



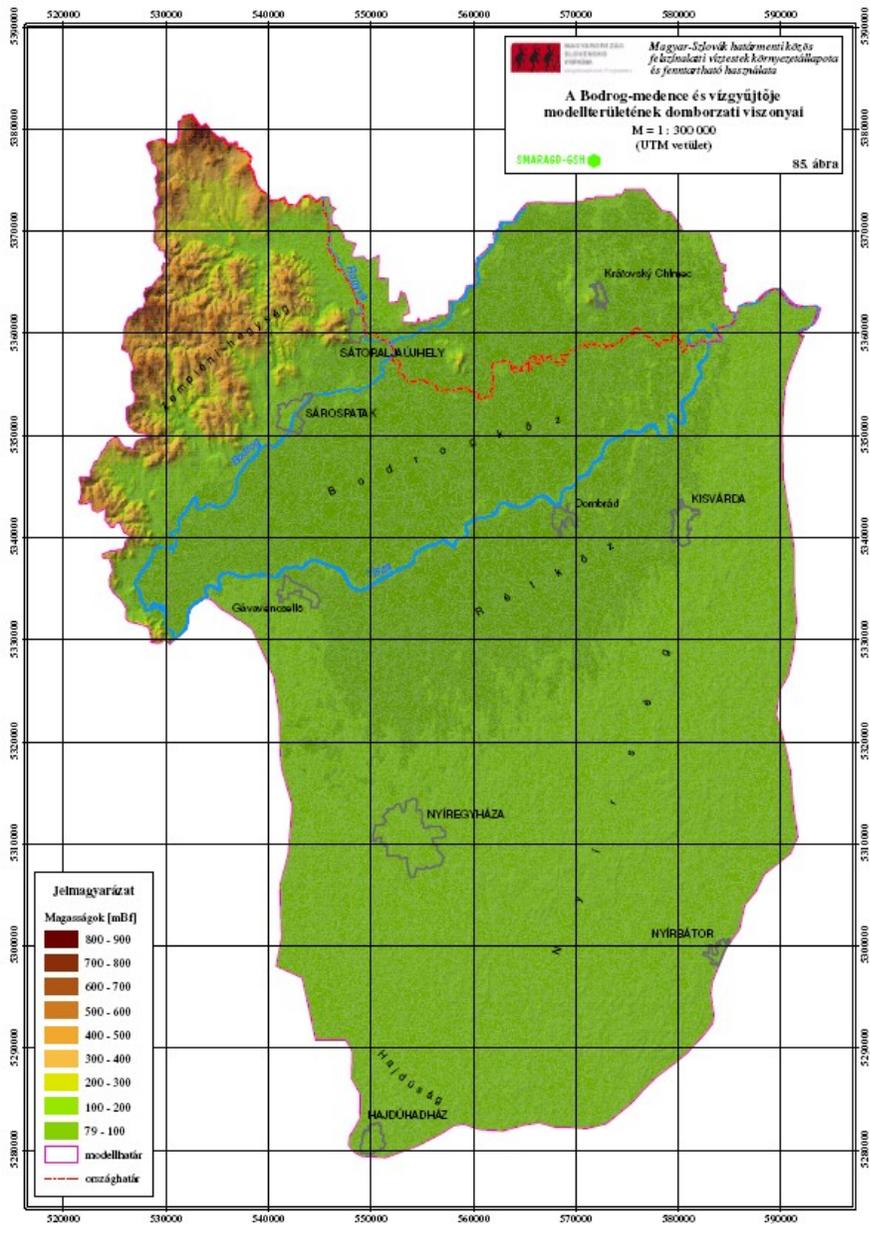
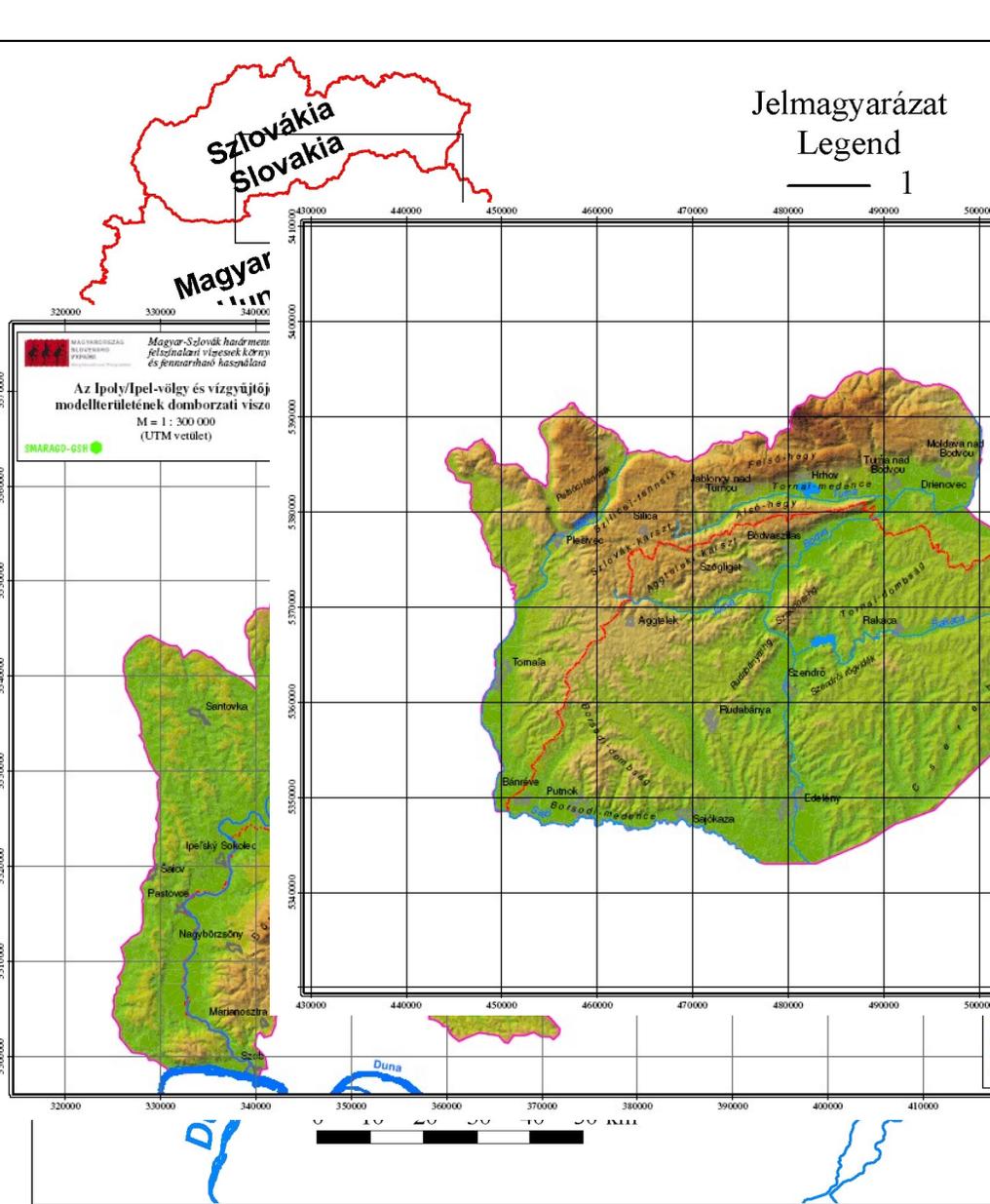
MAGYARORSZÁG
SLOVENSKO
УКРАЇНА
Neighbourhood Programme



WATER MANAGEMENT OF THREE SLOVAKIAN- HUNGARIAN TRANSBOUNDARY GROUNDWATER BODIES

Summary of the ENWAT-project INTERREG IIIA

Kaija, J., Leveinen, J., Gaál, G., Kordik, J., Szőcs, T., Tóth, Gy., Bartha, A.,
Havas, G., Brezsnyánszky, K., Malik, P., Michalko, J., Bodis, D., Slaninka, I.,
Svasta, J., Kun, E., Pethő, S. and Ács, V.



k

on

Objectives of the ENWAT project

- To supply a water management plans for three transboundary groundwater bodies;
- To serve as environmental basis for decision-making process;
- To supply information on quantitative and qualitative status of groundwater;
- To inform the population of the region for rational use of water

TARGET GROUPS

- National and regional authorities
- Local municipalities
- Farmers, agricultural enterprises
- Touristic enterprises
- Local water works and water suppliers
- The ultimate beneficiaries are the local population

Stages of the ENWAT project

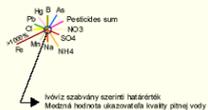
- Delineation of the GW body groups,
- Preparation existing data sets for harmonization
- Selection of the additional sampling sites and harmonized water sampling
- Shared laboratory works
- Evaluation of existing and new chemical data
- **Building ENWAT data-base**
- **Groundwater modeling**
- **Preparation of the groundwater management planning**

Az Aggtelek–Szlovák-karszt felszín alatti vizeinek főbb jellemzői
Hlavné charakteristické vlastnosti podzemnej vody prvého zvodneného horizontu
v oblasti Slovenský kras - Aggtelek
The main characteristics of groundwater in the Aggtelek and the Slovak karst area

1:150 000

Jelmagyarázat
Legenda
Legend

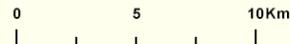
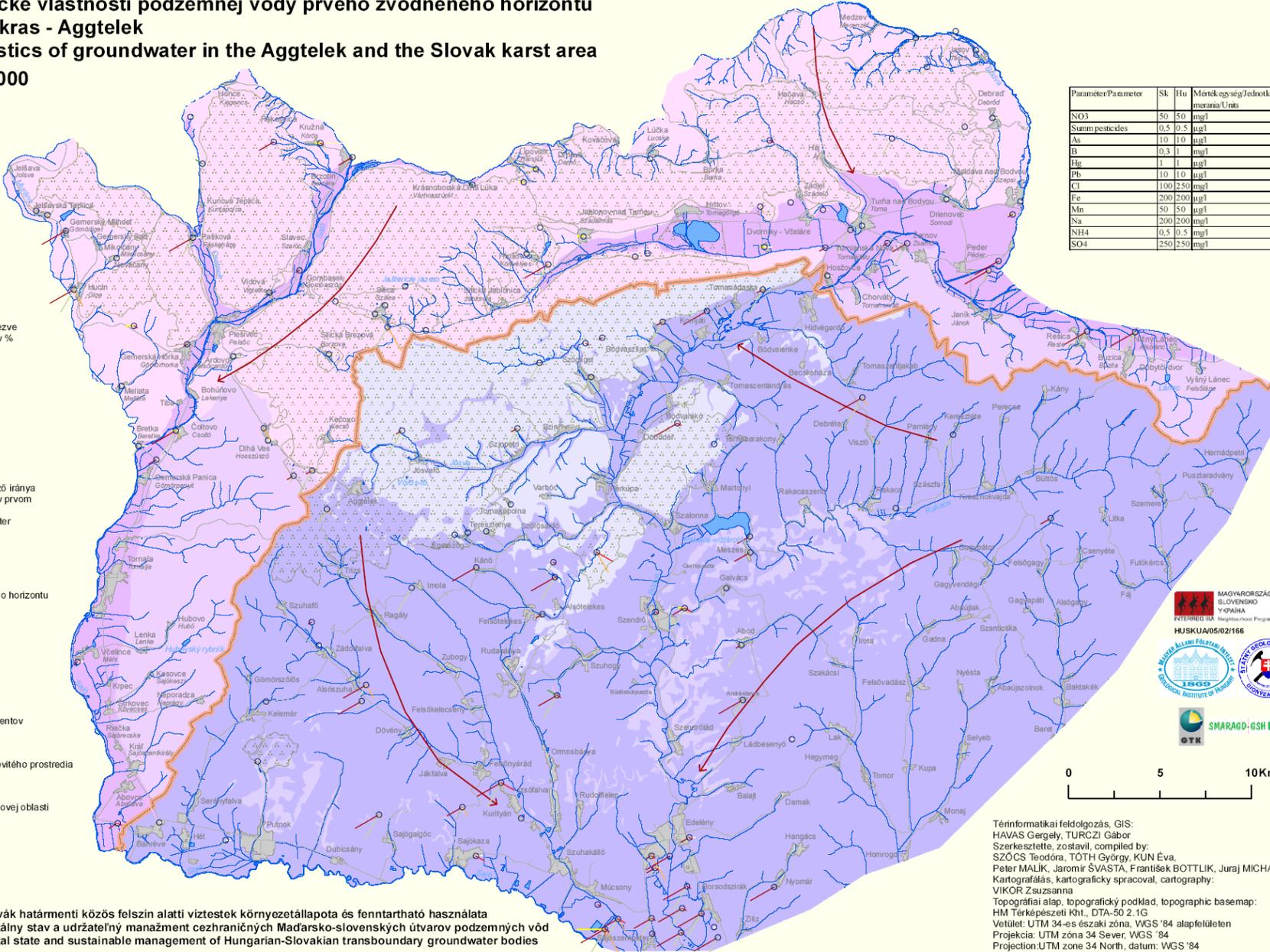
Ivóvíz szabványt meghaladó paraméterek %-ban kifejezve
 obsah zložiek, ktoré prekračujú normu pre pitnú vodu v %
 Parameters above drinking water standards in %



Sekély felszín alatti vizek áramlási jellemzői
 tipické smery prúdenia podzemnej vody v prvom
 zvodnenom horizonte
 Typical flow direction of shallow groundwater

- Természetvédelmi terület
Chránené územia
Nature conservation area
- Sekély felszín alatti víztest
Útvar podzemnej vody prvého zvodneného horizontu
Shallow groundwater body
- Hegyvidéki felszín alatti víztest
Útvar podzemnej vody horskej oblasti
Mountainous groundwater body
- Karszt felszín alatti víztest
Útvar podzemnej vody krasovej oblasti
Karst groundwater body
- Kvarter felszín alatti víztest
Útvar podzemnej vody kvartérmű sedimentov
Quarter groundwater body
- Prekvarter porózus felszín alatti víztest
Prekvarterny útvar podzemnej vody pórvíthető prostredia
Prequarter porous groundwater body
- Prekvarter karszt felszín alatti víztest
Prekvarterny útvar podzemnej vody krasovej oblasti
Prequarter karst groundwater body

Paraméter/Parameter	SK	Hu	Mérték-egység/ Jednotka mértékegysége
NO3	50	50	mg/l
Summ pesticides	0.5	0.5	µg/l
As	10	10	µg/l
B	0.3	1	µg/l
Hg	1	1	µg/l
Pb	10	10	µg/l
Cl	100	250	mg/l
Fe	200	200	µg/l
Mn	50	50	µg/l
Na	200	200	mg/l
NH4	0.5	0.5	mg/l
SO4	250	250	mg/l



Térinformatikai feldolgozás, GIS:
 HAVAS Gergely, TURCZI Gábor
 Szerkesztette, zösvény: SZŐCS Teodóra, TÓTH György, KUN Éva,
 Peter MALK, Jaromír ŠVASTA, František BOTTLIK, Juraj MICHALKO
 Kartográfusok, kartograficky spracoval, cartography:
 VIKOR Zsuzsanna
 Topográfiai alap, topografický podklad, topographic basemap:
 HM Térképészeti Kht., DTA-50 2.1G
 Vetület: UTM 34-es északi zóna, WGS '84 alapfelületen
 Projekcia: UTM zóna 34 Sever, WGS '84
 Projection: UTM zone 34 North, datum: WGS '84

ENWAT Magyar-szlovák határmenti közös felszín alatti víztestek környezetállapota és fenntartható használata
 Environmentálny stav a udržateľný manažment cezhraničných Maďarsko-slovenských útvarov podzemných vôd
 Environmental state and sustainable management of Hungarian-Slovakian transboundary groundwater bodies

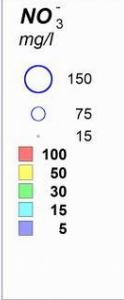
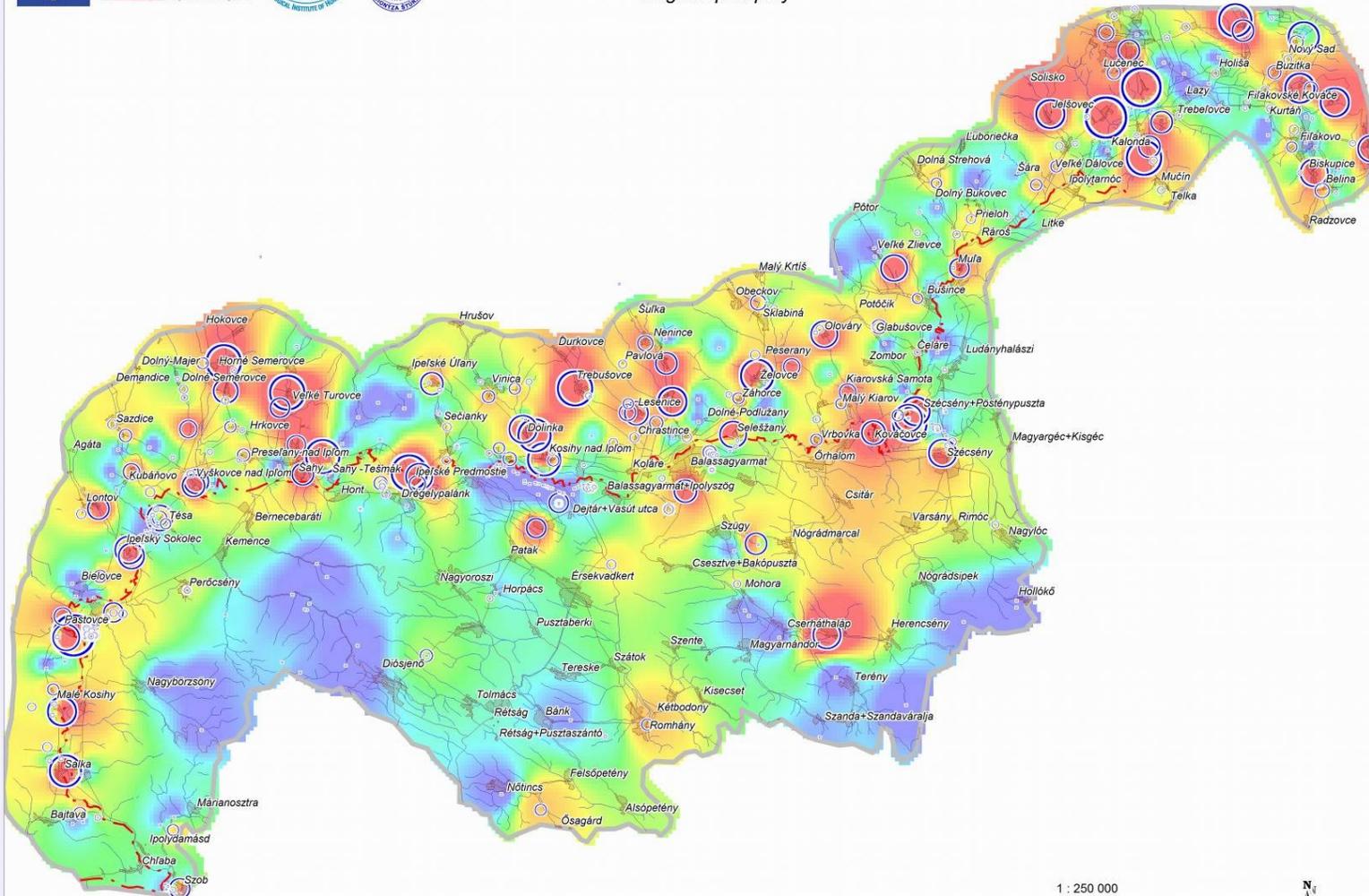
MAIN RESULTS

Groundwater management

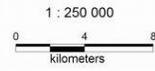
- Synthesis of all available information → propose measures needed for reaching Environmental Objectives of WFD
- Support tools to the ongoing River Basin Management Planning-process
- What was evaluated:
- The trend of the relationship of surface and subsurface water, especially for ecosystems depending on subsurface waters;
- The effects influencing the current water usage and the future possibilities and limitations of water production;
- The effects influencing the chemical status of groundwater, so that the present unfavorable influences could be stopped, the expected adverse effects could be avoided, and the necessary actions could be formed



Región Ipeľ - Ipoly régió
Region Ipeľ/Ipoly

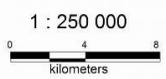
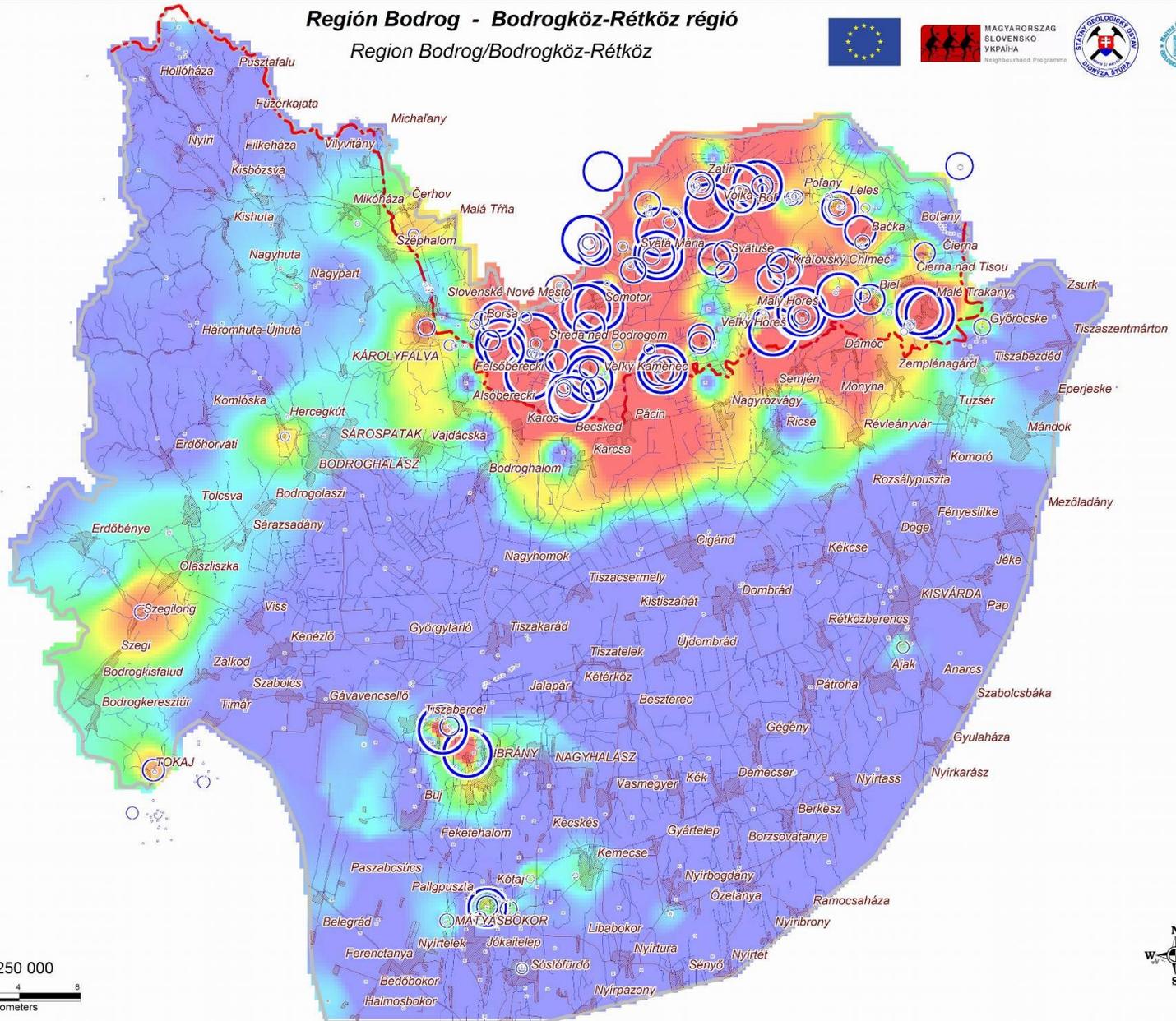
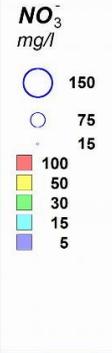


A nitrátok térbeli eloszlása a felszín alatti vizekben
Distribúcia dusíčanov v podzemných vodách
Distribution of nitrates in groundwaters



project: ENWAT, GEOLOGICAL INSTITUTE OF HUNGARY (Budapest), STATE GEOLOGICAL INSTITUTE OF DIONÝZ ŠTÚR (Bratislava), 2008

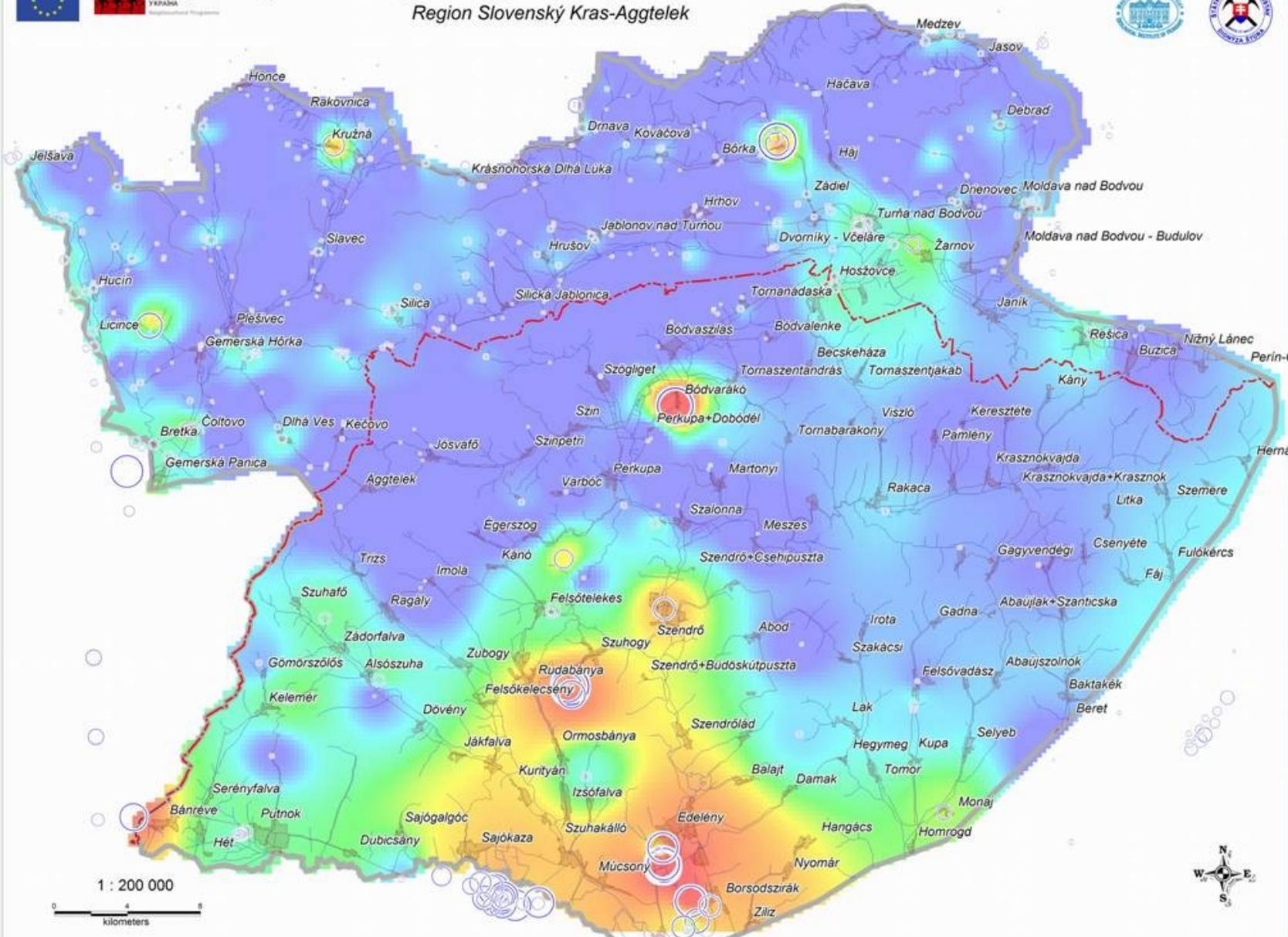
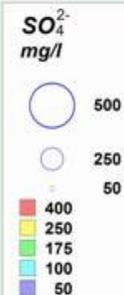
Región Bodrog - Bodrogeköz-Rétköz régió
Region Bodrog/Bodrogeköz-Rétköz



A nitrátok térbeli eloszlása a felszín alatti vizekben
Distribúcia dusičnanov v podzemných vodách
Distribution of nitrates in groundwaters



Región Slovenský Kras-Aggtelek - Aggtelek-Szlovák karszt régió
Region Slovenský Kras-Aggtelek



1 : 200 000
 0 4 8
 kilometers



A szulfátok térbeli eloszlása a felszín alatti vizekben
Distribúcia síranov podzemných vodách
Distribution of sulphates in groundwaters



Development of water services in rural areas

- Part of the social and economical development
- Current focus on the development of water services by regional operators and large entities
- Small municipalities /substantial parts out side the target areas
- Waste water and solid waste induce environmental problems
- Possibilities to develop sustainable water and waste water management
 - Examples with small rural communities with economically competent drinking water services
 - Good practices e.g. from Finland
 - Training of local experts e.g. veterinarians
 - Water co-operatives, ppp-solutions, service contracts
 - Active regional participation and planning
 - Regional/transboundary co-operation

Lessons learnt

- WFD good motivation for transboundary joint activities
- Regional scale 3D groundwater modeling is significant tool for support the decision making.
- Joint models and database: the best basis for the quantitative and qualitative status assessment
- Joint work reduces overlapping and provides logistical advantages
- Preparation GW management by the third independent party gives good audit of the present GW management strength or weaknesses
- Stakeholder meetings, important information on the issues of their concern effecting the groundwater status
- Direct links and cross-border co-operation between **regional** and even **municipal authorities and expert organizations** (rather than using high-level representatives as middle-men without a good knowledge of the conditions on field).

Thank you for your attention!

Detailed information of the ENWAT project:

www.enwat.eu

DVD:

available on request: dvd@enwat.eu

