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"Resilience of agricultural systems against crises"

Development of China Digital Soil Map at 1:50,000 Scale

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Abstract

In order to meet the increasing demands for soil information with a high resolution by different disciplines such as agriculture, environment and economy, China Digital Soil Map at 1:50,000 Scale (CDSM-50000) has been developed since 1999. Soil and soil nutrient maps at 1:50,000 scale and soil profile records were collected from 2400 counties of China. These maps and records were achieved during the period of the 2nd Chinese National Soil Survey from 1979 to 1985. A data model called CDSM-50000 was developed, which contains 10 map layers and 16 attribute tables. Data of about 150,000 soil profiles were, for the first time, integrated into CDSM-50000. Every profile contains dozens of soil physical and chemical properties, such as soil depth, texture, organic matter, pH value, contents of N, P, K, S, etc. Soil nutrient information of 80,000 plough layer samplings during the period from 1999 to 2008 was also collected and integrated into CDSM-50000. To merge different county soil maps with different mapping standards into one map according to the data model of CDSM-50000, a complicated soil data processing procedure was developed. Map data of 1100 counties had been already merged to CDSM-50000. The data model was approved to be successful to organise all soil survey information of China of the last 50 years. Hundreds of soil profiles were collected from 5 provinces to test the reliability of the developed CDSM-50000. A good coherence was found between CDSM-50000 and the reality of soil type distribution. The finalised digital soil map was supplied to 15 provinces and applied in cropland nutrient management, arable land fertility evaluation, strategy development in eutrophication controlling, and to study the effects of climate chance.

Keywords: Digital soil map, organic matter, soil profile, soil quality

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