POWER-LAW CORRELATIONS OF LANDSLIDES IN CENTRAL AND NORTHERN ITALY

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The frequency-area statistics of landslide distributions triggered by severe meteorological events in central and northern Italy are presented. Three datasets are considered. Data set A contains 4233 landslides (shallow soil slips and slump-earth flows, and deep-seated complex slides) that were triggered by snow pack ablation caused by a sudden raise in air temperature on January 1997 in the Umbria Region of Central Italy. An inventory of these landslides was obtained from the interpretation of 400 aerial photographs taken 3 months after the event. Data set B contains 1024 landslides (shallow soil slips and debris flows, and a few deep seated complex landslides) that were triggered by a high intensity rainfall event on November 2000 in the Liguria Region of Northern Italy. An inventory of the Imperia landslides was obtained through the interpretation of 220 color aerial photographs taken 2 months after the event. Data set C contains 1307 landslides (shallow soil slips and debris flows, and deep seated rock-block slides) that were triggered by high intensity and prolonged rainfall on November 1994 in three tributaries of the Tanaro River, in the Piedmont Region of Northern Italy. An inventory of the landslides in the Tanaro basin was obtained through the interpretation of aerial photographs taken after the event and extensive field investigation. The three data sets are discussed and compared using frequency-magnitude statistics. In particular, the frequency-area statistics of the three data sets follow remarkably well a power-law scaling, and exhibit for the smallest landslide area a characteristic Şrollover Ť that is believed to be real and not an artifact due to the mapping resolution or to the effect of under sampling. The range of variation in the exponent of the power-law scaling for data set C is larger than that of data sets A and B.