

## A preliminary study on using MODIS NDVI time series for monitoring abandoned farmlands in mountainous areas

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This study preliminary evaluated the feasibility of Normalized Difference Vegetation Index (NDVI) time series for monitoring abandoned farmlands in mountainous areas in Chiba prefecture. NDVI time series was derived from 8-day composite of MODIS Surface-Reflectance Product (MOD09) for the period from 2003 to 2013. The noise component in NDVI time series, which was induced mainly by cloud contamination and atmospheric variability, was reduced with the method based on Savitzky-Golay filter. The refined NDVI time series was then decomposed into trend, seasonal, and remainder components. A simple linear regression model was fitted to the trend component of each pixel, and model parameters (i.e., intercept and slope) estimated were considered to be candidate features to find the occurrence of abandoned farmlands in the pixel area. This idea was based on the assumption that (1) overall NDVI in mountainous areas would be higher than that in other areas because of relatively-dense vegetation; and that (2) NDVI in specific seasons would have differences between farmlands and abandoned farmlands due to the effect of cropping activity. Classification performance was measured with the area under the receiver operating characteristic (ROC) curve (AUC). The results showed that the model parameters were poor (AUC=0.6) in terms of classification performance. Further efforts are needed to evaluate the feasibility of NDVI time series for detecting abandoned farmlands in mountainous areas.