

A Water and Risk Management Tool for Sustainable Production of Bioenergy Feedstocks



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Background

Biofuels are a renewable energy source that can reduce our dependence on fossil fuels, mitigate greenhouse gas emissions, and create new markets/uses for existing and new crops. However, despite our many excellent options for biofuel feedstocks available in the U.S., critical limiting factors like available water resources must be addressed first to create sustainable bioenergy production. This project focuses on four candidate bioenergy crops: sugarcane, Miscanthus, switchgrass, and miscane at four locations in Texas through the use of two simulation models.

Objectives:

- Use APEX (a watershed and land management simulation model) to evaluate combinations of biofuel feedstocks and water resource options under different weather and soil conditions with the highest probability of success;
- Use an economic financial model to estimate production costs and economic feasibility to estimate the minimum price at which farmers can grow energy crops economically; and,
- Create an online tool for decision makers (growers, regulatory agencies, and fuel companies) to evaluate the ecological and economic cost-benefit ratios and the risk of investment in feedstock production and processing.

The outcomes of this research will:

- Allow growers and policy makers to assess site-specific environmental and economic costs of different biofuel feedstocks and make informed decisions that maximize energy production while minimizing water use (biomass/fuel yields per unit of water input) and impairment.
- Show regions most suitable for feedstock production and the likely water quality impact.
- Provide the framework for modeling new feedstocks and production practices as they become available.



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