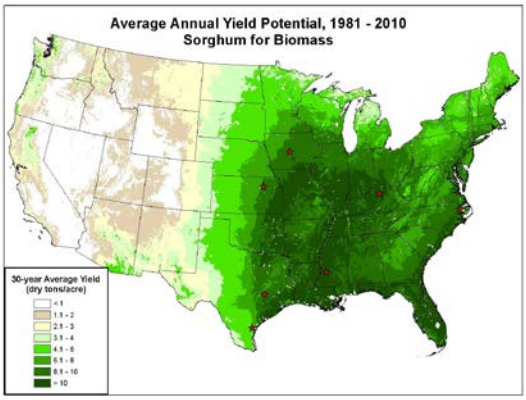
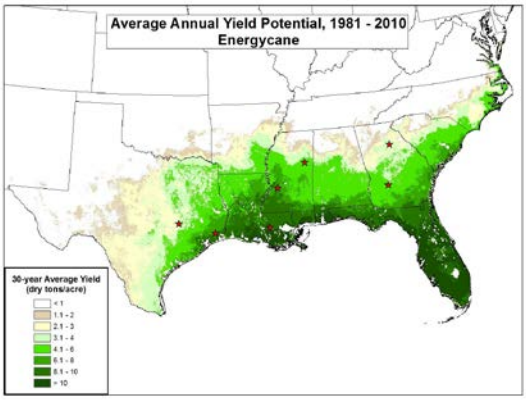
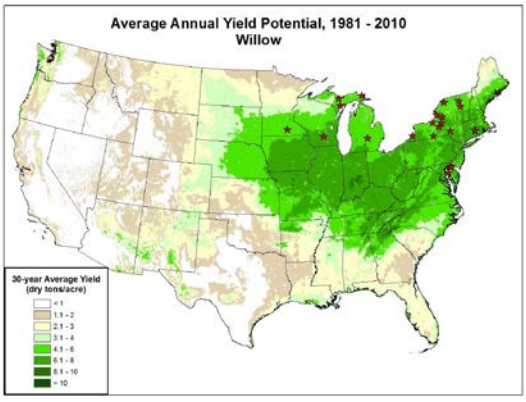
Regional Feedstock Partnership Highlights—Western Region Biomass Resource Assessment

Nationwide Feedstock Resource Mapping. The Sun Grant Western Region GIS Center, housed within the PRISM Climate Group at Oregon State University, has undertaken a large-scale modeling effort to produce a series of digital maps that describe potential productivity patterns of important biomass feedstocks nationwide. There is little understanding of how climate and soil conditions influence yield potential of these feedstocks in many parts of the country because most are not widely grown. These maps provide spatially-explicit information on expected long-term average biomass yields required by a wide range of planning activities, from optimal refinery siting to large-scale economic analyses and forecasts.



This nationwide mapping effort, undertaken in cooperation with Oak Ridge National Laboratory, utilizes PRISM-EM (PRISM Environmental Model), a statistical-mechanistic modeling system developed by the PRISM Climate Group. PRISM-EM takes a "limiting factor" approach that reduces a species' relative yield if it is constrained by any of several environmental limitations including soil moisture, winter cold, and summer heat, and by soil conditions such as pH, salinity, and drainage. Based on available information regarding the tolerance of a species to these factors, PRISM-EM was parameterized to produce a gridded, first-draft map of feedstock relative yield (0-100%) across the entire conterminous US. This map set the stage for an intensive, face-to-face workshop with species experts from the Regional Feedstock Partnership by providing a spatial framework for assimilating and interpreting yield data from their field trials. With input from the species experts, the PRISM-EM relative yield map was transformed into an actual yield map through statistical relationships between the relative and observed yields (masks can be applied to screen out unsuitable land use types). Feedstock resources mapped to date include lowland switchgrass, upland switchgrass, sorghum, energycane, miscanthus, CRP grasses, short rotation willow, poplar, and pine. Examples are shown on the right for sorghum (top), energycane (middle), and short rotation willow (bottom). Future work will focus on temporal yield variability and risk assessment.





FUNDING:
This research was supported by funding from the North Central Regional Sun Grant Center at South Dakota State University through a grant provided by the US Department of Energy Bioenergy Technologies Office under award number DE-FC36-05GO85041.