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SPACE-BASED MODEL FOR PREDICTION OF DROUGHT-RELATED WHEAT LOSSES IN
AUSTRALIA

Abstract

An early crop losses assessment in response to weather impacts is an important issue to address since these losses have always been a concern for farmers, governments, traders and policy makers for the purpose of balanced food supplies, demands, trade, and distribution of aid to the nations in need. Among the largest world agricultural grain producers (USA, Russia, European Union and Canada) Australia is number five exporting wheat grown in the country and contributing strongly to the availability of wheat at the global market and its prices. Meanwhile, in some periods Australia sells more wheat (1990-1994) but in the others sells less (2000-2004) following losses of wheat production due to a bad weather, specifically droughts, which are typical for agricultural areas of Australia's continent. Nearly 90 climate stations (AG 2016) provide weather information for Australia's 7.741 million km area, of which around 25 stations provide weather information in wheat grown area (approximately one station per 31,000 km). Such coverage is not sufficient to assess accurately weather impacts on wheat production and especially for an early prediction of weather-related wheat losses. Therefore, 4 km resolution observations from the NOAA operational environmental satellites were used for these purposes. This paper discusses utility of space-based Vegetation Health (VH) indices for modeling and prediction of wheat in Australia. One of the most important parts of this work is an early (1-2 months) prediction of drought related losses of wheat permitting an estimation of consequences for global wheat trade.