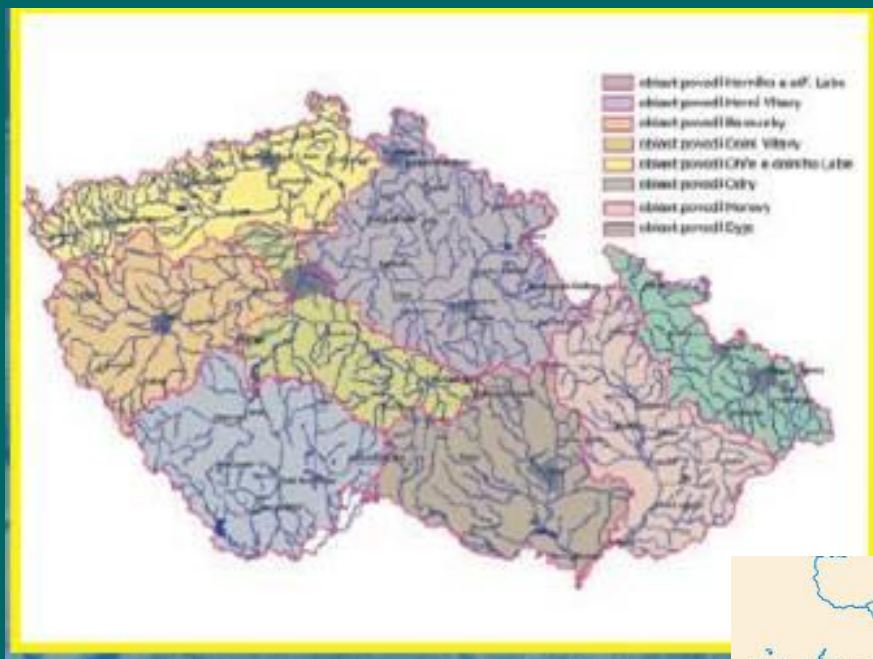


# Dyje River – Břeclav, Morava River – Olomouc

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River Morava  
River Dyje  
catchment





# Two rivers – two towns – Břeclav - Olomouc

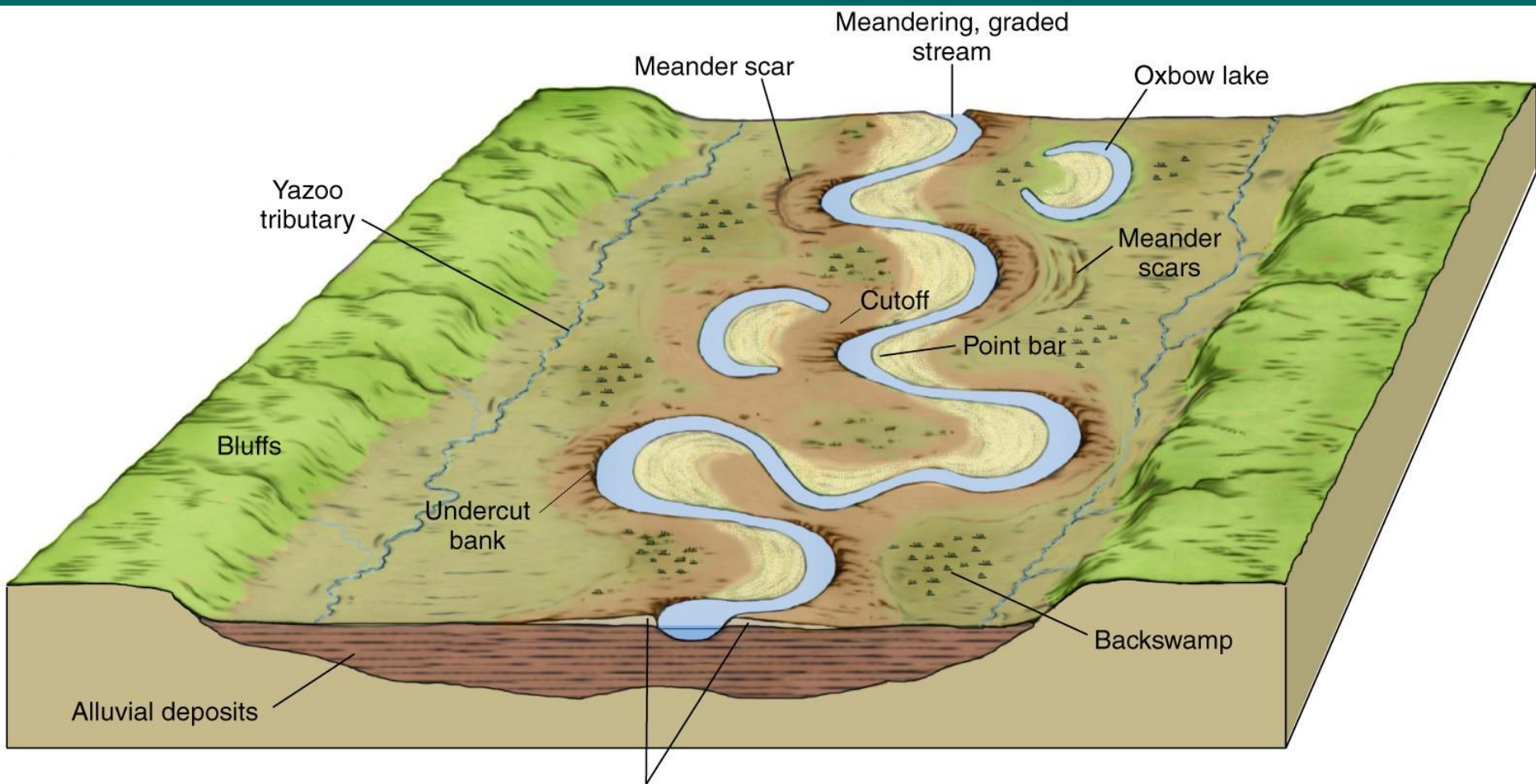


# Ecosystem services

## The river - the floodplain – the catchment

- provides a wide range of services ...
- floodplain is a type of landscape
- floodplain is formed - created - modified by flood
- flooding continually reworks and reshapes the physical floodplain structure





Natural levees  
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# The landscape structure - terminology

- internal arrangement, internal configuration
- composition at different levels

that depends on units definition

- (1) primary - **natural structure**, example: habitats, biotopes, geological structure, structure of floodplain features
- (2) secondary - **civilizational structure**, example: land use, transport infrastructure
- (3) tertiary – structure of territories defined by statute (by law, act), example: protected areas

**Flood, floodplain and civilizational structure**









Flood in the city





Veltrusy 2013



# Is the flood a useful ecosystem service for nature but not for civilization?

- solutions of flood danger are different
- ecosystem services of rivers (Dyje, Morava) and catchments are different







Spring of Morava river – CHKO Jeseníky





bicycle path – NP Podyjí

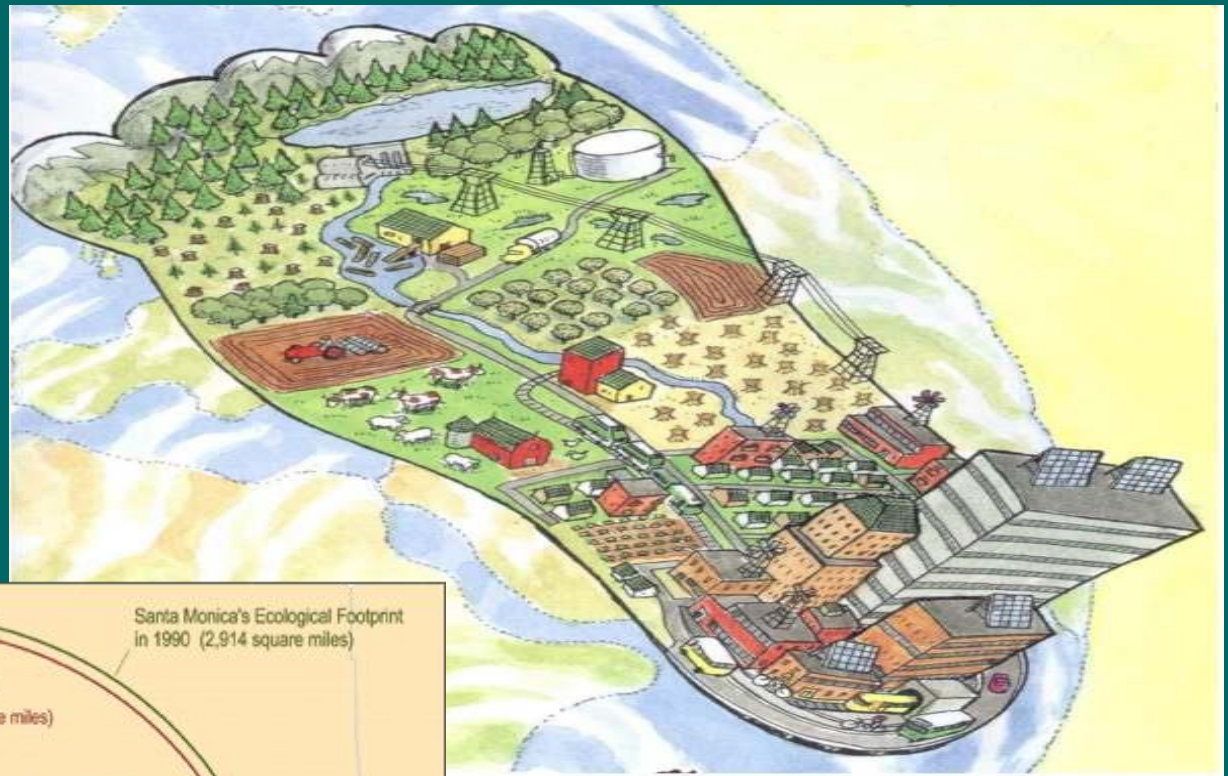




Canoeing - the traffic jam – Vltava river



# the ecological footprint of one city



not only the built-up area, but the entire catchment area



# A study on flood problems from the spring to the mouth of river



Spring of river Dyje  
in the highlands



Telč city



# Oblast povodí Dyje

Stanovená záplavová území

## Legenda

-  Vodní toky se stanoveným záplavovým územím
-  Plochy rozlivů  $Q_{100}$
-  Vodní toky
-  Vodní útvary povrchových vod - stojaté
-  Hranice vodních útvarů povrchových vod
-  Pracovní čísla vodních útvarů povrchových vod
-  Hranice oblasti povodí Dyje
-  Hranice České republiky
-  Hranice krajů
-  Obce s rozšířenou působností
-  Les





Where is Deutche Thaya?



Kollmitz







Dyje river  
Austria – Thaya river  
Moravian Dyje  
Deutche Thaya

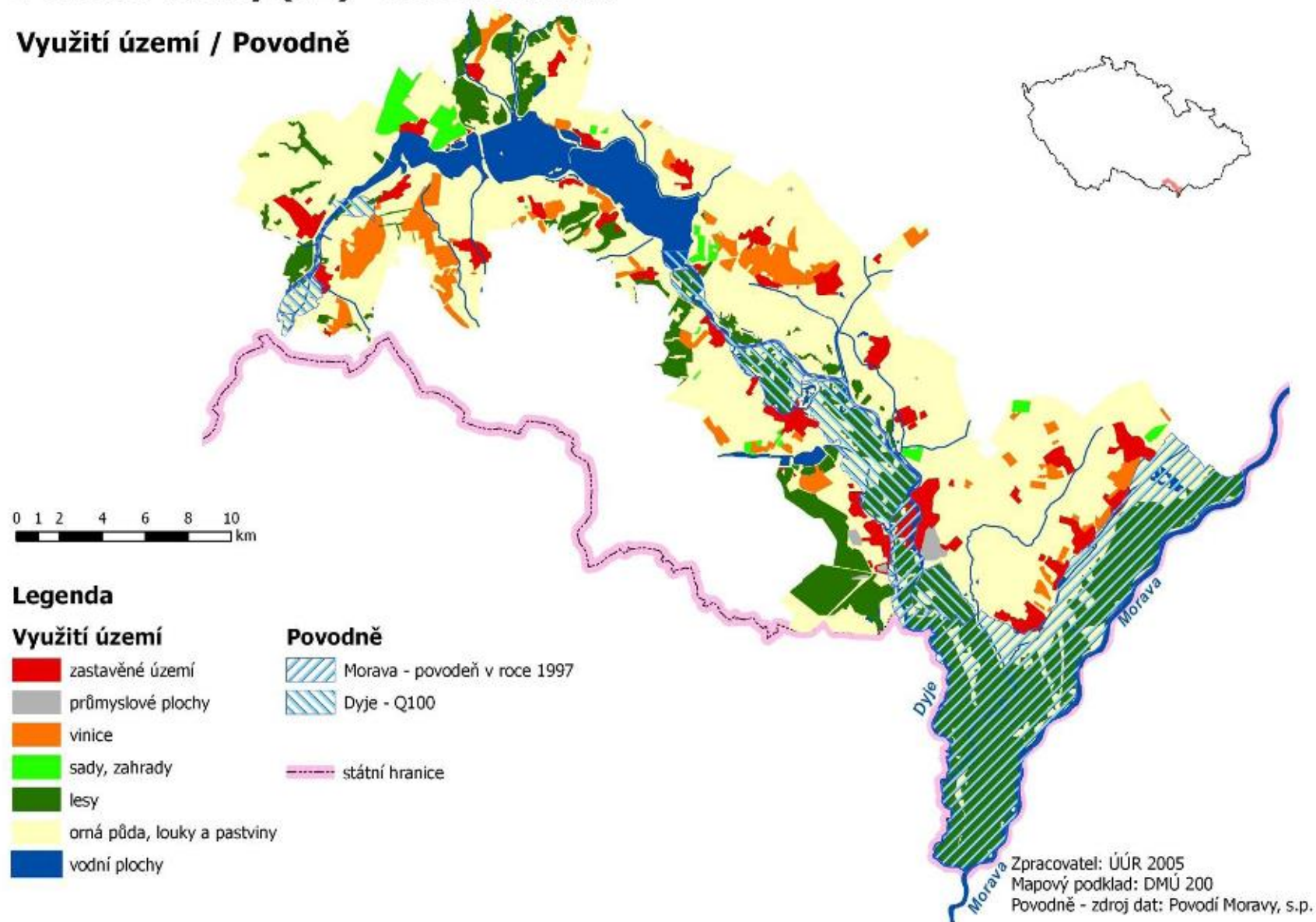




# What we can study?

## Povodí Moravy (CZ) - řešené území

### Využití území / Povodně





# The artificial lake - reservoir VDNM 1994





vdnm - Pavlov





Flooded Oak trees in  
Winter.

In the background the  
Landscape  
protected area  
Palava.











As the highlands erode due to weathering and water flow the sediment from the hills is transported to the lower plain. The Mud in the Lake.



# The construction of the Island inside the large Lake.











The deposition of river sediments - the construction of the Island inside the Lake. As the sediments are deposited during flood conditions in the floodplain of a creek, the elevation of the floodplain will be raised. It reduces the river floodwater capacity.



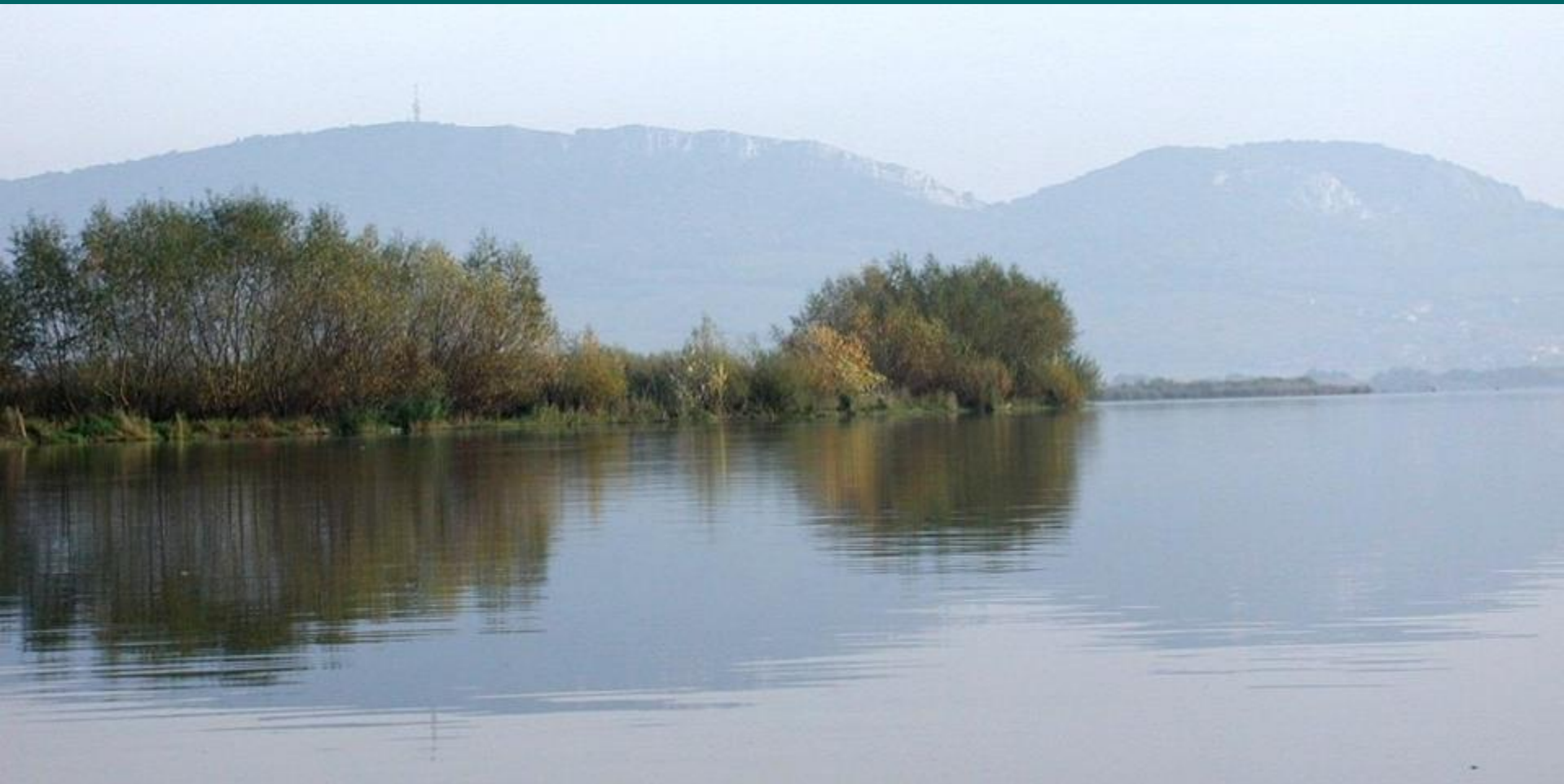
# VDNM 1994 -2004



change

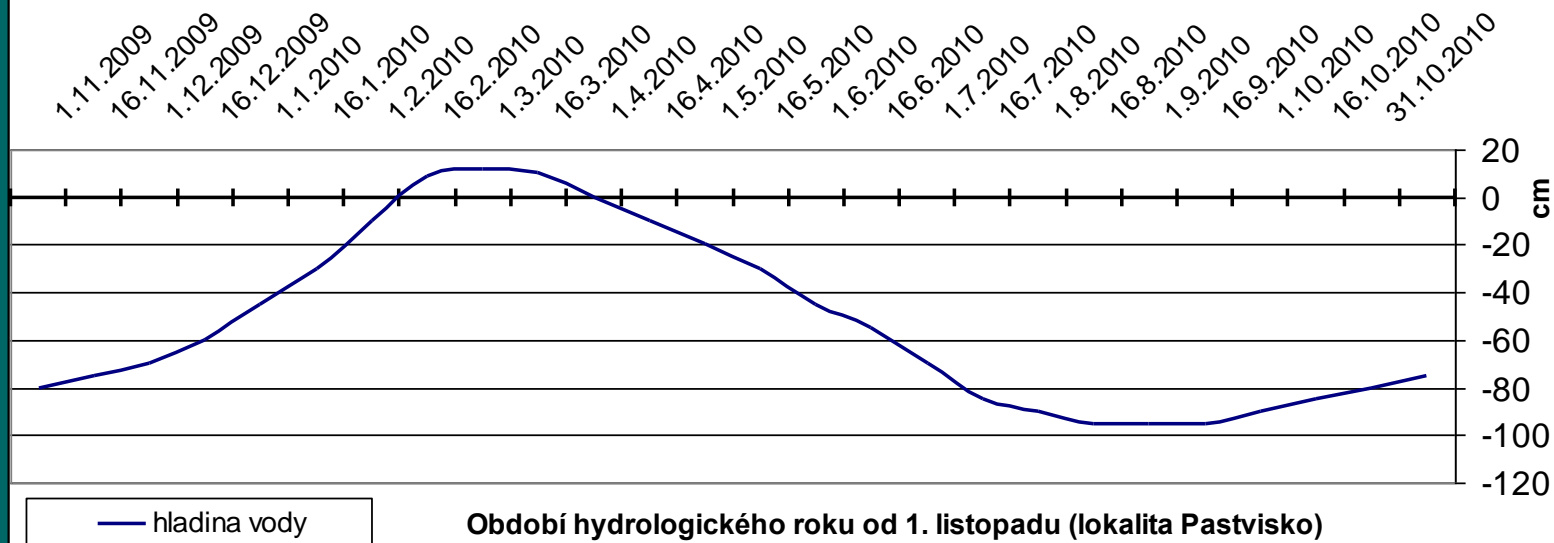


First Island – the future bio-corridor.  
Plants - trees inside the lake.





## Měkký luh - roční průběh úrovně hladiny vody (Láznička, Sobotková 2010)







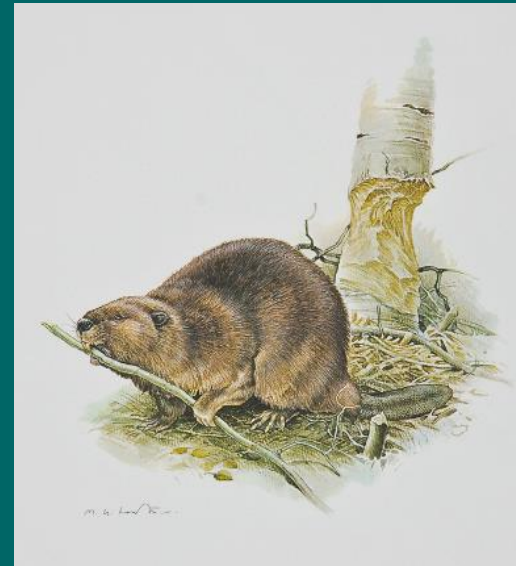
Water gate







Beaver dam ...





# Beaver dams in fluvial agricultural landscape



The growing European beaver (*Castor fiber*) population in the area of the Dyje river flood plain stabilized in 2006-2015 at around 60-80 family groups.



As a result, the water levels in the upper part of the catchment area were raised, to the general benefit of the beavers living there, but the beavers living in the lower part then experienced a corresponding lowering of water levels and suffered from a shortage of water.





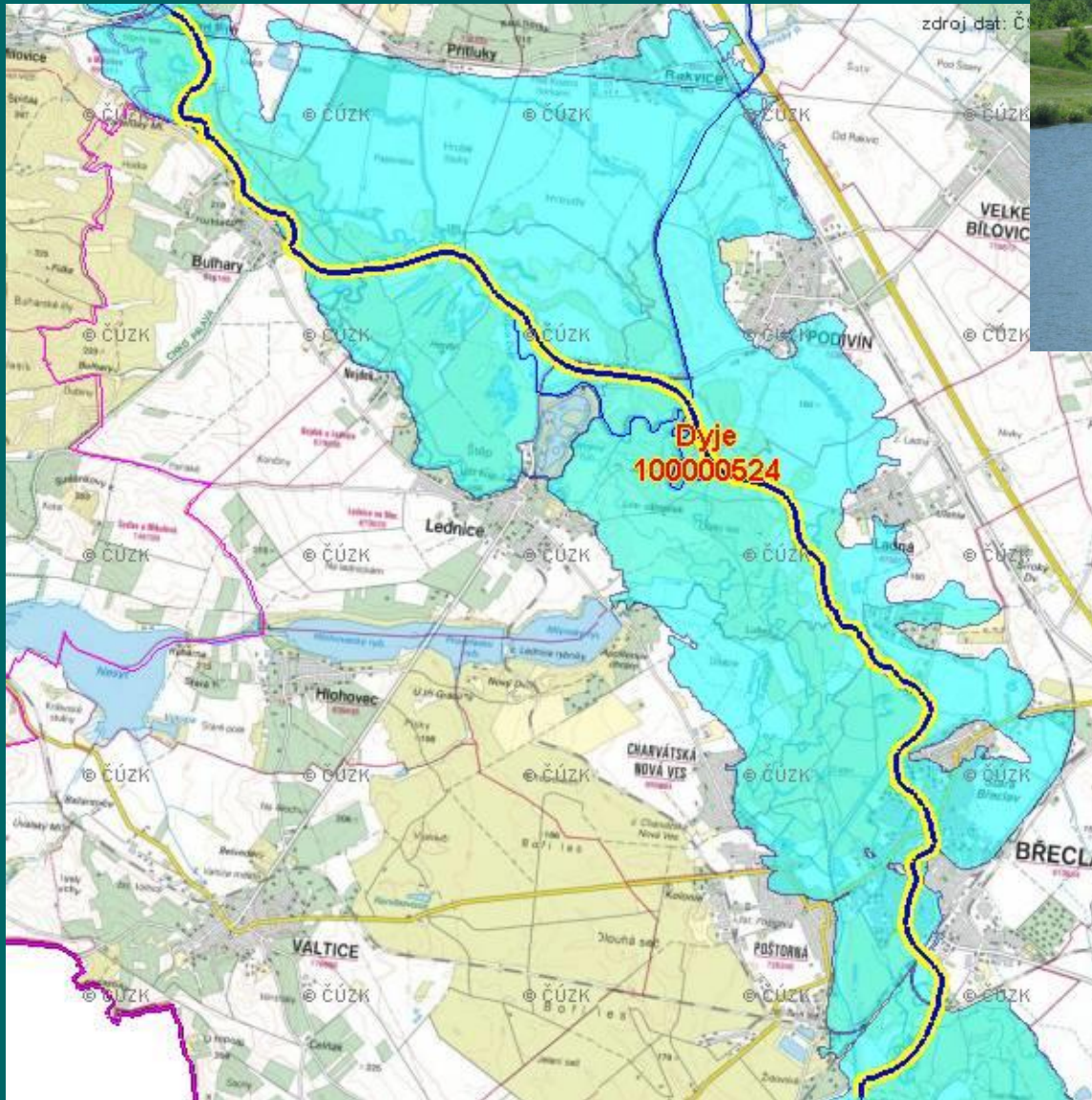


The beavers constructed 22  
dams along 12 km of water  
canals





# The water retention



water inlet

tertiary structure:  
territories defined  
by statute (by law,  
act)  
Floodplain by act  
versus primary -  
natural structure







# 2006 - Landscape park Lednice



03.04.2006 - záplavy - v pozadí minaret



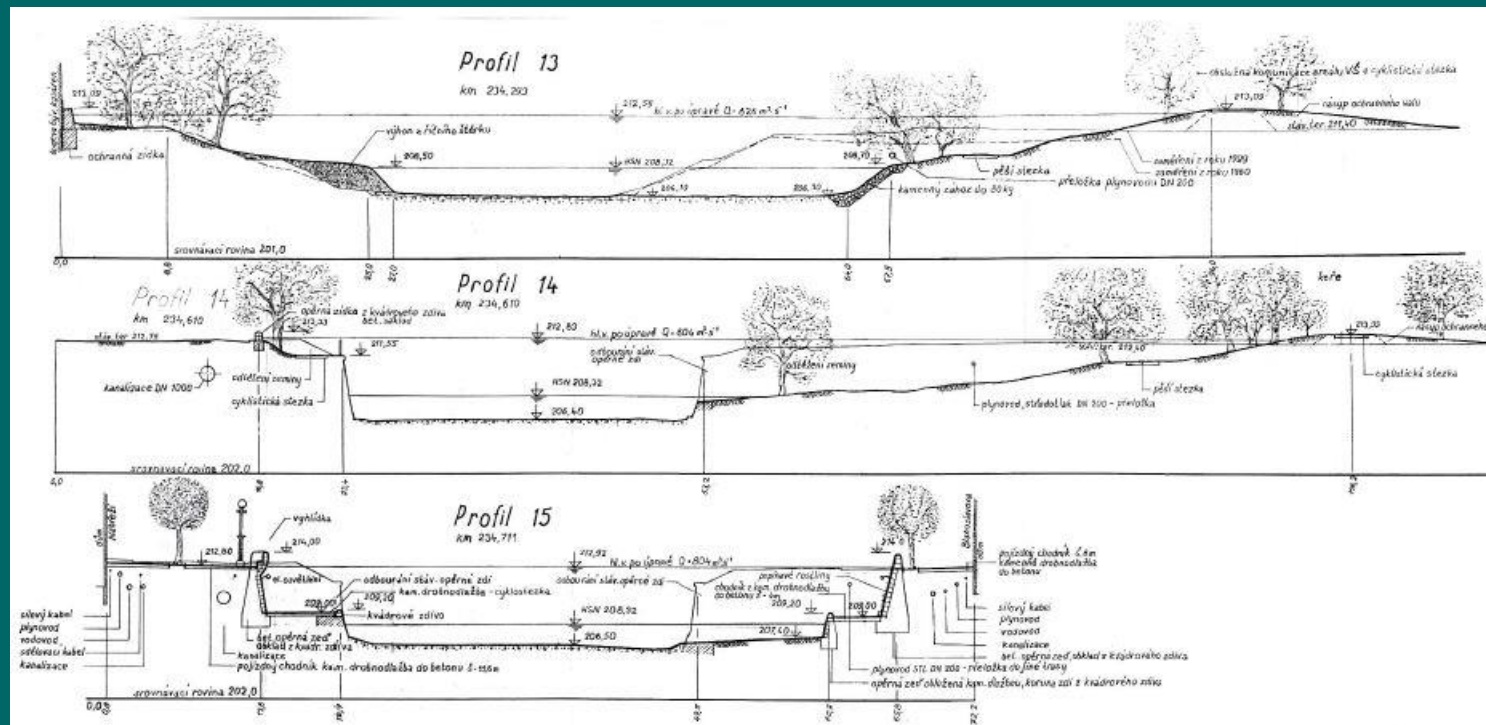


Secondary channels are a good solution to relieve the pressure from the River Dyje during high water levels. The new secondary channel will be located on the right side of Breclav and will end in the flood forest downstream of Breclav.





# Olomouc Morava – transverse profiles – how to increase the river bed capacity







**Thank you for your attention**