

Soil erosion is one of the most severe land degradation problems afflicting many parts of the world where topography of the land is relatively steep. Owing to inaccessibility to this steep terrain, such as slopes in open-pit mines and forested mountains, advanced data processing techniques are required to identify and predict high risk erosion zones. Unlike existing methods that require human observations, which can be expensive and error-prone, the proposed approach uses a fully automated algorithm to indicate when an area is at risk of erosion; this is accomplished by processing Landsat and aerial images. In this paper, an image processing algorithm is presented to identify the scene of an image by classifying it in one of six categories: open-pit mine, mountain, forest, degraded forest, cropland, and grassland or orchard. This paper focuses on automatic scene detection using global features with local representations to show the gradient structure of an image. The output of this work counts as a contextual cueing and can be used in erosion detection, and for erosion control in a variety of applications; particularly, predicting erosion risks in open-pit mines. We also discuss the environmental implications of deferred erosion control in open-pit mines.

