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Analysis of geohazards events along Swiss roads from autumn 2011 to present

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In Switzerland, roads and railways are threatened throughout the year by several natural hazards. Some of these events reach transport infrastructure many time per year leading to the closing of transportation corridors, loss of access, deviation travels and sometimes infrastructures damages and loss of human lives (3 fatalities during the period considered). The aim of this inventory of events is to investigate the number of natural events affecting roads and railways in Switzerland since autumn 2011 until now.

Natural hazards affecting roads and railway can be classified in five categories: rockfalls, landslides, debris flows, snow avalanches and floods. They potentially cause several important direct damages on transportation infrastructure (roads, railway), vehicles (slightly or very damaged) or human life (slightly or seriously injured person, death). These direct damages can be easily evaluated from press articles or from Swiss police press releases. Indirect damages such as deviation cost are not taken into account in this work.

During the two a half last years, about 50 events affecting the Swiss roads and Swiss railways infrastructures were inventoried. The proportion of events due to rockfalls is 45%, to landslides 25%, to debris flows 15%, to snow avalanches 10% and to floods 5%. During this period, three fatalities and two persons were injured while 23 vehicles (car, trains and coach) and 24 roads and railways were damaged. We can see that floods occur mainly on the Swiss Plateau whereas rockfalls, debris flow, snow avalanches and landslides are mostly located in the Alpine area. Most of events occur on secondary mountain roads and railways. The events are well distributed on the whole Alpine area except for the Gotthard hotspot, where an important European North-South motorway (hit in 2003 with two fatalities) and railway (hit three times in 2012 with one fatalities) are more frequently affected. According to the observed events in border regions of Switzerland, the trend in the Alps is similar.