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(Inter)Continental hydrogeological mapping at BGR for societal impact

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Hydrogeological maps and derived thematic products (printed, web map services and digital spatial data) are key elements for knowledge transfer from the scientific community to decision makers in politics, economy and society. In the past decades, the Federal Institute for Geosciences and Natural Resources of Germany (BGR), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Association of Hydrogeologists (IAH), and the Commission for the Geological Map of the World (CGMW), have collaborated in financing, managing, compiling, editing and publishing numerous hydrogeological mapping missions. This presentation will summarize some of the past and ongoing projects, at the pan-European and global scale and provides an outlook on important upcoming issues.

Completed and current projects discussed in the presentation include: i) the latest edition of the World-wide Hydrogeological Mapping and Assessment Programme (WHYMAP) on global groundwater vulnerability to floods and droughts, ii) the upcoming new WHYMAP layer being developed at the Karlsruhe Institute of Technology (Germany) covering karst aquifers, including springs and caves, and iii) the finalisation of the International Hydrogeological Map of Europe (IHME) by including the North Cape/Northern Russia territory and developing a hierarchical legend derived from the lithology.

However, there is a growing need to enhance a maps readability and comprehensibility by non-scientists, allowing sound opinion and ultimately decision making. Consequently, the content of a map is going beyond the scientific preparation of hydrogeological information at high resolution. In fact, categories and legends have to be developed, that assure a transfer of precise hydrogeological data into planning societal benefit areas, for instance: How can the quantity and quality of available groundwater be estimated with respect to IPCC scenarios? Which groundwater management policy should be implemented in 2050 in the Middle East, adapting to climate change? This can be achieved by aggregation of map units and combination with information from various fields, e.g., quaternary geology, hydrology, geotechnical engineering, ecology, biology, agriculture, geochemistry, meteorology and social sciences. Examples provided in this presentation, such as the European Landslide Susceptibility Map (ELSUS) and ongoing projects implying the use of soil data and climate change scenarios, highlight the need to move on to integrated mapping facilitating decision making processes on short- and mid-term time scales.

References:

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