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## Application of Python Script in National Geographic Conditions Monitoring Project of China

**Zhaokun Zhai**, Jianjun Liu, and Yin Gao

National Geomatics Center of China, Geoinformation Database, China (zhaizhaokun@ngcc.cn)

The geographic conditions monitoring is an important mission in geosciences. Its aim is to study, analyze and describe national conditions in the view of geography. The National Geographic Conditions Monitoring Project of China, based on remote sensing and geospatial information technology, has acquired large-scale and various kinds of geographic data in China, such as remote sensing images, land cover information and geographic conditional elements. The goal of this project is to build National Geographic Conditions Monitoring Database, which is aimed to offer reliable fundamental geoinformation for government decision-making. It plays an important role in natural resources supervision, environmental protection and emergency management. Moreover, it also contributes to the development of geosciences. However, as China is such a huge country, large quantity of data is produced by many institutions and companies. It makes it difficult to finish data quality check manually before importing data into oracle spatial database. Besides, there are many data applications from lots of institutions every year, which also spends plenty of time.

Python is an open source computer programming language. It has the characteristics of friendly, clear syntax and easy to learn. There are large numbers of standard libraries and third-party libraries. Based on python, we developed lots of python scripts for this project. From the viewpoint of geodatabase construction, we developed scripts to check collected data, mainly include directory check, structure check, attribute check and topology check to ensure data is standardized and correct. Spatial analysis and statistical calculation can also be finished rapidly and accurately using python script. For production supply, we also developed scripts which can distribute data from database automatically according to any region.

Tools are critical to the progress and development of science. The application of python scripts improves the efficiency of our work to some extent, which can make sure the project is successfully completed on time every year. Geographic data is obtained that covered all over the country, which contributes to the economic and social development, national strategic decision and planning. The source code of these scripts is public. It also helps to optimize and improve these scripts. I believe open source software will play a greater role in the future. Geoscience will get better and better when geographic data is processed and analyzed using open source software.