

# Introduction of the selected pilot basin

## 1<sup>st</sup> Stakeholders Workshop

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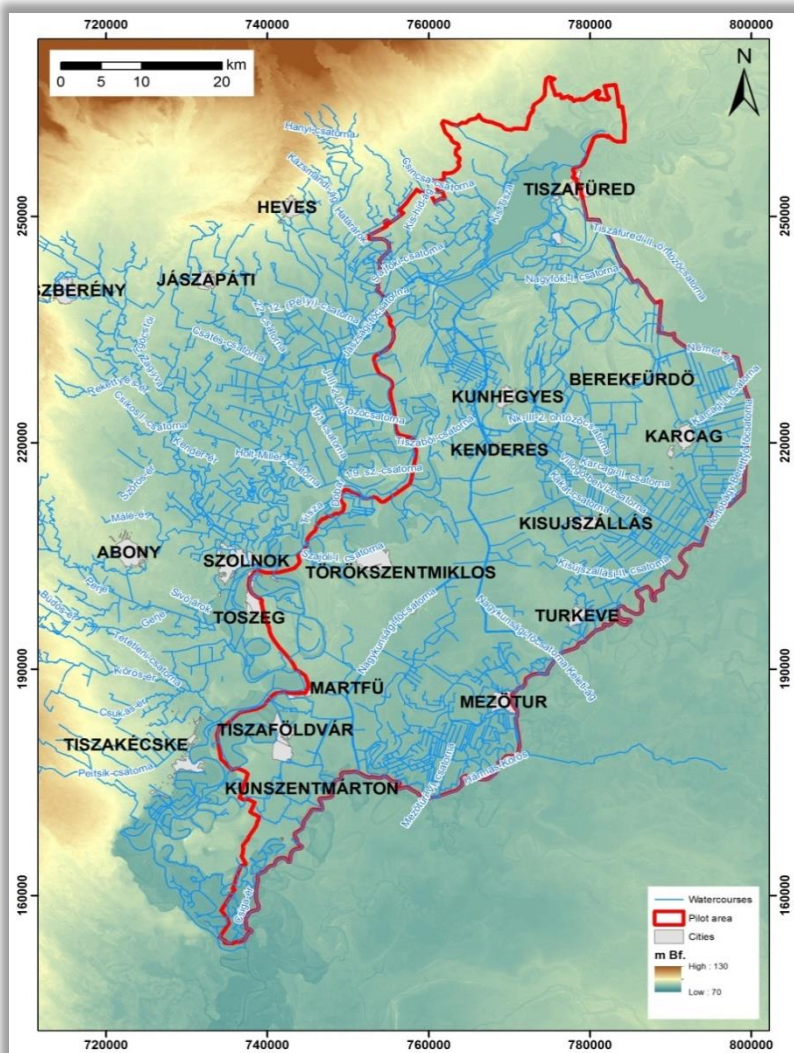
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# Introduction of the pilot area



- Size: 3296 km<sup>2</sup>
- Driest climate of the country
- Part of the KÖTIVIZIG operational area
- Part of the TIKEVIR water management system

# Water management system of the pilot area

- The pilot area's channels get water from the Lake Tisza

- It was created by the Kisköre Dam
- Largest artificial Lake of Hungary
- Considered as a multipurpose facility



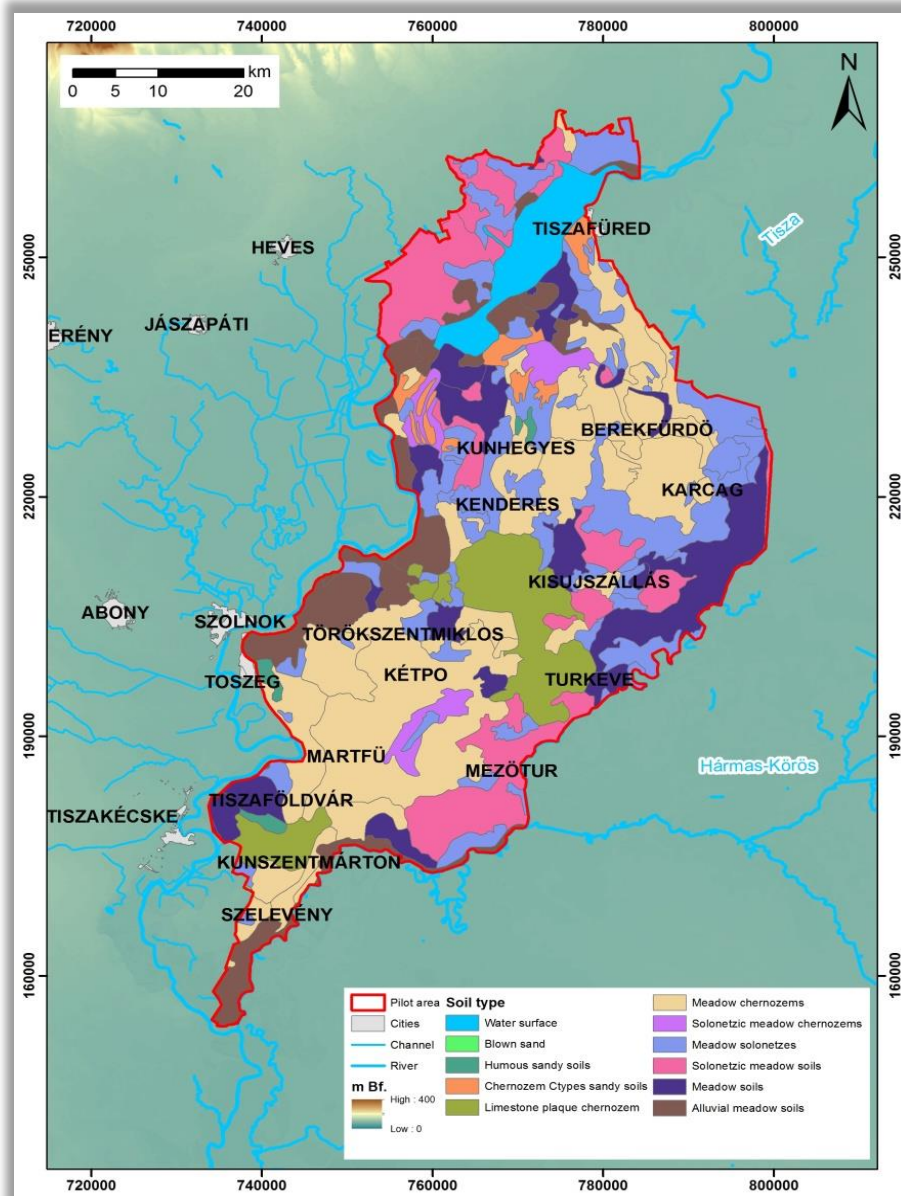
# Water management system of the pilot area

- The most significant rivers of the pilot area:
  - Tisza, Körös, Hortobágy-Berettyó
- The most significant channels of the pilot area:
  - Nagykunsági irrigation channel
  - Nagykunsági-III-2. irrigation channel
  - Tiszafüredi irrigation channel
  - Kakat channel
  - Villogó channel
- Most important things that water is used for:
  - Irrigation, fishing, ecological, industry
- If the water is not used for irrigation, or for other purpose, it is transferred to the Hármas-Körös, and the Hortobágy-Berettyó

# Distribution of soils

## The Highest proportion of soil types

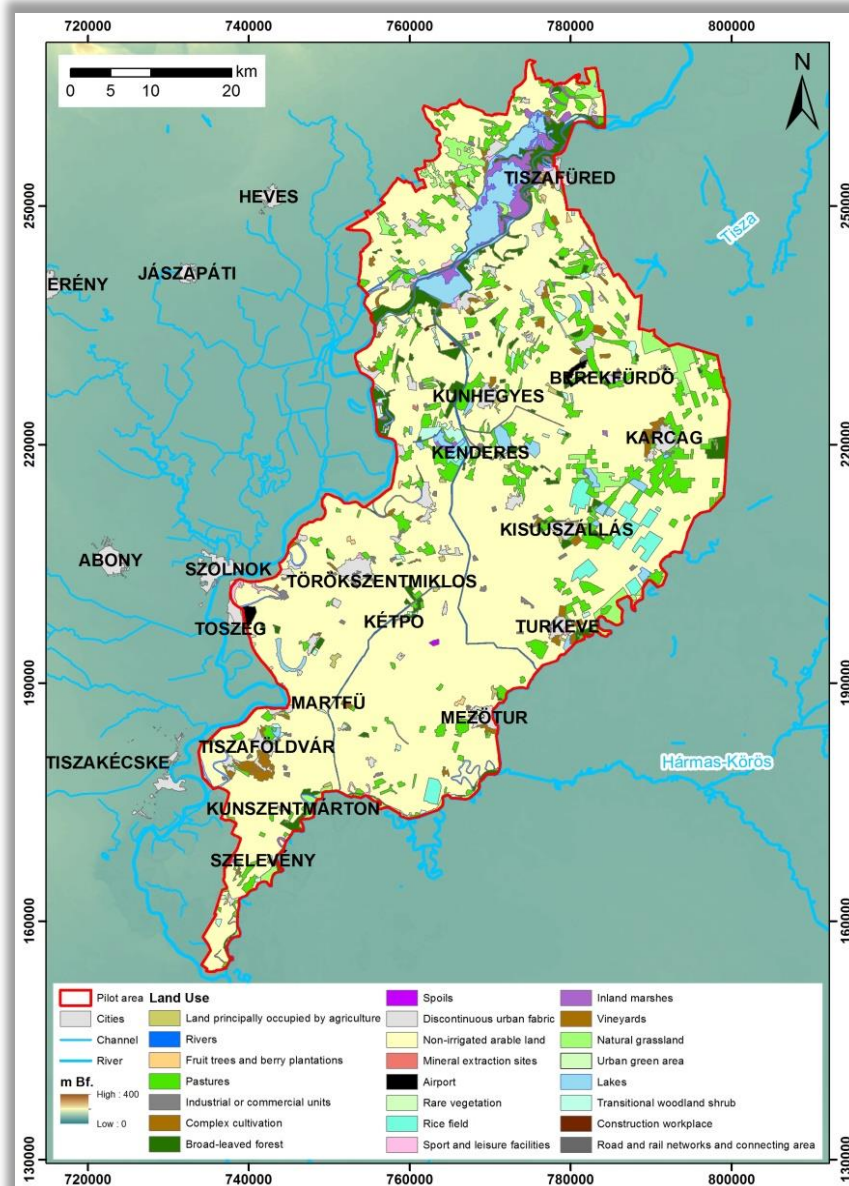
- Meadow chernozems [31.01 %]
- Meadow solonetztes [18.42 %]
- Solonetzic meadow soils [12.53 %]
- Meadow soils [12.05 %]



# Distribution of land use

## The Highest proportion of land use

- Arable land [72.77 %]
- Pastures [8.05 %]
- Broad-leaved forest [3.30 %]
- Discontinuous urban fabric [3.20 %]



# Water quality of the Nagykunsági irrigation channel

Component	dimension	Water quality limits						Water body's value			Qualification				
		excellent / good (lower limit)	excellent / good (upper limit)	good / medium (lower limit)	good / medium (upper limit)	medium / weak	weak / bad	minimum	maximum	average	excellent	good	medium	weak	bad
pH	(-log[+])	7	8.5	6.5	9	9.5	10	7.38	8.40	7.94	5				
Specific conductivity	(μs/cm)	0	600	0	900	3000	5000	296	467	395	5				
Chloride ion	(mg/L)	0	40	0	60	300	500	17.0	46.0	31.7	5				
Dissolved oxygen	(mg/L)	8	0	7	0	4	3	3.8	9.9	7.3		4			
BOI <sub>5</sub>	(mg/L)	0	3	0	4	15	25	0.6	1.9	1.1	5				
KOI <sub>Cr</sub>	(mg/L)	0	15	0	25	50	75	9.6	21.0	14.8	5				
Ammonium-N	(mg/L)	0	0.2	0	0.4	2	5	0.010	0.1	0.03	5				
Nitrite-N	(mg/L)	0	0.03	0	0.06	0.3	1	0.004	0.016	0.008	5				
Nitrate-N	(mg/L)	0	1.5	0	2	25	50	0.130	0.4	0.266	5				
Total-N	(mg/L)	0	2.5	0	3	30	55	0.640	1.8	1.158	5				
Orthophosphate-P	(μg/L)	0	80	0	120	700	1500	5	30	11	5				
Total-P	(μg/L)	0	150	0	250	1000	2000	25	130	40	5				

# Main stakeholders

- Authorities
- Water Management Boards
- Water Directorate
- Regional Waterworks
- Local governments
- National Park
- Water users
- Non-governmental organizations
- Scientific organizations

# Potential conflicts among water users

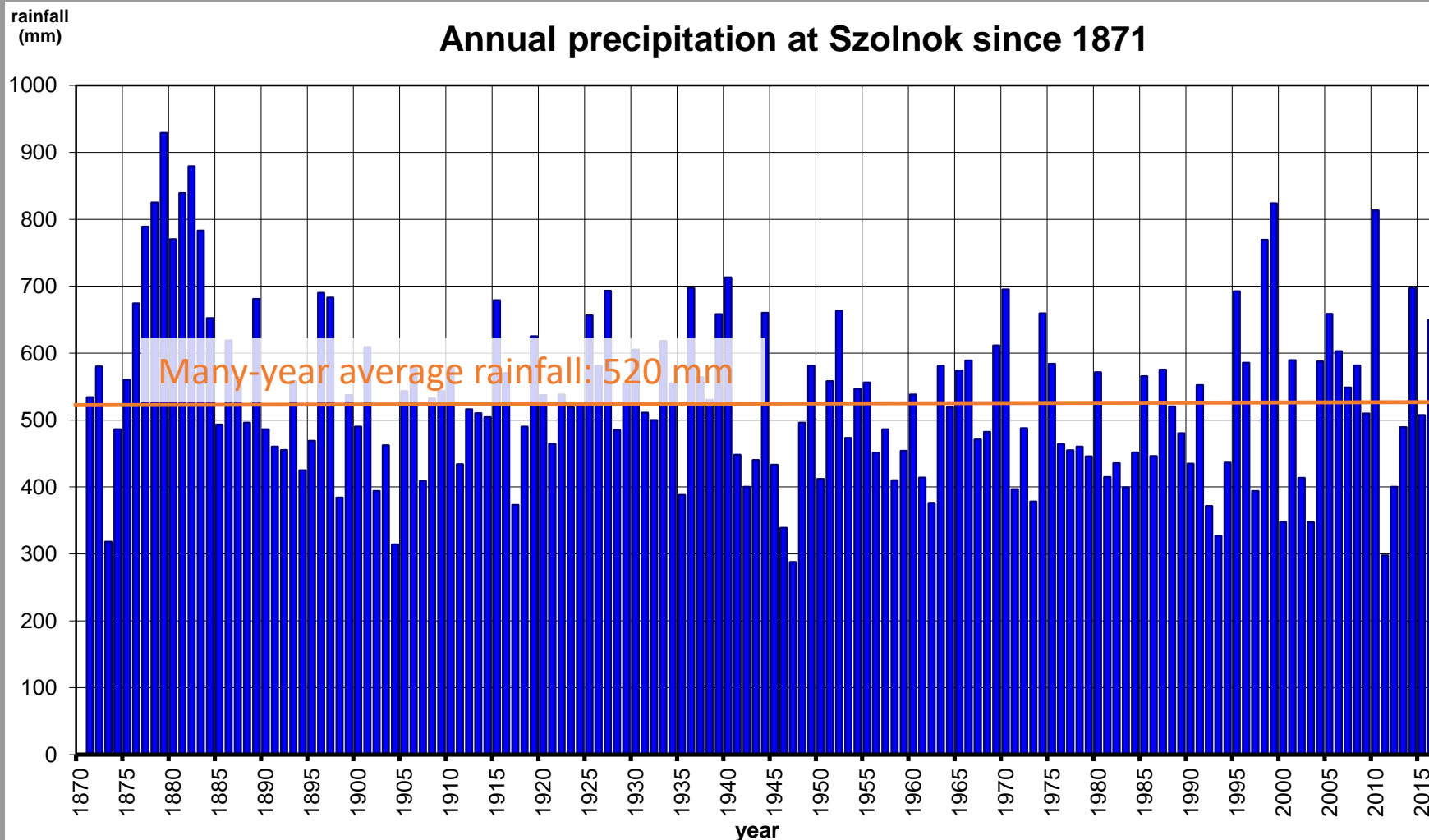
- **Resources and demands during low water periods**
  - Watercourses are reduced
  - Water level of lakes decrease
  - Groundwater-level decreases
  - Specific water demands increase
- **Water quality control**
  - Natural self-cleaning ability
  - Non-climatic effects

# Potential conflicts among water users

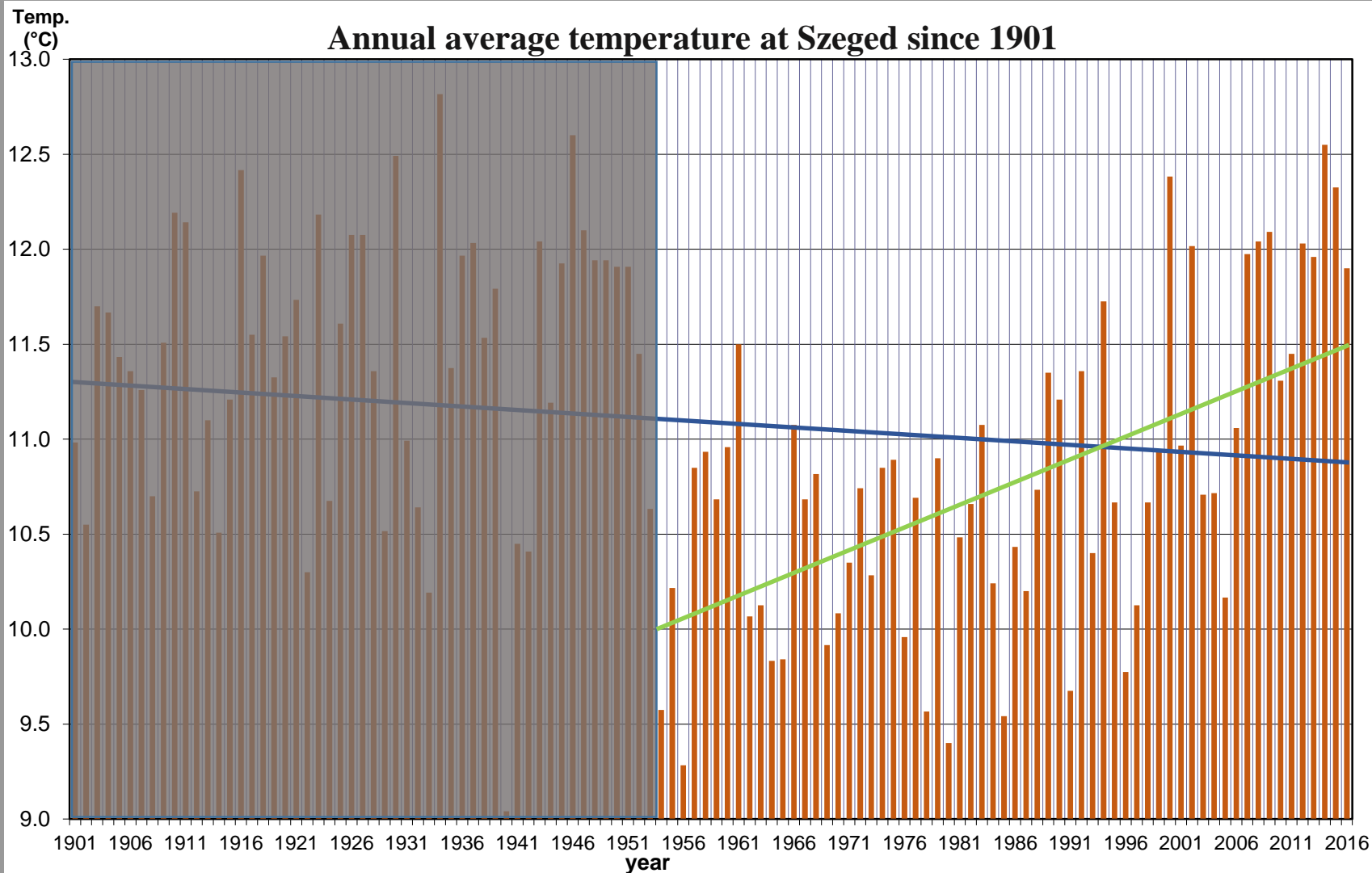
- **Pay for water**
  - Negotiate about water demands
  - Documentation about the amount of used water
  - Adaptation of the new rules
- **Territorial water management**
  - More frequent droughts
  - Demand for irrigation
  - River basin water management plans

# Climate change impacts

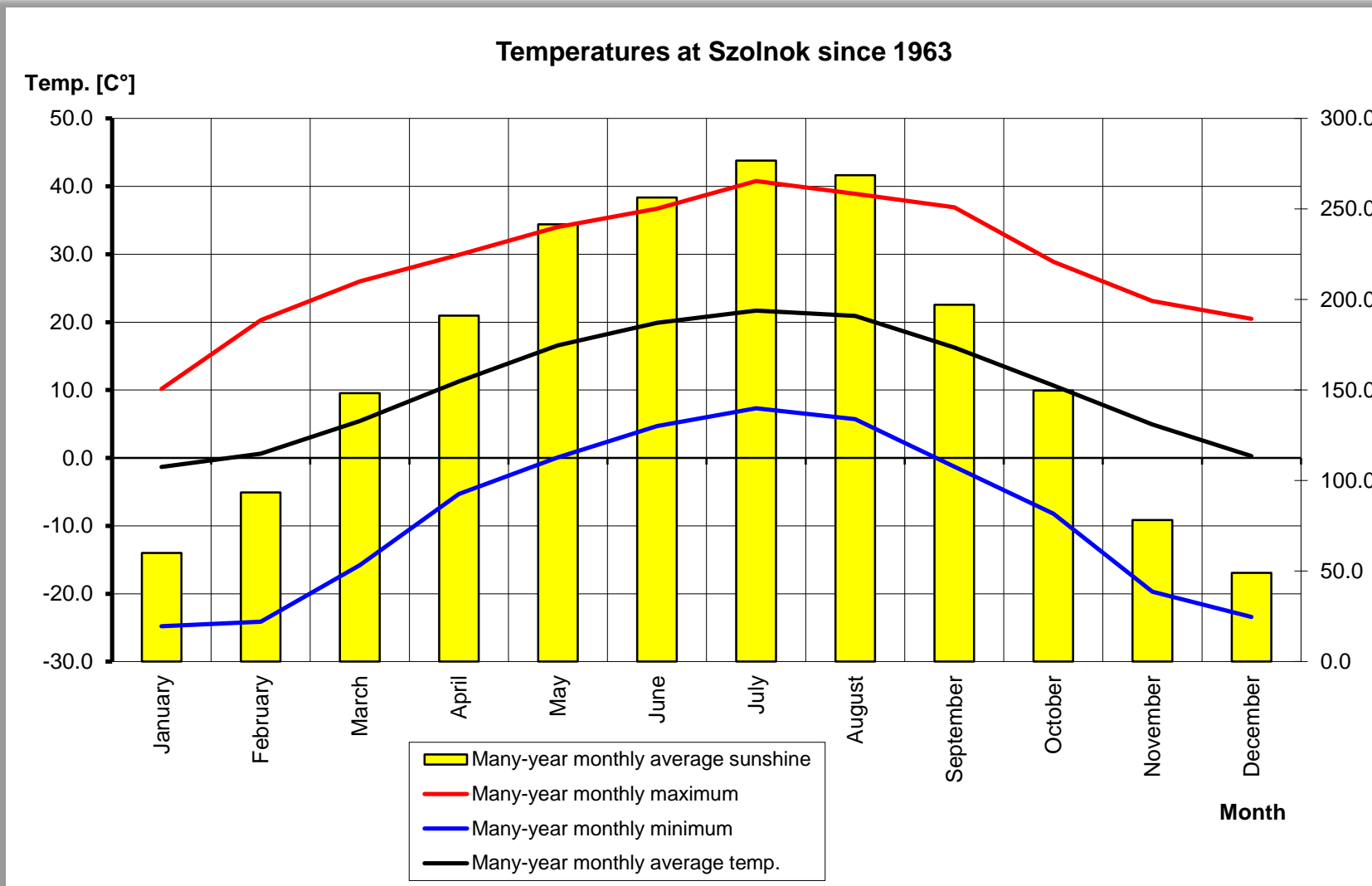
Annual precipitation at Szolnok since 1871



# Climate change impacts



# Climate change impacts



# Palfai Drought Index

$$PAI^x = k_t * k_p * k_{gw} * PAI$$

Where:  $k_t$  - temperature correction factor

$k_p$  - precipitation correction factor

$k_{gw}$  - groundwater correction factor

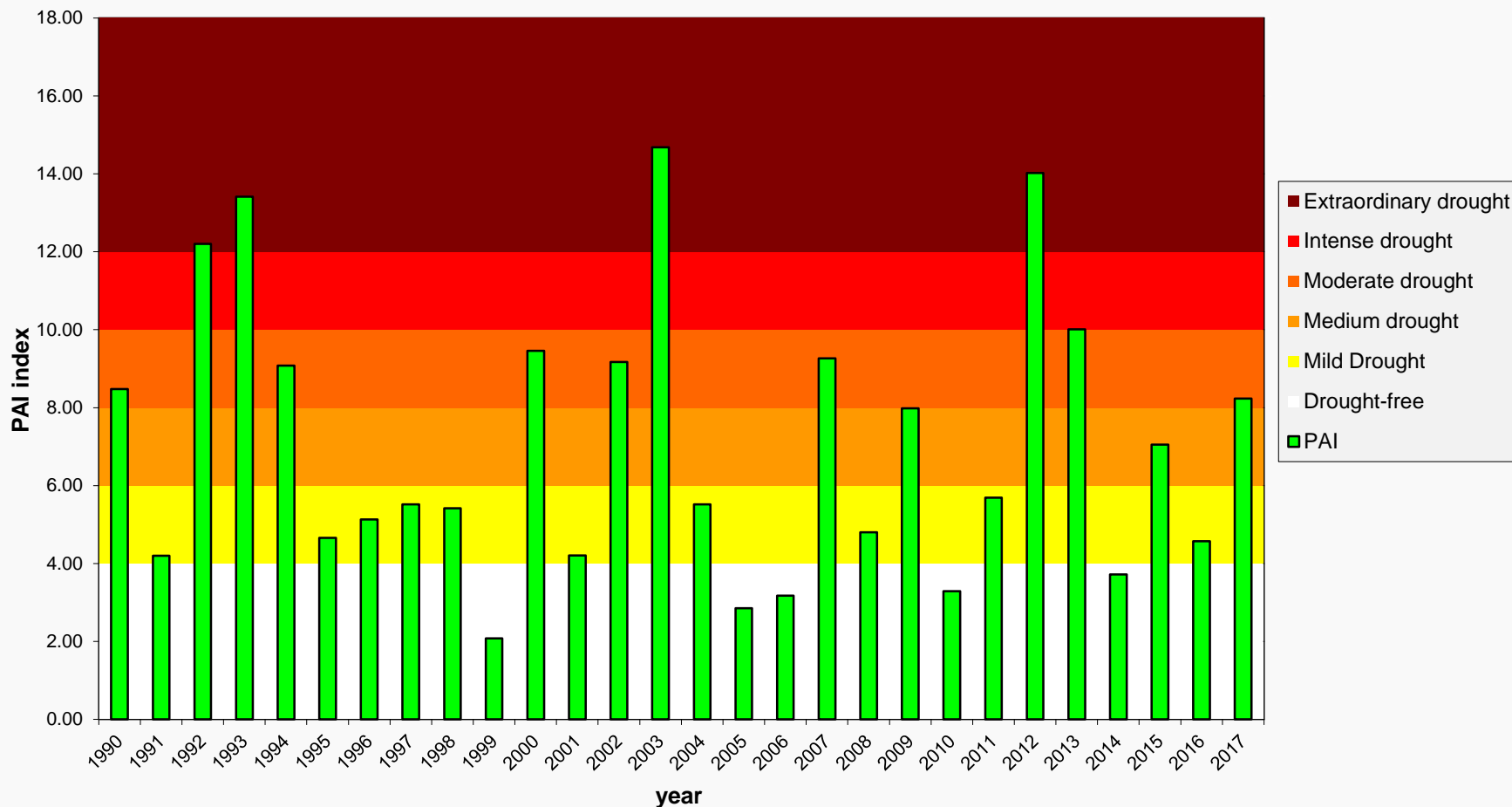
$$PAI = \frac{100 * \text{mean air temp. (from april to august)}}{\text{weighted sum of precip. (from oct. to august)}}$$

What do we need for the calculations?

- **Temperature → Number of hot days**
- **Precipitation**
- **Groundwater level**

# Climate change impacts

Drought Index - Szolnok



# Summary

- The climate of the area is very extreme
  - **There may be a serious inland excess water, followed by a severe drought in the same year**
- Extremely important to manage the water resources well in the area
- Very important to communicate with the stakeholders for this purpose

# Thank you for your attention!

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Partners: General Directorate of Water Management, Hungary | Global Water Partnership Central and Eastern Europe, Slovakia | International Commission for the Protection of the Danube River | Ministry of Water and Forests, Romania | Ministry of Foreign Affairs and Trade, Hungary | National Administration "Romanian Waters", Romania | National Institute of Hydrology and Water Management, Romania | Public Water Management Company "Vode Vojvodine", Serbia | Regional Environmental Center for Central and Eastern Europe, Hungary | The Jaroslav Černi Institute for the Development of Water Resources, Serbia | Water Research Institute, Slovakia | World Wide Fund for Nature Hungary

Associated Partners: Interior Ministry, Hungary | Republic of Serbia Ministry of Agriculture and Environmental Protection – Water Directorate | Secretariat of the Carpathian Convention (SCC), Austria | State Agency of Water Resources of Ukraine | Tisza River Basin Water Resources Directorate, Ukraine