Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

HDS27-P02 Room:Convention Hall Time:May 24 16:15-17:30

Automated Delineation of Slope Unit using Airborne LiDAR derived Digital Elevation Models

Nagazumi TAKEZAWA[1], Makoto MATSUZAWA[1], Tadanori ISHIZUKA[1], Hidetomo TATSUMI[2*], Fumi TAKEMURA[2], Ryoichi OHNO[2]

[1]Public Works Research Institutes, [2]JAPAN CONSERVATION ENGINEERS & CO.LTD

Digital elevation models can provide us with wide variety of information about the land surface using existing GIS softwares and programs. When analyzing the susceptibility of hillslopes to displacement as well as landsliding, stability is usually determined on a watershed basis. However, basic evaluation is conducted on individual hillslope bounded by ridges and streamlines with which combinations of slope units comprise a watershed. Here, watershed boundaries can be extracted by automated GIS programs. Nonetheless, hillslopes are often manually digitized from scanned contour maps which are then made into geographic data.

For an attempt to develop an objective method for automated delineating of slope unit, the authors applied Zhou's approach (2004) of reversed elevation model and extracted hillslopes through raster processing. The dataset used in this study was an airborne LiDAR derived elevation models collected in Hofu City, Yamaguchi Prefecture in 2009. Identified slopes were then combined with normally obtained watersheds to obtain slope units bounded by ridges as well as streamlines. For analyzing sensitivity of outcomes, five-different window size and three-repeat counts were tried to when calculating summit planes while five-different minimum contributing areas were tried when dividing watersheds.

Keywords: Airborne LiDAR, digital elevation model, slope unit, automated delineation, slope failure