environment.
2. Put the Landsat-8 imagery into the 'predata' file and click run step by step.
3. In the 6th 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.



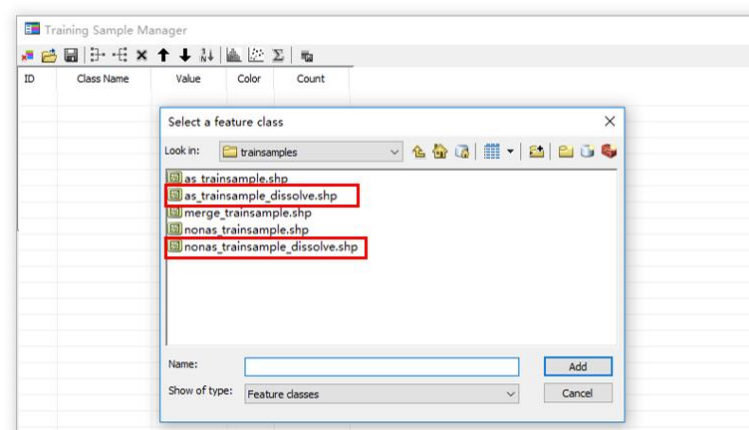
Range of the NPP-VIIRS nighttime data

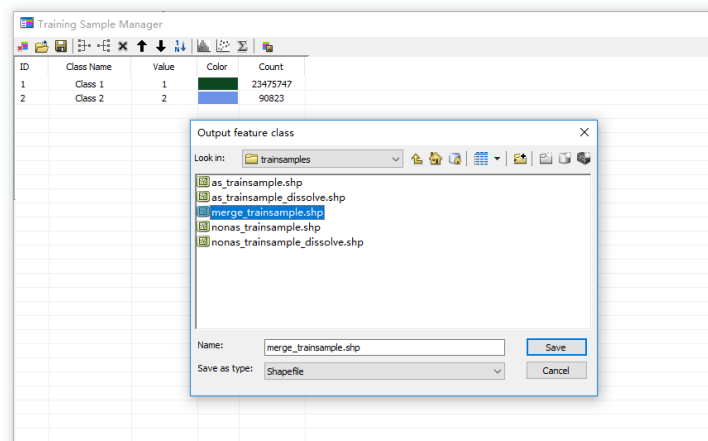
```
as_remapString = "0 81.01102941 0;81.01102941 276 1"
arcpy.Reclassify_3d(NTLing_Path, field, as_remapString, trainpath + '\\aspotential_trainsample.tif', 'NODATA')
nonas_remapString = "-1 0 1;0 276 0"
arcpy.Reclassify_3d(NTLing_Path, field, nonas_remapString, trainpath + '\\nonas_trainsample.tif', 'NODATA')
Target_remapString = "-1 6.480882353 0;6.480882353 276 1"
arcpy.Reclassify_3d(NTLing_Path, field, Target_remapString, trainpath + '\\Target_area_NTL.tif', 'NODATA')
```

DN=0 threshold 1st threshold 4th threshold

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'.

