Communications of the Society

DiGeo: Introduction and a new tutorial to geological maps with QGIS 3.X

Georg H. ERHARTER[1)2)*)], & Markus PALZER-KHOMENKO[3)]

[1)] Institute of Rock Mechanics and Tunnelling, Graz University of Technology, Rechbauerstraße 12, A-8010 Graz, Austria;

[2)] geo-zt gmbh – poscher beratende geologen, Saline 17, A-6060 Hall in Tirol, Austria;

[3)] Department für Geodynamik und Sedimentologie, Universität Wien, Althanstraße 14, A-1090 Wien, Austria;

[*)] Corresponding author: erharter@tugraz.at

The ongoing digitalization is seen as one of the major challenges of our times. Many geologists hesitate to utilize the advantages provided by digital systems because of their ostensible complexity and a lack of proper training. Therefore, the main objective of the Austrian Geological Society's working group on Digital Geology (DiGeo) is the support of earth scientists in facing these challenges. The working group tries to accomplish this by providing software courses (https://geologie.or.at/index.php/kurse), written tutorials, discussion panels and group meetings.

We hereby present a new tutorial on the creation of geological maps with QGIS 3, an open source geographic information system (GIS) application that can be freely downloaded from https://www.qgis.org/en/site/forusers/download.html. The GIS software in general is made for the visualization, analysis and modification of geospatial data and, today, it is widely used in many scientific, industrial and governmental applications. As an official project of the Open Source Geospatial Foundation (OSGeo), QGIS was designed to be user-friendly and can be executed from different operating systems. It is constantly updated and provides an ever-increasing number of tools for various applications (QGIS Development Team, 2018).

Other tutorials on QGIS-based geological maps exist, but these are often based on older versions of the program (e.g. Lorscheid, 2013; Mohsen Alshaghdari, 2017). For geologists, QGIS is a highly valuable software for the visualization of geological data and the creation of maps.

The presented tutorial offers a step-by-step guideline to create and design a geological map. The full version can be found under https://geologie.or.at/index.php/downloads2/category/5-qgis.

The tutorial "Geological Maps with QGIS 3.X" is made for inexperienced users who want to create their first digital geological map. Nevertheless, more experienced users will probably find new, valuable functions as well. The tutorial comprises a step-by-step instruction, which can be worked through consecutively, but individual chapters stand for themselves as well. Throughout the tutorial, an exemplary geological map is created (Fig. 1).

Following a general overview of the software, the first step explains the download and installation of the programme. Further on, basic information on coordinate reference systems is given. The second step explains the implementation of different basemap layers (e.g. raster data, web map services and scanned maps) as background maps. The georeferencing tool for the implementation of scanned maps is also presented. In the third step, the creation of points, lines and polygons is explained, which constitutes the actual creation of an individual geological map. The last step shows how to create a map layout including elements, such as a coordinate grid, a north arrow and a scale bar, as well as how to export the finalized map.
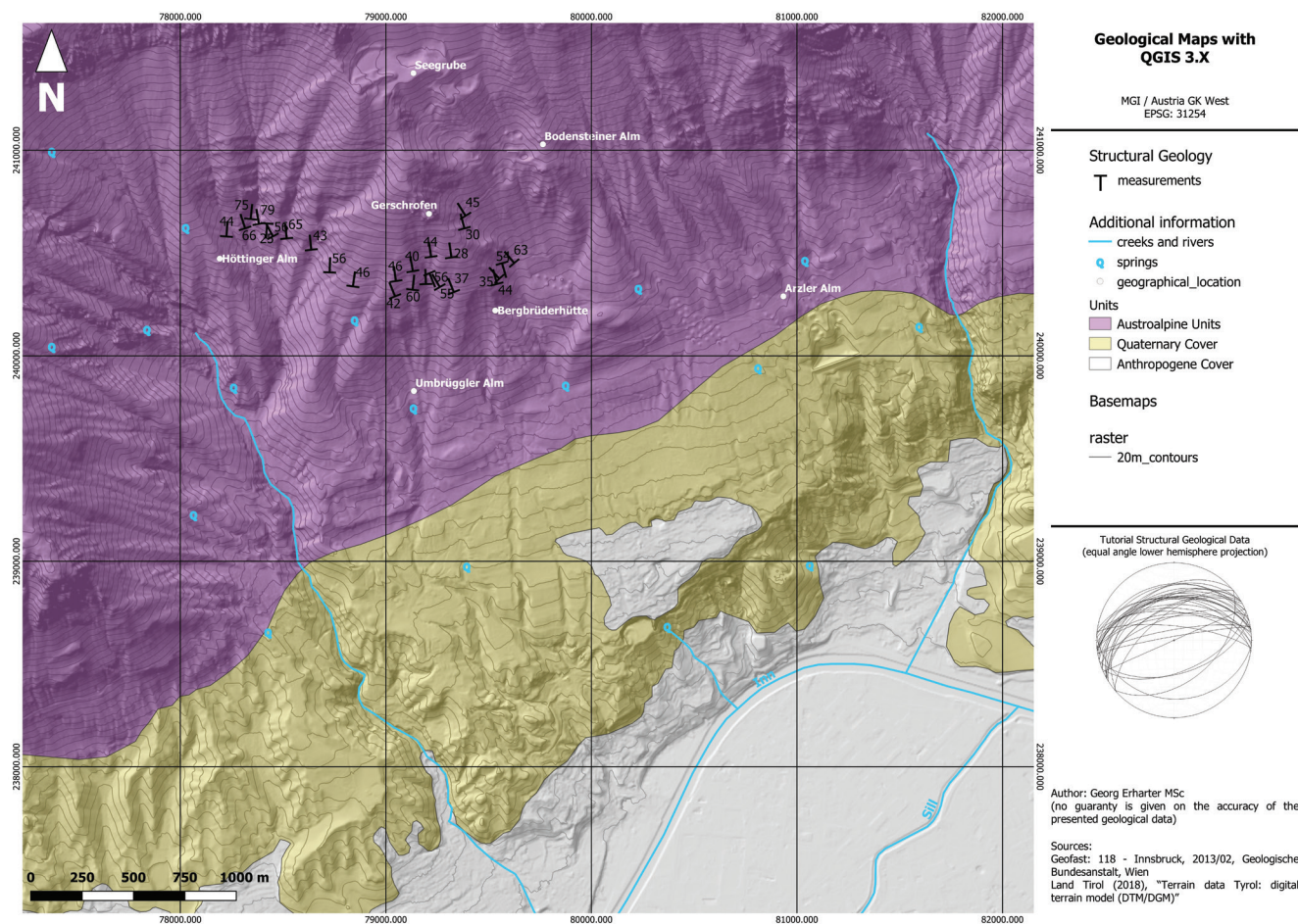
Acknowledgements

Figure 1: The geological map that is created over the course of the tutorial.

References

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