



FLASH FLOODS AND PLUVIAL FLOODING



ISPRA

Istituto Superiore per la Protezione
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REGIONE AUTONOMA
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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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Working Group F Thematic Workshop

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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)



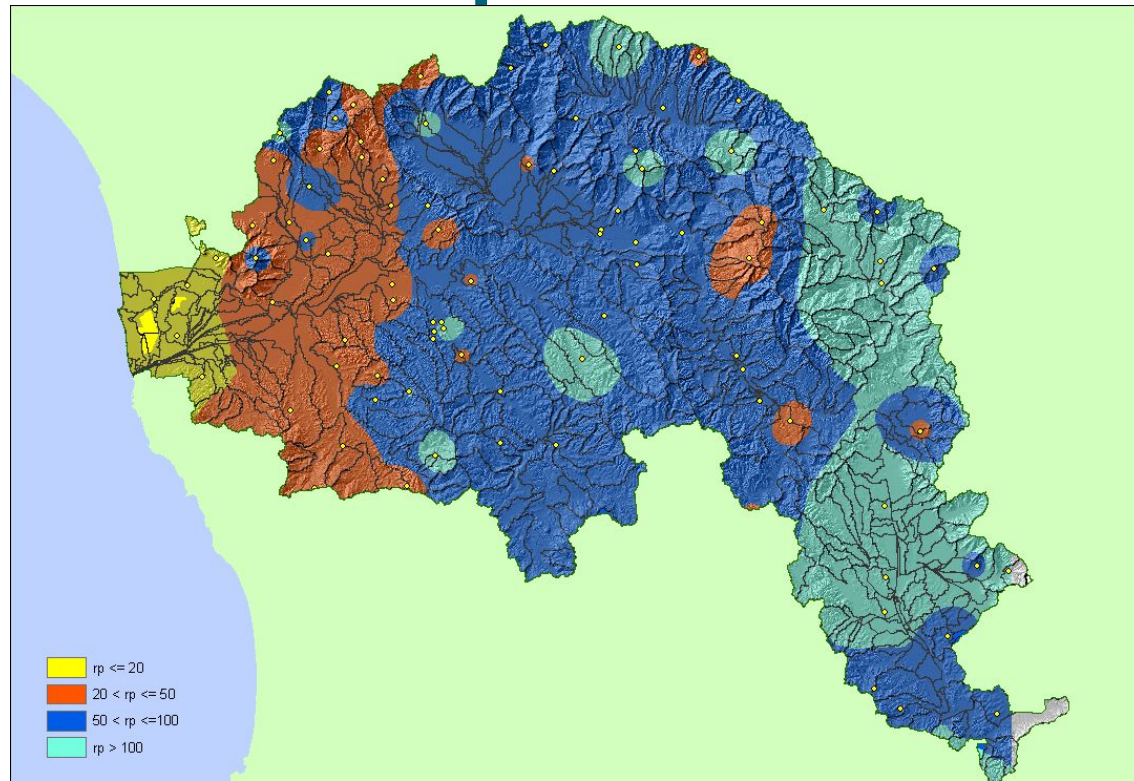
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Heavy rainfall hazard map

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?

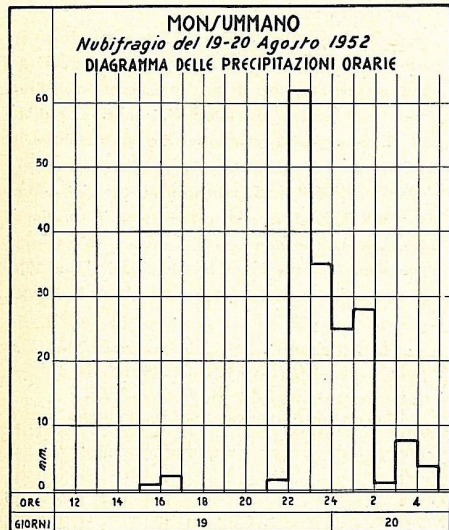
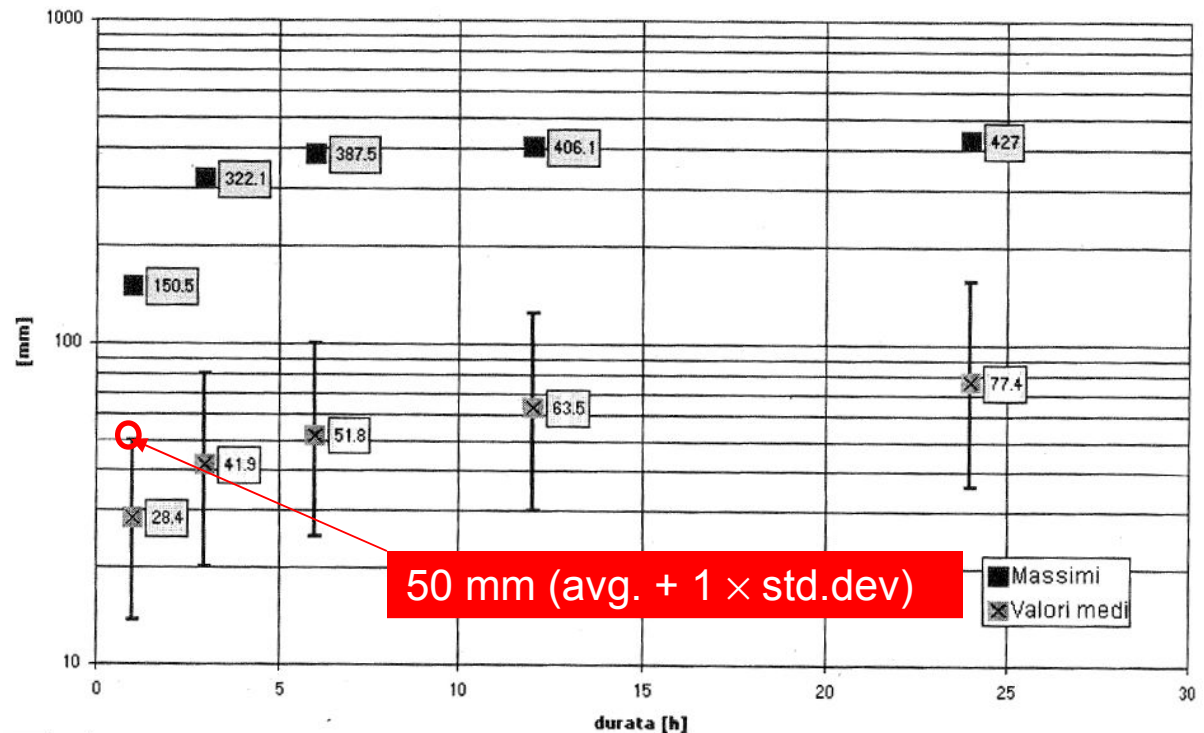


Fig. 3



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?

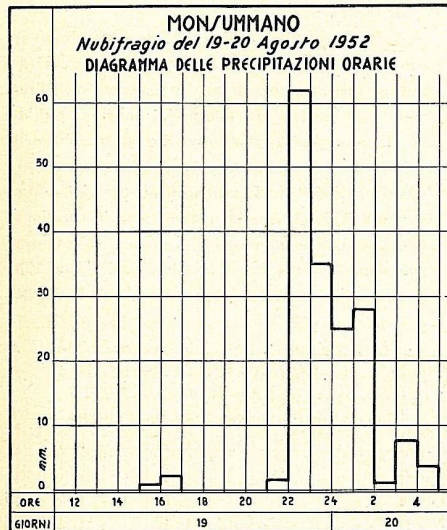
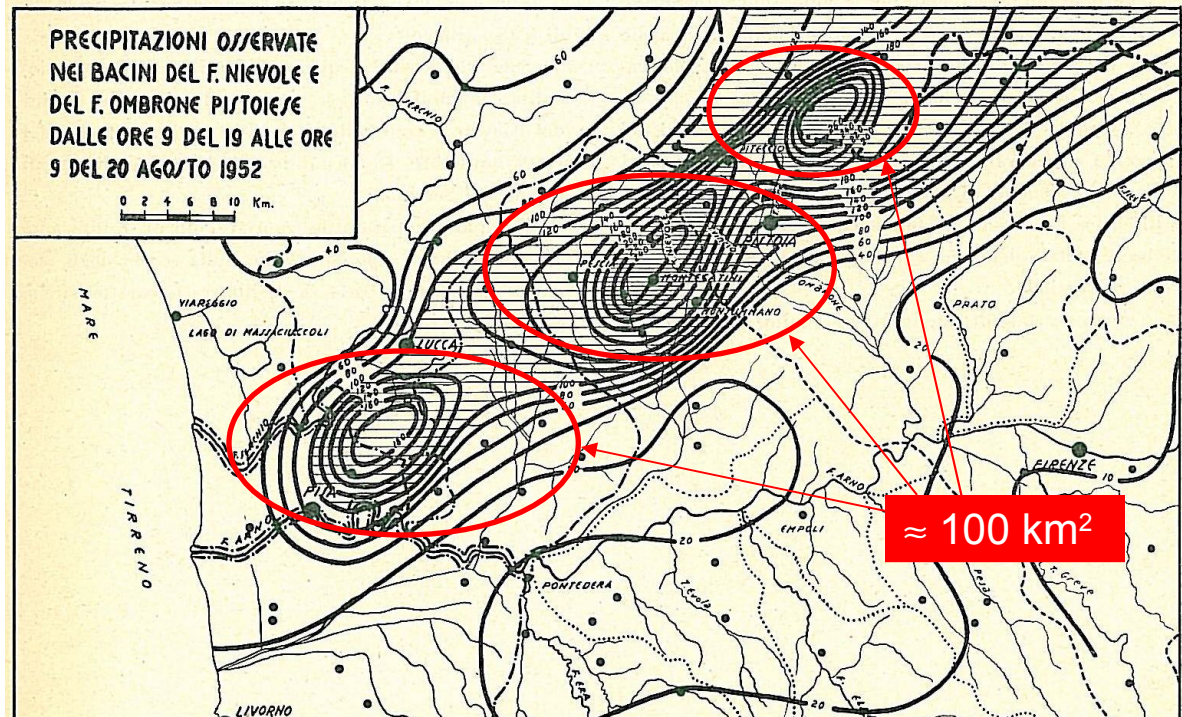


Fig. 3

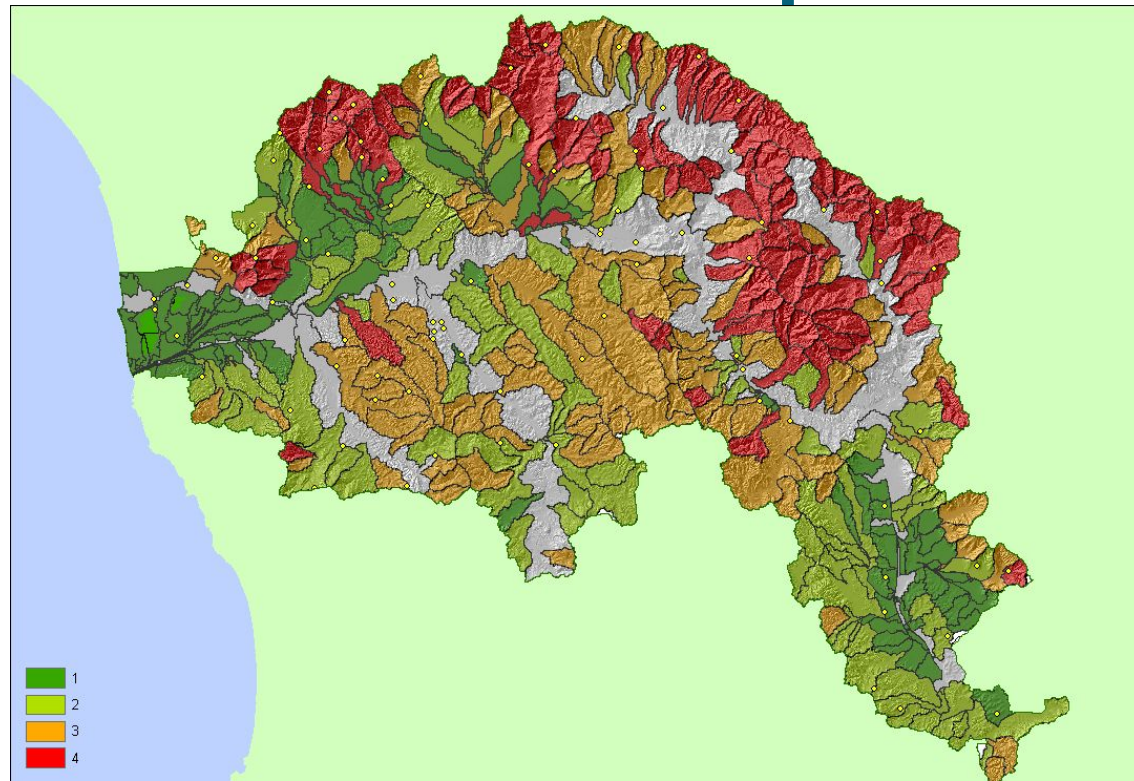


Flash Flood event of 20/08/1952 (!), Arno River basin



Susceptibility to a flash flood response

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

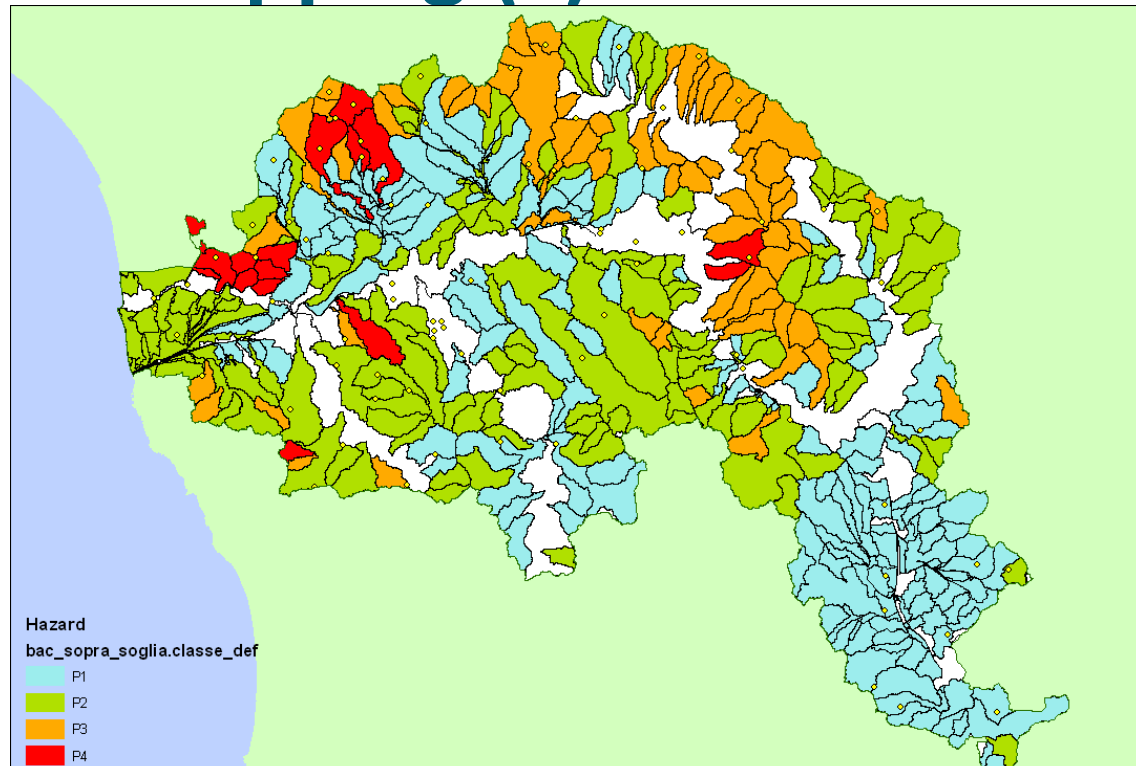
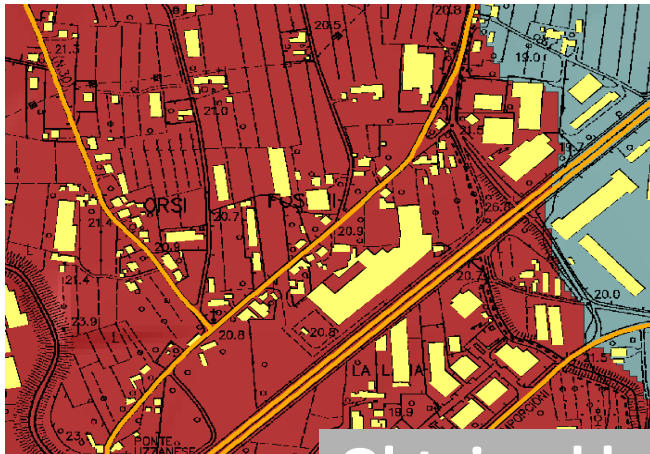


Tendency of small scale basin to transform heavy, short precipitation events in very high discharge levels



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