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In [1]: import os

import rasterio
from rasterio.plot import reshape_as_image
import rasterio.mask
from rasterio.features import rasterize

import pandas as pd
import geopandas as gpd
from shapely.geometry import mapping, Point, Polygon
from shapely.ops import cascaded_union

import numpy as np
import cv2
import matplotlib.pyplot as plt
```

```
In [3]: # Reading raster file
raster_path = "/Users/Emirhan/Desktop/Pompano/geo_velocity_pompano.tif"
with rasterio.open(raster_path, "r") as src:
    raster_img = src.read()
    raster_meta = src.meta
```

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In [4]: #Reading shape file (vector)
shape_path = "/Users/Emirhan/Desktop/Pompano/buffered_rail_pompano.geojson"
train_df = gpd.read_file(shape_path)
```

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In [5]: #To check raster and vector file both have same coordinate reference system
print("CRS Raster: {}, CRS Vector {}".format(train_df.crs, src.crs))
```

CRS Raster: EPSG:4326, CRS Vector EPSG:4326

```
In [6]: #Generating polygon
def poly_from_utm(polygon, transform):
    poly_pts = []

    poly = cascaded_union(polygon)
    for i in np.array(poly.exterior.coords):

        # Convert polygons to the image CRS
        poly_pts.append(~transform * tuple(i))

    # Generate a polygon object
    new_poly = Polygon(poly_pts)
    return new_poly

# Generate Binary mask
poly_shp = []
im_size = (src.meta['height'], src.meta['width'])
for num, row in train_df.iterrows():
    if row['geometry'].geom_type == 'Polygon':
        poly = poly_from_utm(row['geometry'], src.meta['transform'])
        poly_shp.append(poly)
    elif row['geometry'].geom_type == 'MultiPolygon':
        for p in row['geometry'].geoms:
            poly = poly_from_utm(p, src.meta['transform'])
            poly_shp.append(poly)

mask = rasterize(shapes=poly_shp, out_shape=im_size)

# Convert the mask to boolean (False and True)
mask = mask.astype(bool)

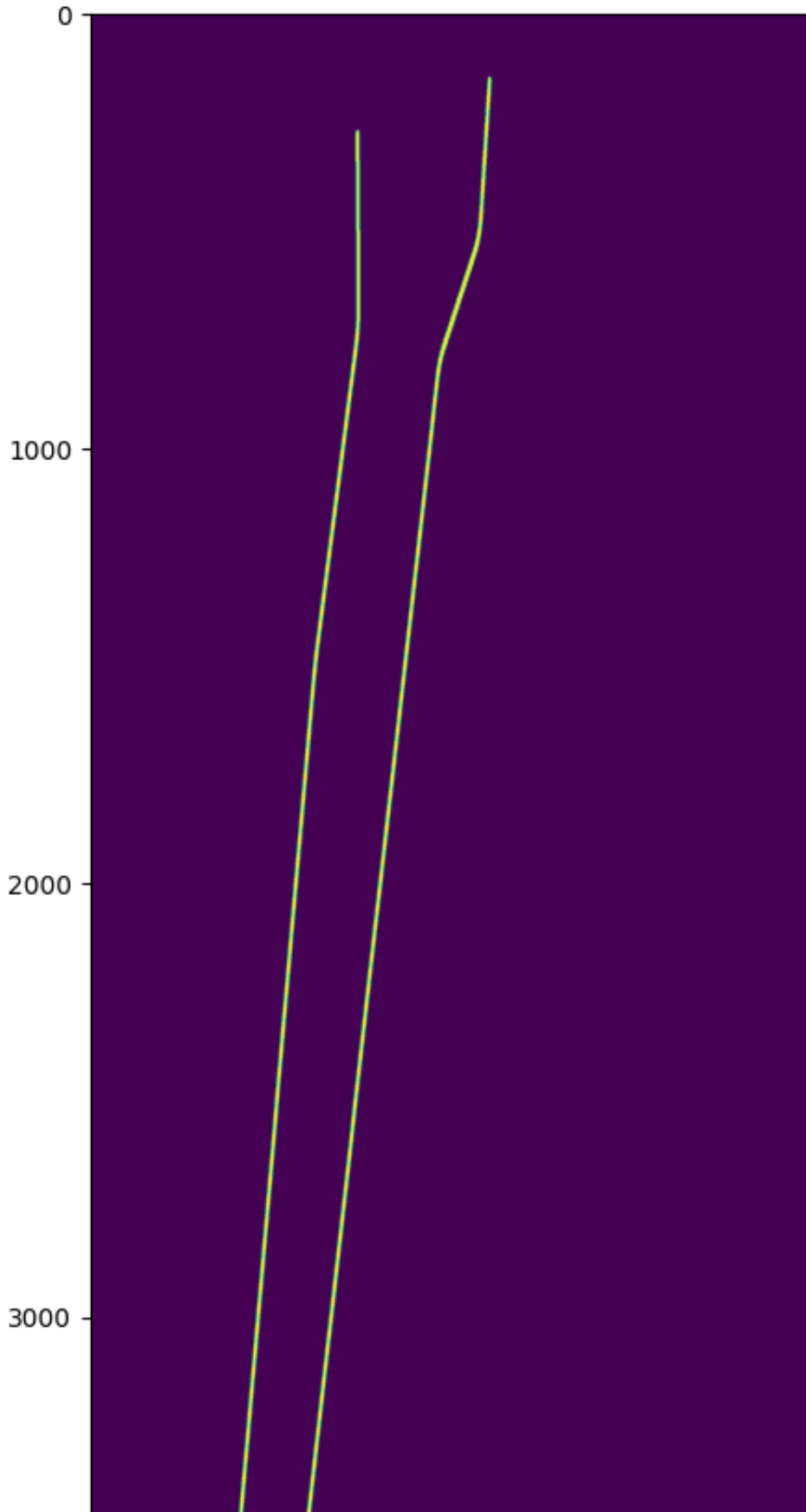
# Create a single-band raster
output_meta = raster_meta.copy()
output_meta.update(count=1)

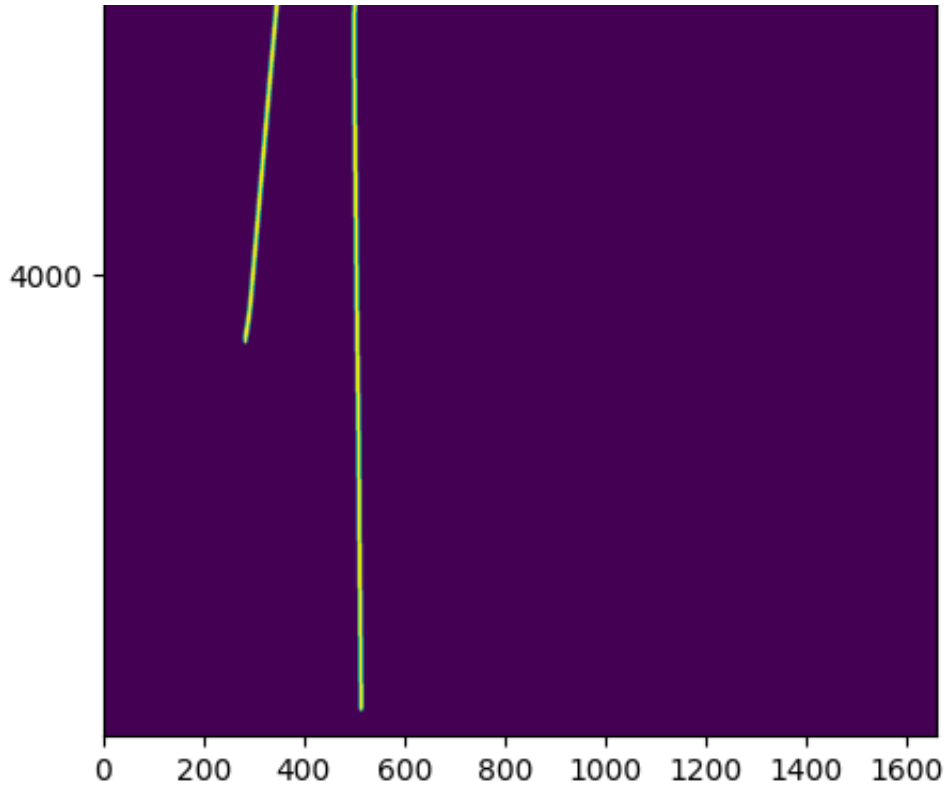
# Save the boolean mask as a single-band TIFF
output_path = "/Users/Emirhan/Desktop/Pompano/mask_pompano.tif"
with rasterio.open(output_path, 'w', **output_meta) as dst:
    dst.write(mask, 1)

# Plot the mask
plt.figure(figsize=(15, 15))
plt.imshow(mask)
```

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/var/folders/lc/h3fst5350wlcldp_gqccwx60h0000gq/T/ipykernel_20670/1821542396.p
y:5: ShapelyDeprecationWarning: The 'cascaded_union()' function is deprecated
. Use 'unary_union()' instead.
poly = cascaded_union(polygon)
```

Out[6]: <matplotlib.image.AxesImage at 0x12e1f9810>





In []: