

A small guide through water management risks due to lack of water in north-eastern Bohemia



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Prague 18.10.2018 (Hotel Duo) – MGS 2018

Extreme hydrological events (Elbe River Board)

Floods

1897

1926

1997

1998

2002

2006

2010

2013



Drought

1921

1947

1953

1983

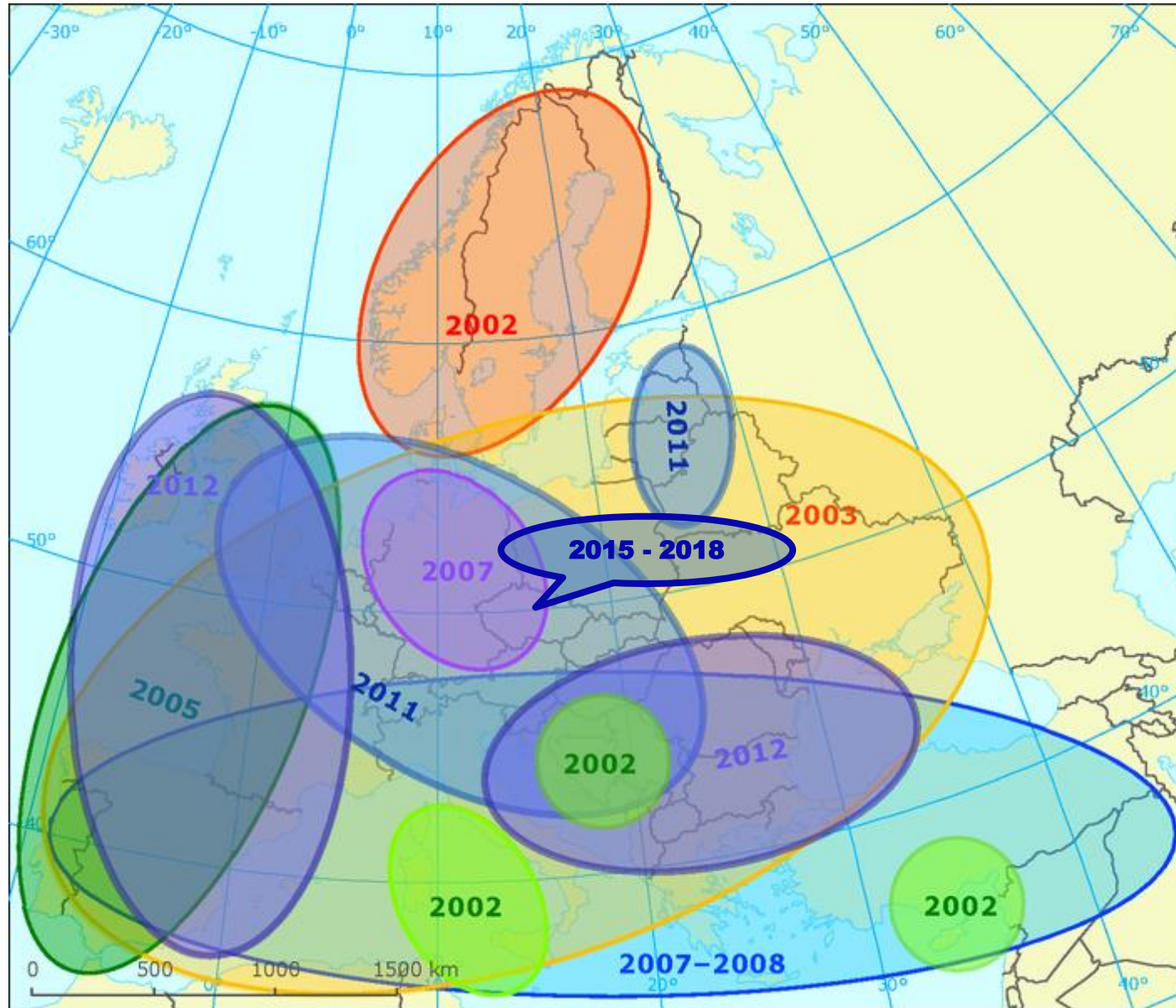
1992

2003

2015 -

2018

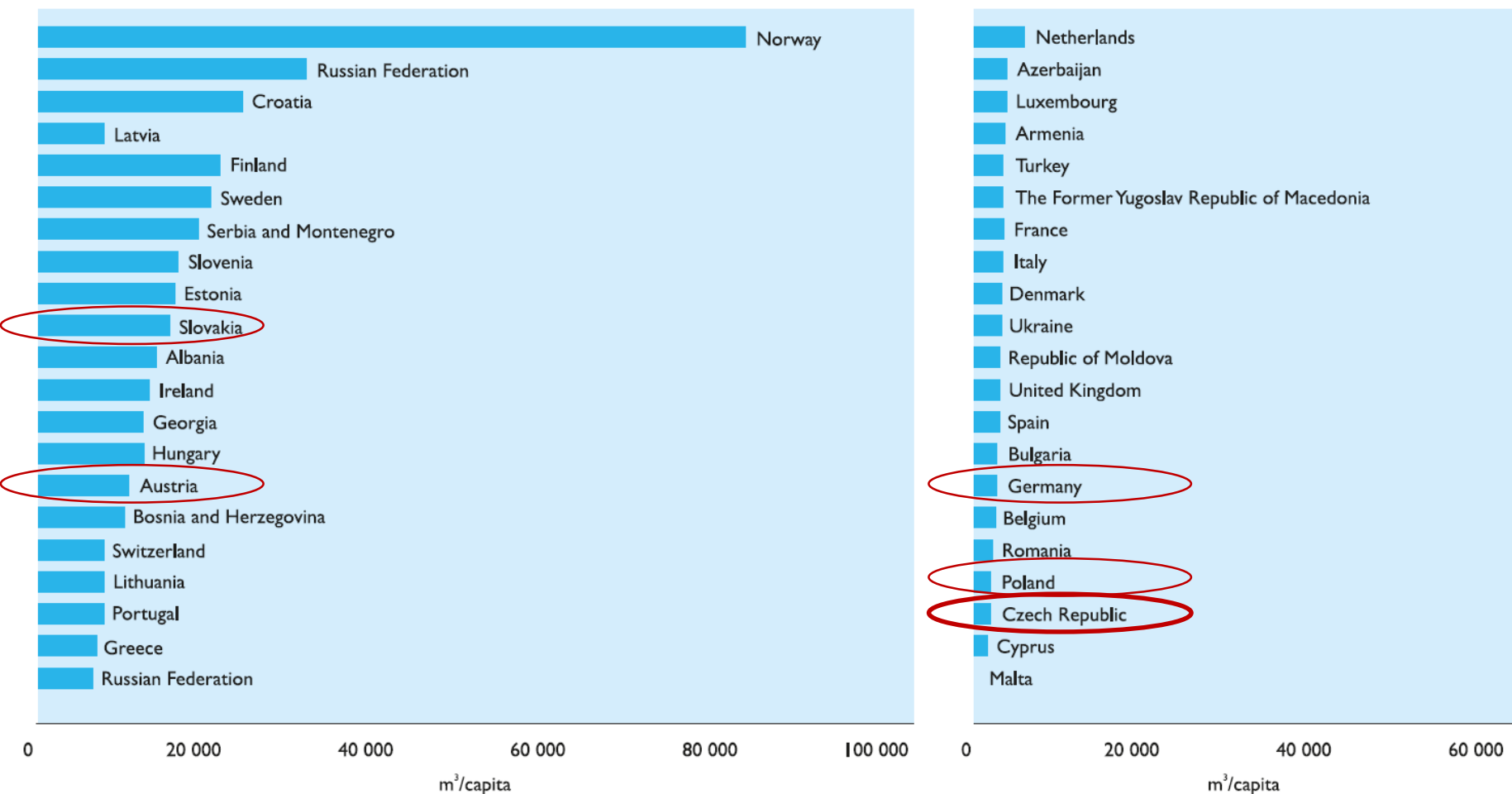
Water scarcity and drought in Europe



Water scarcity and drought events in Europe during the last decade

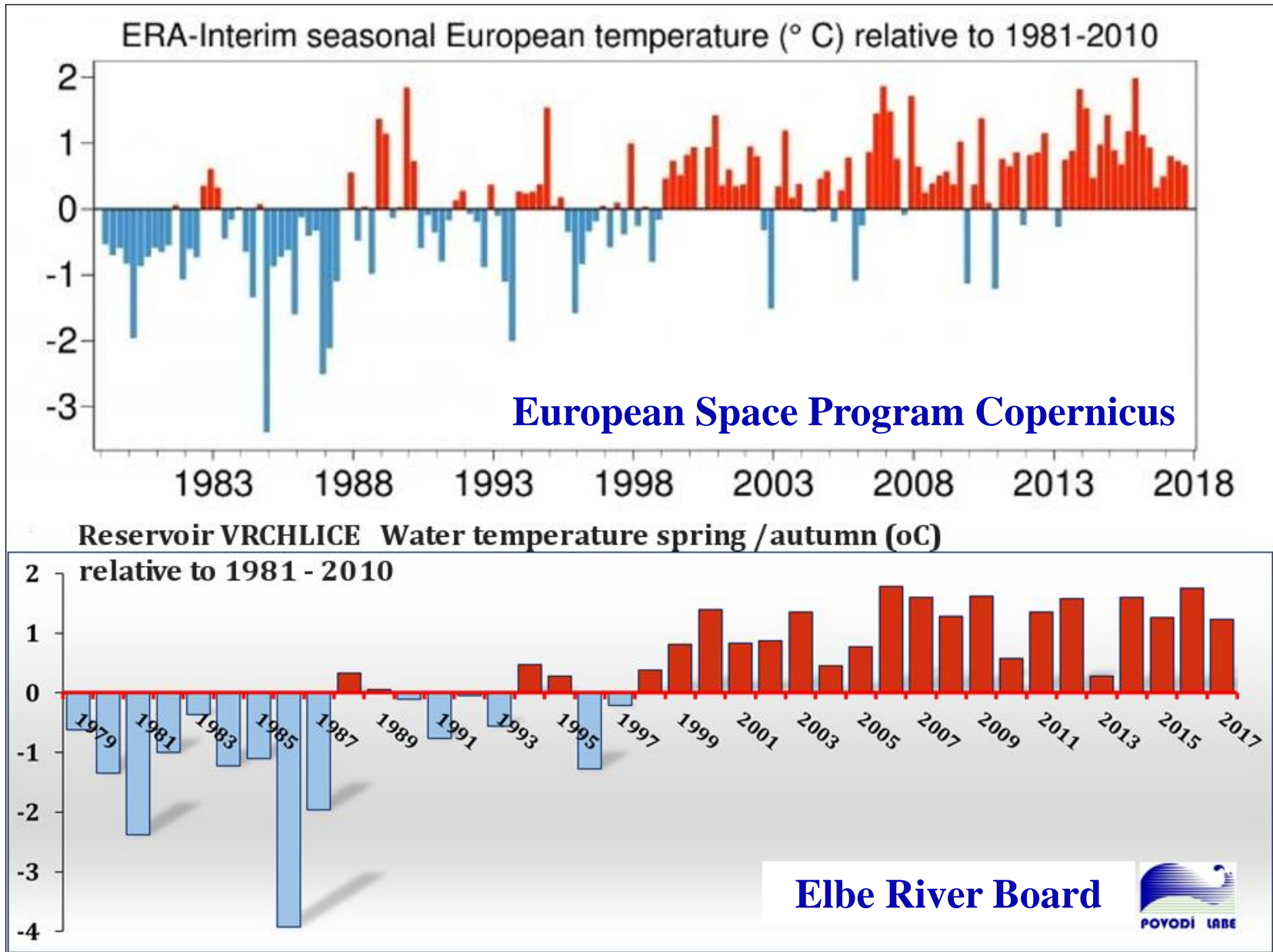


Available water sources in other countries



Zdroj: EEA – Istanbul, 2009

Increase of temperatures in Europe

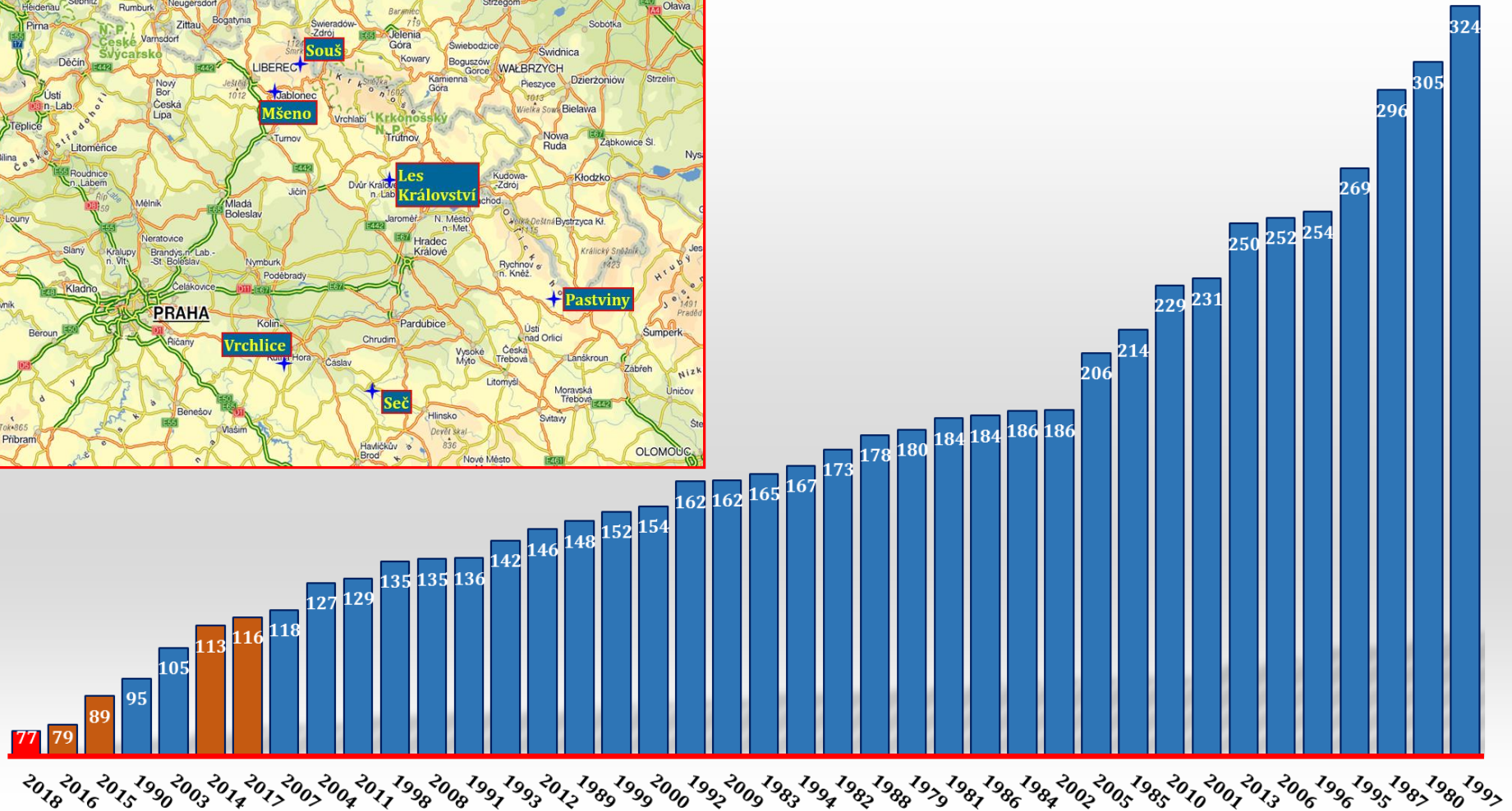
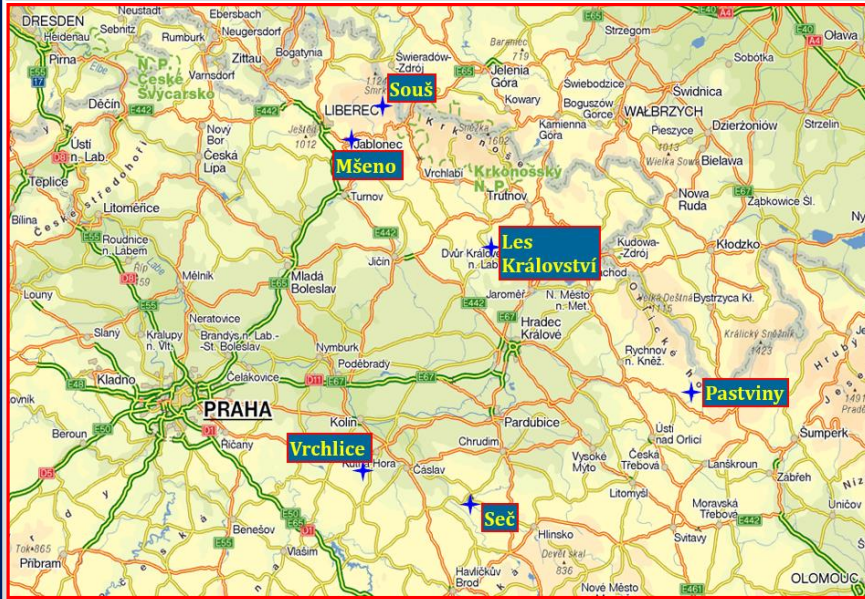


Growth chart year over year comparisons for cumulative volume of the inflows to six reservoirs managed by the River Elbe Board during the growing season

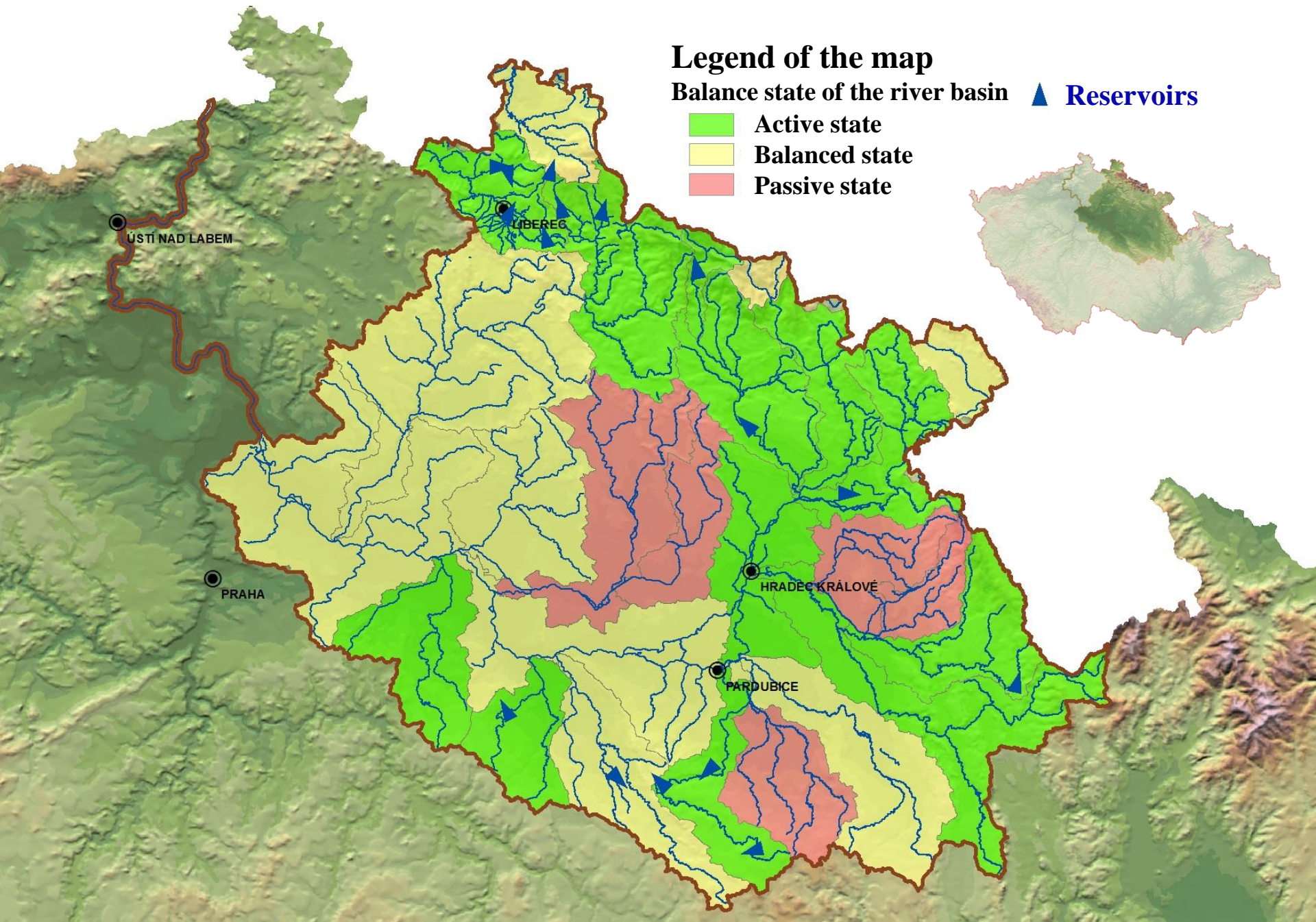
Growing season: 15th April – 15th September

Tested years: 1979 - 2018

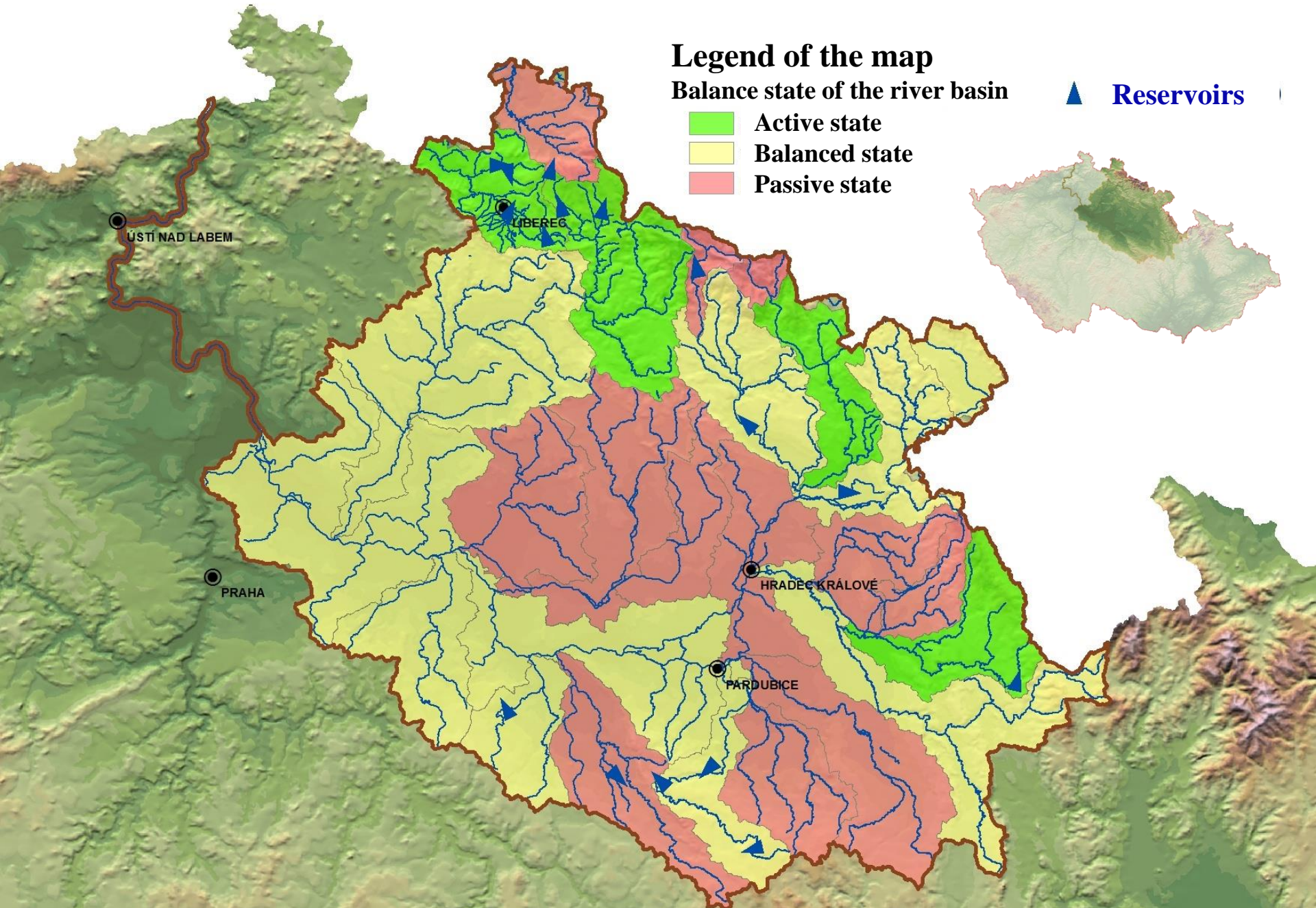
SIX RESERVOIRS 1979 - 2018 (Cumulative volumes of the inflow/mil. m³)



River basin water balance – current status

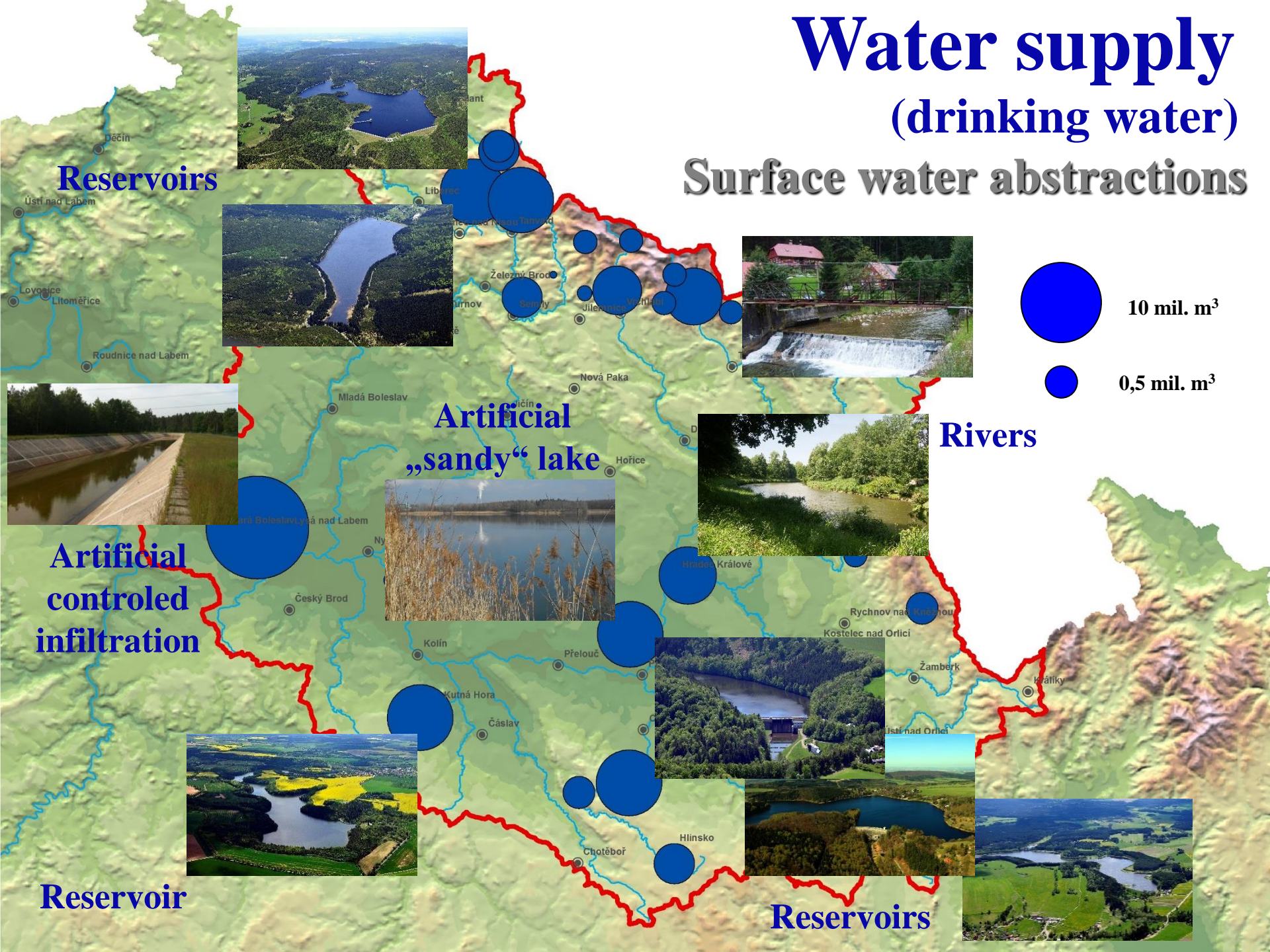


River basin water balance – view to 2085



Water supply (drinking water)

Surface water abstractions



Reservoirs

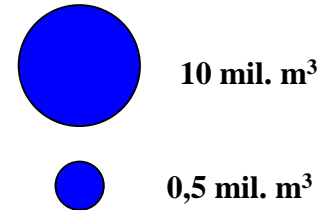
Artificial
„sandy“ lake

Rivers

Artificial
controled
infiltration

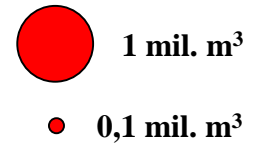
Reservoir

Reservoirs



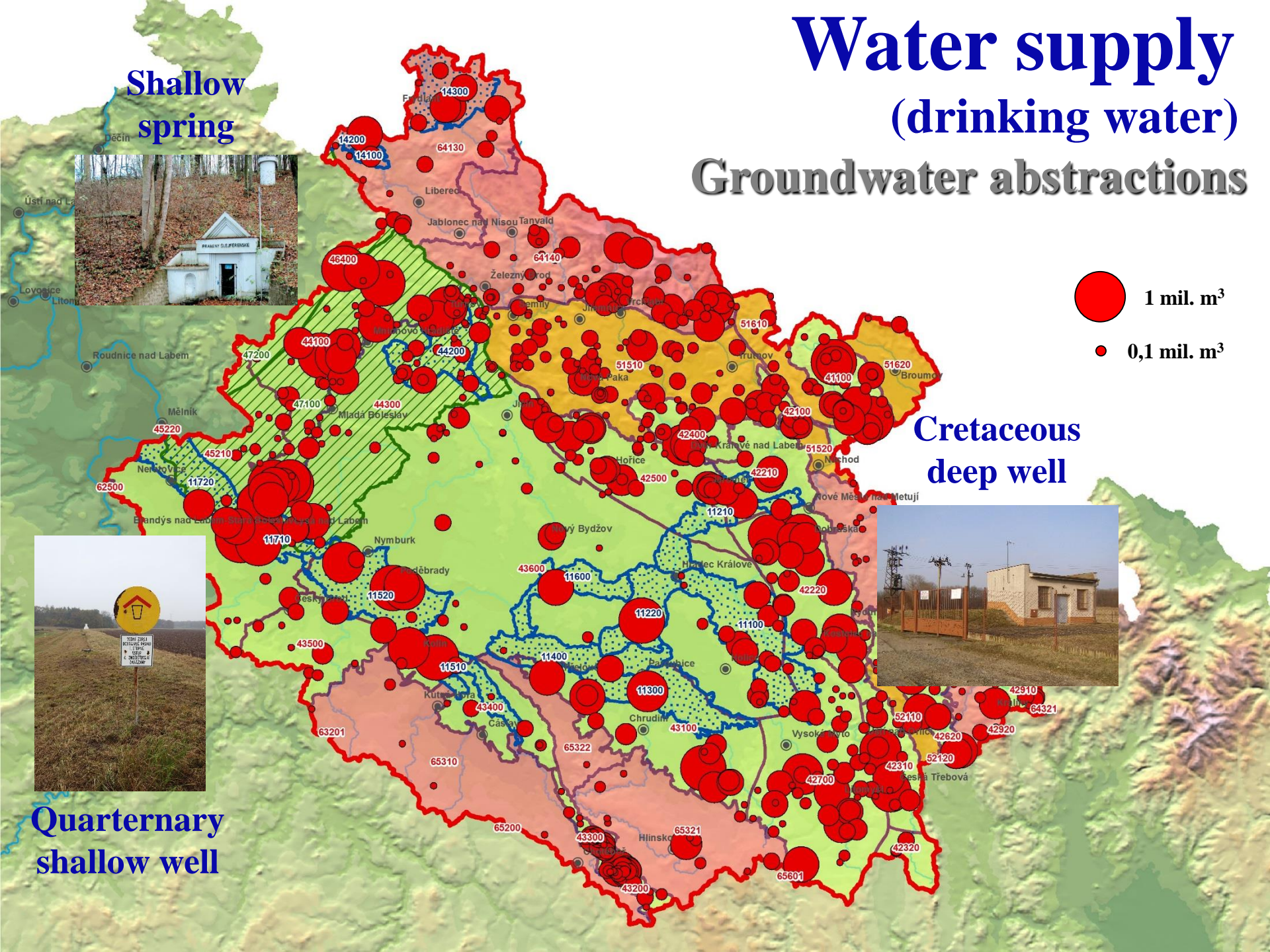
Water supply (drinking water)

Groundwater abstractions



Cretaceous deep well

Quarternary shallow well



Surface water abstractions

Groundwater abstractions

SW = 600 mil. m³ (7% drinking water)
GW = 100 mil. m³ (85% drinking water)

Elbe River Board
(for drinking water)

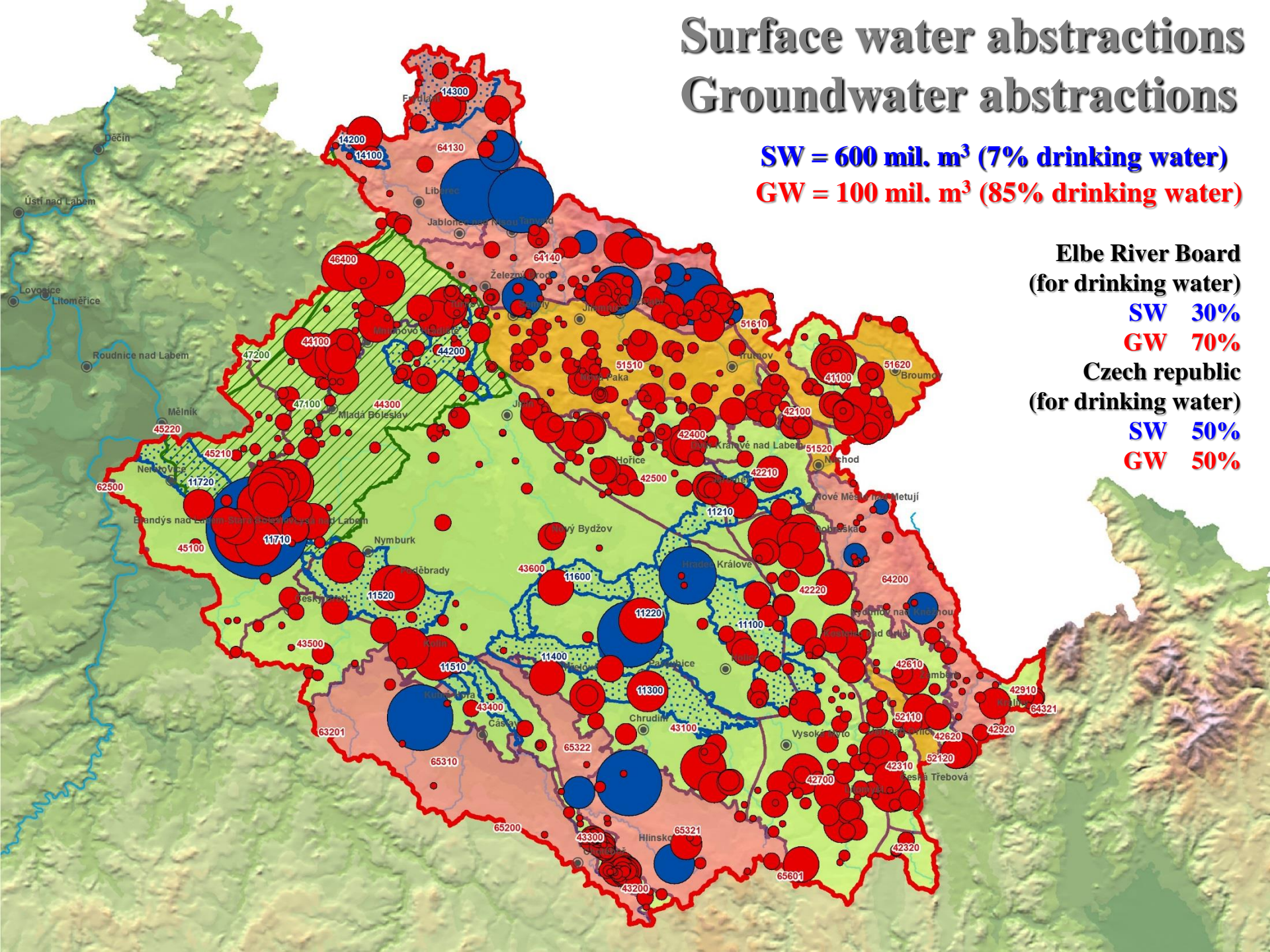
SW 30%

GW 70%

Czech republic
(for drinking water)

SW 50%

GW 50%



Industry and Energy

**Powerplant
Mělník (Elbe)**



**Firm minimum (ecological) discharge
Temperature**

**Powerplant
Trutnov –
Poříčí
(Úpa)**



Powerplant Opatovice (Elbe)



**Škoda Auto
Kvasiny
(Bělá)**



Agricultural irrigation

Firm minimum (ecological) discharge
Technical infrastructure

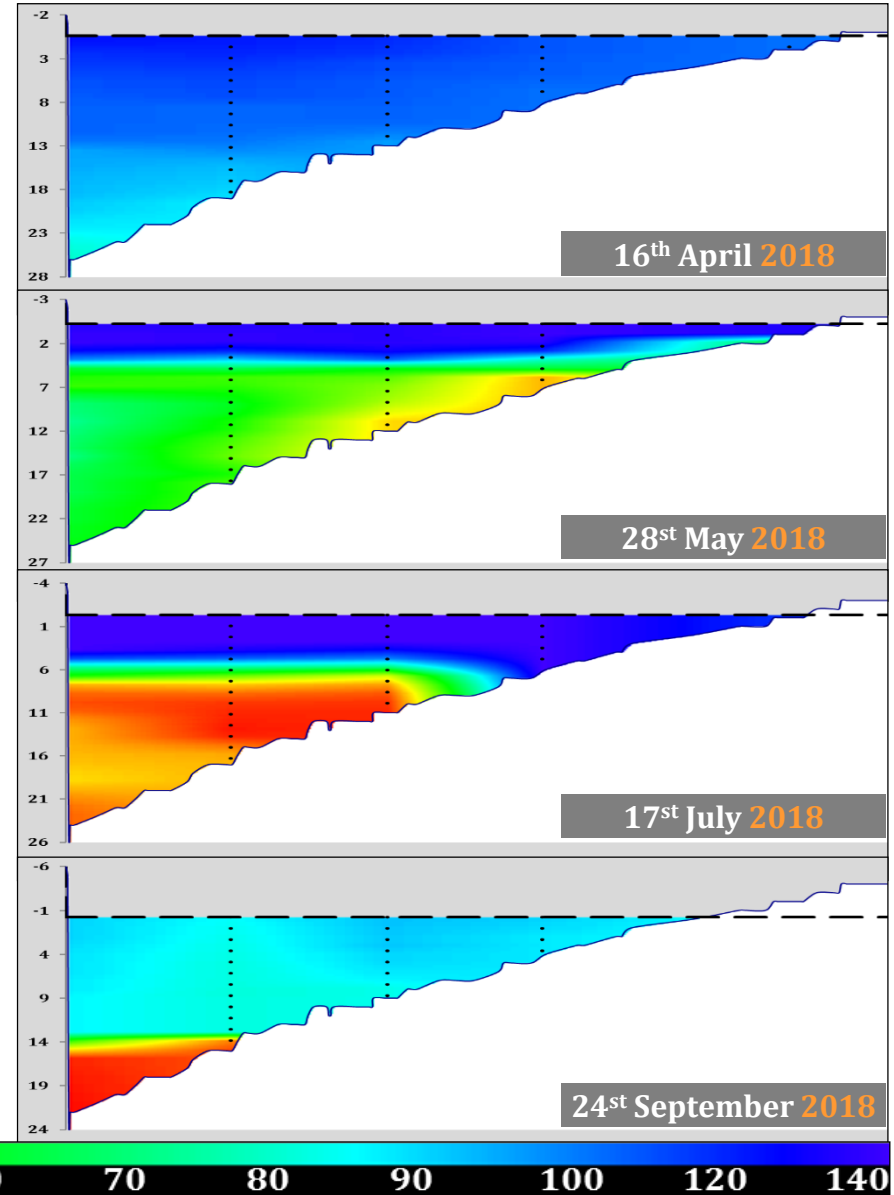
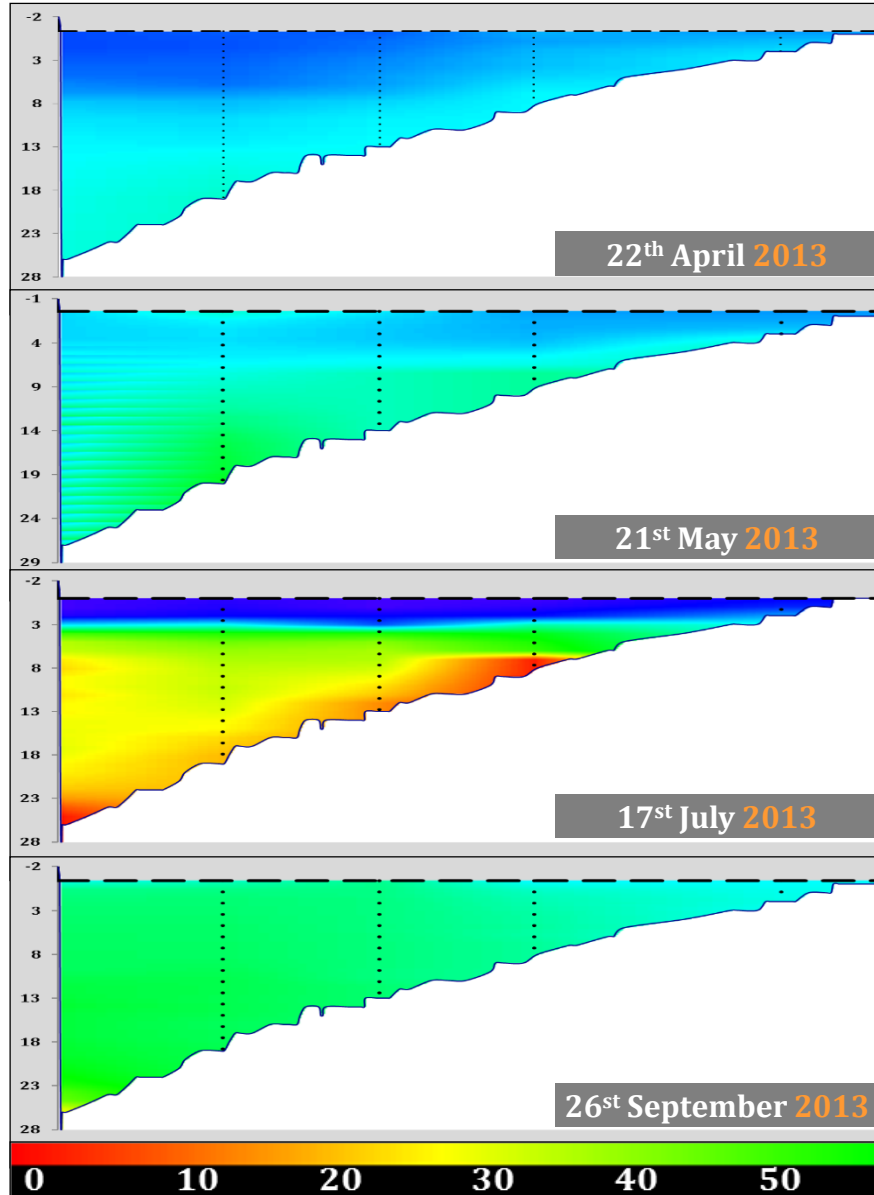


Qualitative aspects during drought

Seč reservoir – longitudinal profile – development of oxygen (%)

2013 – wet year (ordinary precipitation)

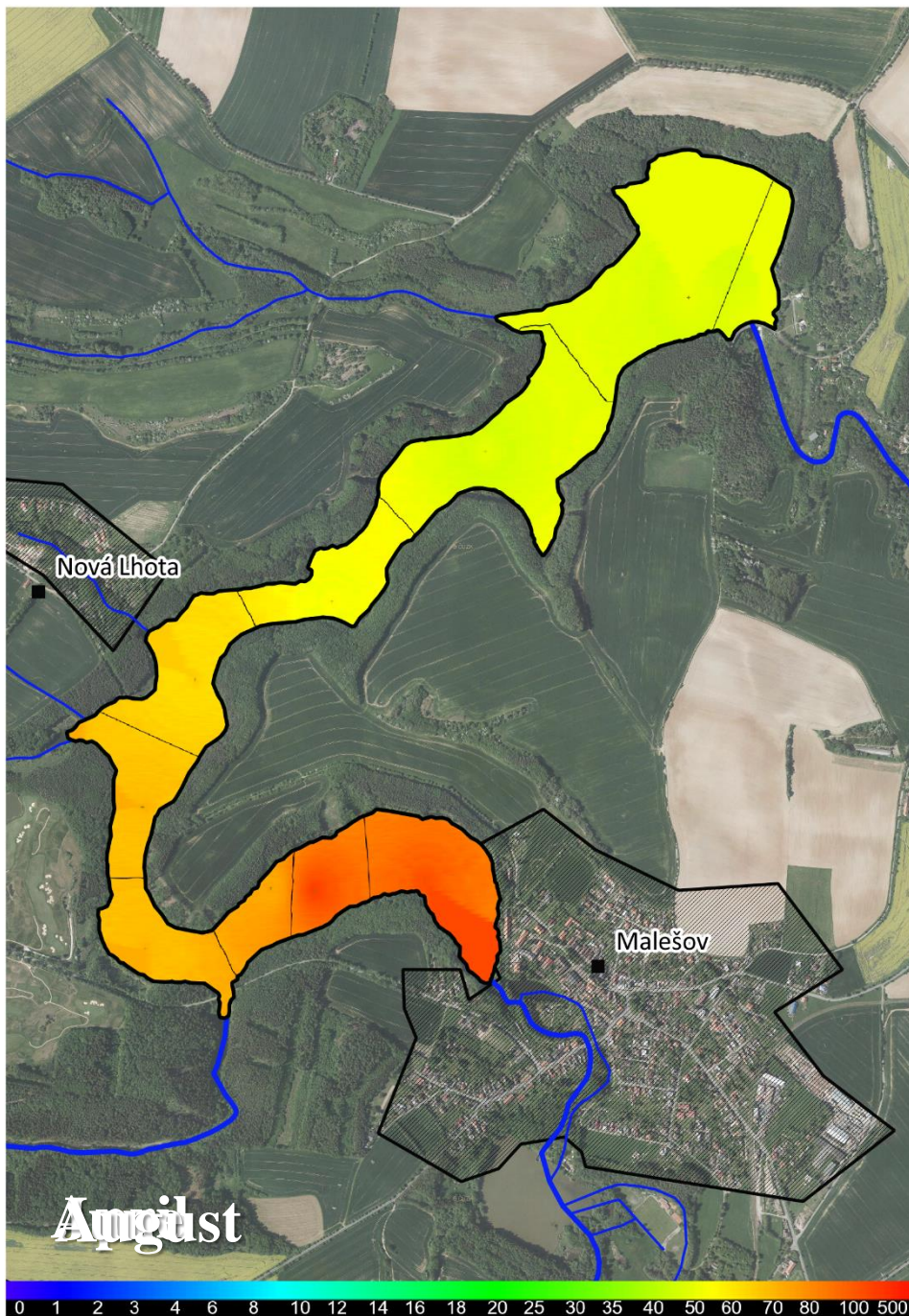
2018 – dry year (little precipitation)



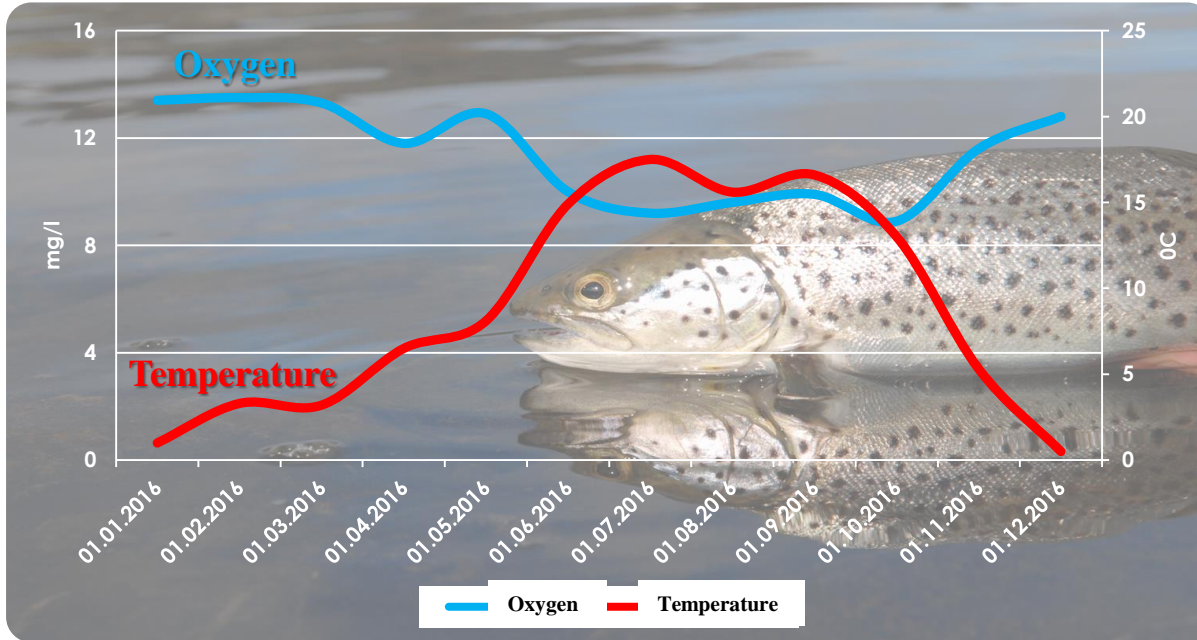
Qualitative aspects during drought

Quality monitoring on the surface water level (horizontal view)
Vrchlice reservoir (2018)

The presence of green algae and cyanobacteria concentration of chlorophyll-a ($\mu\text{g/l}$)



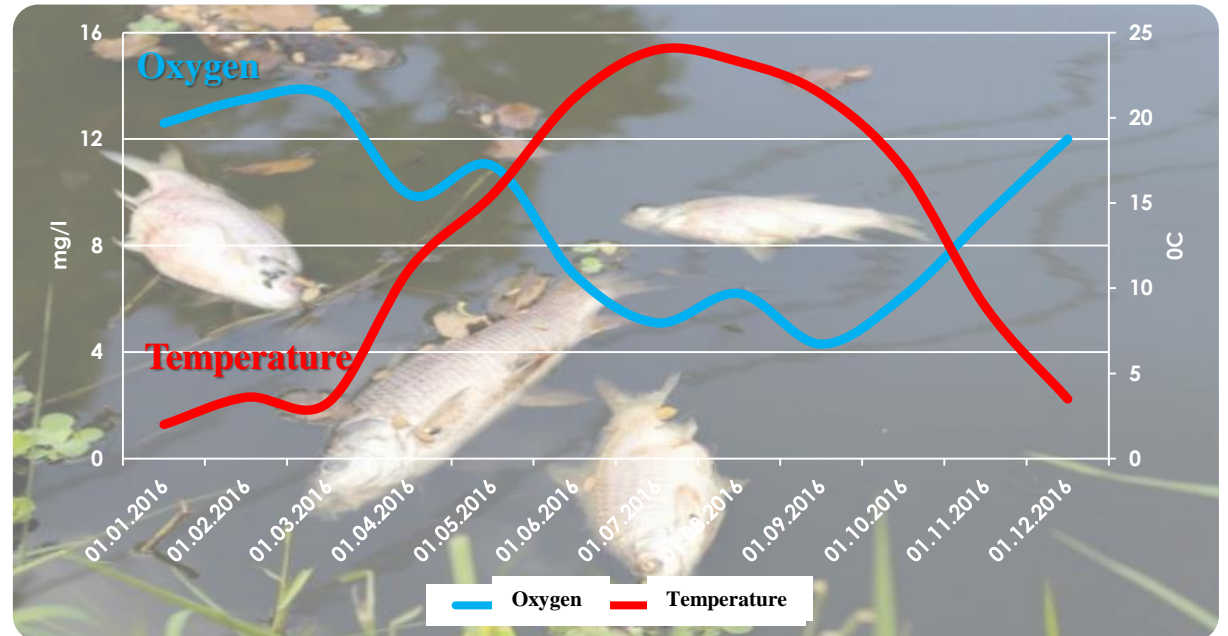
Ecological aspects during drought (fish kill)



The upper part of the Elbe (Kláštecká Lhota village)
Good status – Salmonids



The middle part of the Elbe (Nymburk town)
Worse status – recurrence of fish kill in autumn



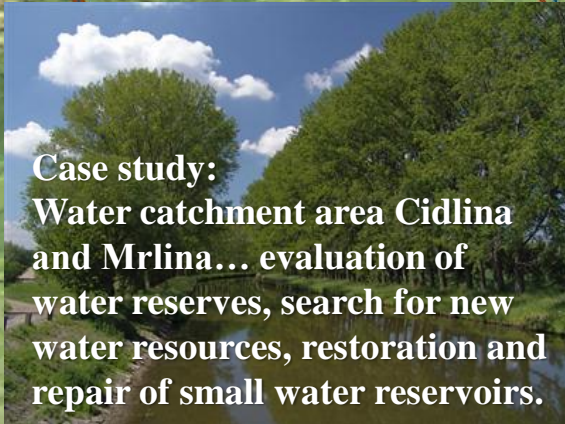
Measures to increase the capacity of water resources (Elbe River Board)



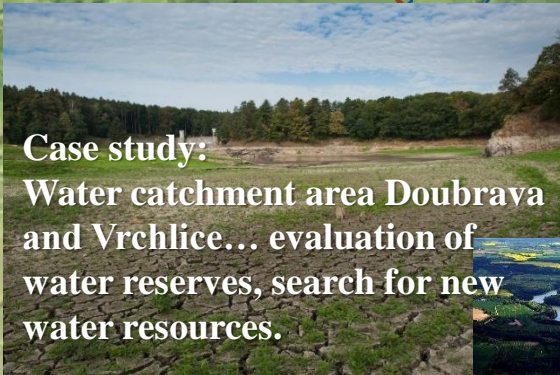
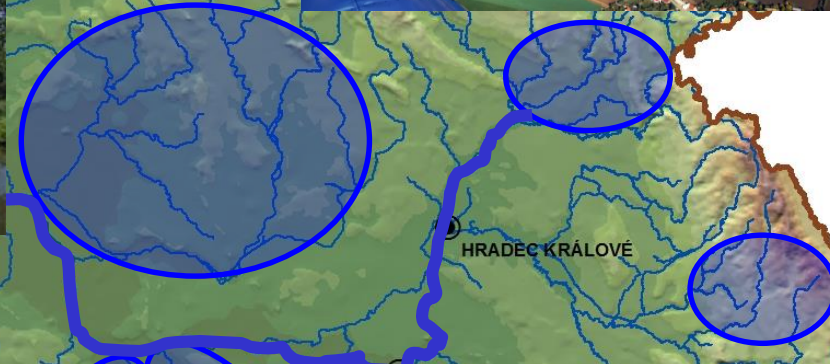
Josefův Důl reservoir – increase the capacity by water transfer of the neighboring river basin.



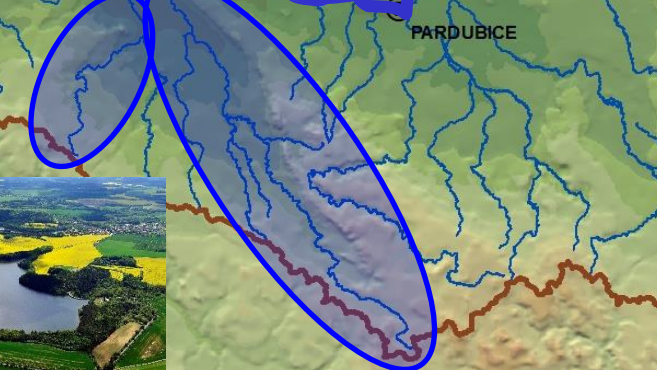
Rozkoš reservoir – increase the storage space by sediment removal, reflections about water transfer.



Case study: Water catchment area Cidlina and Mrlina... evaluation of water reserves, search for new water resources, restoration and repair of small water reservoirs.

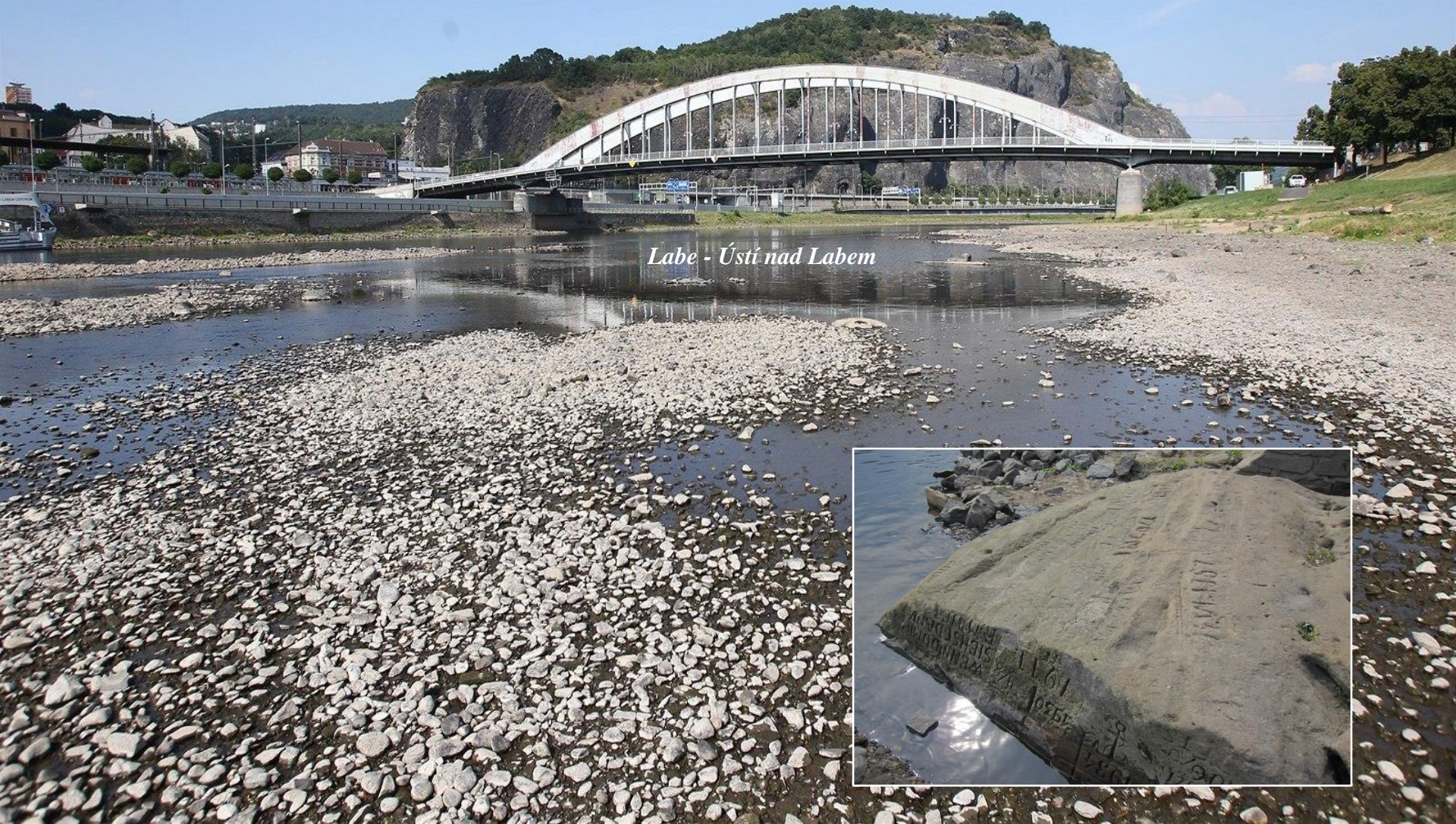


Case study: Water catchment area Doubrava and Vrchlice... evaluation of water reserves, search for new water resources.

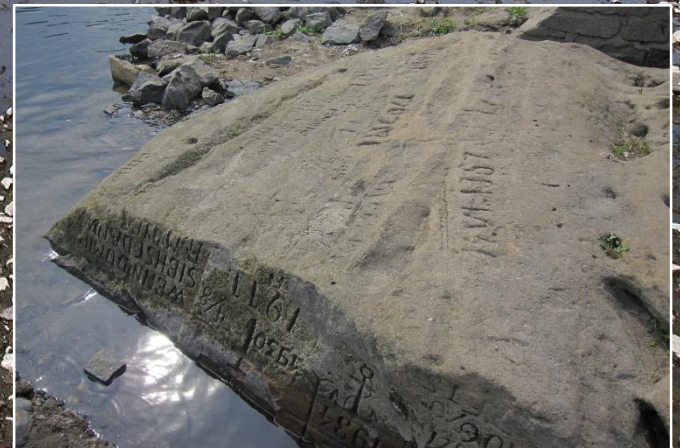


Pěčín reservoir – new water supply reservoir for the Eastern Bohemia region.

Let's hope in better water availability...



Labe - Ústí nad Labem



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...Thank you for your attention