

## Application of Information on Seasonal Landscapes for Landcover Classification by Satellite Data

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We cannot ignore the influence of seasonal landscapes in landcover classification by Satellite data. Therefore in the analysis, we always have to select the data acquired in the best season for available landcover classification. The seasonal landscape change is also caused by human activities as well as natural conditions. The higher the resolution of the data used for classification, the influence on the landscape by human activity increases in the results. Considering human activity on the classification, it seems that we cannot obtain the realistic image for natural conditions. We do not have much interest in the influence of classification of natural conditions induced by landcover classification based on human activity and the countermeasure. In this study, seasonal landcover classifications based on human activity are analyzed in Aso volcano with remarkable seasonal change of landscape every year. Then, the accuracy is confirmed by such as sign of human activity that can be identified in the classified images. Finally, I discuss on the influence of the classification to that of natural conditions in the volcano and show a countermeasure for the problem in the classification. We used four ALOS data acquired in spring 2010, summer 2006, autumn 2007 and winter 2007 for the classification. The study area was classified into 6 items such as green grass, withered grass, forest, arable land, urban area, open burning area by the supervised maximum likelihood classification.

On the landcover classified maps of all seasons, similar distribution patterns were observed on forest of caldera wall and piedmont of central cone, and on arable land and urban area of caldera floor. On the other hand, distribution of different items was shown in crater rim and mountainside of central cone every season. They are green grass in September, green grass, arable land and withered grass in November, withered grass in February, green grass, withered grass and open burning area in April. On the classified maps, the large seasonal landscape changes at the grassland in crater rim and mountainside of central cone can be understood. From the interpretation of these changes, signs of human activity of boundary of management association for grassland, such as firebreak of open burning were identified clearly. However, this classification work could not induce appropriate classified images that represent the natural conditions in the volcano at the summit area and crater lake area of central cone, dissected valley of lava dome and past slope failure area in caldera wall. At the summit area of central cone, I selected the seasonal image that is easy to represent the distribution for each class of natural conditions. The items in the image were reclassified into the classes of natural conditions and the values of the power of 10 were given to them. Finally, I obtained the realistic landcover classification image at the volcanic area from the overlay analysis by using the reclassified images. Consequently, I clarified in this study that landcover classification representing the characteristics of natural conditions can be performed with high accuracy by using the information of seasonal landscapes based on human activities.

Keywords: Aso volcano, landcover classification, ALOS, seasonal change, natural condition