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The key role of meteorological preconditions in triggering large-scale floods in Germany

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The key role of meteorological preconditions in triggering large-scale floods in Germany

Central Europe has seen some major flood events over recent year. In Germany, for example, the severe flooding in 2002 caused total loss amounting to 11.2 Billion Euros, representing the costliest natural disaster ever. In 2013, another disastrous flood event was responsible for losses of 8 Billion Euros.
In November 2015, an exceptional heavy rain event affected mainly southern Germany with widespread rain amounts between 50 and 200 mm within 36 hours across an area of roughly 100.000 km^2 (federal states of Bavaria and Baden-Württemberg). Usually such a rain event inevitably would trigger several floods, but in that case, surprisingly only a few gauges exceeded flood stages and only marginal damage has been caused. Due to exceptional dry weather conditions in the previous months, most of the precipitation drained with the consequence that surface runoff was very low.
Within CEDIM's (Center for Disaster Management and Risk Reduction Technology) forensic disaster analysis Task Force we examined the relation between event precipitation, preconditions, and water levels for that and other events in Germany. Such information helps to rapidly evaluate ongoing flood events and to assess their potential severity as an important component of disaster response activities. Furthermore, closely monitoring and documenting the hydro-meteorological factors that are most decisive for the generation and triggering of flood events is one part of CEDIM's approach. The investigation of meteorological preconditions (e.g., Antecedent Precipitation Index) and the combination with expected rain amounts provides a valuable basis for the in-depth analysis and improved understanding and forecasting of floods and their key drivers.