Interreg
Danube Region

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PANNONIAN.GW

Harmonisation of joint monitoring and modelling of groundwater system of Pannonian Plain

PANNONIAN.GW

29th Steering Group Meeting

3-4 June, 2025

Lidija Tadić

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1.Introduction

Project PANNONIAN.GW started in September 1, 2024

Duration: 12 months

Financing: Danube Region Programme, Interreg Danube Region

Project type : Seed Money Facility (SMF) project

Budget: 55,245.40 EUR

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2.SMF Projects

SMF project **is a tool for kick-starting development of strategic projects and largescale initiatives for the EU Strategy for the Danube Region (EUSDR, https://danube-region.eu/).**

2.SMF Projects

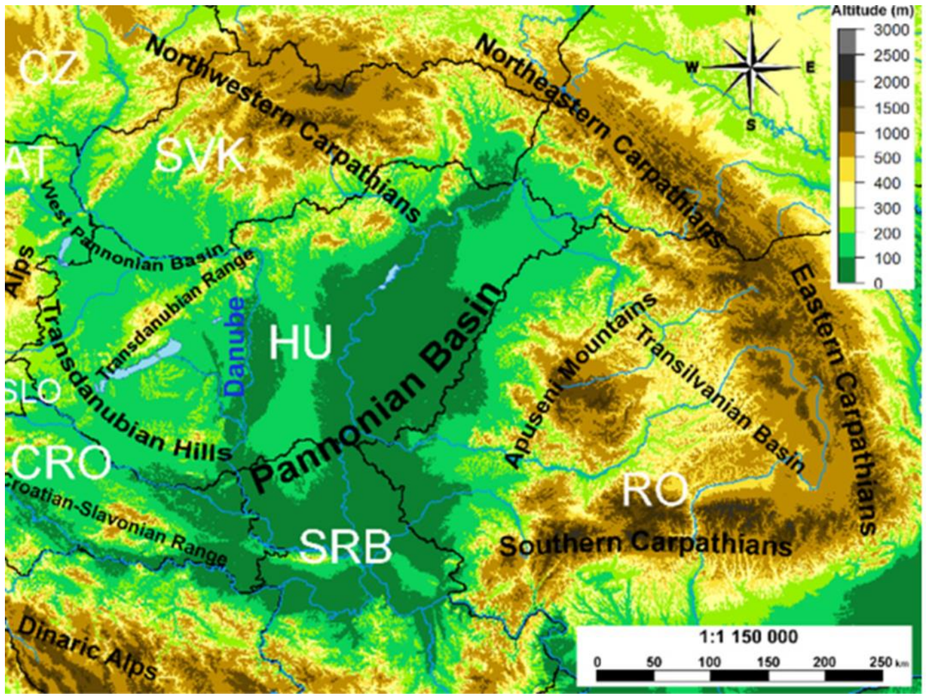
SMF projects develop:

- analysis of the needs and challenges addressed by the **MAIN** project *(completed)*

- working plan,
- project team,
- financing possibilies

in the process

3. Partners and Methods



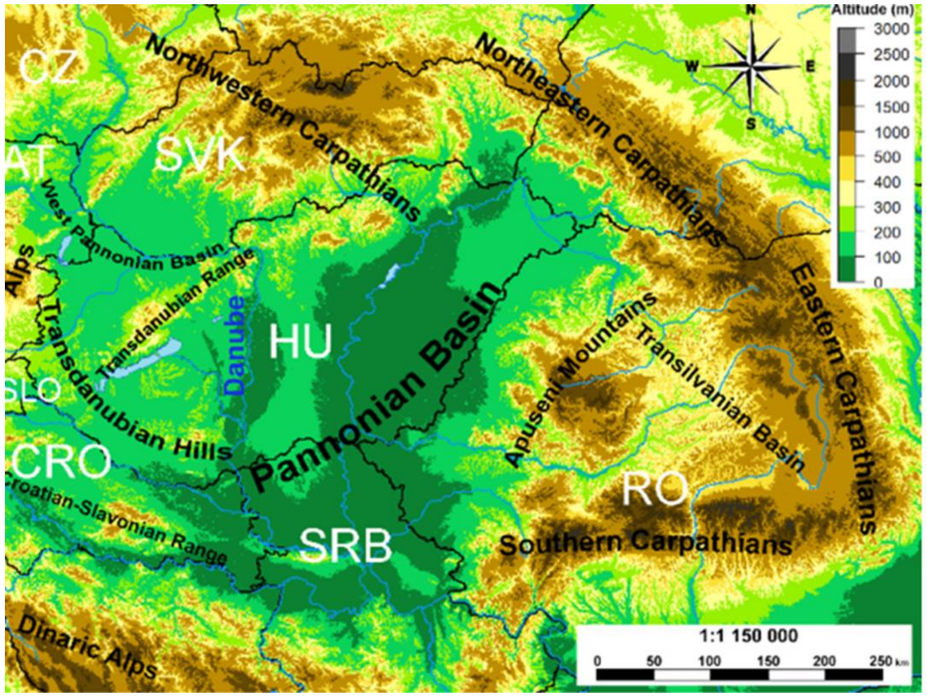
PARTNERS:

- **Faculty of Civil Engineering and Architecture Osijek (CRO) (LEAD PARTNER)**
- **Univeristy of Public Services Budapest , Faculty of Water Sciences Baja (HU)**
- **Academy of Sciences and Arts of Slovenia Ljubljana (SLO)**
- **Subotica Tech, Subotica (SRB)**
- **National Institute of Hydrology and Water Management, Bucharest (RO)**

ASSOCIATED STRATEGIC PARTNERS:

- **Technical University Kosice (SVK)**
- **Technical University Bucharest, (RO)**
- **City of Orašje (B&H)**
- **Institute of Agriculture Osijek (HR)**
- **Green Osijek-NGO (HR)**

3. Partners and Methods



MAIN TASKS:

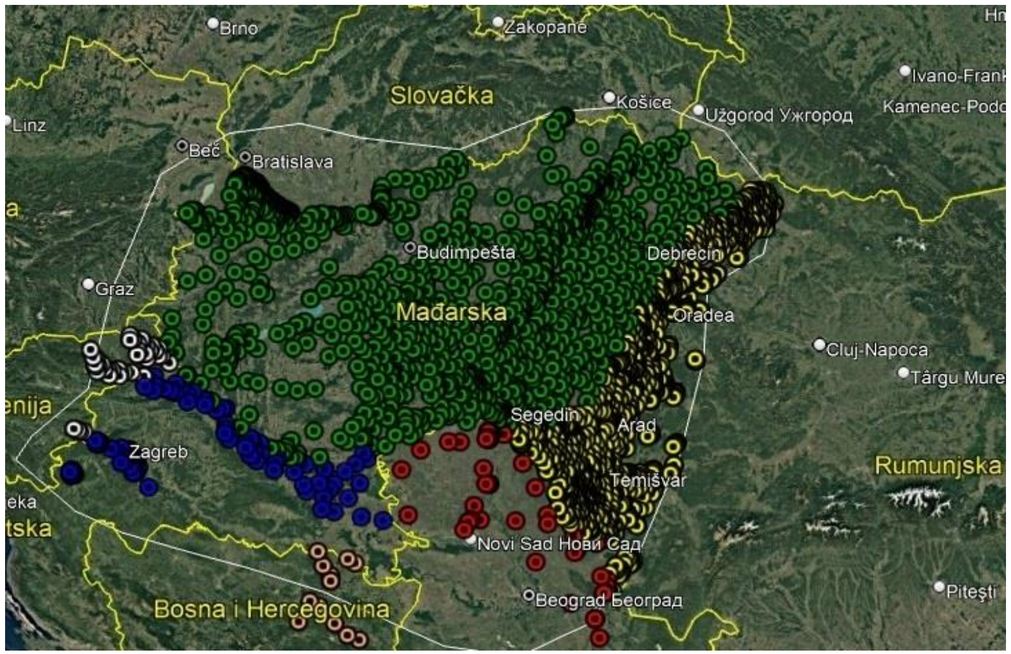
- Networking of national groundwater (GW) monitoring networks on entire Pannonian Plain (state and reccommendations for their improvement)
- Research on potential climate change impacts on shallow groundwater table
- Definition of critical points related to GW decreasing and their impacts on environment and agriculture
- Development of main project (working plain, financing, stakeholders, new partners etc.)

3. Partners and Methods

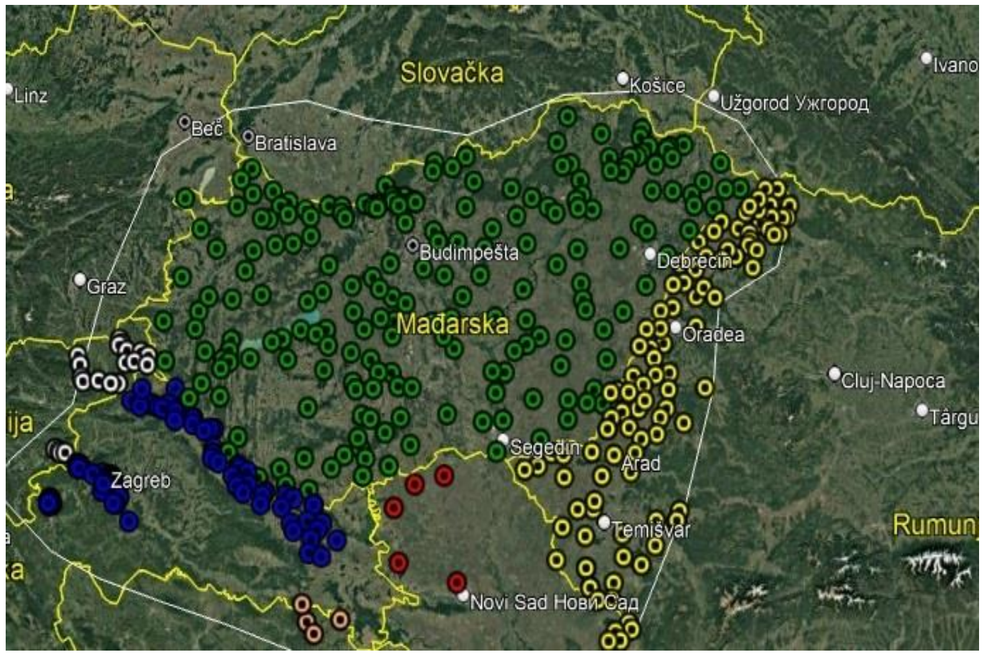
a) total GW observation network

b) reduced GW observation network (short time series, many gaps in observations, unreliable data, etc.)

a)



b)



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3. Partners and Methods

Period of observation: 1990-2022

	COUNTRY	TOTAL NUMBER OF OBSERVATION WELLS (Pannonian Plain) Map 1	OBSERVATION WELLS INCLUDED IN ANALYSIS (Map 2)
1	Romania	1098	96
2	Croatia	703	98
3	Serbia	303	5
4	Slovenia	41	20
5	Hungary	1082	200
6	Bosnia and Herzegovina	5	0
7	Slovakia	?	0
	TOTAL	**3233**	**419 (~13%)**

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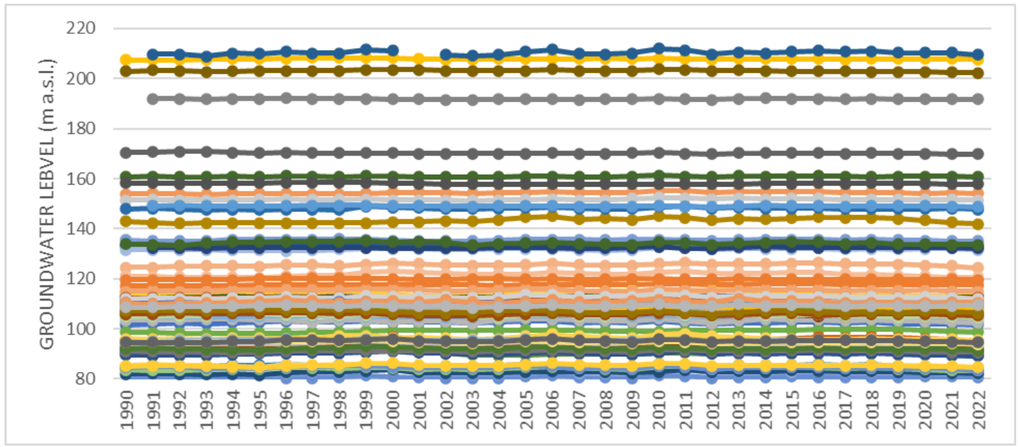
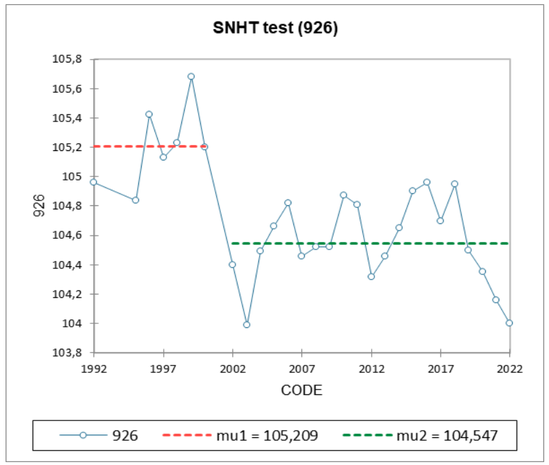
3. Partners and Methods

Example from Hungary:

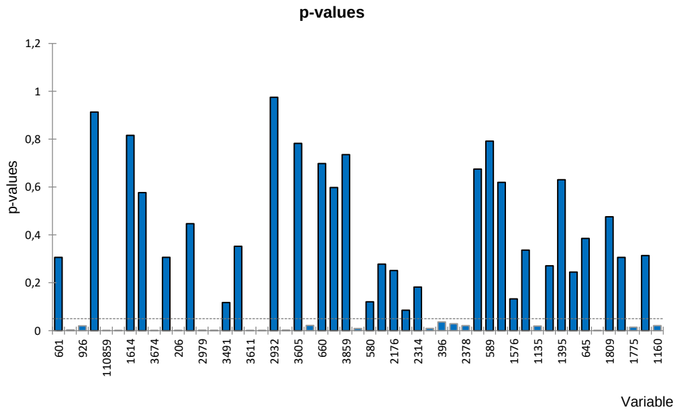
-Annual data



- Homogeneity test (SNHT)



- Mann-Kendal trend test (p>0.05 significant trend)



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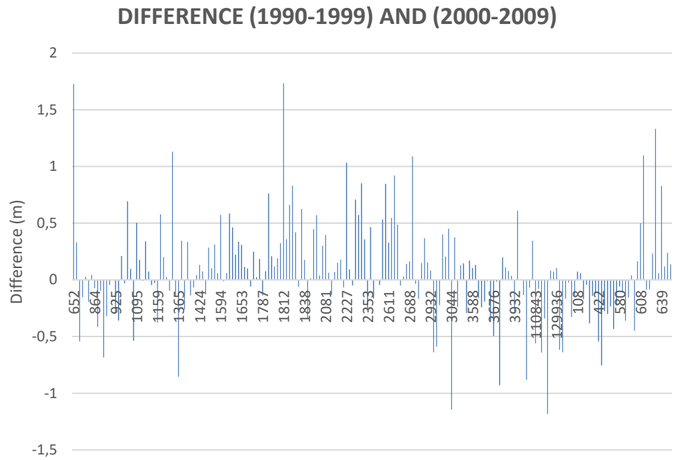
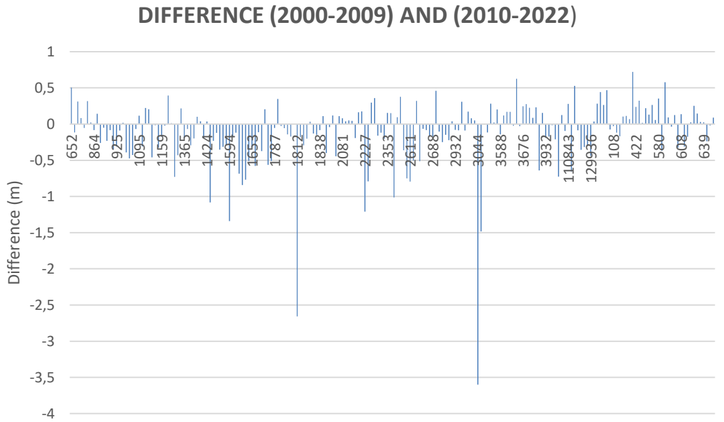
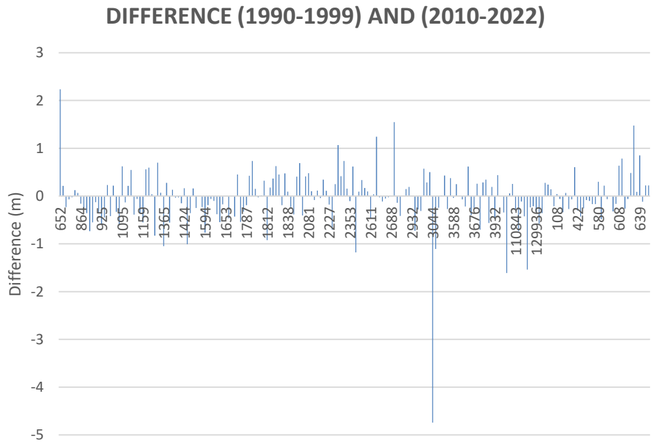
3. Partners and Methods

- **Differences between average GW level per decades**

Example from Hungary:







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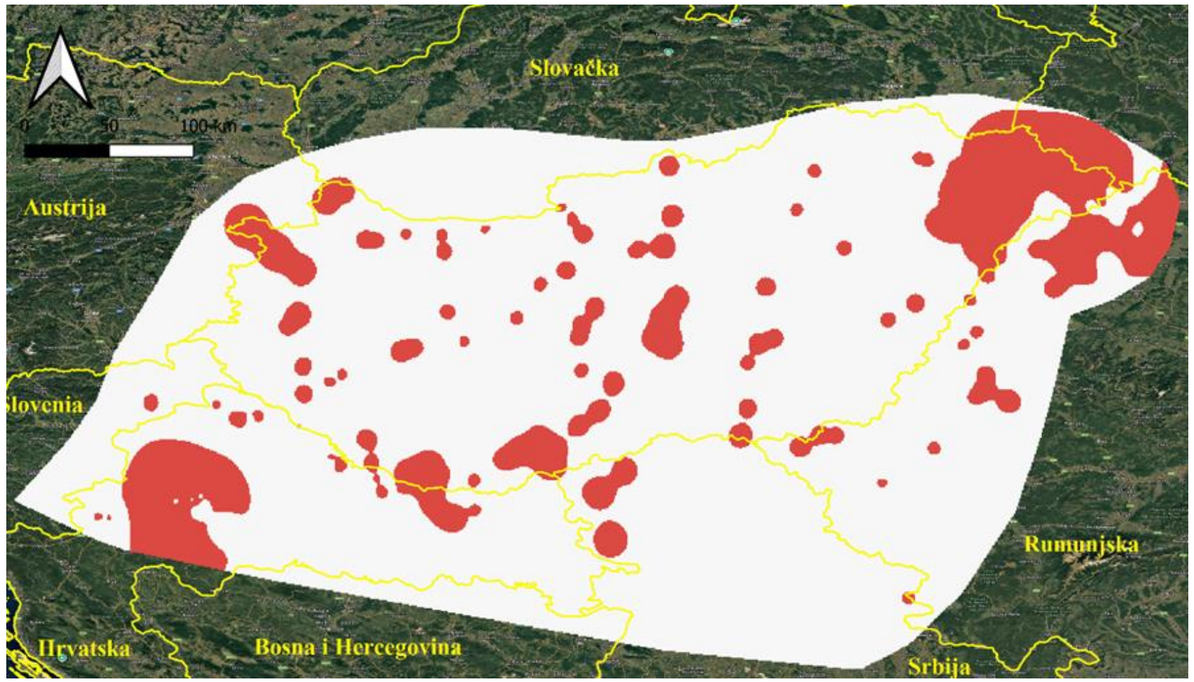
4.Results and Conclusions

CRITICAL REGIONS- groundwater table lowering in Pannonian Plain



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4.Results and Conclusions

- Shallow GW data base is very developed but data are not easily available for the public
- Results are obtained on the annual time scale what means that we can expect much more variations on the shorter time basis
- Further modelling of these changes on shorter time scale, such as season, will be one of the main tasks
- Some regions potentially can have problems with environment and agriculture in the future
- Involving stakeholders, governmental institution, NGOs and research institutes of all Pannonian Plain countries are necessary
- **PANNONIAN.GW proved potential problem with shallow groundwater table and necessity of furthe research**

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4. Results and Conclusions

DETAILS AND RESULTS ARE AVAILABLE ON PROJECT WEBSITE:

http://www.gfos.unios.hr/homepage/harmonization-of-joint-monitoring-and-modelling-of-groundwater-system-of-pannonian-plain

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Thank you for your attention!

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