

The method for identification of the cryoconite distribution by using satellite image

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Cryoconite, which is very small dark substance on glacier containing cyanobacteria and growing tangling with minerals, can absorb sunlight much, causing the faster melting than usual white snow. The valuable field survey enables us to study the cryoconite, albeit applying in the small area and with long interval. And a few remote sensing study uncover the glacier darkening and regression. Nevertheless no one knows how to point out its distribution over a wide area.

Here, according to luminance difference of between the glacier and the cryoconite, we propose new method with using multispectral bands of Landsat8 (resolution 30m), band2(450-515nm, B2) and band5(850-880nm, B5) to distinguish those two by making a new formula” $(B5-B2)/(B5+B2)$ ” (R). In the range of B2, the cryoconite's reflectance is about 10%; otherwise the glacier has high percentage. In the range of B5, the cryoconite's one is about 20%; in contrast the glacier's almost half. The satellite images we use in 2016 July 30th, are analyzed since the cryoconite appeared widely and well in the period of 2016 late July to the beginning of August. We were successful in remove the shadow on this image by comparing R and RGB image. If a pixel in R is brighter than the other images, the place of the pixel should be cryoconite or sand.

The calculated index(R), in their spectra from previous study, applied that both of the cryoconite and the sand take a positive value while the glacier take a negative value in the pixel. The criterion will be shown in the presentation.

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