



Alsó-Tisza vidéki Környezetvédelmi és Vízügyi Igazgatóság

**DIRECTORATE FOR ENVIRONMENTAL PROTECTION AND WATER MANAGEMENT
OF LOWER TISZA DISTRICT**

H-6720 Szeged, Stefánia 4. Phone: 36-30-349-1722 e-mail: kozakp@atikovizig.hu

Extreme flood events in the Lower Tisza Region

The relevance of the excess water

Dr. Péter Kozák Ph.D

Director

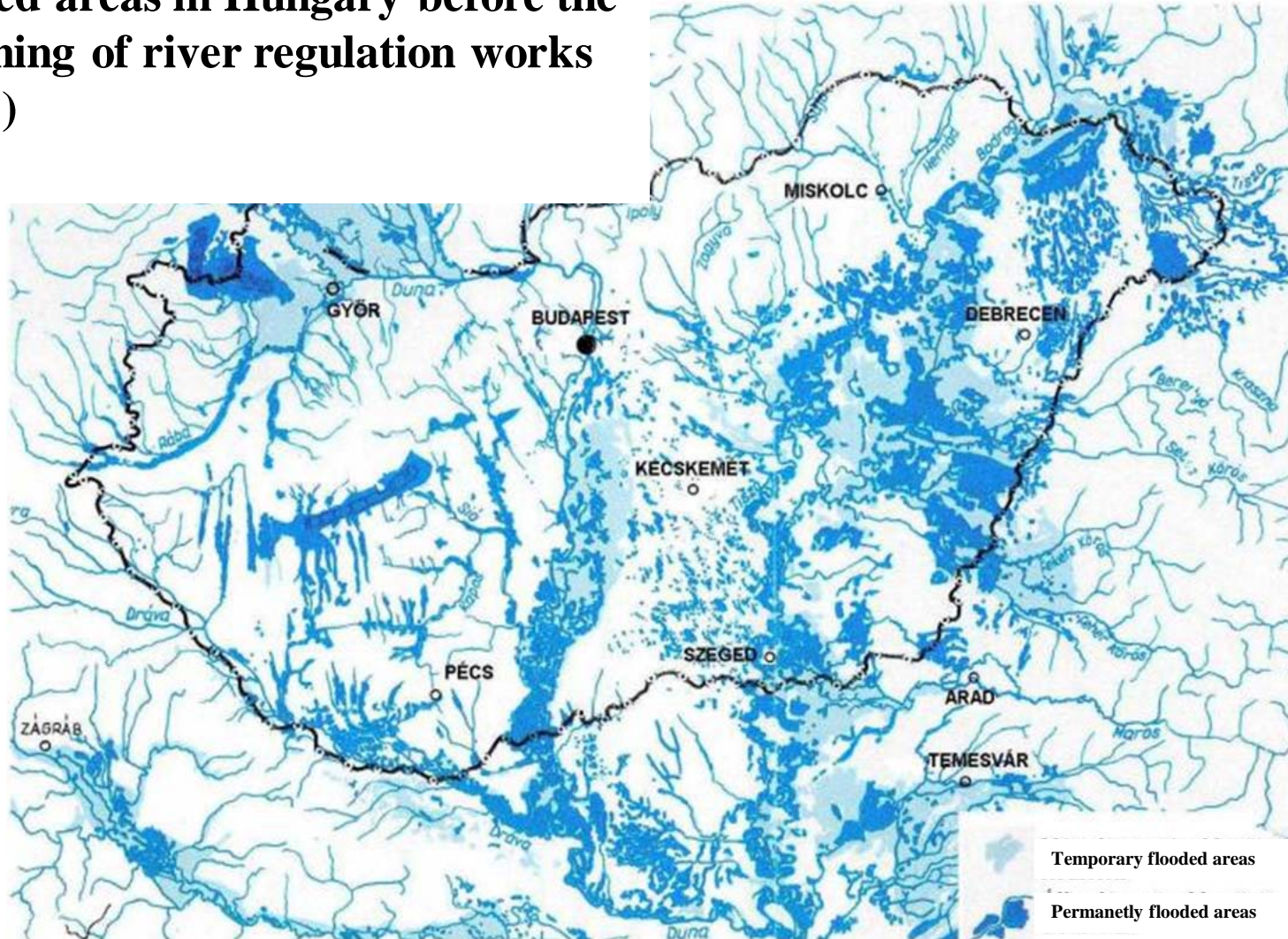


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Flooded areas in Hungary before the beginning of river regulation works (1846.)



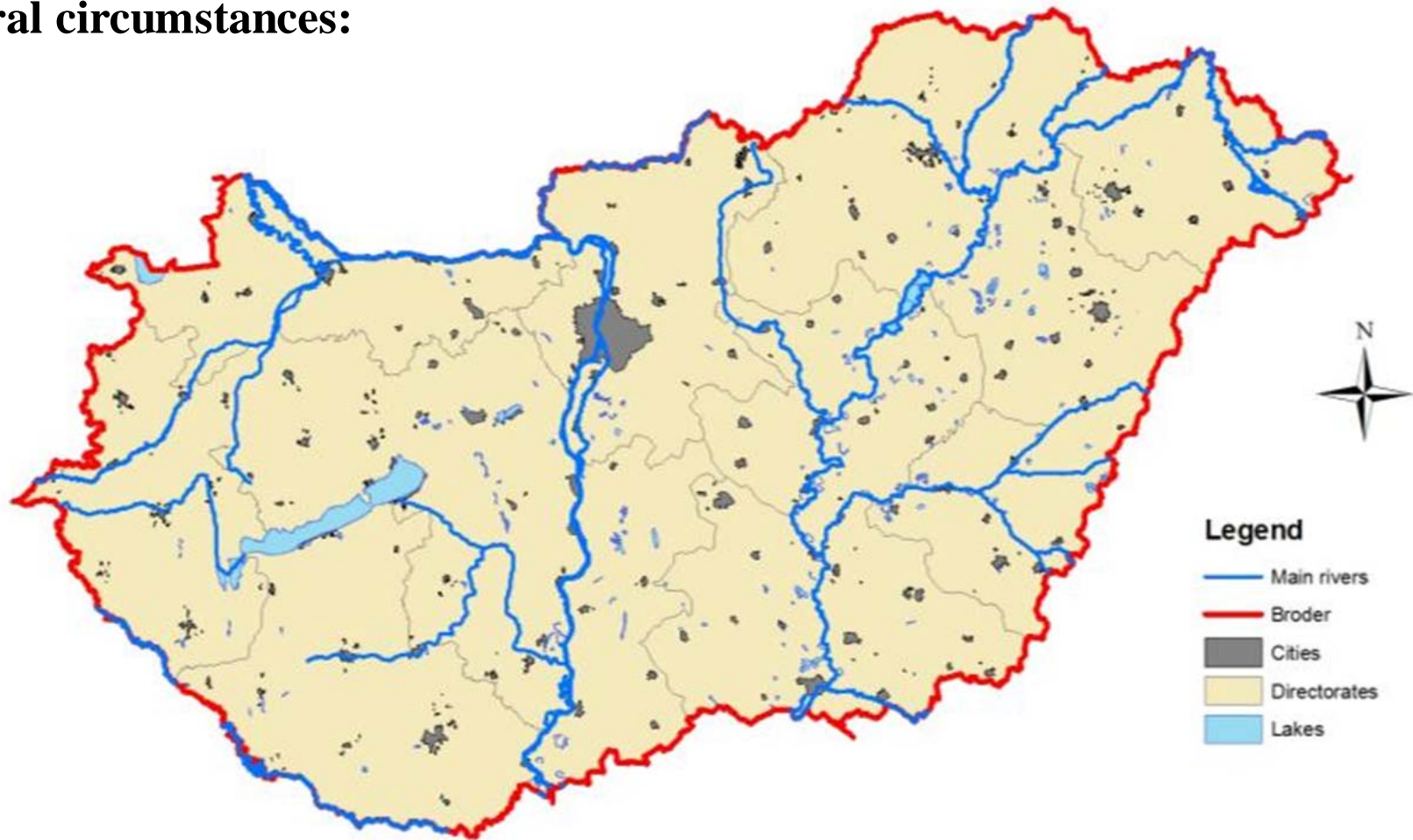


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Natural circumstances:



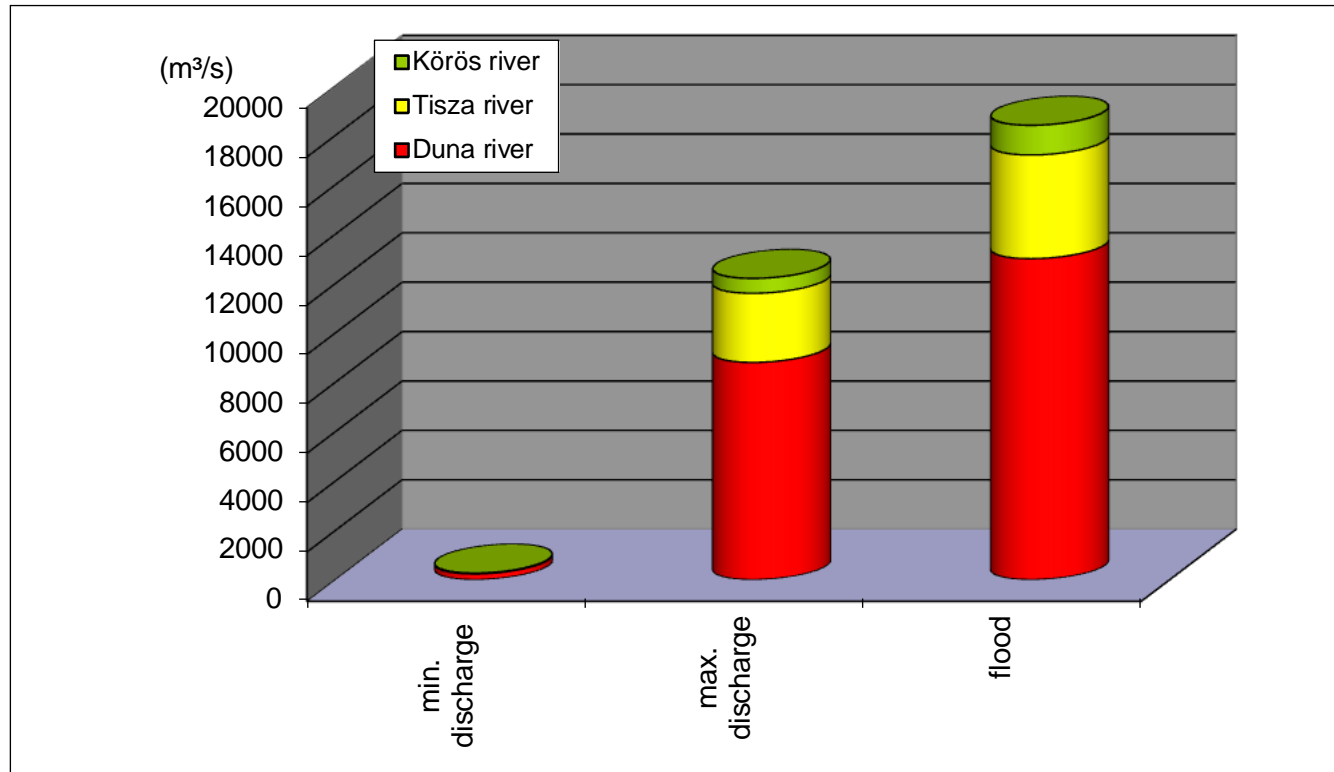


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Natural circumstances:



River name	min. discharge	max. discharge	flood	quotient
Duna	235	8800	13000	55
Tisza	30	2800	4200	140
Körösök	0,9	600	1200	1 333

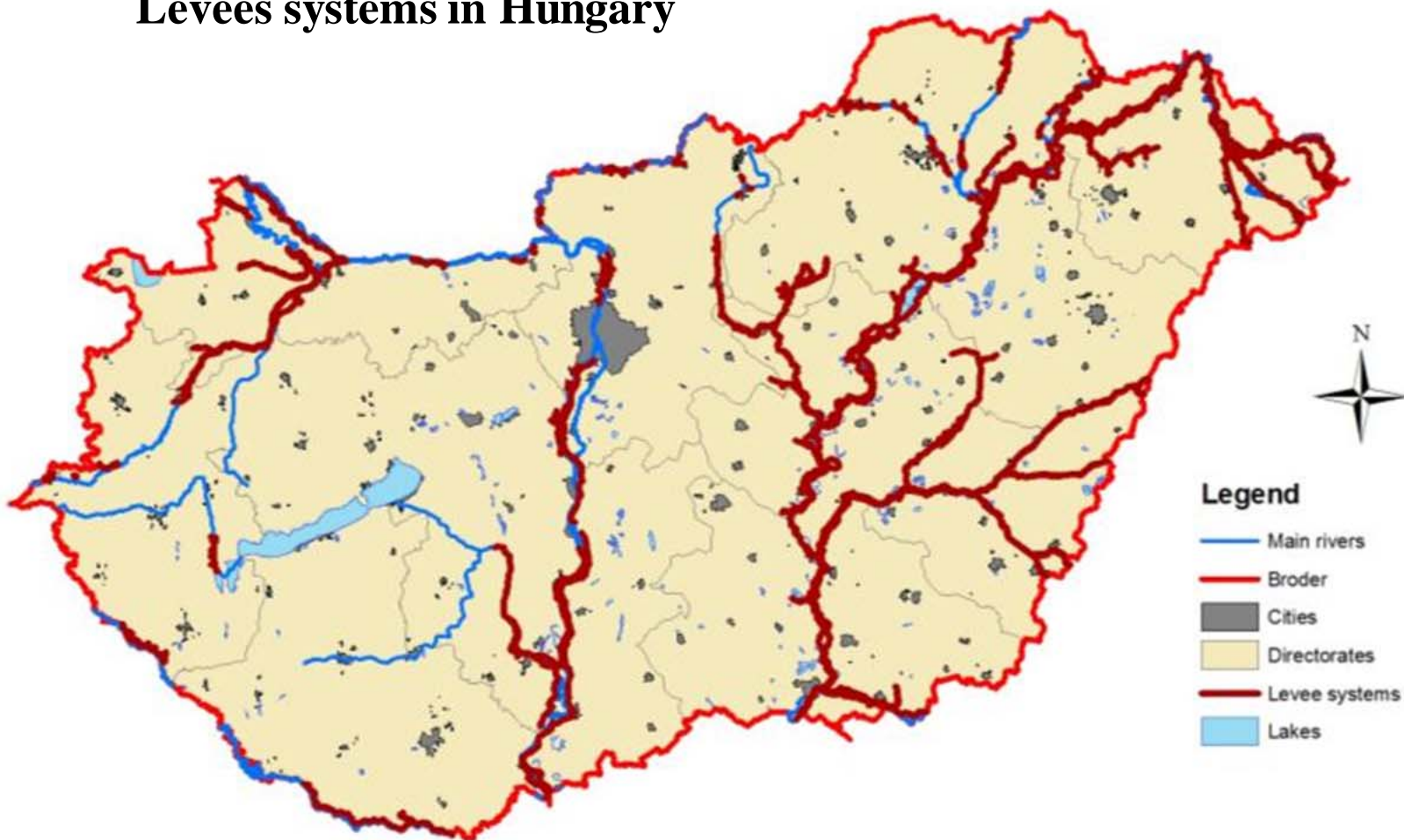


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Levees systems in Hungary





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The **regional directorate for environmental protection and water management** based on 12 sub-basins were directed by the Ministry of Environment and Water (KvVM).

Since the 1st January, 2004 the National General Directorate for Environment, Nature Protection and Water (VKKI) was established by the Government. The 12 local directorates are financed by the KvVM from the state budget.





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Water Management Directorates activities in water management:

- tasks of water management and relationships with river basin development
 - prevention and protection of water damages (floods, excess surface water, water scarcity (drought), water quality damages)
 - water uses – irrigation
 - operating activity of water drainage systems (canals, pump stations)
 - hydrologic monitoring
 - preserve of the future drinking water bases
 - regional development plans for sewage treatment plant
 - inspection of the State Program of drinking water, sewage
 - others
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I. Types of flood events:

- Excess water
 - Floods
-



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II. Excess water:





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II. Excess water:

The excess water occurs inundations on the surface, or make full the ground layers and these waters don't flow away on natural (gravitational) way.

The excess water depends on

Natural circumstances:

- meteorological conditions (temperature, precipitation),
 - morphological conditions (altitude, geographic structure, convexity),
 - soil (permeability, physical structure, reservoir ability, type of soil),
 - hydrogeological conditions (ground water level state),
 - geological conditions (soil format rock, impermeable layer statement)
-



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II. Excess water:

The excess water occurs inundations on the surface, or make full the ground layers and these waters don't flow away on natural (gravitational) way.

The excess water depends on

Artificial facilities (results of human interventions)

- drainage system (capacity of the system at excess water's time, its construction, backwater effect)
 - agricultural conditions (irrigation, used agricultural technologies, type of cultivated plant)
 - increasing of the settlements areas.
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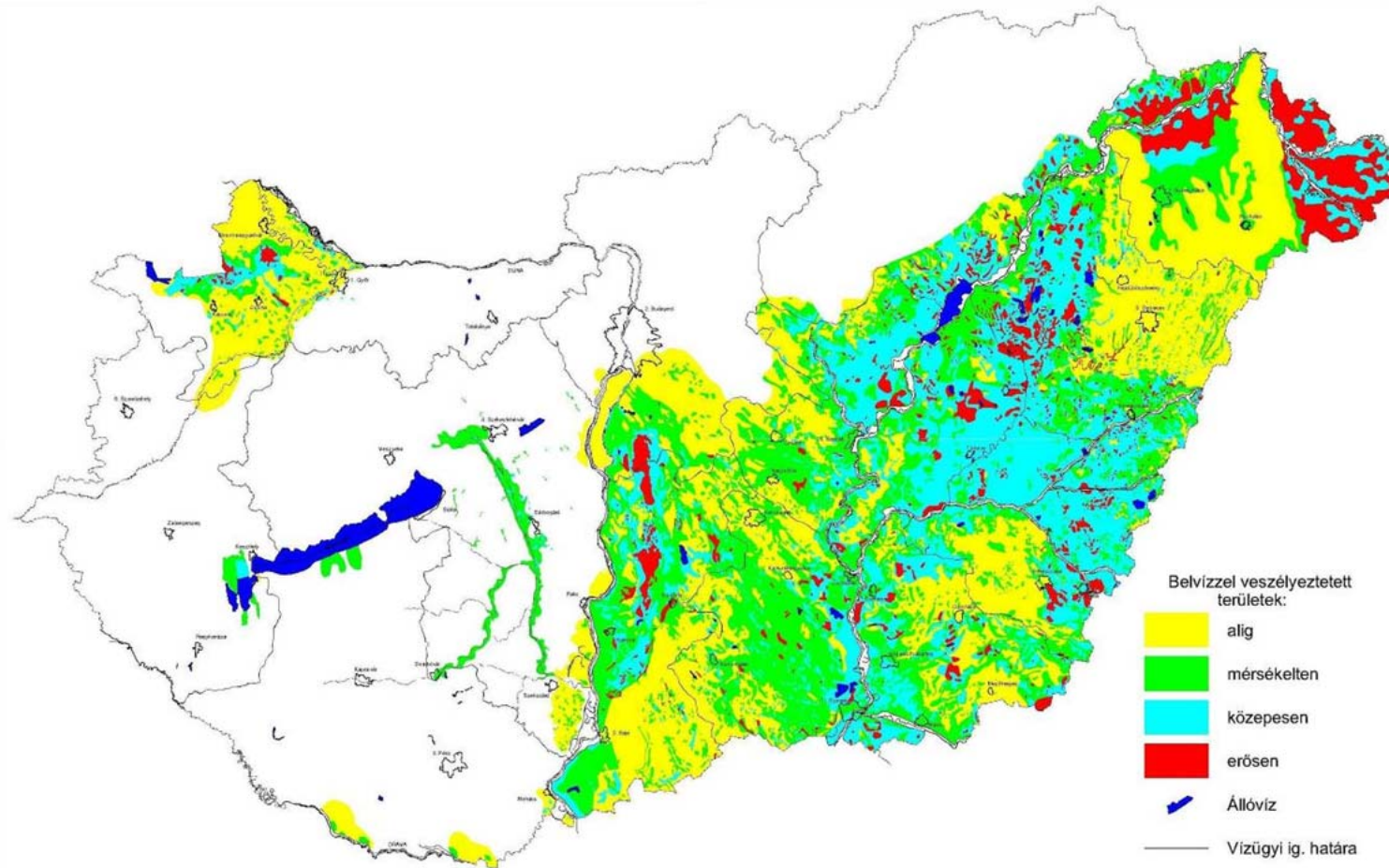


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The current state of excess water is a result of dynamic and static factors.



Dr. Palfai designed a map of endangered areas by excess water in Hungary



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The current state of excess water is a result of dynamic and static factors.

General data in Hungary:

Maximum area of excess waters: 600.000, hectares (1942)

Maximum area of inundations in 1999: 400.000, hectares

ACTUALLY: 230.000, hectares (9.12.2010)

in our region: 70.000, hectares

Seasonality:

- *in spring frequently,*
 - *in summer at the local downpour (dangerous for the agricultural culture, because usually the cultivated plants stage of development are high and they can't tolerate the inundations),*
 - *in autumn very rare.*
-



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II. Prevention and mitigation of Excess water:

Damages of excess water:

- Direct damages in the agricultural sector by the inundations.
 - Damages in the structure of soil with physical and chemical consequences.
 - Damages due to the delaying of the agricultural works.
 - Damages in the settlement's flooded areas. (!!!!!)
-



II. Prevention and mitigation of Excess water:

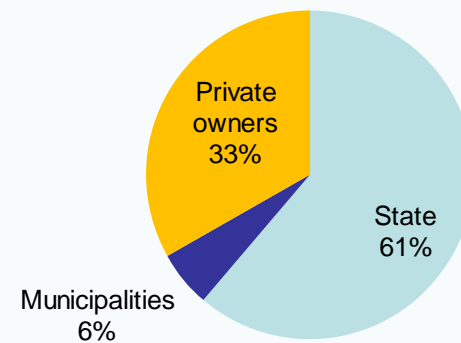
Drainage system:

A system of the ownership of a drainage system has a strong connection with the land ownership. The drainage systems have property of municipalities in the settlements.

Types of owners:

- Private,
- Municipality,
- State – Government,

Percent of lengths of drainage systems by owners





II. Possibilities for mitigation of excess water

- excess water always will arise when the circumstances prevail that,
- the mitigation is possible only for the excess water damages

for this reason:

- ➔ building reservoirs for exemption of lower areas of catchment,
- ➔ to make possibilities for of water conveying water to another sub-catchment (parallel runoff-ways).

- integrated solution in connection with the excess water:

reservoirs with long residential time which are able to retain the excess water allowing of the water utilization (for irrigation or nature conservation)

These solutions are very sensitive on the water quality conditions!!



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Thank for your kind attention!