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Multi-scale Geochemical Monitoring Network for Land Quality in China

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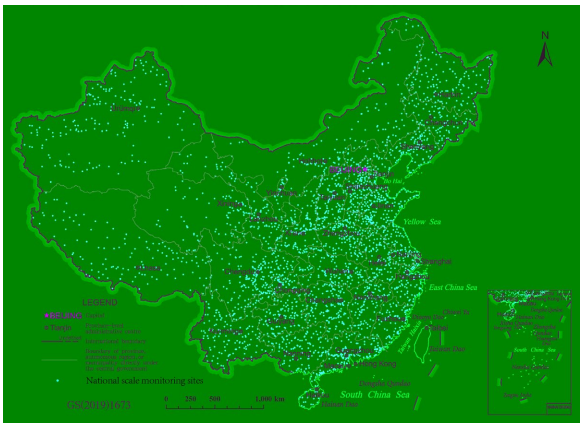

Geochemical monitoring in China was initiated in 1992, when a pioneering project called "Environmental Geochemical Monitoring Networks and Dynamic Geochemical Maps" (EGMON) developed the methodology for large-scale floodplain sediment sampling to investigate the broad geochemical patterns in China [1]. Floodplain sediment samples were collected throughout China and analyzed for 66 elements and indicators, providing the first scientific baseline for understanding China's soil environmental quality in the early 1990s and establishing important reference data for tracking subsequent environmental dynamics. Based on EGMON, the China Geological Survey launched the multi-scale geochemical monitoring network for land quality project in 2015. By the end of 2024, a hierarchical national soil quality monitoring system with three different spatial scales has been established, the national scale: currently comprising 3,657 monitoring sites across the mainland (Fig 1); regional scale: 7,588 sites strategically distributed in six key regions - Yangtze River Delta, Xiangjiang River Basin, Pearl River Delta, Beijing-Tianjin-Hebei region, Songliao Plain and Poyang Lake Basin - covering 595,000 km²; local scale: 500 high-density sites focused on critical zones, including the Weining-Hezhang area in Guizhou Province and the Leishui River Basin in Hunan Province, covering 6,000 km². This multi-scale monitoring network has enabled systematic tracking of national trends in soil quality evolution; identification of localized environmental challenges, including nutrient depletion and salinization; and establishment of a comprehensive geochemical database to support multi-level land management decisions. The ongoing monitoring program continues to provide essential scientific support for national soil protection strategies, regional ecological protection initiatives and basic research on soil ecosystems.

[1] Cheng, H., et al. (2008). A New Round of Global Geochemical Mapping: Opportunity and Challenge to China. Earth Science Frontiers 15(5): 9-22.