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## Green Water Appropriation of the Cropland Ecosystem in China

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Despite the awareness that green water is the main source of water to produce food, studies on green water use in cropland ecosystems are still rather limited, and almost no research has so far explored its driving factors. In this study, with the help of CropWat 8.0, the green water footprint (GWF) of main crops in China was estimated for the period from 1979 to 2016. On this basis, a novel concept, i.e., green water appropriation rate (GWar) was introduced to reveal the relationship between GWF and precipitation. Then, for the first time, the center of gravity trajectory and the driving factors of the GWar were further investigated. The results show that the total GWF in China has continuously increased from 312,915 million m<sup>3</sup> in 1979 to 397,207 million m<sup>3</sup> in 2016, an increase of 27%. The provinces with the largest increases were Inner Mongolia (223%), Xinjiang (127%), and Ningxia (123%). Meanwhile, the GWFs of 11 provinces have decreased, and 9 of them were municipalities or coastal areas. The GWar first rose from 30% in 1979 to 38% in 2009 in China, and then dropped to 30% in 2016. Generally, the GWar in the eastern and central provinces was greater than that in the western provinces. The center of gravity of the GWar has always been in Henan Province, but it has moved westward from Kaifeng City in 1979 to Sanmenxia City in 2016 and may further move to Shanxi Province soon. The total power of agricultural machinery and the effective irrigation rate had positive effects on the GWar, while the agricultural GDP was negatively correlated with the GWar. It is expected that the results will explicitly provide a scientific basis for the development of water-appropriate agriculture and the full utilization of rainwater.