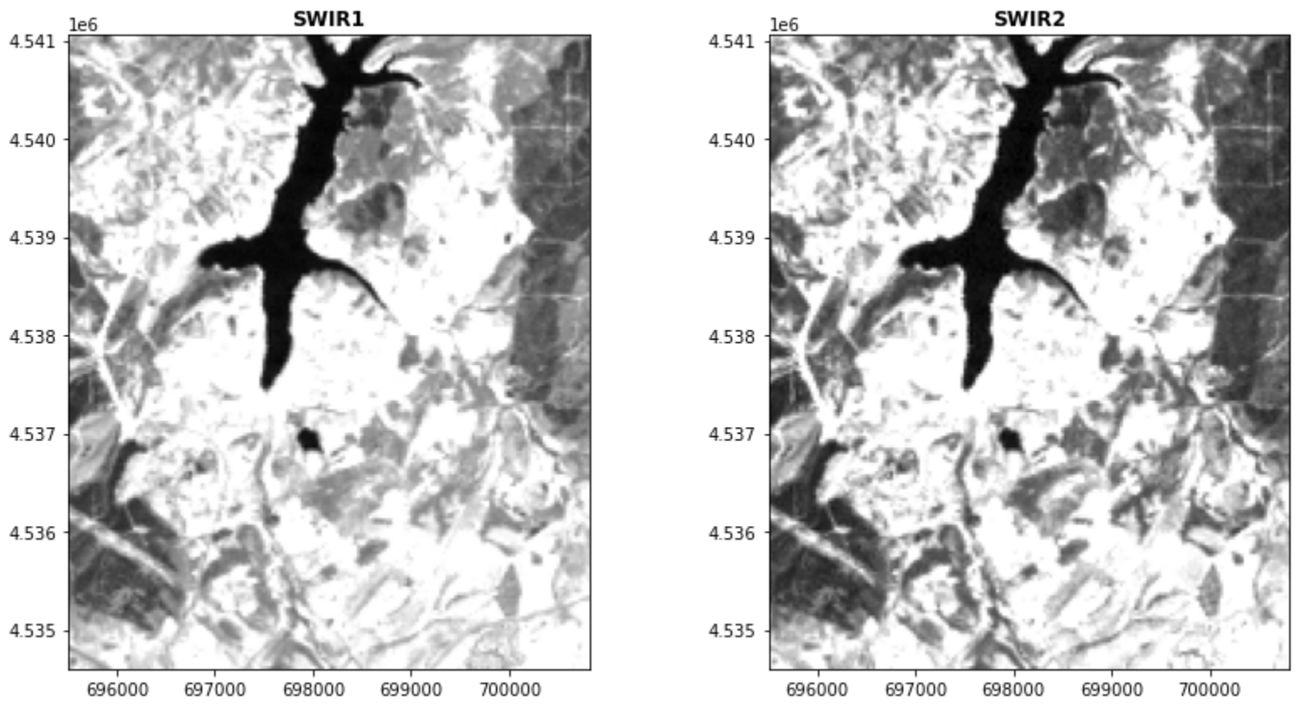
In [1]:
```
import rasterio
from rasterio import plot
import matplotlib.pyplot as plt
import numpy as np
%matplotlib inline
```

In [2]:
```
band4=rasterio.open("Images\B5_swir1.tif")
band5=rasterio.open("Images\B7_swir2.tif")
```

In [3]:
```
fig, (ax1, ax2) = plt.subplots(1, 2, figsize=(12, 6))
plot.show(band4, ax=ax1, cmap='gray', title='SWIR1')
plot.show(band5, ax=ax2, cmap='gray', title='SWIR2')
fig.tight_layout()
```

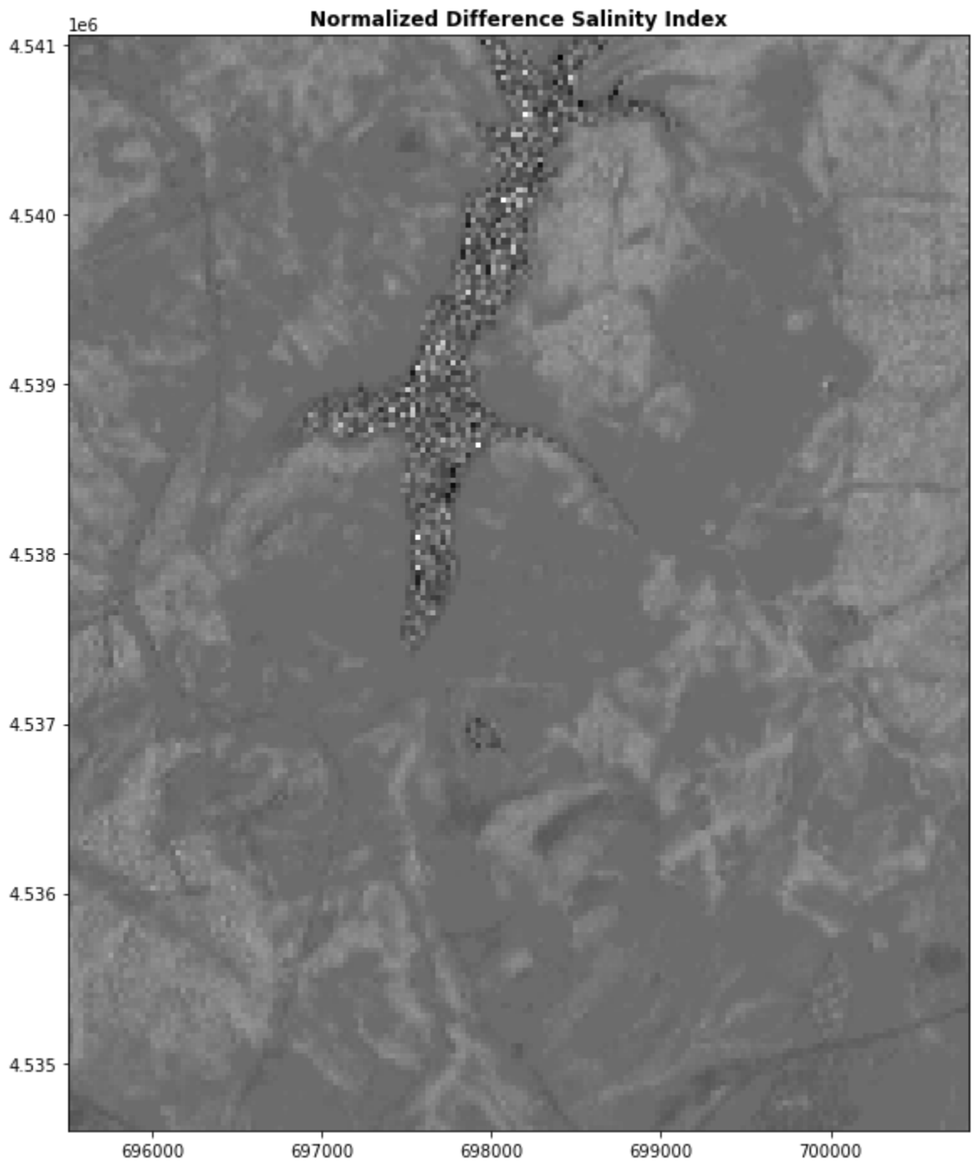


In [4]:
```
swir1=band4.read(1).astype('float64')
swir2=band5.read(1).astype('float64')
```

In [5]:
```
NDSI=np.where(
    (swir1+swir2)==0.,
    0,
    (swir1-swir2)/(swir1+swir2))
```

In [6]:
```
NDSI_image_v2 = rasterio.open('NDSI_image_v2_output.tiff','w',driver='Gtiff',
                          width=band4.width,
                          height = band4.height,
                          count=1, crs=band4.crs,
                          transform=band4.transform,
                          dtype='float64')
NDSI_image_v2.write(NDSI,1)
NDSI_image_v2.close()
```

In [7]:
```
NDSIimg = rasterio.open('NDSI_image_v2_output.tiff')
fig = plt.figure(figsize=(18,12))
plot.show(NDSIimg, cmap='gray', title='Normalized Difference Salinity Index')
```



Out[7]: <AxesSubplot:title={'center':'Normalized Difference Salinity Index'}>

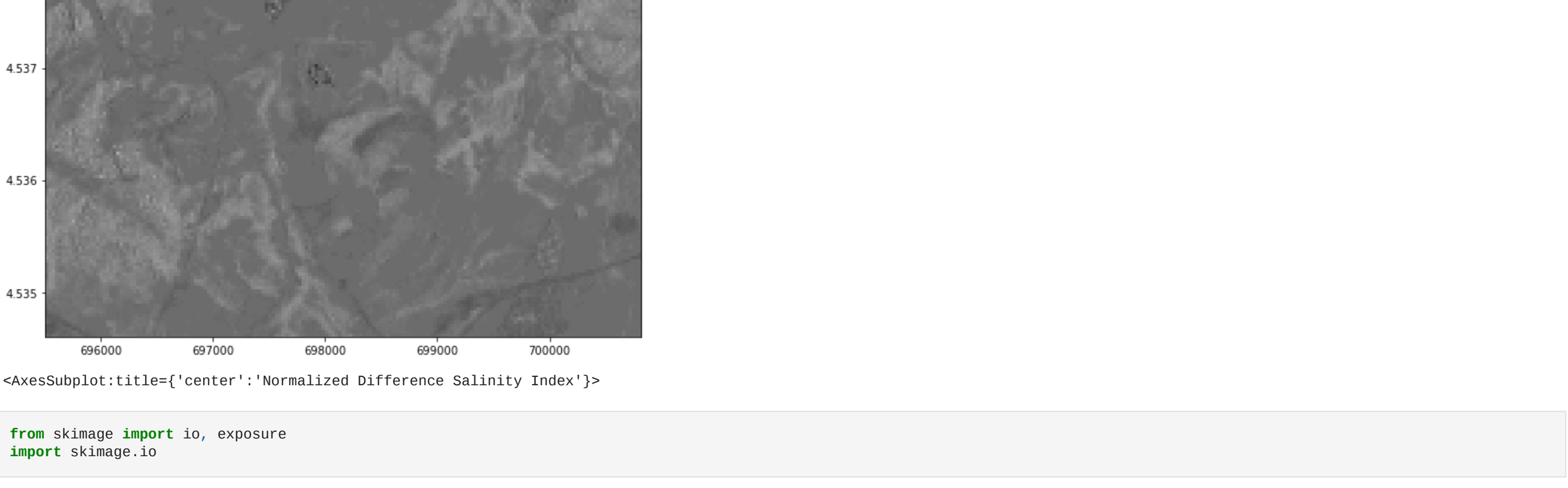
In [8]:
```
from skimage import io, exposure
import skimage.io
```

In [9]:
```
def image_histogram(img):

    co, ce = exposure.histogram(NDSI)

    fig = plt.figure(figsize=(40, 10))
    fig.set_facecolor('white')
    plt.plot(ce[1::], co[1::])
    plt.show()
```

In [10]:
```
image_histogram(NDSIimg)
```



In [ ]: