Assignment 4

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1 Answering Questions

Q: Which bands of Sentinel-2 represent the red, green, and blue channels?
A: For Sentinel-2: Red = Band 4; Green = Band 3; Blue = Band 2

Q: Which bands of Landsat 8-9 represent the red, green, and blue channels?
A: Landsat 8-9: Red = Band 4; Green = Band 3; Blue = Band 2

Q: Which out of the three satellites has the highest spatial resolution, and which one has the lowest?
A: Highest resolution is Sentinel, and lowest resolution is MODIS

Q: Why might the satellite with the lowest resolution still be useful for some applications?
A: For global modeling, low resolution means bigger area coverage which leads to less data as the overall number of cells decreases, thus, storing less data and needing less computational resources (time and power) to model

Q: 'Resolution' can refer to spatial resolution, but what other types of 'resolution' are there?
A: There are 4 types of resolution in remote sensing: Spatial, Temporal, Spectral, and Radiometric

Q: For which Sentinel-2 bands is the reflectance lowest and which is highest?
A: Lowest is band 1 (Coastal Aerosol), and highest is Band 8A (vegetation Red Edge)

Q: How low and how high are these reflectances?
A: Respectively the high and low reflectances are 0.5 and 0.01

Q: Which parts of the electromagnetic spectrum do these bands encompass?
A: These bands encompasses the 443 NM - 865 NM

Q: Is the reflectance higher at Sentinel-2 bands 2, 3, or 4? Does this align with your expectations?
A: Band 3 is the highest reflectance and that is expected due to the green color of vegetation

Q: Does open water exhibit low or high absorbance of radiation?
A: It exhibits high absorbance of radiation and that is evident from the graph–all reflectances are low

Q: Does the NDVI appear markedly different for forested and deforested areas?
A: Yes, the marking are too pronounced

Q: Does the EVI show a distinct difference between forested and deforested regions?
A: EVI shows deforested area to be brighter, but overall quite similar to NDVI. However, it does show more deforestation

Q: Where are the NDVI values highest and why?
A: Along the channel leading to the reservoir, and that is because water moving along the channel helps

irrigate vegetation there

Q: Where are the NDWI values highest and why?
A: In the dam, because NDWI shows where is water, and it is getting collected there

Q: Does cloud cover typically result in higher or lower NDWI values?
A: They exhibit an effect of lowering the NDWI values

Q: Does the presence of vegetation result in a negative or positive NDWI value? Why?
A: Vegetation result in negative NDWI values because if we examine the equation NDWI = (GREEN-NIR)/(Green+NIR), and vegetation reflects a lot of NIR compared to Green (resulting in negative values) and water reflects a lot of Green compared to NIR (resulting in positive value)

Q: What were the periods when the reservoir's water volume was at its lowest and highest?
A: The period of highest volume is from mid Jan - Feb; and periods of lowest is from mid Aug - Sept