

ICS 13.060.10; 07.060
CCS A44



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 43216-2023

Technical requirement for karst critical zone monitoring

岩溶关键带监测技术要求

Issued on: September 7, 2023

Implemented on: January 1, 2024

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1 Scope	1
2 Normative reference documents	1
3 Terms and Definitions	1
4 General rules	1
4.1 Purpose Task	1
4.2 General requirements	2
5 Monitoring work layout of karst key zone	3
5.1 Karst critical zone type	3
5.2 Monitoring station construction	3
5.3 Monitoring station settings	3
5.4 Monitoring station operation	3
5.5 Other conditions for monitoring work layout	3
6 Karst critical zone monitoring	4
6.1 General provisions	4
6.2 Environmental survey of monitoring area	4
6.3 Meteorological element monitoring	4
6.4 Monitoring of hydrological elements	4
6.5 Soil element monitoring	4
7 Special process monitoring	5
7.1 Monitoring of water and soil flow (leakage) process	5
7.2 Monitoring of carbon-water-calcium material cycle in watershed	5
7.3 Karst carbon sink flux monitoring	5
7.4 Karst water environment monitoring	5
8 Monitoring data collection and processing	5
8.1 Database construction and operation and maintenance	5
8.2 Data Convergence	6
8.3 Data product processing	6
9.1 Division of user rights	7
9.2 Service method	7
10 Reference	12

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents. This document is proposed by the Ministry of Natural Resources of the People's Republic of China. This document is under the jurisdiction of the National Natural Resources and Land Spatial Planning Standardization Technical Committee (SAC/TC93). This document was drafted by: Institute of Karst Geology, Chinese Academy of Geological Sciences, China Geological Survey, China University of Geosciences (Wuhan), China Science and Technology Institute of Geochemistry of the College, Shandong Province Lunan Geological Engineering Survey Institute, Shandong Province Geology and Mineral Exploration and Development Bureau 801 Hydrogeological Engineering Site Quality brigade. The main drafters of this document. Zhang Cheng, Jiang Zhongcheng, Wang Shijie, Wu Aimin, Chen Hongfeng, Miao Ying, Xiao Qiong, Sun Pingan, Guo Yongli, Wang Jinliang, Jiang Guanghui, Peng Tao, Zhou Hong, Bu Hua, Luo Weiqun, Luo Huankan, Bai Bing, Wu Zeyan, Liu Wen, Xu Qi.

The special structure of soil on the surface and water underground in karst areas responds sensitively and quickly to climate, hydrology and other environmental factors, causing resource and environmental problems to arise. By monitoring hydrological processes, geochemical processes, and biological processes (three major processes) that respond quickly to environmental changes in the karst critical zone, it is possible to solve resource and environmental problems in karst areas. At present, the construction of a global karst critical zone monitoring station network has not yet been carried out. The area of karst areas in China accounts for 10% of the total land area. This document is formulated to carry out monitoring of key karst zones to solve the problem of soil and water loss, drought and flood disasters, fragile aquifers and ecological problems in karst areas. It is of great significance to protect the ecological environment and other issues; at the same time, it can promote research on karst critical zones, carry out international comparisons of karst critical zones, and continue to maintain our China's international leading position in karstology. Technical requirements for monitoring karst critical zones

1 Scope

GB/T 43216-2023 sets the technical requirements for monitoring the karst critical zone - the layer from the top of the vegetation to the base of the groundwater in limestone terrain. Karst covers a third of southwest China, and it is the hardest ground to monitor because almost nothing happens at the surface: rainfall vanishes into fissures, moves through conduits at speeds no aquifer model predicts, and reappears kilometres away, so a rain

gauge and a stream gauge tell you very little about what the system is doing. The standard sets the general rules with the purpose and requirements, the layout of the monitoring work covering the karst critical zone types, the construction, setting and operation of the monitoring stations, and the monitoring itself: the environmental survey of the area, and the meteorological, hydrological, soil, ecological and geochemical elements to be measured. It took effect on 1 January 2024.

This document stipulates the layout of monitoring work in key karst zones, process (special process) monitoring, monitoring data collection and processing, and monitoring information sharing. Enjoy and service content. This document is applicable to the monitoring of different types of karst critical zones, and the monitoring of other types of critical zones can be used as a reference.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document.

GB/T 12329-1990 Karst Geology Terminology

GB/T 14157 Hydrogeological terminology

3 Terms and definitions

The following terms and definitions as defined in GB/T 12329-1990 and GB/T 14157 apply to this document.

3.1 criticalzone Earth's critical zone The interaction zone of the surface sphere (lithosphere-pedosphere-biosphere-hydrosphere-atmosphere) that is closely related to the human living environment.

Note. From tree crown, soil to aquifer. Critical zone monitoring emphasizes the interaction of hydrological processes, geochemical processes, and biological processes (three major processes).

3.1.1 karst critical zone karst critical zone Key zone (3.1) with carbonate rock as the bedrock.

Note. It has the general characteristics of a critical zone, with the special structure of soil on the surface and water underground, and spatial inhomogeneity. The three major processes are dominated by carbon, water and calcium cycles, and water Soil loss, rocky desertification and other resource and environmental problems are prominent features.

3.2 nodestation nodestation A comprehensive monitoring site covering all monitoring indicators in the karst critical zone type.

3.3 backbonestation backbonestation Representative sites for systematic monitoring of a certain characteristic indicator.

4 General principles

4.1 Purpose and tasks Through monitoring work in the karst critical zone, we can capture the interaction of hydrological processes, geochemical processes, and biological processes in the karst critical zone, and understand the karst karst critical zone.