project

December 18, 2020

[1]:
```
import os
import scipy.sparse as sparse
import numpy as np
import pandas as pd
import geopandas as gpd
import rasterio
from rasterio.plot import show
import rasterstats
from shapely.geometry import Point, Polygon, LineString

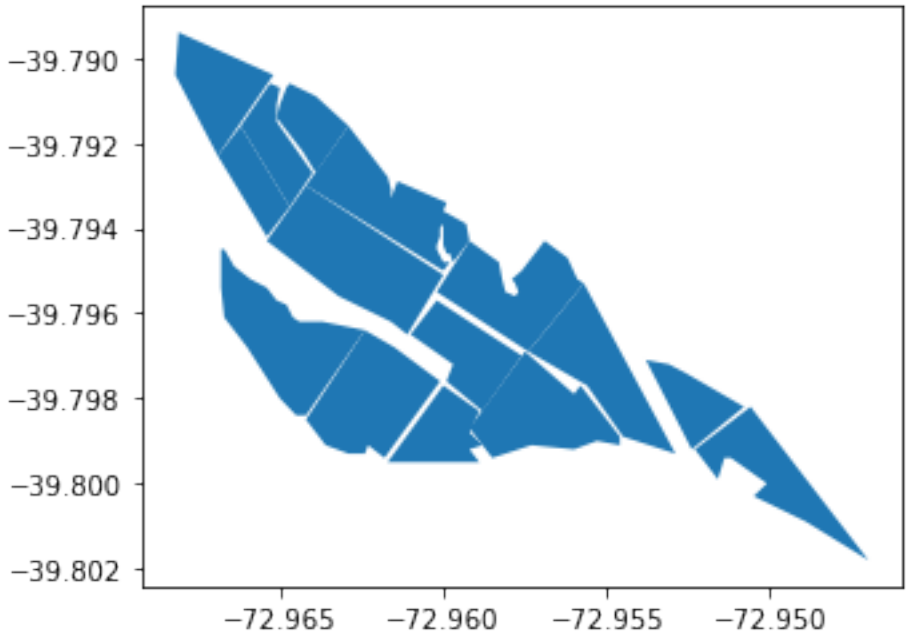
import matplotlib.pyplot as plt
%matplotlib inline

# directory names
raster_dir = "raster"
shape_dir = "shape"
```

Visualización previa del geojson

[2]:
```
potreros = gpd.read_file(shape_dir+"/agrospace_piloto.geojson")
potreros.plot()
```

[2]:
```
<AxesSubplot:>
```



[3]:
```
print(potreros.head())
```

```
   Sector   ID          Name          area  \
0     1.0  1.0  Punta estero  41369.504460
1     1.0  2.0        Laurel  22633.602809
2     1.0  3.0       Patagua  24631.063595
3     1.0  4.0   Lado estero  22348.761392
4     2.0  1.0        Maiz 2  80783.875155

                                              geometry
0  POLYGON ((-72.96810 -39.78940, -72.96520 -39.7…
1  POLYGON ((-72.96540 -39.79420, -72.96690 -39.7…
2  POLYGON ((-72.96470 -39.79350, -72.96620 -39.7…
3  POLYGON ((-72.96480 -39.79070, -72.96470 -39.7…
4  POLYGON ((-72.96540 -39.79430, -72.96420 -39.7…
```

Procesamiento de datos

[4]:
```
# file names
raster_file_names = []
raster_file_dates = []

# data
#array_serial_data = []
#rasters_serial_data = pd.DataFrame()
#transformed_serial_data = []
```

```
# metrics
measured_data = []

for raster in os.listdir(raster_dir):
    # we ensure the files we're going to read have the extension .tif
    if (raster[-4:] == '.tif'):

        date = raster.replace('agrospace_piloto_', '')
        date = date.replace('.tif', '')

        #raster_file_names.append(raster)
        #raster_file_dates.append(date)

        # raster to np array
        m = rasterio.open(raster_dir+"/"+raster)
        # array_serial_data.append([raster, m.read(1)])
        # rasters_serial_data[name] = sparse.coo_matrix(m.read(1), shape = (m.
↪shape[0], m.shape[1])).toarray().tolist()
        # transformed_serial_data.append([raster, m.transform])
        measured_data.append(rasterstats.zonal_stats(potreros, m.read(1),␣
↪affine = m.transform, stats="count min mean max median",
                                                     geojson_out = True))
        for i in range(len(measured_data[-1])):
            measured_data[-1][i]['date'] = date  # añadimos la fecha al␣
↪diccionario

        # plotting
        fig, ax = plt.subplots(1, 1)
        show(rasterio.open(raster_dir+"/"+raster), title = date)
        potreros.plot(ax=ax, facecolor='None', edgecolor = 'red')
        plt.show()
```

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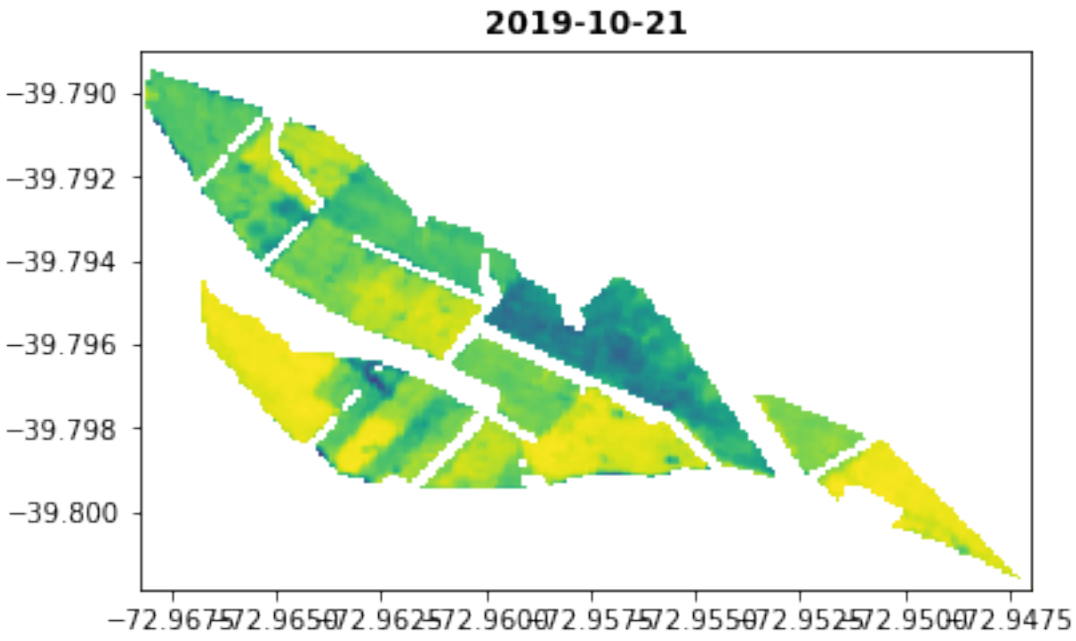


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<Figure size 432x288 with 0 Axes>
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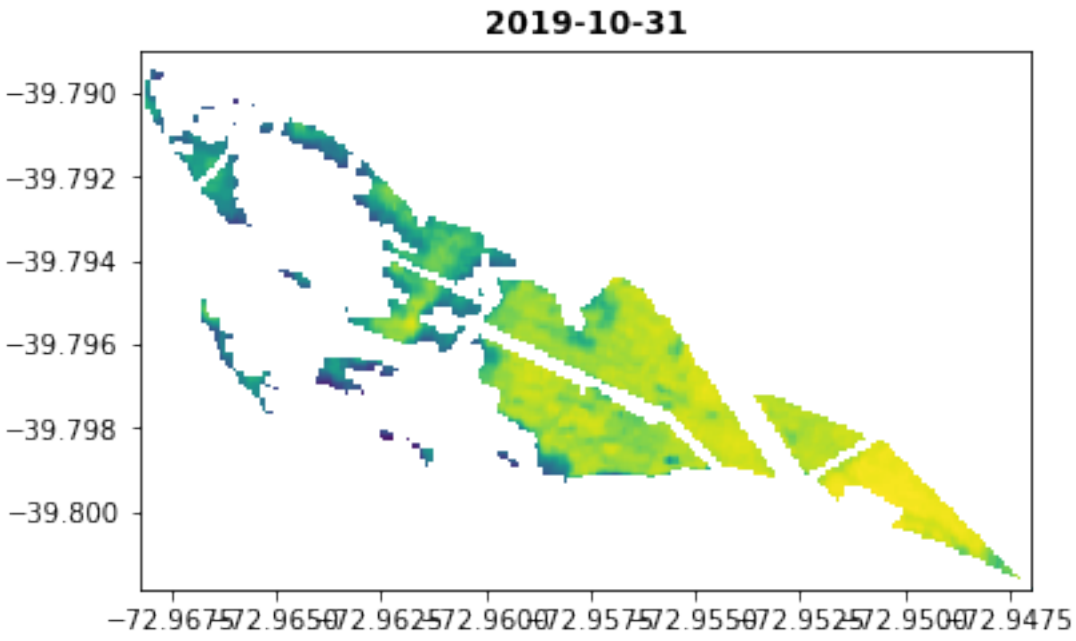


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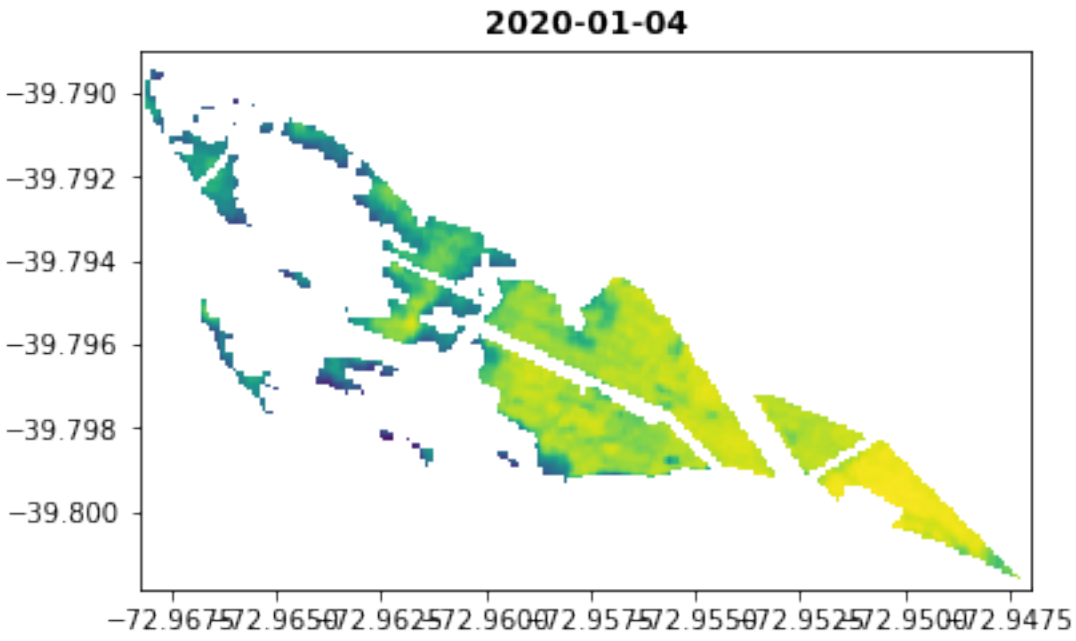


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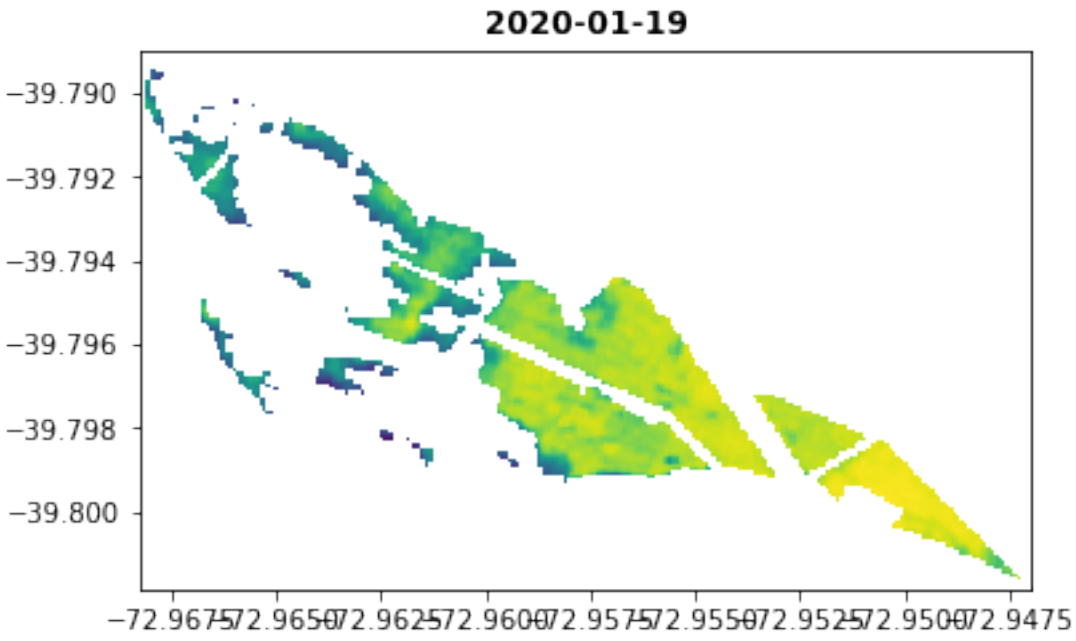


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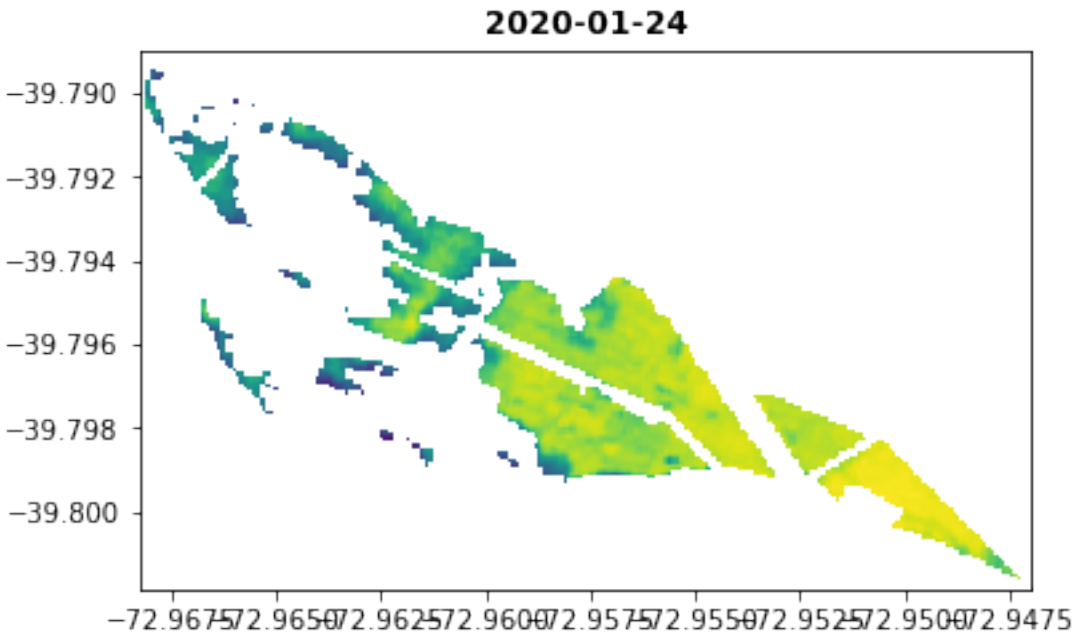


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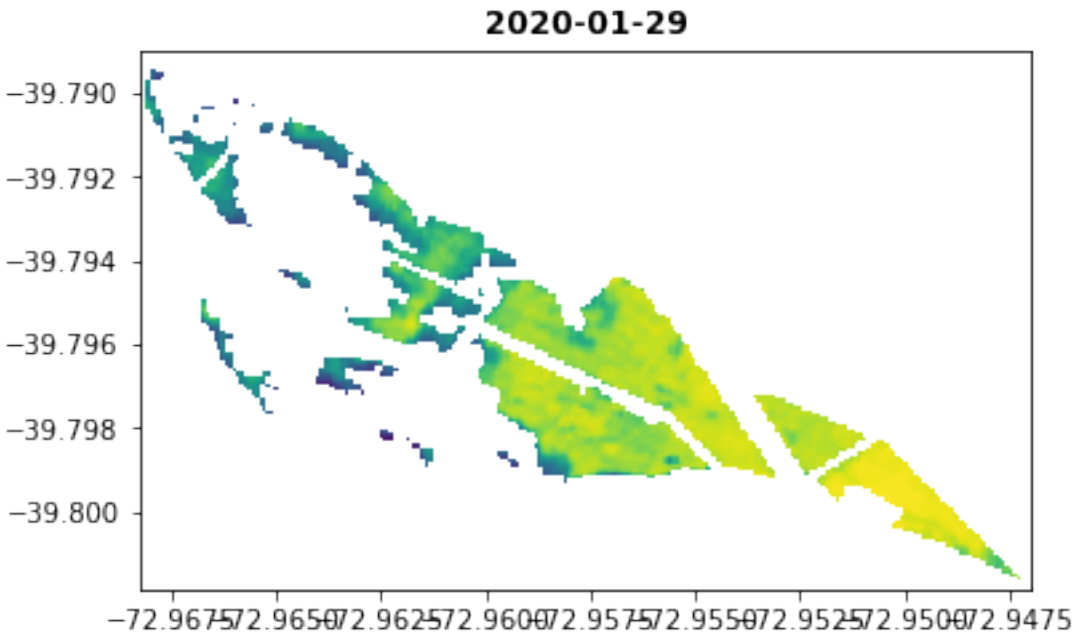


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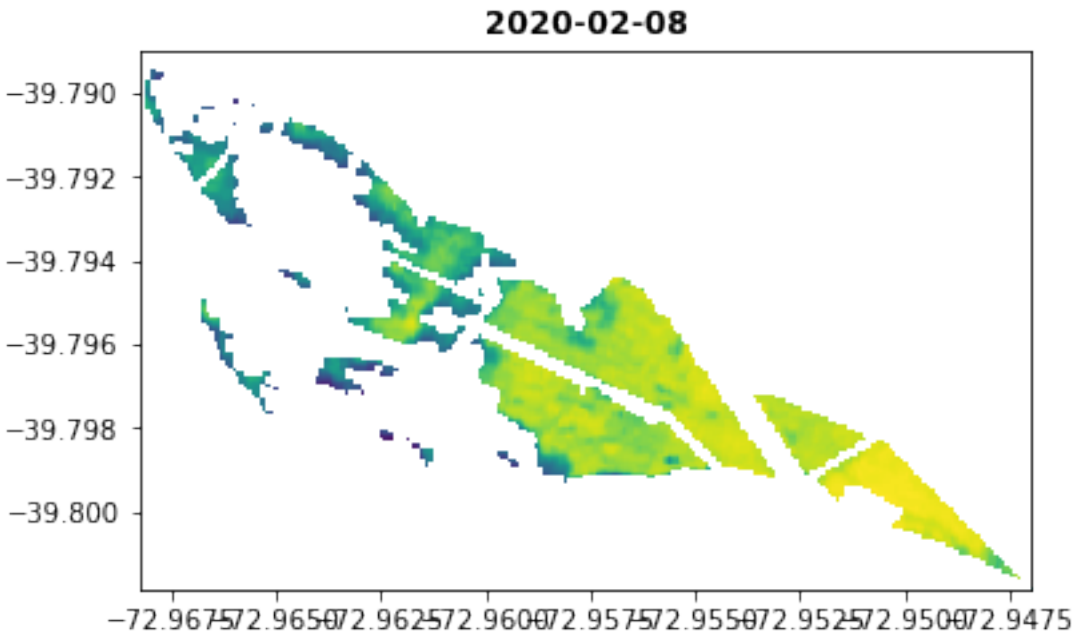


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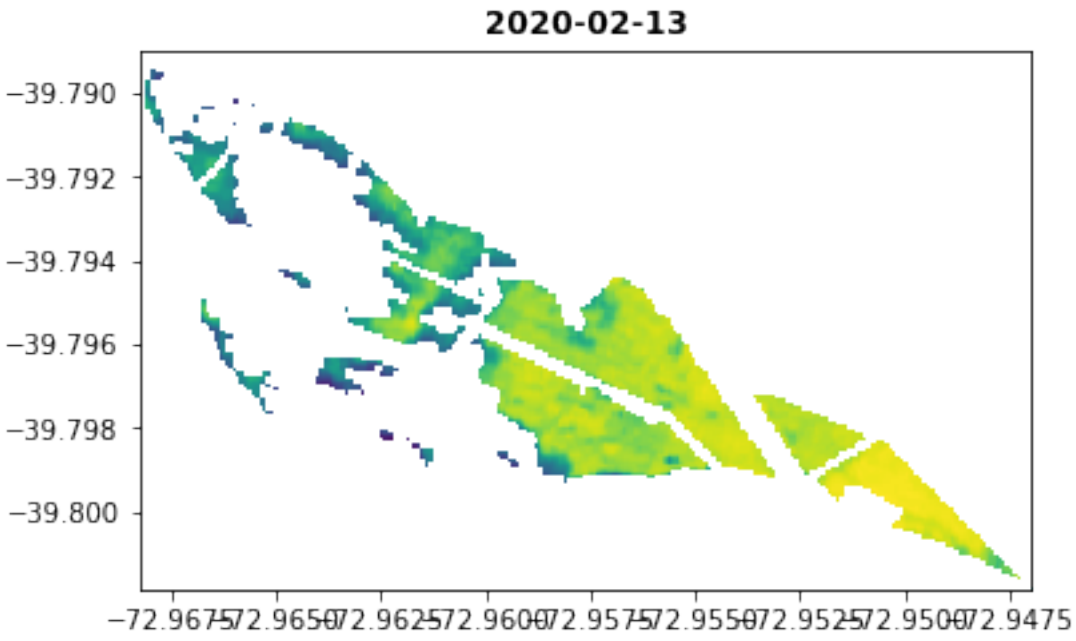


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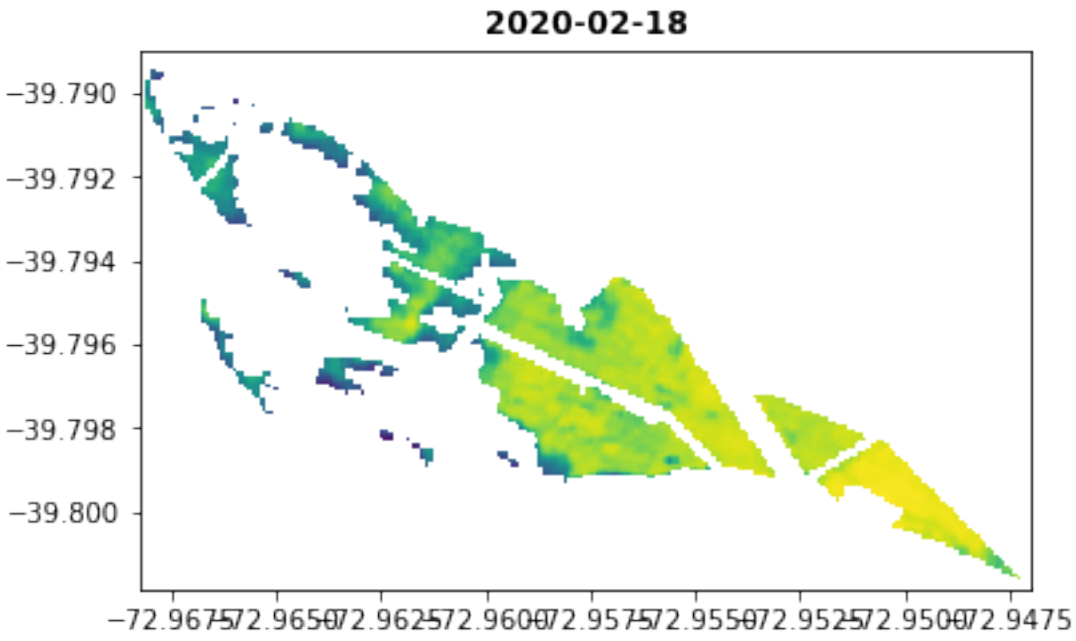


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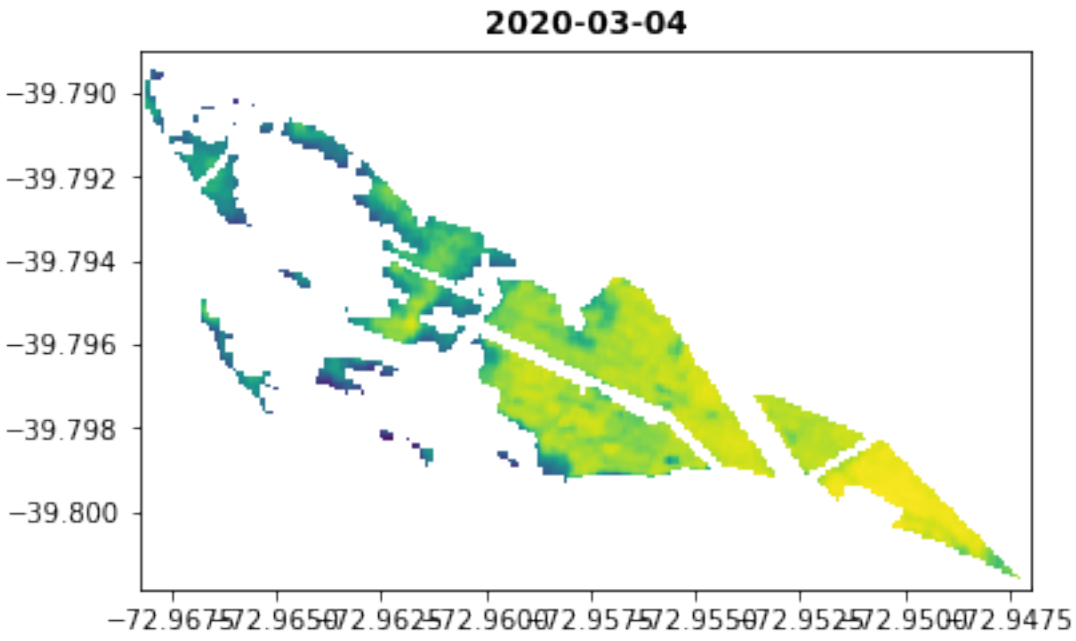


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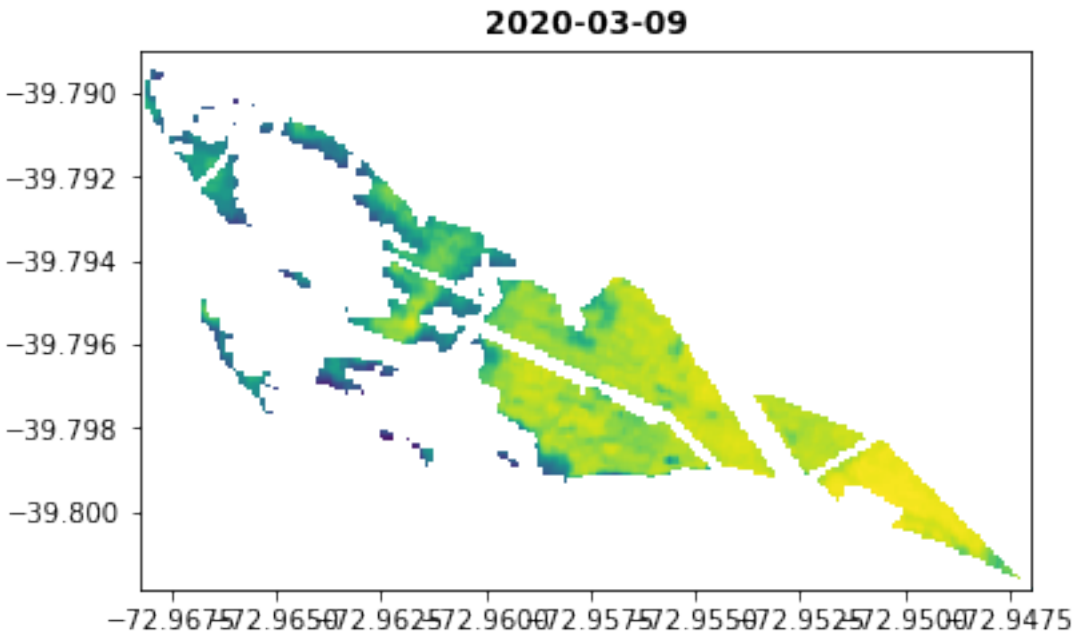


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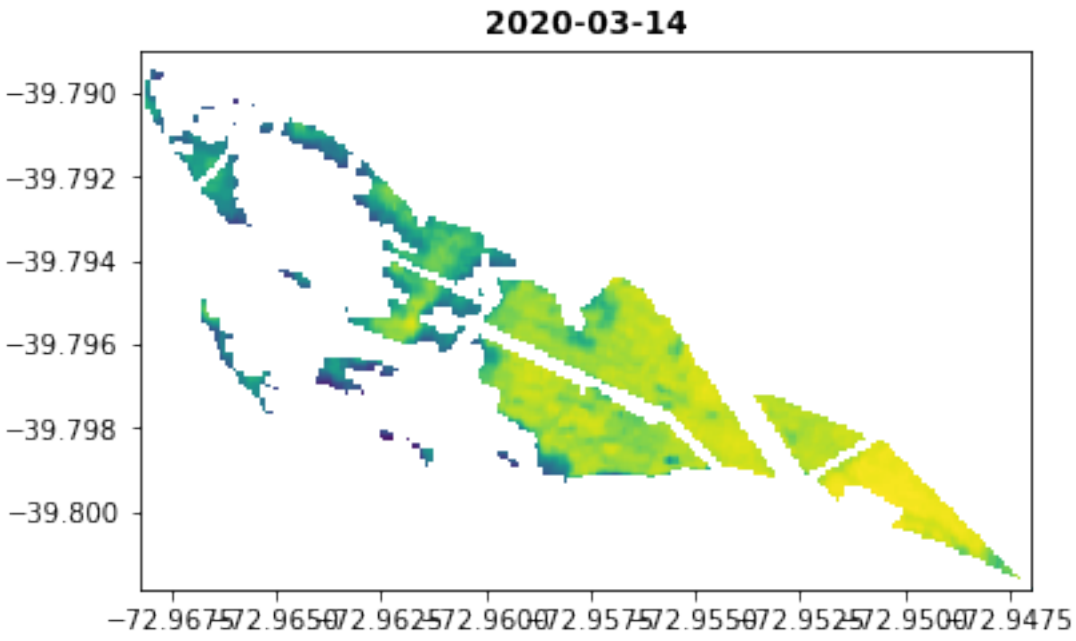


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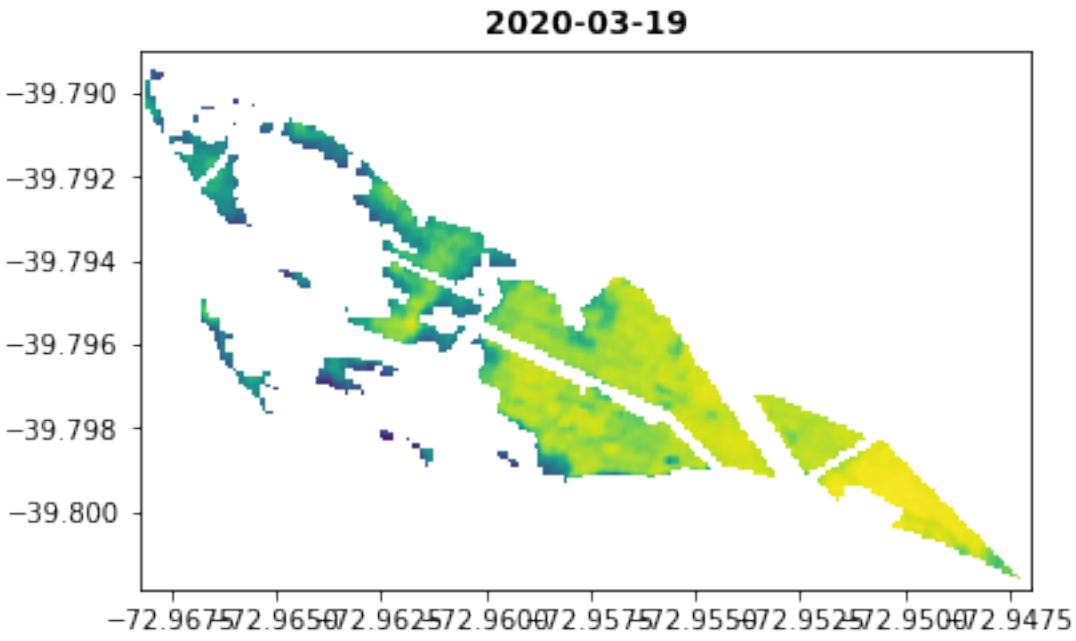


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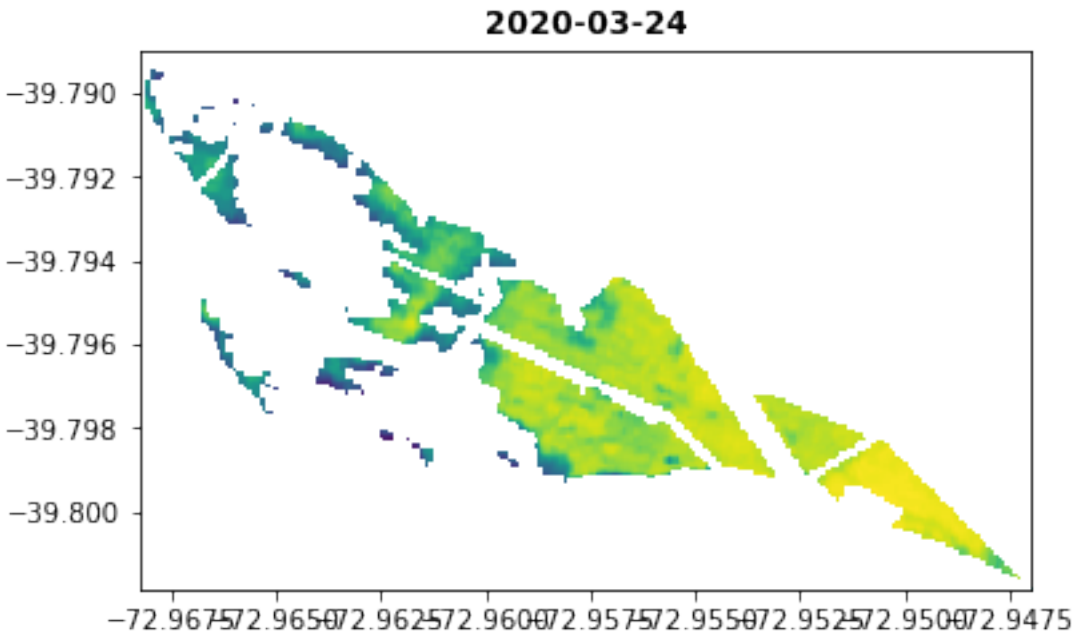


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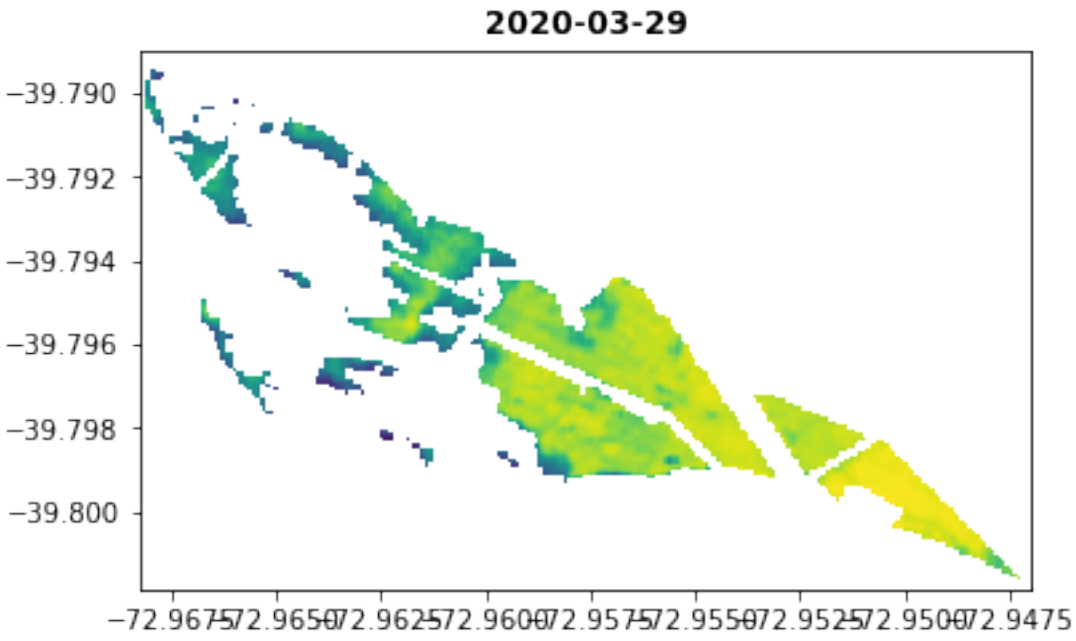


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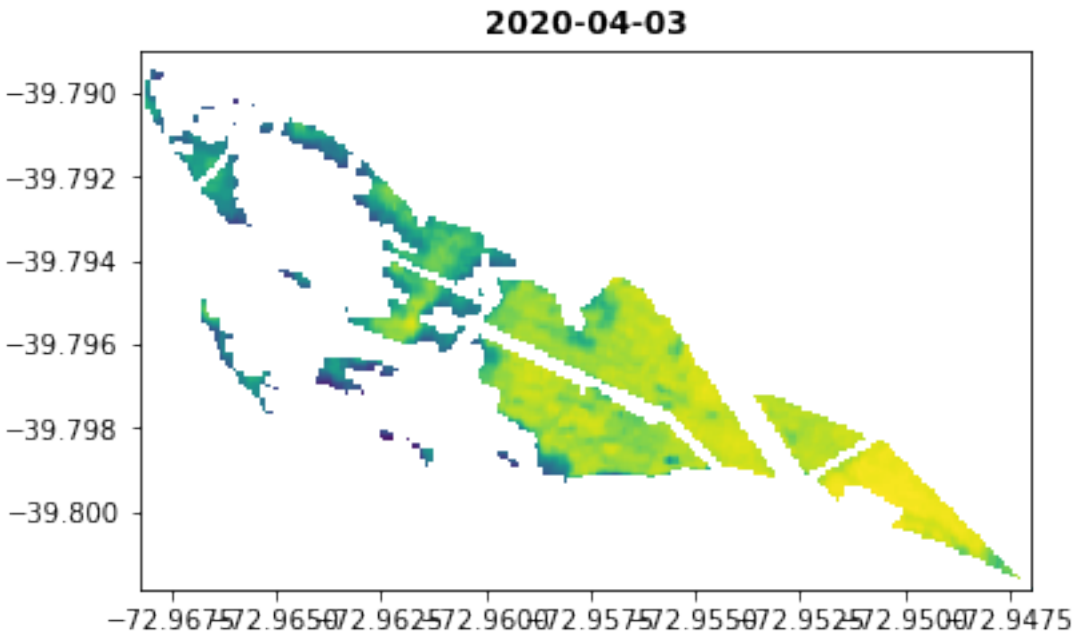


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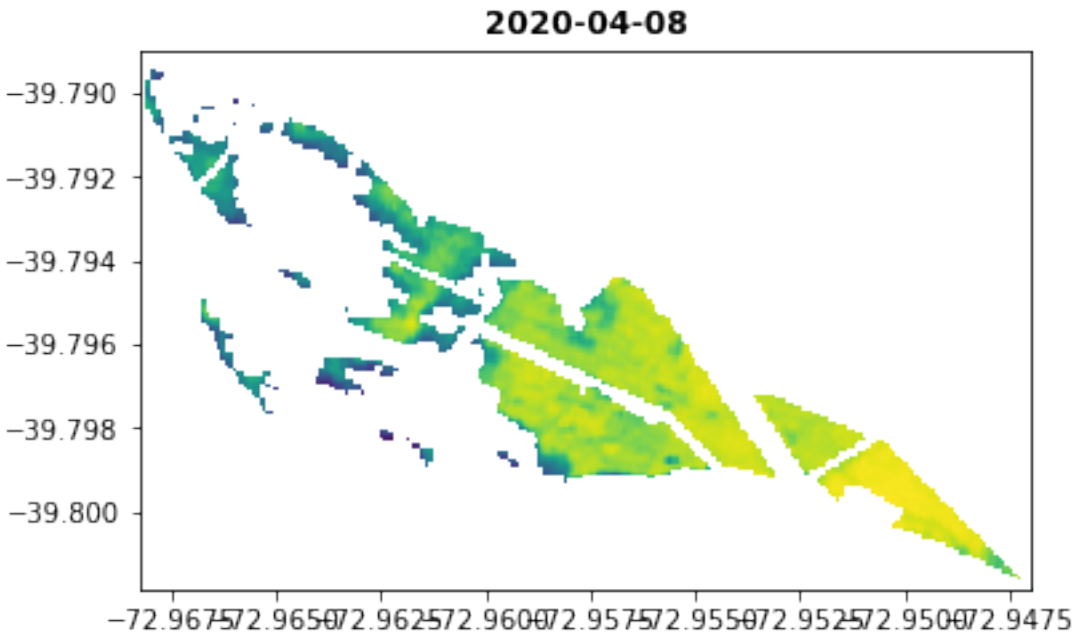


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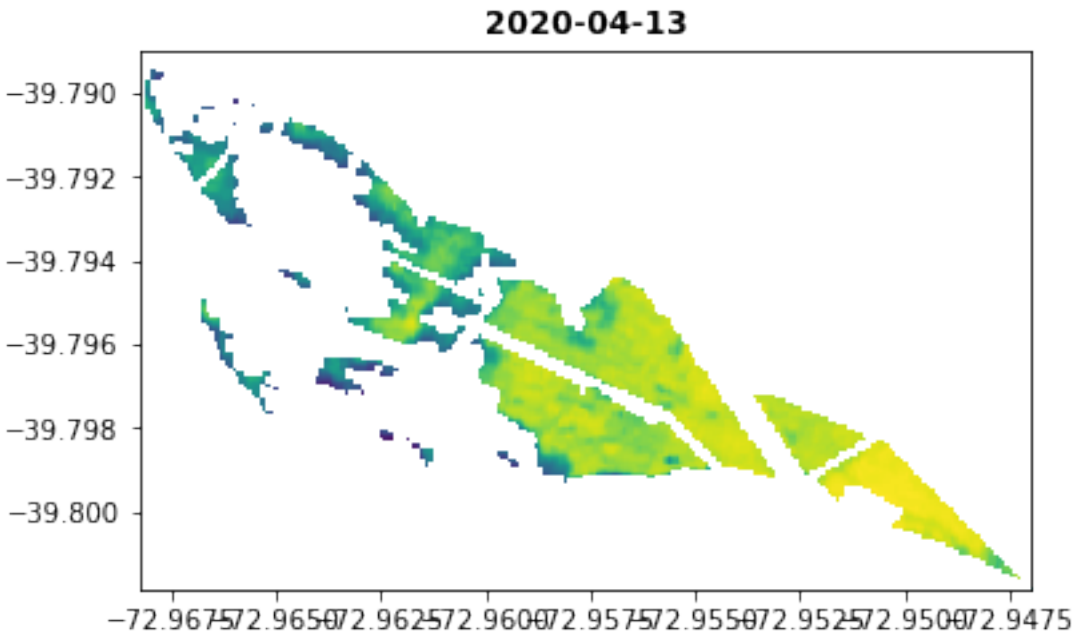


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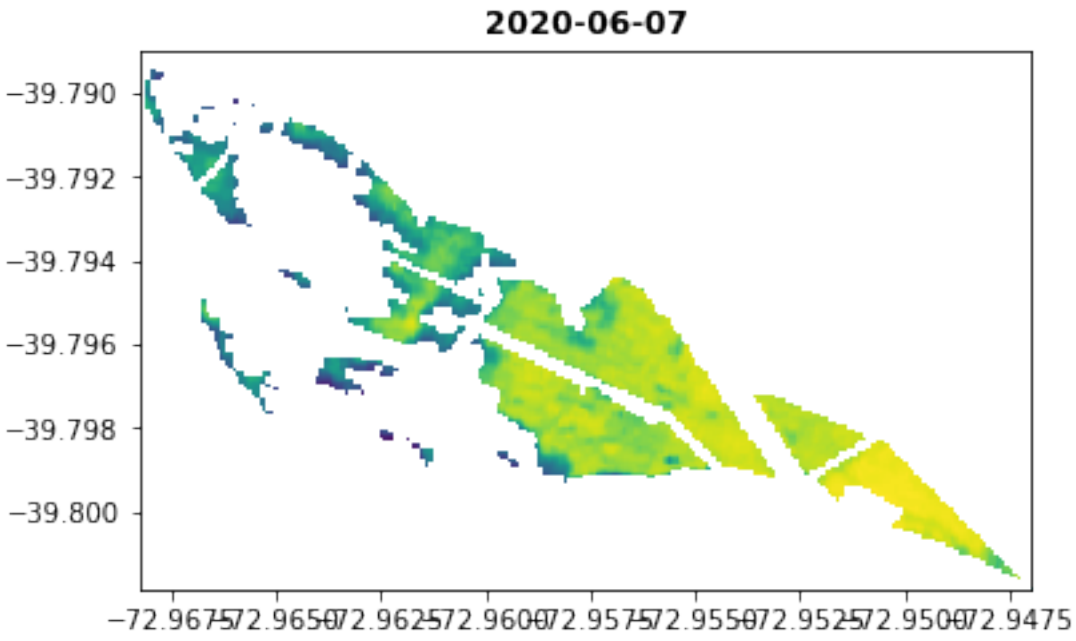


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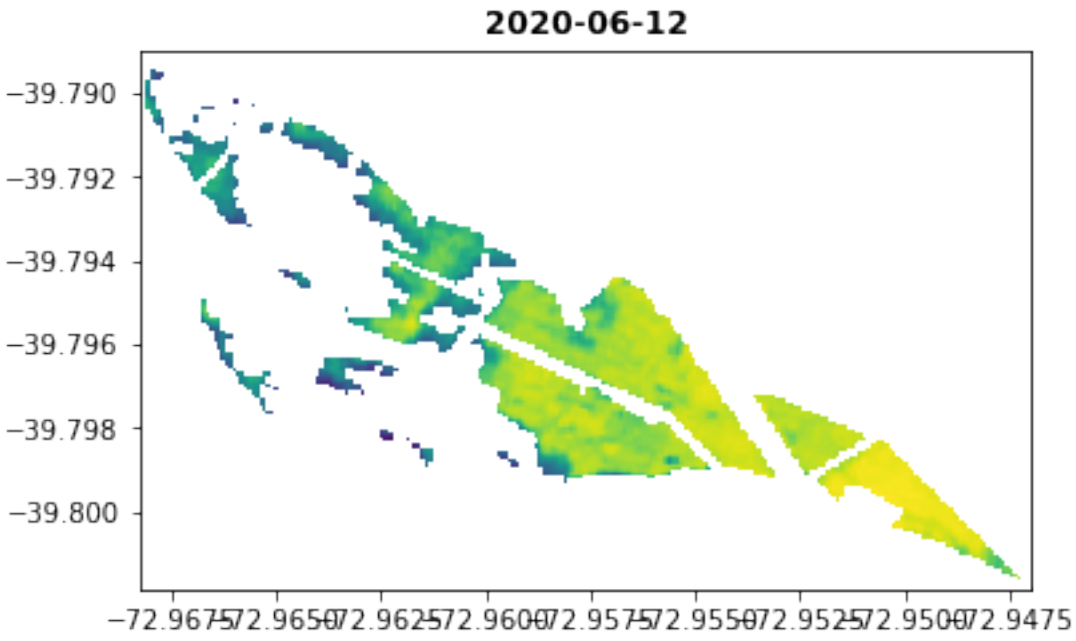


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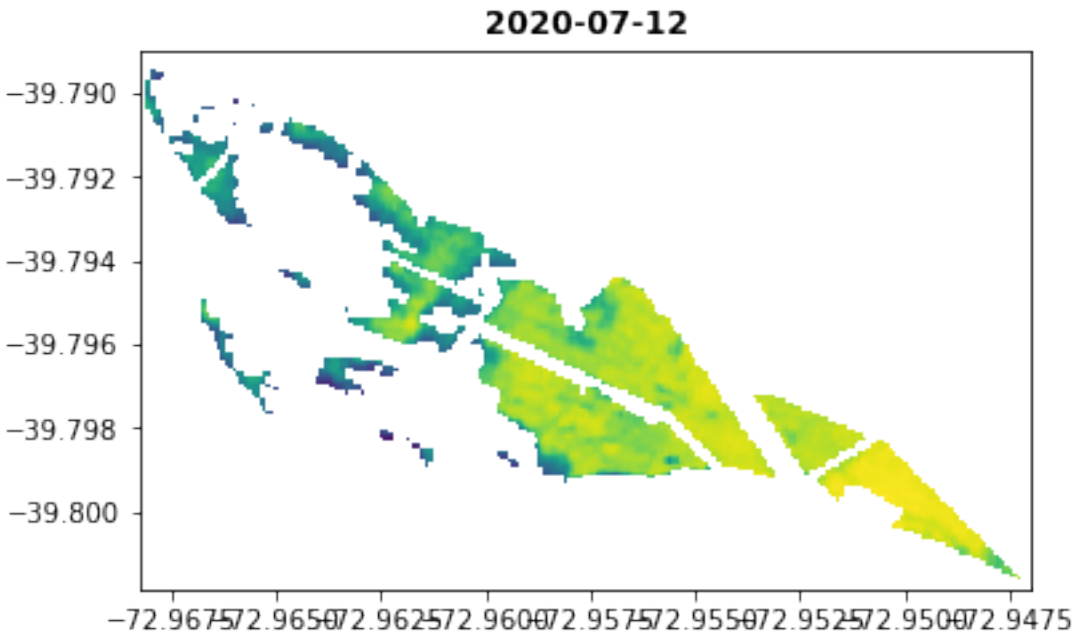
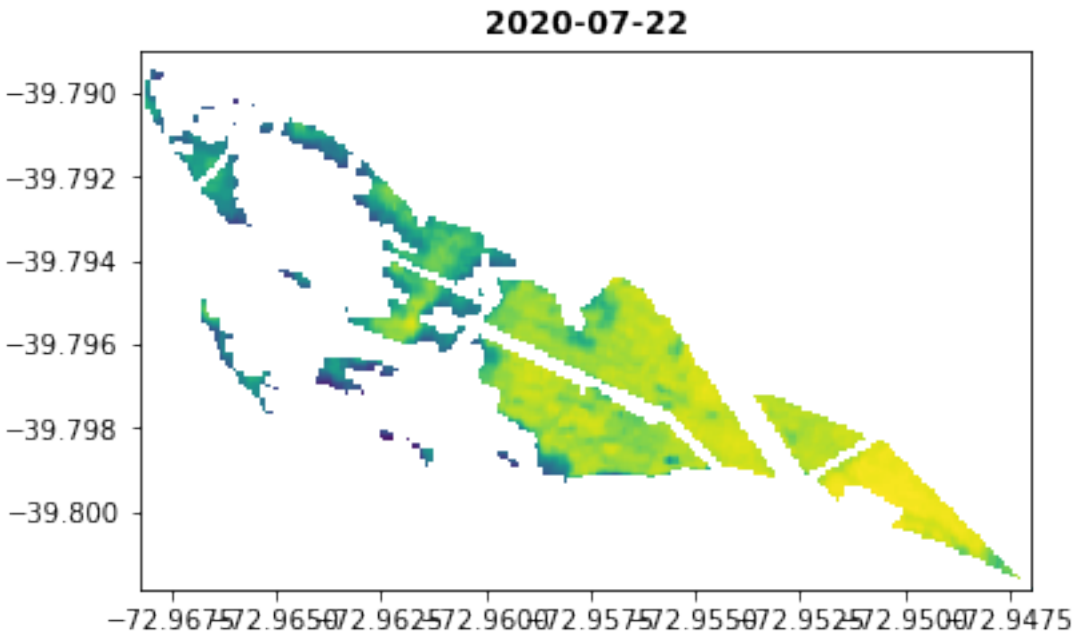



```
<Figure size 432x288 with 0 Axes>
```

```
c:\users\major\desktop\friki\estudios\git\otros\agrospace-intern-
test\venv\lib\site-packages\rasterstats\io.py:302: UserWarning: Setting nodata
to -999; specify nodata explicitly
  warnings.warn("Setting nodata to -999; specify nodata explicitly")
c:\users\major\desktop\friki\estudios\git\otros\agrospace-intern-
test\venv\lib\site-packages\matplotlib\image.py:490: RuntimeWarning: overflow
encountered in true_divide
  A_scaled /= ((a_max - a_min) / frac)
```




```
<Figure size 432x288 with 0 Axes>
```

```
c:\users\major\desktop\friki\estudios\git\otros\agrospace-intern-
test\venv\lib\site-packages\rasterstats\io.py:302: UserWarning: Setting nodata
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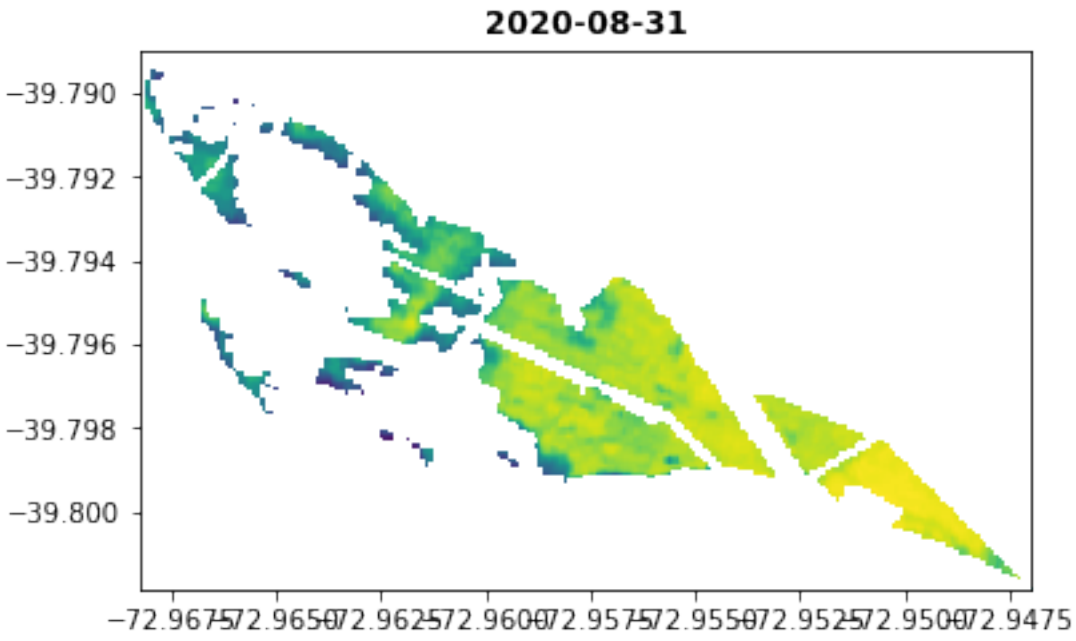
c:\users\major\desktop\friki\estudios\git\otros\agrospace-intern-
test\venv\lib\site-packages\matplotlib\image.py:490: RuntimeWarning: overflow
encountered in true_divide
  A_scaled /= ((a_max - a_min) / frac)
```




```
<Figure size 432x288 with 0 Axes>
```

```
c:\users\major\desktop\friki\estudios\git\otros\agrospace-intern-
test\venv\lib\site-packages\rasterstats\io.py:302: UserWarning: Setting nodata
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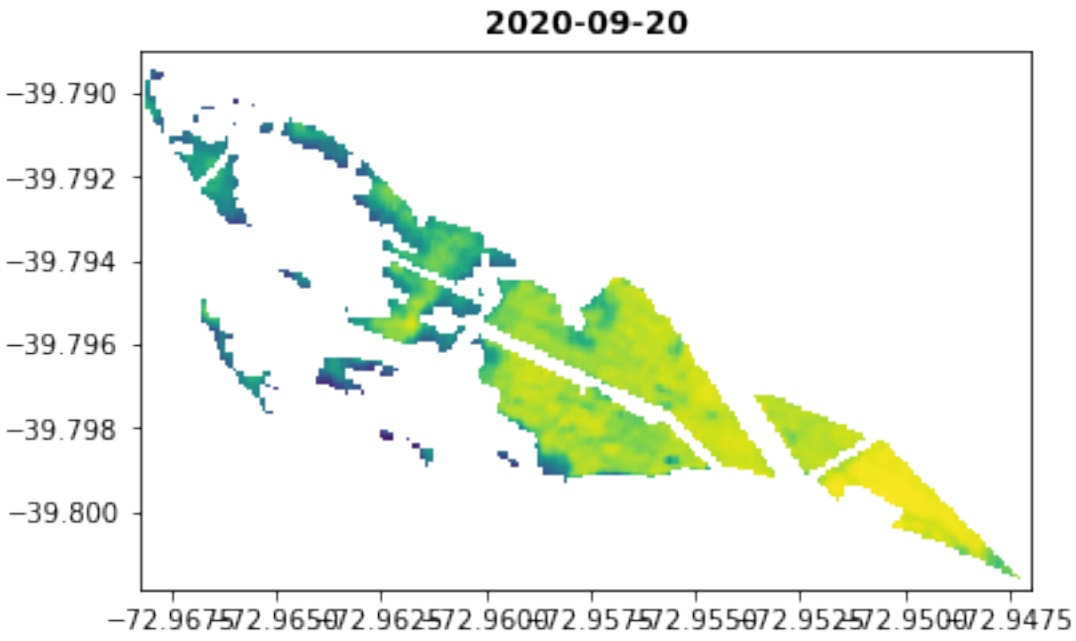
test\venv\lib\site-packages\matplotlib\image.py:490: RuntimeWarning: overflow
encountered in true_divide
  A_scaled /= ((a_max - a_min) / frac)
```




```
<Figure size 432x288 with 0 Axes>
```

```
c:\users\major\desktop\friki\estudios\git\otros\agrospace-intern-
test\venv\lib\site-packages\rasterstats\io.py:302: UserWarning: Setting nodata
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test\venv\lib\site-packages\matplotlib\image.py:490: RuntimeWarning: overflow
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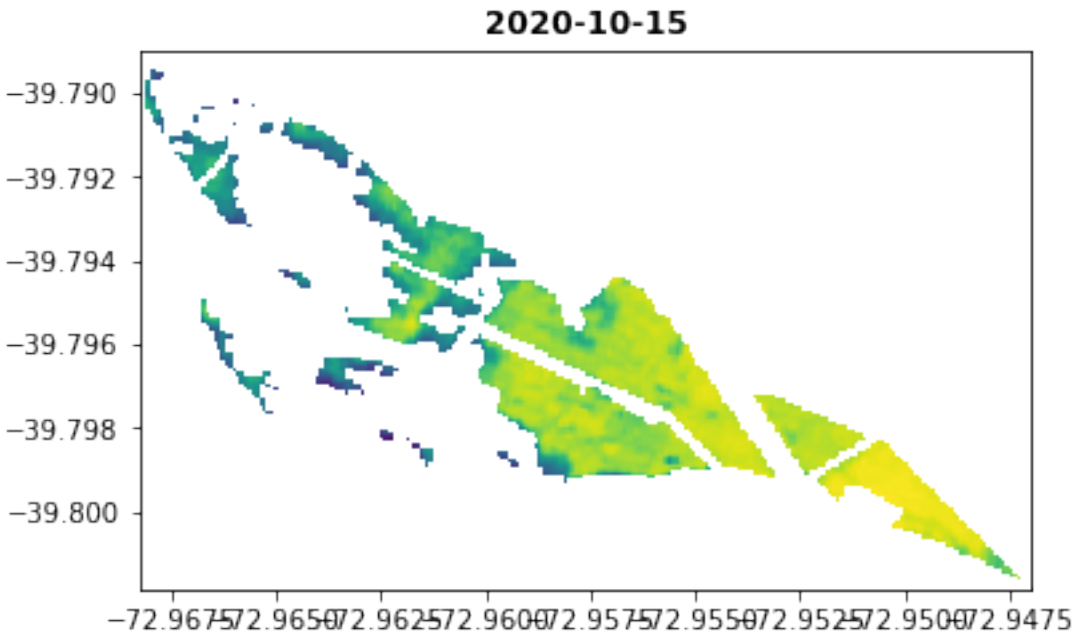
  A_scaled /= ((a_max - a_min) / frac)
```




```
<Figure size 432x288 with 0 Axes>
```

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c:\users\major\desktop\friki\estudios\git\otros\agrospace-intern-
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test\venv\lib\site-packages\matplotlib\image.py:490: RuntimeWarning: overflow
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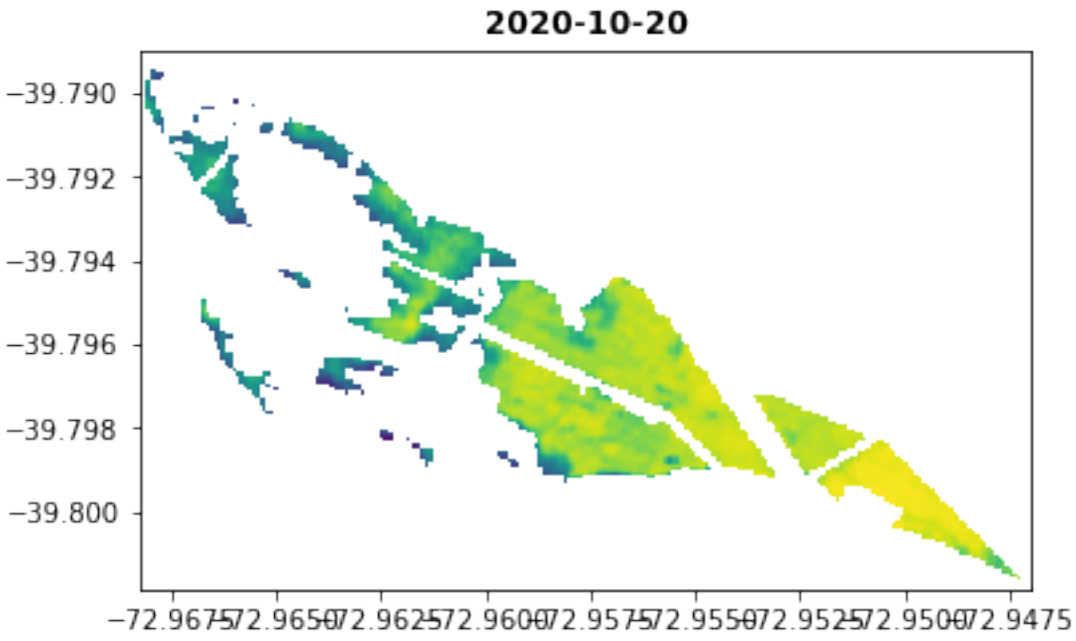
```




```
<Figure size 432x288 with 0 Axes>
```

```
c:\users\major\desktop\friki\estudios\git\otros\agrospace-intern-
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test\venv\lib\site-packages\matplotlib\image.py:490: RuntimeWarning: overflow
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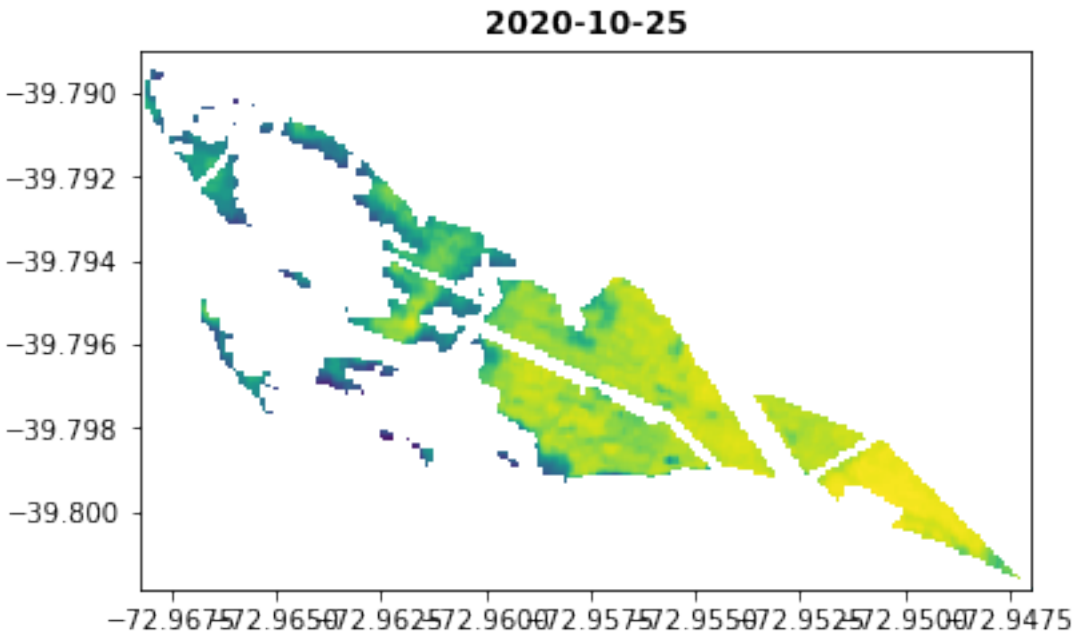
  A_scaled /= ((a_max - a_min) / frac)
```




```
<Figure size 432x288 with 0 Axes>
```

```
c:\users\major\desktop\friki\estudios\git\otros\agrospace-intern-
test\venv\lib\site-packages\rasterstats\io.py:302: UserWarning: Setting nodata
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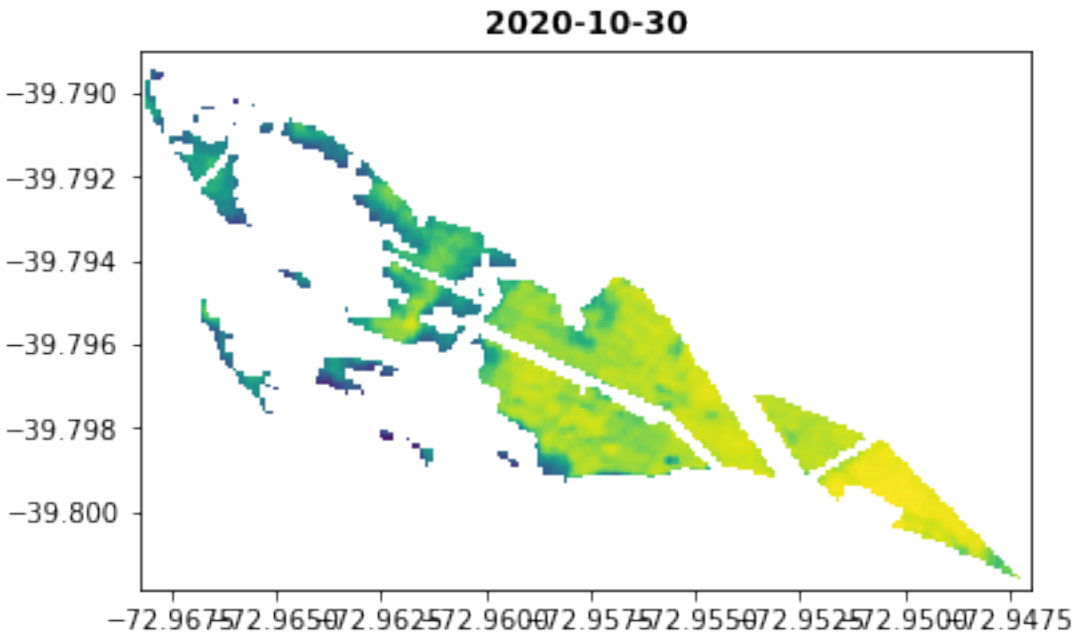
test\venv\lib\site-packages\matplotlib\image.py:490: RuntimeWarning: overflow
encountered in true_divide
  A_scaled /= ((a_max - a_min) / frac)
```




```
<Figure size 432x288 with 0 Axes>
```

```
c:\users\major\desktop\friki\estudios\git\otros\agrospace-intern-
test\venv\lib\site-packages\rasterstats\io.py:302: UserWarning: Setting nodata
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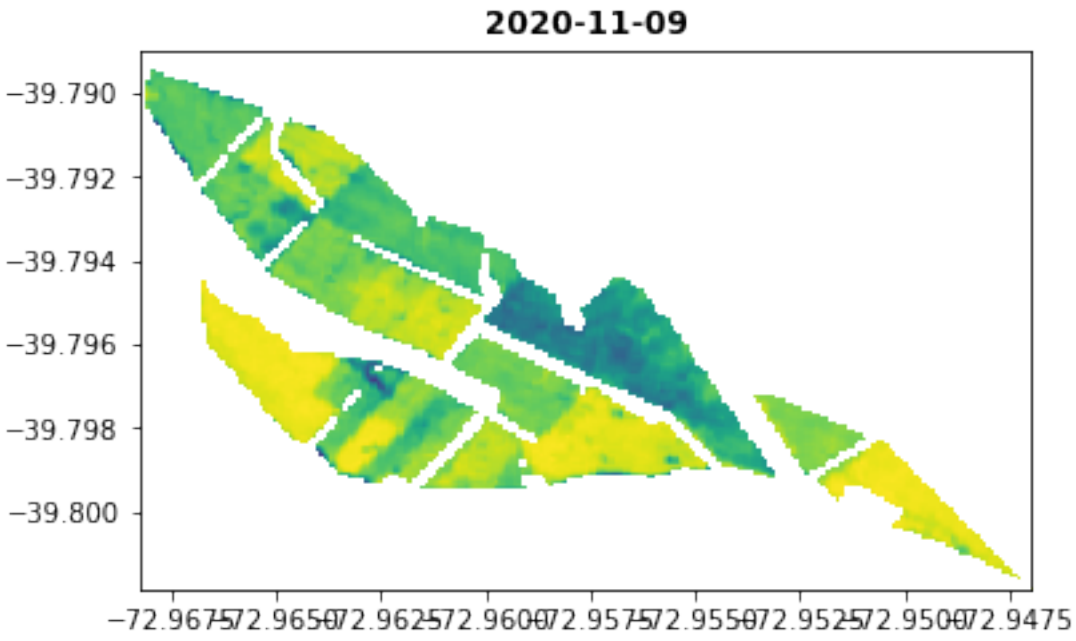
test\venv\lib\site-packages\matplotlib\image.py:490: RuntimeWarning: overflow
encountered in true_divide
  A_scaled /= ((a_max - a_min) / frac)
```




```
<Figure size 432x288 with 0 Axes>
```

[5]:
```
avg_potreros = {}

for t in range(len(measured_data)):  # iterate over the time dictionaries
    for i in range(len(measured_data[t])):  # iterate over the potreros
        name = measured_data[t][i]['properties']['Name']
        if (name in avg_potreros.keys()):
            mean = measured_data[t][i]['properties']['Name']
        else:
            avg_potreros['Name'] = name
#         avg_potreros[name]
```

[6]:
```
measured_data[0][0]['properties']
```

[6]:
```
{'ID': 1.0,
 'Name': 'Punta estero',
 'Sector': 1.0,
 'area': 41369.504460029304,
 'min': 0.17624999582767487,
 'max': 0.7881987690925598,
 'mean': 0.6413577264933674,
 'count': 540,
 'median': 0.6605344712734222}
```