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Web Map Service for Fragmentary Rockfall Inventory

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Abstract : One of the most harmful geological risks is rockfalls. They cause both economic lost, damaged in buildings and infrastructures, and personal ones. Therefore, in order to estimate the risk of the exposed elements, it is necessary to know the mechanism of this kind of events, since the characteristics of the rock walls, to the propagation of fragments generated by the initial detached rock mass. In the framework of the research RockModels project, several inventories of rockfalls were carried out along the northeast of the Spanish peninsula and the Mallorca island. These inventories have general information about the events, although the important fact is that they contained detailed information about fragmentation. Specifically, the IBSD (Insitu Block Size Distribution) is obtained by photogrammetry from drone or TLS (Terrestrial Laser Scanner) and the RBSD (Rock Block Size Distribution) from the volume of the fragment in the deposit measured by hand. In order to share all this information with other scientists, engineers, members of civil protection, and stakeholders, it is necessary a platform accessible from the internet and following interoperable standards. In all the process, open-software have been used: PostGIS 2.1., Geoserver, and OpenLayers library. In the first step, a spatial database was implemented to manage all the information. We have used the data specifications of INSPIRE for natural risks adding specific and detailed data about fragmentation distribution. The next step was to develop a WMS with Geoserver. A previous phase was the creation of several views in PostGIS to show the information at different scales of visualization and with different degrees of detail. In the first view, the sites are identified with a point, and basic information about the rockfall event is facilitated. In the next level of zoom, at medium scale, the convex hull of the rockfall appears with its real shape and the source of the event and fragments are represented by symbols. The queries at this level offer a major detail about the movement. Eventually, the third level shows all elements: deposit, source, and blocks, in their real size, if it is possible, and in their real localization. The last task was the publication of all information in a web mapping site (www.rockdb.upc.edu) with data classified by levels using libraries in JavaScript as OpenLayers.

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