010160620

January 14, 2021

```
[1]: #importing lib
     import rasterio
     from rasterio import plot
     import matplotlib.pyplot as plt
     import numpy as np
     %matplotlib inline
```

```
[63]: import os
      os.listdir('../010160620/input/')
```

```
[63]: ['.DS_Store', 'B3.tif', 'B6.tif']
```

```
[64]: #importing bands as band3 and band6
      band3 = rasterio.open('../010160620/input/B3.tif') #green band
      band6 = rasterio.open('../010160620/input/B6.tif') #swir1 band
```
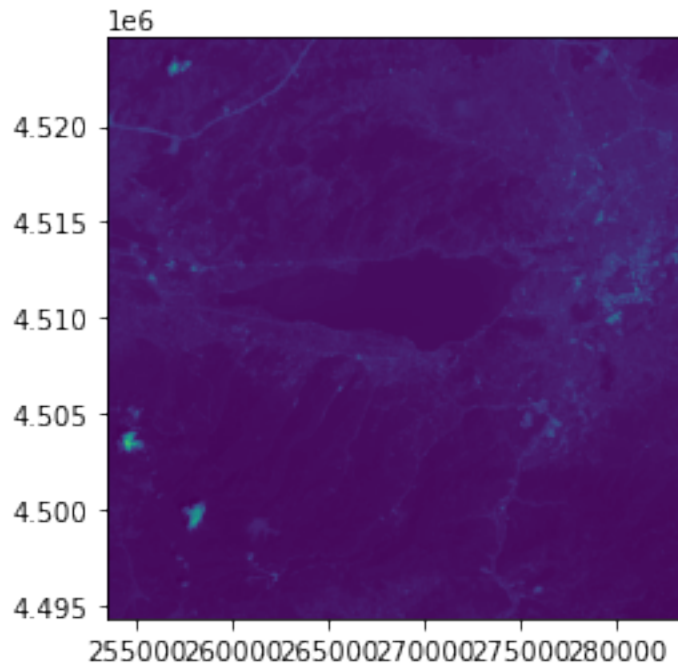
```
[65]: #no of raster rows
      band3.height
```

```
[65]: 1008
```

```
[66]: #no of raster columns
      band3.width
```

```
[66]: 1008
```

```
[67]: #plotting
      plot.show(band3)
```

[67]: `<AxesSubplot:>`

[68]:
```python
#raster byte
band3.dtypes[0]
```

[68]: `'uint16'`

[69]:
```python
#raster sytem of reference
band3.crs
```

[70]:
```python
#transform parameters
band3.transform
```

[70]:
```
Affine(30.0, 0.0, 253395.0,
       0.0, -30.0, 4524615.0)
```

[71]:
```python
#raster values are shown in matrix format
band3.read(1)
```

[71]:
```
array([[9260, 9003, 9428, …, 9041, 8880, 8814],
       [8919, 8950, 9477, …, 9411, 8853, 8930],
       [8874, 8916, 9012, …, 8768, 8672, 8761],
       …,
       [8710, 8692, 8611, …, 8000, 7931, 8279],
       [8670, 8639, 8604, …, 7809, 8005, 8133],
```

```
        [8689, 8735, 8716, ..., 7876, 8516, 8149]], dtype=uint16)
```

[72]:
```python
fig, (ax1, ax2) = plt.subplots(1, 2, figsize=(12, 6))
plot.show(band3, ax=ax1, cmap='Greens') #green band
plot.show(band6, ax=ax2, cmap='Greens') #swir1 band
fig.tight_layout()
```


[ ]:
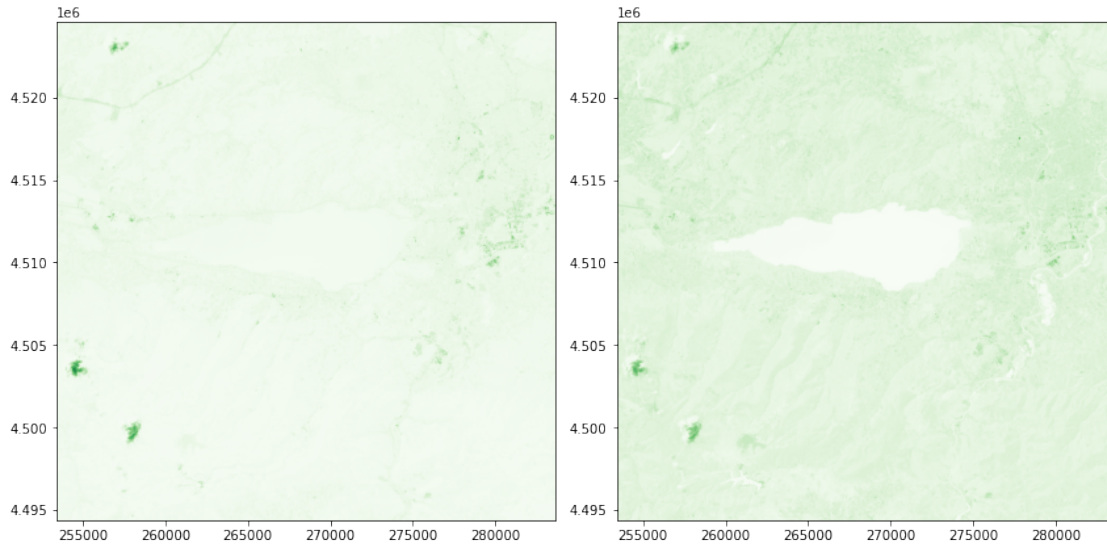
[73]:
```python
#create swir1 and green bands as arrays with float64
green = band3.read(1).astype('float64')
swir1 = band6.read(1).astype('float64')
swir1
```
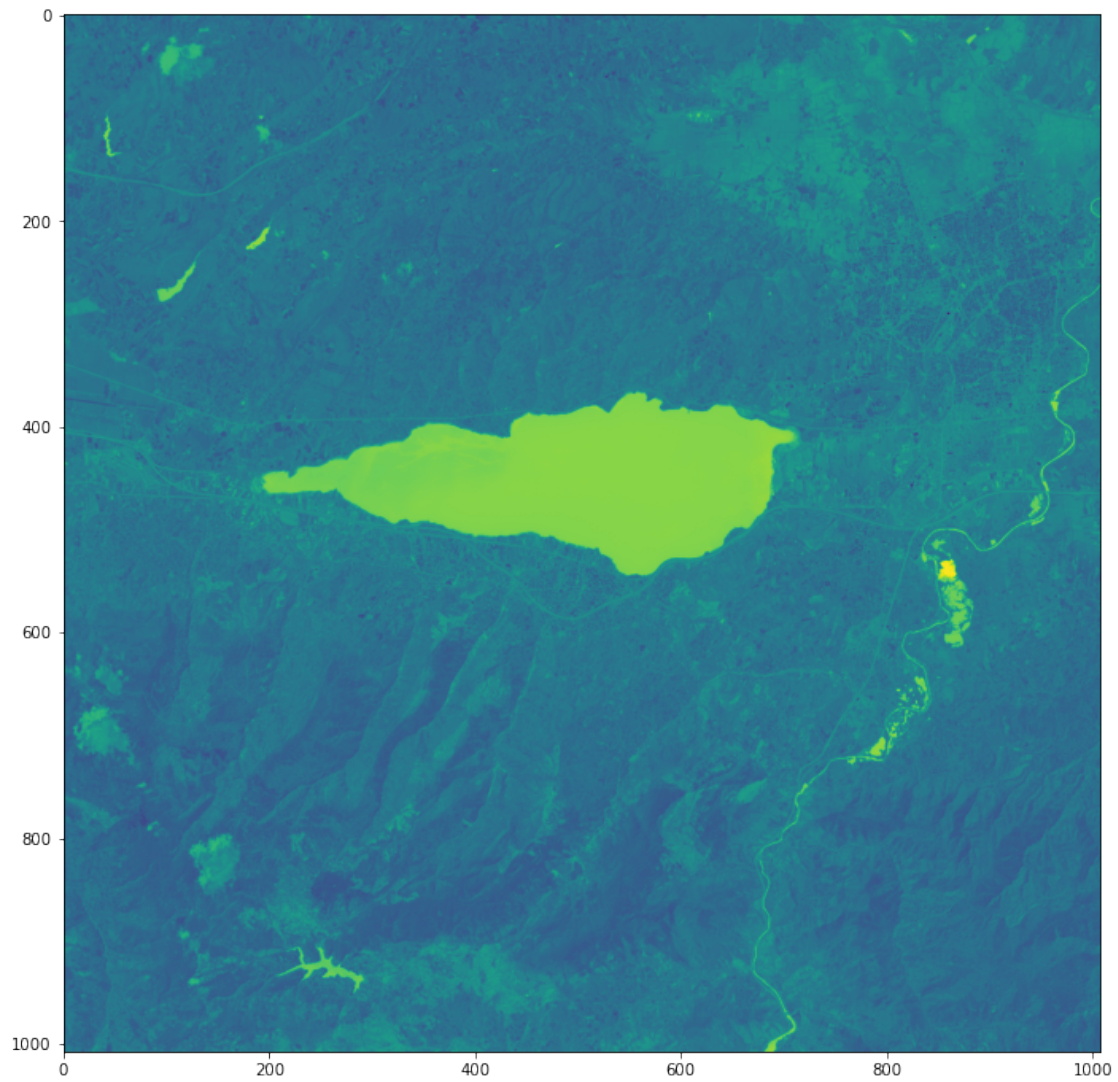
[73]:
```
array([[13471., 13368., 14438., ..., 13578., 13166., 12873.],
       [12217., 12909., 14482., ..., 13718., 12945., 13323.],
       [12957., 12816., 12972., ..., 12827., 12360., 12753.],
       ...,
       [12774., 12359., 11767., ..., 12794., 13161., 14149.],
       [12650., 12240., 12345., ..., 12134., 13008., 13599.],
       [13445., 13479., 13243., ..., 12749., 14295., 13942.]])
```

[74]:
```python
#mndwi formula, empty cells presented as 0
mndwi=np.where(
    (green+swir1)==0.,
    0,
    (green-swir1)/(green+swir1))
mndwi[:5,:5]
```

```
[74]: array([[-0.18525362, -0.19511868, -0.20992206, -0.23592658, -0.21280603],
             [-0.15603709, -0.18111533, -0.20889853, -0.18298286, -0.15743592],
             [-0.18702762, -0.17945886, -0.180131  , -0.14284324, -0.16003226],
             [-0.22477861, -0.19846202, -0.16648623, -0.14859128, -0.20207476],
             [-0.22085566, -0.22528182, -0.19407179, -0.15406853, -0.21955049]])
```

```python
[75]: #exporting mndwi_620.tif
      mndwi_620 = rasterio.open('../010160620/output/mndwi_620.
       ↪tiff','w',driver='Gtiff',
                              width=band3.width,
                              height = band3.height,
                              count=1, crs=band3.crs,
                              transform=band3.transform,
                              dtype='float64')
      mndwi_620.write(mndwi,1)
      mndwi_620.close()
```

```python
[77]: #mndwi_620 image
      mndwi_620 = rasterio.open('../010160620/output/mndwi_620.tiff')
      fig = plt.figure(figsize=(18,12))
      plot.show(mndwi)
```

<AxesSubplot:>

[ ]:

[ ]: