

M2 VMI - UPC: Remote Sensing
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GitHub: [RemoteSensingNDVI](#)

Rapport TP 1

Question 1

Which bands did you print, in which order?

I tried two combinations of bands [B4, B3,B3] and [B3, B4, B8], B3 gave overall the best results, B4 on raw raw gave black image but B3 on the other hand gave better visual on same raw image

Which normalization method seems to give the most natural result?

User Defined Method gave most natural result in case of first combination :[B4, B3,B3], while percentiles gave most natural result on second combination ; [B3, B4, B8]

Which parameters did you use?

Parameters used: display_box = (4200, 6000, 8200, 9500), val_min=100, val_max=2500, min_perc=2, max_perc=98.

Question 2

Zoom on the orthophoto and the Sentinel-2 images (at the same location).

What type of information can you see on the orthophoto, that is not available on the Sentinel-2 data?

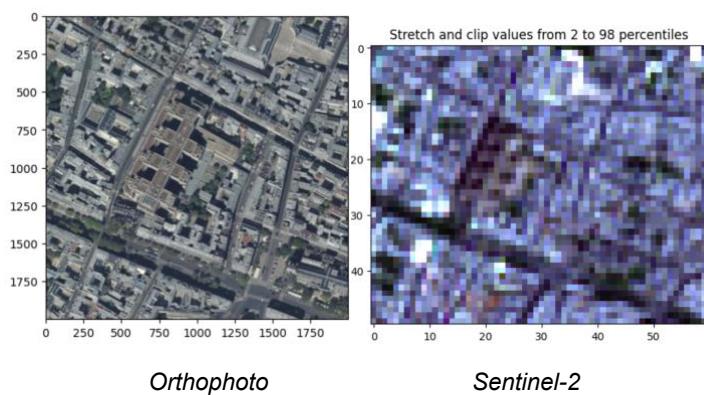
- The orthophoto is high-resolution, we can see individual cars, streets, sidewalks, Small buildings etc and Fine details like small ponds or shadows
- Sentinel-2 is much coarser (10 m/pixel): Small details disappear i.e. buildings, cars, and narrow streets are not visible

The orthophoto gives a clear view of the scene, while Sentinel-2 shows only a pixelated view of the general land cover.

Why would someone work with Sentinel-2 data instead of orthophotos?

- Sentinel 2 covers much larger areas i.e hundreds of km² per image, provides multispectral information beyond visible light (NIR, SWIR) which is useful for:
 - Vegetation health (NDVI)
 - Water quality, soil, and land cover analysis
- Also Sentinel 2 has frequent revisits approximately 5 days

Orthophotos are very detailed but limited area and infrequent. Sentinel-2 are lower in resolution but large-scale, multispectral, and frequent.

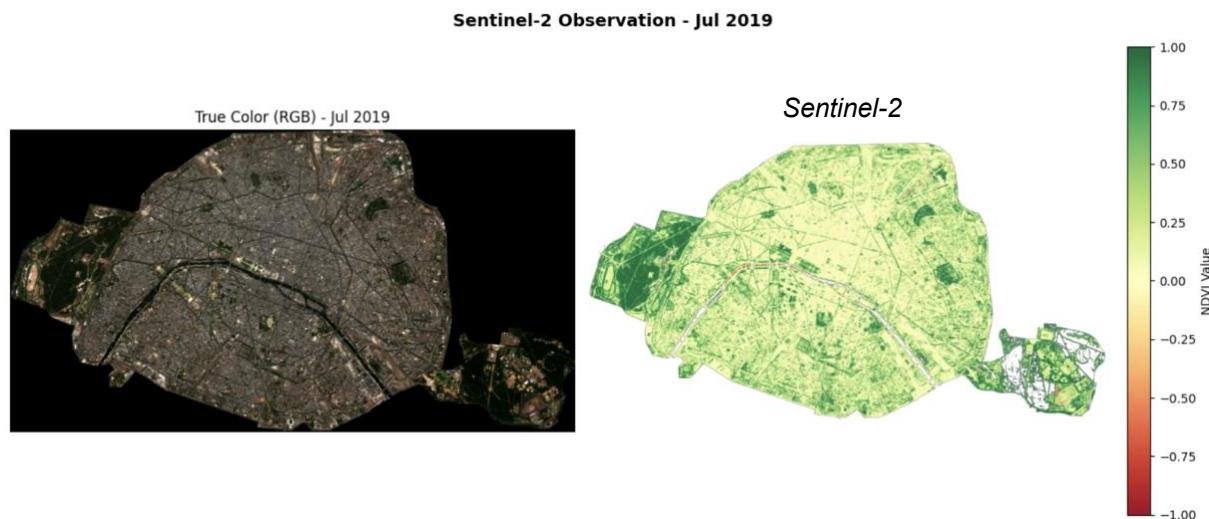


Question 3

After looking at the NDVI maps (you can also look at the original images), what are your thoughts? Can you use all of the images?

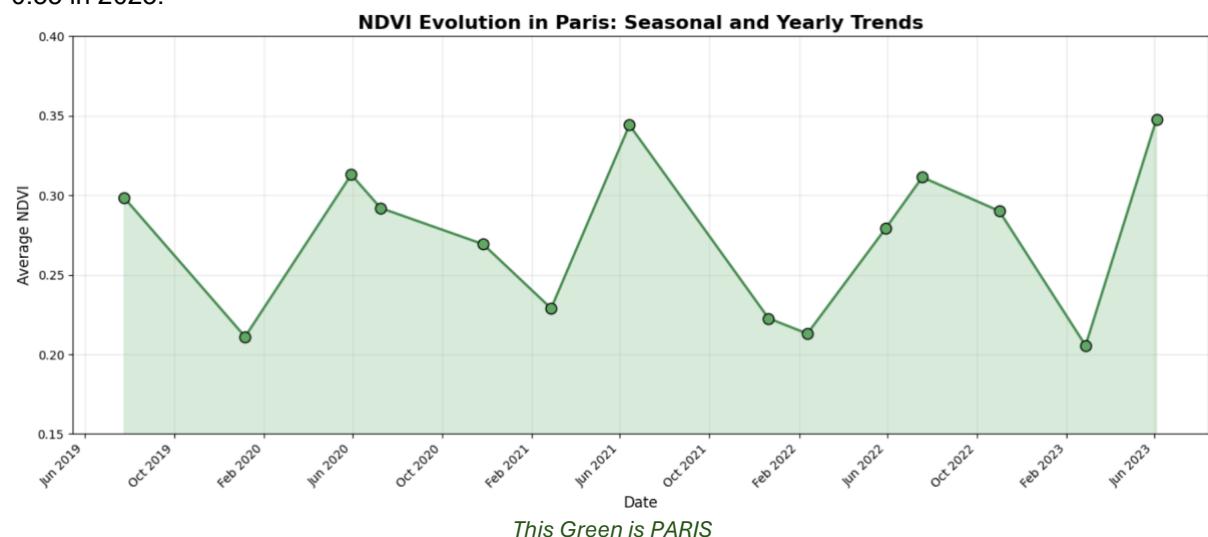
After analyzing the NDVI maps and their temporal trend, we can see that not every image is suitable for consistent analysis. Some scenes especially those captured during **winter months** display **lower NDVI values**, which can be attributed to limited vegetation growth, shorter daylight hours, and lower solar angles rather than real vegetation loss.

Additionally, cloud-covered or hazy images may distort NDVI values and reduce accuracy. To maintain consistency, it's better to **focus on cloud-free summer acquisitions** from each year.



Present and discuss the evolution of the NDVI in your report.

When we observe only those periods, the NDVI trend shows a recurrent seasonal cycle dropping in winter and peaking in summer with a slight upward trend over the years ie from about 0.29 in 2019 to 0.35 in 2023.



This suggests that vegetation density in Paris may be gradually increasing, possibly due to more green spaces or urban vegetation initiatives.