



FLASH FLOODS AND PLUVIAL FLOODING



ISPRA
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REGIONE AUTONOMA
DELLA SARDEGNA



MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

Working Group F Thematic Workshop

How meaningful is flash flood mapping?

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Aim

Hazard and risk mapping for rainfall-driven flash flood

FF Definition

Rainfall intensity threshold
Basin dimension $\leq 500 \text{ km}^2$

Tools

Depth-Duration-Frequency curves
Interpolation of return period estimated values for ≈ 100
rain gauges (over Arno River basin, 8000 km^2)



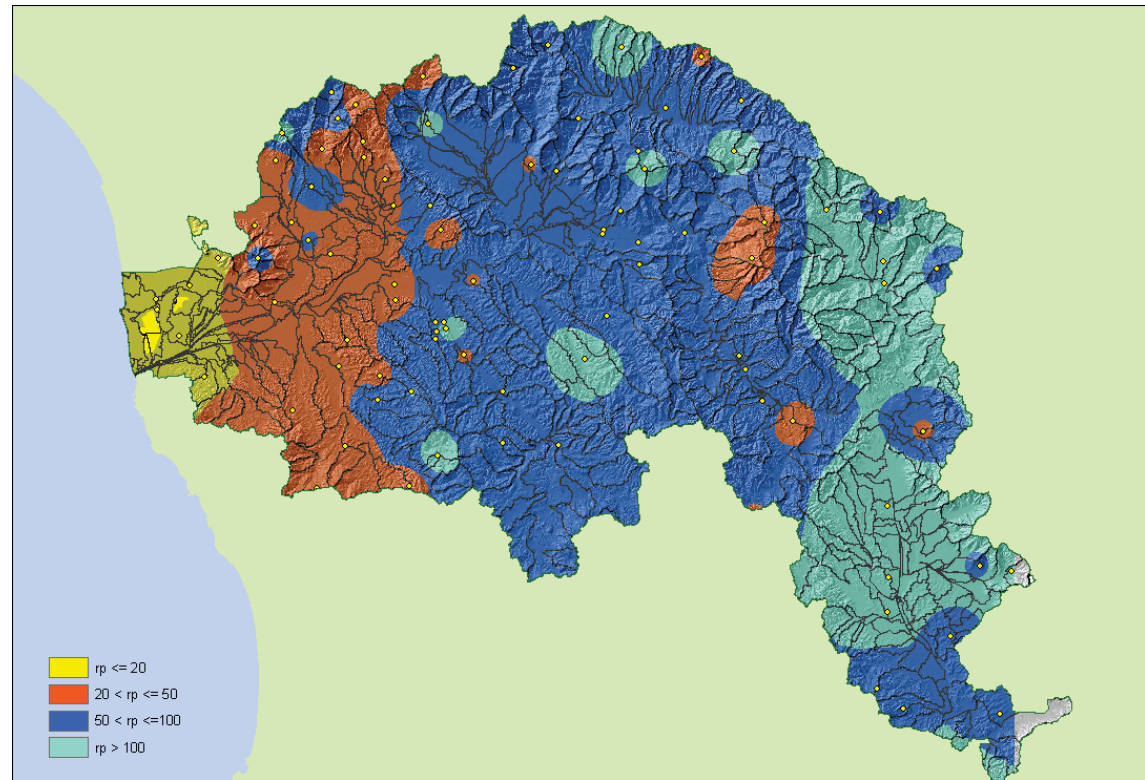
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Heavy rainfall hazard map

Spatial distribution of short, heavy rainfall events frequency (return period distribution for 50 mm/hr)

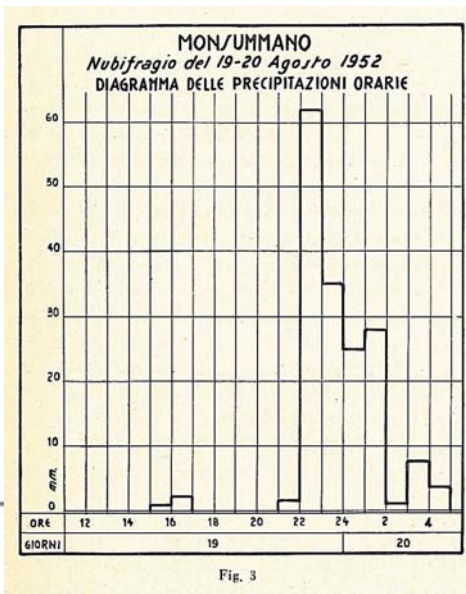
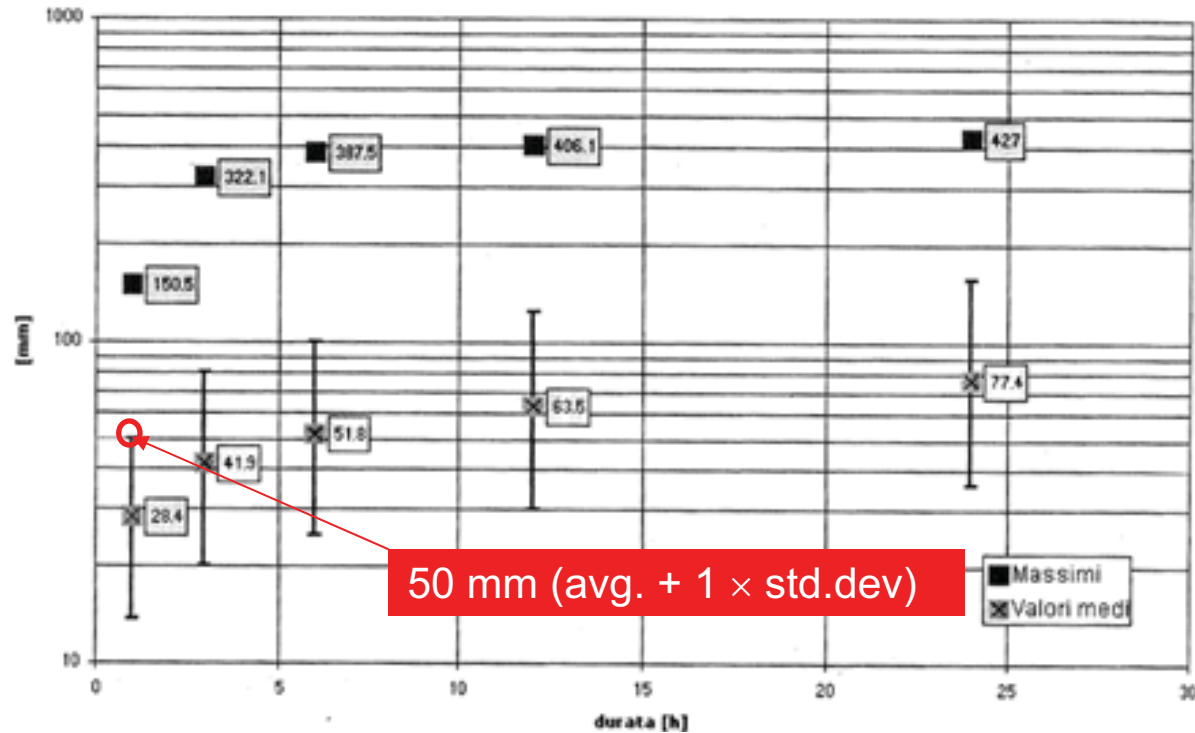


Derived from DDF curves and interpolated after a spatial distribution analysis



Choice of heavy rainfall intensity values

Is it possible to define some thresholds values?



Frequency distribution of yearly rainfall extreme values (1-24 hours)



Choice of spatial scale limits

Is it possible to define some (basin surface) thresholds values?

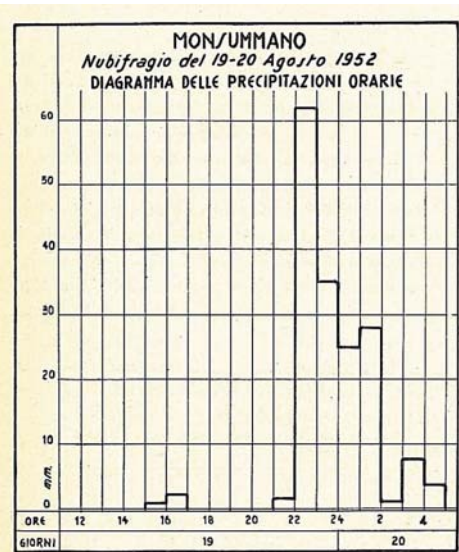
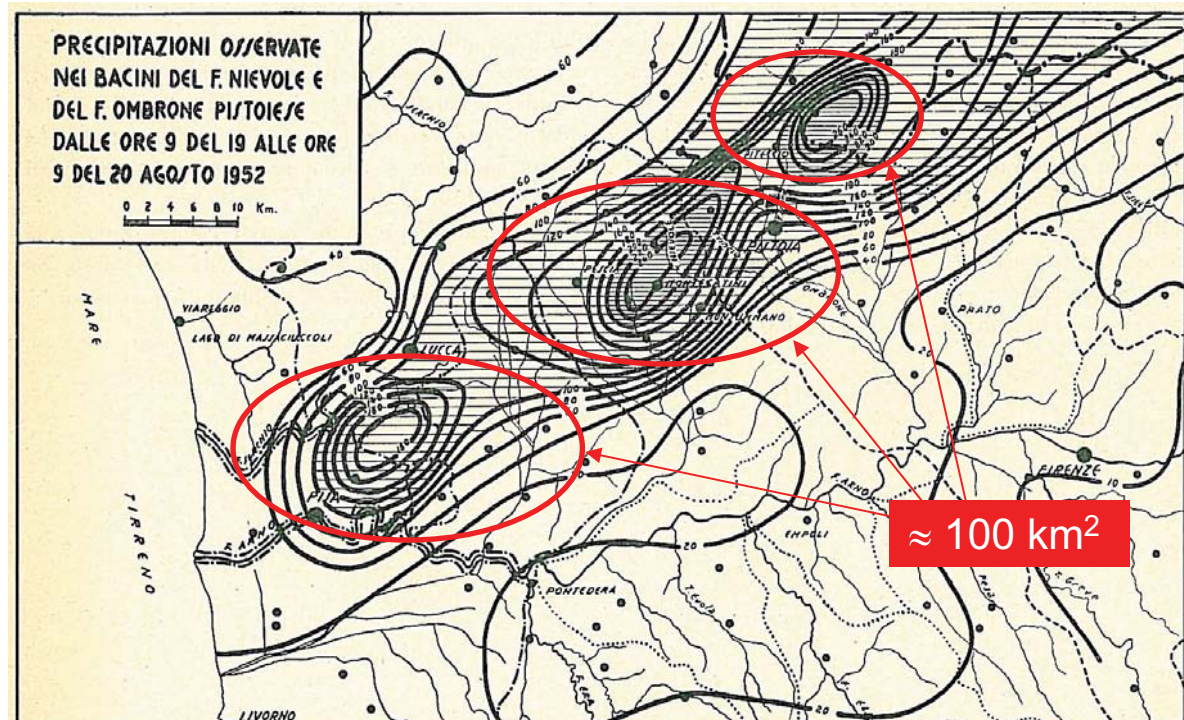


Fig. 3

Flash Flood event of 20/08/1952 (!), Arno River basin



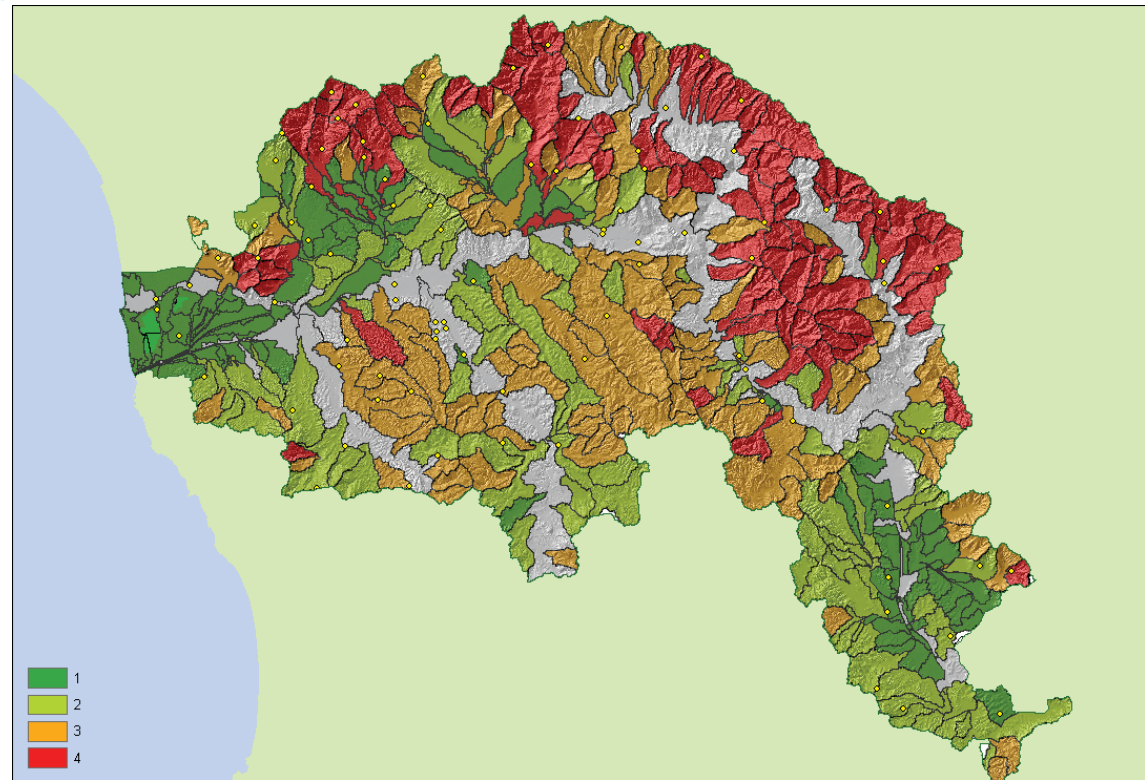
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Susceptibility to a flash flood response

Classification of small size basin depending on “corrivation time” (1 = longest → 4 = shortest response time, from 6 hours to minutes)



Tendency of small scale basin to transform heavy, short precipitation events in very high discharge levels



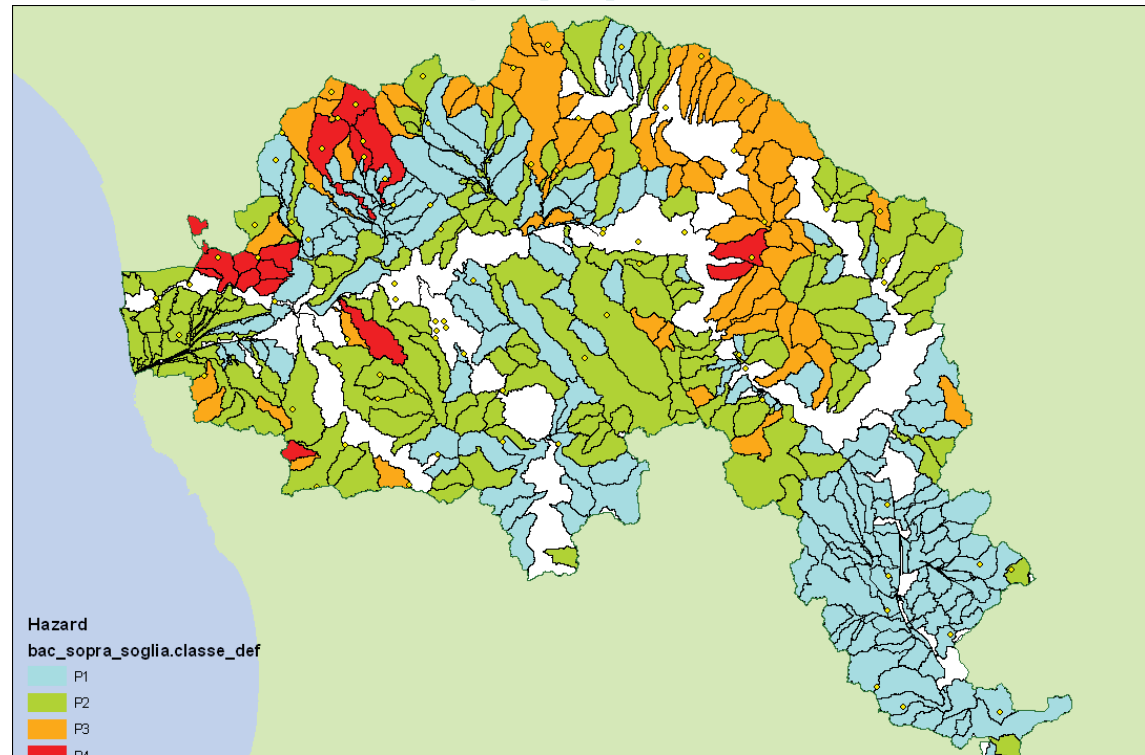
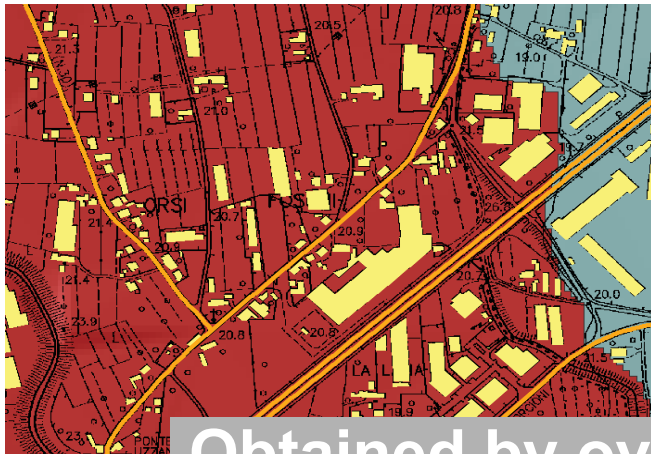
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Hazard and risk mapping (?)

Map of flash flood hazard (1 = lowest → 4 = highest hazard) and risk distribution



Obtained by overlapping heavy rainfall map, spatial distribution of basin corrivation time and vector map of buildings and infrastructures