



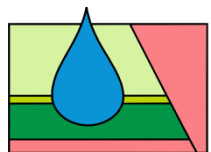
Europäische Union. Europäischer
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Evropská unie. Evropský fond pro
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Ahoj sousede. Hallo Nachbar.
Interreg V A / 2014–2020

Abschlussveranstaltung zum Projekt ResiBil

Resultate und Erkenntnisse aus 4 Jahren Deutsch-Tschechischer Kooperation



ResiBil

LANDESAMT FÜR UMWELT,
LANDWIRTSCHAFT
UND GEOLOGIE



Freistaat
SACHSEN



ČESKÁ
GEOLOGICKÁ
SLUŽBA



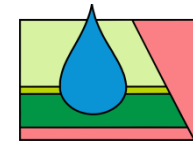


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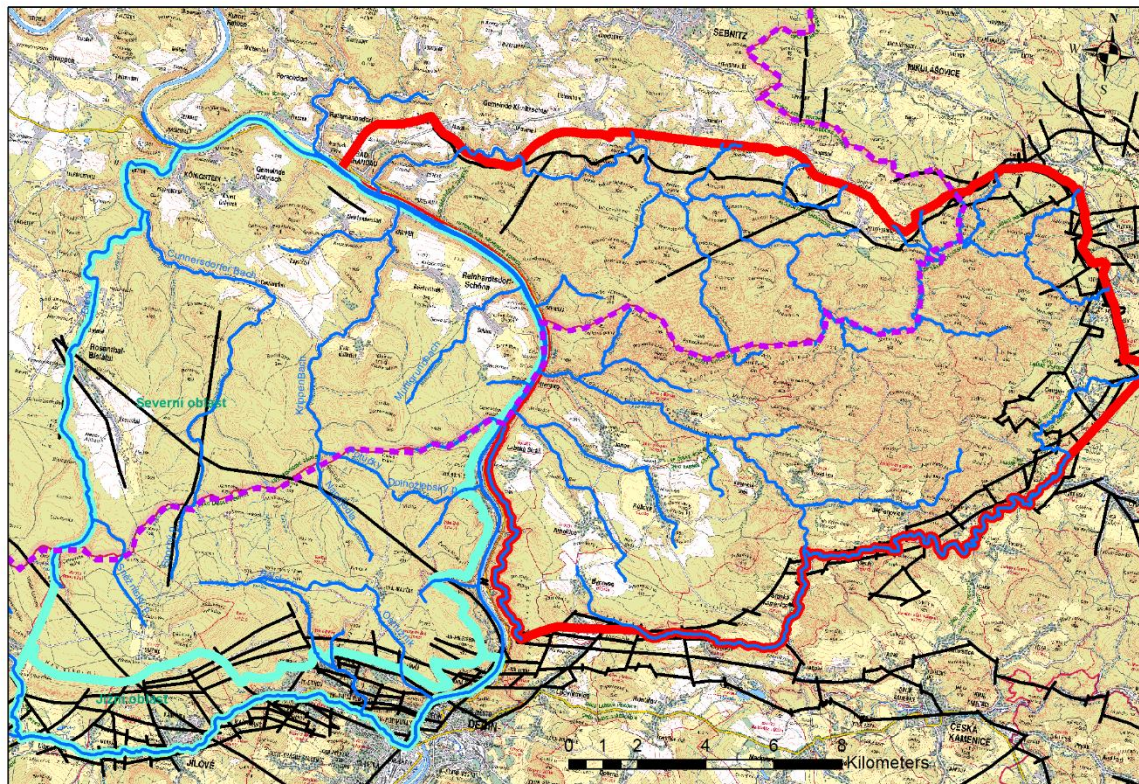


Data assembling to numeric model: Děčínský Sněžník and Kirnitzsch valley

Ondřej Nol



Data assembling to numeric model: Děčínský Sněžník and Kirnitzsch valley





Data assembling to numeric model: Děčínský Sněžník and Kirnitzsch valley

1. Data assembling a analysis
2. Assumptions and Approach
3. Conceptual model and Geometry construction
4. Boundary conditions setting
5. Calibration (observed heads, discharge data)
6. Recharge data
7. Results
8. Prediction



Hřensko - Kirnitzsch valley

Assumptions

1. Geometry of aquifers and model borders shall follow the hydrogeological structures/zones in both countries.
2. 4 aquifers, 3 aquicludes, German terminology
3. German area - geometry of aquifers based on German geological model,
4. Czech area – geometry of lower aquifers based on VUV TGM transboundary model, definition of upper aquifers comes out from German geological model which was extended into Czech area;
5. Model layers are continuous in whole model domain



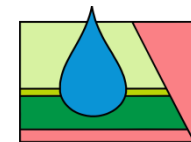
Hřensko - Kirnitzsch valley

Approach

1. For upper aquifers: Translation of German sandstone layers (according to Voight et al., 2013, Kahnt et al., 2014) into 4 aquifers and 3 aquicludes;
2. Based on simulation needs extend this concept and geometry into Czech area, there are only sparse hydrogeological evidences (springs) for upper German aquifers;
3. Keeping layer bottom under expected ground water tables, lowering bottom of model layers.

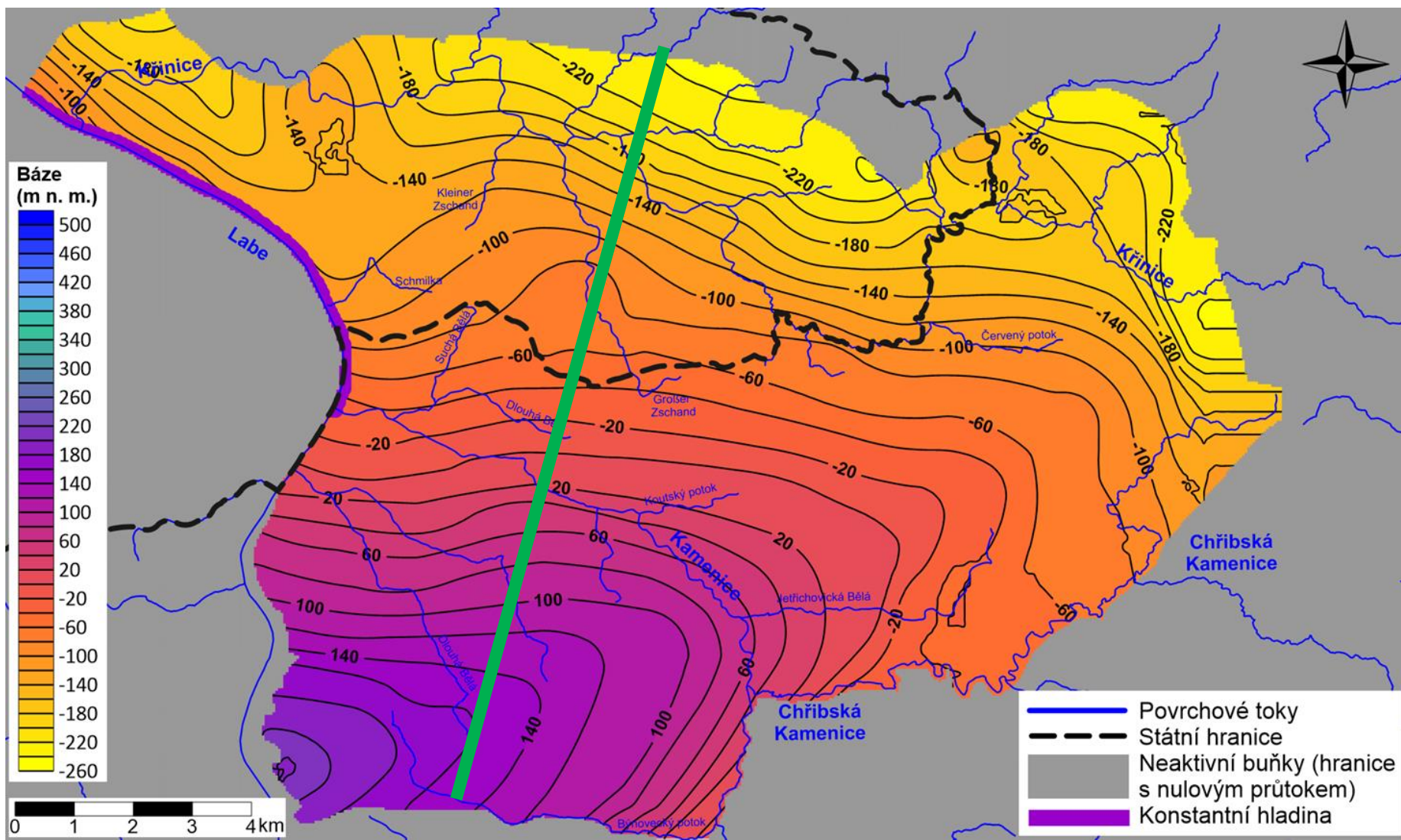


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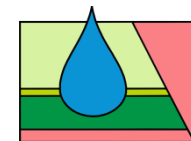
ResiBil

Hřensko - Kirnitzsch valley





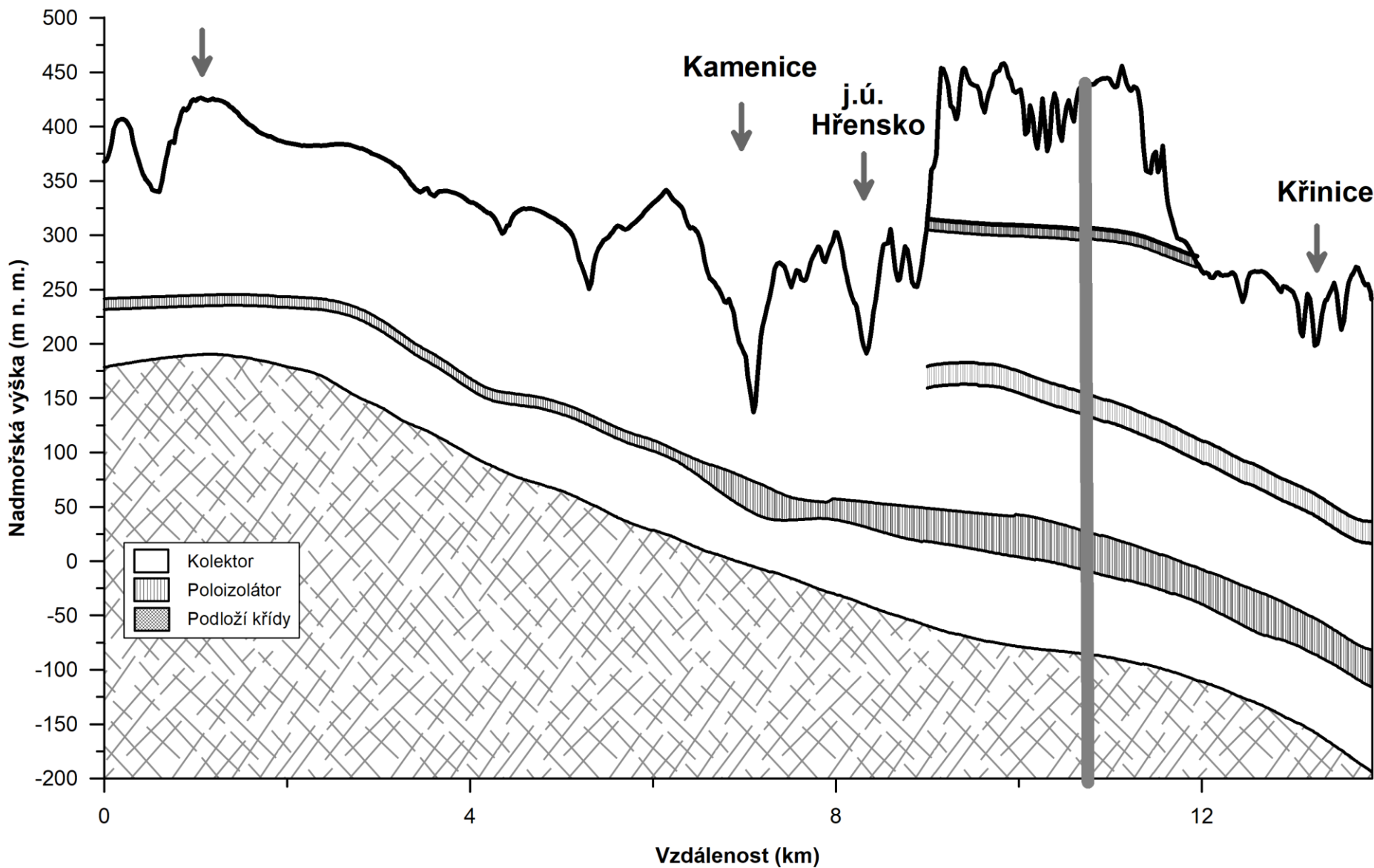
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ResiBil

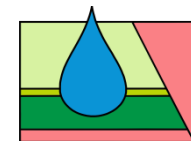
A(J)

A'(S)





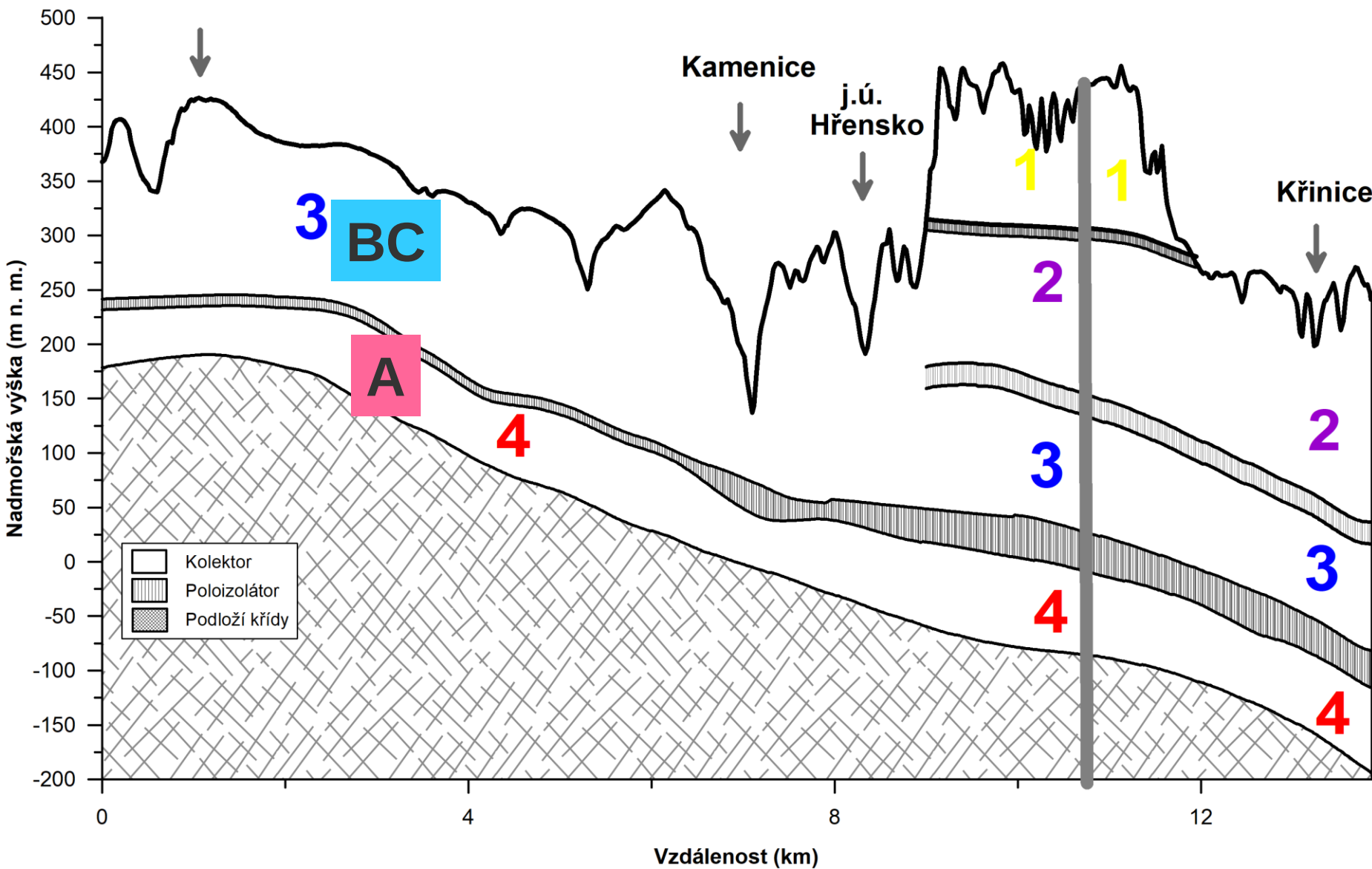
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ResiBil

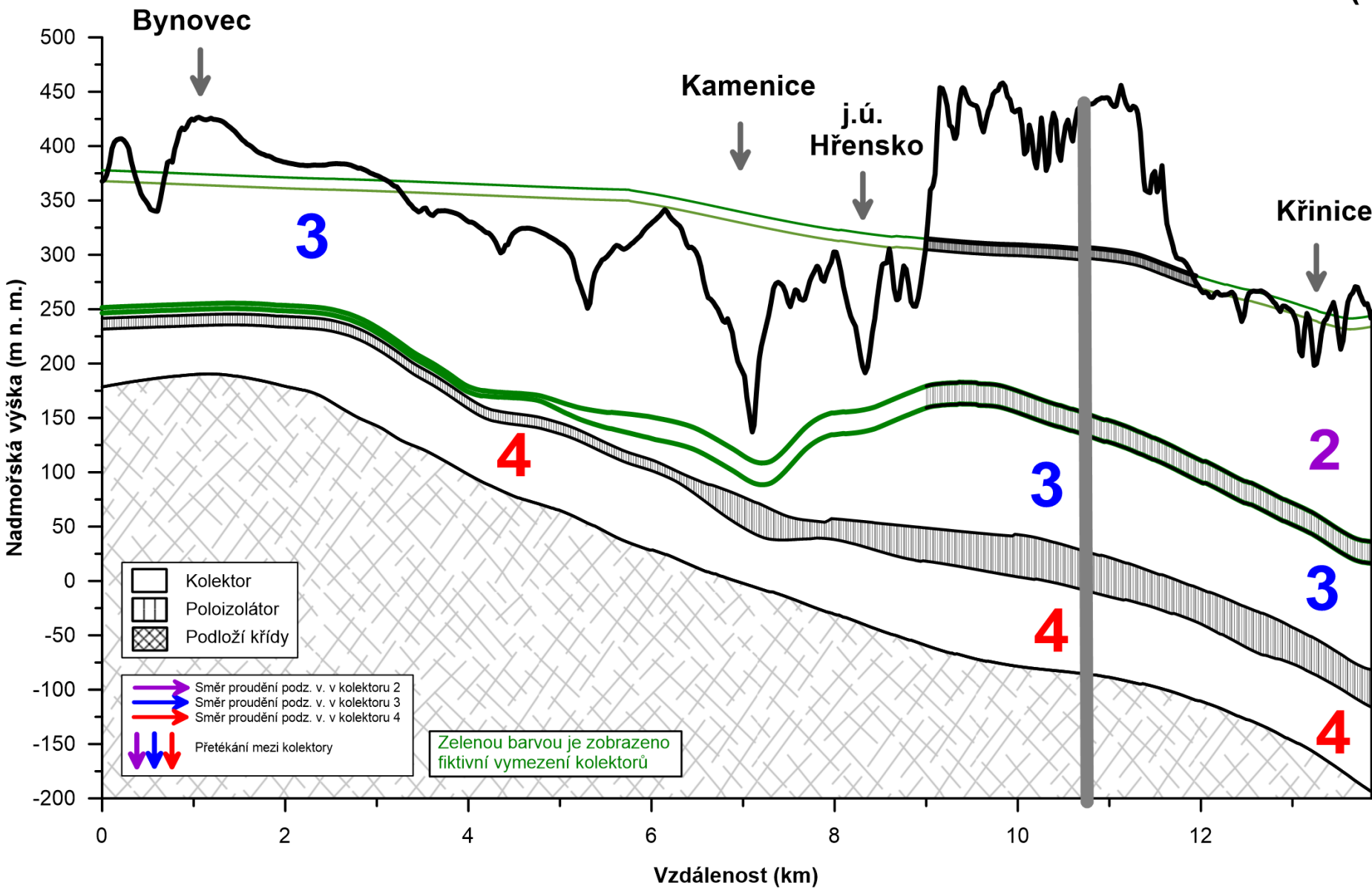
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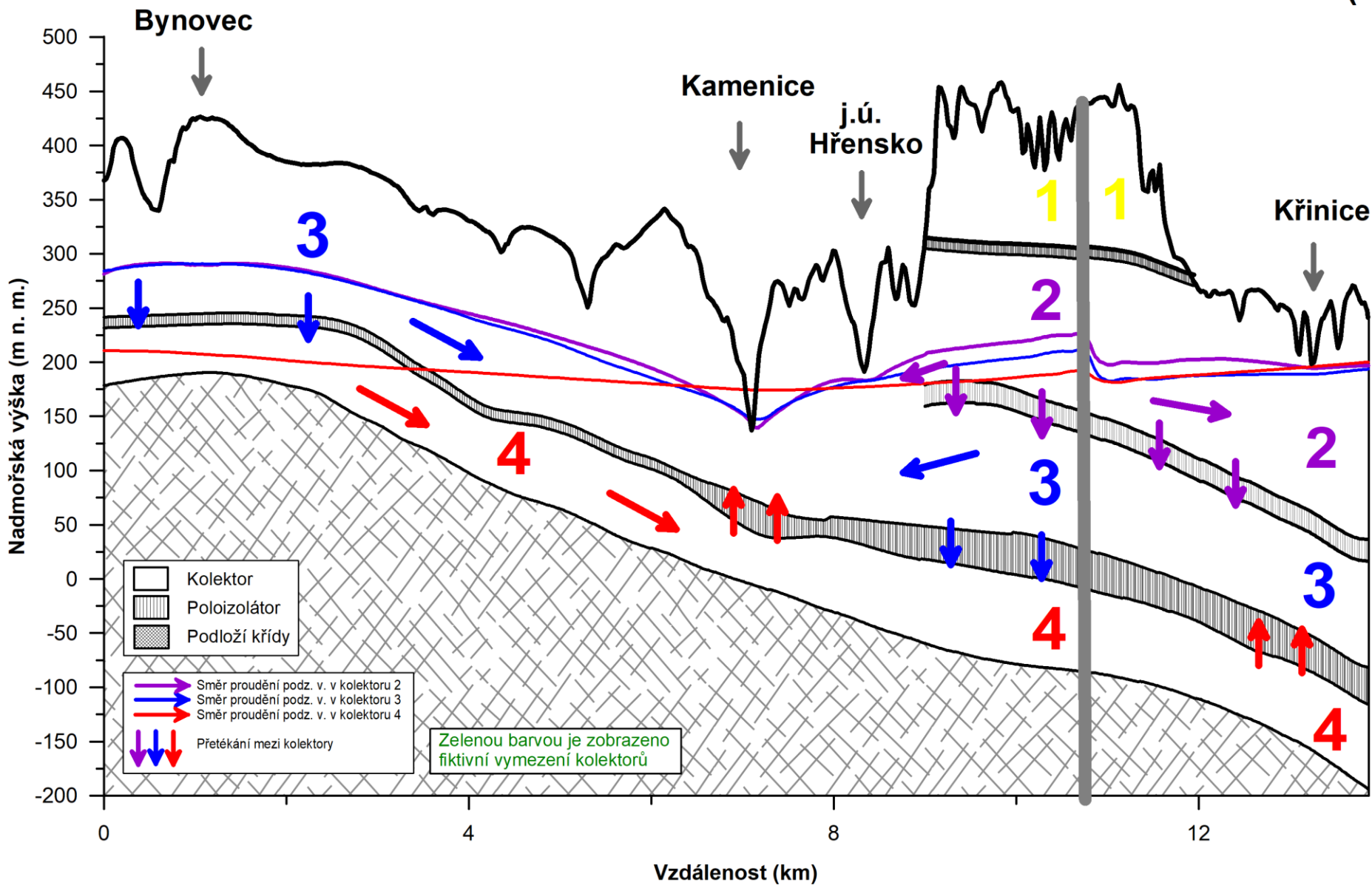
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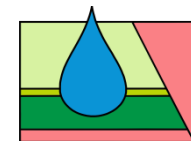
A'(S)




$$A'(S)$$


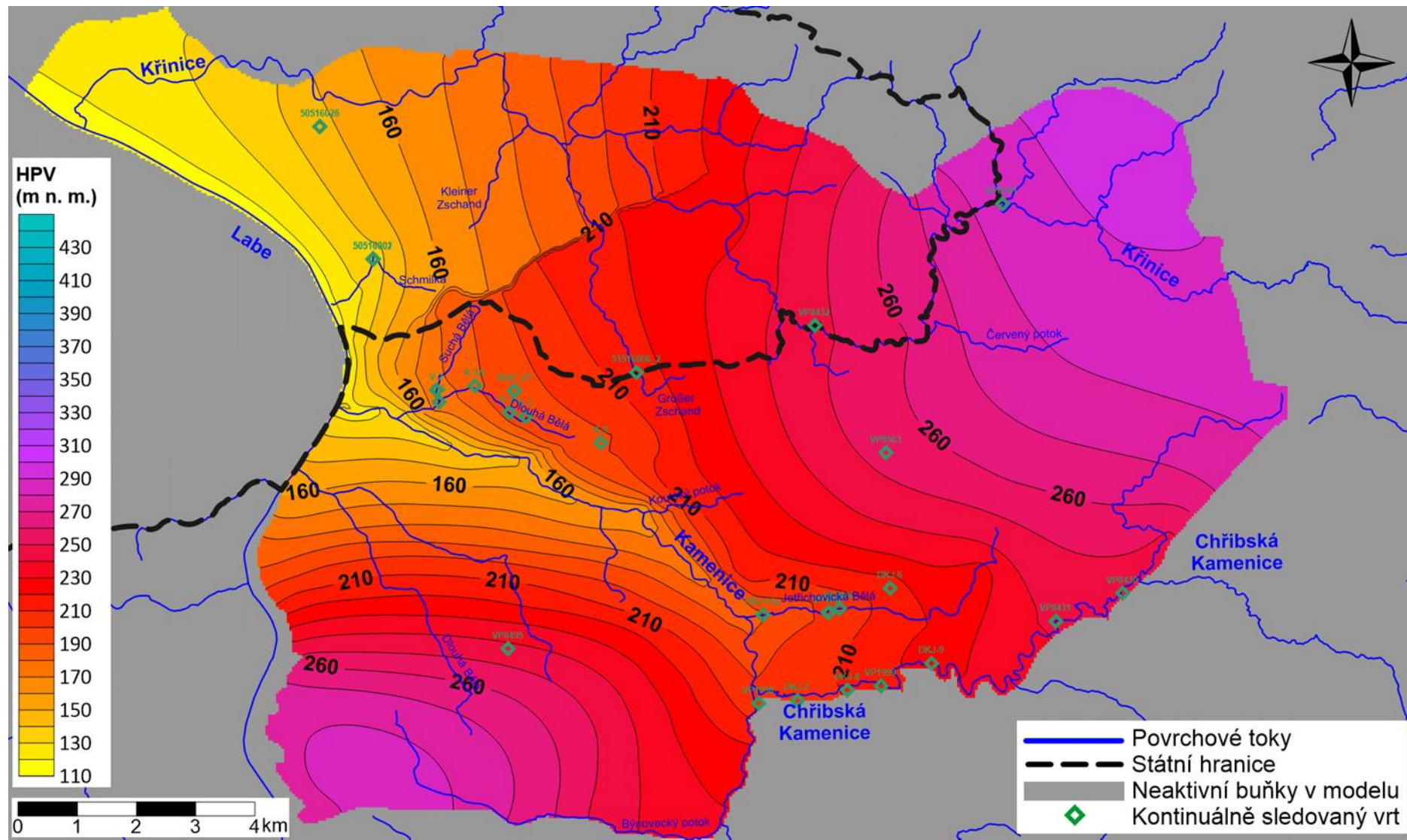


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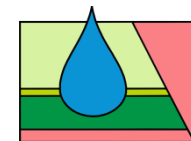
ResiBil

Hřensko - Kirnitzsch valley: GWL aquifer 3



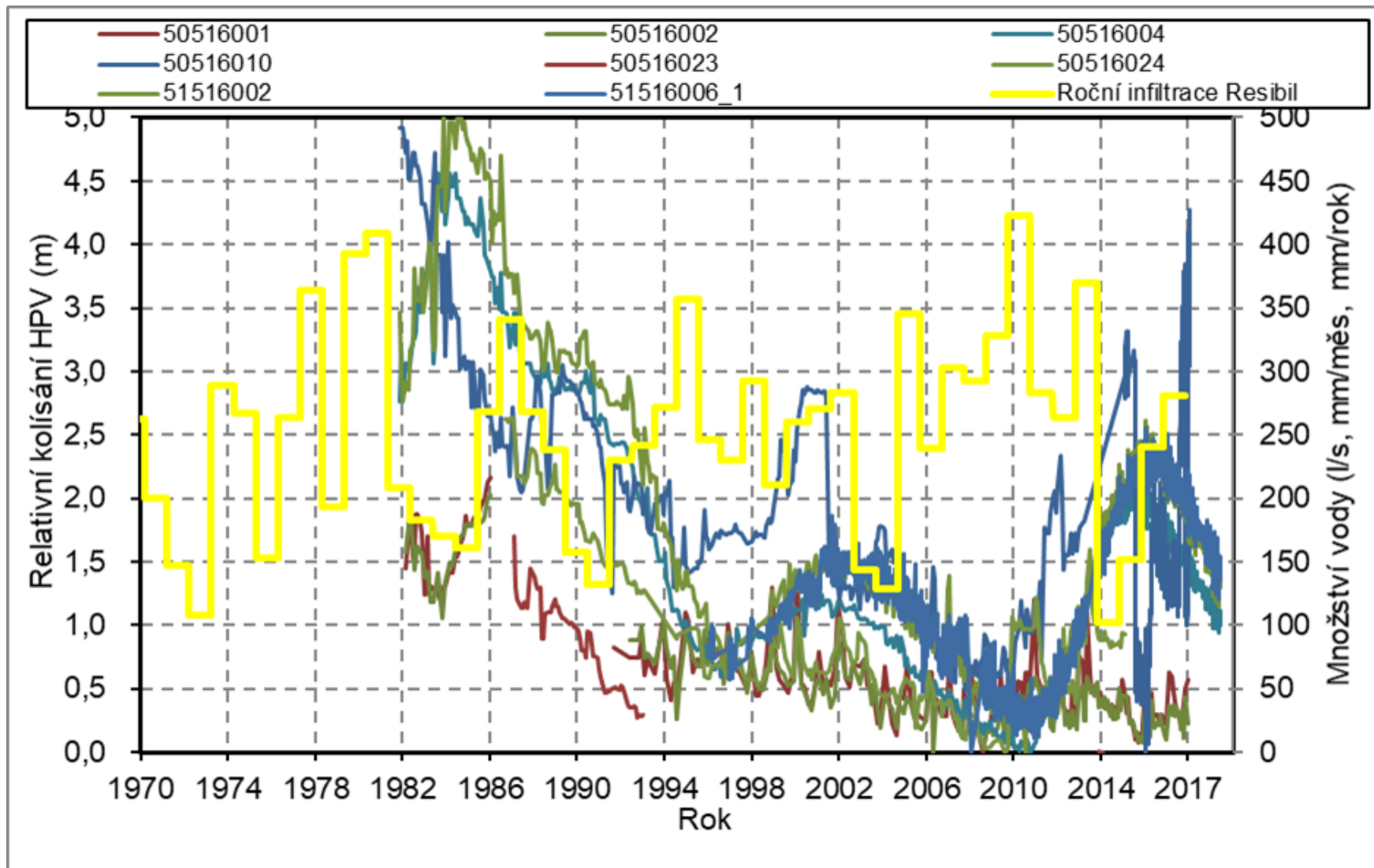


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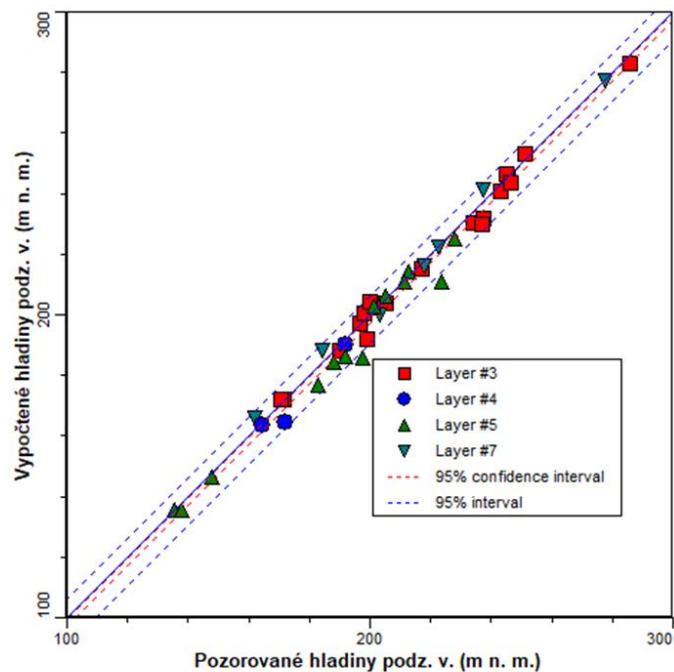
ResiBil

Hřensko - Kirnitzsch valley



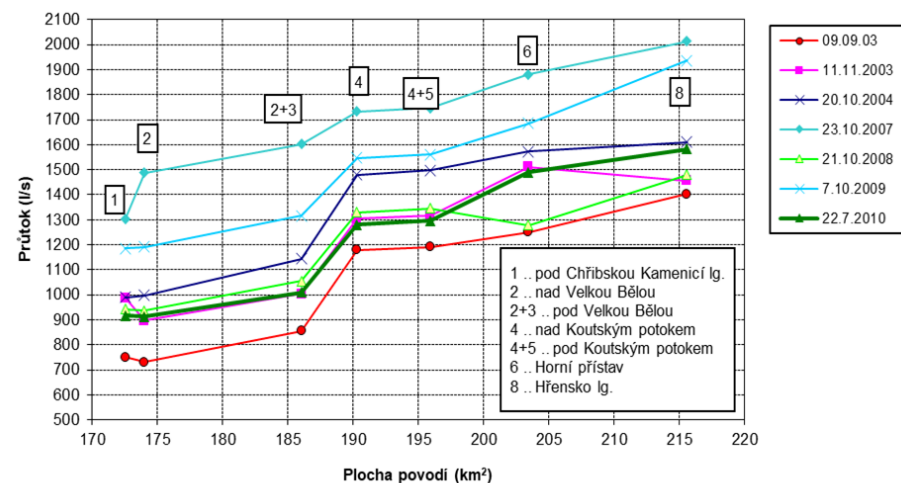
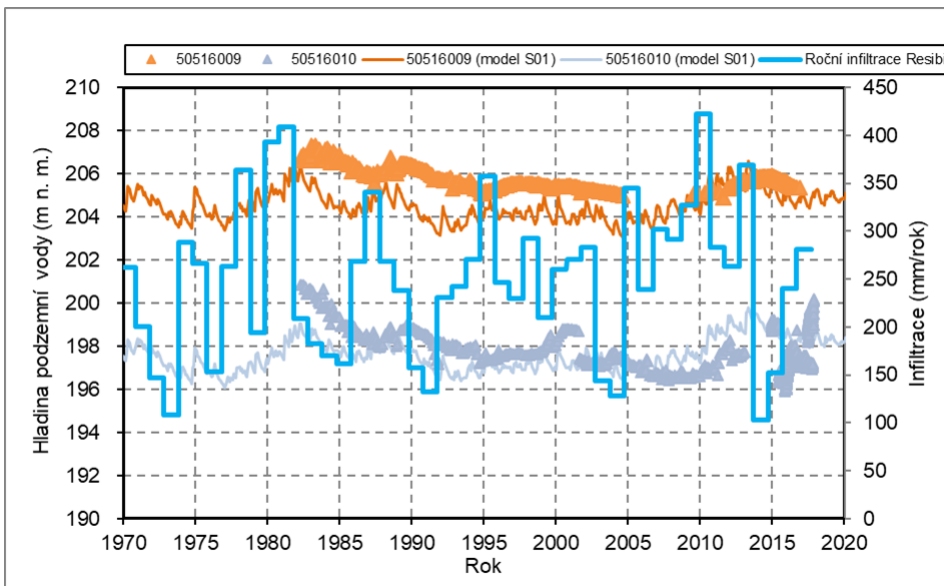


Hřensko - Kirnitzsch valley: calibration



Num. of Data Points : 43
Standard Error of the Estimate : 0.594 (m)
Root Mean Squared : 4.203 (m)
Normalized RMS : 2.793 (%)
Correlation Coefficient : 0.994

Max. Residual: -12.968 (m) at T51516006_2/1
Min. Residual: -0.114 (m) at TVP8430/1
Residual Mean : -1.692 (m)
Abs. Residual Mean : 3.083 (m)





Data assembling to numeric model: Děčínský Sněžník and Kirnitzsch valley

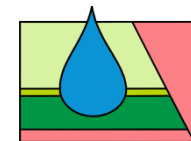
1. Data assembling a analysis
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Děčínský Sněžník

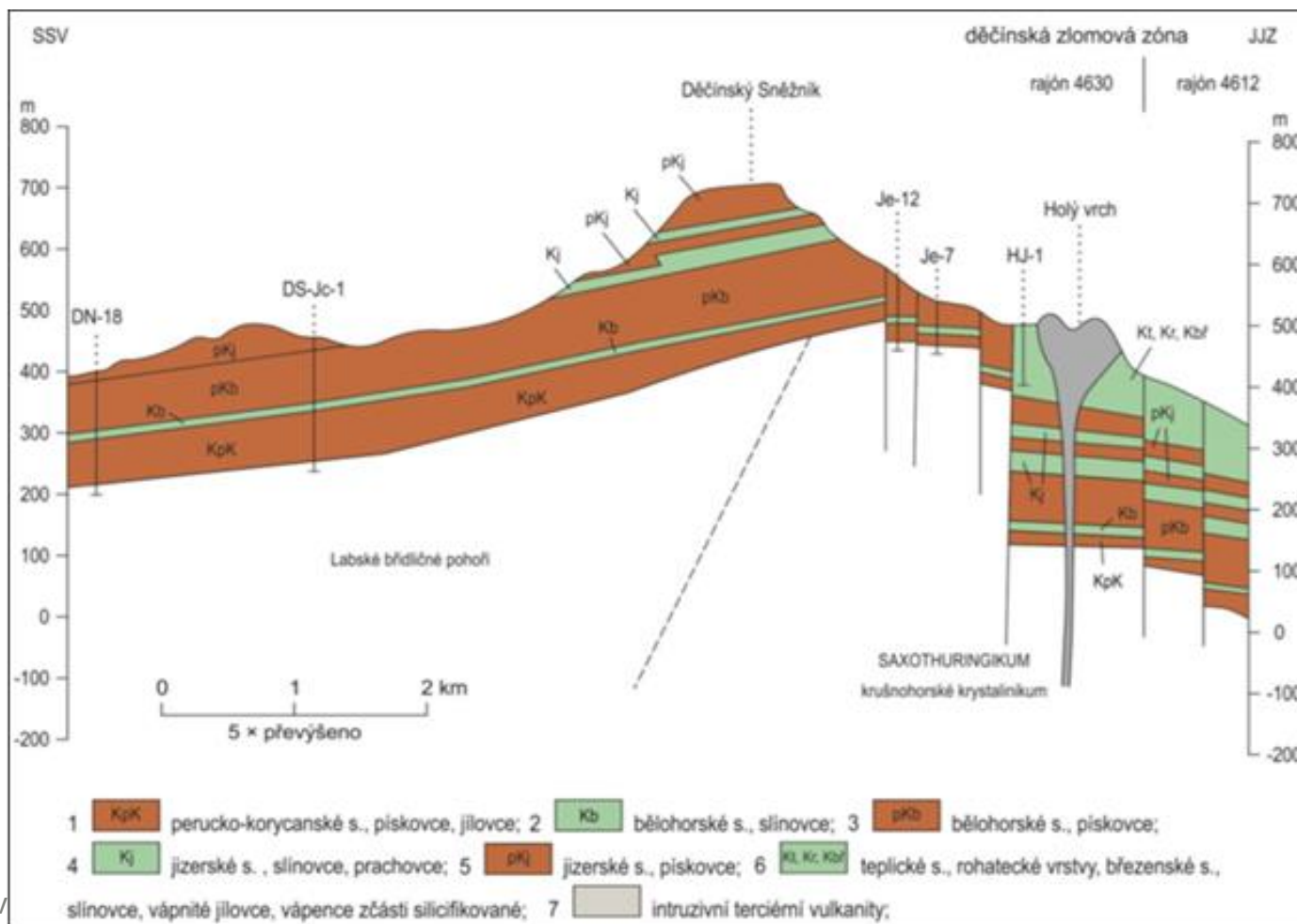
Assumptions

1. 2 aquifers, 1 aquicludes, Czech terminology;
2. Geometry of aquifers based on Transboundary geological model provided by VUV TGM;
3. Model aquifers should be continuous in whole model domain, but there is 300 m skip between aquifers;
4. Model domain was divided in two parts – southern and northern ones.



Děčínský Sněžník

Burda – Venera et al. 2016

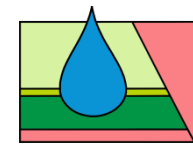




Děčínský Sněžník

Approach

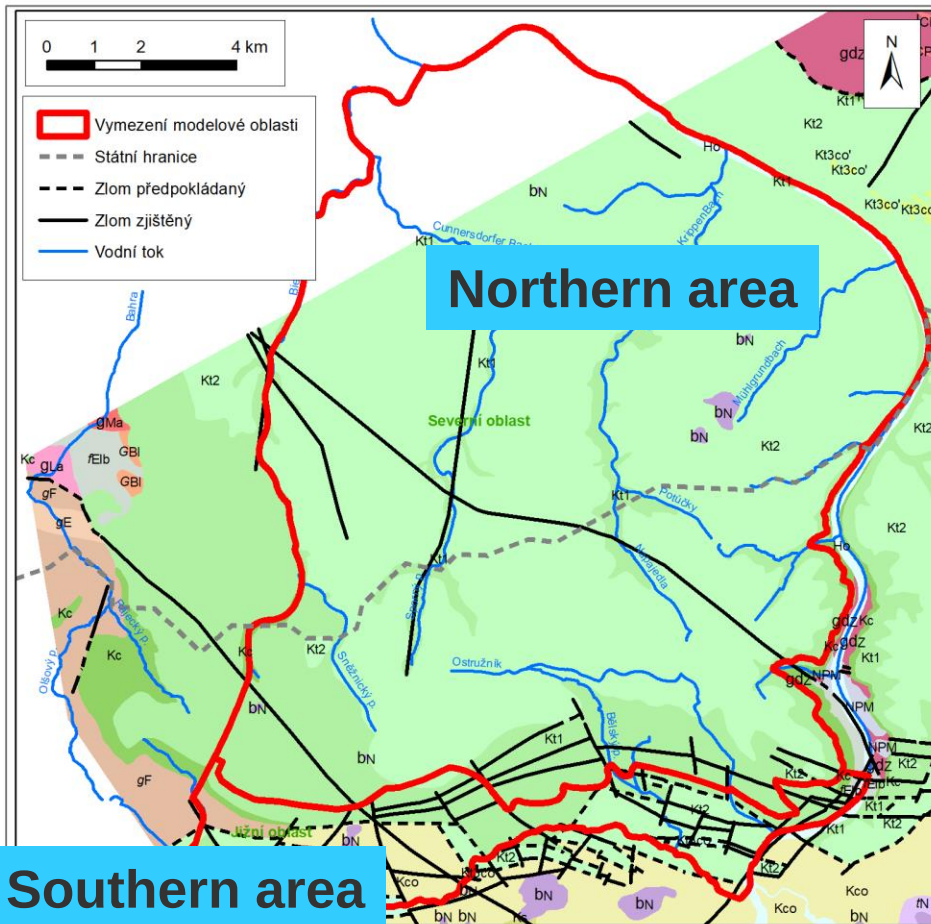
1. Construction of two different geometries for each aquifer and aquiclude in northern and southern part separately;
2. Hydraulic communication between them was allowed.



ResiBil

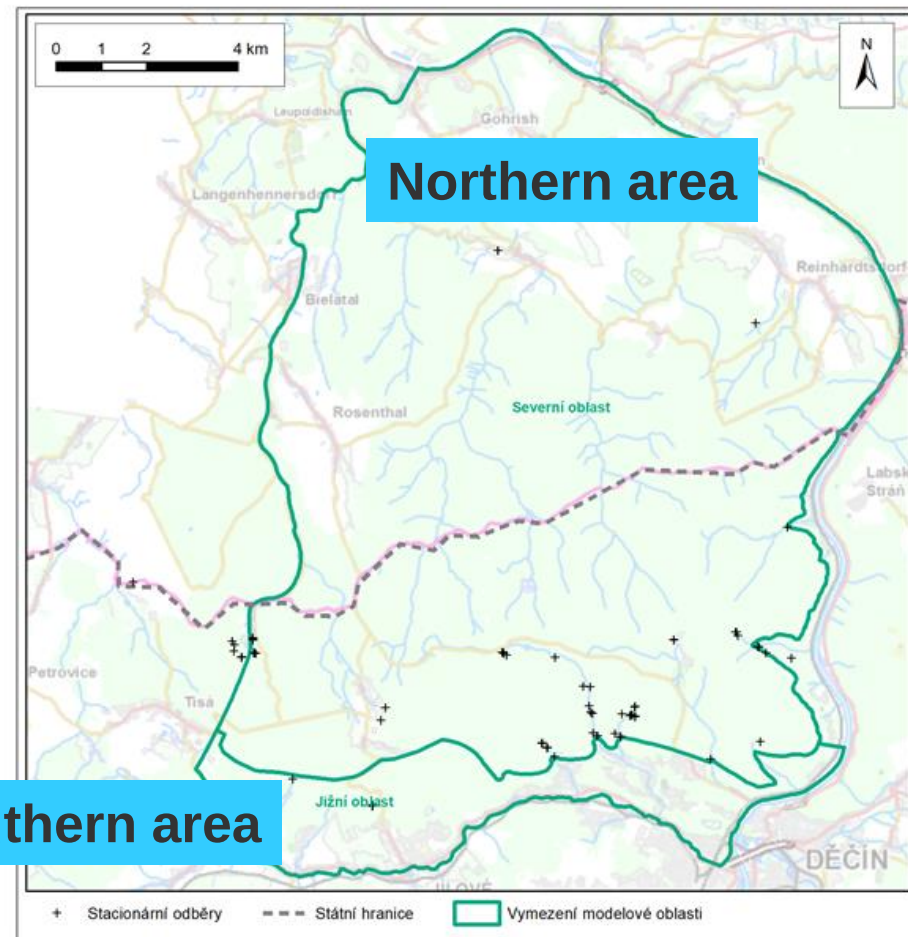
Děčínský Sněžník

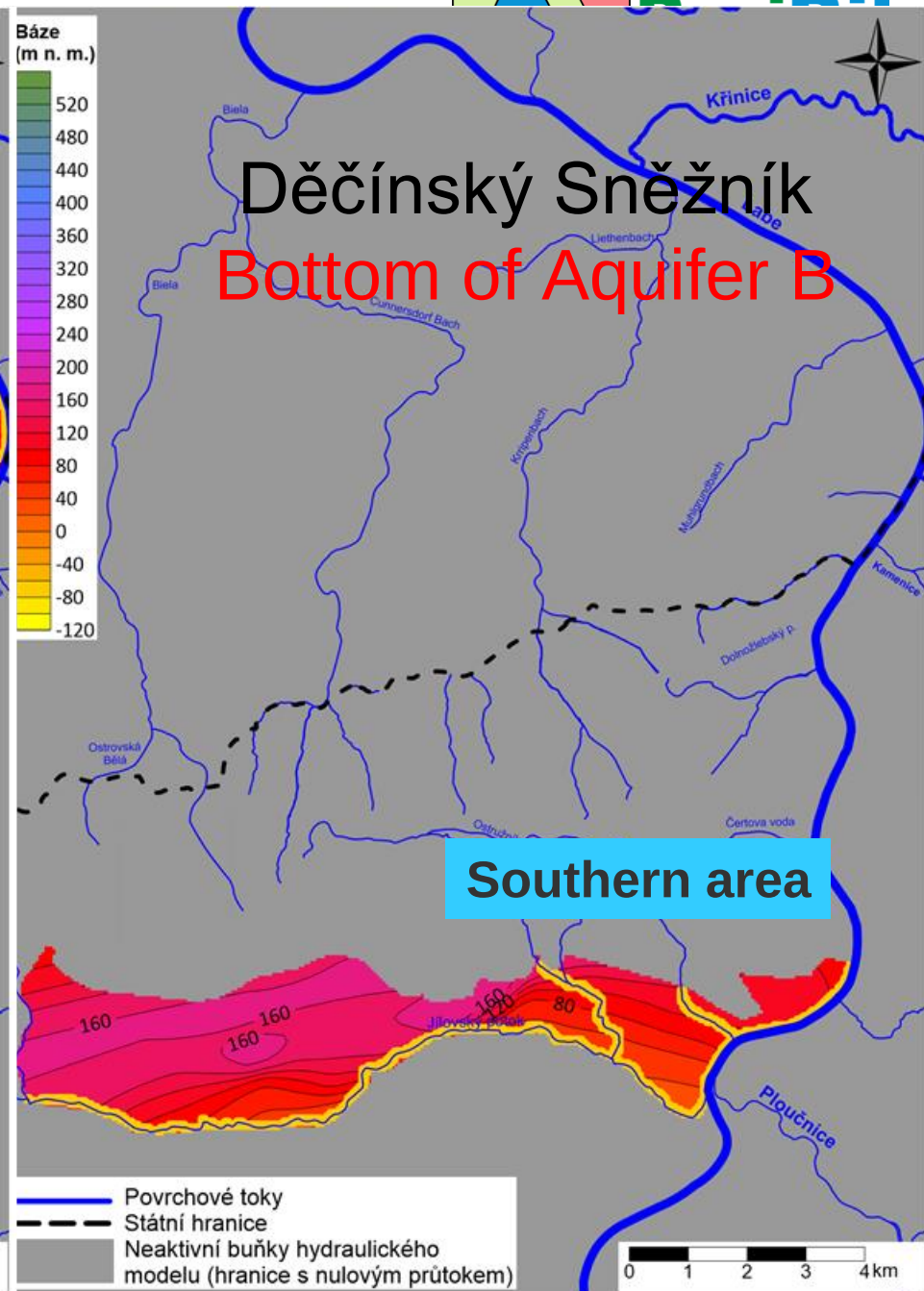
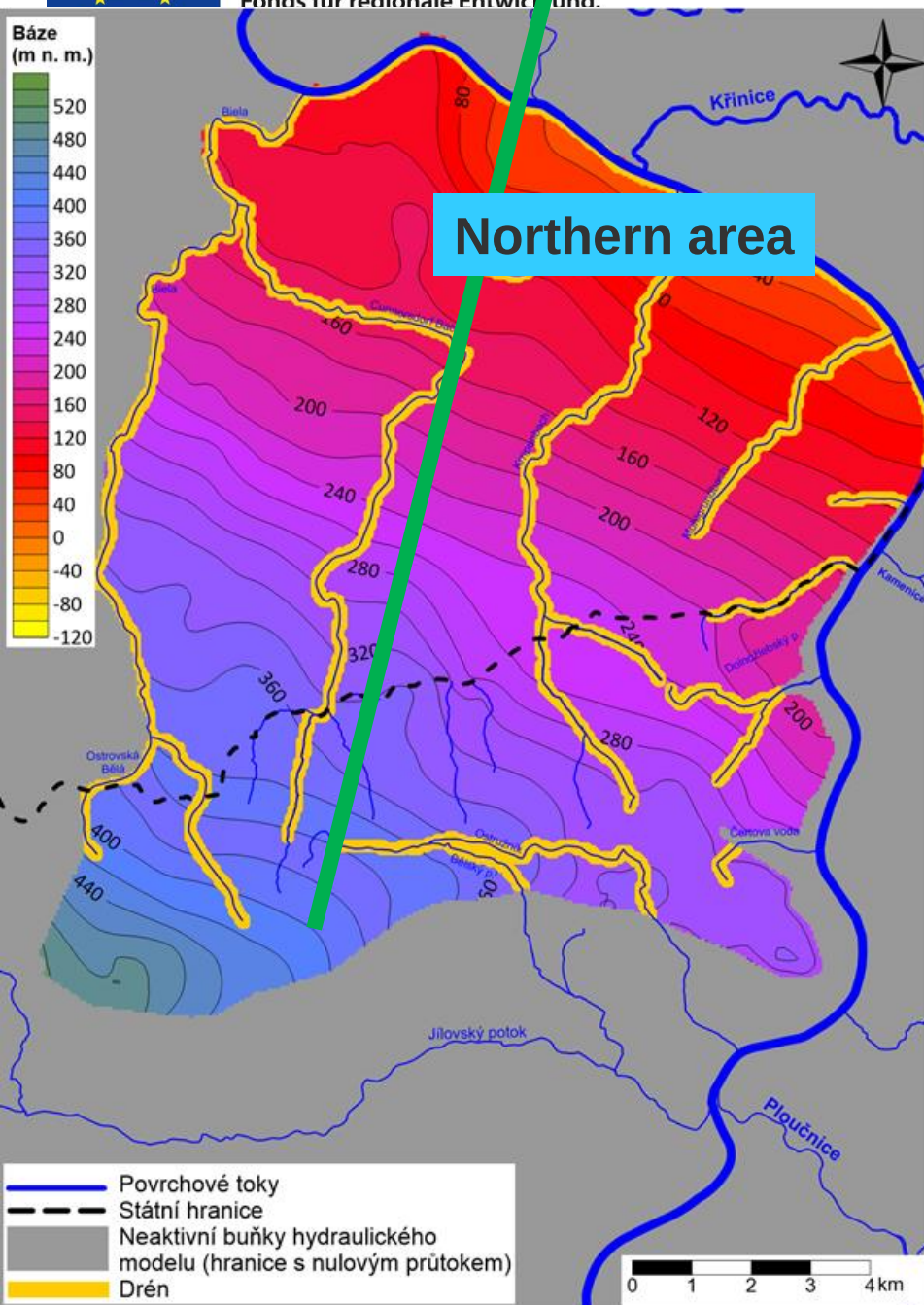
Geology and GW extraction



Geologická jednotka:

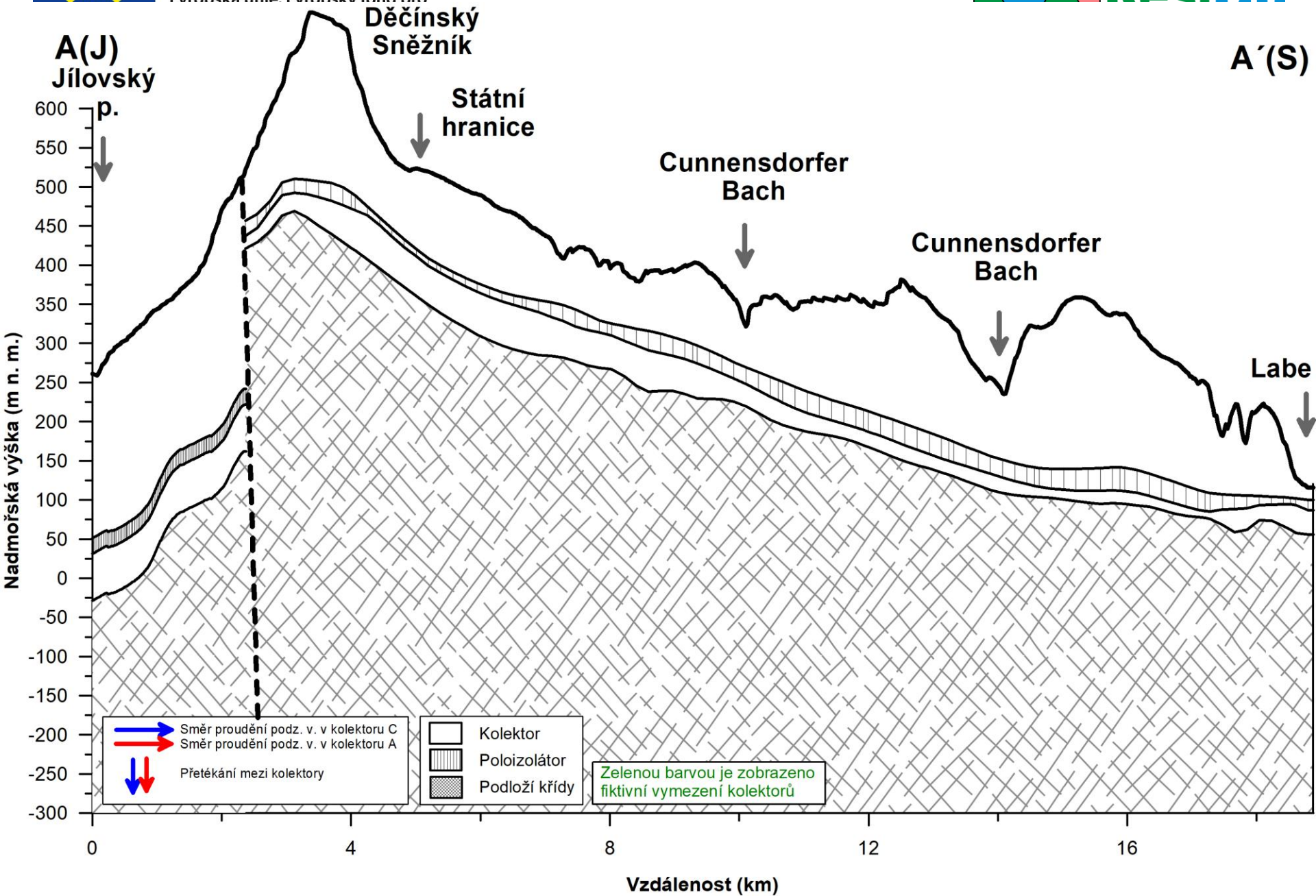
- | | |
|--|--|
| ICP - žilné horniny | Ks - merboltické souvrství (pouze na území ČR) |
| bN - bazické extruzivní horniny | gMa - typ Markersbach |
| GBI - blankensteinské souvrství | Kt2 - střední - svrchní turon |
| Ho - nivní/aluviální sedimenty; antropogenní sedimenty (nerozlišeno) | Kco - březenské souvrství (pouze na území ČR) |
| tN - vulkanoklastika | Kt3co - schrammsteinské souvrství (svrchní část), teplické souvrství |
| gF - freiberské souvrství | Kt3co - lückendorfské souvrství, waltersdorfské souvrství (spodní část včetně sonnenberského pískovce), teplické souvrství |
| gdZ - typ Zawidów, Lobau and Hernhut | fElb - phyllite and quartz-phyllite, quarzite, metabasite, marble/limestone, chloritic gneiss |
| Kc - perucko - korycanské souvrství (pouze na území ČR) | NPM/NPLM - machnínská skupina / lužická hlavní skupina |
| gLa - turmalinické granity | gE - krušnohorské krystalinikum |
| Kt1 - bělohorské souvrství (pouze na území ČR) | |

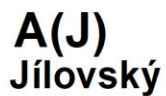
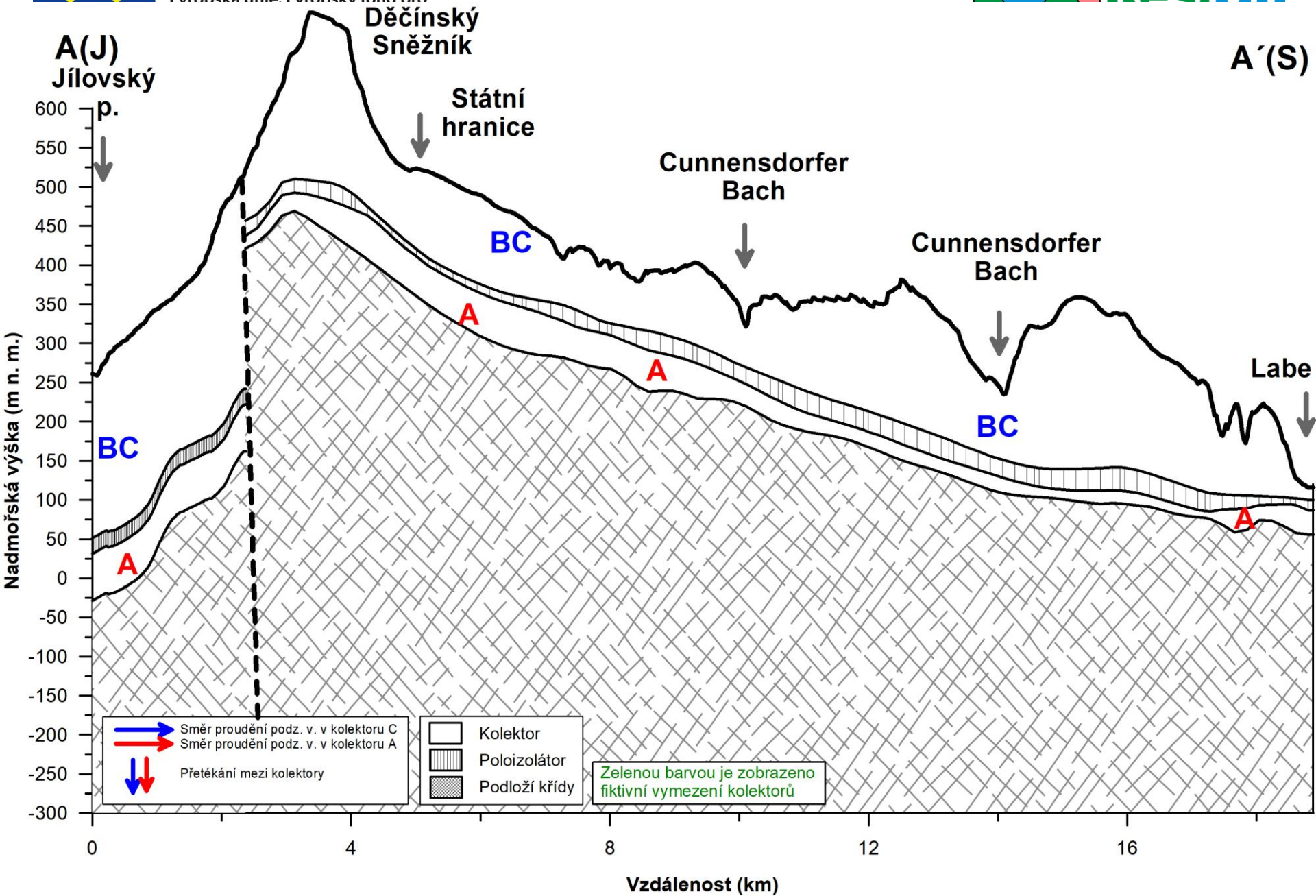






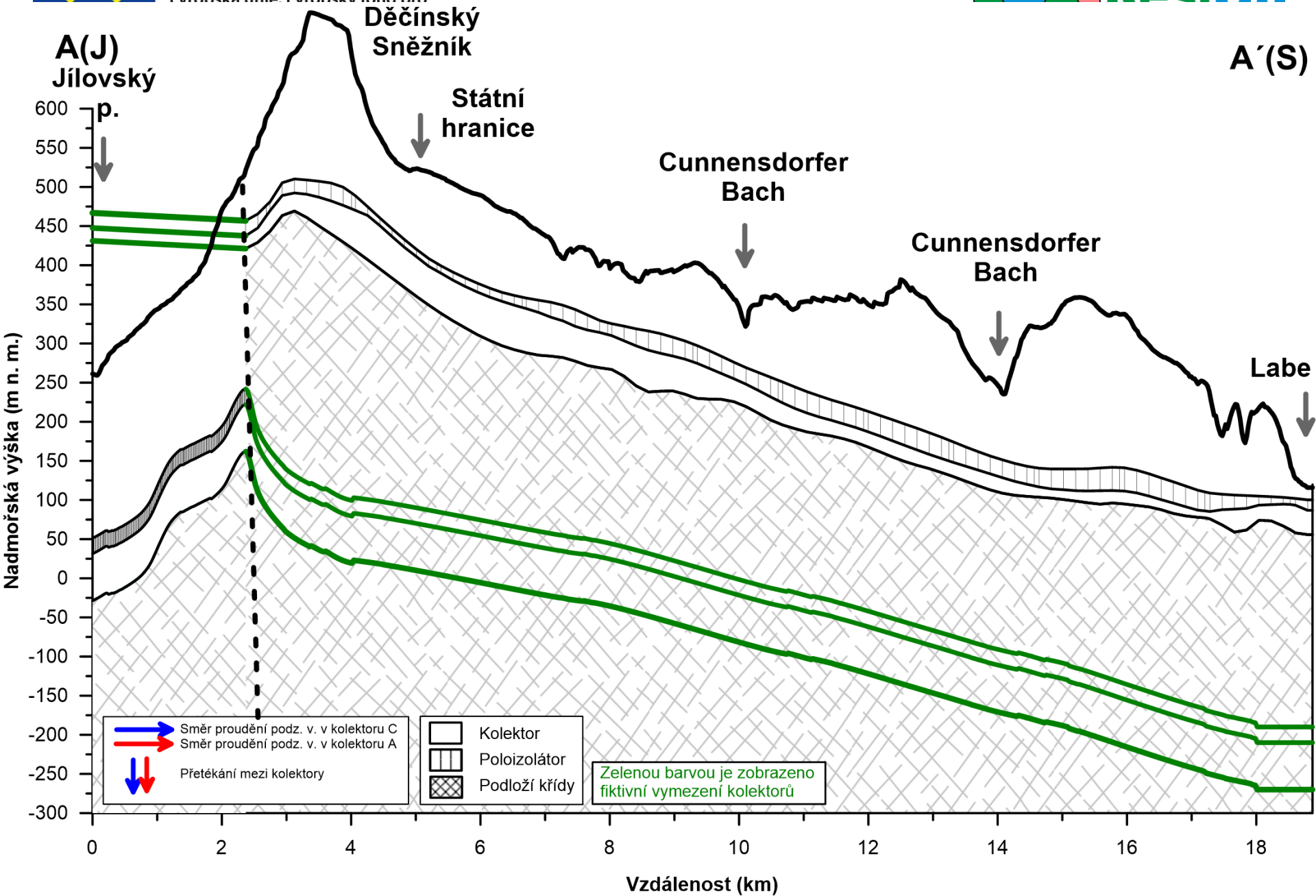
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Európska únia. Európský fond pre



 $A'(S)$ 

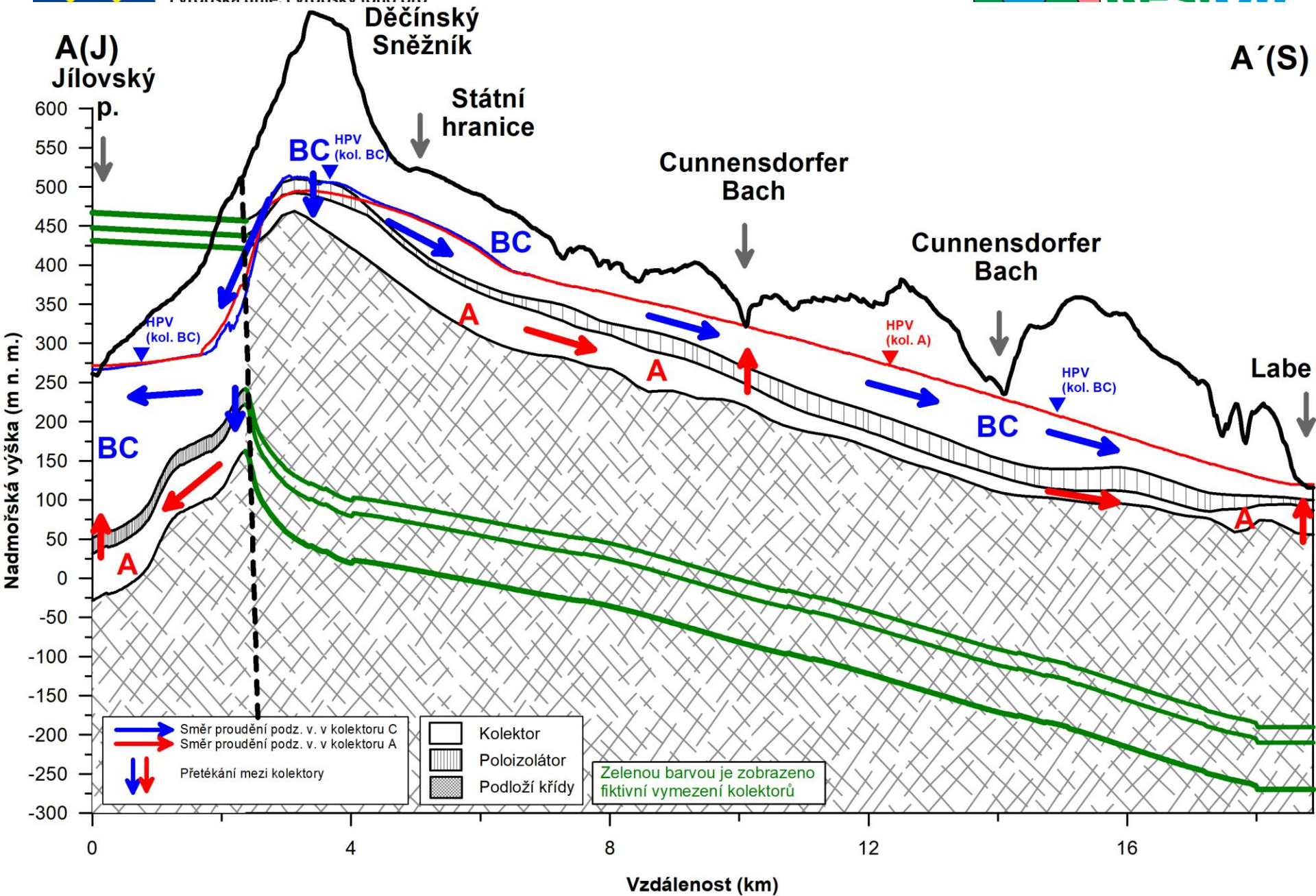


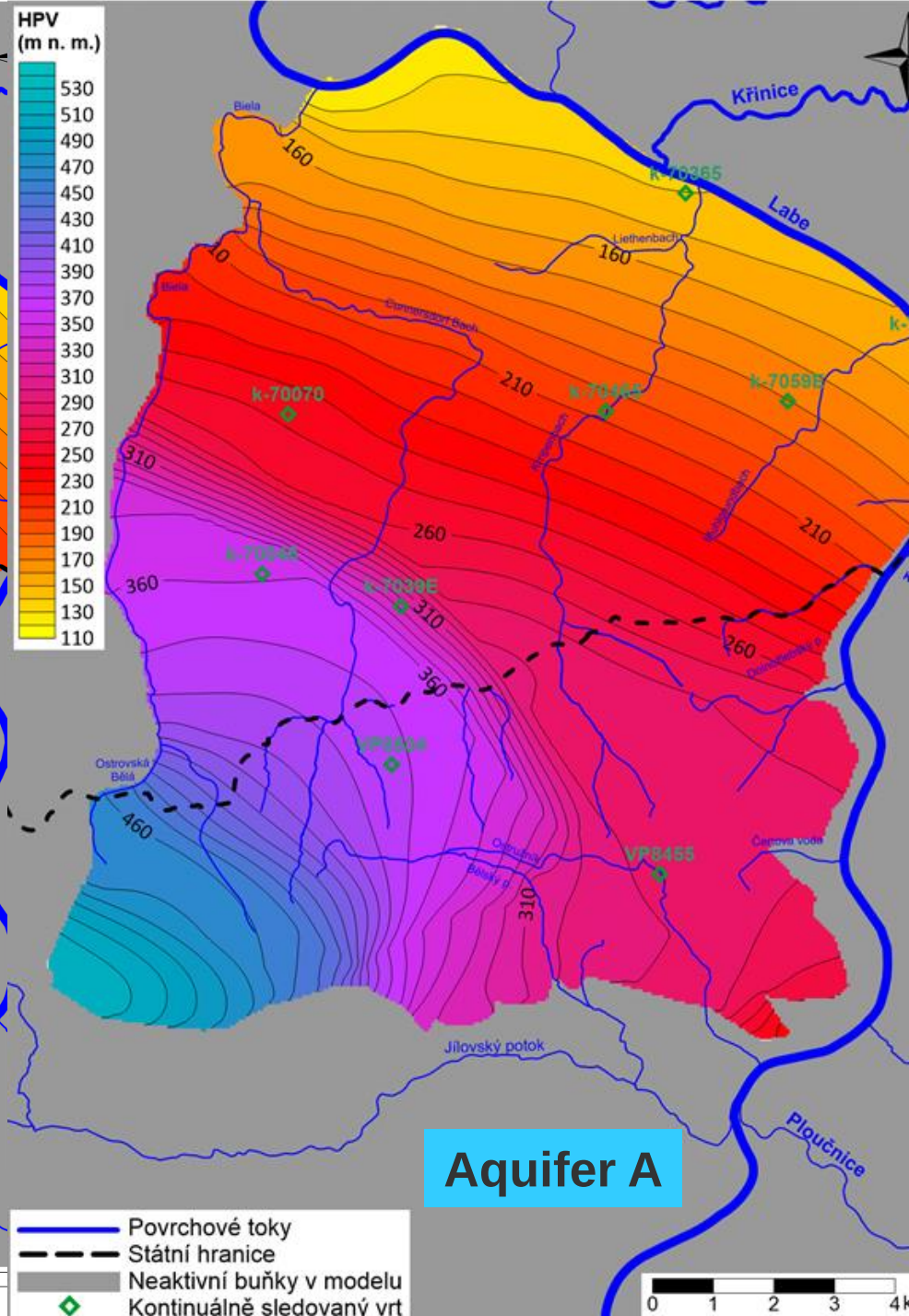
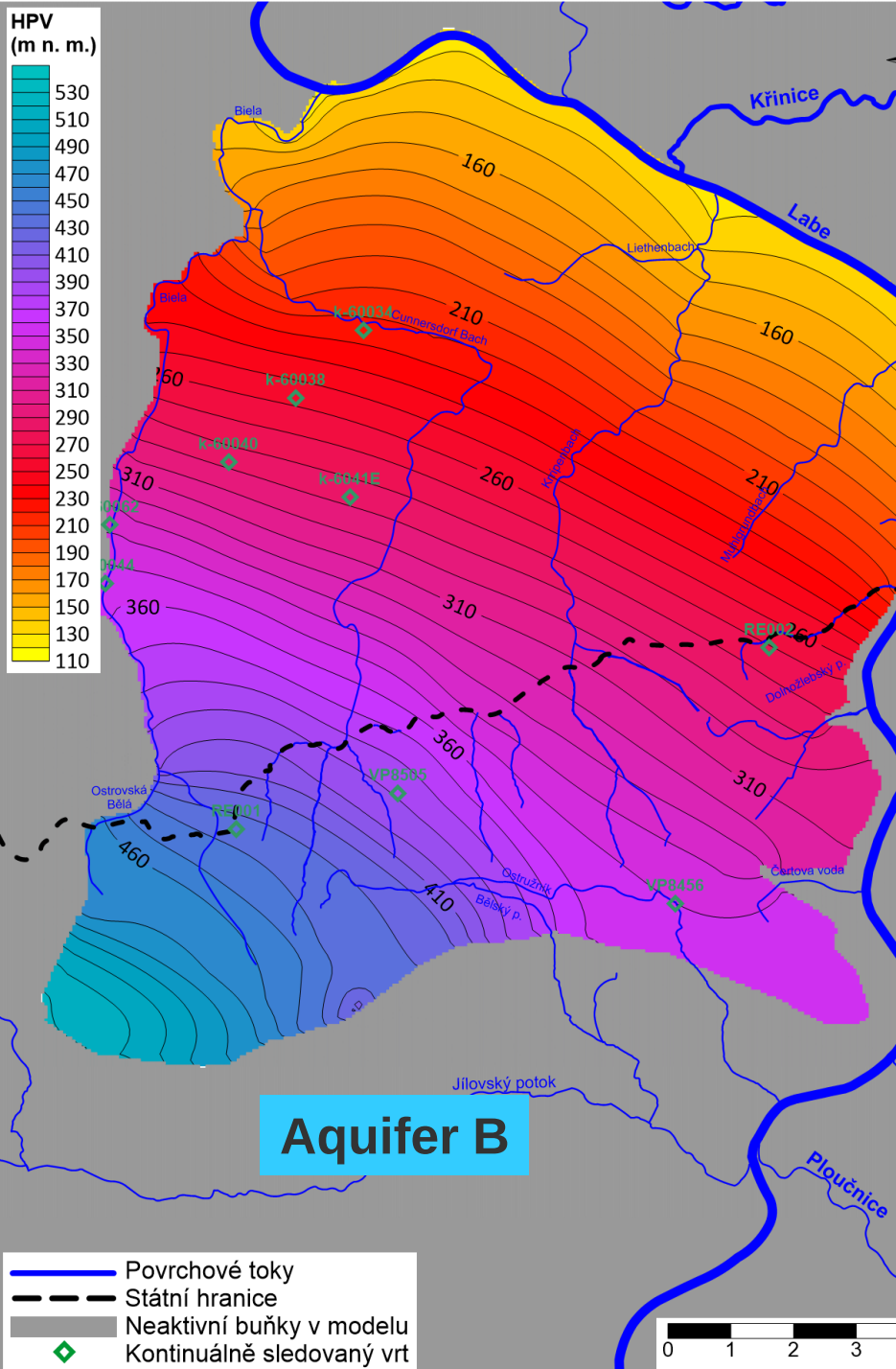
Evropská unie. Evropský fond pro regionální rozvoj.
European Union. European Regional Development Fund.

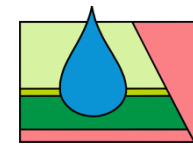




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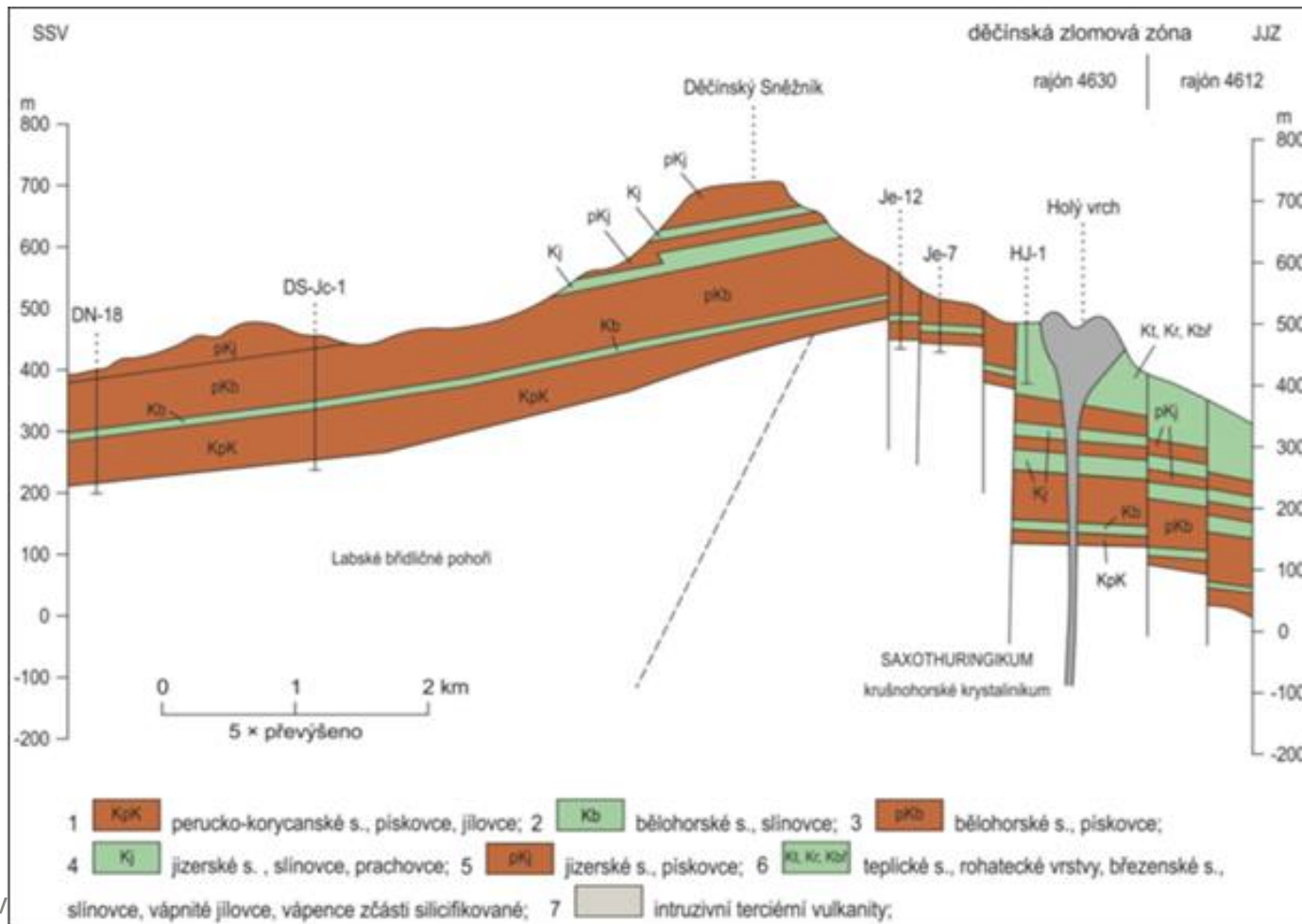


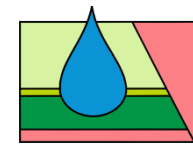




Děčínský Sněžník

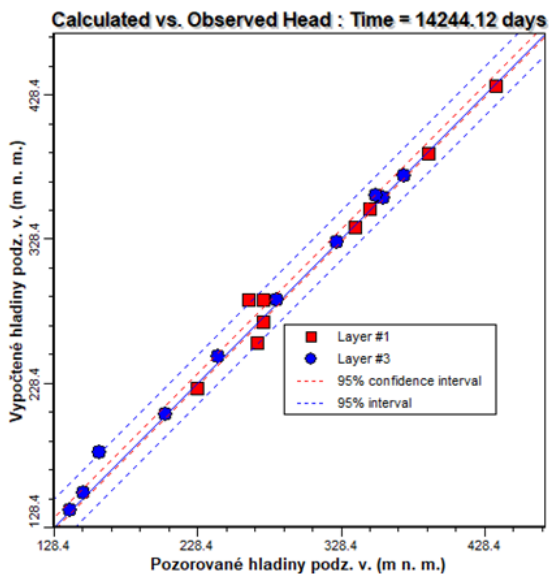
Burda – Venera et al. 2016



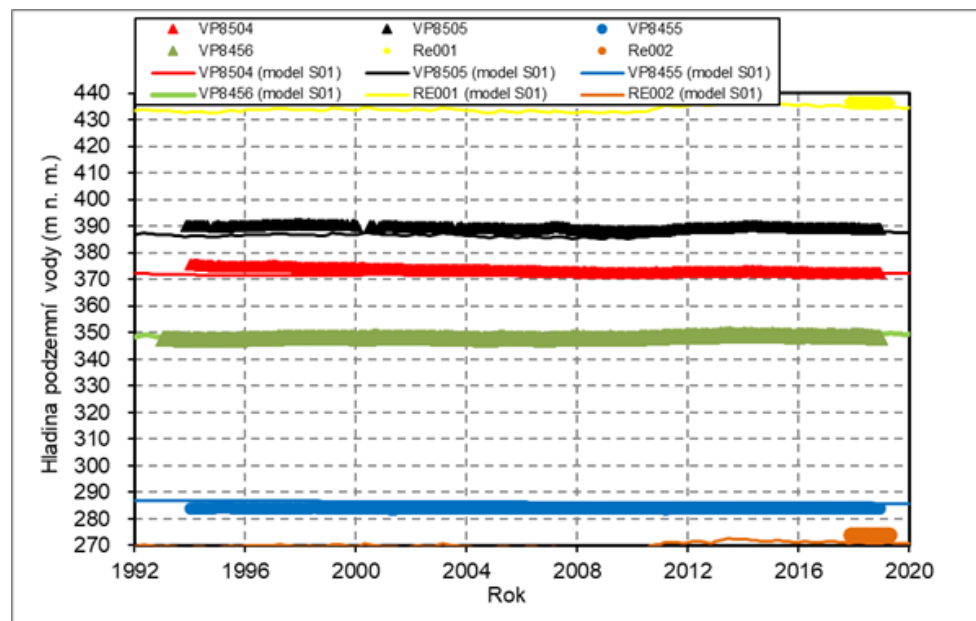


Děčínský Sněžník

Calibration



Num. of Data Points : 19
Standard Error of the Estimate : 1.888 (m)
Root Mean Squared : 8.409 (m)
Residual Mean : 2.557 (m)
Abs. Residual Mean : 5.25 (m)
Normalized RMS : 2.83 (%)
Correlation Coefficient : 0.995





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Auf Wiedersehen!!
na shledanou!!