

## Status of China's Geological Survey and Geological Environments in 2013

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With the approach of the 45<sup>th</sup> World Earth Day, China's Ministry of Land and Resources issued the status of the Chinese geological survey and environments on 22<sup>nd</sup> April 2013. Regional geological survey in 2013 achieved new results—(why was oceanic in twice?) polar and oceanic expedition were fully completed, a national census of geography was begun, and the security capacity of mapping geographic information was enhanced. A new idea for integrated geological survey and scientific research was proposed to enhance marine geological surveys and to improve service capabilities.

### 1 Basic Geology Survey

In 2013, regional geological survey covering an area of  $21.3 \times 10^4 \text{ km}^2$  was completed; aeromagnetic survey with an area of  $25 \times 10^4 \text{ km}^2$  was carried out; geochemical exploration covering an area of  $24 \times 10^4 \text{ km}^2$  was conducted; and the working degree for the major metallogenic belts (three? list them) was increased to 44%, 50% and 35%, respectively (using this you should name the three belts implied). An area of  $4 \times 10^4 \text{ km}^2$  of hydrogeological survey was completed, and  $3 \times 10^4 \text{ km}^2$  of environmental geological survey was done. An area of  $24 \times 10^4 \text{ km}^2$  of regional gravity survey and  $13 \times 10^4 \text{ km}^2$  of geochemical survey at a scale of 1:250,000 were completed, and their working degree of continental areas increased to 57% and 66%, respectively. Areas of multi-target geochemical survey of  $6.4 \times 10^4 \text{ km}^2$  and  $20 \times 10^4 \text{ km}^2$  of groundwater pollution investigation were completed as well as areas of marine geological survey of  $108 \times 10^4 \text{ km}^2$  at a scale of 1:1,000,000 and  $1.5 \times 10^4 \text{ km}^2$  at a scale of 1:250,000.

### 2 Basic Geological Surveys Promote Prospecting Breakthroughs

The Naruo and Tiegelongnan copper (gold) deposits have been newly discovered, and an ore concentration area of the Longrong-Zhuobuge was delineated in 2013. This stimulated investments in commercial exploration of 0.32 billion yuan. By the end of 2013, the proved accumulative copper resources in the Duolong area of Tibet amounted to 16.24 million tons, associated with 481 t gold and 1393 t silver. Of these, the newly increased copper resources (332+333 type) in 2013 was 6.5 million tons, associated with 103 t gold and 1115 t silver. This constituted another important breakthrough in copper prospecting.

### 3 Geological Disaster Prevention

In 2013, a total of 15,403 geological disasters happened, including 9849 landslides, 3313 collapses, 1541 debris flows, 371 ground subsidence, 301 ground cracks and 28 ground settlements. In toto these caused 481 deaths, 18 missing persons, 264 injured and a direct economic loss of 10.15 billion yuan. Compared with 2012, the number of geological disasters, deaths and missing persons, and the direct economic loss increased by 7.5%, 78.4% and 92.2%, respectively. During the year 2013, capital investments on super-large geological disasters were 4.5 billion yuan, and as a consequence, 1757 geological disasters were successfully forecasted, avoiding 187,584 casualties and a direct economic loss of 1.9 billion yuan (Fig. 1).

### 4 Groundwater Monitoring

In 2013, national groundwater quality monitoring was carried out in 203 cities, with an overall 4778 monitoring points,

and 800 national monitoring points. Among these, there were 498 monitoring points with excellent water quality, accounting for 10.4%; those with good water quality were 1287, occupying 26.9%; those with fairly good water quality were 148, accounting for 3.1%; those with poor water quality were 2095, occupying 43.9%; those with very poor water quality were 750, accounting for 15.7%. The major components exceeding national standards were total hardness, iron, manganese, total dissolved solids, and “three nitrogen” (including nitrite nitrogen, nitrate nitrogen and ammonium nitrogen), sulfate, fluoride and chloride, with individual monitoring points containing excessive heavy metals lead, hexavalent chromium and arsenic (Fig. 2).

## 5 Geological Environments of Mines

The national financial investment on mine environmental governance was 3.553 billion yuan, with a planned yearly decrease of 24.1%. In 2013, all of the country's 31 provinces (areas and cities) set up a deposit system of recovery and governance of mine geological environments. The 71,726 mines that have paid the deposit, account for 80%.

## 6 Service Capability Constructions

A core digital system for the National Geological Archives was built, and a network for China's geological survey data was opened, having completed 3317 pieces of medium-scale regional survey and a public version of mapping results as well as a “map” of land and resources and an integrated monitoring platform construction. The results of field verification of mining rights, geological survey, mineral, 1:50 million geological map at all levels, the overall land use planning and basic farmland and other important data were incorporated into this map. Mineral reserves in 2012, integrated exploration data in the second batch of 31 areas, and national coal planning areas were compiled into the database. In addition, data of mining and mined and idle land were stored in the database. The country's 29 provinces (area, city) have established a map covering the area of the “map”. A comprehensive supervision platform had been deployed by the end of 2013, using an 18-network information monitoring system and 12 comprehensive online statistical systems. The information collection in this platform covers 17 categories and 421 sub categories (more than 8000 indicators), and has more than 70,000 users. A comprehensive monitoring platform covering 25 regions and cities was also established.

(Excerpt from “China Land and Resources Communiqué in 2013” of China's Ministry of Land Resources)

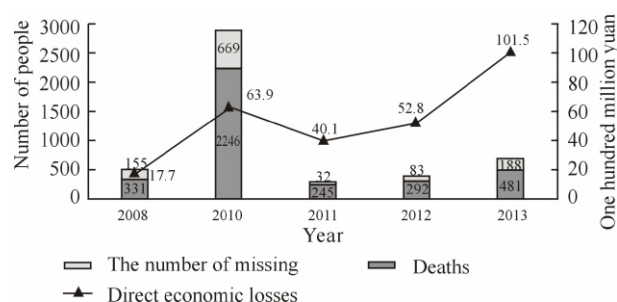


Fig. 1. Casualties and direct economic loss caused by geological disasters in 2009–2013.

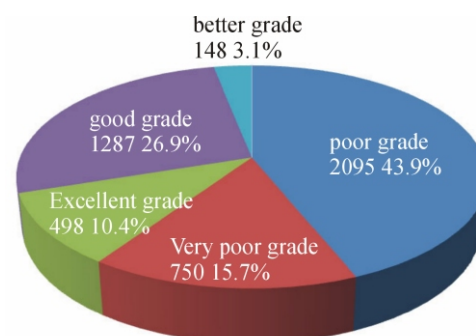


Fig. 2. Water quality of groundwater monitoring points in China.