



INTEGRATED DROUGHT RISK MANAGEMENT IN THE CZECH REPUBLIC

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MINISTRY OF THE ENVIRONMENT



Czech Drought Strategy (2017) – core strategic goals

Increase awareness of drought risk through monitoring and drought prediction, ensure drought preparedness using (among others) drought management plans.

Ensure the balance between water resources and water demands across sectors in changing climatic conditions.

Mitigating drought impacts on aquatic and terrestrial ecosystems by restoration of natural water retention capacity in the landscape.

BASIC HYDRO FACTS

Czechia lies on the main European watershed separating the North Sea, Baltic Sea, and Black Sea basins

All waters flow away from the territory (Czechia = „roof of the Europe“).

Water resources dependent solely on atmospheric precipitation.



Danube River Basin

Elbe River basin

Oder River basin

ANOTHER BASIC FACTS

- Area: 78,871 km²
- Population: 10.7 million
- Land use: 54.8% agricultural land, 34.4 % forests, 10.8% others
- Average air temperature: 5.5 - 9 °C
- Long-term rainfall: 686 mm/year
- Length of watercourses: 98,941 km



Danube River Basin



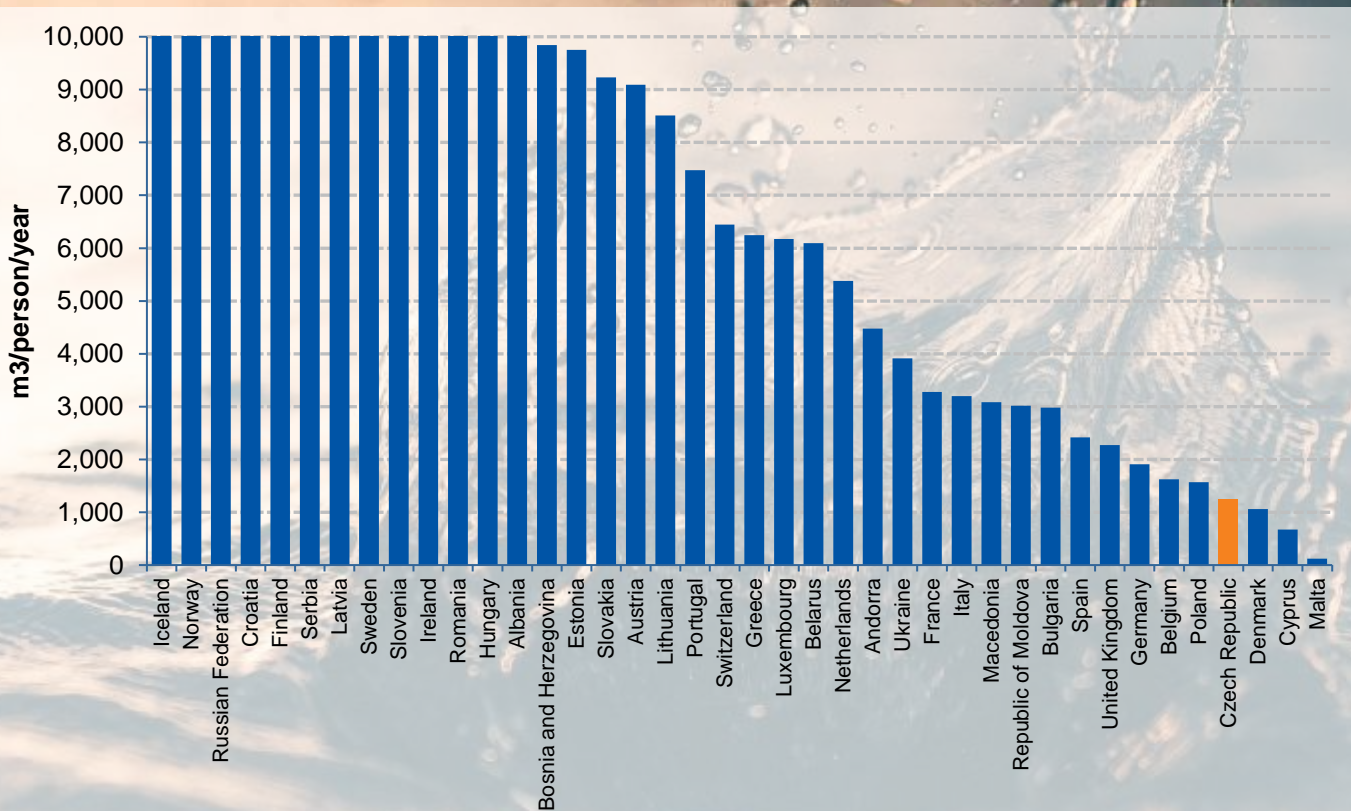
Elbe River basin



Oder River basin



„LIMITED“ TOTAL FRESH WATER RESOURCES COMPARING TO EU AVERAGE

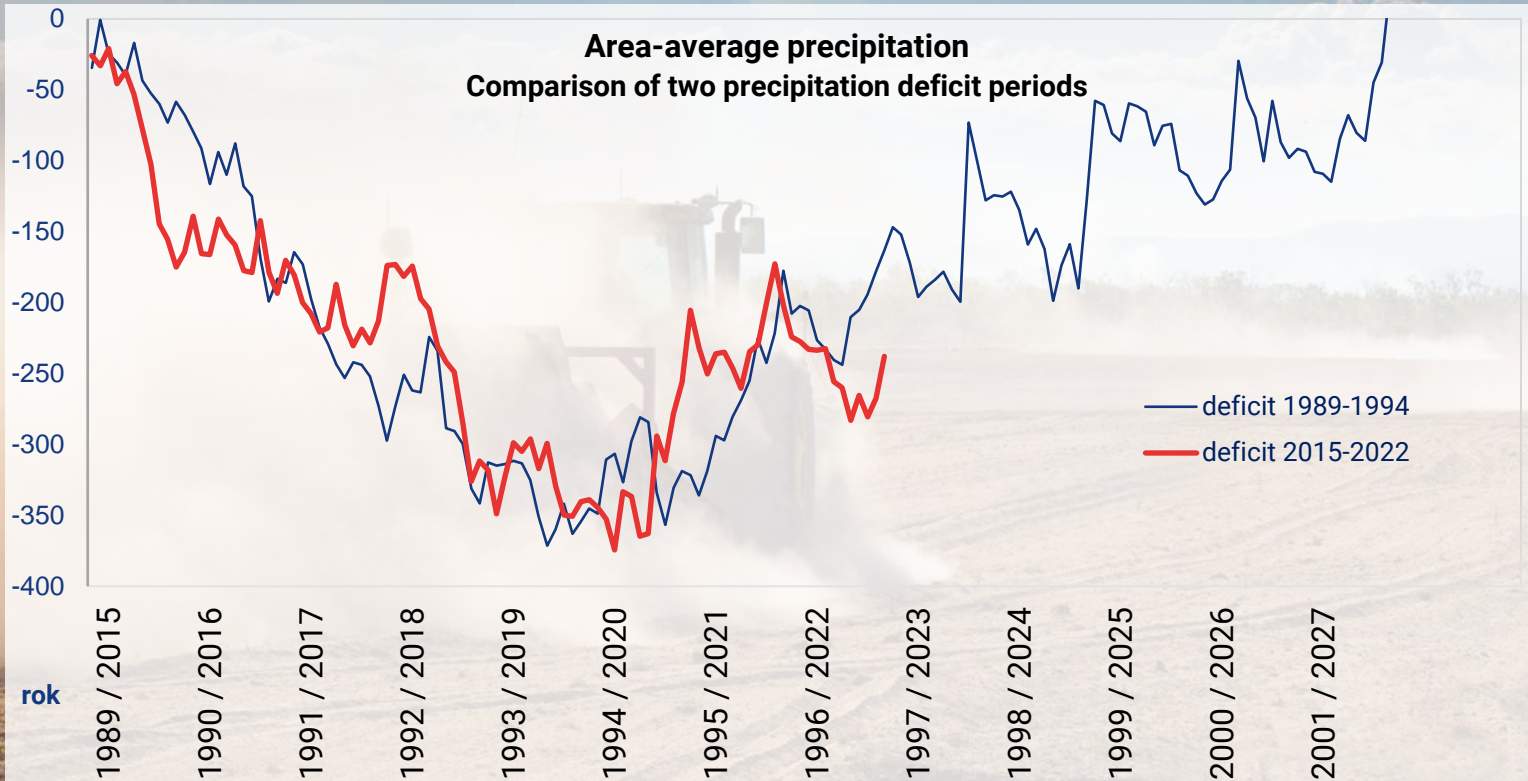


Total fresh water resources
=
Total volume of water that is additionally available due to internal flow and external inflow

Source:

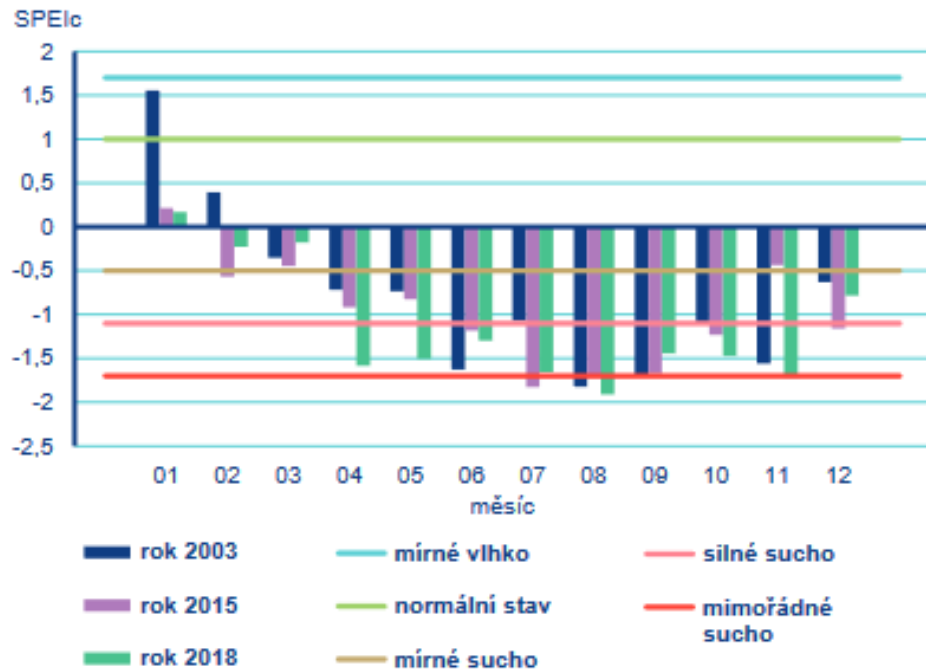
<https://ec.europa.eu/eurostat/databrowser/view/ten00001/default/bar?lang=en>

DRY EPISODE IN 2014 - 2022 COMPARED TO 1989 - 1994



EXTREME DROUGHT IN 2003, 2015 AND 2018

Average values of the SPEIc index for the Czech Republic in individual months of 2003, 2015 and 2018



AVERAGE TEMPERATURE PROJECTION

(1990 – 2014, 2021–2040, 2041–2060, 2061–2080, 2081–2100)

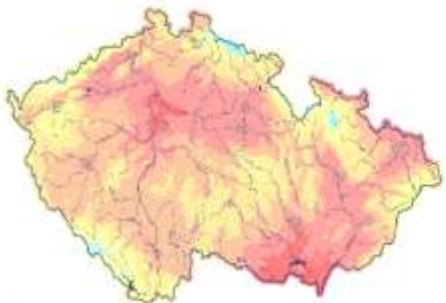
Průměrná roční teplota vzduchu za období let 1990–2014 (DRIST)



www.drist.cz

Průměrná roční teplota vzduchu za období let 2021–2040 (SSP5-R.S. BIAS)

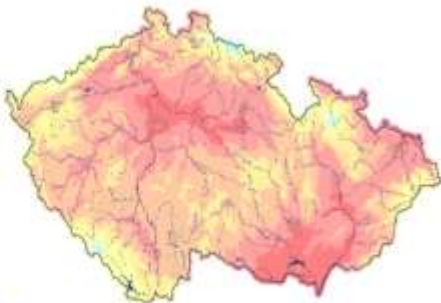
PERÚK



Mapa: Teplota vzduchu 2021-2040

Průměrná roční teplota vzduchu za období let 2041–2060 (SSP5-R.S. BIAS)

PERÚK



Mapa: Teplota vzduchu 2041-2060

Průměrná roční teplota vzduchu za období let 2061–2080 (SSP5-R.S. BIAS)

PERÚK



Mapa: Teplota vzduchu 2061-2080

Průměrná roční teplota vzduchu za období let 2081–2100 (SSP5-R.S. BIAS)

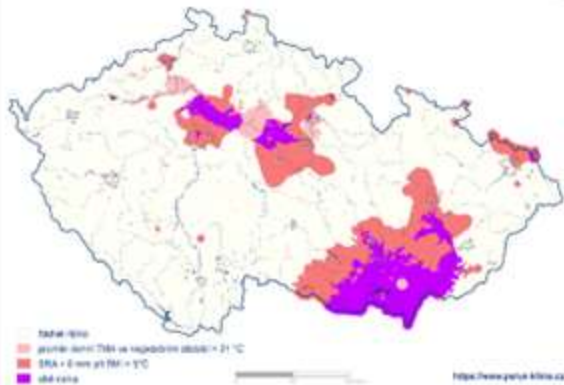
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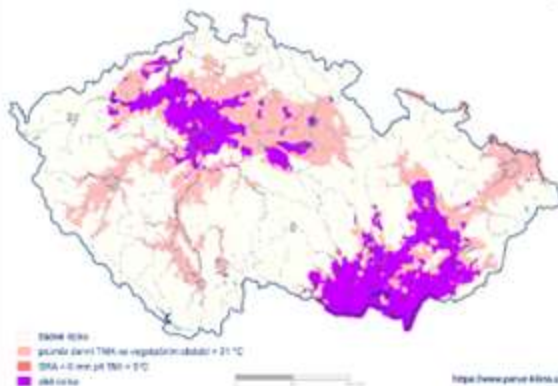
Mapa: Teplota vzduchu 2081-2100

COMBINED RISK OF DROUGHT PROJECTION (1991-2100)

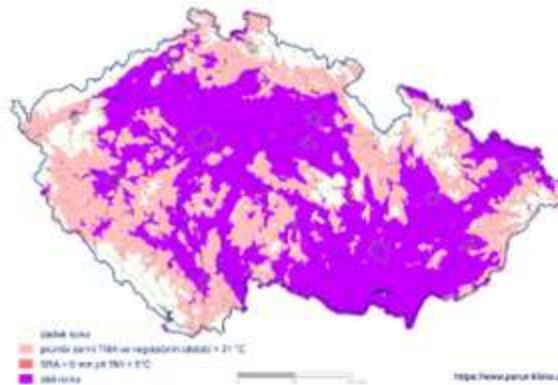
Riziko výskytu sucha za období 1991-2020



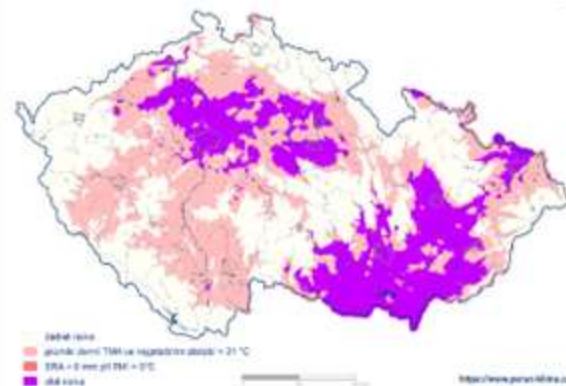
Riziko výskytu sucha za období 2021-2040



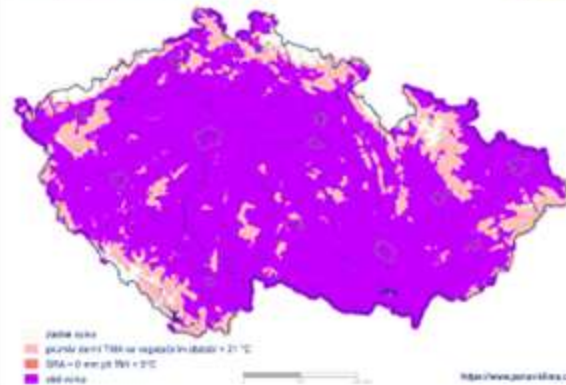
Riziko výskytu sucha za období 2041-2060



Riziko výskytu sucha za období 2061-2080



Riziko výskytu sucha za období 2081-2100



STEPS TOWARDS A DROUGHT POLICY:

- AMENDMENT OF THE WATER ACT
- NATIONAL AND REGIONAL DROUGHT MANAGEMENT COMMITTEES
- NATIONAL AND REGIONAL DROUGHT MANAGEMENT PLANS
- MEASURES FOR STATE OF WATER SCARCITY
- DROUGHT FORECASTING SERVICE





2014

INTERSECTORAL COMMISSION ON WATER & DROUGHT

2015

1ST DROUGHT PEAK –
GOVERNMENT DECREE CALLING FOR ACTION

2017

NATIONAL DROUGHT STRATEGY ADOPTED

2018

2ND DROUGHT PEAK- CRITICAL STATE OF
GROUNDWATERS

2020

WATER ACT - DROUGHT MANAGEMENT INCLUSION

2023

NATIONAL DROUGHT STRATEGY UPDATE

KEY TIME PERIODS

KEY TIME PERIODS

January
2021

AMENDMENT TO THE WATER ACT CAME INTO FORCE

April
2021

THE ESTABLISHMENT OF A DROUGHT COMMISSIONS AT REGIONAL LEVEL

September
2022

CENTRAL (NATIONAL) DROUGHT COMMISSION ESTABLISHED

January
2023

PREPARATION OF REGIONAL DROUGHT PLANS AND THEIR PUBLICATION

January
2024

PREPARATION OF THE NATIONAL DROUGHT PLAN AND ITS PUBLICATION

AMENDMENT OF THE WATER ACT



NEW WHOLE CHAPTER X

"MANAGEMENT OF DROUGHT AND WATER SCARCITY"

The aim of the amendment is to set up **operational** management for drought and water scarcity.

DEFINITION OF „DROUGHT“ AND „WATER SCARCITY“

- **„DROUGHT“**

Is a temporary fluctuation in water availability, resulting from a deficit in rainfall and manifested by a decrease in watercourse flows and groundwater levels

- **„WATER SCARCITY“**

Is the situation when the water resource is insufficient to meet long-term average water demands of water users. It is necessary to restrict water usage and impose additional measures

DROUGHT COMMISSION

THE GOVERNOR

Water
authority
(administr.)

River basin
authority

Czech
Hydrometeoro
logical
Institute

Police

Regional Fire
Rescue
Service

Regional
sanitary
station

- **Mandatory at regional and central level**
- **Multiple Experts from various relevant fields are taken onboard**

The Commission is an expert decision-maker as a collegial body (votes by majority of the participants) instead of one single officer of the water authority



DROUGHT COMMISSION

The Central Drought Commission is established by the Government

Coordinates measures that may have an trans-regional impacts

Declare and retract the state of water scarcity

When the state of water scarcity is declared, the Commission may impose her own statewide measures

Affected water users and representatives of municipalities are invited to the Commission's meetings with no right to vote

TAKING ACTION WHEN THE WATER SCARCITY SITUATION IS DECLARED

- **The Drought Commission shall issue measures in the form of an individual decision or a measure of a general nature, in order to**
 - a) modify, restrict or prohibit the „non-permitted“ usage of surface water
 - b) modify, restrict or even prohibit permitted water usage
 - c) restrict the usage of tap water
 - d) impose an extraordinary manipulation on the water struct. (dam) beyond the approved manipulation
 - e) decides on usage of backup water source
 - f) decides on or modifies the permitted E-flow or minimum groundwater level rates
 - g) order the owner of the necessary water management facility to put it into operation and provide it for the sake of management of the water scarcity situation, if technically possible
 - h) impose extraordinary/emergency dedicated monitoring program of water quantity and quality

DROUGHT AND WATER SCARCITY MANAGEMENT PLANS

Content

- Definition and description of the area with identification of water sources, description of drought risks including its potential impacts and local guideline limits and criteria for declaring a water scarcity situation
- Drought management procedures and water scarcity measures to be imposed

Basis for

- Decisions taken by the water authority in drought management
- Decision on the need to convene a drought commission
- Decisions of the drought commission on water scarcity measures

- Drawn up for the territory of each region (14) and one statewide



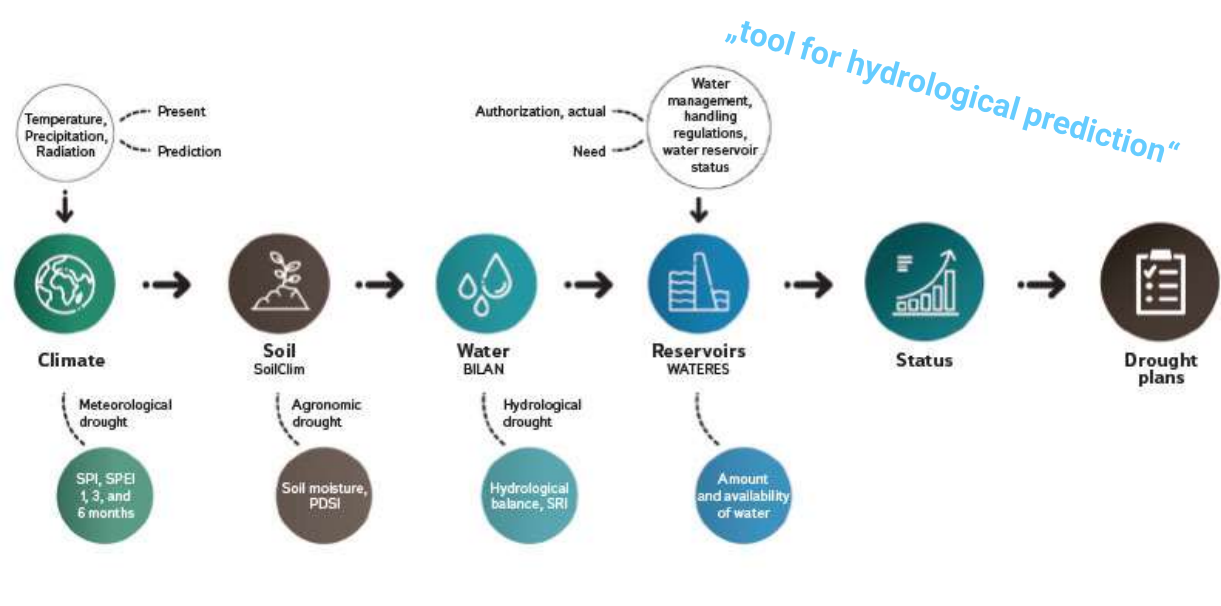
The measures adopted by the commission based on the drought plan must correspond to the importance of the water usage according to the following hierarchy:

- a) Critical infrastructure assurance
- b) Drinking water supply to the public
- c) Livestock agriculture and the ecological function of water
- d) Usage for economic purposes (not stated above)
- e) Other usage

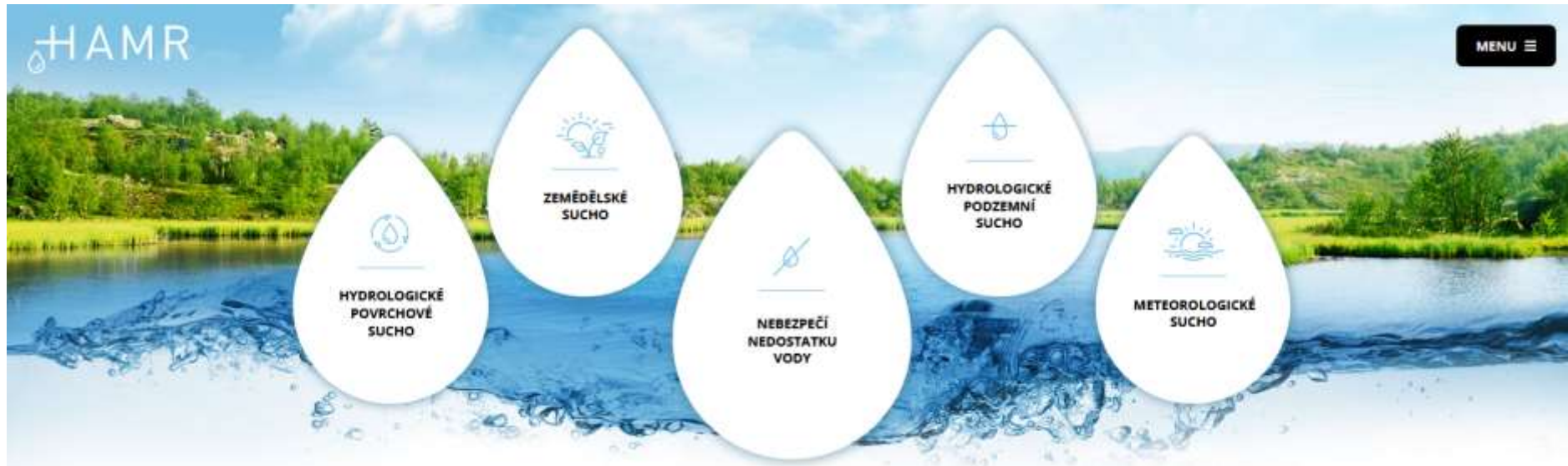
DROUGHT FORECASTING SERVICE

Each component is represented by a mathematical model based on physics

Hydrological
Agronomic
Meteorological
Retention



- Shows the current drought status (surface and groundwater levels, reservoir levels and soil moisture)
- Presents the intensity of drought using drought indicators
- Predicts the hydrological situation for up to 8 weeks
- Compares available water supplies and user's demands and simulates the impacts of any planned restrictions





HYDROLOGICKÉ
POVRCHOVÉ
SUCHO



ZEMĚLŠKÉ
SUCHO



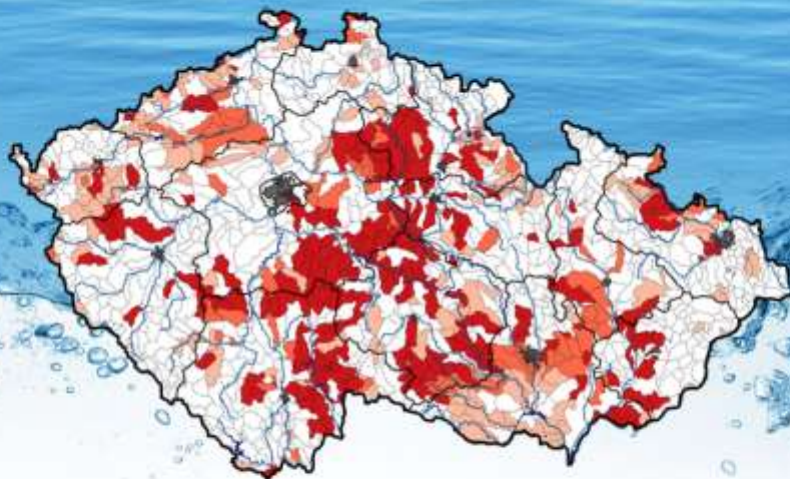
NEBEZPEČÍ
NEDOSTATKU
VODY



HYDROLOGICKÉ
PODZEMNÍ
SUCHO



METEOROLOGICKÉ
SUCHO



Mimořádné sucho	18,9 %
Silné sucho	6,6 %
Mírně sucho	13,6 %
Normální stav	60,9 %
Mírná vlhka	0,0 %
Silná vlhka	0,0 %
Mimořádně vlhka	0,0 %

41. TÝDEN
9. 10. – 15. 10.
2023

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41

Vyberte rok

Zjistit více



HYDROLOGICKÉ
POVRCHOVÉ
SUCHO



ZEMĚDĚLSKÉ
SUCHO



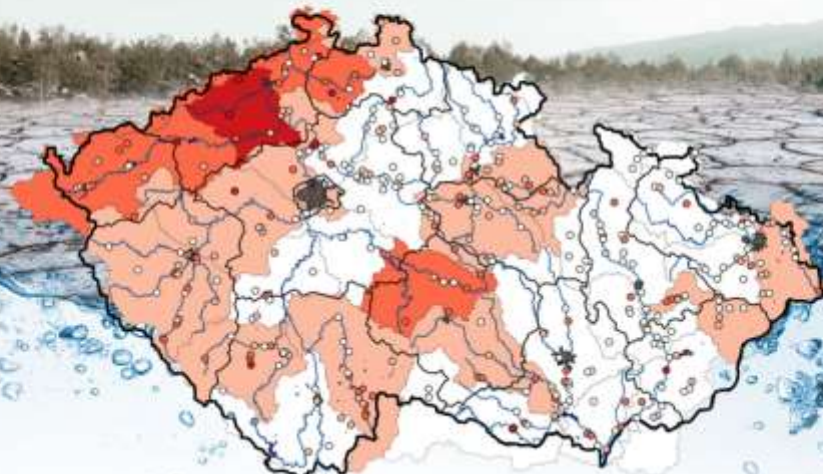
NEBEZPEČÍ
NEDOSTATKU
VODY



HYDROLOGICKÉ
PODZEMNÍ
SUCHO



METEOROLOGICKÉ
SUCHO



mimořádně nadnormální	0,0 %
silně nadnormální	0,5 %
mírně nadnormální	2,7 %
normální	52,1 %
mírně podnormální	22,5 %
silně podnormální	18,7 %
mimořádně podnormální	3,5 %

41. TÝDEN
8. 10. - 13. 10.
2023

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 21 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41

Vyberte rok

Zjistit více

HAMR

NEBEZPEČÍ
NEDOSTATKU
VODY

41.
TÝDEN



HYDROLOGICKÉ
POVRCHOVÉ
SUCHO



ZEMĚDĚLSKÉ
SUCHO



NEBEZPEČÍ
NEDOSTATKU
VODY



HYDROLOGICKÉ
PODZEMNÍ
SUCHO



METEOROLOGICKÉ
SUCHO

MENU

Mimořádné sucho	1,6 %
Silné sucho	0,5 %
Mírné sucho	0,8 %
Normální stav	76,3 %
Mírné vlhko	5,7 %
Silné vlhko	4,0 %
Mimořádné vlhko	11,1 %



41. TÝDEN
9. 10. - 15. 10.
2023

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41

Výběr let

Zjistit více



RAINWATER RETENTION AND HARVESTING PROJECTS FUNDING BY STATE

„Dešťovka“ program

9 549 projects

367 mil. CZK 

data as of 30th September 2022

ALLOCATION FOR 2021 - 2027



ST	Drought mitigation measures	Allocation (billion CZK)
	water and vegetation elements, urban vegetation, study and plan, drainage facilities	4,91
1.3	rain water	2,0
	preventive flood control measures, operations	0,78
	flood protection	1,51
1.4	wastewater treatment plant, sewage	10,37
	water supply	3,69

= 9,2 billion

= 14,1 billion



A person wearing a blue long-sleeved shirt is shown from the chest down, pouring a stream of light-colored sand from their right hand into a grey bucket. The background is a blurred outdoor setting with a sandy ground. In the top left corner, there is a decorative horizontal bar with three segments in shades of green.

RESUME

- **The Czech Republic has very limited amount of water resources**
- **Precipitation rate seems to be constant, but evaporation is the issue
=> if temperature increases, drought intensifies**
- **It is essential to retain and efficiently use the rainwater**
- **As a first step, it's advisable to establish robust and sound strategic framework, which might be further implemented through various legislative proposal, project implementation, economic measures etc.**

RESUME

- The Czech republic responded to the drought episode also by adopting so-called Drought Amendment to the Water Act, which defines the system of operational management in times of water scarcity
- The amendment to the Water Act did not increase the price of surface water and groundwater, it only enhanced supervision over certain abstractions and introduced the mechanisms for restricting abstractions in times of water scarcity
- The best way how to protect sources of groundwater is to strike a good balance between the price of ground and surfacewater
- When having experienced harsh drought spell and things start moving ahead it's crucial to keep up the momentum



THANK YOU FOR YOUR ATTENTION