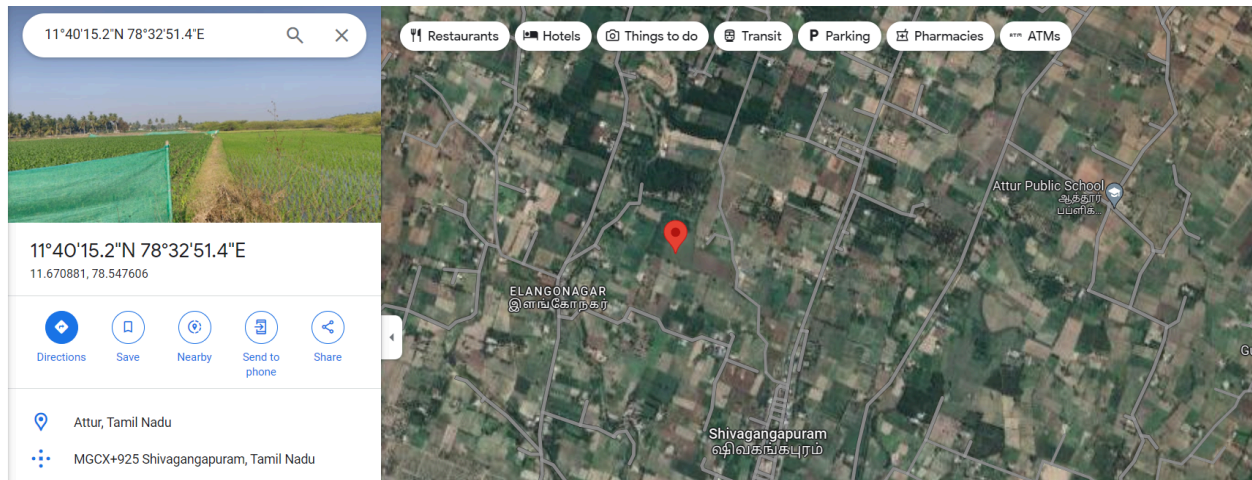


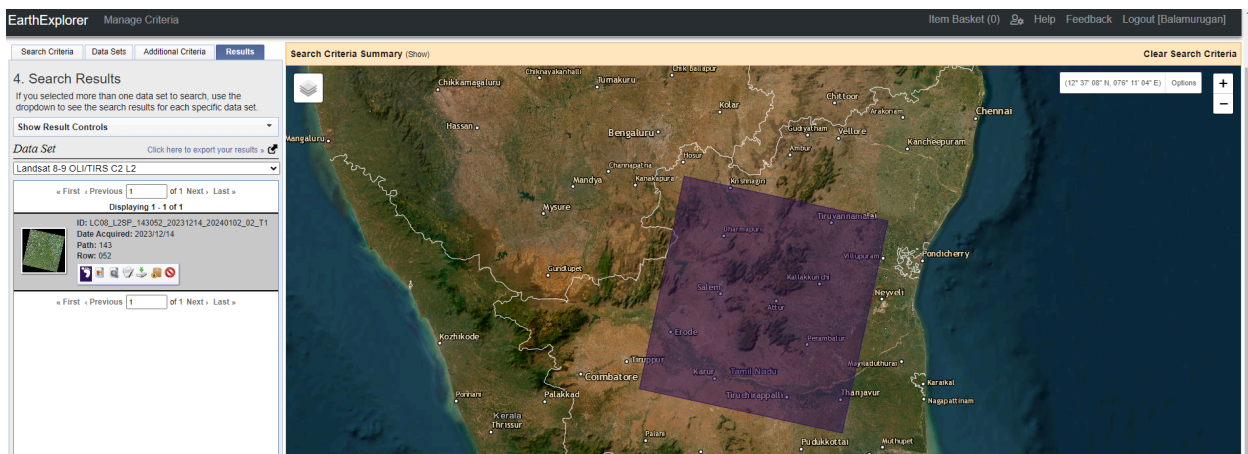
NDVI and SOCI report using FastAPI

Area of interest: Rice fields near Attur, Tamil Nadu of area ~10.sq.km



API Used: FastAPI

Imagery Used: Landsat 8 Multispectral imagery with cloud cover of 25% (Not available below that). The imagery was taken on date 14/12/2023, just before the harvesting season. Source : USGS EarthExplorer



Indices: NDVI and SOCI

Formula used to calculate the normalized difference vegetation index (NDVI):

$$NDVI = \frac{NIR - Red}{NIR + Red}$$

Formula used to calculate the soil organic carbon index (SOCI):

$$SOCI = \frac{\rho_{Blue}}{\rho_{Red} \cdot \rho_{Green}}$$

Source: <https://www.geo.umass.edu/faculty/ylu/2019ThalerSSSAJ.pdf>

Though, there are other methods to calculate SOCI, the method used here is to calculate SOCI from spectral bands.

Model:

The model developed and the requirements for the model is given in the following Github repository.

<https://github.com/bala1699/ndvi-soci-report/>

Results:

NDVI and SOCI values are calculated and Charts, Heatmaps are created out of it using the model.

FastAPI

0.1.0 OAS 3.1

/openapi.json

default

GET	/get_ndvi_values/	Get Ndvi Values	▼
GET	/get_ndvi_chart/	Get Ndvi Chart	▼
GET	/get_ndvi_heatmap/	Get Ndvi Heatmap	▼
GET	/get_soci_values/	Get Soci Values	▼
GET	/get_soci_chart/	Get Soci Chart	▼
GET	/get_soci_heatmap/	Get Soci Heatmap	▼
GET	/getpixelcount/	Get Pixel Count	▼

-H 'accept: application/json'

Request URL

http://127.0.0.1:8000/get_ndvi_values/

Server response

Code

Details

200

Response body

```
{
  "1": {
    "x": "232654.69342748093",
    "y": "1288931.93191875",
    "ndvi": 0.2517757231855879
  },
  "2": {
    "x": "232684.73428244275",
    "y": "1288931.93191875",
    "ndvi": 0.26498116431706087
  },
  "3": {
    "x": "232714.7751374046",
    "y": "1288931.93191875",
    "ndvi": 0.25627922148526694
  },
  "4": {
    "x": "232744.81599236644",
    "y": "1288931.93191875",
    "ndvi": 0.25857977687267575
  },
  "5": {
    "x": "232774.85684732825",
    "y": "1288931.93191875",
    "ndvi": 0.2785583581963759
  },
  "6": {
    "x": "232804.8977022901",

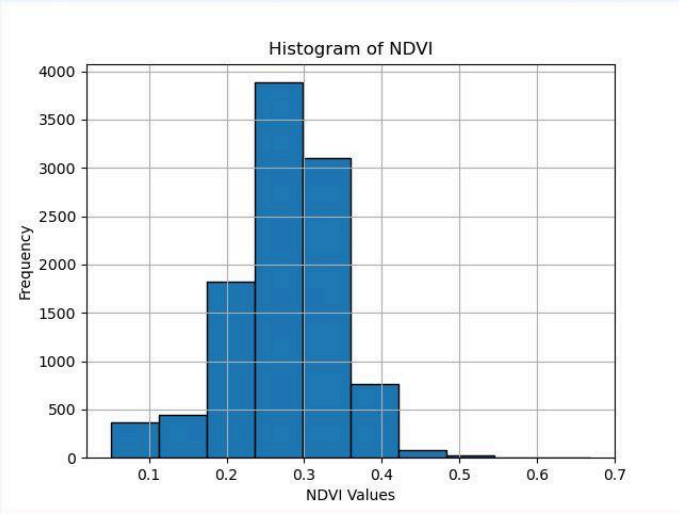
```

Download

Response headers

200

Response body



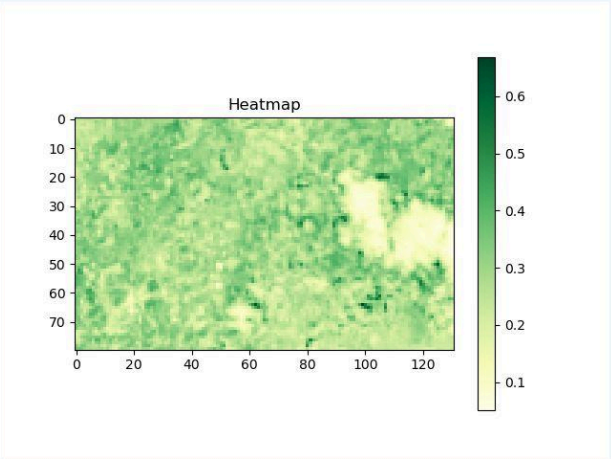
Response headers

Server response

Code Details

200

Response body



Response headers

http://127.0.0.1:8000/get_soci_values/

Server response

Code Details

200

Response body

```
{
  "1": {
    "x": "232654.69342748093",
    "y": "1288931.93191875",
    "soci": 0.00008952713485691887
  },
  "2": {
    "x": "232684.73428244275",
    "y": "1288931.93191875",
    "soci": 0.00009195530354460163
  },
  "3": {
    "x": "232714.7751374046",
    "y": "1288931.93191875",
    "soci": 0.00008282493778474364
  },
  "4": {
    "x": "232744.81599236644",
    "y": "1288931.93191875",
    "soci": 0.00007835608779818136
  },
  "5": {
    "x": "232774.85684732825",
    "y": "1288931.93191875",
    "soci": 0.0000809285413038894
  },
  "6": {
    "x": "232804.8977022901",
    "y": "1288931.93191875",
    "soci": 0.0000809285413038894
  }
}
```

Download

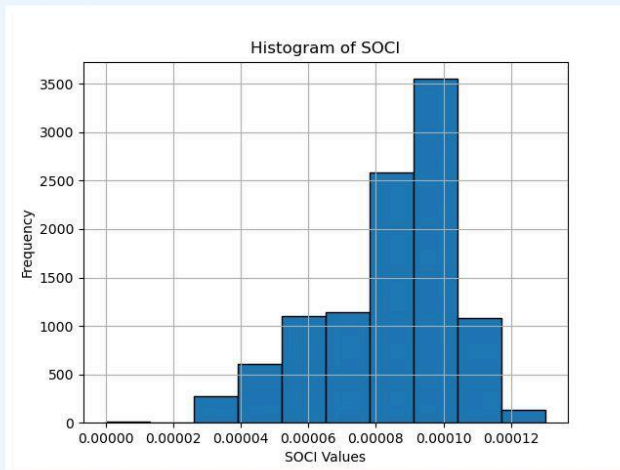
Response headers

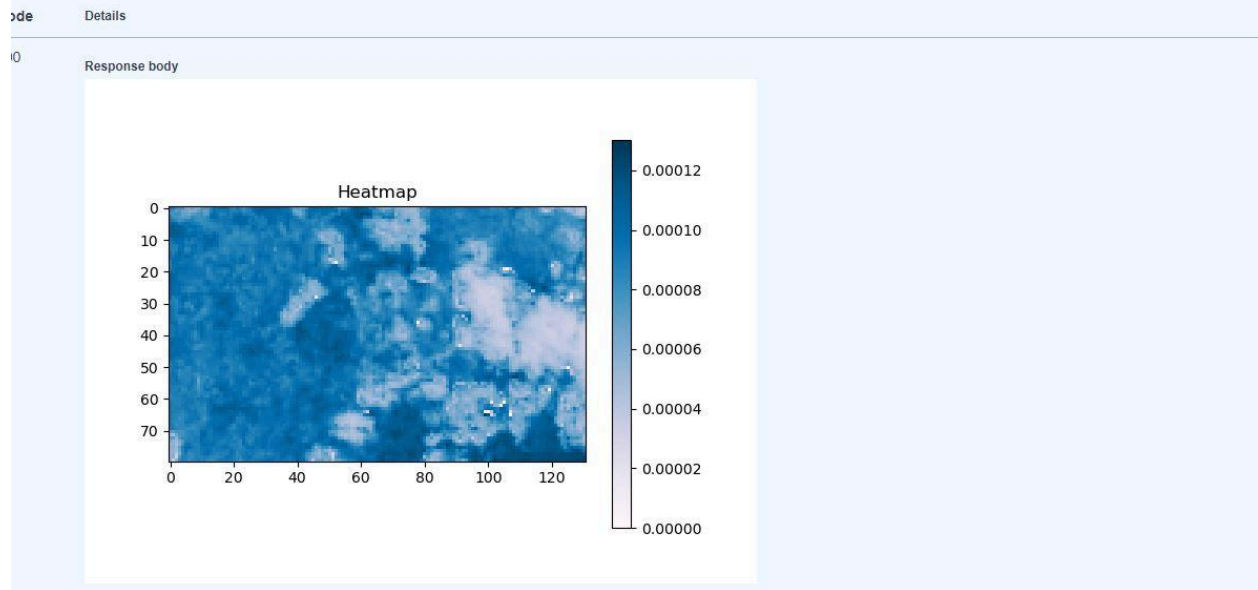
```
content-length: 904914
content-type: application/json
```

Code Details

200

Response body





Responses

Curl

```
curl -X 'GET' \
  'http://127.0.0.1:8000/getpixelcount/' \
  -H 'accept: application/json'
```

Request URL

http://127.0.0.1:8000/getpixelcount/

Server response

Code Details

200

Response body

```
{
  "Total number of pixels": 10460
}
```

Response headers

```
content-length: 32
content-type: application/json
date: Sat, 06 Apr 2024 12:19:05 GMT
server: uvicorn
```

Responses