



The flood event of November 2013 in Calabria (southern Italy): damage and hydrogeological characteristics

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On November 19th, 2013, Calabria region (southern Italy) has been affected by a flood event which caused numerous damages in particular in the Ionian side of the region. In this work, the event is analyzed in terms of damage and hydrologic features.

Beside rainfall, the event has been characterized by intense sea storms which, increased by Sirocco gusts, obstructed the outlet of the floods toward the sea. As a result, river overflowing was amplified and caused the breaking of either natural or artificial embankments. Damage affected 49 municipalities located in the mid-east sector, on a surface of 1898 km² (12.6% of the Calabrian area). Roads (damaged in 86% of the affected municipalities) and private buildings (39%) were the most heavily damaged elements: in many cases the water level reached 1m. People were directly involved in risky situations but they managed to save their lives: only two people were injured. Return periods of daily rain can be classified as ordinary (between 2 and 13 years) with the only exception of a gauge located in the northern east sector, which showed a return period of more than 100 years. On the contrary, 3-hour rain shows peak values of 160 mm and return period higher than 200 years.

As a result, the event can be considered an “impulsive” one, powered by intense hourly rain, and its dangerousness was mainly related to the “flash” character of the triggered floods. The analysis of circumstances in which people were directly threatened confirms floods as the main source of risk, both indoors (65% of cases) and outdoors (35%); in the latter case, the majority of people involved were on board of vehicles (26%). Differently from the past Calabrian damaging hydrogeological events, people did not adopt unnecessary risky behaviors, and in 26% of cases they managed to save their life without any help. Probably this is the factor that lead to low damage to people, since only two people were slightly injured. These results could be proficiently used in information and awareness campaigns for people on self-protective behavior to be used during damaging hydrogeological events.