

Why and how did polish scientists work for CocaCola co.?

The example of Hydrogeological research in the Beskidy Mountains (the Karpaty Massif, Poland)

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In 2005-2007, a polish research team from the University of Wroclaw has participated in a big hydrogeological project in the Karpaty Mountains prepared for CocaCola co. The research area is located in SE Poland of the Beskidian part of Karpatian Massif near the Tylicz city and belongs to the cleanest and precious areas of polish natural environment. Therefore, it is a great place for exploitation of non-polluted groundwater to produce one of the most popular bottled water by Coca Cola Co. called "The Drop of Beskid".

Big companies are usually interested in pumping a great amount of fresh groundwater (best sale water). In the Beskidy Mountains, however, the water exploitation is not allowed without hydrogeological control unit, because of coexistence and dependence of both, fresh groundwater and therapeutic groundwater together (mineral water containing naturally dissolved carbon dioxide). The therapeutic and fresh groundwater resources are protected by polish law, therefore, the hydrogeological expertise concerning the possibility of groundwater exploitation has been required in the Tylicz area.

The scientists from Wroclaw University had to answer for several company questions: "What is the volume of groundwater which could allow for efficient pumping without disturbance of groundwater resources?, Where the new wells can be drilled?, How the quantity and quality of groundwater will effect the exploitation?" etc. The answer for these questions have been complicated because of wide diversity within geological and tectonic structures of the Beskidy Mts.

The wide range of methods/activities has been carried out to describe groundwater interactions in the Tylicz area. This included cameral and field studies of

several aspects within geology, hydrogeology, hydrogeochemistry, hydrology and soil properties. Based on that data the numerical and conceptual hydrodynamical and hydrogeochemical models have been constructed using VisualModflow, MT3D, PhreeqCI software and statistical methods. The 7-layer hydrodynamical model allowed for determination of exploitation resources within fresh and therapeutic groundwater. The MT3D model showed the potential sources of pollutants and their migration pathways. The PhreeqC hydrogeochemical model showed the potential chemical effect on fresh and therapeutic groundwater mixing. The statistical methods helped to describe the hydrogeochemical background and factors influencing the anthropogenic pollution.

All these studies helped to understand a natural environment of the most beautiful Polish area and will help to protect groundwater in the future.