



Analysis of damages caused by heavy precipitation events in Marche Region (Italy)

Emanuela Toto, Paolo Principi, and Francesca Sini
Università Politecnica delle Marche, Ancona, Italy (ing_ema@yahoo.com)

The specification of EU Floods Directive 2007/60/EC for flood data collection were successfully implemented in the FloodCat catalogue, owned by the Italian National Civil Protection Department (reference: FloodCat manual). This web-GIS platform guarantees consistency of flood data collection at national level taking into account each flood event, its phenomena and specific damage classified in categories and sub-categories. It includes consequences on Human health, Environment, Cultural heritage and Economic activity. Regions are in charge of populating FloodCat with recent and historical loss data. Here it is reported the implementation of FloodCat in Marche Region.

Loss data requested by FloodCat are collected by different offices in relation of the affected sector. The main data sources are: the flood event reports (regional civil protection), the georeferred flooded areas (basin or district authority), the damage data collected following the civil protection ordinances in case of national emergency declaration, data collected by the regional agriculture service following the state of natural calamity. These last two sources provide statistics regarding the economic cost of damages as the estimate allows to have access to public national funds. This information is relevant for FloodCat as disaster databases usually lack on economic loss data.

A methodology was defined in order to make a homogeneous data record and to adapt historical data already collected to FloodCat requested database fields. It consists on correlating the meteorological event with the Unit of Management and flood phenomena to basin or sub-basin, damage to municipality. The data were recorded taking into account three elevation bands: mountainous, hilly and coastal in order to analyse the different flood mechanisms depending on territory's altitude. Standard Operating Procedures for the information flow in case of emergencies was constructed to optimize data collection from different sources for the national platform requirement.

The data of Marche Region consist on ten ordinances and need recognition after emergencies in case of severe weather, starting from 2002, thirty-four flood event reports of minor events and the delimited flooded area of the event of May 2014. For each event metadata information was stored as required in the INSPIRE Directive.

The statistics on regional flood data show which are the most affected elevation bands, the most affected category for each elevation band, and the most affected municipalities in terms of economic losses on environment, economic activities trade, industry, crafts and building sectors, economic activities tourist-recreational sector, cultural and landscape heritage, private buildings and goods, communication and transport infrastructures, technological and service infrastructures, hydraulic works, population/human health and public interest structures/services. The statistics are also made in terms of units affected for selected categories/sub-categories (number of persons, means of transport, civil buildings etc.). Temporal histograms shows which are the years and the flood events with the highest economic losses. The percentage of affected municipalities are also described. Spatial distribution maps were produced showing the most impacted areas. Once set and regularly populated, this loss/damage database can drive interventions for risk mitigation and decision making processes at regional and national level.