

Principal component RGB image for July 15 using Maximum and Minimum stretch type

Esri Canada, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, NRCAN, Parks Canada, Esri, NASA, NGA, USGS, FEMA

Factor Loading								
	PC 1	PC 2	PC 3					
Band 1	5.31E-01	4.19E-01	6.58E-01					
Band 2	5.60E-01	3.95E-01	6.03E-01		Eigenvalue	%variance	accumulative	
Band 3	3.38E-01	4.83E-01	9.17E-01	1	1.32E+07	55.7914	5.58E+01	
Band 4	6.08E-01	3.67E-01	9.51E-01	2	8.26E+06	34.8537	90.6451	
Band 5	-7.89E-01	6.15E-01	1.52E-02	3	1.99E+06	8.3993	99.0444	
Band 6	7.30E-01	6.24E-01	-2.67E-01					
Band 7	7.92E-01	5.94E-01	4.19E-03					

3a. Based on the factor loading, the band 5 value in principal component 1 are contrast with the other band. Band 5 in Landsat 9 is the band for Near-infrared. The factor of band 5 is assigned to a negative value. In this case, the vegetation DNs in the eigenimage should be smaller according to the equation. In PC2, all of them are positive values, and bands 5, and 7 contribute the most to the eigenimage, however, I assumed the pixels containing water are smaller. The reason is the pixel that contains water is only contributed by small reflectance from bands 1,2,3 and 4. The pixels containing vegetation, for example, are contributed by all of the seven bands. In PC3, band 6 is assigned a negative value which means the things that have higher reflectance in short-wave infrared are deeper. I amusement that some soil and cloud are darker in the PC3 image. In addition, the snow which has a higher reflection in visible and near-infrared but a lower reflectance in short-wave infrared would display a large number.

3b. Yes it supports my interpretation. I set a higher value display as black color(darker)and a lower value display as white(lighter) For PC1 eigenimage, I can see the pixel containing vegetation are lighter. In PC2, the highlight features are water which is lighter. For PC3, we can see some clouds in the image display darker. The middle of the lake displays a darker value because of the snow cover

5. the Vegetation is displayed in green color due to the PC1 eigenimage. The purple represents the water and snow cover due to the PC2 and PC3. The soil is displayed as a gold color because all of the eigenimages have a higher value. The cloud and some of the snow cover in the mainland are represented as white color due to PC3.