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Flood risk mapping in Europe: A comparative evaluation of methods, availability and applications

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Losses from floods in Europe have increased significantly during the last two decades. Between 1998 and 2002 over 100 major floods occurred in Europe, resulting in around 700 deaths, displacing about halve a million people and causing at least EUR 25 million euro of insured losses. Losses are expected to increase due to persisting developments in flood-prone areas and global climate change, which would increase the frequency and intensity of extreme rainfall events. In order to cope with these issues many countries have recognized the need to move from traditional flood protections strategies, which are aimed at flood prevention, to risk management approaches which aim to reduce the impact of floods. The European Union is in the process of adopting a directive on flood management under which member states will be obliged to create flood maps and flood management plans. Various countries and institutions have already created, or are in the process of creating, flood maps for various kind of purposes. These maps are produced using different methods for their specific needs.

In a comparative study, an overview is provided of different flood map practices in Europe. The paper provides an overview of what kinds of maps are currently available, how they are produced and the way they are used. It is found that the majority of flood maps is created by national governments to support spatial planning and by (re-)insurance companies to determine risk premiums. Flood maps exist in almost all European countries, though their nature, coverage and use vary considerably. Maps range from displaying historical flood events to maps showing the extent of floods with a known return period using sophisticated hydrological and hydraulic models, stochastic precipitation datasets and probabilistic approaches to flood defense failures. It appears that few countries use risk zones derived from flood maps in their spatial planning system, though in many countries they serve as supportive material.

Because of the wide variety in methods and uses of flood maps, governments and institutions can potentially benefit a lot from other's experiences. The different methods and tools used to create the maps, as well as the legislations accompanying them in the various countries can be of interest to many parties in view of the EU Flood Directive.