

Adam Vizina, Martin Hanel et al.

# Dopad klimatické změny na vodní režim v České republice

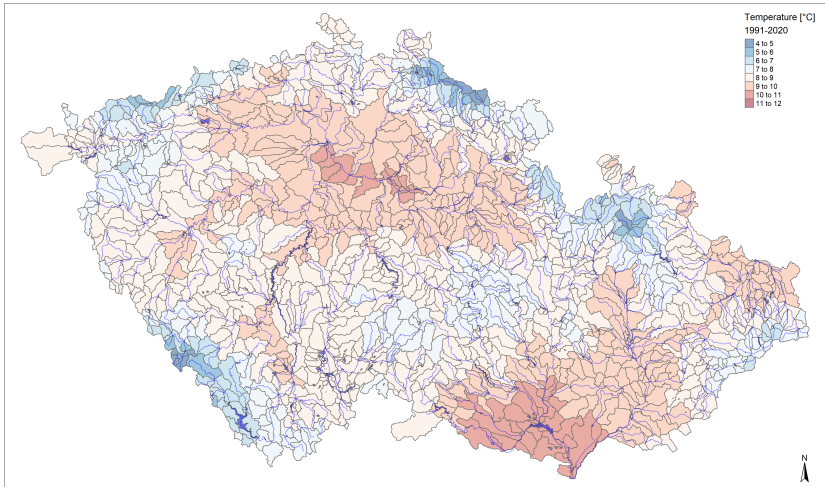
T. G. MASARYK WATER RESEARCH INSTITUTE  
public research institution, Prague  
vizina@vuv.cz | [www.vuv.cz](http://www.vuv.cz)

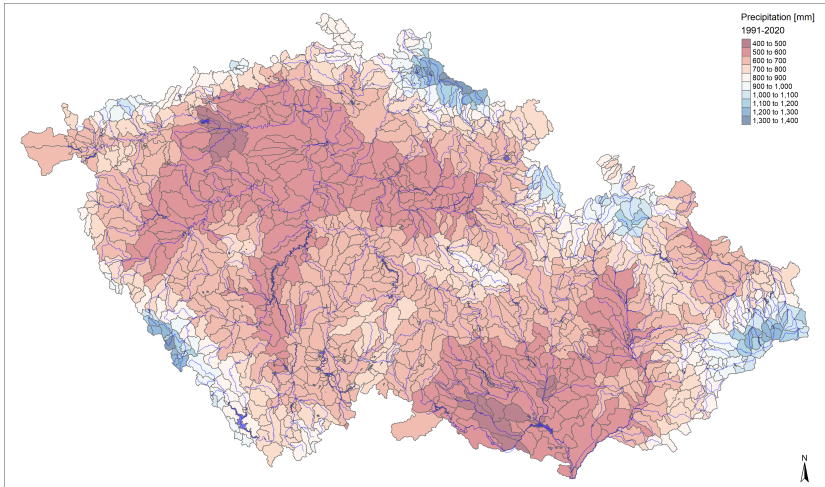
## Observations:

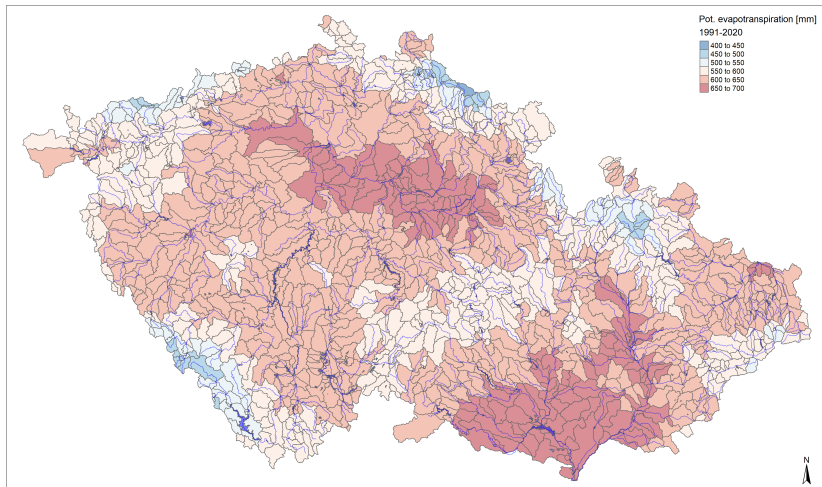
- ▶ daily precipitations interpolated from SC to each UPOV
- ▶ daily temperature interpolated from SC to each UPOV
- ▶ daily discharges from gauge stations (+- 500 stations)

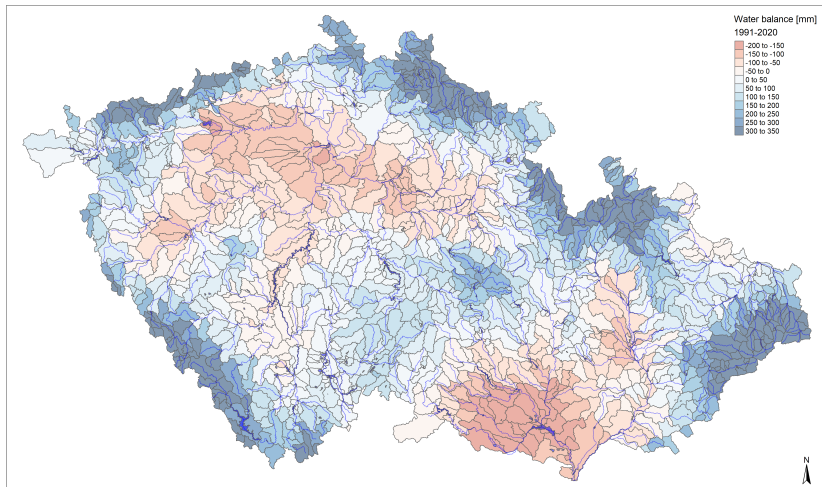
## Climate data:

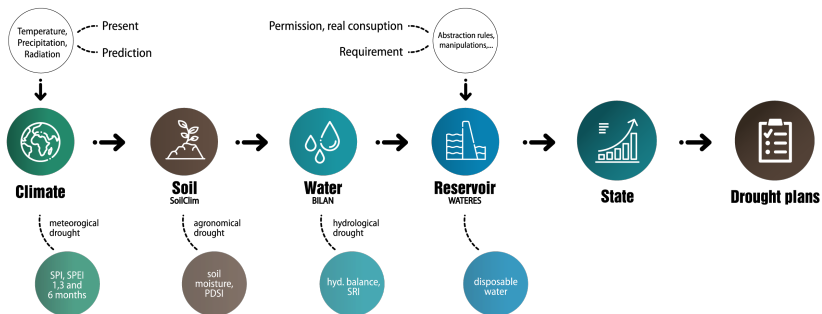
- ▶ The advanced delta change (ADC) method (van Pelt et al., 2012) allows for changes in the distribution of precipitation by application of a non-linear transformation of observed precipitation data such that the changes in the 60% and 90% quantiles of the precipitation distribution match those from the GCM simulation. In addition, inherent to the method is a correction for the biases in these quantiles. Temperature is transformed in a way reflecting the changes in mean and variance from the GCM simulation.
- ▶ 6 GCM ... SSP126, SSP245, SSP 370 and SSP585

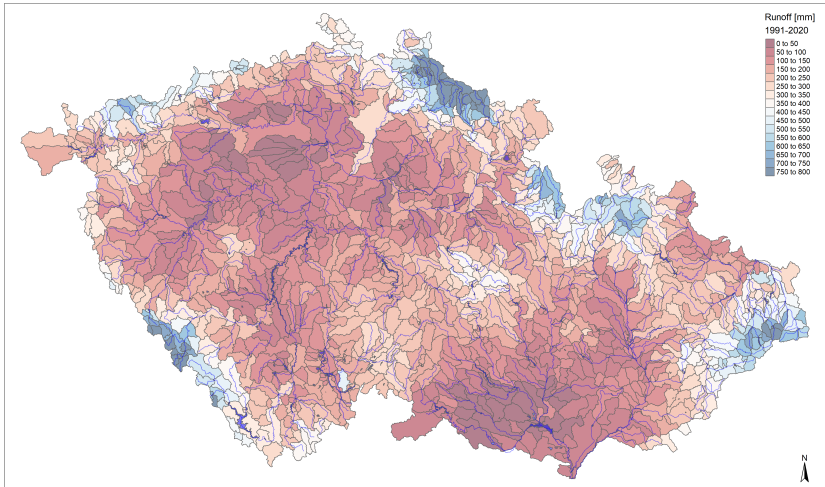


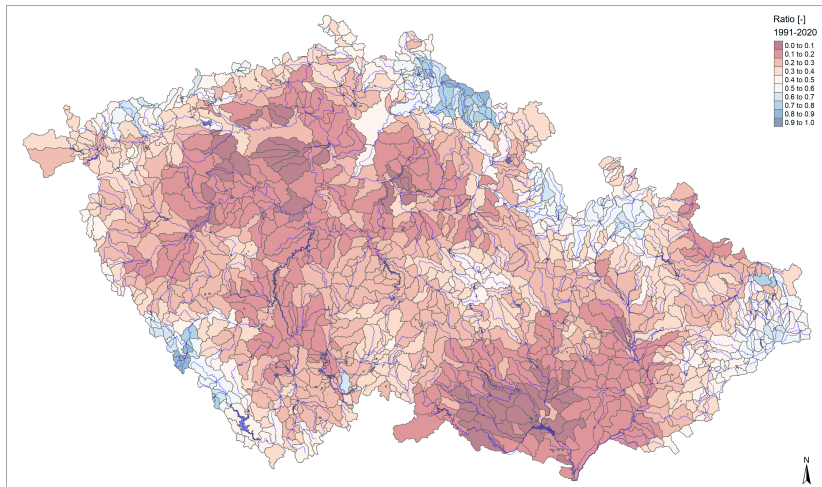


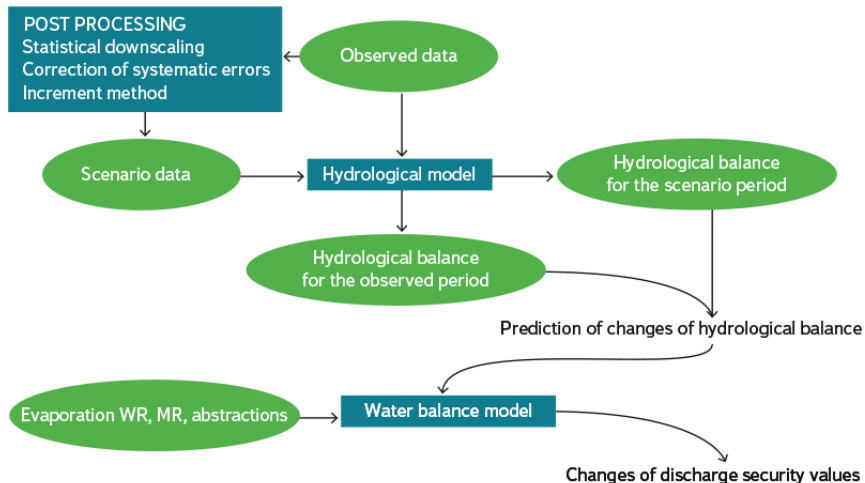


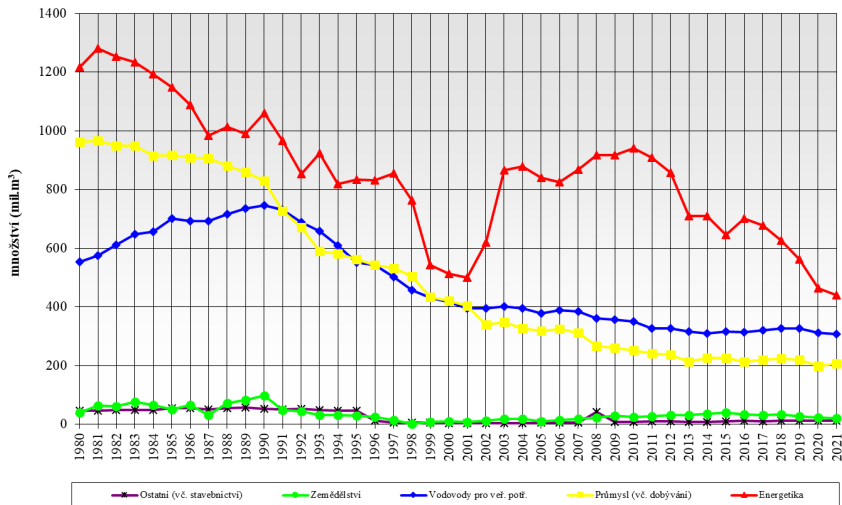


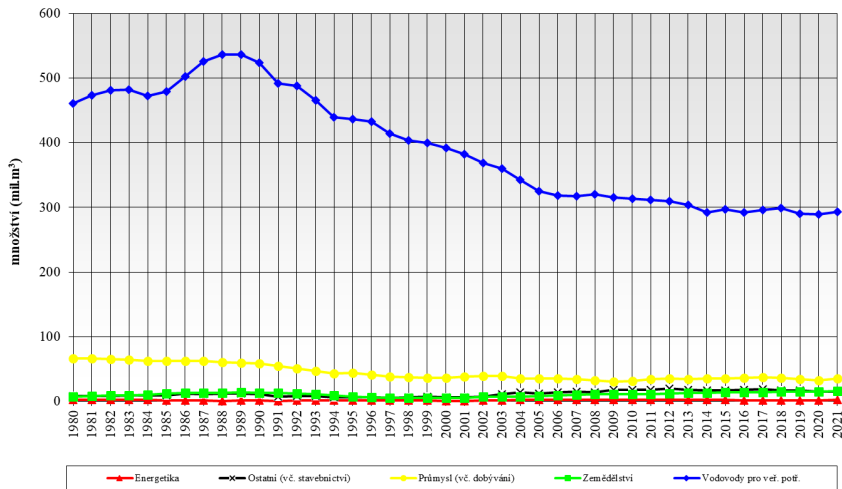


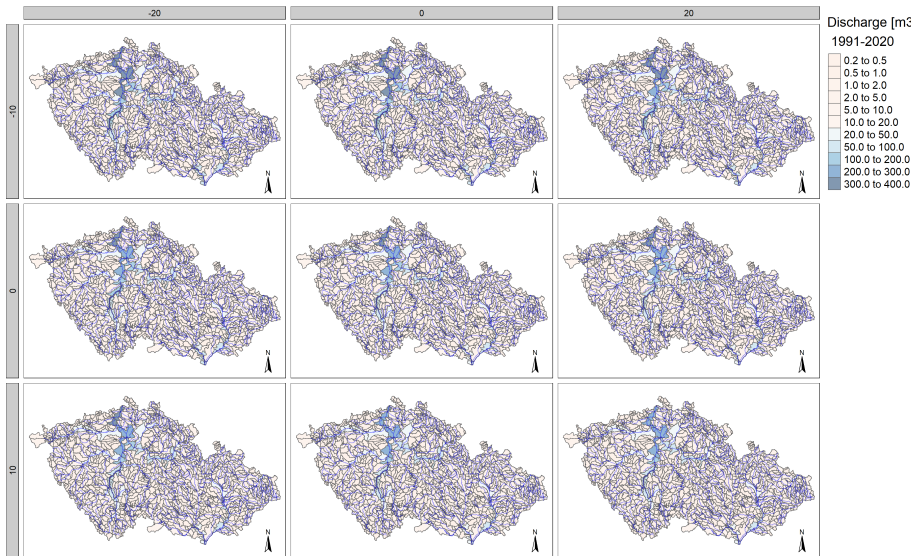








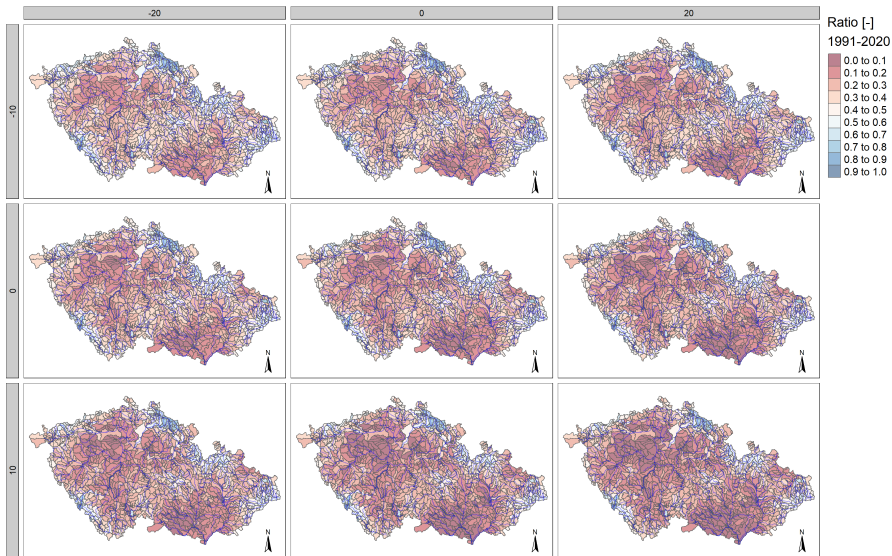


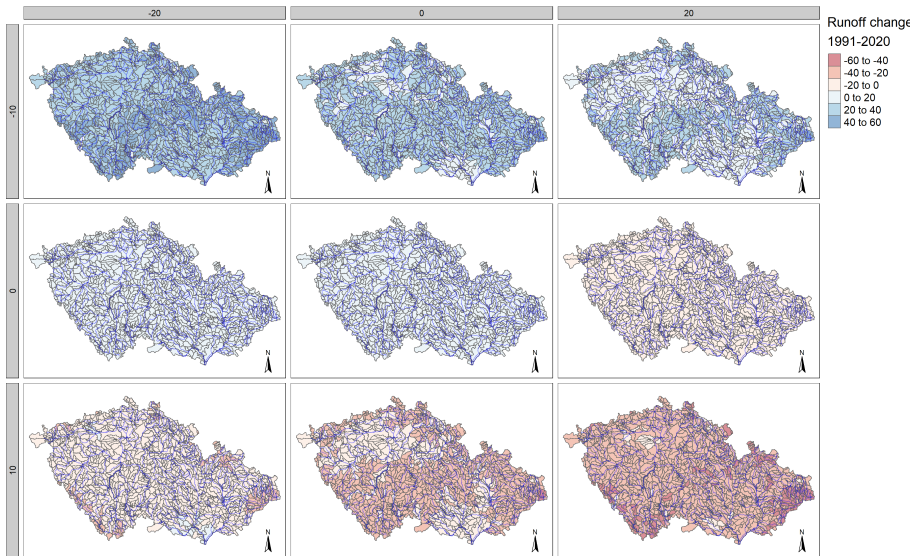


Because of the computational complexity (variant solution), the measures were finally limited to a change:

1. Retention
2. Potential evapotranspiration
3. Manipulation - change in minimum residual flow
4. Water storage volume of water reservoirs
5. *Erosion*

Variants (RUNS):  $6 \text{ GCM} \times 4 \text{ SSP}_{sc} \times 3 \text{ RET} \times 3 \text{ PET} \times 2 \text{ MAN} \times 5 \text{ PER} = 2\,160$  variants (daily RUNS of water balance model)



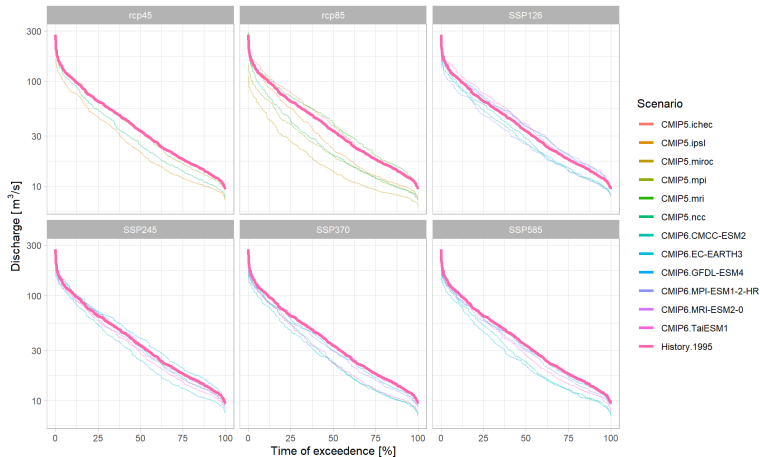


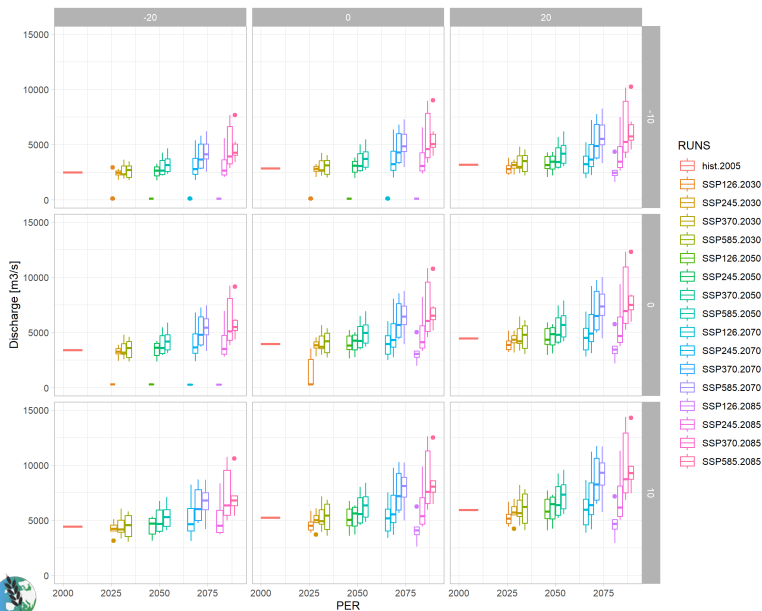


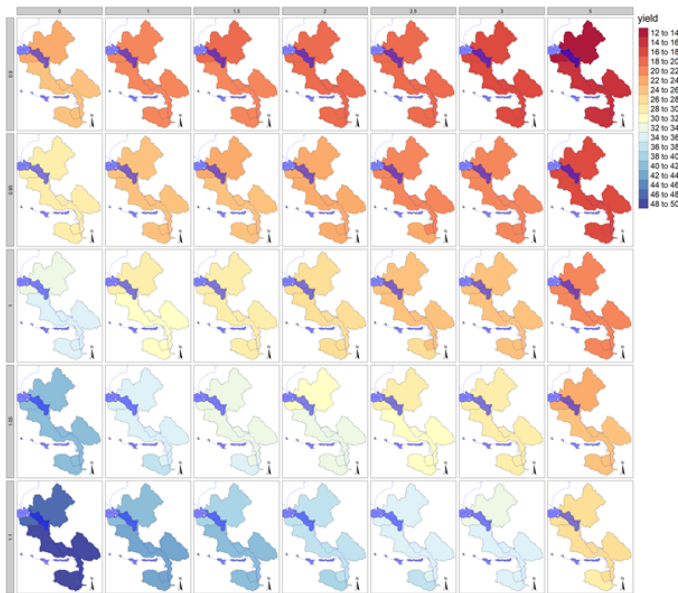


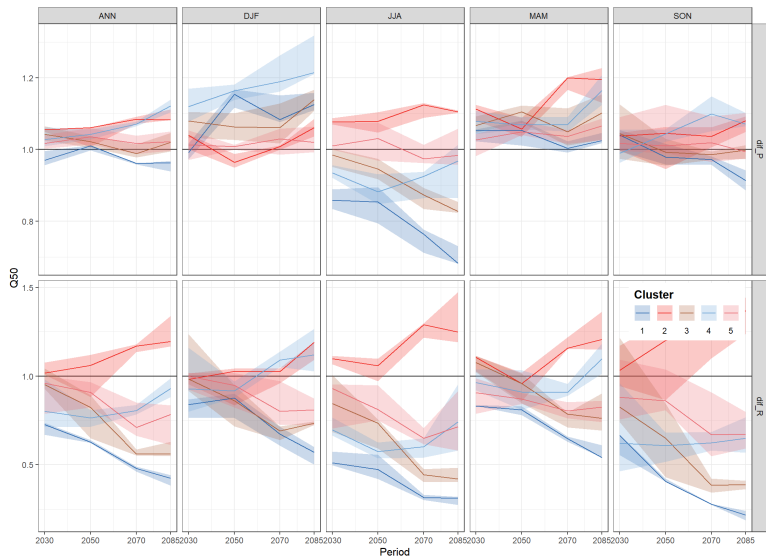












## Areas protected for surface water storage category A

### Total controllable capacity Vo

- ▲ < 10 mil. m<sup>3</sup>
- ▲ 10–20 mil. m<sup>3</sup>
- ▲ > 20 mil. m<sup>3</sup>
- flow improvement assessed

## Current annual abstraction [thousand m<sup>3</sup>]

- up to 1,000
- ▨ 1,000–10,000
- ▨ more than 10,000

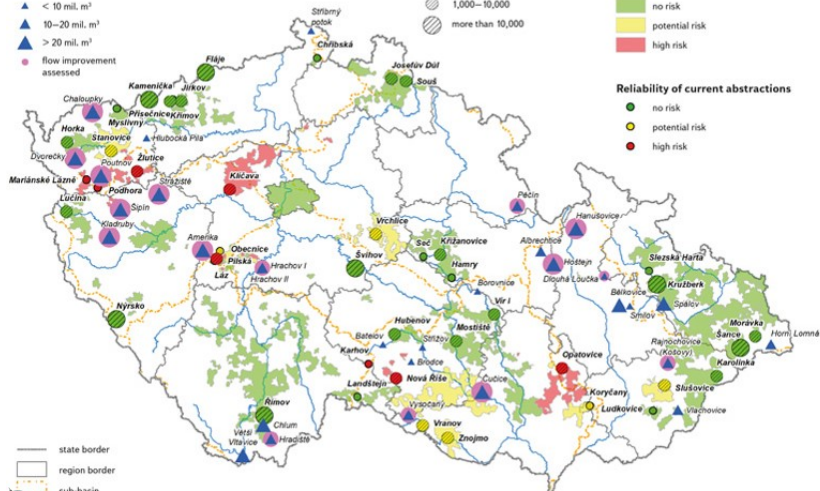
## Supplied areas (cadastral areas)

### Security of abstractions provided by water reservoirs

- no risk
- potential risk
- high risk

### Reliability of current abstractions

- no risk
- potential risk
- high risk

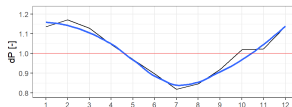
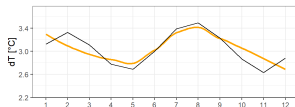


- state border
- region border
- sub-basin
- watercourse

Produced by TGM WRI, p. r. i., October 2022

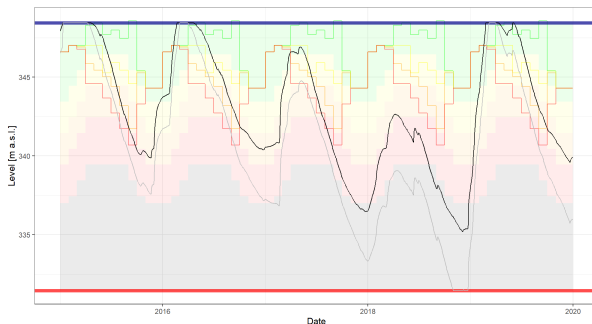
Data sources: MoA, TGM WRI, p. r. i., Povodí State Enterprises, CHMI, ČÚZK

Perioda: 2050 Hymod: Bilan ES: SSP245 GCM: EC RUN: CMIP6



Regulation	N	Percentage	Security	MAN
RS 1	8369	58.50		NEW
RS 2	3013	21.06		NEW
RS 3	2101	14.69		NEW
RS 4	628	4.39		NEW
RS 5	194	1.36		NEW
SN	0	0.00	100	NEW

Regulation	N	Percentage	Security	MAN
RS 1	3695	25.83		OLD
RS 2	1773	12.39		OLD
RS 3	1063	7.43		OLD
RS 4	1984	13.87		OLD
RS 5	5744	40.15		OLD
SN	46	0.32	99.68	OLD



1. TA ČR: (SS02030027 ) a Vodní systémy a vodní hospodářství v ČR v podmínkách změny klimatu a (SS02030040) Predikce, hodnocení a výzkum citlivosti vybraných systémů, vlivu sucha a změny klimatu v Česku (PERUN).
2. SustES project, Adaptation strategies for sustainable ecosystem services and food security under adverse environmental conditions, CZ.02.1.01/0.0/0.0/16019/0000797.
3. BV III/1-VS (VI20192022159): Vodohospodářské a vodárenské soustavy a preventivní opatření ke snížení rizik při zásobování pitnou vodou.

**Thank you for your attention**

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