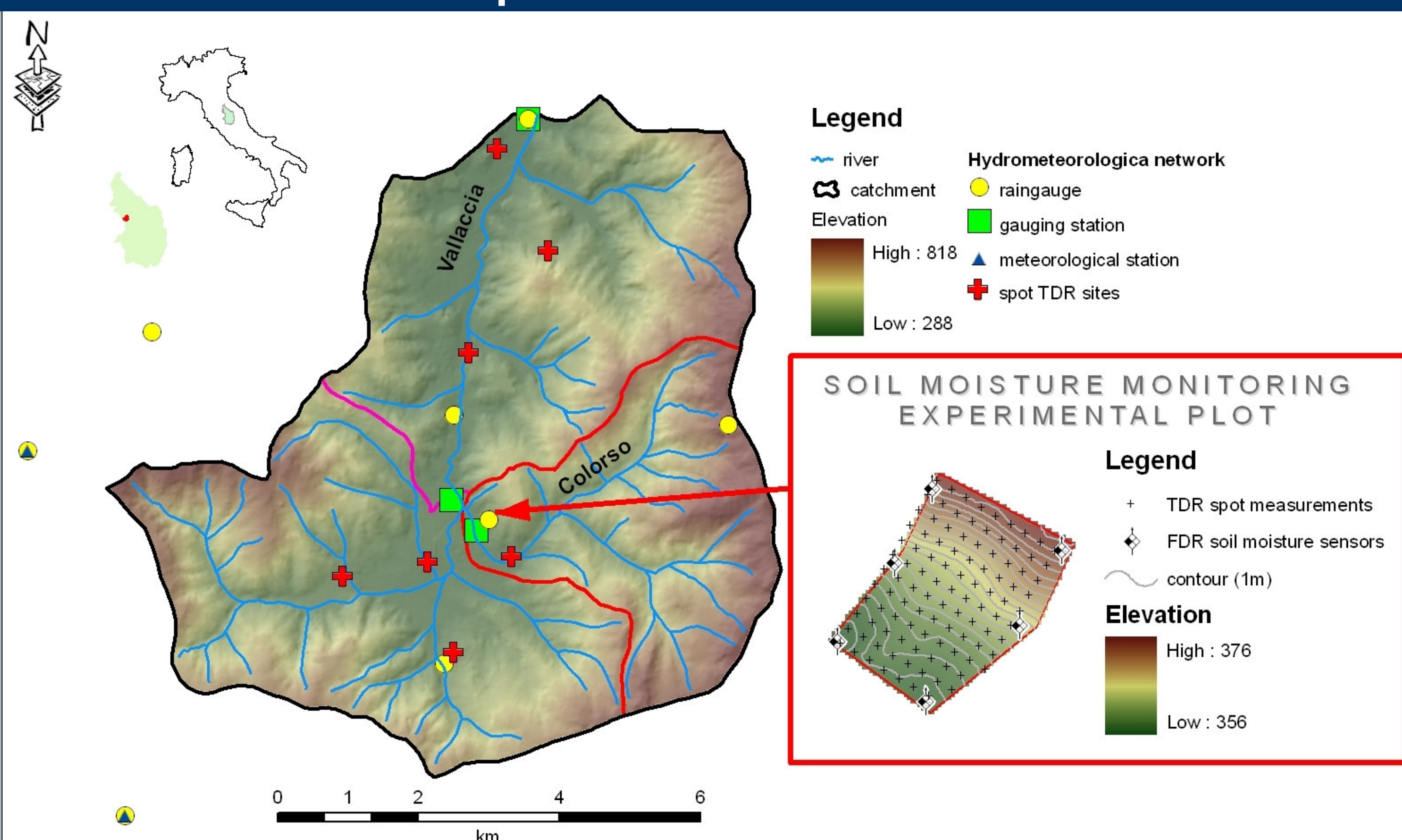


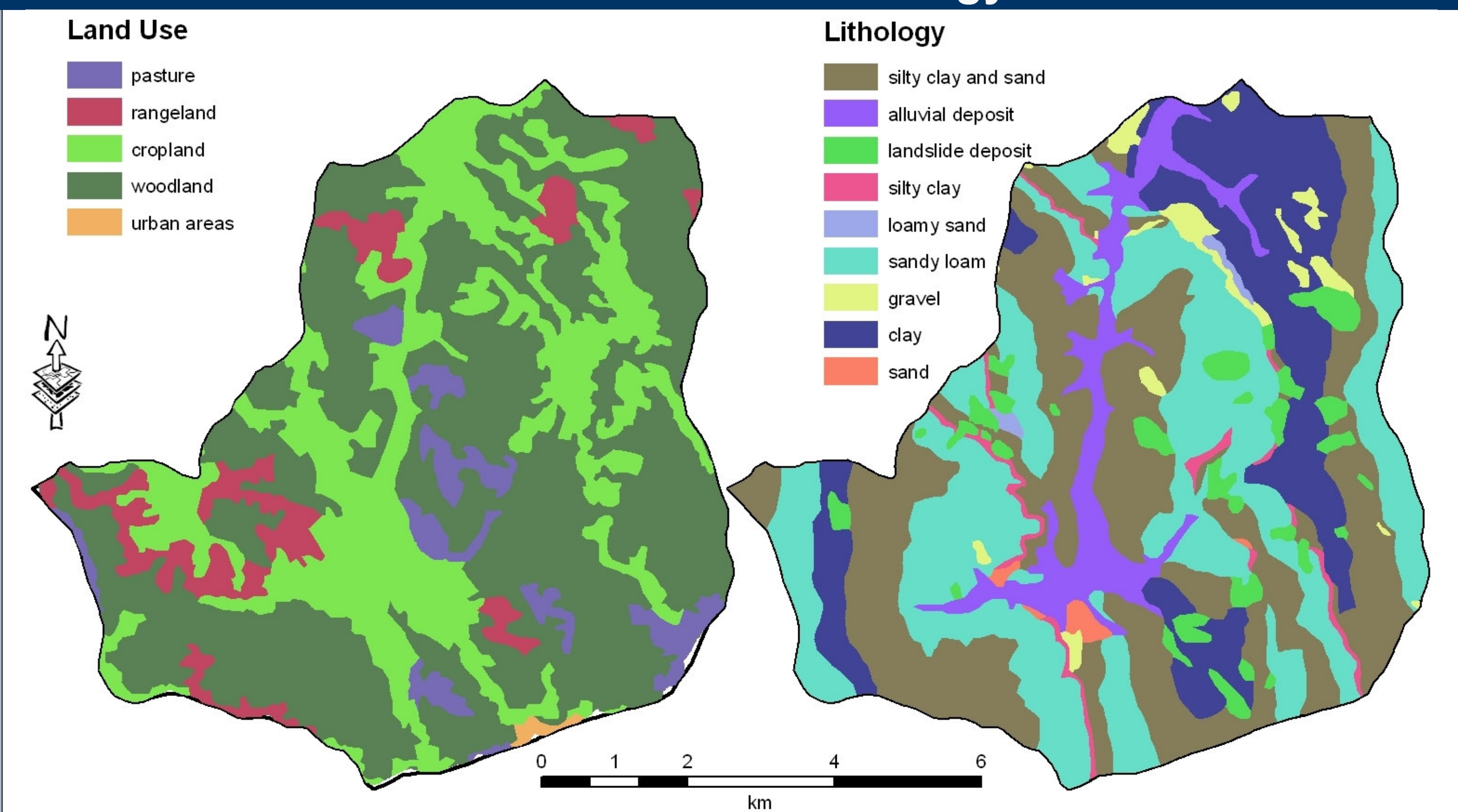
Basin characteristics

River Basin / River Basin (according EU-WFD)	Upper Tiber River Basin/ Niccone River Basin
Operation (from... to...)	Since 1995, still in operation
Gauge coordinates / Gauge datum:	12°12' E; 43° 16' N / 288 m a.m.s.l.
Catchment area:	12.9 km ² , 34.1 km ² , 57.6 km ²
<small>Colorso at C. Mandorle, Vallaccia at P. Marte, Vallaccia at Molino</small>	
Elevation range:	288 – 818 m a.m.s.l.
Basin type:	lowland / mountainous
<small>(alpine, mountainous, lowland)</small>	
Climatic parameters:	930 mm, 302 mm, 12.7 °C, 800 mm (1994-2008)
<small>(mean annual rainfall, runoff, temperature and potential evapotranspiration)</small>	
Land use:	57.7% woodland, 29.6% cropland, 5.1% pasture, 7.4% rangeland, 0.3% urban areas
Lithology:	16.6% clay, 1.5% silty clay, 34.6% silty clay and sand, 2.3% gravel, 31.5% sandy loam, 0.6% sand, 0.4% loamy sand, 7.6% alluvial deposit, 4.9% landslide deposit
Characteristic water discharges:	0 m ³ /s, 14.4 m ³ /s, 0.077 m ³ /s (2002-2008)
<small>Colorso at C. Mandorle, Vallaccia at P. Marte, Vallaccia at Molino</small>	0 m ³ /s, 26.3 m ³ /s, 0.101 m ³ /s (1998-2008)
<small>(Q_{min}, Q_{max}, Q_{mean})</small>	0 m ³ /s, 48.9 m ³ /s, 0.350 m ³ /s (1998-2008)

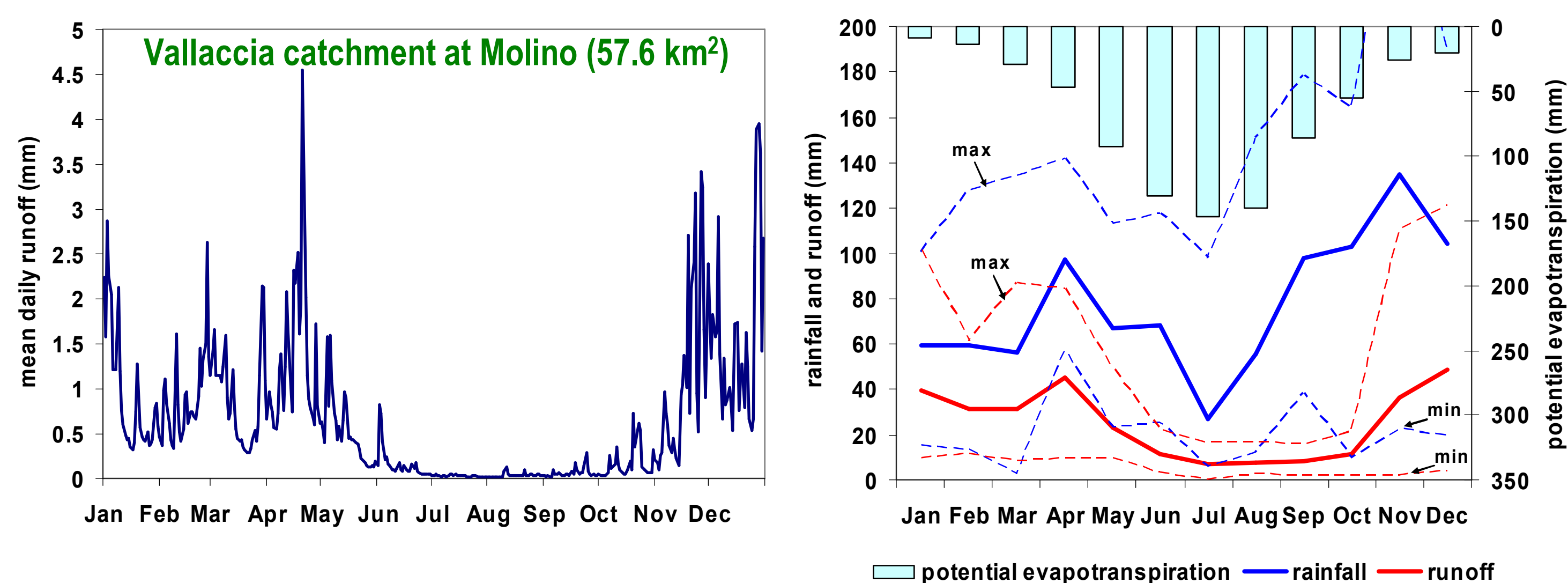
Map of the research basin



Land use and Lithology



Monthly rainfall, runoff and potential evapotranspiration



Instrumentation and data

Measured hydrological parameters	Measuring period	Temporal resolution	Number of stations
Stream flow	1998 – cont. (Molino, P.Marte) 2002 – cont. (C.Mandorle)	30 min.	3
Precipitation	1951 – cont. 1985 – cont.	daily 30 min.	2 8
Air temperature, humidity, wind	1951 – cont. 1988 – cont.	daily 30 min.	2
Soil moisture (continuous)	2002 – 2006 2006 – cont.	30 min hourly	6 in 1 plot 6 in 4 plot
Soil moisture (spot measurements)	Oct 2002 – Jan 2006 Nov 2006 – Nov 2007	7 times weekly (35)	108 points 210 points

Applied models

- MISD [3, 10, 15]
- MISDc [9]
- CRRM [4, 10]
- HBV
- IHACRES
- PDM

Main scientific results

SOIL MOISTURE SPATIAL VARIABILITY [2, 6, 8, 10, 11, 14]

- Characterization of soil moisture spatial variability across scales through statistical and geostatistical methods.
- Identification of the factors influencing soil moisture spatial variability (topography, vegetation, soils, ...).
- Optimization criteria for a soil moisture monitoring network aimed at flood prediction and forecasting through temporal stability analysis.
- Reliability assessment of geophysical methods (self potential, electrical resistivity) for soil moisture monitoring.

MODELING SOIL MOISTURE TEMPORAL VARIABILITY [4, 7, 9, 10, 13]

- Characterization of the soil moisture temporal variability at the plot and small catchment scale.
- Identification of principal factors determining soil moisture temporal evolution at the short and long time scale.
- Development of a robust conceptual water balance model for soil moisture estimation based on widely available meteorological data.

ANTECEDENT WETNESS CONDITIONS ESTIMATION FOR RAINFALL-RUNOFF MODELING [1, 3, 4, 7, 9, 10, 12, 15]

- Representativeness of spot measurements for soil moisture estimation at the catchment scale.
- Assimilation of ground-based and remotely sensed soil moisture observations in rainfall-runoff modeling.
- Development of a continuous rainfall-runoff model based on the outcomes of soil moisture monitoring at different scales.

REMOTE SENSING OF SOIL MOISTURE [1, 5]

- Reliability assessment of satellite sensors for soil moisture estimation in view of flood prediction and forecasting.

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