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Under the ice and over the sky – aspects of building the International Quaternary Map of Europe and potentially useful parallels to planetary geological map projects

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The project of the International Quaternary Map of Europe project (IQUAME 2500) is a major international initiative coordinated by BGR under the auspices of the CGMW (Commission of the Geological Map of the World, Sub-Commission Europe) and with support of INQUA (International Union for Quaternary Research). It started in 2011 at the INQUA congress in Bern and aims to show the distribution of Quaternary features at the land surface and general marine deposits across the entire European continent. The map is planned as web-based geographical information system (GIS) and is going to include the Quaternary on- and off-shore information on e.g. glaciogenic elements, geomorphologic features, age and lithology of Quaternary units, last extent of ice sheets (Weichselian, Saalian, if possible Elsterian), faults, active faults off-shore Quaternary information (in cooperation with the European Union EMODnet Geology project) and more.

Partner institutions from more than 30 countries including geological survey organisations from Russia in the East, Portugal in the West, Norway in the North and Cyprus in the South are participating; a scientific board of Quaternary researchers ensures the high scientific quality of resulting map. For a multinational and cross-boundary project like this, international collaboration is the key to success. This project requires that data originally set up in a plethora of regional and national classifications need to be adapted, integrated and harmonized in respect to semantics, structure and geometry. To achieve this aim common rules needed to be used such as those defined by the European INSPIRE Directive or be set up and applied by all participants: structured vocabularies (incl. definitions of terms) to describe the above contents, cartographic guidelines to suite the scale and last but not least generally applicable tools to aid the partners to submit their data to the project.

Ultimately, the aim is to create an pan-European, internationally harmonized, comprehensive, spatial geological database where relevant properties of the Quaternary layers can be retrieved, combined, selected and cross-referenced across political boundaries and also to provide a summary of the current status of European Quaternary geological research.

Looking at planetary mapping, e.g. of Mars and Moon, there are several similarities. The surfaces

of terrestrial planets are shaped by geologic processes that are similar to those operating on Earth, therefore endogenic and exogenic landforms (such as lava flows, glacial deposits, and impact craters) are regularly mapped by the scientific community. Beside specific scientific mapping projects conducted by individual researchers and groups different organisations and institutes are producing planetary maps, such as NASA, ESA, ROSCOSMOS and MIIGAiK (Russia), USGS (USA), CAS/NOAC/SGCAS/RADI (China), DLR (Germany), or the British Ordnance Survey. This presentation aims to introduce the small-scale Quaternary mapping of one part of planet Earth, i.e. Europe, to present its collaborative aspects, to highlight the parallels to planetary mapping and to suggest potentially useful aspects for planetary geological mapping projects.