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## Effects on floods of recent afforestation and urbanisation in the Mella River (Italian Alps)

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**Abstract.** River floods are influenced by factors such as the duration, intensity and spacial distribution of precipitation and the land-use as well as the morphological characteristics of the river basin. While the characteristics of the precipitation are tied to the climatology of the region and can change only over the long term, anthropogenic land use changes exhibit a more pronounced dynamic. However, the consequences of such changes on the increment in flood volumes and their frequency must be estimated objectively. To quantify the effects of the urbanisation on the flood volumes and peaks in the Mella river basin, 311 km<sup>2</sup> in size, changes in land use in the past 50 years have been compared using two land use maps; the first was based on aerial photographs taken in 1954 and the second on photointerpretation and surveys in 1994. The comparison showed an increase in the forested areas in the upper part of the basin as the use of wood for fuel had declined and an increase in urban development in the valley bottom. Correspondingly, cultivated areas decreased in size. The consequence of these changes is that surface runoff, simulated with a distributed hydrological model, changes insignificantly at the catchment scale, but with slightly reduced flood peaks and volumes in today's conditions.

**Keywords:** floods, land use changes, afforestation, urbanisation

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