



GPS monitoring system in landslide hazard mapping. A case study in the Dolomites (Eastern Alps, Italy)

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The use of GPS technique to detect and measure with high accuracy superficial deformations caused by slope instability is by now a consolidated and successful tool. This paper explains how GPS surveys can also be used in better defining hazards maps. In the last years the Research Institute for Geological and Hydrological Hazard Prevention (IRPI) of the Italian National Research Council in collaboration with the Direzione Generale Geologia e Ciclo dell'Acqua of the Veneto Region carried out a project in order to assess both the landslide hazard and susceptibility in the high Cordevole river basin (Eastern Dolomites, Italy). The hazard map was carried out adopting a semi-deterministic approach that takes into account parameters such as velocity, geometry and frequency of landslide. Usually these parameters are collected by means of geological and morphological surveys, historical archive analysis, aerialphotogrammetric analysis etc. However in this framework the dynamic of an instable slope can be difficult to determine. Therefore GPS surveys can be an useful tool in highlighting fields of velocity with high accuracy and so to improve the model. In the study area more than nine hundred landslides have been mapped, among these the Chertz phenomena recovers as particular interest. The Chertz plateau lithology consists of an alternance of marls and sandstones. This type of lithology, along with the high amount of rainfall, causes a large number of landslides distinguished by rotational slides and earth flow. In order to quantify the velocity of landslides a GPS network was installed. Thirty GPS benchmarks have been distributed on the whole area and three surveys have been carried out. This allowed us to reach a higher degree of accuracy and reliability in landslide hazard mapping.