Built-up Areas Mapping From Remotely Sensed Imagery

Version 2.0

Corresponding Author:

Chang Liu, Kang Yang

Changliu811@gmail.com, kangyang@nju.edu.cn

Phone: (+86)17302560154

School of Geography and Ocean Science, Nanjing University

We updated the code version 2.0 based on the version 1.0. This updated code is to map built-up areas by fusing Landsat-8 imagery and NPP-VIIRS nighttime data in batch processing.

Python Environment:

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

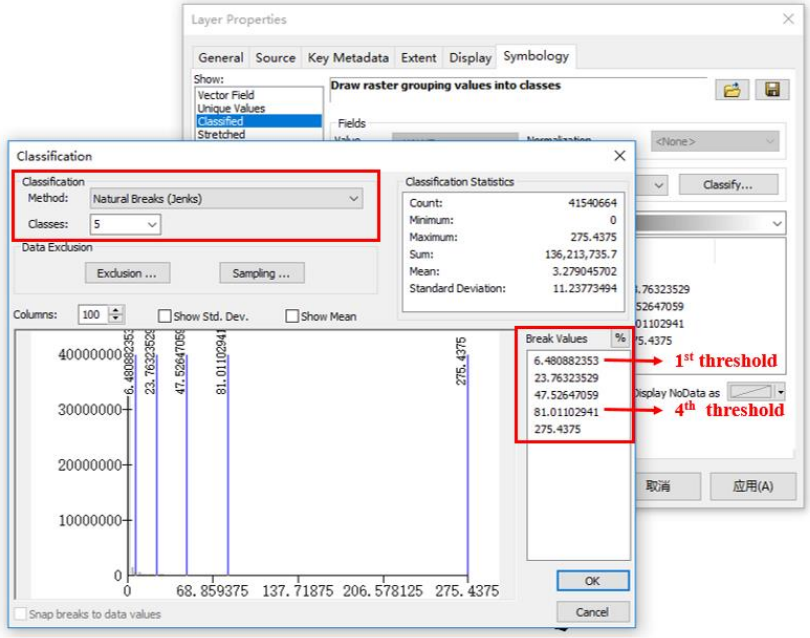
Python Pip:

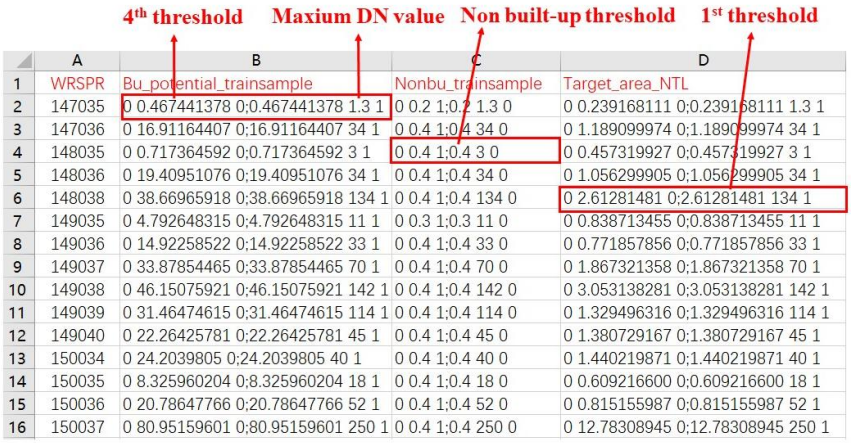
Arcpy- os, math, shutil, sys.

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

Attention:

1. This code has 9 steps. All the steps run with Arcpy environment except the 6th step. The 6th step runs with anaconda environment.
2. Put the Landsat-8 imagery into the 'predata' file and click run step by step.
3. In the 7th 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=0.4 or lower DN as the threshold to get the non-built-up areas training samples. Put all the batch thresholds in excel. Pay attention to the excel format. Excel example is below.

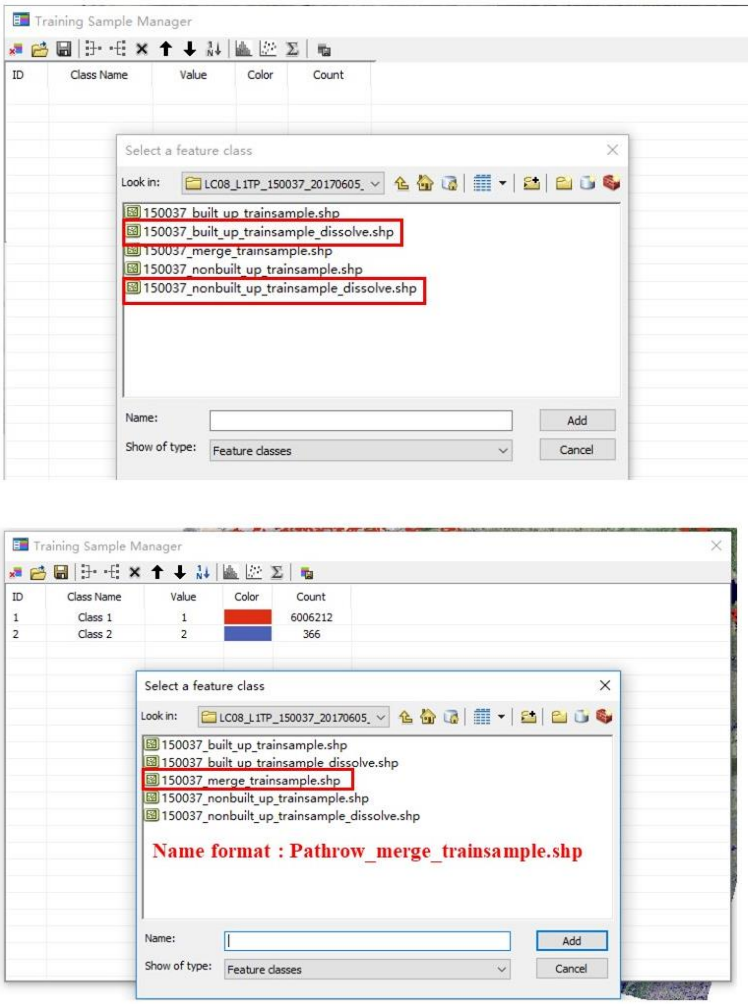




	A	B	C	D
1	WRSPR	Bu_potential_trainsample	Nonbu_trainsample	Target_area_NTL
2	147035	0 0.467441378 0;0.467441378 1.3 1	0 0.2 1;0.2 1.3 0	0 0.239168111 0;0.239168111 1.3 1
3	147036	0 16.91164407 0;16.91164407 34 1	0 0.4 1;0.4 34 0	0 1.189099974 0;1.189099974 34 1
4	148035	0 0.717364592 0;0.717364592 3 1	0 0.4 1;0.4 3 0	0 0.457319927 0;0.457319927 3 1
5	148036	0 19.40951076 0;19.40951076 34 1	0 0.4 1;0.4 34 0	0 1.056299905 0;1.056299905 34 1
6	148038	0 38.66965918 0;38.66965918 134 1	0 0.4 1;0.4 134 0	0 2.61281481 0;2.61281481 134 1
7	149035	0 4.792648315 0;4.792648315 11 1	0 0.3 1;0.3 11 0	0 0.838713455 0;0.838713455 11 1
8	149036	0 14.92258522 0;14.92258522 33 1	0 0.4 1;0.4 33 0	0 0.771857856 0;0.771857856 33 1
9	149037	0 33.87854465 0;33.87854465 70 1	0 0.4 1;0.4 70 0	0 1.867321358 0;1.867321358 70 1
10	149038	0 46.15075921 0;46.15075921 142 1	0 0.4 1;0.4 142 0	0 3.053138281 0;3.053138281 142 1
11	149039	0 31.46474615 0;31.46474615 114 1	0 0.4 1;0.4 114 0	0 1.329496316 0;1.329496316 114 1
12	149040	0 22.26425781 0;22.26425781 45 1	0 0.4 1;0.4 45 0	0 1.380729167 0;1.380729167 45 1
13	150034	0 24.2039805 0;24.2039805 40 1	0 0.4 1;0.4 40 0	0 1.440219871 0;1.440219871 40 1
14	150035	0 8.325960204 0;8.325960204 18 1	0 0.4 1;0.4 18 0	0 0.609216600 0;0.609216600 18 1
15	150036	0 20.78647766 0;20.78647766 52 1	0 0.4 1;0.4 52 0	0 0.815155987 0;0.815155987 52 1
16	150037	0 80.95159601 0;80.95159601 250 1	0 0.4 1;0.4 250 0	0 12.78308945 0;12.78308945 250 1

4. Before running the 9th step, you need to create the training features manually in Arcmap, they can not create in python automatically.

   Add the '_nonbuilt_up_trainsample_dissolve.shp' and 'built_up_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 ‘image_result’ file, you will get the final mapping result of built-up areas. ‘result_bustack_TOA_LC08_L1TP_150038_20170605_20170616_01_T1’