

```
1  # -*- coding: utf-8 -*-
2  """
3  created on: 2024-05-24
4  @author:    Jasper Heuer
5  use:        create mask for MAR resample and cropping of raw data
6  """
7
8  # import packages =====
9
10 import os
11 import numpy as np
12 from osgeo import gdal, osr, ogr
13
14 # set working directory =====
15
16 base_path = "C:/Jasper/Master/Thesis/Data/"
17 os.chdir(base_path)
18
19 # create raster mask =====
20
21 driver = gdal.GetDriverByName("GTiff")
22
23 # set coordinates (by adding 5000m * np.sqrt(2) in each direction to get all MAR pixels):
24 xmin = 547515 - (5000 * np.sqrt(2)) # = length of diagonal of 5000m pixel
25 xmax = 558795 + (5000 * np.sqrt(2))
26 ymin = 7283505 - (5000 * np.sqrt(2))
27 ymax = 7290015 + (5000 * np.sqrt(2))
28
29 # set metadata:
30 outfn = "./Masks/MAR_mask.tif"
31 nbands = 1
32 xres = 30
33 yres = -30
34 dtype = gdal.GDT_Int16
35
36 # calculate raster height/width in pixel:
37 xsize = abs(int((xmax-xmin) / xres))
38 ysize = abs(int((ymax-ymin) / yres))
39
40 # create new raster:
41 ds = driver.Create(outfn, xsize, ysize, nbands, dtype)
42 ds.SetProjection("EPSG:32624")
43 ds.SetGeoTransform([xmin, xres, 0, ymax, 0, yres])
44 ds.GetRasterBand(1).Fill(1) # value of raster (and later on shapefile) mask
45 ds.GetRasterBand(1).SetNoDataValue(np.nan)
46
47 # FlushCache to write to disk and set data to none:
48 ds.FlushCache()
49 ds = None
50
51 # polygonize raster mask for WGS84 =====
52
53 # read mask file:
54 src = gdal.Open(outfn) # open mask raster
55 srcband = src.GetRasterBand(1) # get first (and only) band
56
57 # define driver:
58 shape_driver = ogr.GetDriverByName("ESRI Shapefile")
59 dst = shape_driver.CreateDataSource("./Masks/MAR_mask_UTM-24N.shp")
60
61 # set CRS:
62 sp_ref = osr.SpatialReference()
63 sp_ref.SetFromUserInput('EPSG:32624')
64
65 # create new layer:
66 dst_layername = "mask"
67 dst_layer = dst.CreateLayer(dst_layername, srs = sp_ref)
68
69 # create field in attribute table:
70 fld = ogr.FieldDefn("mask", ogr.OFTInteger)
71 dst_layer.CreateField(fld)
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72 dst_field = dst_layer.GetLayerDefn().GetFieldIndex("mask")
73
74 # polygonize raster to shapefile:
75 gdal.Polygonize(srcband, None, dst_layer, dst_field, [], callback=None)
76
77 # set data to none:
78 dst.FlushCache()
79 src = None
80 dst = None
81
```