

Climate change impacts and vulnerability assessment in some sectors in Slovakia

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IWAC Meeting, 2-3 March 2011, Bratislava

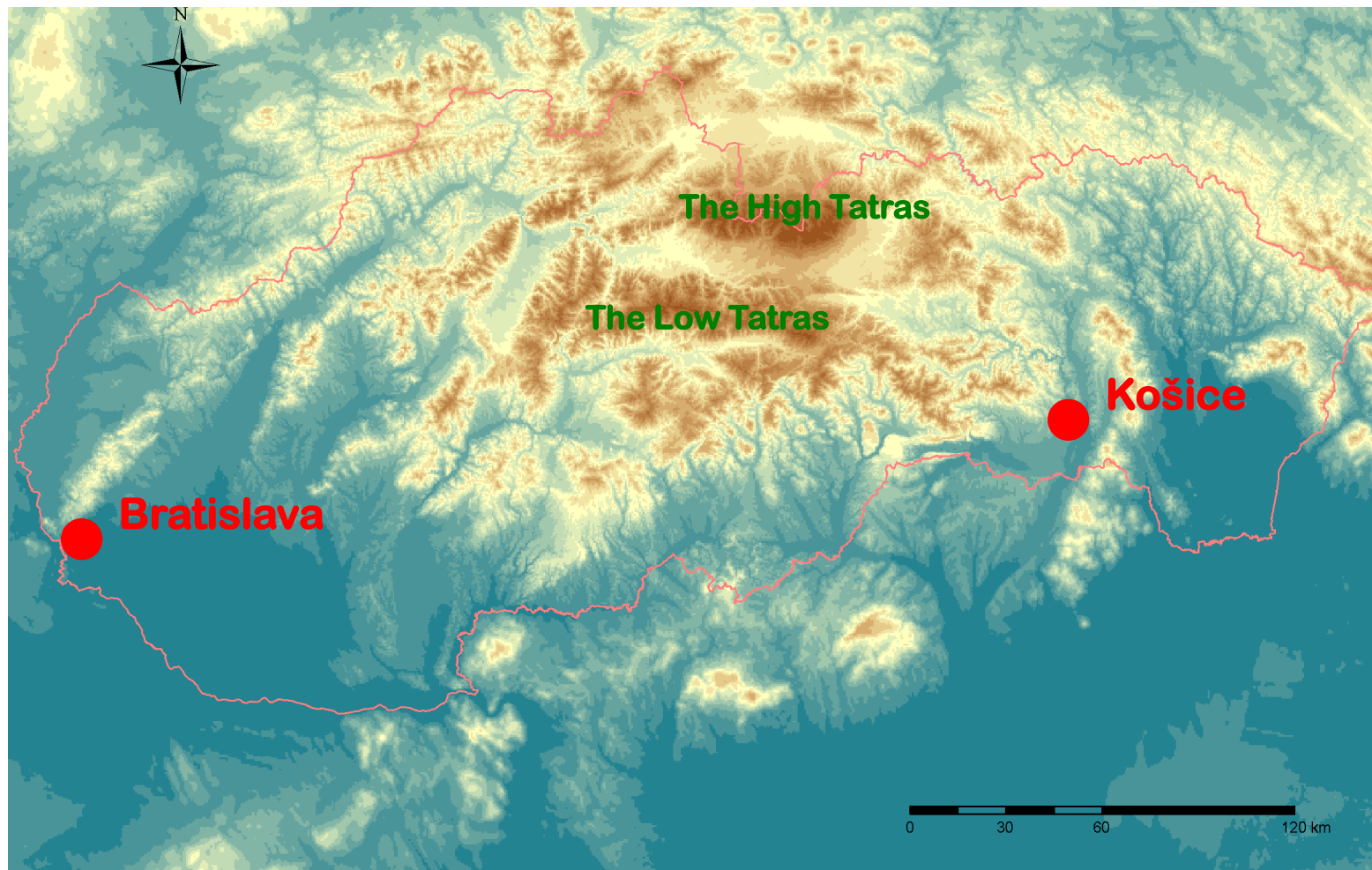
Presentation content

1. Meteorological and precipitation stations network of SHMI
2. Slovak National Climate Programme
3. The Fifth National Communication of the Slovak Republic on Climate Change

Position of the Slovak Republic in Europe

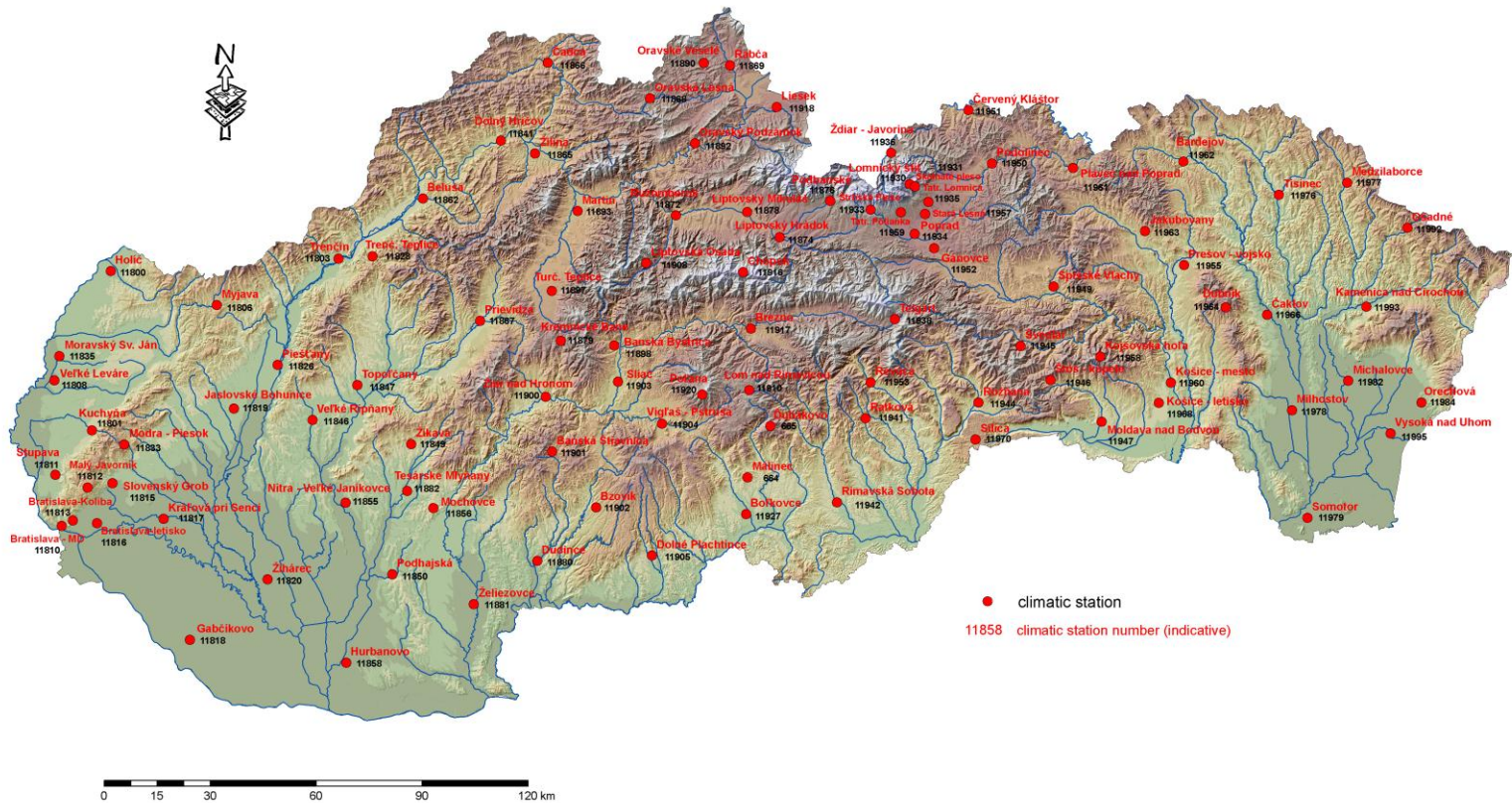


The Northern Carpathians Range - Main impact on meteorological and hydrological regime



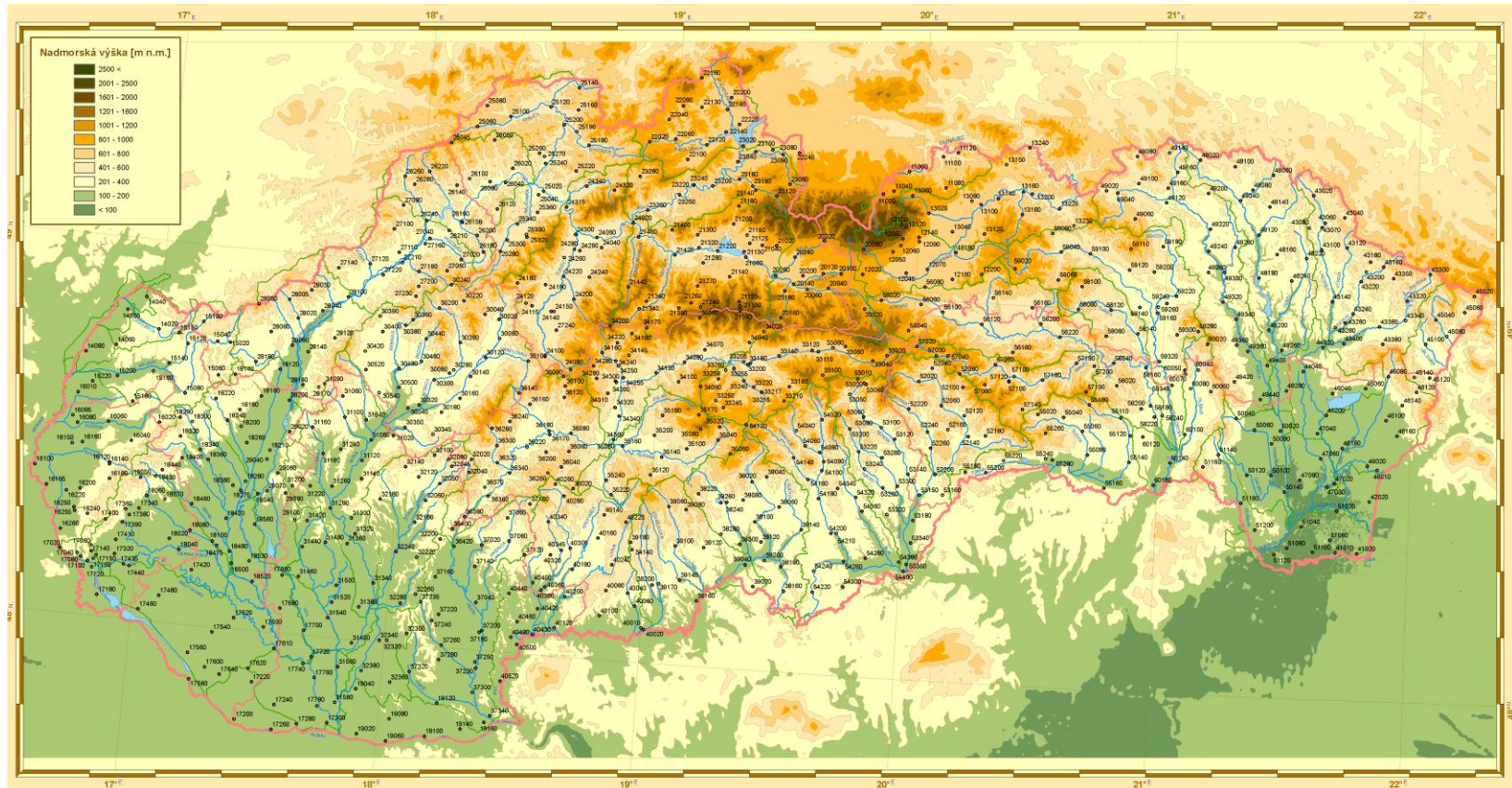
Climatological stations network

Climatic stations network in Slovakia



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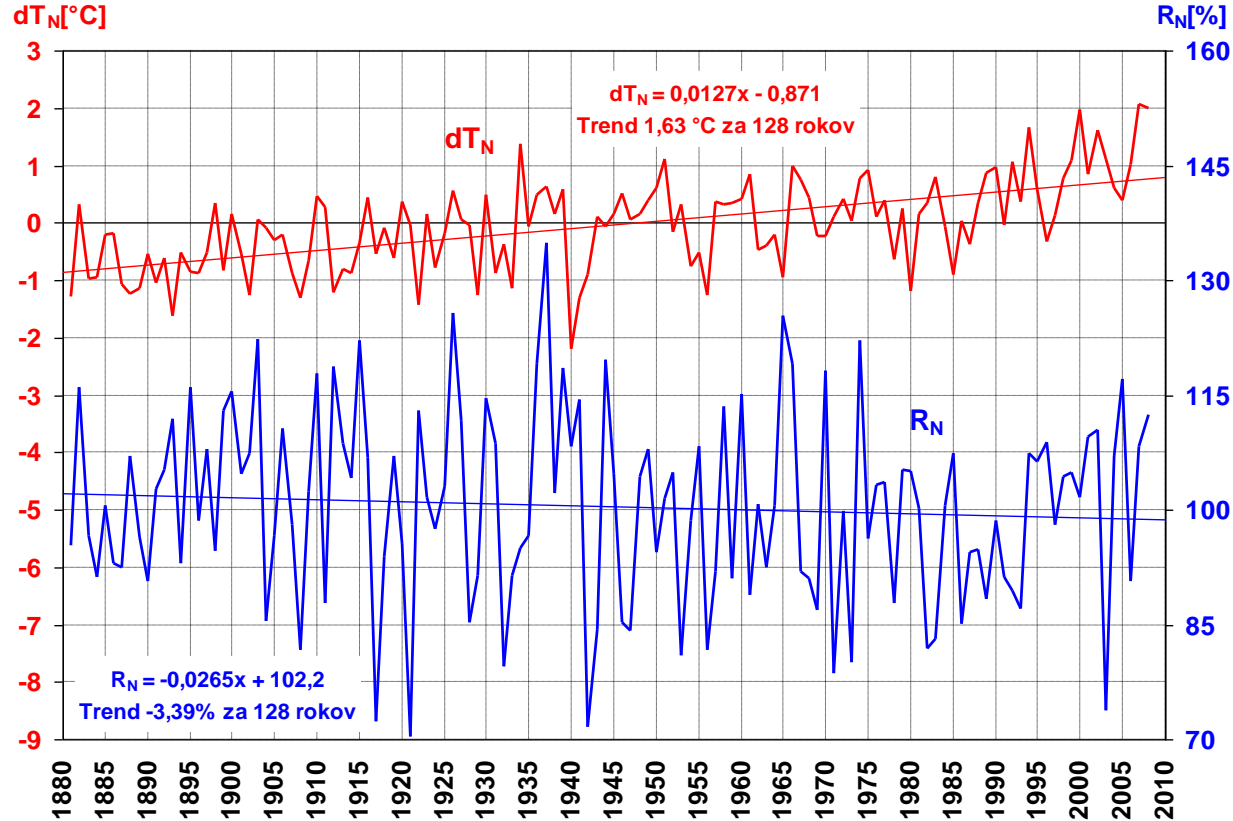
Precipitation stations network



Slovak National Climate Programme (NCP) (since 1993)

- NCP started with activities:
- Recent and projected climate change impacts
- Vulnerability assessments and adaptation in sectors: Water, Agriculture, Forestry, Biodiversity

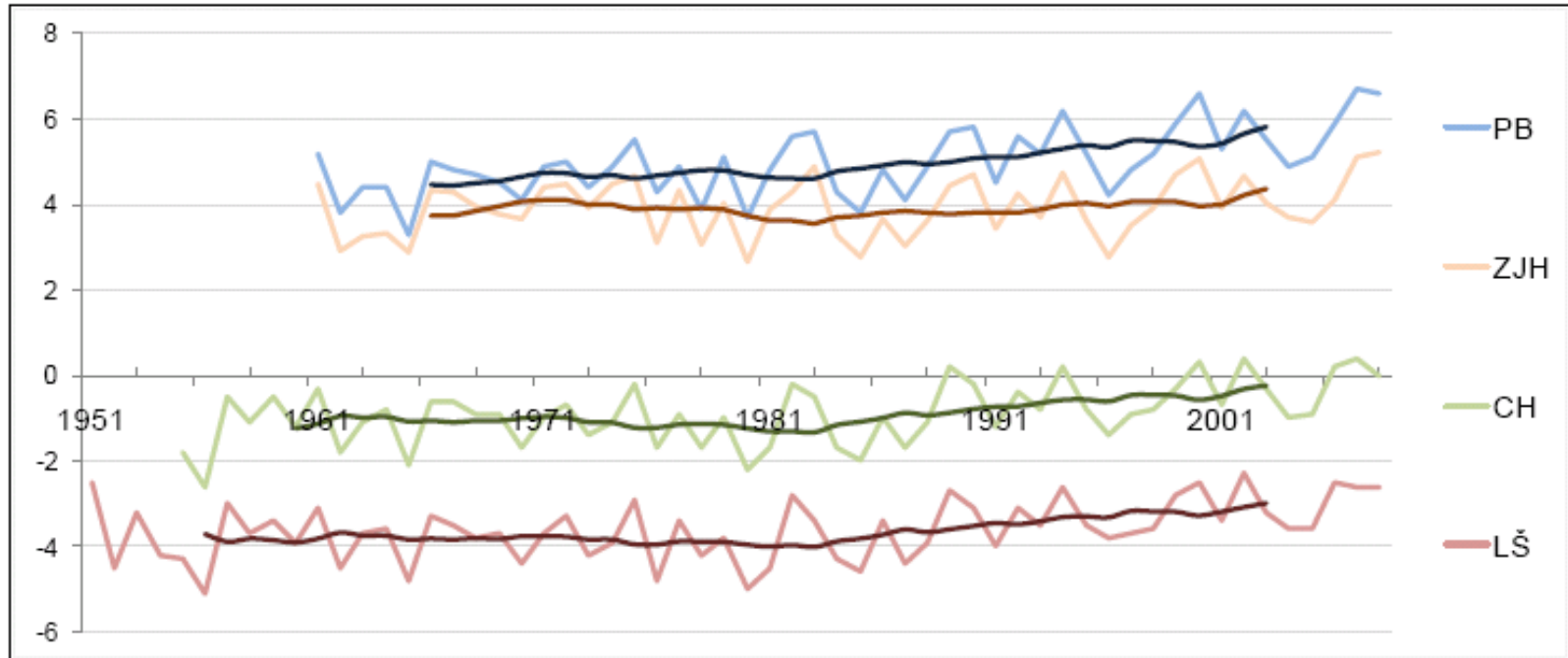
Results of the Slovak NCP



Deviations of the mean annual air temperature (dT_N) from the normal and annual areal atmospheric precipitation sum (R_N) in Slovakia (% of normal) in the period of 1881 – 2008 and a linear trend

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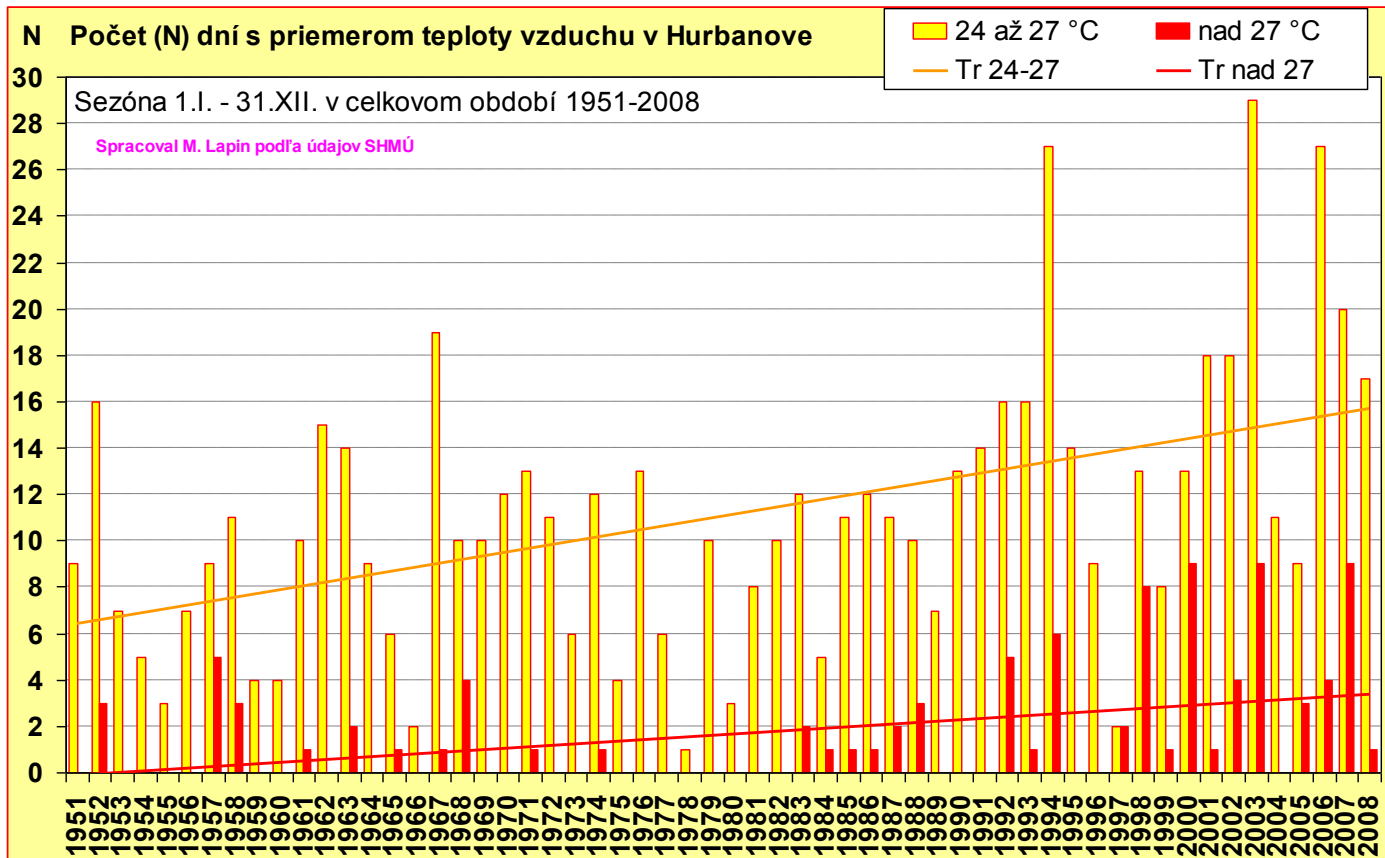
Results of the Slovak NCP



Mean annual daily temperatures (°C) and 11-year running averages from the mountainous stations (Podbanské (PB), Ždiar-Javorina (ZJH), Chopok (CH) and Lomnický štít (LŠ))

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Results of the Slovak NCP

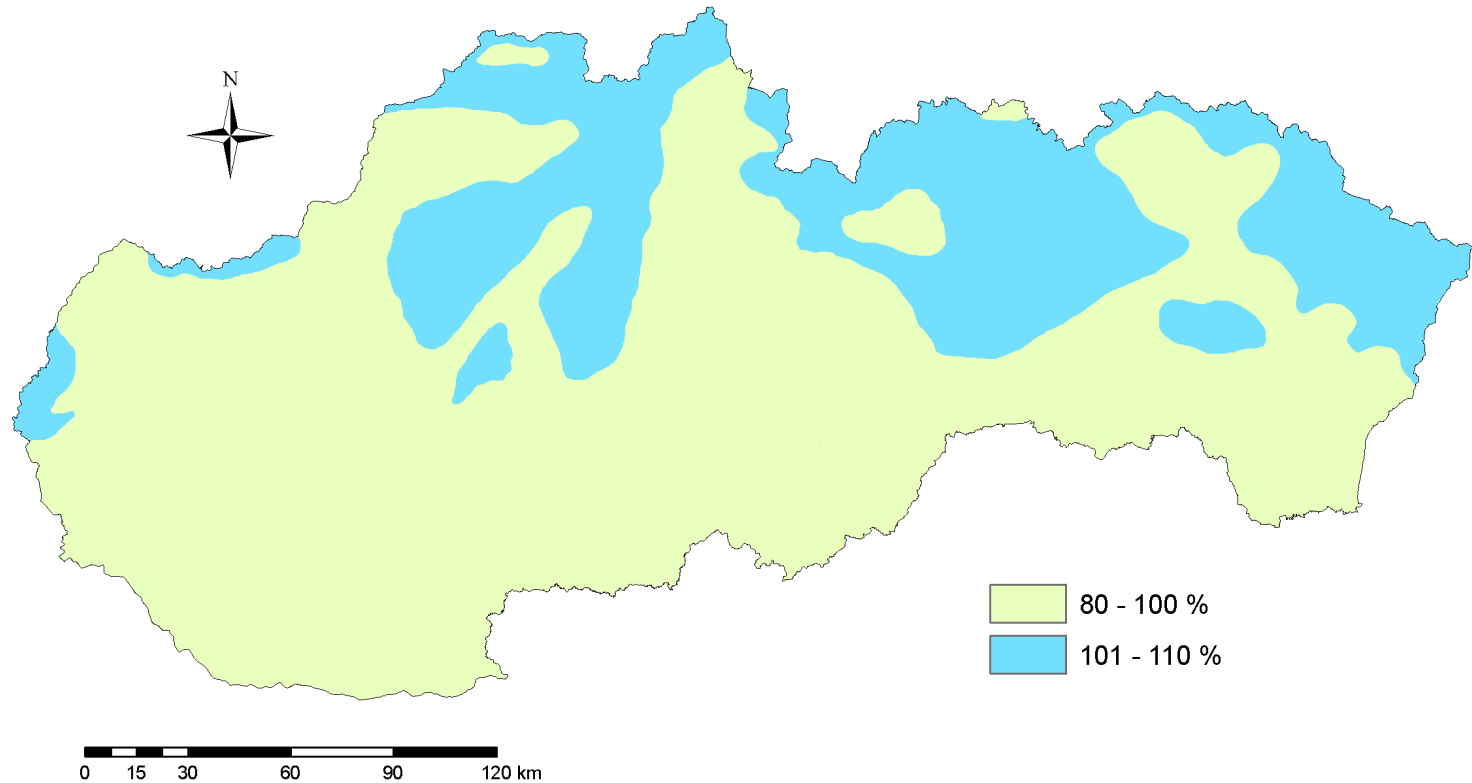


Number of days with the average air temperature of 24-27°C and above 27°C at Hurbanovo in 1951 - 2008

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Results of the Slovak NCP

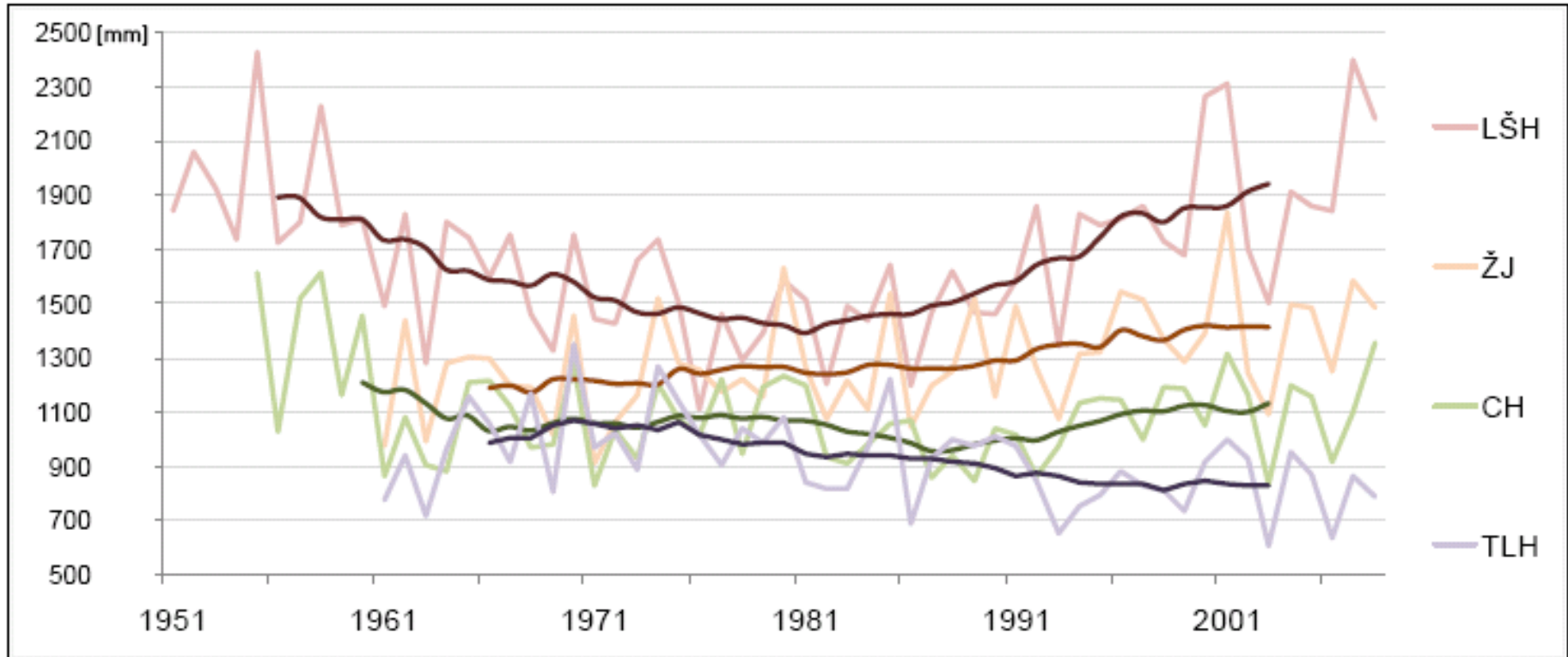
Annual mean precipitation totals in Slovakia for 1988-2007 period
in % of 1901-2000 period



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*Mean annual precipitation totals in 1988-2007 period
(in % of 1901-2000)*

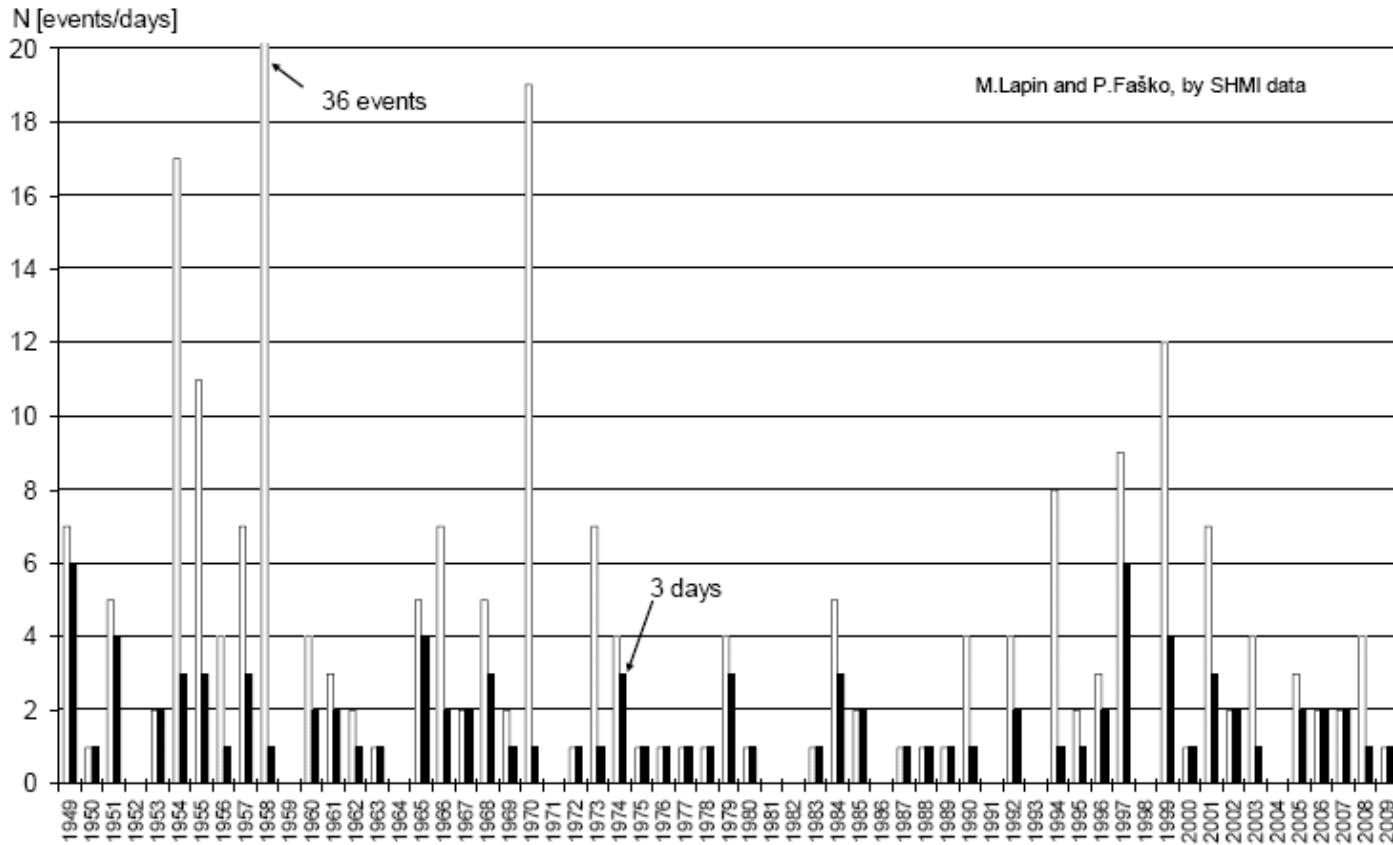
Results of the Slovak NCP



Mean annual precipitation totals in 1951-2007 period for the mountainous stations in Slovakia

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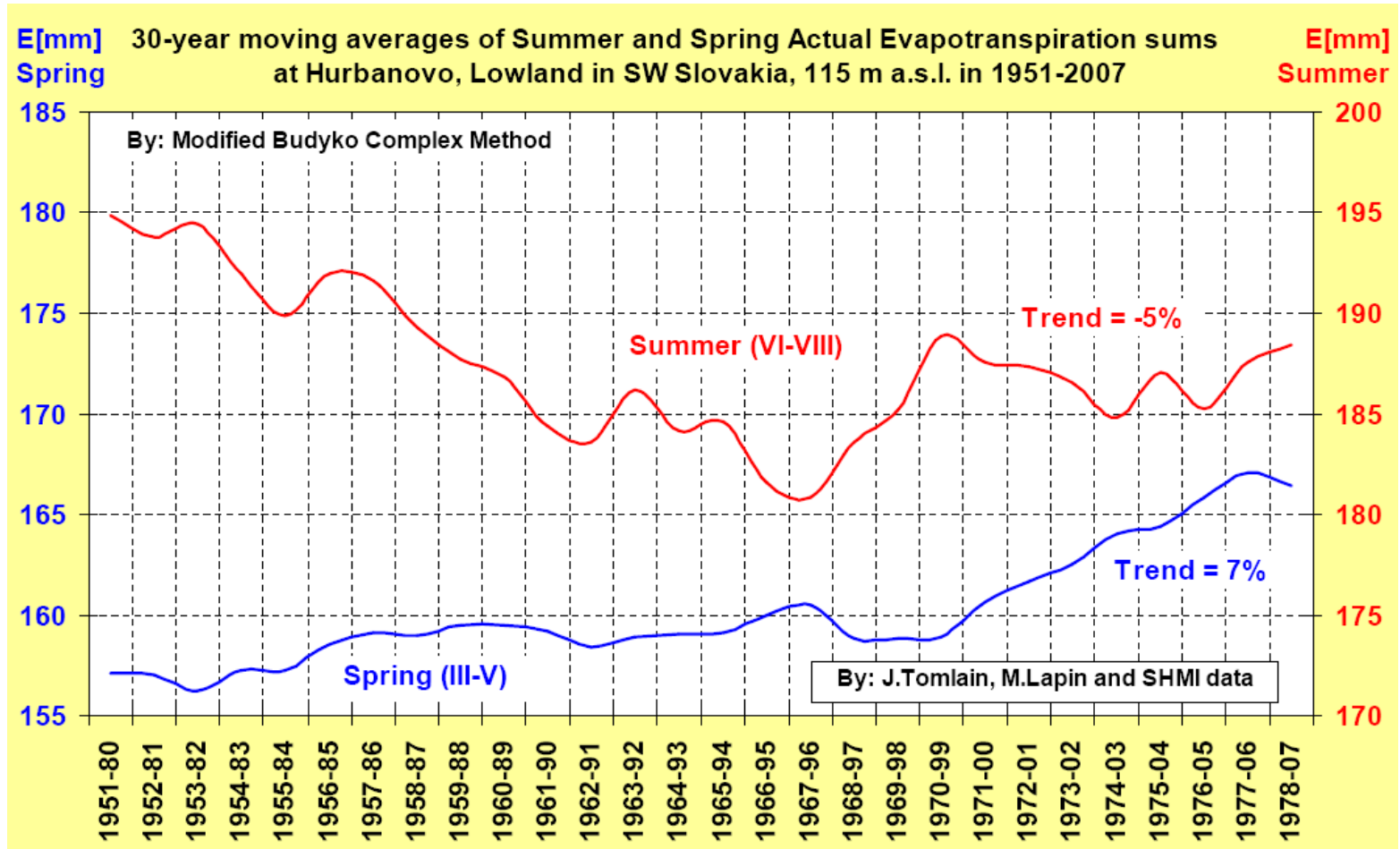
Results of the Slovak NCP



Number of events and number of days with daily precipitation sum of 100 mm and more, recorded at least at one station (data compiled from ca. 600 meteorological stations of Slovakia)

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Results of the Slovak NCP



Summer and Spring Actual Evapotranspiration sums at Hurbanovo in 1951 - 2007 period

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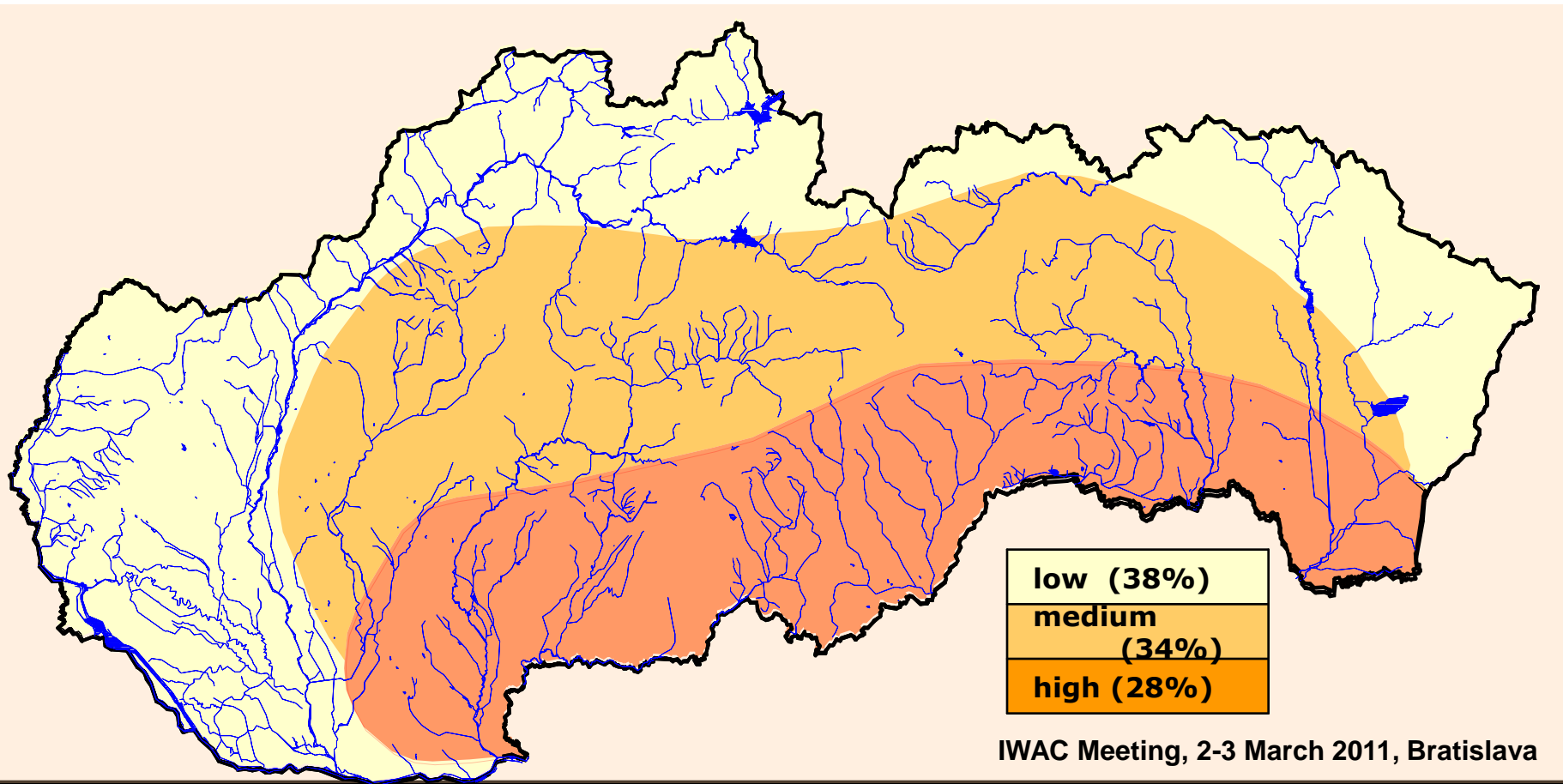
- Issued in 2009
- Special chapter on impacts, vulnerability and adaptation measures
- Sectors:
 - *Hydrology and water management*
 - *Agriculture*
 - *Forest management*
 - *Biodiversity*
 - *Transport*
 - *Tourism*

Hydrology and water management

Vulnerable field	Examples/Comments on vulnerability and impacts
Hydrology and water management	<ul style="list-style-type: none">–Threat of water resources for water supply and electric energy production–Decrease in water resources in the south and east of Slovakia–Decrease in the electric energy production from big water power stations–Increase in the occurrence of drought and floods–Change of hydrologic cycle

Hydrology and water management

Water resources vulnerability in Slovakia



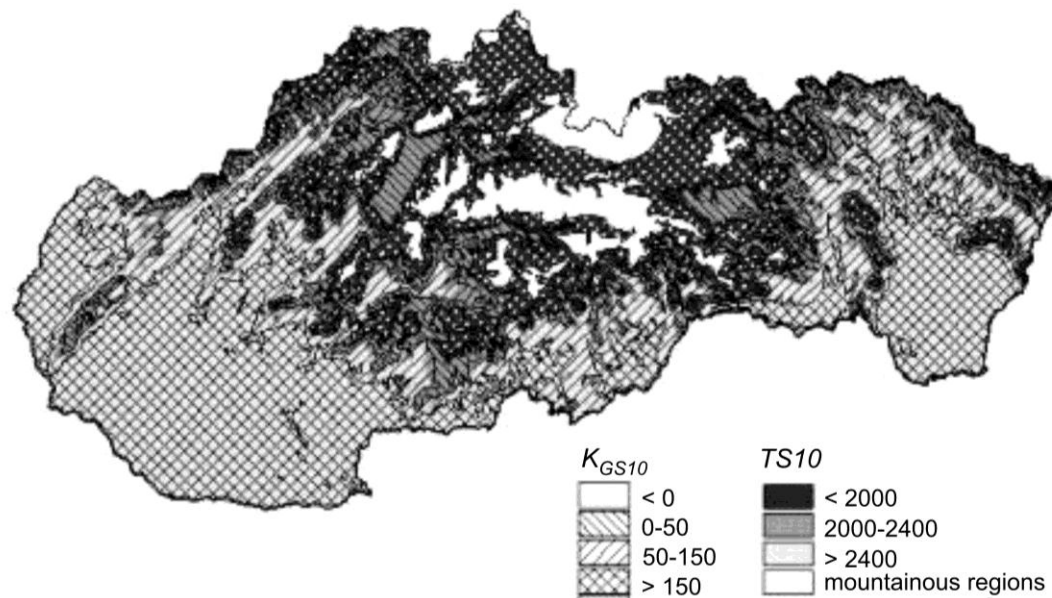
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Agriculture, Forest management, Biodiversity

Vulnerable field	Examples/Comments on vulnerability and impacts
Agriculture	–Creeping aridification of maize production area –Occurrence and spread of pests and diseases of agricultural plants, trees and animals
Forest management	–Adverse influence of drought on forest ecosystems in the south of Slovakia –Increased risk of forest fires –Damage to forest ecosystems by new dynamics of pests –Destruction of spruce forests –Shift of wet snow zone to higher altitudes resulting in snowbreak and rooting out trees
Biodiversity	–Invasions of some species of insects as agricultural pests –Invasions of vector diseases threatening human health –Decrease in biodiversity

Agriculture

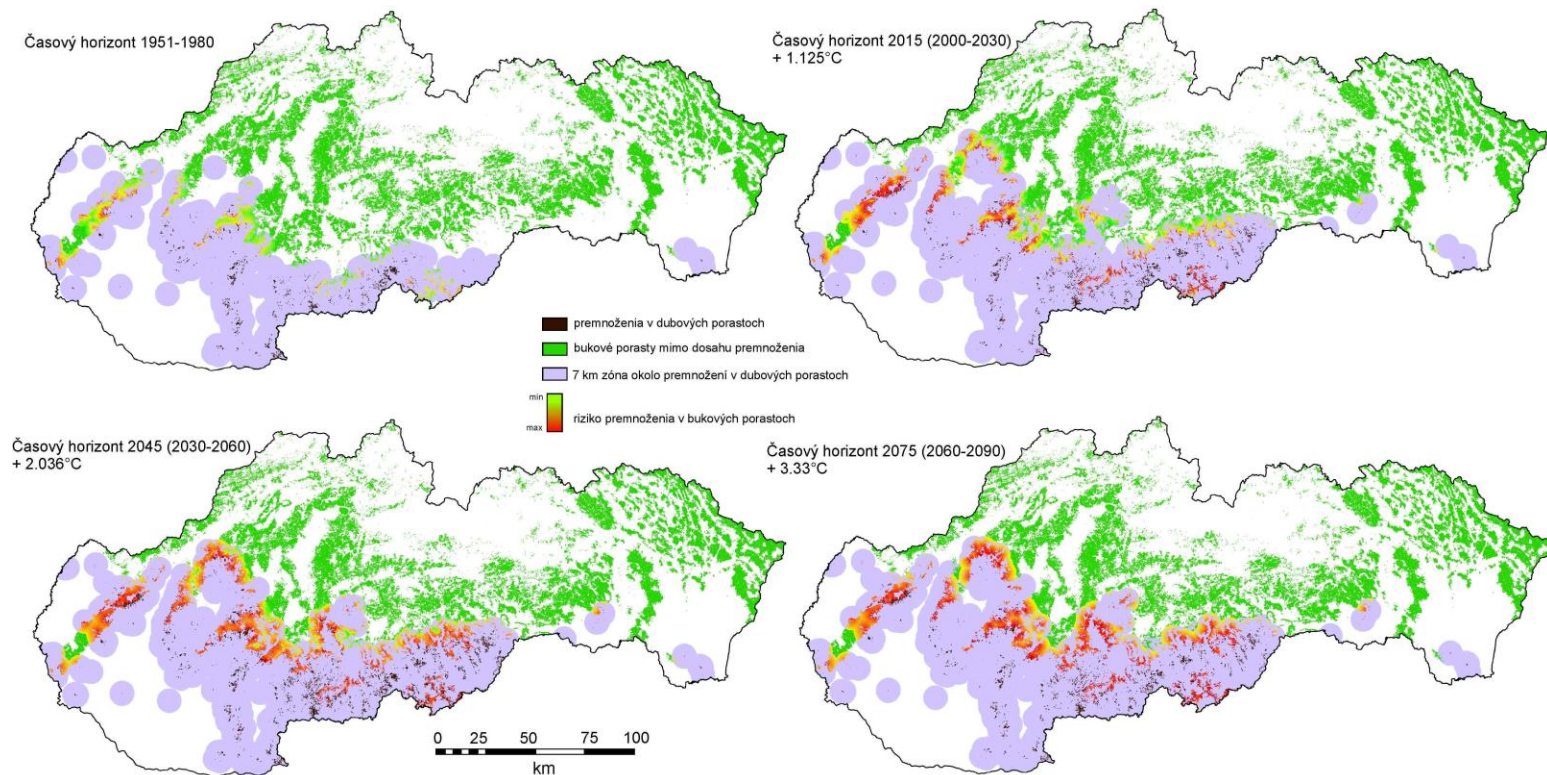
Creeping aridification of maize production area



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Forest management

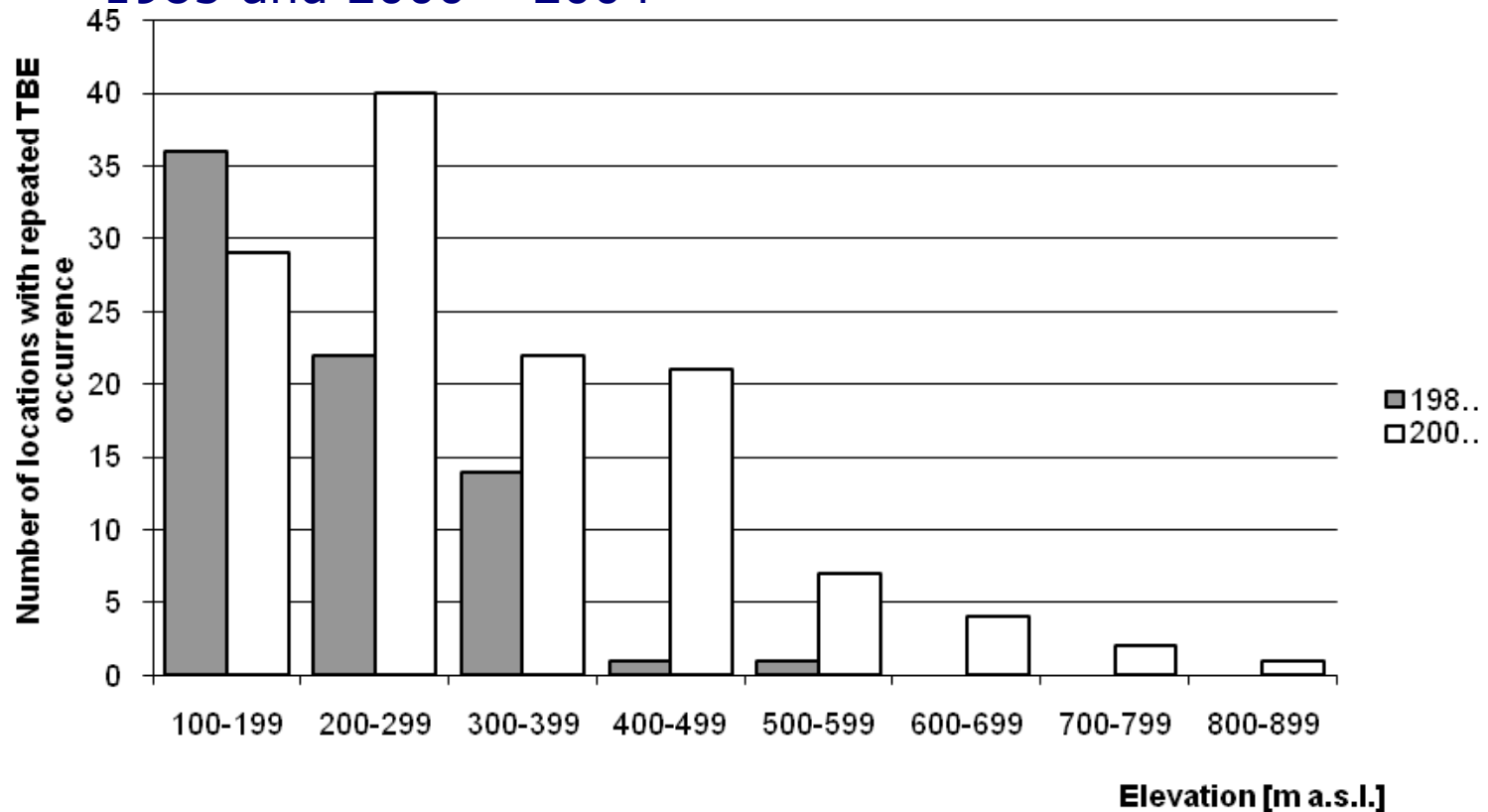
Expected changes in niche space of the gypsy moth infestation in oak forests



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Biodiversity

Distributions of ticks (*Ixodes*) depending on the altitude in the SR in the periods of 1980 – 1985 and 2000 – 2004



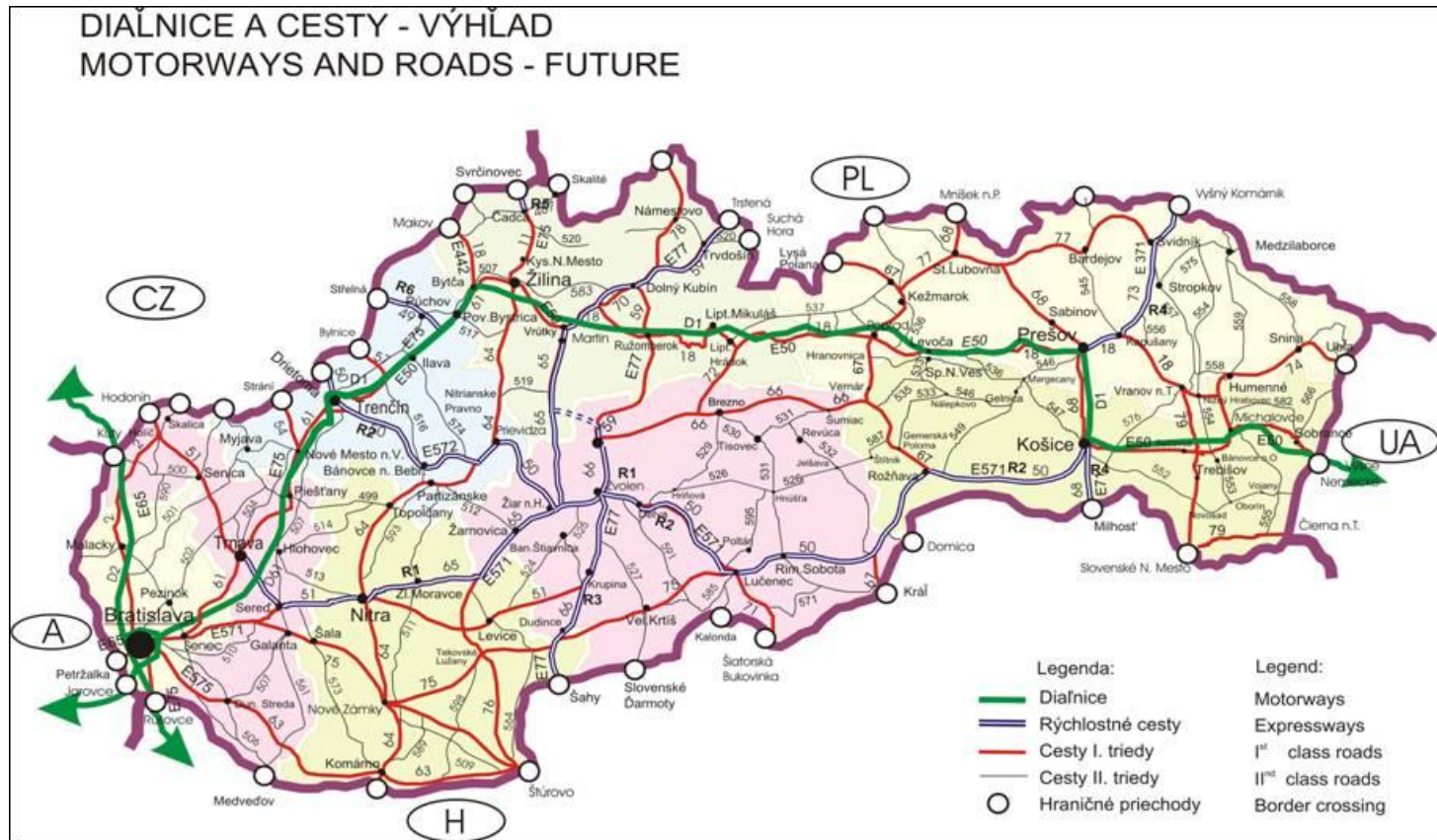
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Transport, Tourism

Vulnerable field	Examples/Comments on vulnerability and impacts
Transport	<ul style="list-style-type: none">–Affecting road transport by higher precipitations and snow in mountains–Affecting air transport by dangerous meteorological phenomena–Negative impact of the decrease in precipitation totals on inland water transport
Tourism	<ul style="list-style-type: none">–Less snow and irregular occurrence of snow cover in lower localities–Winter season shortening in lower localities–Restriction of water tourism in the south of Slovakia

Transport

Affecting road transport by higher precipitations and snow in mountains



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Tourism

Activities the most affected by climate change and their potential development in the regions of Slovak Republic

	Bratislavský	Podunajský	Záhorský	Dolnopovažský	Strednopovažský	Nitriansky	Hornonitriansky	Severopovažský	Turčiansky	Oravský	Liptovský	Ipeľský	Gemerský	Horehronský	Pohronský	Tatranský	Spišský	Košický	Šarišský	Hornozemplínsky	Dolnozemplínsky	
Ski tourism and cross-country skiing											X			X		X						
Staying and relaxation at water	X	X																				X
Cycling tourism	X	X	X								X					X						
Staying and relaxation at thermal water		X		X	X						X					X						
Water sports	X	X		X						X	X											X
Downhill skiing								X	X	X	X			X		X						
Water tourism	X	X	X			X		X			X			X	X	X						

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Thank you for your attention