

Regional transportation network blocked by snowdrifts: assessment of risk reduction strategies by the example of the wind event of February 2015 in the Canton of Vaud, Switzerland

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The 5-8th February, a meteorological situation characterized by a strong wind coming from the North generated many snowdrifts on roads and railways in the Canton of Vaud, Switzerland. The affected region, about 900 km², is located on the Swiss Plateau. More than thirty roads and few railways were blocked during the event. On some areas, too many roads and railways tracks were closed to assure the school transports making obligatory the total closure of seven schools and the partial closure of three schools affecting 8'000 students, which is almost 10% of students of the Canton of Vaud. Over hundred vehicles blocked in the snowdrifts had to be unobstructed. Over 150 snowplows drivers were requisitioned but the wind with gusts of over 80 km/h was too strong to release the roads from the snow accumulation. The boat transport on the Lake Geneva was interrupted during three days because of the danger generated by the strong wind during the berths. This interruption generated up to 100 km deviation for commuting traffic. The county police recommended to the population to limit their travels on the road. The last roads closures due to snowdrifts in the Canton of Vaud occurred ten years ago, in 2005.

This particular event that affected considerably the accessibility of a large area of the Canton of Vaud is interesting because results of a "simple" meteorological situation that strongly reduced the accessibility during four days of an area with a population of about 340'000. It raises several questions as for examples: how the emergency services accessibility is assured; what are the tools that can reduce the roads closures; what is the best road management to follow during such an event (which roads must be priority cleaned, which roads can be left covered by snow); how to prevent such an event, are snow fences enough to avoid snowdrifts or is there another way to limit their creation? To try obtaining answers to those questions, we assess the most critical infrastructures where an accessibility is crucial to be maintained. We analyze then the road network to highlight the roads vulnerability from snowdrifts with topographic and meteorological indicators. We also assess the ratio cost/benefit of different measures limiting snowdrifts. We finally discuss strategies to reduce the risk of this winter meteorological event.