

## Application Research of New Cartographic Technology in Geological Exploration



LI Xiaolei<sup>1,2</sup>, YAN Taotao<sup>3,\*</sup>, QI Fanyu<sup>1,2</sup> and JIA Liqiong<sup>1,2</sup>

<sup>1</sup> Development and Research Center of China Geological Survey, Beijing 100037, China

<sup>2</sup> National Geological Archives of China, Beijing 100037, China

<sup>3</sup> Key Laboratory of Geochemical Exploration, Institute of Geophysical and Geochemical Exploration, CAGS, Langfang 065000, China

Citation: Li et al., 2019. Application Research of New Cartographic Technology in Geological Exploration. *Acta Geologica Sinica* (English Edition), 93(supp.2): 398–399.

**Abstracts:** Geological mapping is one of the important means to reflect the geological phenomenon and geological work. In recent years, with the rapid development of the geological exploration industry, the role of geological mapping has become more and more significant, and the requirements for geological mapping are becoming even higher. In order to further improve the convenience and directness of geological maps, and make these maps serve the geological exploration industry much better, the research of new cartographic technology is particularly important, which has important guiding significance for geological exploration and prospecting work. At the present, domestic geological mapping products mainly include raster data and vector data. Raster data products are not convenient because users cannot edit and process them. However, vector data products rely on the technical platform software formed by the data. Users need to install GIS software and be familiar with GIS software operation before editing and processing vector data. The research and production of geological mapping products that can be applied on different platforms would solve the problems on platform to some extent. Vector pdf can store vector data, including graphic data and attribute data (Xu, 2014). Users can turn on or off layers, edit vector data and other operations as required to form specific graphics products. By using Google Earth, users can obtain coordinate, terrain, landform, water system and other information. In the actual geological exploration, geologists can quickly delineate the exploration area with Google Earth. Google Earth can load files in KML and KMZ formats, which can be used to save point, line, surface and other information (Huang et al, 2011). However, the vector data of geological maps collected by the National Geological Archive are mainly in MapGIS and ArcGIS formats. By converting the vector data of geological maps into KML format and loading it into Google Earth, users can not only solve the problem of the confidentiality of geographical information, but also obtain the geological information such as the distribution of strata, structure and magmatic rocks in the research area. In the process of making the geological map, the corresponding geological map specification will be compiled to explain the regional geological survey, strata, magmatic rocks, metamorphic rocks, structures and other information. The geological map and the specification of geological map are single documents, which need to be

checked and compared to understand the regional geological conditions. Study the correlation technology of geological map and geological map specification, turn each mapping product into the key technology of aggregation and correlation, establish the index relationship between geological map and geological report, and realize the correlation between map and report, to form new mapping products, by these means, to facilitate the comprehensive research and discovery of map and report. With the development of science and technology, more and more new cartographic techniques have been applied in geological exploration, which have greatly improved the work efficiency and reduced work intensity and cost. Vector PDF is easy to use and portable. The production of geological map vector PDF enables geological data to better serve the public. In a way, it avoids the problem that the national basic geological database needs to rely on special software, symbol database and font database. It also overrides the limitation of geological map product in public service and avoids the contradiction between specialty and popularity. Loading geological map data in Google Earth can visually reflect the general situation of the geological work area. On the one hand, it provides convenience for geological exploration, improves work efficiency, saves confidential resources, and guarantees timely and high-quality geological work. On the other hand, it can solve the problem that the scale geological map in China is restricted by the closely related geographical base map to some extent and give full play to the important value of geological data. Studying on the key technologies of the geological map and the geological map specification establishes the correlation between the geological map and the geological map specification. It greatly saves time for geological workers to read maps and read reports, facilitates comprehensive research and analysis of geological maps and geological map instructions, and provides convenient data support for geological exploration. Under the new situation, the demands for geological exploration work and geological data are increasing obviously. Through the comprehensive research and analysis of new cartographic technologies such as vector PDF and KML, it is proposed that the new cartographic technologies in geological exploration have gorgeous prospects. These new cartographic technologies would fulfill requirements of different geological workers, enlarge the service mode of geological data, improve the service level of geological data, and provide favorable data support for geological exploration.

\* Corresponding author. E-mail: yantaotao@igge.cn

**Keywords:** new cartographic technology, geological prospecting, vector PDF, Google Earth

**Acknowledgments:** This work is granted by Development and Utilization of Collection Archives Program (Grant No. DD20190412)

#### References

- Huang, Y.F., Fan, L.X., Li, S.L., 2011. Geological seismic information display based on Google Earth. *Surveying and Mapping Information and Engineering*, 36(2):49–54 (in Chinese).
- Xu, T., 2014. Necessity and feasibility of new research results of Geo PDF map in basic surveying and mapping.

*Standardization of Surveying and Mapping*, 30(2):19–20(in Chinese).

#### About the first author

LI Xiaolei (1988-), female, master, engineer, graduated from China University of Geosciences, Beijing; mainly engaged in geological data integration and processing, E-mail:lxiaolei@mail.cgs.gov.cn, phone:010-58584325, 18810552963.

#### About the corresponding author

YAN Taotao (1989-), male, doctor, engineer, graduated from China University of Geosciences, Beijing; mainly engaged in geological data integration and processing, E-mail: yantaotao@igge.cn, phone:0316-2267623, 13220134133.