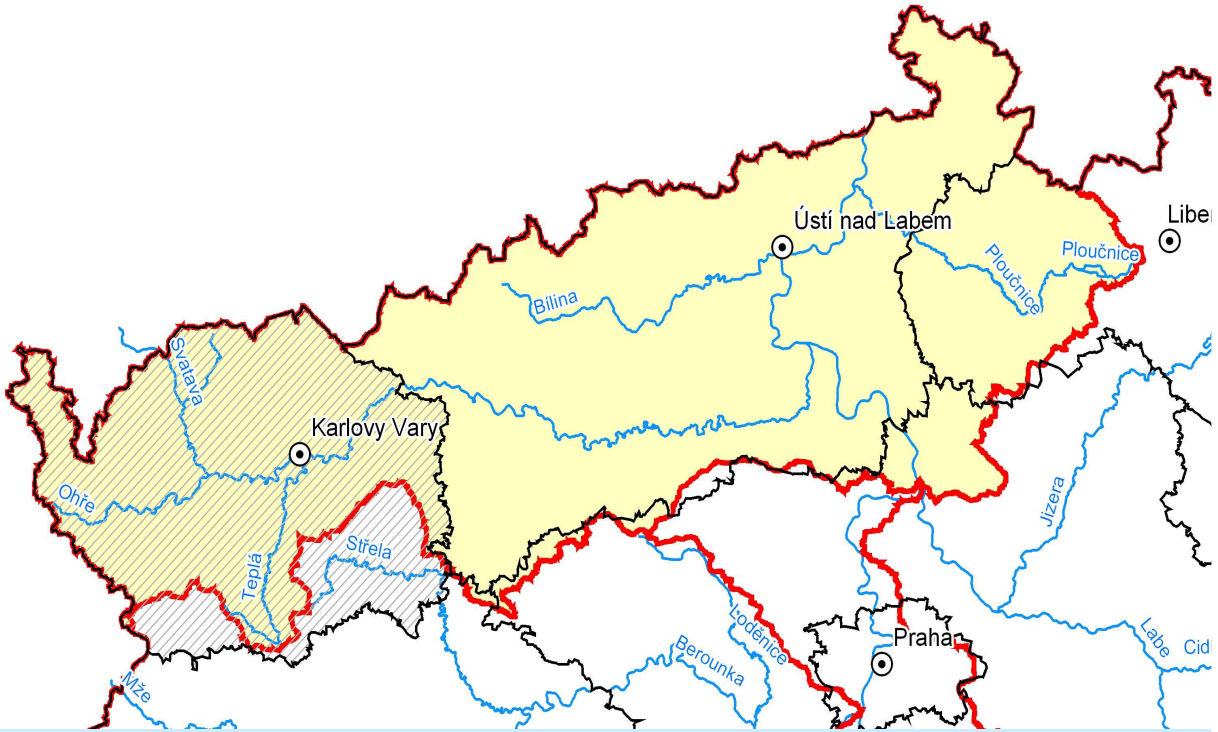
ASSESSMENT OF WATER DEMANDS AND SOURCES IN THE OHRE AND LOWER ELBE RIVERS

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PROJECTS



Results of projects

- sponsored by
  Ohre River Board corp., Karlovy Vary Region,
  Ministry of Agriculture, Ministry of Environment
- carried out by VÚV T.G.M., v.v.i and VRV a.s.

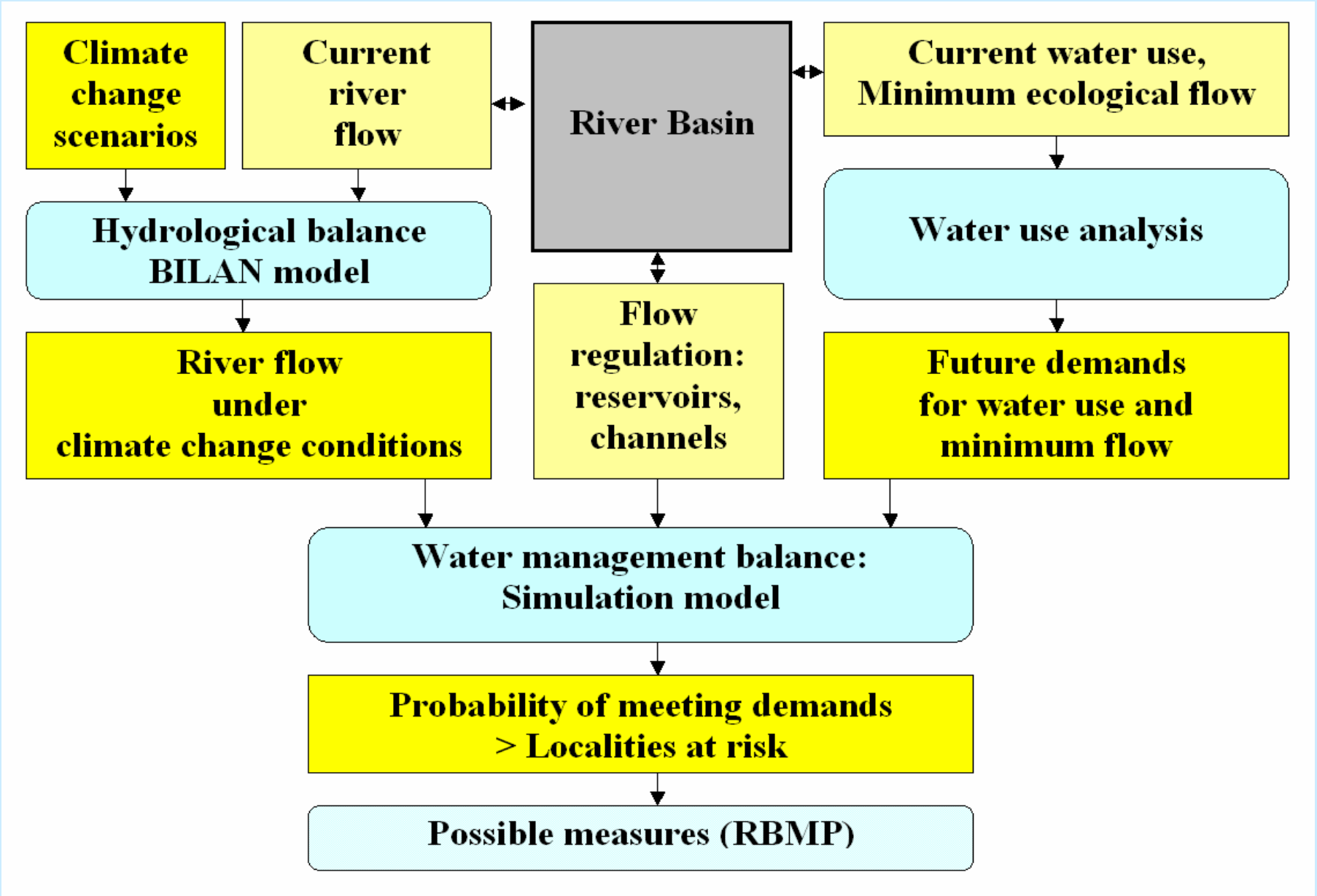
OBJECTIVE OF THE PROJECTS

Main objective was to **assess capacities** of the water management system of the Ohře and Lower Elbe Rivers **to meet the water supply requirements:**

- under current conditions and those affected by **climate change** (reference years 2025 and 2085)
- and for current and possible **future water demands**

and **propose possible measures** to reduce problems in localities where the water demands exceed the water availability.

WORKFLOW AND METHODOLOGY

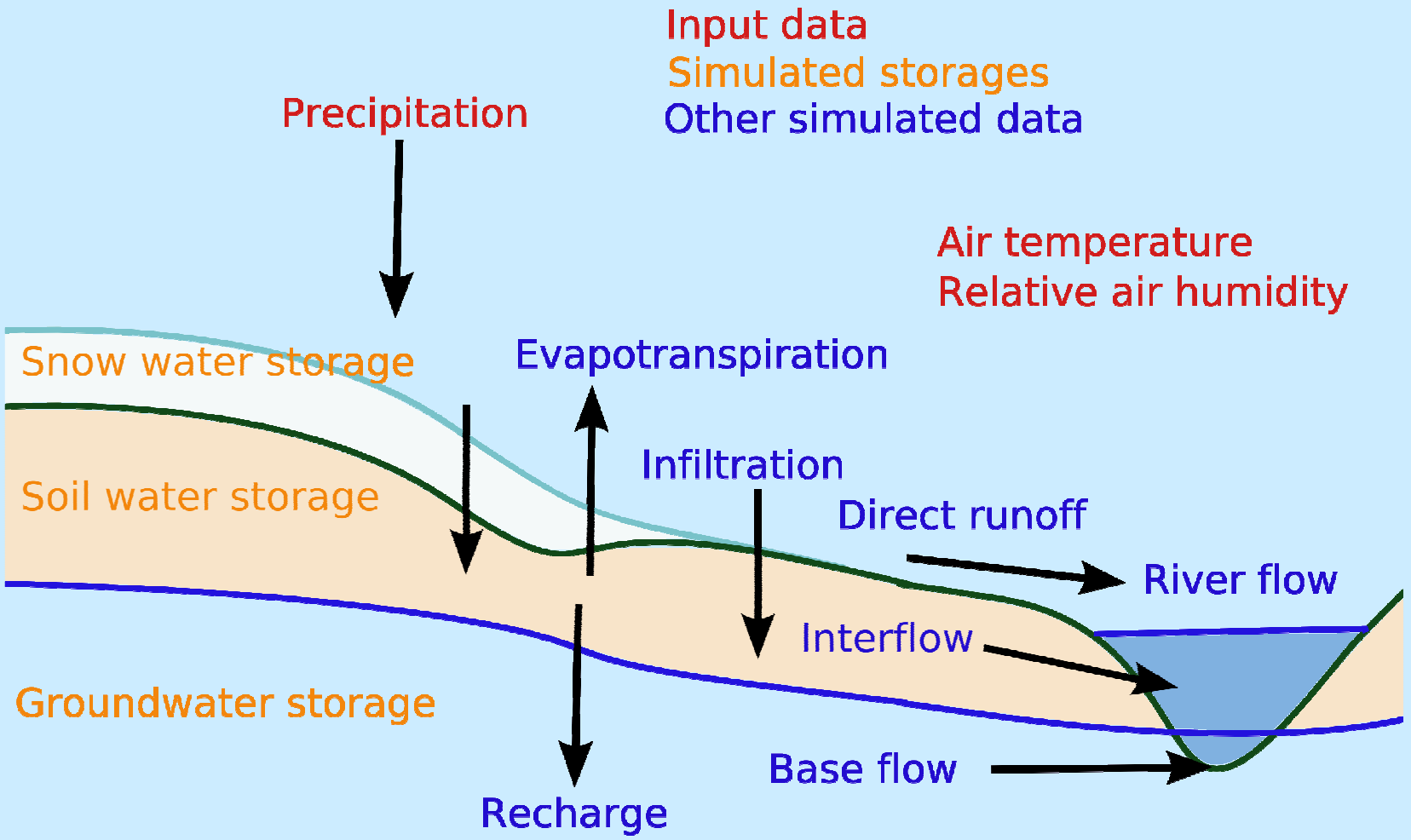


HYDROLOGY

Methods:

- hydrologic balance model
- climate change scenarios

BILAN WATER BALANCE MODEL



INPUT DATA

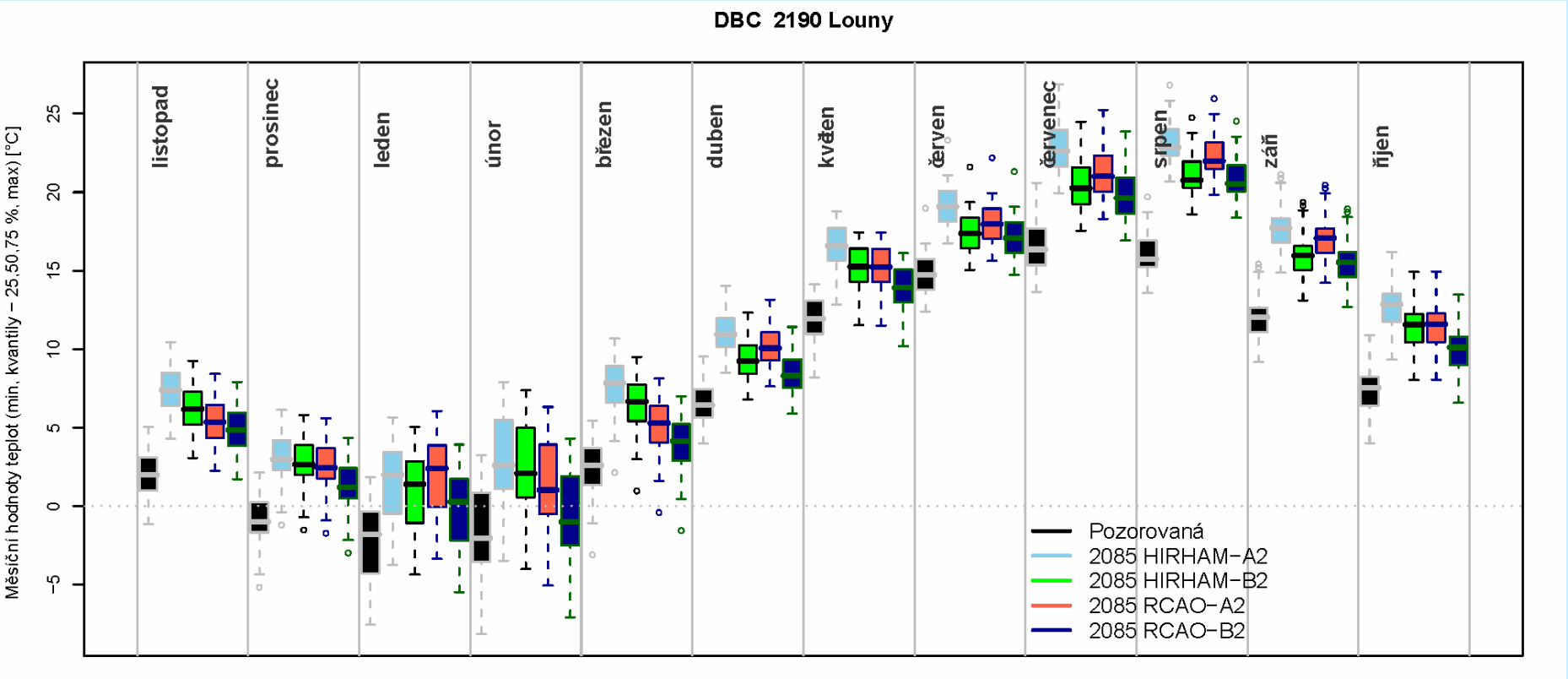
- air temperature (monthly)
- precipitation (monthly)
- relative air humidity (monthly)
- runoff (monthly)

SCENARIOS

Period	Climate model	Emission scenarios	Description
1975-2006	X	X	Observation
2011-2040	HIRHAM	A2	2025 HIRHAM A2
2011-2040	HIRHAM	B2	2025 HIRHAM B2
2011-2040	RCAO	A2	2025 RCAO A2
2011-2040	RCAO	B2	2025 RCAO B2
2071-2100	HIRHAM	A2	2085 HIRHAM A2
2071-2100	HIRHAM	B2	2085 HIRHAM B2
2071-2100	RCAO	A2	2085 RCAO A2
2071-2100	RCAO	B2	2055 RCAO B2

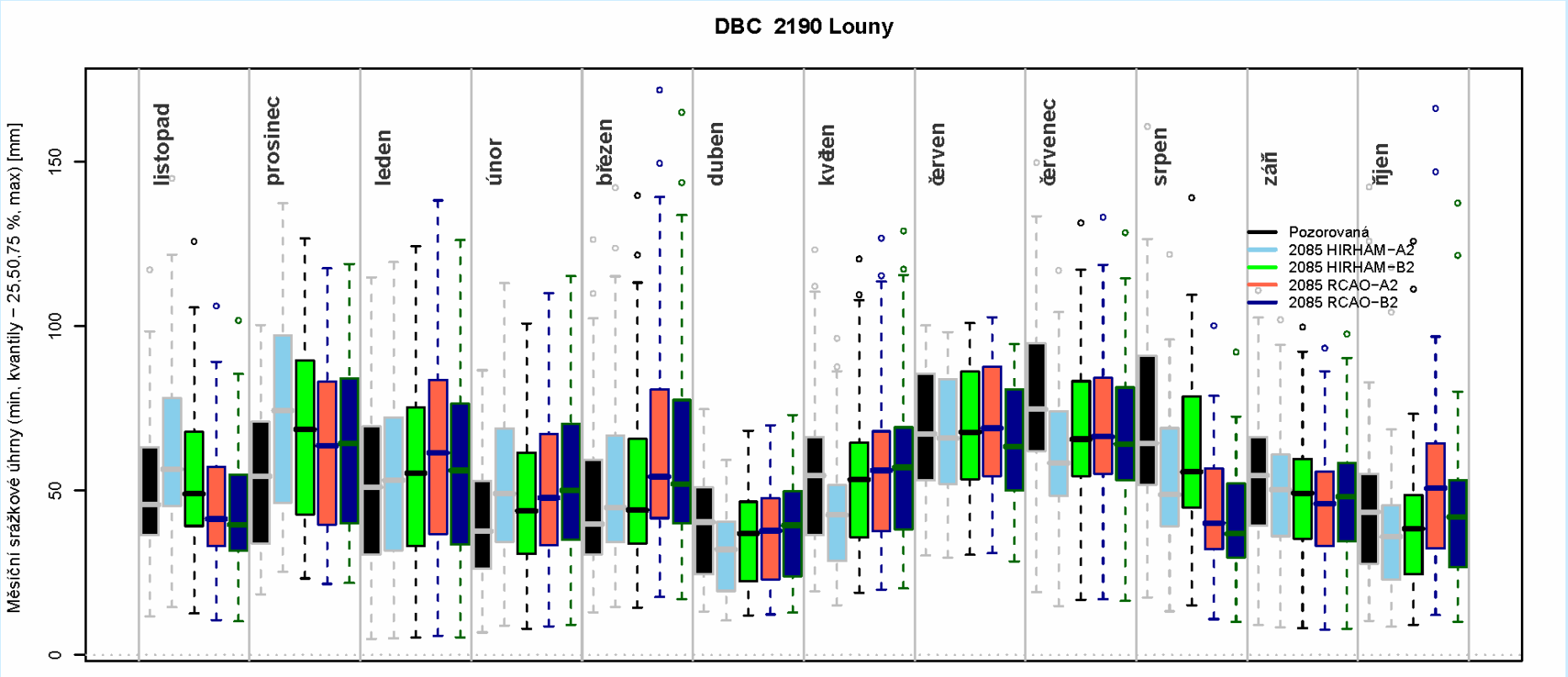
RESULTS

temperature 2085

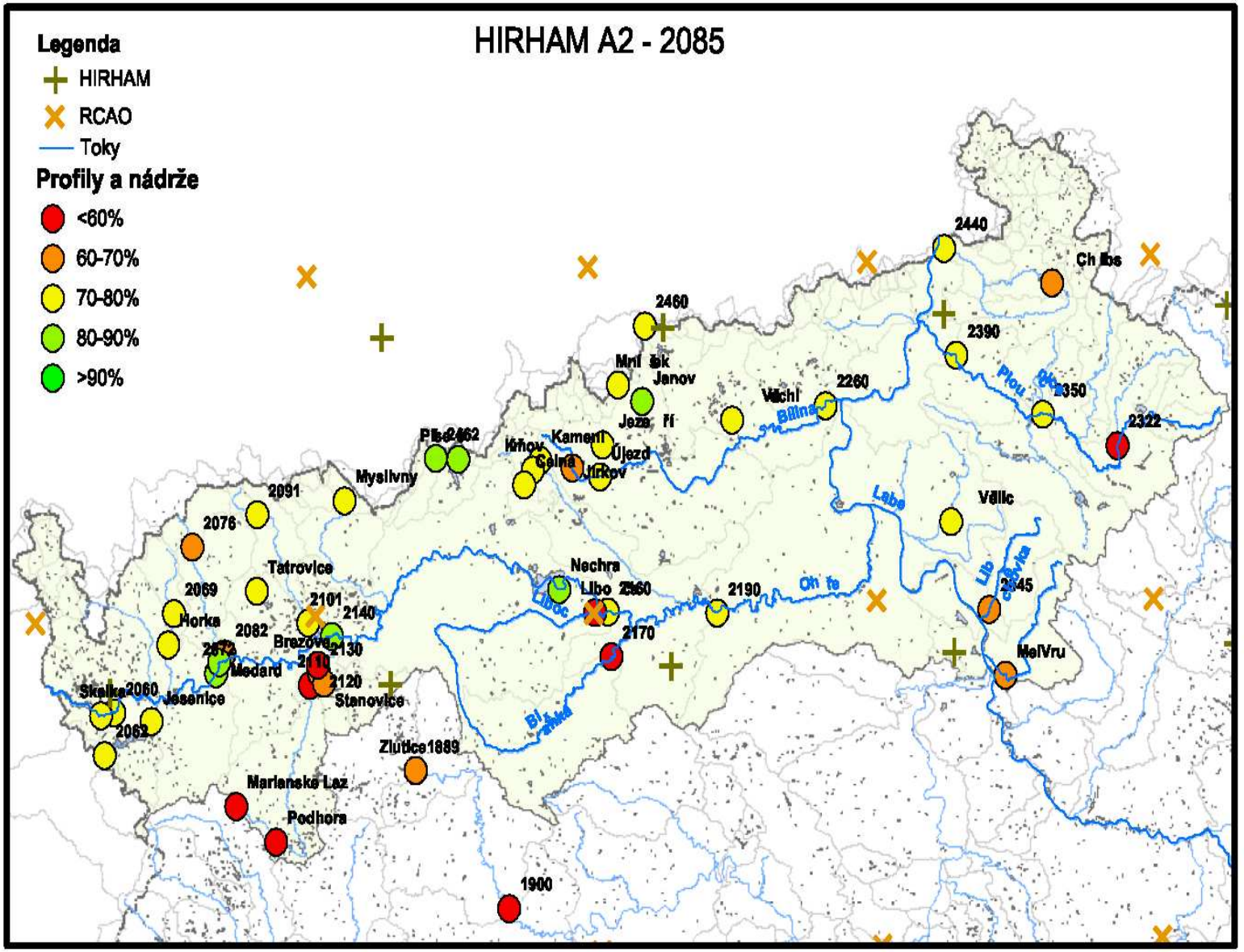


RESULTS

precipitation 2085

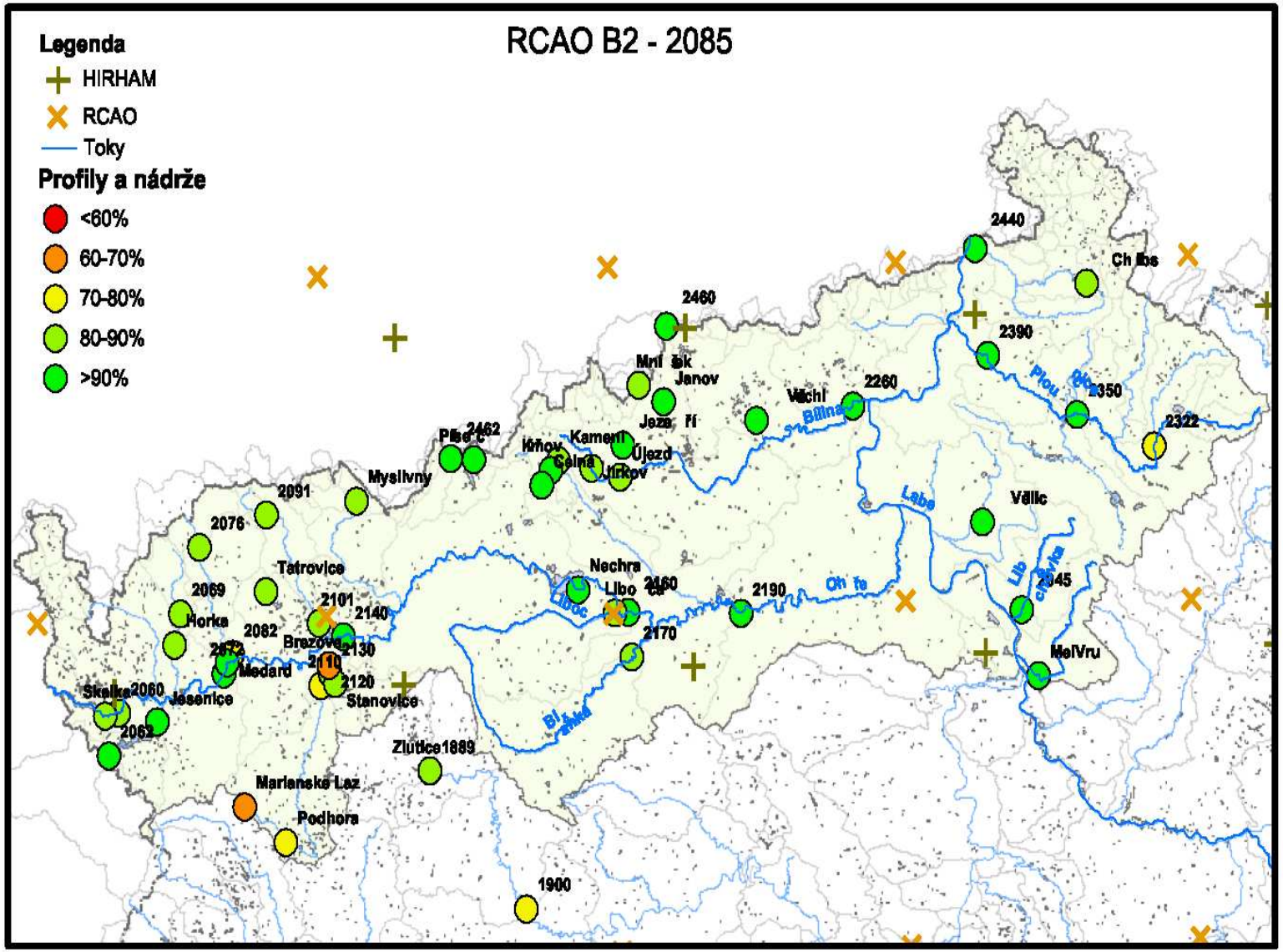


RESULTS: runoff



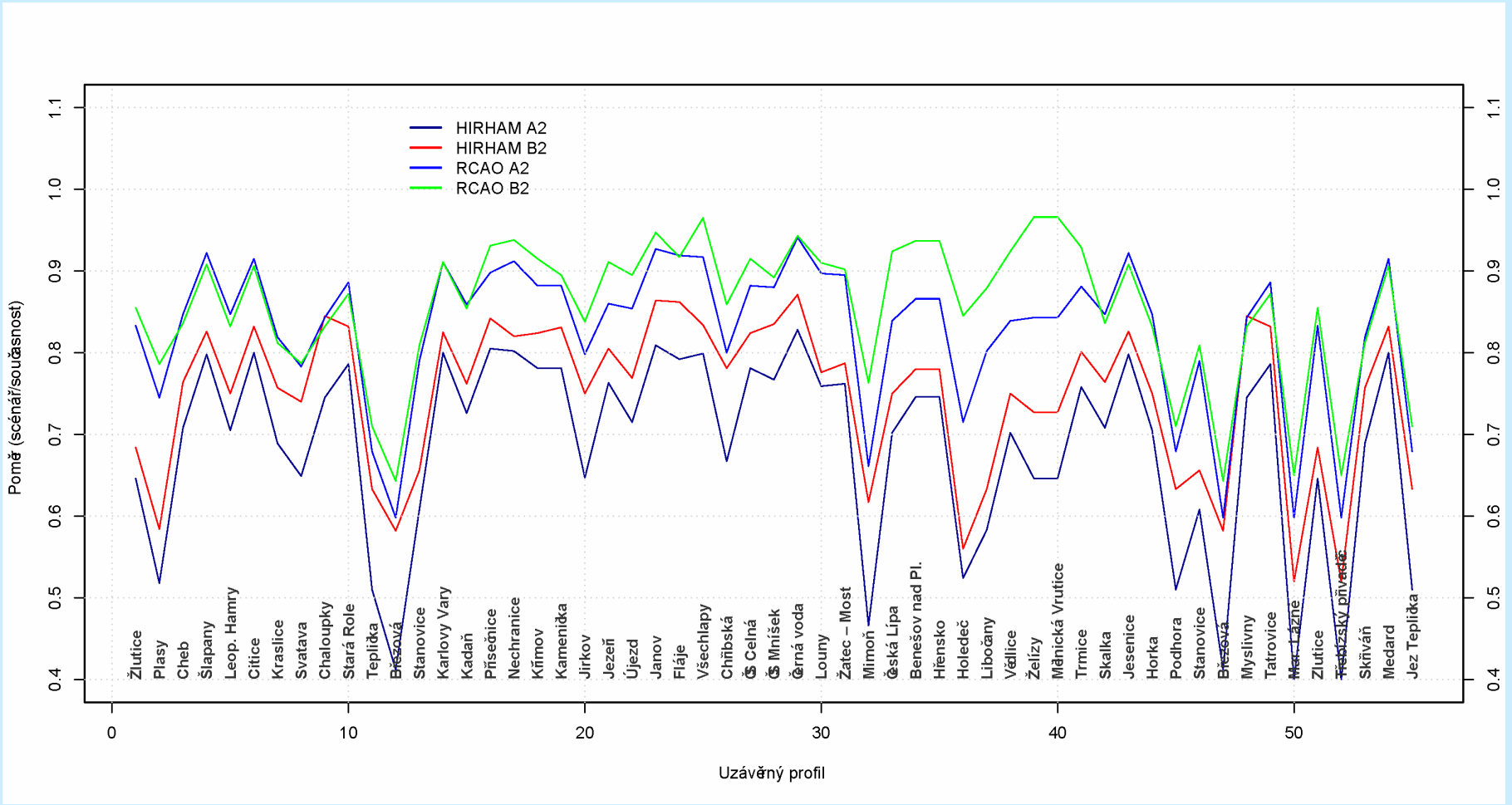
P.Vyskoč, V.Koterová, A.Vizina: Hodnocení požadavků a zdrojů vod v oblasti povodí Ohře a dolního Labe. Magdeburský seminář o ochraně vod, Teplice 2010

RESULTS: runoff



P.Vyskoč, V.Koterová, A.Vizina: Hodnocení požadavků a zdrojů vod v oblasti povodí Ohře a dolního Labe. Magdeburský seminář o ochraně vod, Teplice 2010

RESULTS: runoff

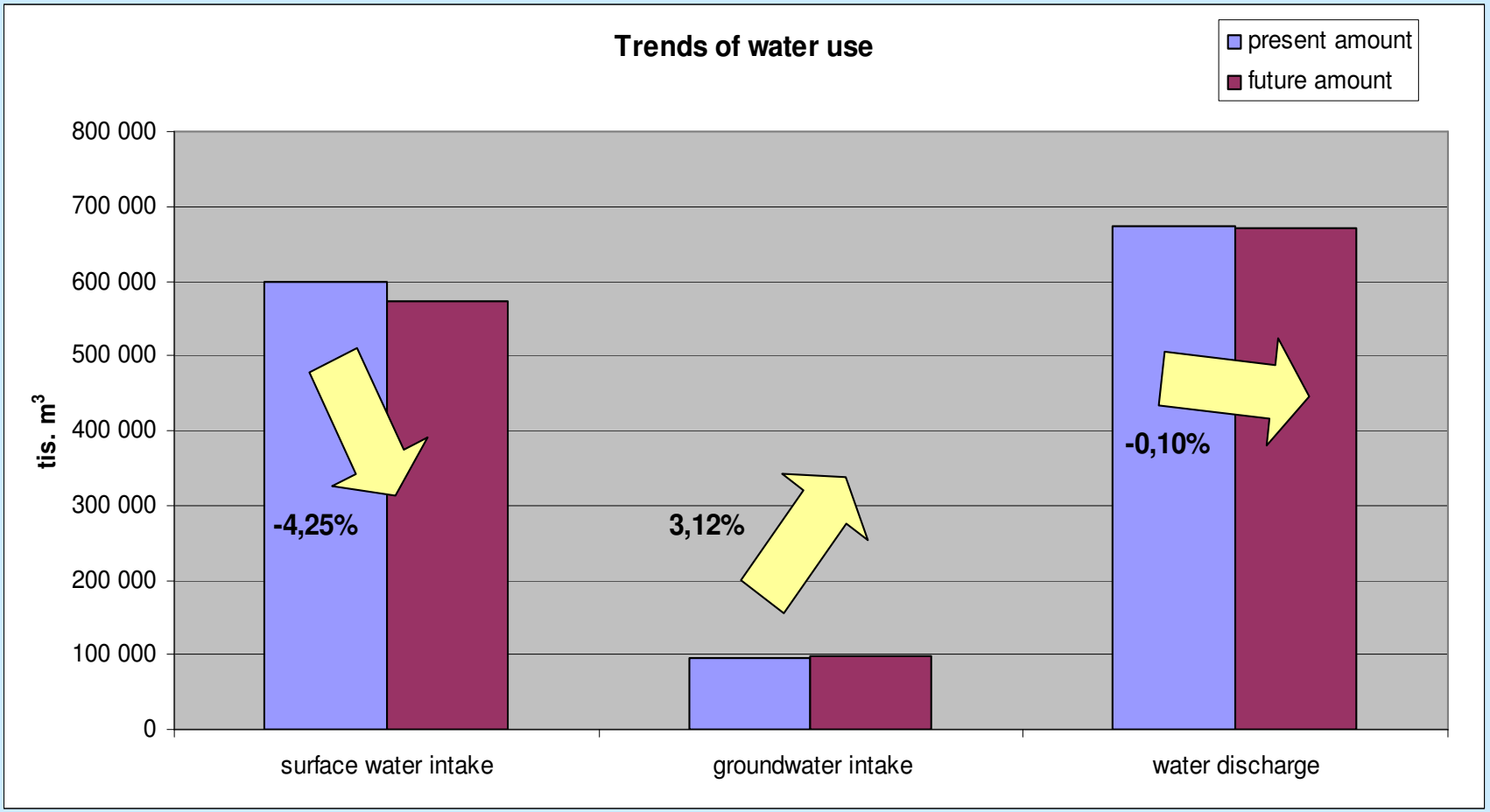


WATER USE ANALYSIS

Describing of **changes in water use in present and future**

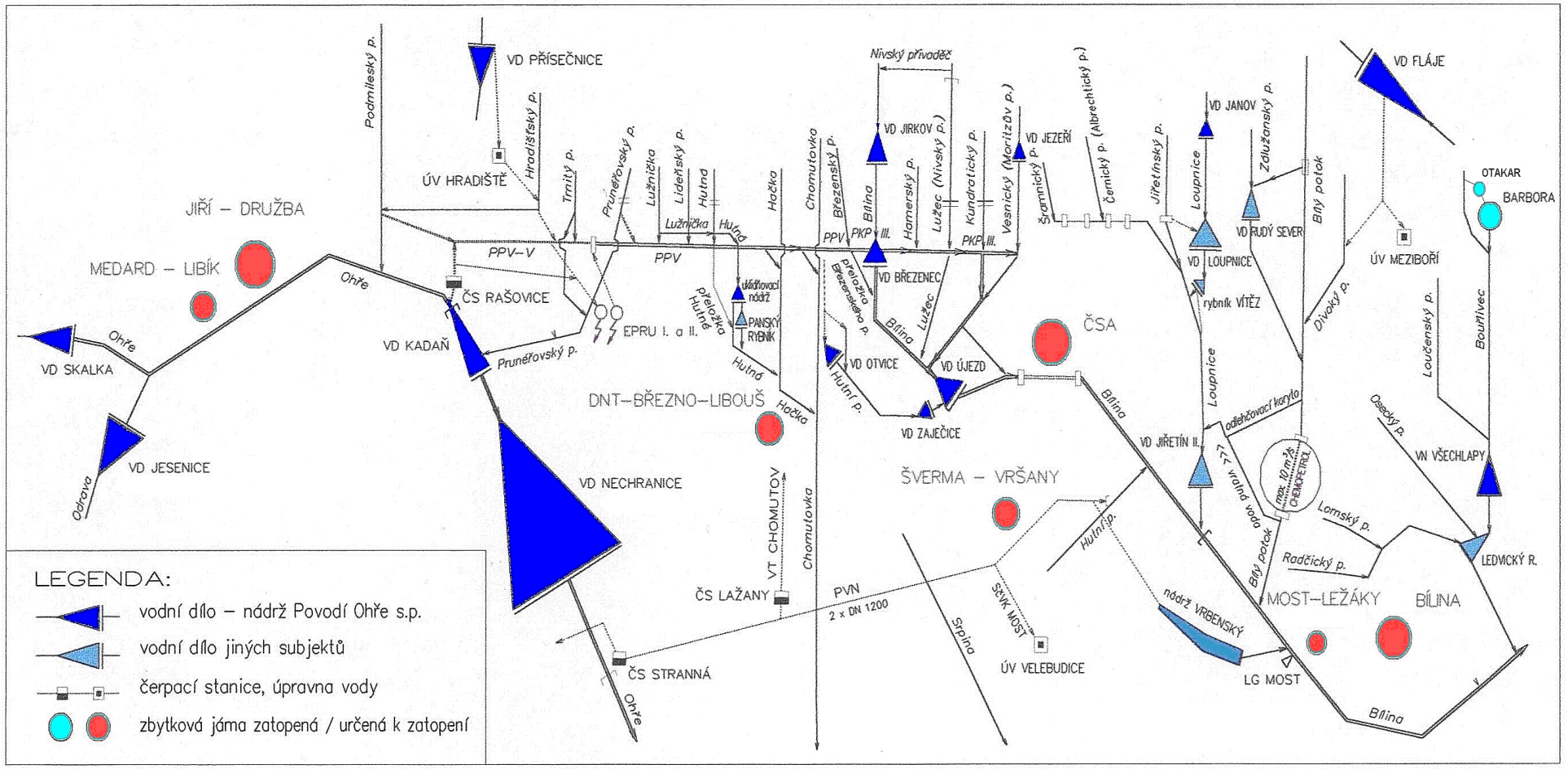
- obtaining and analyzing of documents
- allocation of water use groups
  - water discharge, surface and groundwater intake
  - allocation by sectors of the economy
- determine trends of each group
- determine the future status of water use for further analysis

WATER USE ANALYSIS SUMMARY



WATER USE

FLOODING OF RESIDUAL MINING PITS



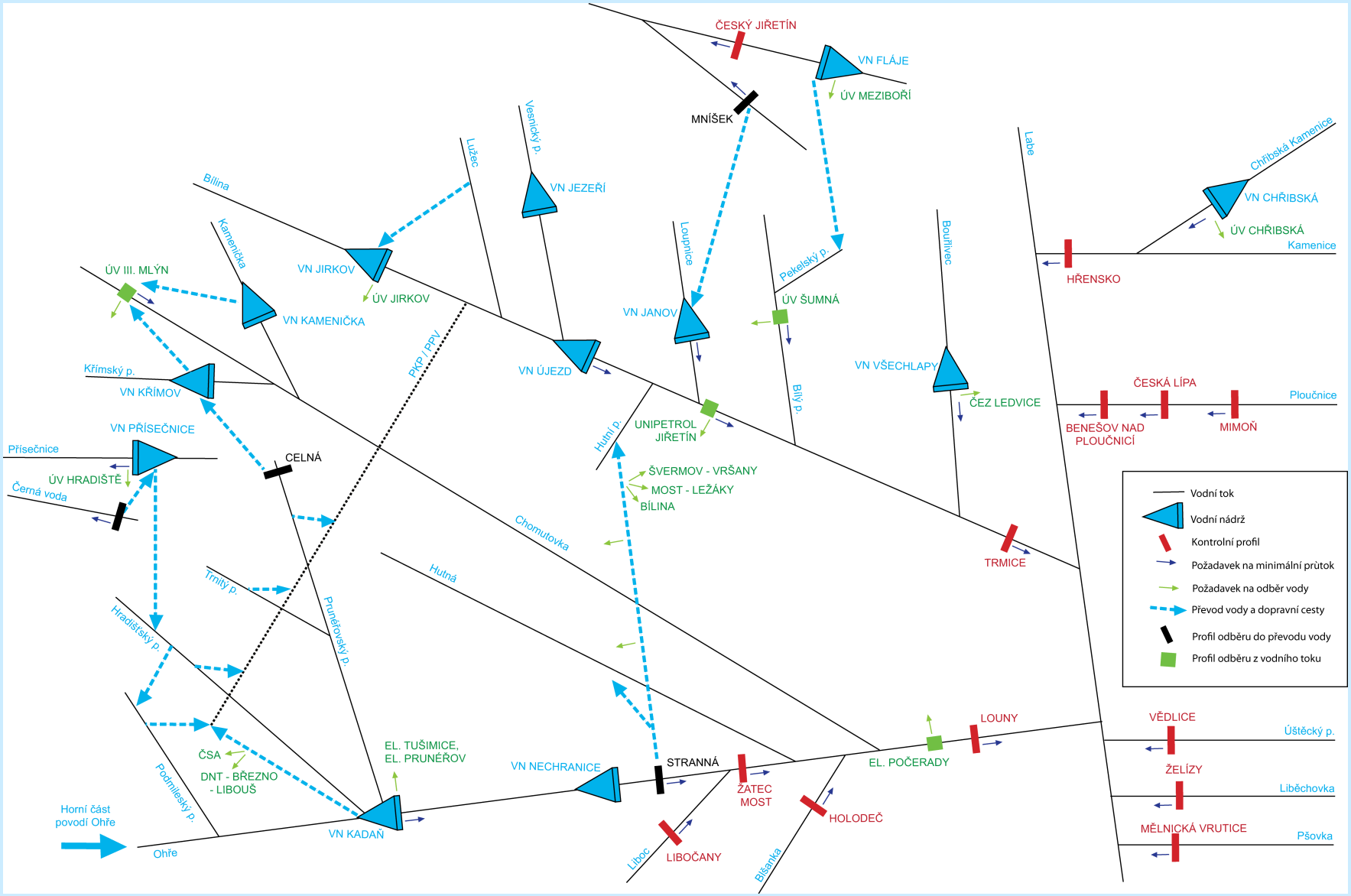
Source: Hydroprojekt CZ a.s.

P.Vyskoč, V.Koterová, A.Vizina: Hodnocení požadavků a zdrojů vod v oblasti povodí Ohře a dolního Labe. Magdeburský seminář o ochraně vod, Teplice 2010

WATER MANAGEMENT BALANCE

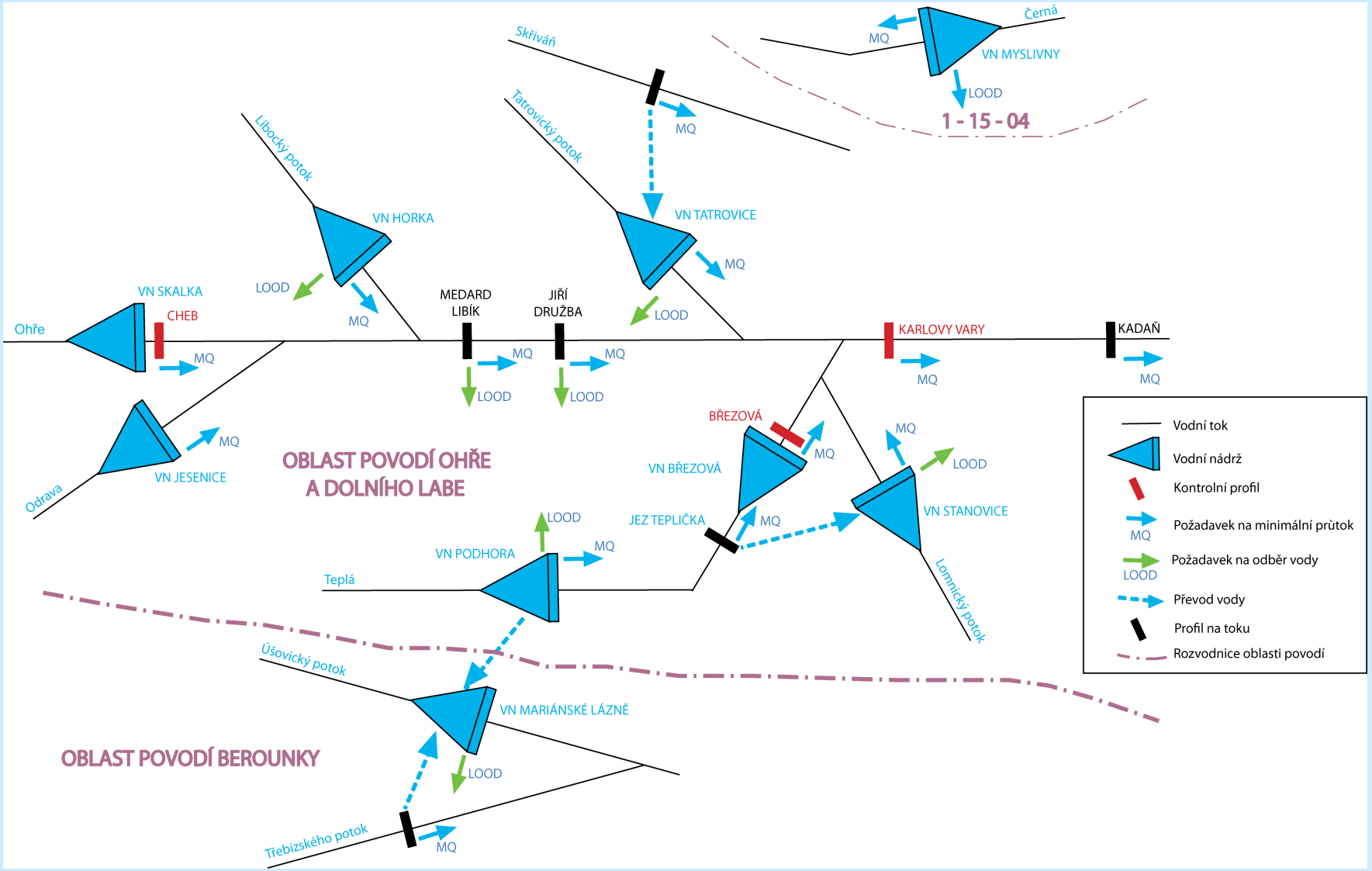
- Objective: sources vs. demands assessment.
- Method: **simulation model**, monthly step.
- Input data: monthly time series of flow (simulated by BILAN model), water use demands (abstraction/ discharge), minimum ecological flows, water storages and operation rules in reservoirs.
- Output data: **probability of meeting demands.**
- Criteria of meeting demands: the demanded reliability ranges between 95 – 99.5 % depending on water use (drinking water supply, industrial sector etc.).

WATER RESOURCE SYSTEM



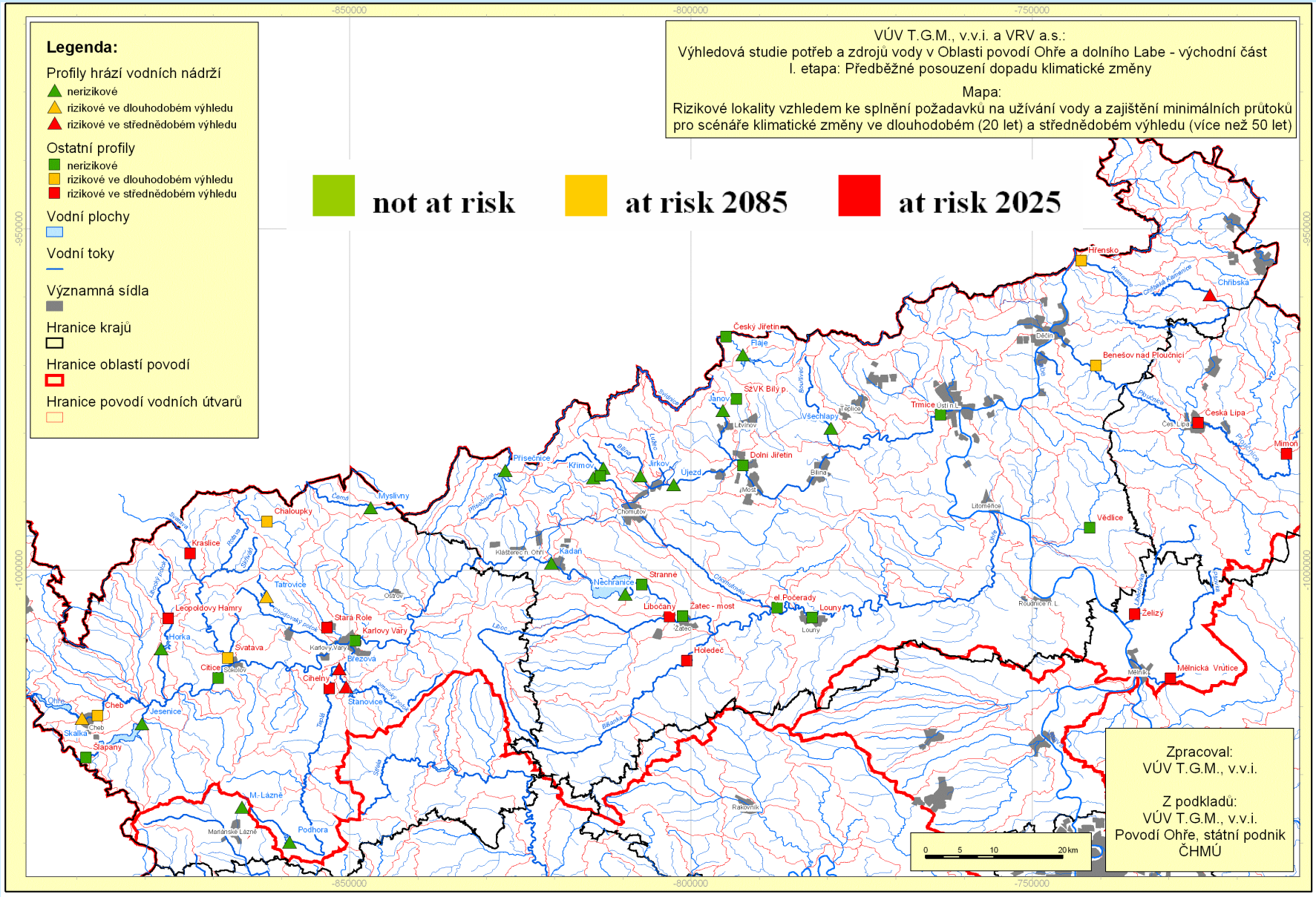
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WATER RESOURCE SYSTEM



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RESULTS: LOCALITIES AT RISK



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PROPOSALS FOR MEASURES

- Modification of operation rules in reservoirs (Jesenice, Skalka).
- Use of free storage capacity in some reservoirs (Horka, Myslivny, Přísečnice, Fláje) plus connection of water supply systems.
- Increase in abstraction from Ohře river.
- **Increase in storage capacity of river basins**
  - Protected areas for surface water accumulation (8 areas),
  - Identification of additional localities with possible storage capacity in Blšanka, Liboc and Ploučnice river sub-basins (cca 30 localities identified).

CONCLUSIONS

- Impact of climate change: **localities at risk** (water supply) **and possible measures identified**.
- **Uncertainties**:
  - climate change scenarios (optimistic/pesimistic),
  - minimum ecological flow (flow regime),
  - water quality.
- The results will provide **inputs for water management planning** (2. and 3. cycle of RBMP).

THANK YOU FOR YOUR ATTENTION

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