Getting Started with Microsoft Planetary Computer STAC API

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Description:

The *Microsoft Planetary Computer* is a powerful platform designed to provide access to petabytes of geospatial data and computational resources for Earth

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- **Interoperability:** Supporting open standards like SpatioTemporal Asset Catalog (STAC), the Planetary Computer facilitates seamless data access and integration with external tools and platforms, promoting interoperability across systems.

- **Environmental Focus:** Unlike Google Earth Engine, the Planetary Computer maintains a specific focus on environmental issues, empowering stakeholders to make informed decisions and take action to promote sustainability and mitigate environmental risks.

Accessing Landsat Collection 2 Level-2 Data

This notebook operates with or without an API key, but having one grants more permissive access to the data.

- However, if you're working locally (i.e., on your own machine), you can set up your API key by either defining an environment variable called `PC_SDK_SUBSCRIPTION_KEY` or using a specific function called `pc.settings.set_subscription_key(<YOUR API Key>)`. This ensures that your local environment is properly authenticated to access data from the

🤔**Note:** Azure Blob Storage is a cloud-based object storage service provided by Microsoft Azure, a leading cloud computing platform. It allows users to store and manage large amounts of unstructured data, such as text or binary data, in the form of objects called blobs. These blobs can be accessed over the internet from anywhere in the world.

```
catalog = pystac_client.Client.open(
    "https://planetarycomputer.microsoft.com/api/stac/v1",
    modifier=planetary_computer.sign_inplace
)
```

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```
qa: Surface Temperature Quality Assessment Band
ang: Angle Coefficients File
red: Red Band
blue: Blue Band
drad: Downwelled Radiance Band
emis: Emissivity Band
emsd: Emissivity Standard Deviation Band
trad: Thermal Radiance Band
urad: Upwelled Radiance Band
atran: Atmospheric Transmittance Band
cdist: Cloud Distance Band
green: Green Band
nir08: Near Infrared Band 0.8
lwir11: Surface Temperature Band
swir16: Short-wave Infrared Band 1.6
swir22: Short-wave Infrared Band 2.2
coastal: Coastal/Aerosol Band
```

```
bands_of_interest = ["nir08", "red", "green", "blue", "qa_pixel", "lwir11"]
data = odc.stac.stac_load(
    [selected_item], bands=bands_of_interest, bbox=bbox_of_interest
).isel(time=0)
data
```

Next, we'll convert our xarray Dataset to a DataArray and generate plots of the RGB and SFCC images. We use `robust=True` in `imshow` to automatically handle color limits (vmin and vmax), avoiding the need for manual computation. This setting helps manage data not scaled between 0-1 and eliminates extreme values that may result in a washed-out image.
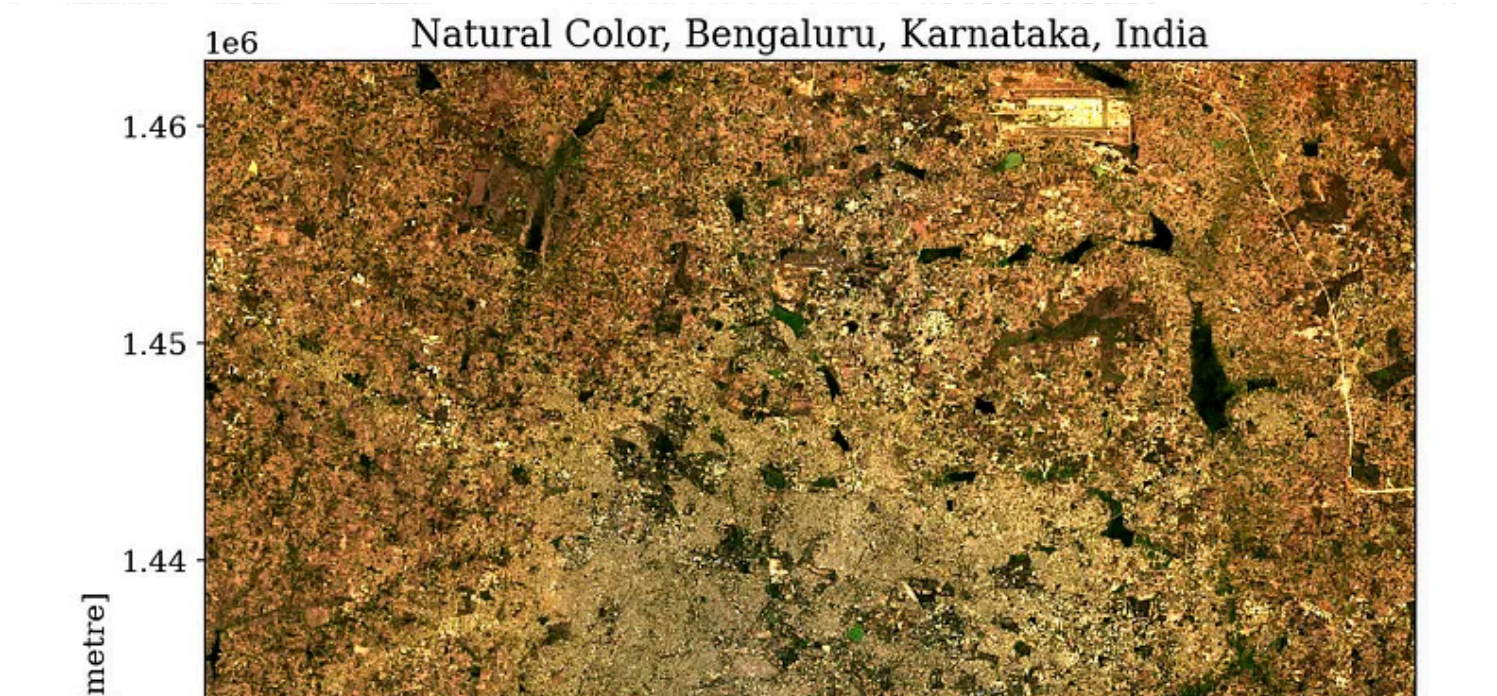
Natural Color, Bengaluru, Karnataka, India

$1e6$

1.46

1.45

1.44

metre]

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Standard False Color, Bengaluru, Karnataka, India
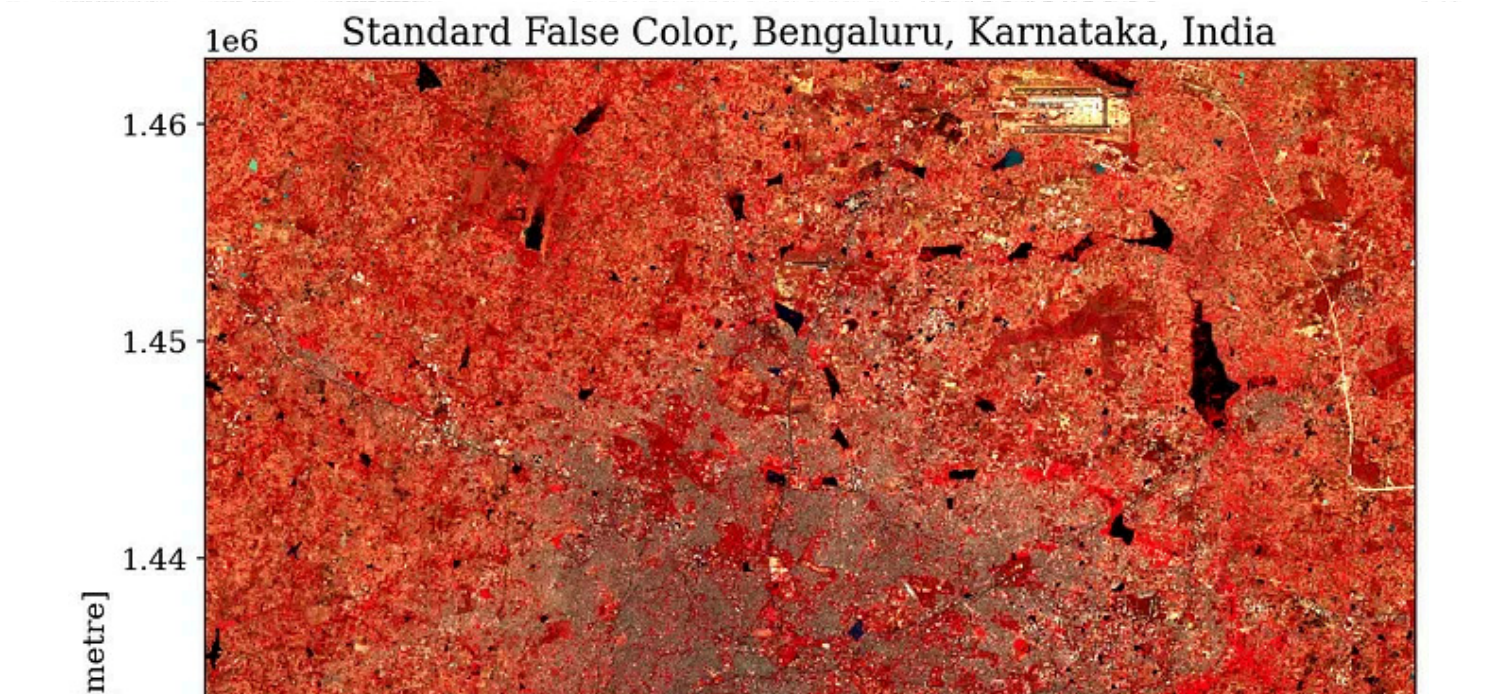
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bands to a data type capable of holding negative values to accurately store negative NDVI values.

Selecting specific platforms

Landsat Collection 2 Level-2 includes assets from several different Platforms.

```
catalog.get_collection("landsat-c2-l2").summaries.to_dict()["platform"]
```

Consider narrowing down your search to specific platforms to avoid issues like the Landsat 7 Scan Line Corrector failure. Utilize the `"platform": {"in": ... }` query to designate particular platforms.

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```
band_info = selected_item.assets["lwir11"].extra_fields["raster:bands"][0]
band_info
```

```
{'unit': 'kelvin',
 'scale': 0.00341802,
 'nodata': 0,
 'offset': 149.0,
 'data_type': 'uint16',
 'spatial_resolution': 30}
```
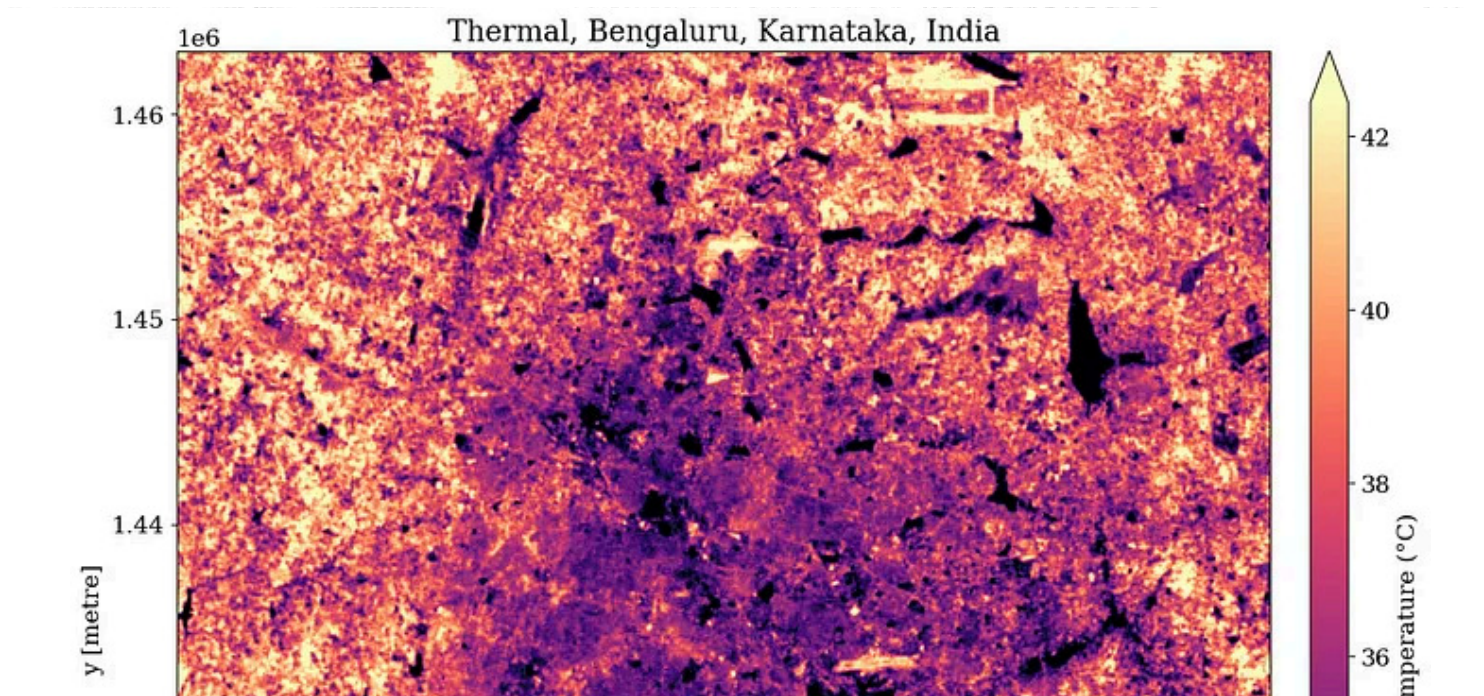
Cell Output

Thermal, Bengaluru, Karnataka, India

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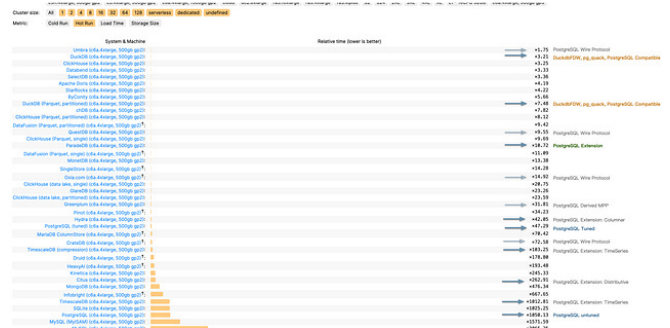# Sign up to discover human stories that deepen your understanding of the world.

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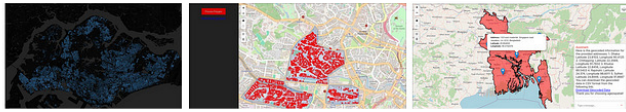
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