Modeling Agricultural Crop Production in China using AVHRR-based Vegetation Health Indices

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Weather related crop losses have always been a concern for farmers. On a wider scale, it has always influenced decision of Governments, traders, and other policy makers for the purpose of balanced food supplies, trade, and distribution of aid to the nations in need. Therefore, national policy and decision makers are giving increasing importance to early assessment of crop losses in response to weather fluctuations. This presentation emphasizes utility of AVHRR-based Vegetation health index (VHI) for early warning of drought-related losses of agricultural production in China. The VHI is a three-channel index characterizing greenness, vigor and temperature of land surface, which can be used as proxy for estimation of how healthy and potentially productive could be vegetation. China is the largest in the world producer of grain, including wheat and rice and cotton. In the major agricultural areas, China's crop production is very dependent on weather. The VHI, being a proxy indicator of weather impact on vegetation, showed some correlation with productivity of agricultural crops during the critical period of their development. The periods of the strongest correlation were investigated and used to build regression models where crop yield deviation from technological trend was accepted as a dependent and VHI as independent variables. The models were developed for several major crops, including wheat, corn, and soybeans.