Diagnosis and Identification of Ecological Health in Global Critical Karst Zone

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The eco-environmental issues in the critical karst zone today are difficult to be solved by a single discipline or single factor, which necessitates multidisciplinary collaborative research (Legrand, 1973; Bai et al., 2013). Based on diverse information from Geography, Geology, Geophysics, Geochemistry, Remote Sensing etc., the global remote sensing geochemical big data and decision support platform has been ensemble to create and form a series of dynamic maps and forecasting systems of spatiotemporal evolution of global vegetation degradation and soil moisture, develop the first spatial distribution maps and simulation system for the weathering and soil formation rates of global carbonate rock and establish a series of dynamic maps and prediction and forewarning system for the global spatiotemporal evolution of rainfall erosion force (Li et al., 2018, 2019); also, a new global ecosystem carrying capacity model is created to realize the spatialization of global water resources carrying capacity, and a series of dynamic maps and the calculating system for global ecological asset including the North and South Poles are established. Moreover, the amazing cooling phenomenon is found under the background of global warming in the past 100 years, and the theoretical maximum potential carbon sink magnitude and its spatiotemporal evolution characteristics caused by the dissolution effect in the global karst region are revealed. The above research achievements provide scientific and technological support for the management and optimal regulation of ecosystems in global critical karst zone.

Key words: karst critical zone, carbon, rock weathering, remote sensing, soil erosion

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References

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