Remote sensing image interpretation can be classified into human-computer interaction interpretation and automatic interpretation. Co-seismic landslides caused the dramatic changes of surface vegetation, which could be easily identified in the aerial photos and satellite images. Taking Mianyuan River Basin as case study, the co-seismic landslides were detected automatically by decision-making tree method on ALOS satellite imagery post the earthquake (Figure 1). The color tone and spectral values of a co-seismic landslide is usually an expression of bare lands with unique spectral signature (Figure 2). Normalized Difference Vegetation Index (NDVI) was used to determine the relationship between the vegetation density and a co-landslide, which is calculated from the NIR band (Band 4) and the red band (Band 3) of the ALOS images.

The automatically detected co-seismic landslides in the Mianyuan river basin covered an area of 48.5 km², most of which were shallow disrupted rock falls and slides which had been common in many previous disastrous earthquakes. Near the co-seismic fault, the strong ground shaking caused many deep seated, high-speed and long-run-out landslides. It was indicated in the GIS statistical analysis that the distribution of landslides was dominated by the seismogenic fault. Owing to the duel effect of Yingxiu-Beichuan Fault and Jiangyou-Guanxian Fault, the landslides were concentrated in the hanging wall of two faults. Furthermore, the lithology determined the type of landslides. Shallow disrupted falls were mainly located in the hard rocks such as magmatic rocks and dolomites, while deep seated landslides were likely to occur in the strata with rigid upper layer and soft lower layer. Moreover, most landslides occurred within the elevation range from 1000 to 2000 m above sea level. In addition, most landslides occurred in the slope gradient range from 25 to 55 degrees. And slope direction also affects the distribution of landslides. The slopes opposing the direction of seismic source (seismogenic fault) were more likely to have landslides than the slopes facing the direction seismic source (seismogenic fault).

**Key words:** Wenchuan earthquake, landslide, automatic detecting, statistical analysis, decision-making tree, ALOS imagery

![Fig. 1. The decision-making tree model for landslide detection](image1)

![Fig. 2. Spectral values of vegetation (a) and co-seismic landslide (b) are obvious different in the near-infrared band of ALOS images (band 4) sampling from ALOS images post the Wenchuan Earthquake](image2)