

## **A Biomass Future for the North American Great Plains: Toward Sustainable Land Use and Mitigation of Greenhouse Warming**

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Although described by early explorers as ‘the Great American Desert,’ the North American Great Plains (NAGP) was, prior to European settlement, a rich and diverse grassland. This grassland has largely been converted to agriculture and ranching and is now the source of a significant share of the world’s corn, soybeans, wheat and cattle. But the NAGP is subject to frequent and severe drought and extreme temperatures that reduce its productivity. Soil erosion and depletion of groundwater resources are already persistent problems. Global warming, due largely to emissions from fossil fuel combustion, is projected to worsen climate on the Plains.

The region is poor, particularly in its drier western portion; its agrarian economy is highly dependant on government payments. Employment opportunities on the land are limited. A return of much of the region to grassland has been proposed as a way to reduce its vulnerability to drought and to stabilize its economy

Biomass crops add no new carbon to the atmosphere and can be used to substitute for fossil fuels. Herbaceous biomass crops including switchgrass and other native species are well suited to the NAGP. These can be used to make cellulosic ethanol or directly-fired to generate electric power. While adding a new ‘cash crop’ to its rural economy, biomass will compete with food and feed crops for good farmland. To avoid food shortages agricultural productivity must continue its long-term rate of increase of 1-2% per annum. Plant breeding, possibly aided by genetic engineering, will be critical to increasing productivity. This book evaluates prospects for a future in which biomass provides an ecologically and economically viable way to help in re-grassing the Plains, reducing soil erosion, use of fertilizers, chemicals and irrigation water. And, by so doing, the Plains will help in the fight to mitigate global warming.

### **About the Author**

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