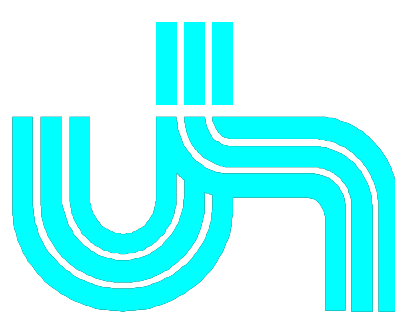




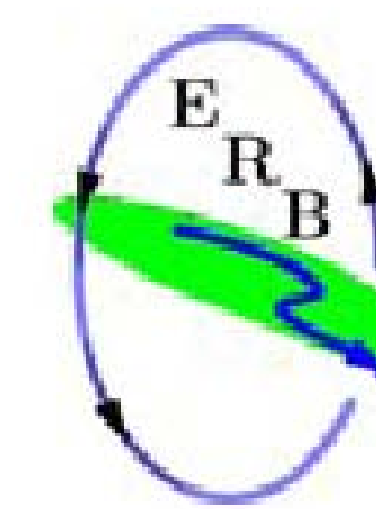
Slovak
Hydrometeorological
Institute, Bratislava



Institute of Hydrology
SAS Bratislava

Bela, Podbanske

Bela river basin, Slovakia



Basin characteristics

River Basin / River Basin (according EU-WFD)

Operation (from... to...)

Gauge coordinates / Gauge datum:

Catchment area:

Elevation range:

Basin type:
(alpine, mountainous, lowland)

Climatic parameters:
(mean precipitation, temperature and others)

Land use:

Soils:

Geology:

Hydrogeology:
(Type of aquifers, hydraulic conductivity)

Characteristic water discharges:
(Q_{min} , Q_{max} , Q_{mean})

SKV0011, Vah River Basin / Danube River basin

Since 1924, still in operation

49° 8' N, 19° 54' E, 922.72 m a.s.l.

93.49 km²

1571 m, max=2494 m.a.s.l., mean 1551 m a.s.l.

Alpine in The Tatras National Park (TANAP)

Preliminary results P=1473 mm, R=1181 mm. (1901-2000),
Runoff coef. 0.8, t= -0.8°C -Kasprowy, 4.6°C -Podbanske

Forest-61%, pine dwarf-26%, rock-13%, lakes-0.239 km²,

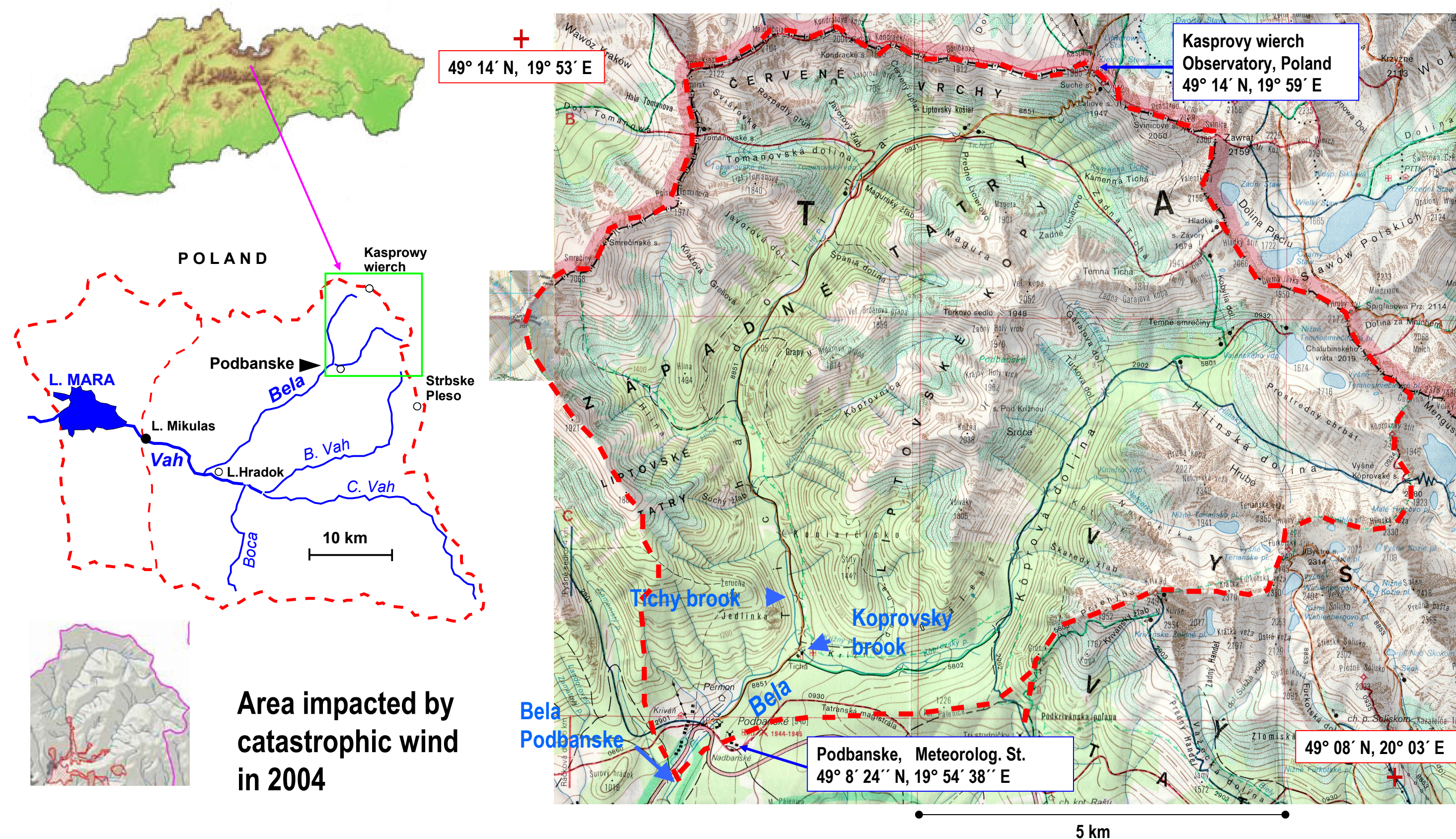
Up to 1500 m brown forest soils

crystallinicum, small parts limestones dolomites

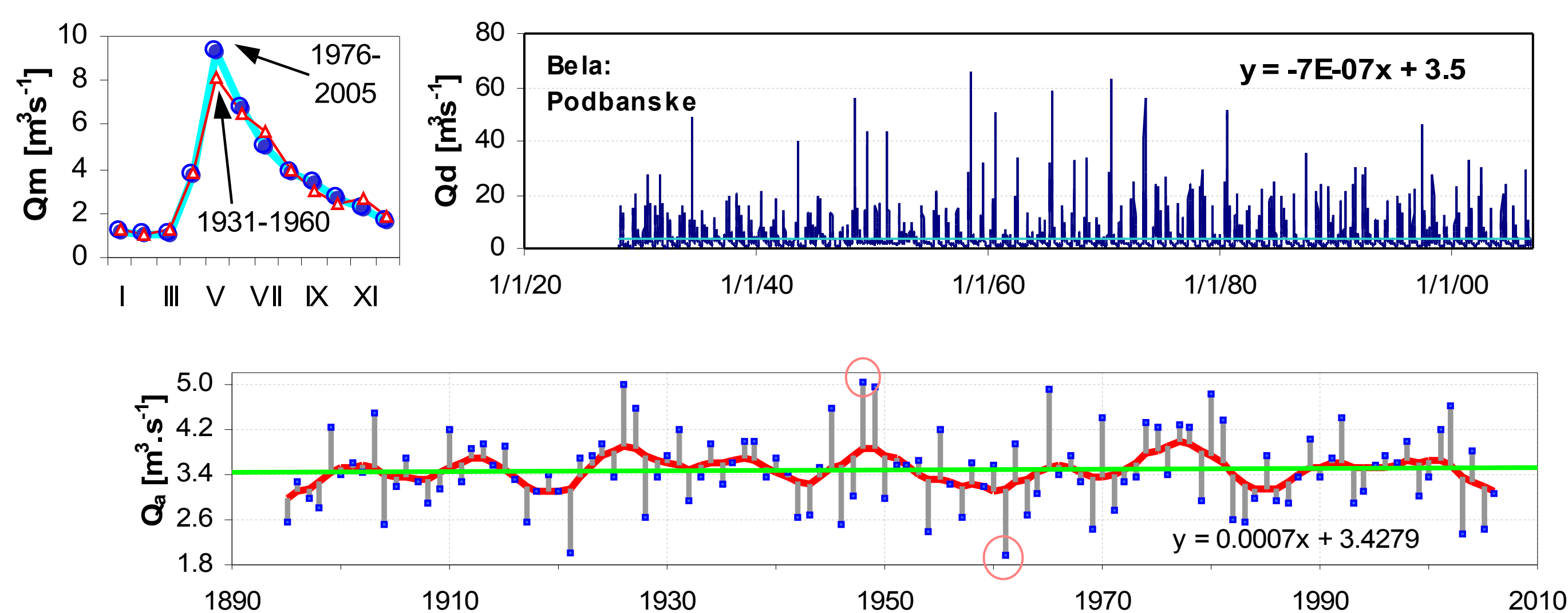
Impermeable bedrock

$Q_{min} = 0.48$; $Q_{max} = 170$; $Q_{mean} = 3.5 \text{ m}^3\text{s}^{-1}$

Map of the Bela basin



Flow regime

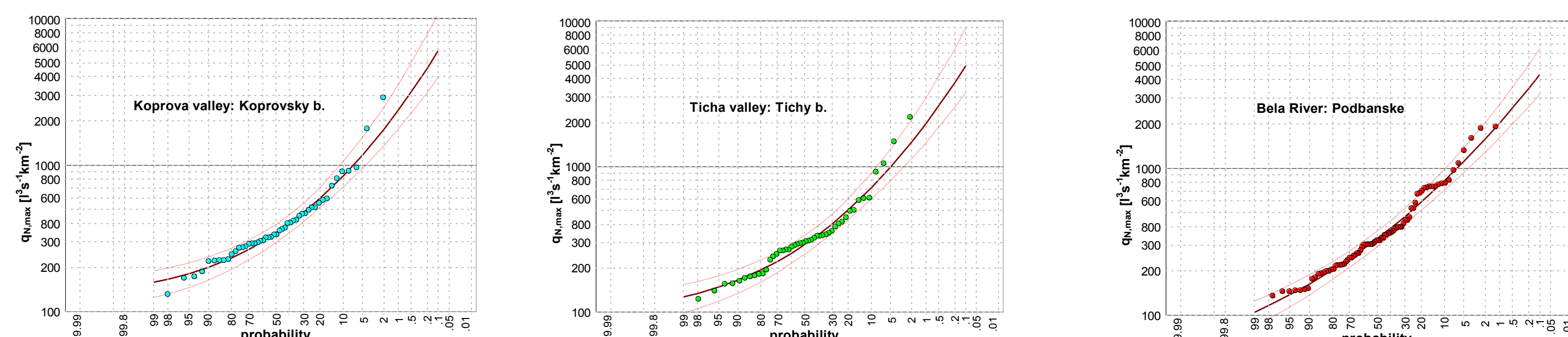


Long-term monthly Q_m (two periods) and average daily Q_d flows, measured series,
long-term trend 1928–2006, (above).

Average annual discharge Q_a , 1895–1927 supplemented series, residuals of 5-year moving averages
(below), trend 1895–2006, Bela river.

Extreme runoff characteristics in Bela subbasins

$q_{N,max}$, log-Pearson III. type distribution



Comparison of N-year specific yields in three subbasins (1941-1960 and 1971 – 1999).

Instrumentation and data

Measured hydrological parameters	Measuring period	Temporal resolution	Number of stations
water level Bela:Podbanské, 922.7 m a.s.l.	1924-1948, 93.5 rkm 1949-60 limnigraph 91.1 rkm 1961-89 limnigraph 93.5 rkm 1989-09 hourly 93.5 rkm	Observer, 3x daily Mean daily Mean daily Hourly	
water level Koprovsky creek	1941-1960 observer 1972-1989 limnigraph 1989-1999 limnigraph	Mean daily Mean daily Hourly	
water level Tichy creek	1941-60 observer 1972-89 limnigraph 1989-1999 limnigraph	Mean daily Mean daily Hourly	
Meteo station, Liptovsky Hradok	1881-2009	T, P Daily T Hourly	
Meteo station, Podbanske	1960-2009	Daily	
Observatory Kasprowy wierch Poland, 1991 m a.s.l	1938-up to day	N / A	

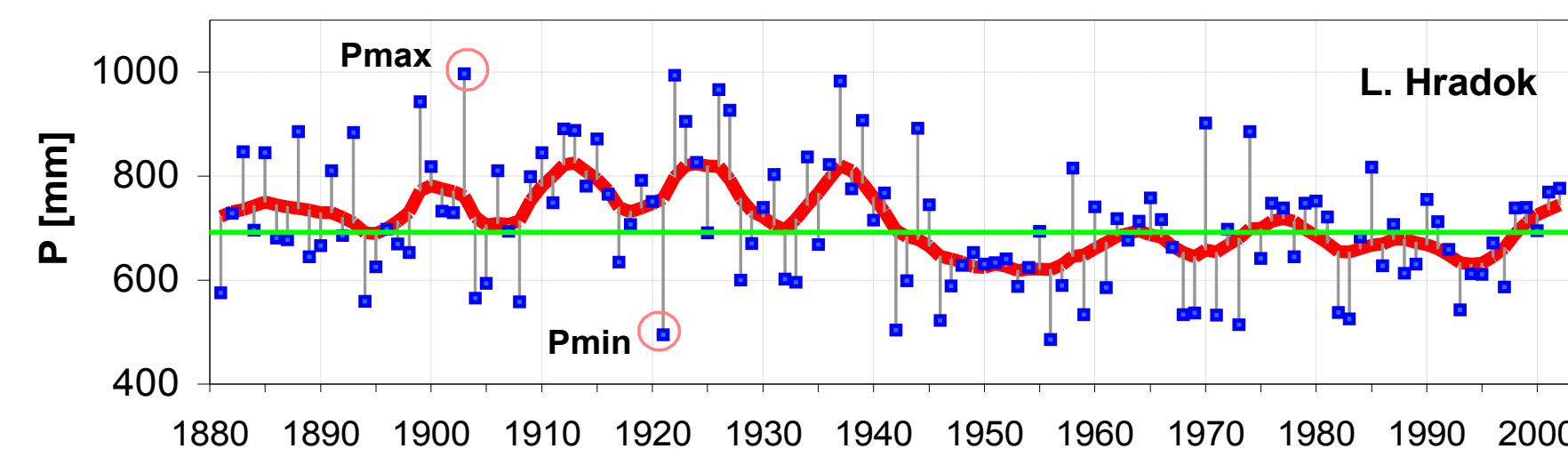
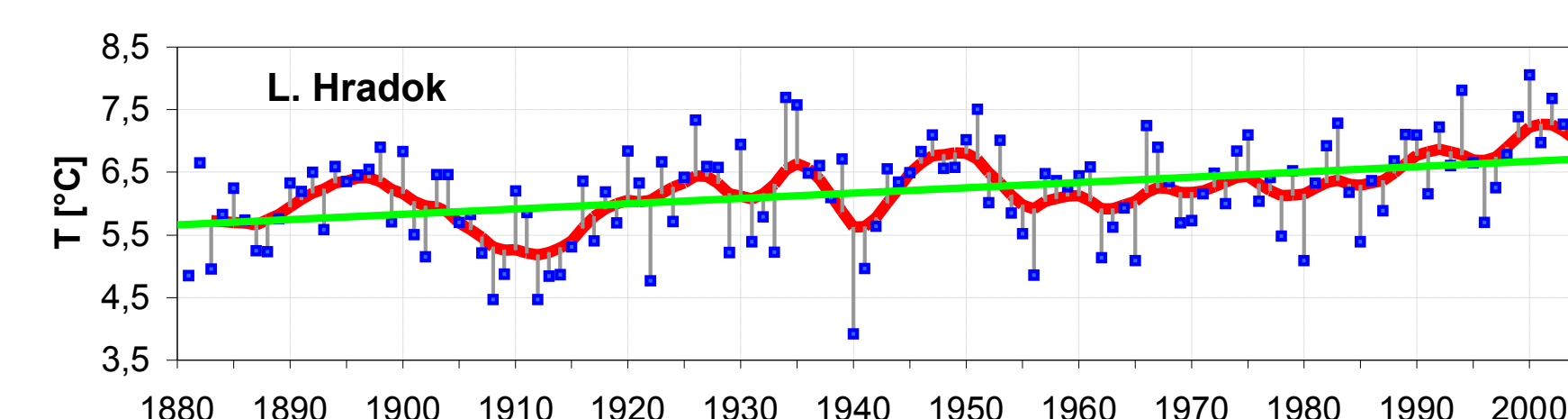
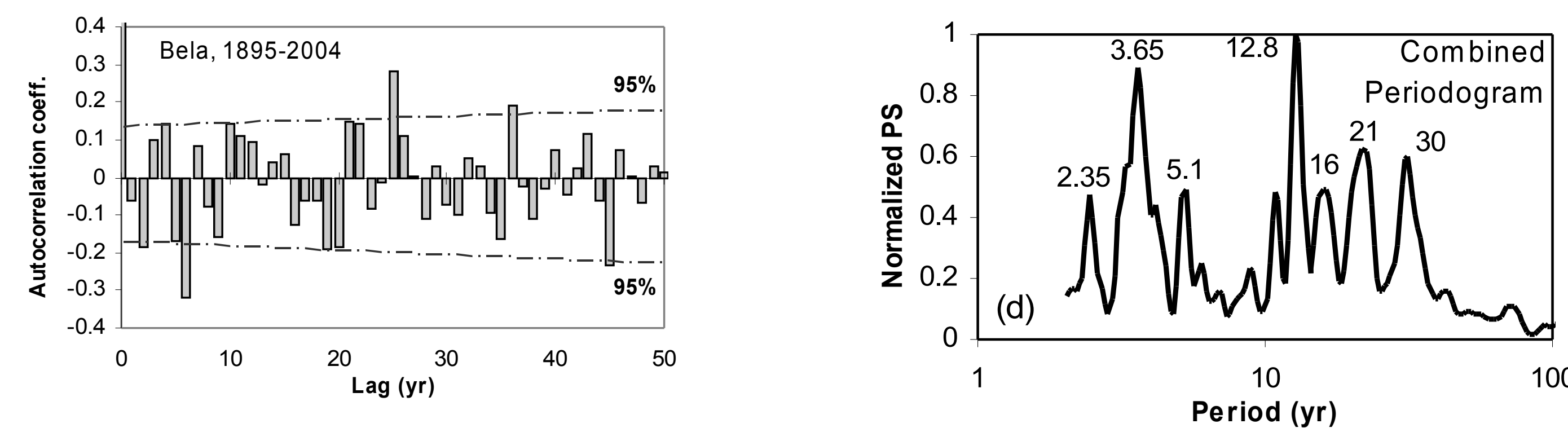
Applied models - no

Main scientific results

Auto-correlogram of the discharge series of Bela River and spectral analysis of the mean annual discharge of Bela River

The spectral analysis by method MESA, identified as the most significant period of 3.6 year.

Other significant periods are those of 12.8, 5.1, 4.2, and 2.47 years. Using method of the combined periodogram (Pekarova et al., 2003), long periods of 16, 21, and 30 years were identified.



From the Bela at Podbanske mean annual discharge analysis, it follows:

1. Annual discharge series Belá at Podbanské is homogeneous.
2. The series long- term trend is zero.
3. The most significant period, identified by spectral analysis is of 3.6 years.
Significant are also periods of 29- years ; 21- years , 36- years ; 13- years ; 4,2- years.

Key references for the basin

1. Hlubocky B. (1974): Representative basin of Bela – preliminary surface water regime assessment. (In Slovak.) Internal report, SHMU, Bratislava, 79 p.
2. Pacl J. (1959): Catastrophic flood in the Tatras region in June 1958. (In Slovak.) Collection of works of TANAP, Vol.3, 17–56.
3. Pekarova P., Pekar J., Pacl J. (2005): Time variability of annual discharge in the Bela mountainous catchment during 1901–2000. (In Slovak.) In Proc. Hydrology for integrated management of water resources, Bratislava, (eds. Majercakova O., Nachazel K., Szolgay J.), SHMU, CVUT, STU, CD ROM, ISBN 80-88907-53-5, 2005, 417-429.

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