



## **December 2008-April 2009: landslide phenomena in Asti Provincia - Northwest Italy (interference with secondary roads)**

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This work focus on the flood event that involved the Asti Provincia (Monferrato and Langhe Hills - Northwest Italy) between december 2008 and april 2009, which presented peculiar characteristics.

In detail in the studied period 4 different critical phases have been registered, in which main landslide phenomena took place; more significative phases are those referable to december 15-16, 2008 and april 26-27, 2009.

First event has triggered landslides characterized by rapid kinematic involving more surfacial horizons (saturation landslides and fluidification), took place on december 15-16 2008.

Second event took place in the first week of february 2009, when precipitation not so strong, together with melting of snow, favour few wide landslide phenomena, characterized by slow and complex kinematic that involved deeper portions of slopes, even on gently tilted.

Third event has been registered in the first days of April, with triggering of new landslides and evolution of the phenomena already in act.

Fourth event took place during precipitation of april 26-27 2009. This event caused the evolution of the phenomena already knew and triggered wide fluidification phenomena and complex movements involving significant portions of hills. During this event several houses and groups of houses have been involved, with consequent civil protection evacuation.

The present work will be developed analyzing the prolonged and intense precipitations with a particular attention to the contribution of snow and ground saturation, then the landslide phenomena that have involved the slopes will be analyzed, focousing on those that have involved the secondary road network.

In conclusion we will analized the triggers about landslides and more employed solutions. Moreover, possible solutions for soil use able to minimize the effects in case of precipitation events so intense.