

The International Quaternary Map of Europe and Adjacent Areas: Results from mapping of extreme environments inclusive

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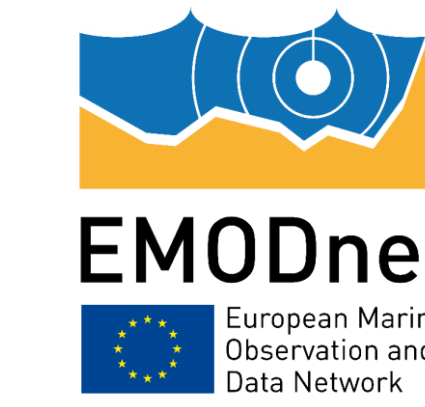
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Work in progress



The project of the International Quaternary Map of Europe (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.

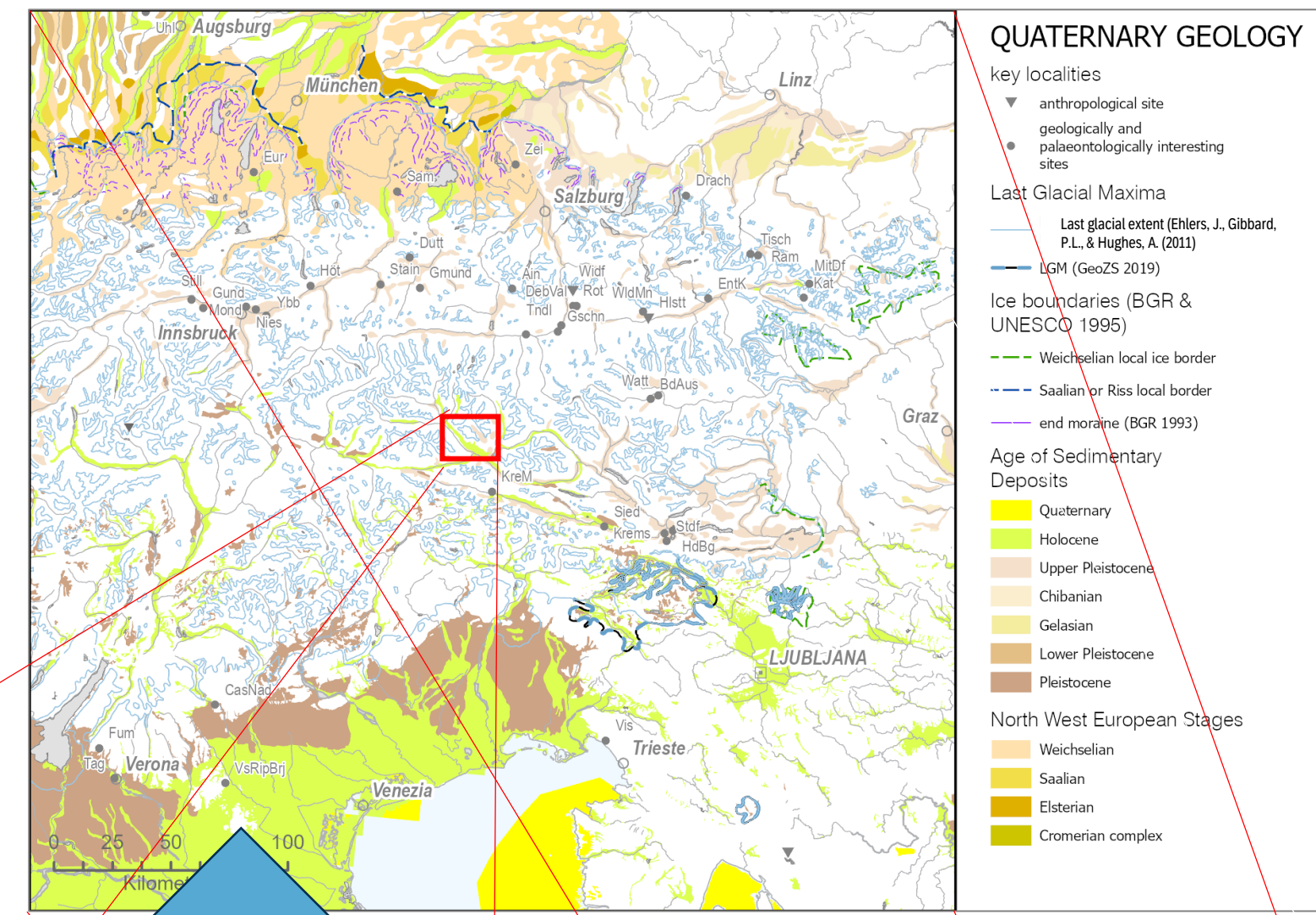


Fig. 3: Extract map from the Central and Eastern Alpine part of the IQUAME, showing the stratigraphical age, key locations and the Last Glacial Maximum.

The project is collecting and compiling information from more than 40 partner institutions on numerous aspects of the European Quaternary.

Themes:

- lithology,
- geochronological age,
- genetic descriptions,
- maximum extent of the ice sheets,
- extent of Arctic sea ice,
- off-shore Quaternary information (with information from the EU EMODnet Geology project),
- directions of ice movement,
- postglacial rebound,
- active faults,
- extent of permafrost,
- extent of sea ice,
- key localities (geologically and anthropologically interesting sites).

Participation of the numerous international partners and the many different topics require considerable data harmonisation (semantics, structure and geometry). To achieve this, common standards and guidelines were set up and used by all participants:

- structured, controlled vocabularies to describe the IQUAME's contents in pre-defined Excel tables,
- a common topographic base map (Vmap 0),
- a booklet of technical guidelines how to deliver the data.

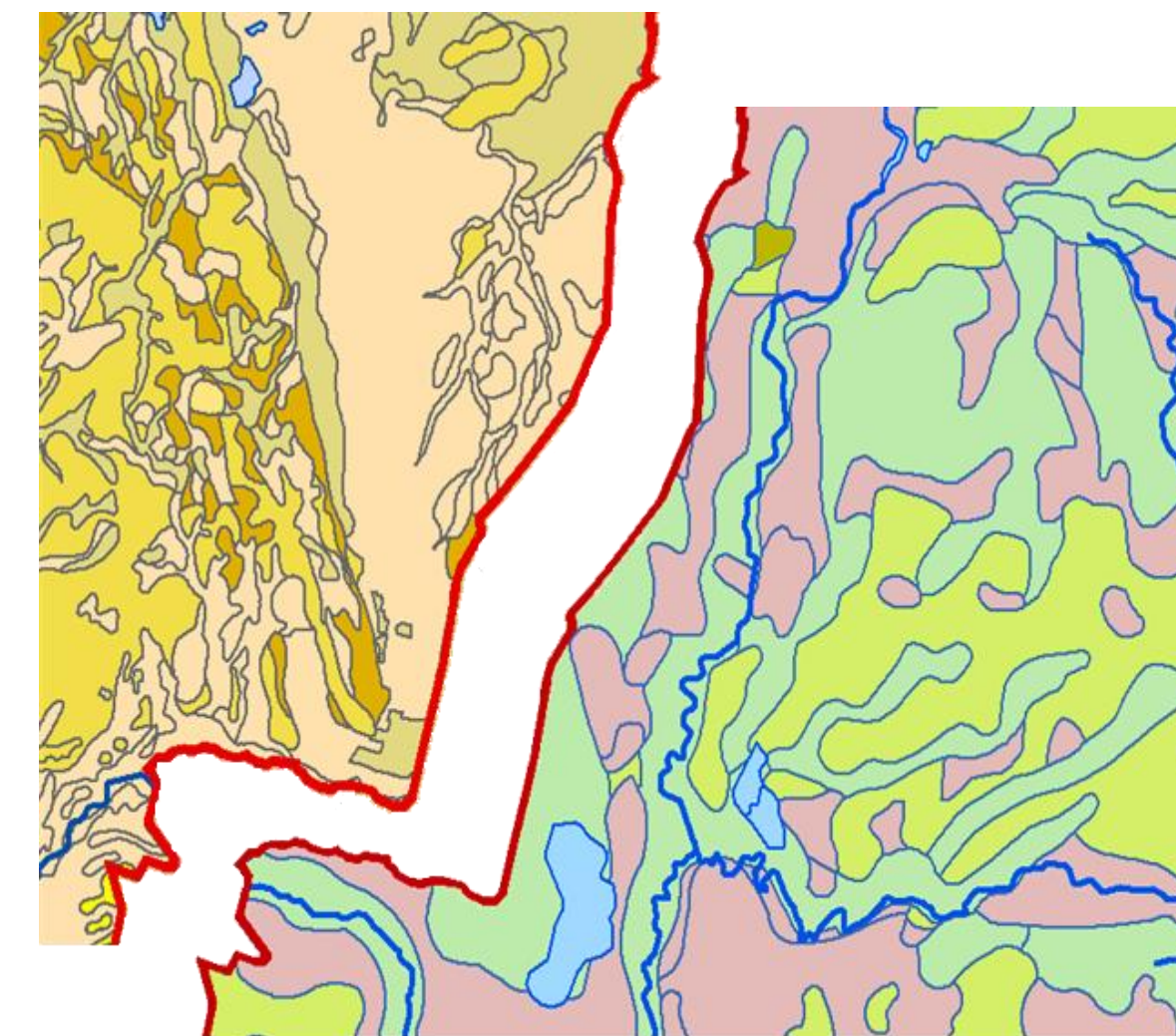


Fig. 5: Discrepancies at political boundaries in respect to mapped unit, terminology and scale require harmonization.

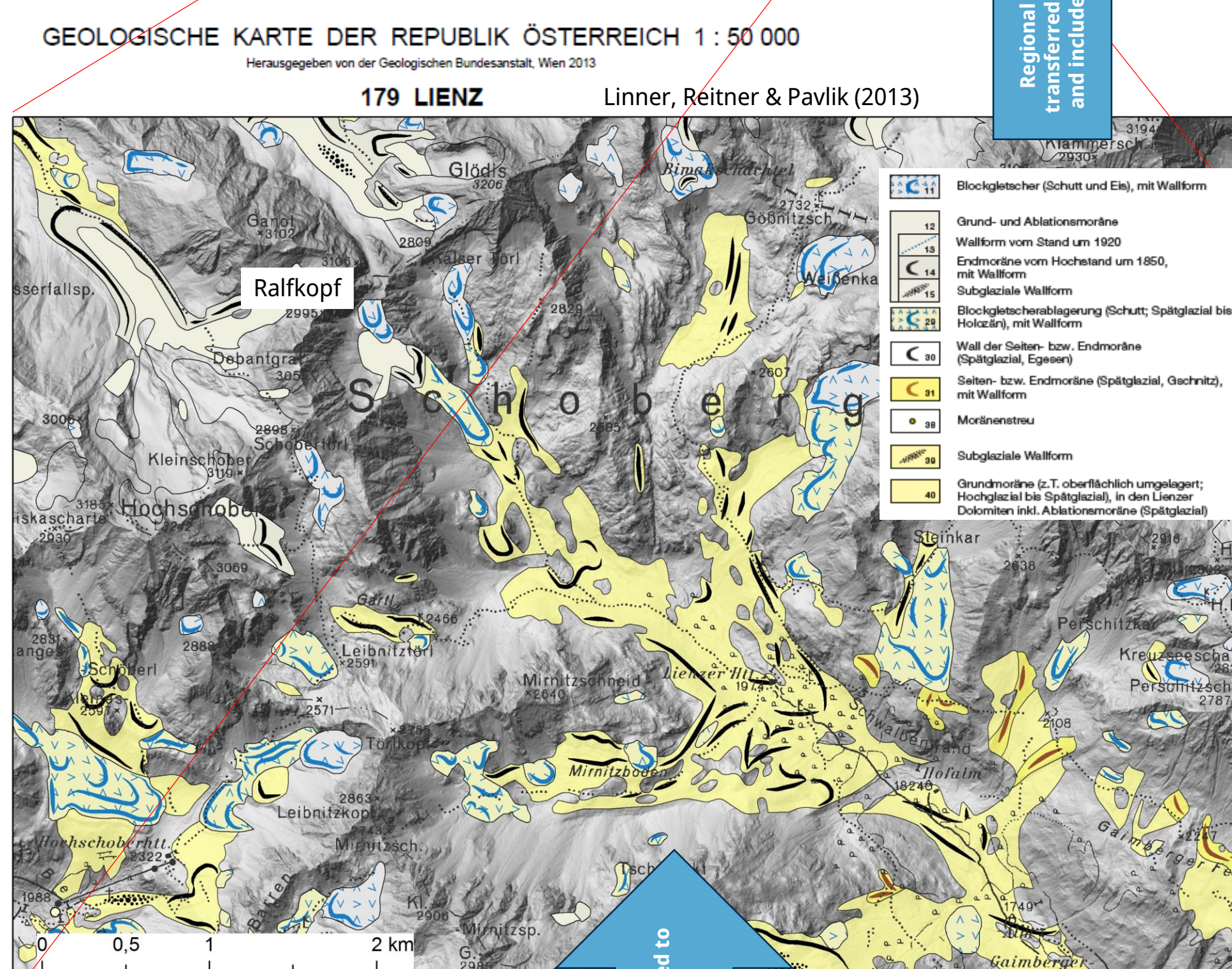


Fig. 2: Extract showing the Quaternary geology of the geological map sheet Lienz (Austria).

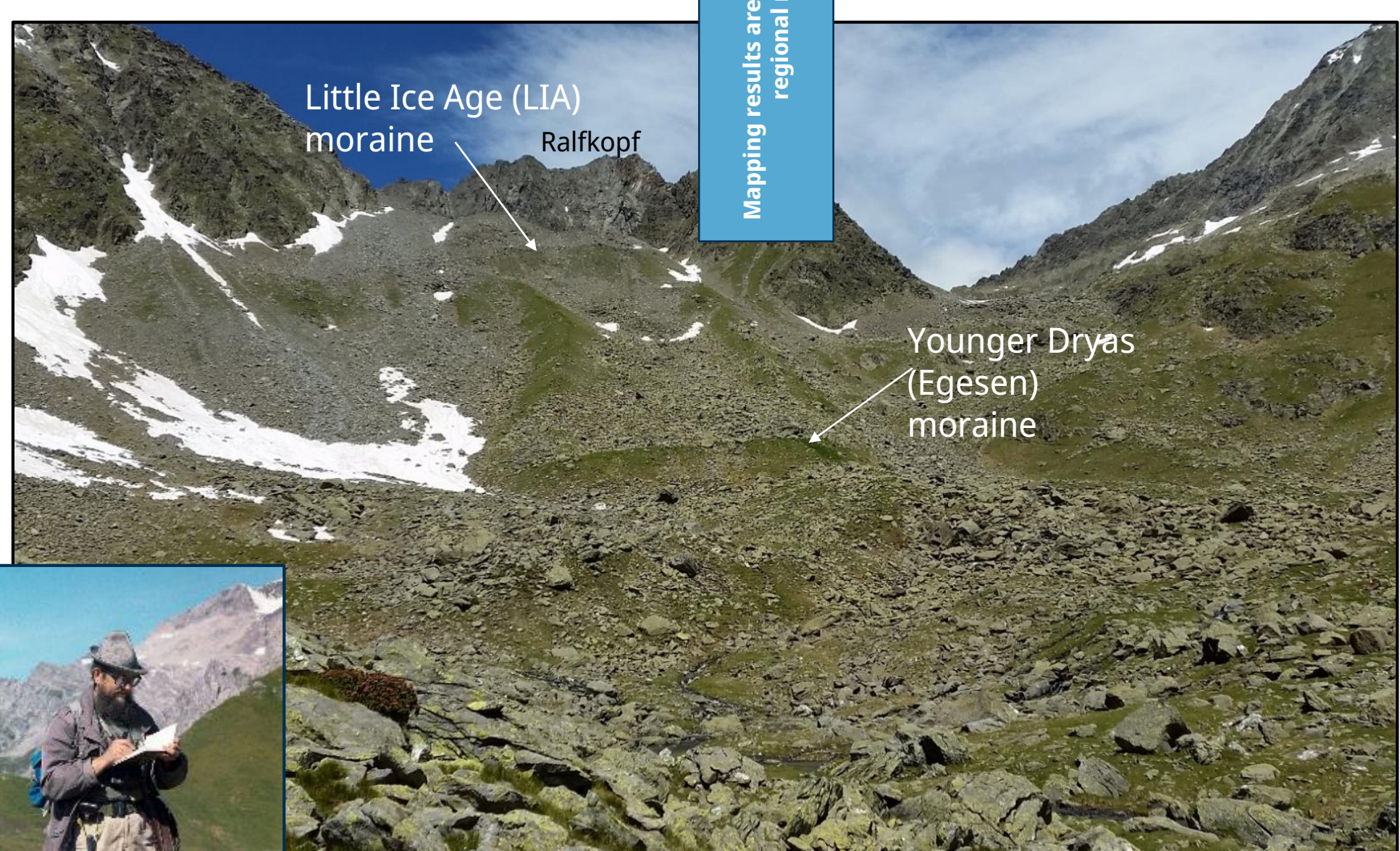


Fig. 1: Moraines and tills of the Little Ice Age and the Egesen Stadial (Younger Dryas), Schobergruppe mountains, Tyrol, Austria.

Acknowledgements

Thank you to the IQUAME 2500 participants for their excellent contributions to the map layers. Special thanks goes to Alexander Müller of BGR, who perfectly processed and provided the maps in the Figures 3, 4, 6 and 7, and Christa Vinnemann and Ann-Kathrin Sternkiker (both BGR) for their thorough review.

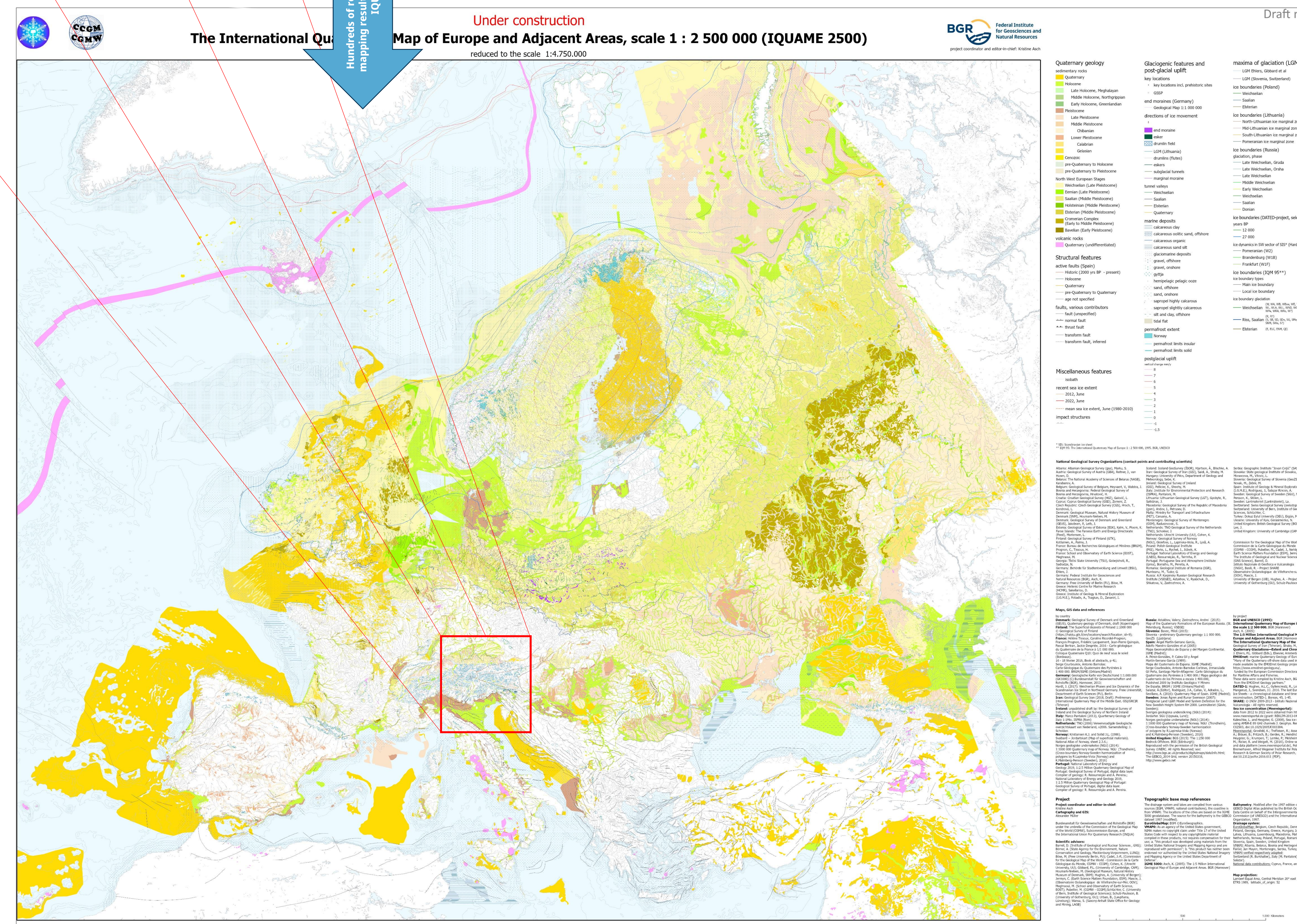
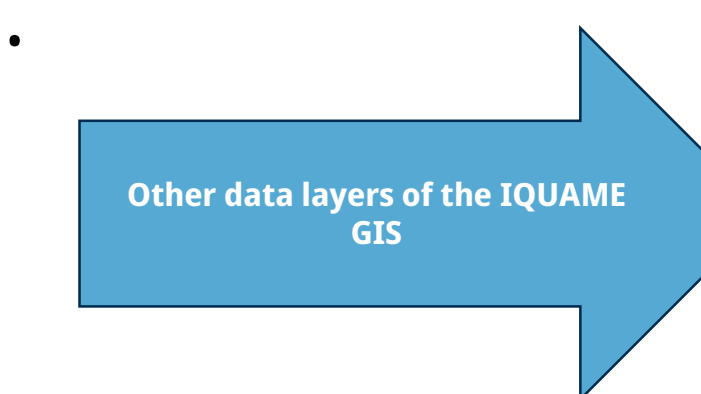


Fig. 4: EMODnet Geology; Seafloor Geology; geomorphology layer

The IQUAME is based on hundreds of mapping campaigns all over Europe. A considerable amount took place in extreme environments such as in polar, glaciated regions or mountainous regions, e.g. in the Schobergruppe in the Eastern Alps in Austria (Fig.1). This example shows the mapping of Late Glacial moraines indicating extensive multiple glacier advances after the breakdown of the Last Glacial Maximum ice cap which occur in a high alpine environment with peaks of 3000 m altitude and steep slopes, and its inclusion as one of numerous mapping results that were included into the IQUAME 2500.



The data are constantly updated and progress in harmonisation continues. The IQUAME also presents off-shore map information, most of which originate from the European Marine Observation and Data Network Geology project (EMODnet Geology).

Selected references

Asch, K., Gdaniec, P. & Müller, A. (2019): Review of the 1 : 2.5 Million International Quaternary Map of Europe. General Information and Guidelines for the Review. Working Paper. 2nd ed.. BGR (Hannover)
 BGR & UNESCO (1967-1995): International Quaternary Map of Europe in the scale 1:2 500 000 (IQM 95): 14 sheets. BGR (Hannover)
 Ehlers, J. & Gibbard, P.L. & Hughes, P.D. (Eds.) (2011): Quaternary Glaciations—Extent and Chronology. Elsevier, Amsterdam
 EMODnet Geology: [Geology | European Marine Observation and Data Network \(EMODnet\) \(europa.eu\)](http://www.emodnet-geology.eu)
 GeoZs, Slovenia (2018): Map of Last Glacial Maxima of Slovenia. Unpublished
 Linner, M., Reitner, J.M. & Pavlik, W. (2013): Geologische Karte der Republik Österreich 1:50.000 Blatt 179 Lienz. Geological Survey of Austria

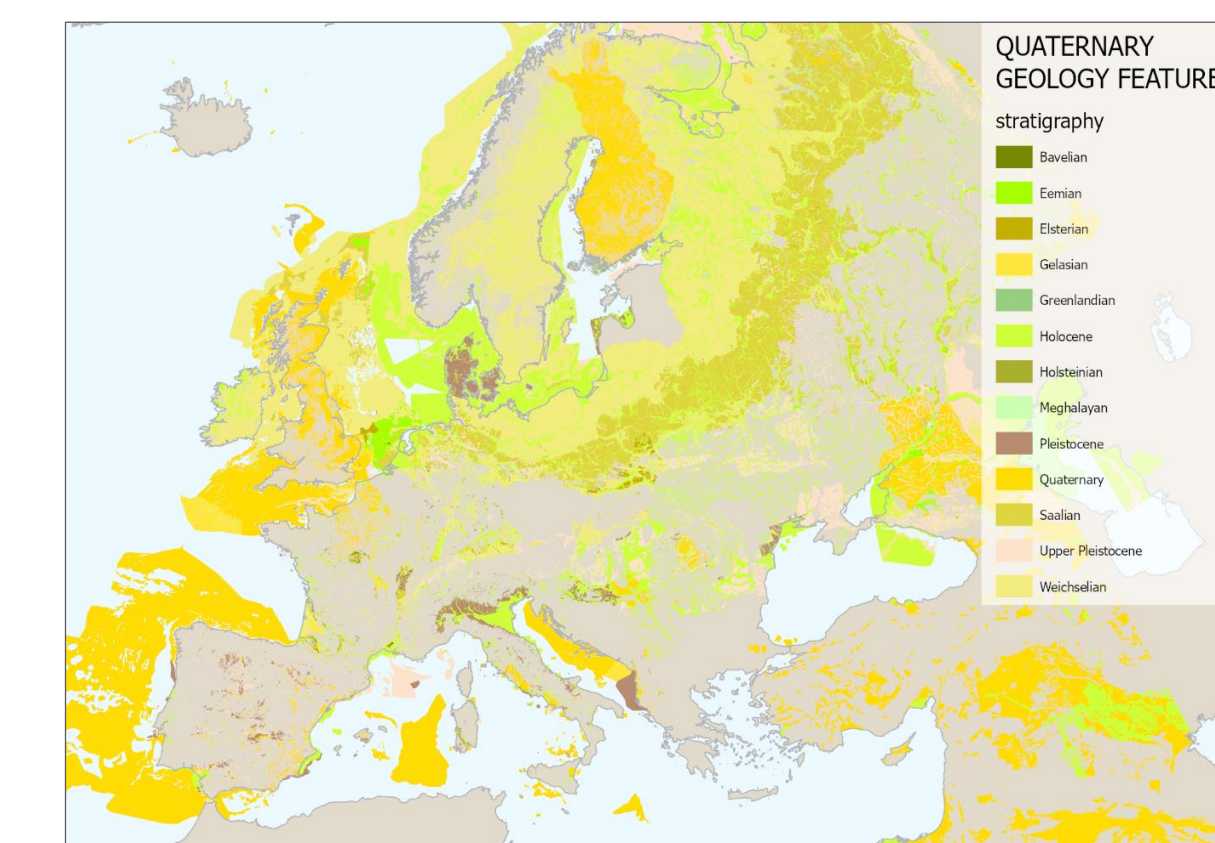


Fig. 6: Stratigraphy layer showing the geological age within the IQUAME 2500.

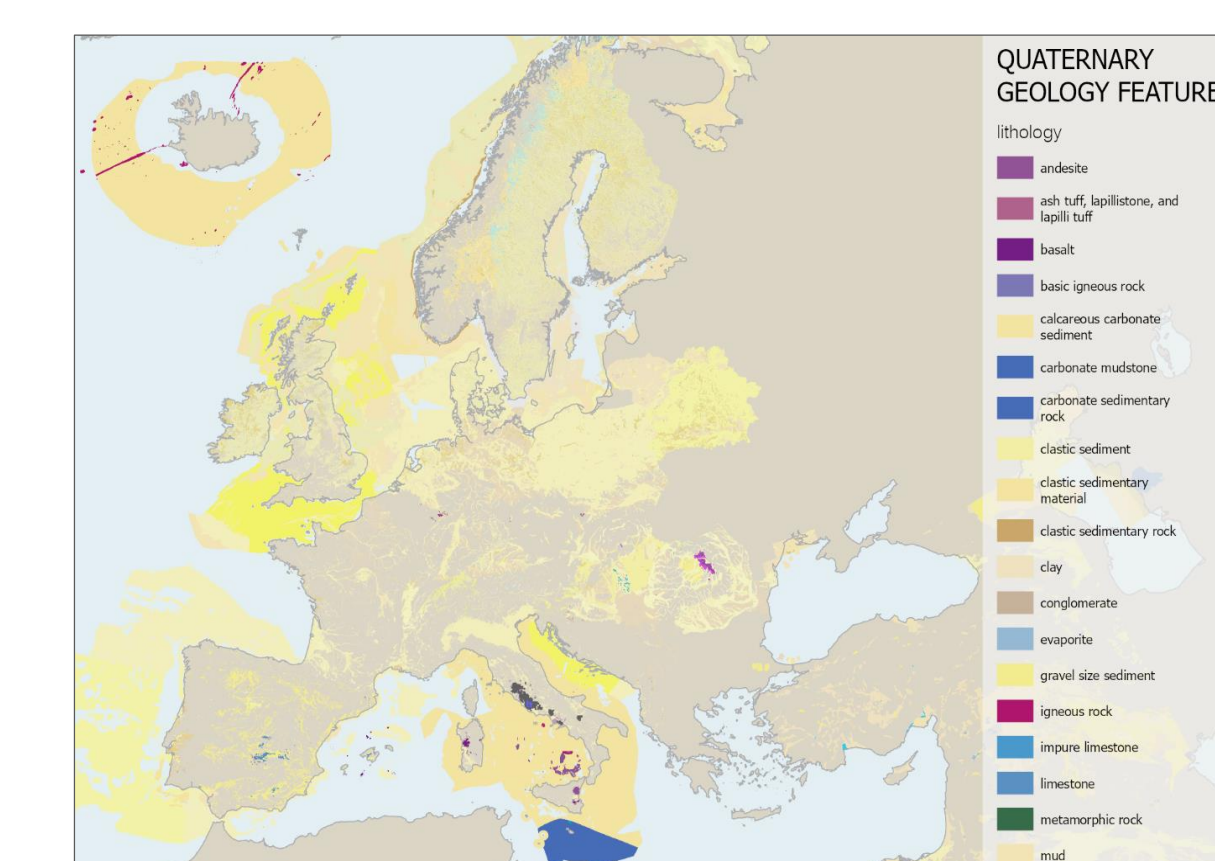


Fig. 7: Lithology layer within the IQUAME 2500.

