GLBRC
Great Lakes Bioenergy Research Center

Development of a sustainable bioenergy economy

For a bioenergy economy to positively impact the United States, we must address complex issues in agricultural, industrial, environmental and behavioral systems. Within this area, the GLBRC will take a holistic approach to evaluating the economic and environmental sustainability of transforming biomass to biofuel.

Leading this area of GLBRC research is G. Philip Robertson, a professor of crop and soil sciences at Michigan State University. As a crop and soil scientist and also an ecosystem ecologist, Robertson focuses much of his research on the role that agriculture plays in greenhouse gas dynamics, and he is internationally known for his expertise in this area. Robertson has been the director of the Long Term Ecological Research (LTER) at the Kellogg Biological Station in Hickory Corners, Mich., the only site in the national LTER network to focus on agriculture, for almost 20 years.

The overarching charge of the GLBRC's sustainability thrust is to ***improve sustainability of bioenergy practices***. Researchers in this area will support the biomass-to-bioenergy pipeline by developing ecological, agricultural and life cycle practices that are economically viable and environmentally responsive.

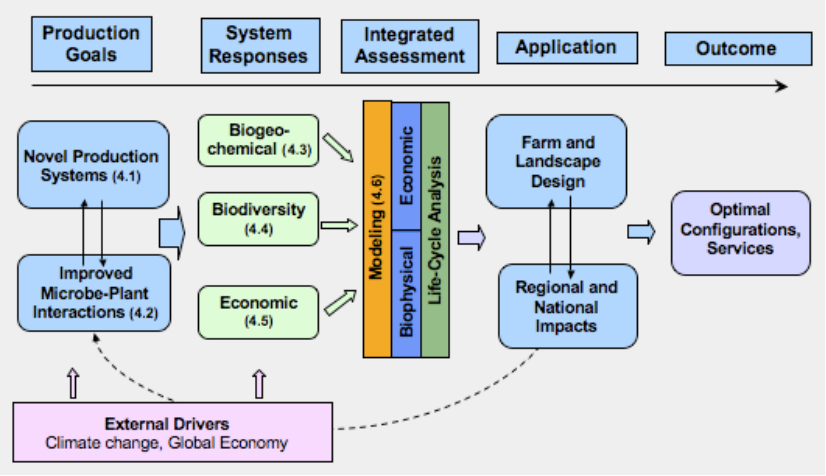
GLBRC research will address bottlenecks in agricultural, industrial, & behavioral systems to improve:

- **Carbon neutrality** and net greenhouse gas mitigation across the entire biofuel life cycle
- **Ecosystem services** in biofuel landscapes (e.g. water quality, biodiversity, pest suppression)

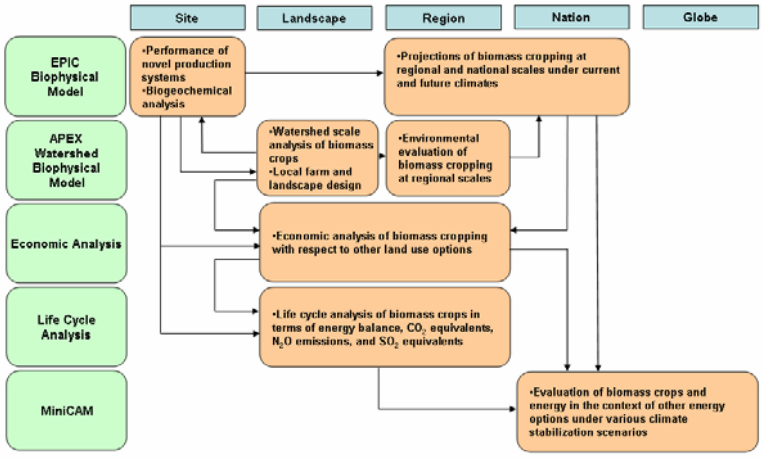
GLBRC research will integrate ecological, agricultural & life cycle practices with:

- Improved plants (GLBRC Thrust 1)
- New processing (GLBRC Thrust 2)
- Improved conversion (GLBRC Thrust 3)

OBJECTIVE: Determine elements of biofuel production systems that can be optimized to improve environmental & economic sustainability



Modeling systems will be used to predict the impacts that the biofuel production pipeline will have both locally and globally. The goal of the modeling efforts is to develop a comprehensive framework that enables the analysis of biomass cropping in reference to land use requirements and competition, environmental consequences (e.g., water balance, nitrogen balance, carbon balance, and soil quality), and competing energy technologies.



For more information about sustainability research at the GLBRC, please contact Phil Robertson (robertson@kbs.msu.edu/269-671-2267).