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### Distribution of available soil water capacity in China

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The available soil water capacity (ASWC) is important for studying crop production, agro-ecological zoning, irrigation planning, and land cover changes. Laboratory determined data of ASWC are often not available for most of soil profiles and the nationwide ASWC largely remains lacking in relevant soil data in China. This work was to estimate ASWC based on physical and chemical properties and analyze the spatial distribution of ASWC in China. The pedo-transfer functions (PTFs), derived from 220 survey data of ASWC, and the empirical data of ASWC based on soil texture were applied to quantify the ASWC. GIS technology was used to develop a spatial file of ASWC in China and the spatial distribution of ASWC was also analyzed. The results showed the value of ASWC ranges from  $15 \times 10^{-2} \text{ cm}^3 \cdot \text{cm}^{-3}$  to  $22 \times 10^{-2} \text{ cm}^3 \cdot \text{cm}^{-3}$  for most soil types, and few soil types are lower than  $15 \times 10^{-2} \text{ cm}^3 \cdot \text{cm}^{-3}$  or higher than  $22 \times 10^{-2} \text{ cm}^3 \cdot \text{cm}^{-3}$ . The ASWC is different according to the complex soil types and their distribution. It is higher in the east than that in the west, and the values reduce from south to north except the northeastern part of China. The "high" values of ASWC appear in southeast, northeastern mountain regions and Northeast China Plain. The relatively "high" values of ASWC appear in Sichuan basin, Huang-Huai-Hai plain and the east of Inner Mongolia. The relatively "low" values are distributed in the west and the Loess Plateau of China. The "very low" value regions are the northern Tibetan Plateau and the desertified areas in northern China. In some regions, the ASWC changes according to the complex topography and different types of soils. Though there remains precision limitation, the spatial data of ASWC derived from this study are improved on current data files of soil water retention properties for Chinese soils. This study presents basic data and analysis methods for estimation and evaluation of ASWC in China.

Paper (PDF)

**关键词:** available soil water capacity; pedo-transfer functions; China