



Water and land limitations on China's food production

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The effects of water and land limitations on food security have been a source of controversy for a number of years. However, there is still surprisingly little analysis on this topic in the professional scientific literature. The issue of food self-sufficiency is crucial since it has major implications for human welfare, national security, and international trade. Advances in remote sensing now allow us to carry out systematic analysis of food production in developing countries where the necessary information was sometimes difficult to obtain in the past. In this talk we present a quantitative analysis of China's current food production. Our analysis derives a detailed spatial distribution (in approximately 50km by 50km pixels) of actual evapotranspiration and of the land area devoted to major crop sequences by combining meteorological observations from a global data base with reported values of provincial crop production, river flows, and total cultivated area. A least-squares approach is used to balance uncertainties from different sources of information. Our description of current cropping patterns provides a basis for predicting the number of people that China can sustainably feed under various scenario assumptions about water transfers and climate change. The overall approach is general enough to be applied to most other regions of the world.