

# Monitoring and modelling of sediment transport at the Slovak-Hungarian section of the Danube river

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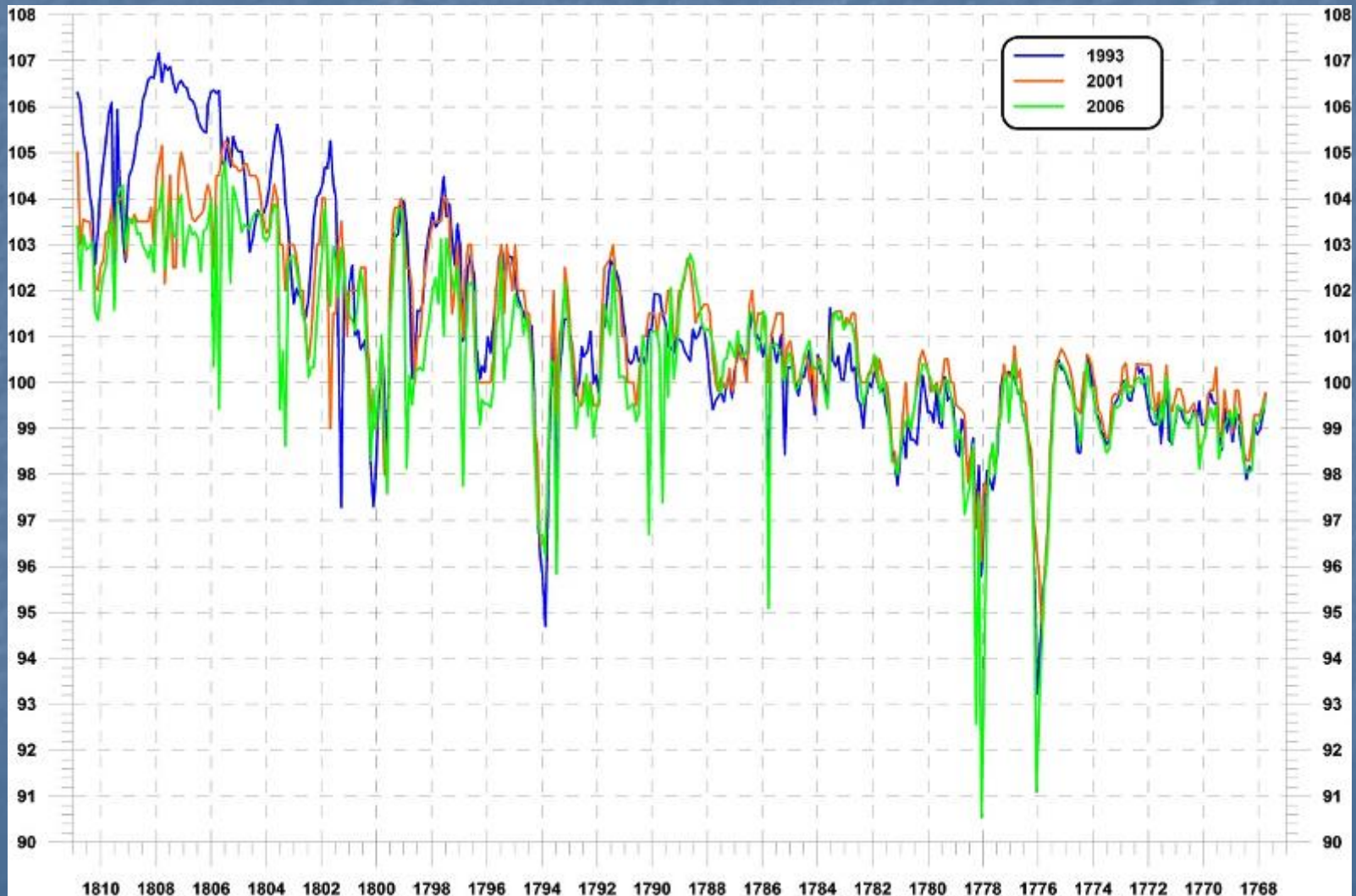
Water Research Institute Bratislava, Slovakia



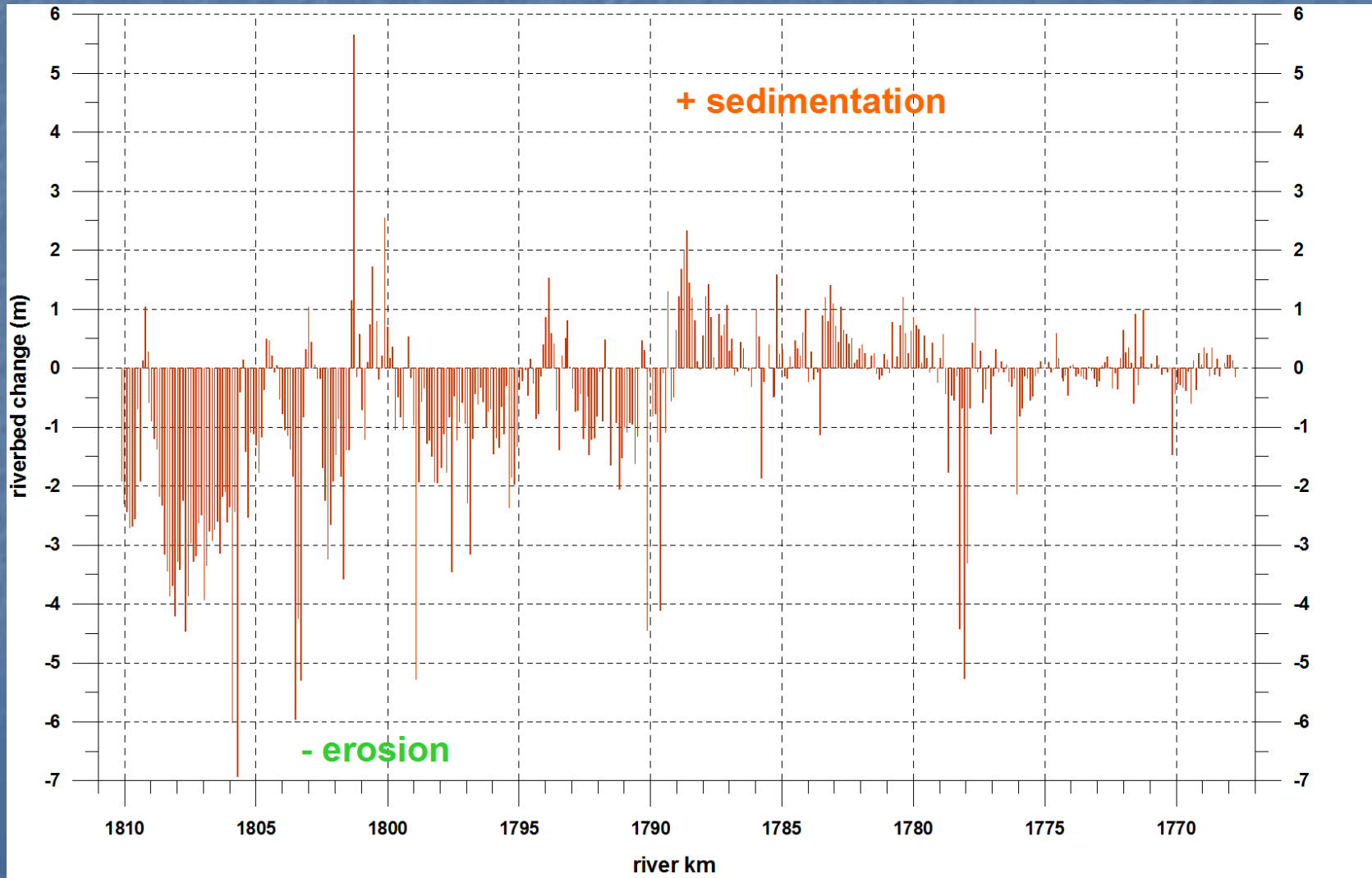
# Negative consequences of non-equilibrium sediment transport

- Sedimentation of reservoirs
- **River bed degradation**
- Threat to stability of water structures
- Decrease of flood protection
- Deterioration of navigation conditions
- Decrease of water quality
- ...

# Morphological development of the Danube riverbed



# Morphological development of the Danube river bed



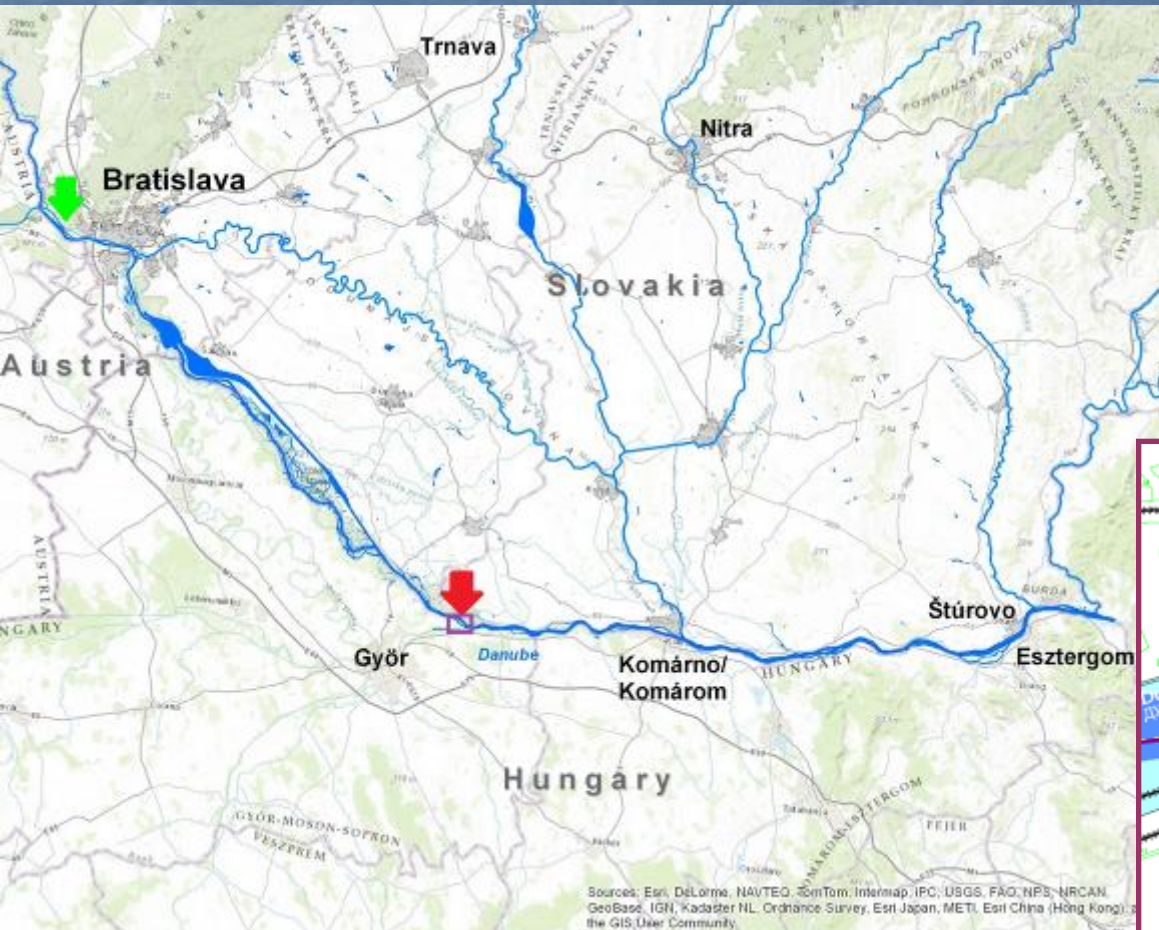
# Bedload regime on the Danube – field surveys



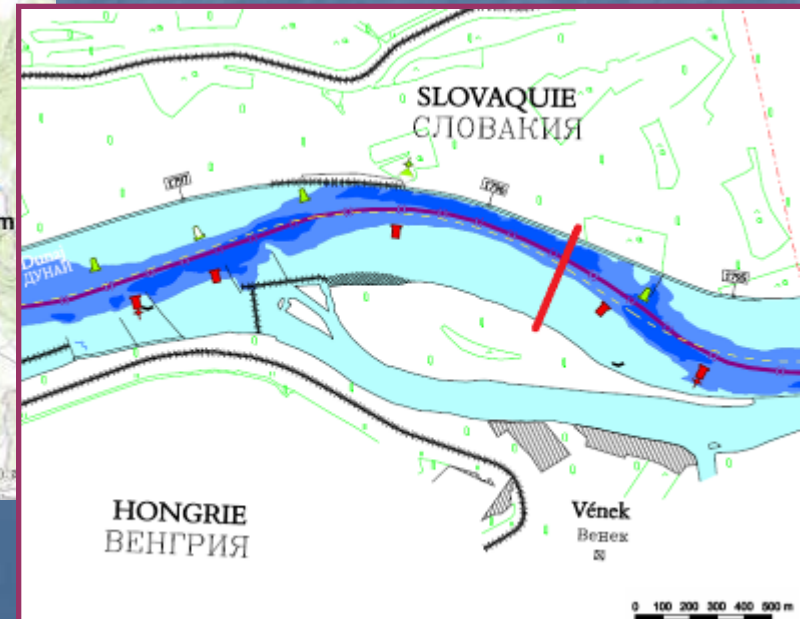
downstream of Devin (1998-2003)



downstream of Sap (2000-2002)



Sources: Esri, DeLorme, NAVTEQ, Swisstopo, Intermap, IPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community



# Searching the most proper bedload sampler for the local Danube river conditions



**Helley-Smith (big size)**



**VUV sampler (Novák 1957)**

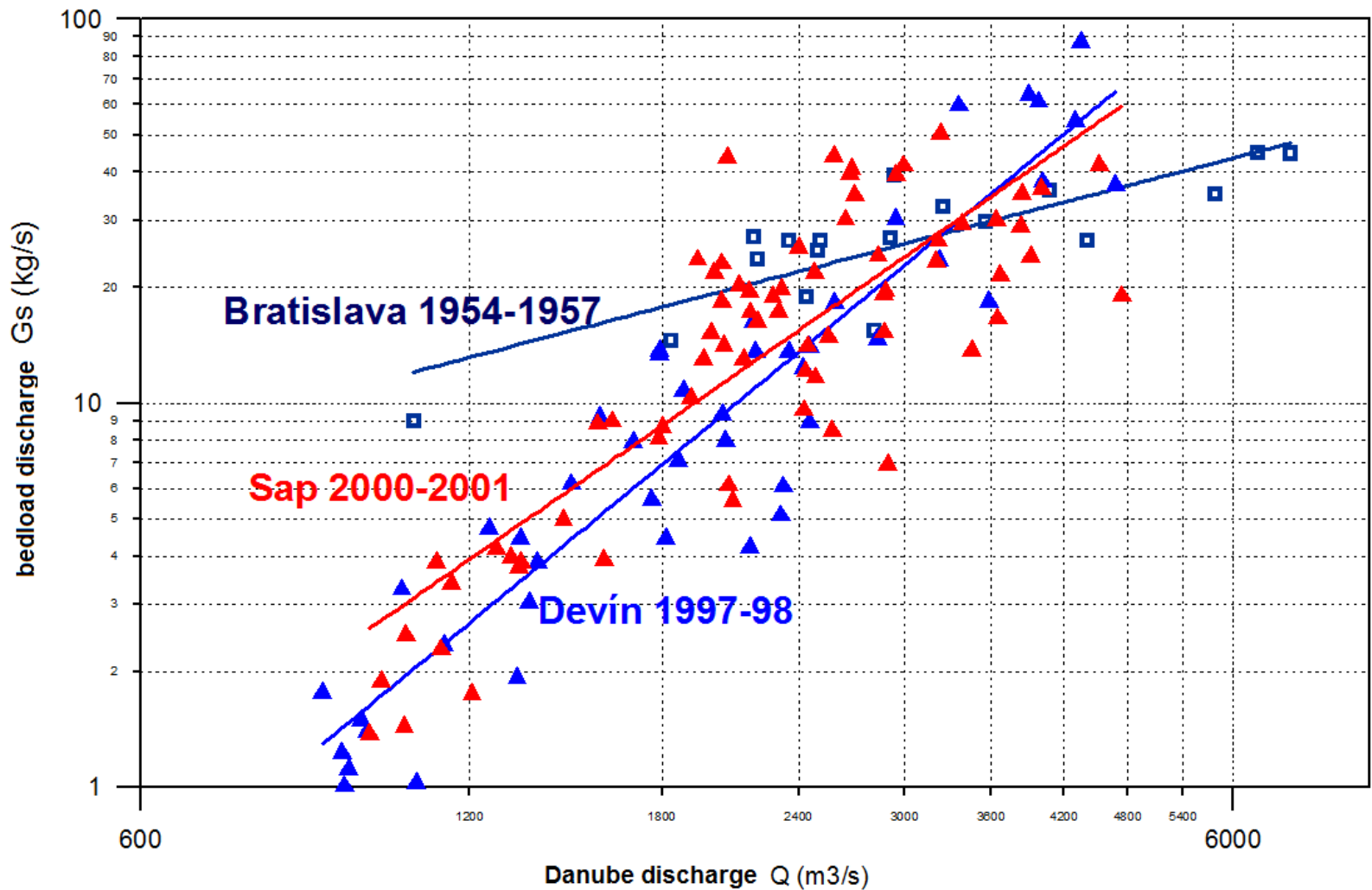


**basket sampler (Swiss type)**

# Bedload regime on the Danube – field surveys



# Bedload rating curves



# Suspended load regime on the Danube – field surveys

**Occasional survey** (research projects): measurements in the whole cross section – several verticals

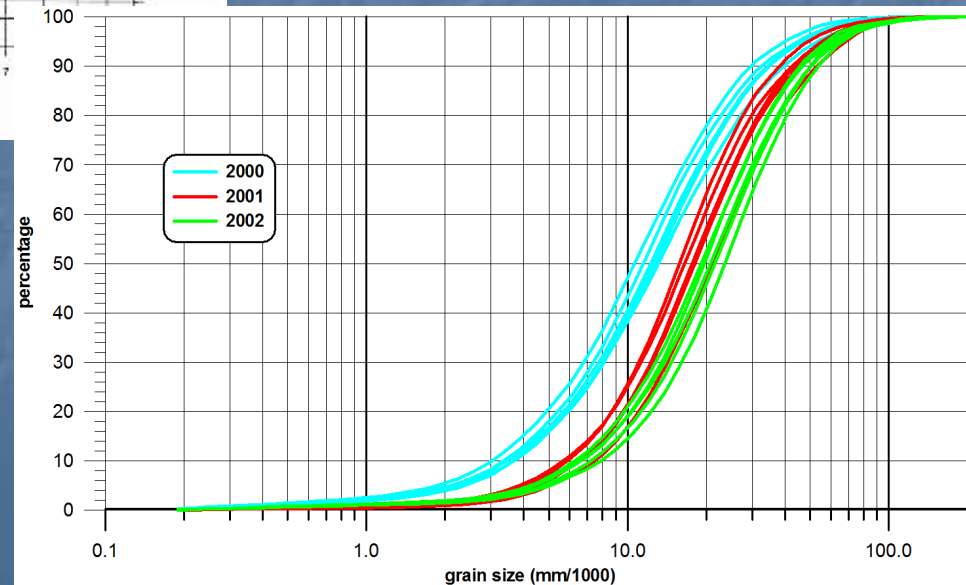
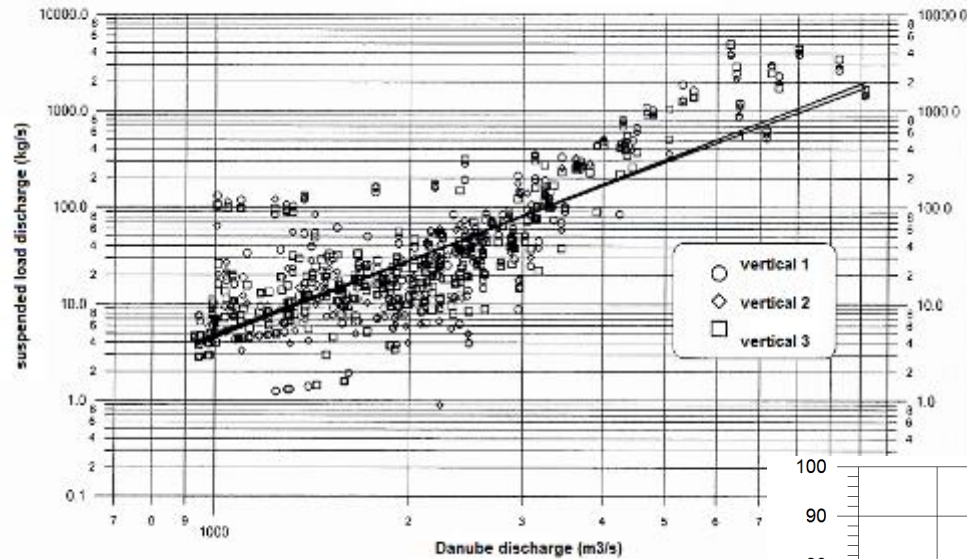


**Long lasting monitoring:** Representative localities (usually on the bridge) - one vertical

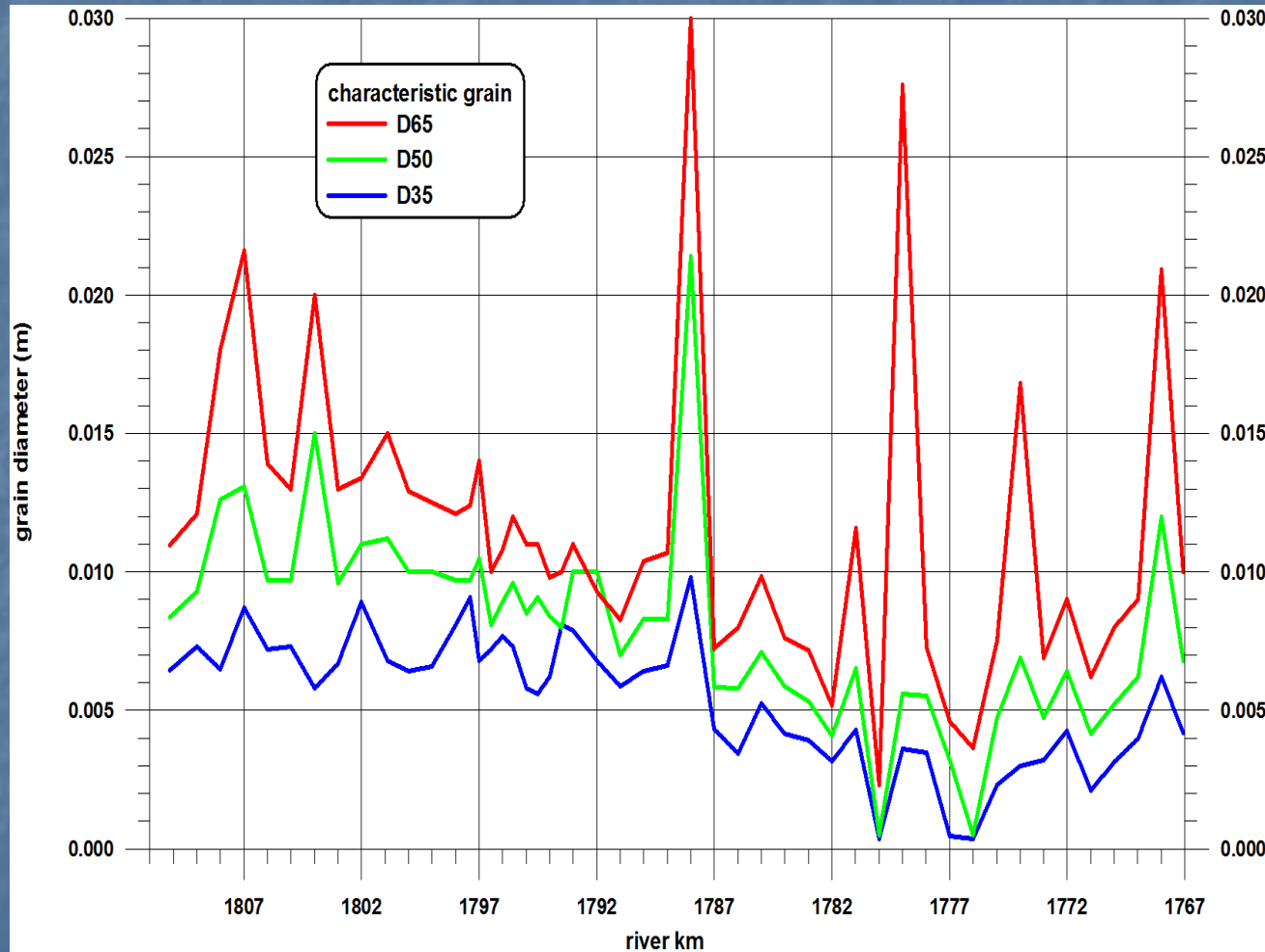


# Monitoring of suspended load regime

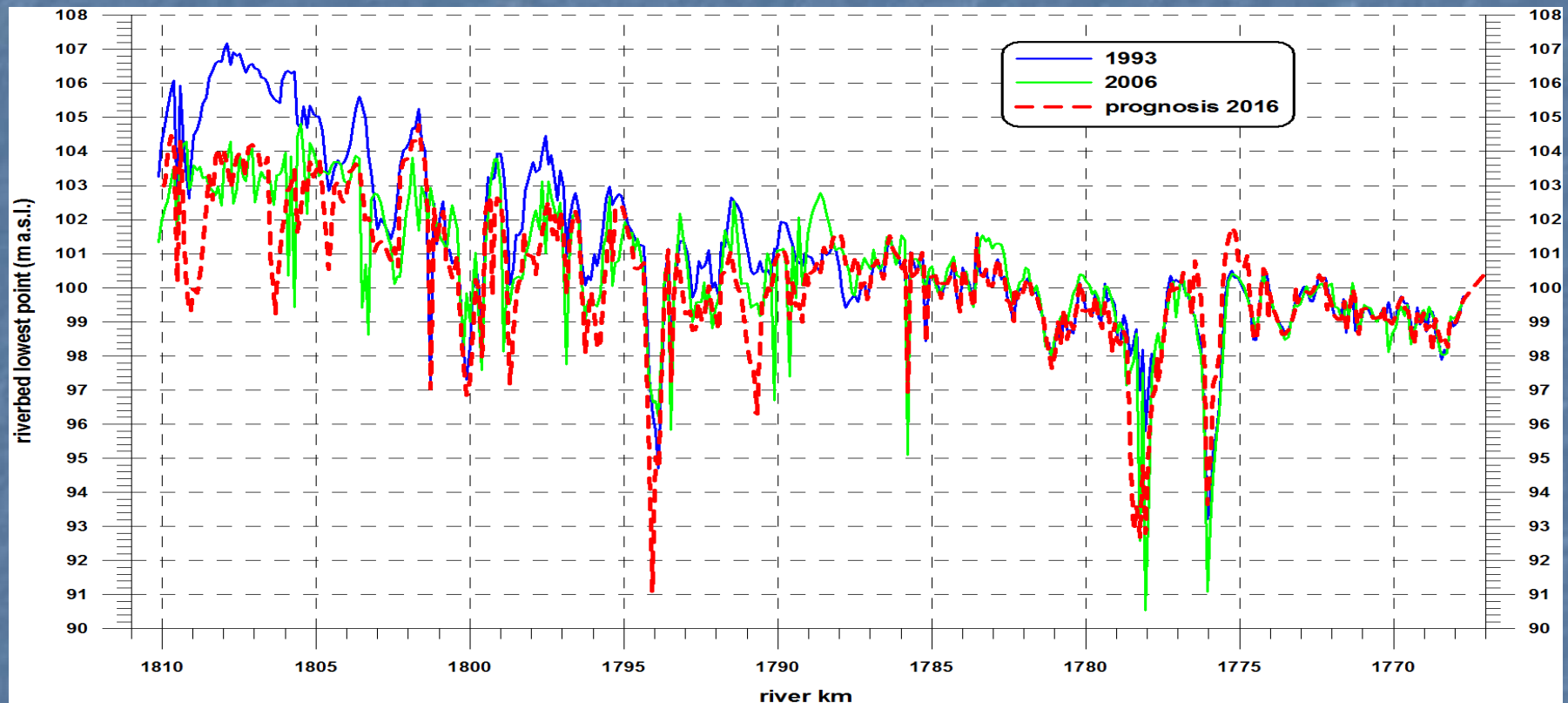
Danube - Medvedov bridge  
sampling programme 2000-2002



# Danube bed material – detailed sampling



# Prognosis of the Danube riverbed development using morphological model



- o significant change of riverbed longitudinal slope
- o intensity of riverbed erosion will decrease
- o riverbed erosion will propagate further downstream



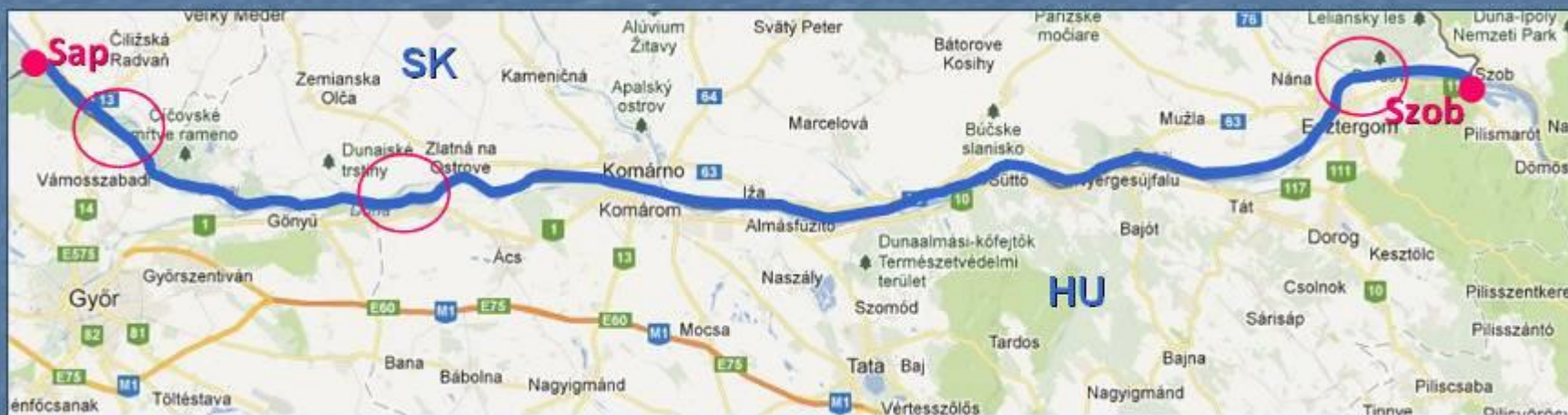
## „Danube floodplain rehabilitation to improve flood protection capacity and enhance the ecological values of the river section between Sap and Szob“

### Principal project goals:

Evaluation of the current state of flood protection

Proposal of effective measures to decrease flood water levels

Proposal of river restoration measures at the selected sites



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*Thank you for your attention !!*

