Bioenergy and Biobased Products Relationships and Resources

James H. Perdue

USDA-Forest Service

Biomass Power Technical Seminar

Louisiana Tech University

Ruston, LA

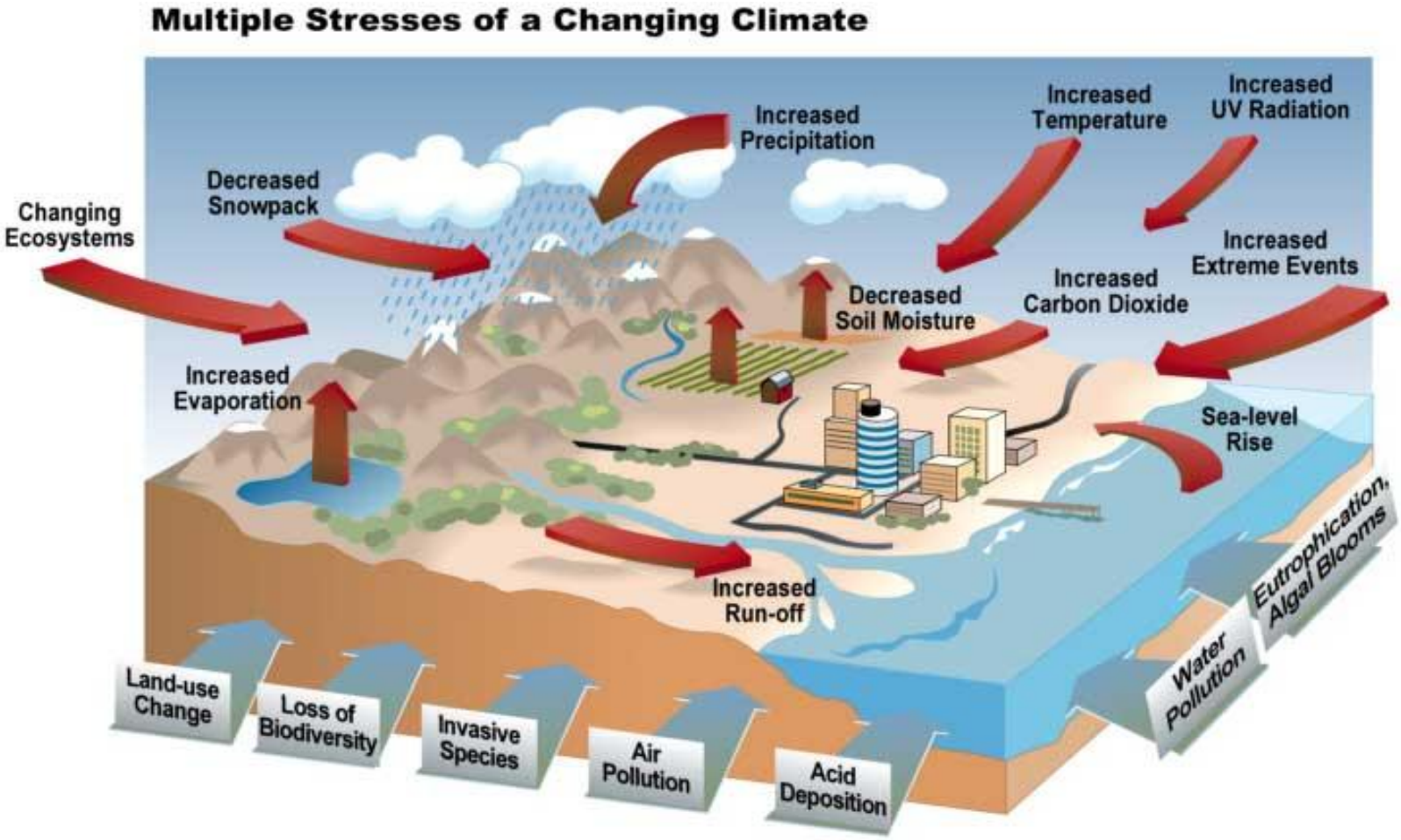
October 28-30, 2009

Special Thanks to Co-Author: Dr. Marilyn Buford
Silviculture Research, National Program Leader

... to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations ...

…dedicated to providing and developing scientific and technical knowledge aimed at improving our capability to protect, manage, and use forests and rangelands…

A new management environment



Drought, pests, and wildfires

- Warming and crowding increase fire severity in low- to mixed-severity fire regimes.
- Many large fires are in diseased and drought-stressed forests.

Challenge - Integrating Systems

Not Only

- **Sustaining existing systems,**
- **Restoring selected systems,**

Also

- **Enhancing capacity of systems to meet future resource needs,**
- **Managing systems to provide for increasing levels of a variety of benefits,**

Target outcomes such as:

- **…Fire Resilience, Climate Resilience, Healthy Climate, Forest Restoration, Abundant Clean Water, Watershed Protection, Preserve Wildlife Habitat, New Service Markets, Viable Wood Markets, Vibrant Local Economies, Sustain Working Landscapes, etc….**

Forests: A Strategic Asset

- Energy Security
- Environmental quality
- Economic opportunity

The Opportunity & Potential

Feedstock

- Forest Residues
- Hazardous Fuel Treatments
- Short Rotation Woody Crops
- Wood Waste
- Conventional Forestry
- Mill Wastes & Residues

Conversion

- Manufacturing
- Co-firing
- Combustion
- Gasification
- Hydrolysis
- Digestion
- Pyrolysis
- Extraction
- Separation

Uses

Fuels:
- Ethanol
- Other Liquid Fuels
- Hydrogen

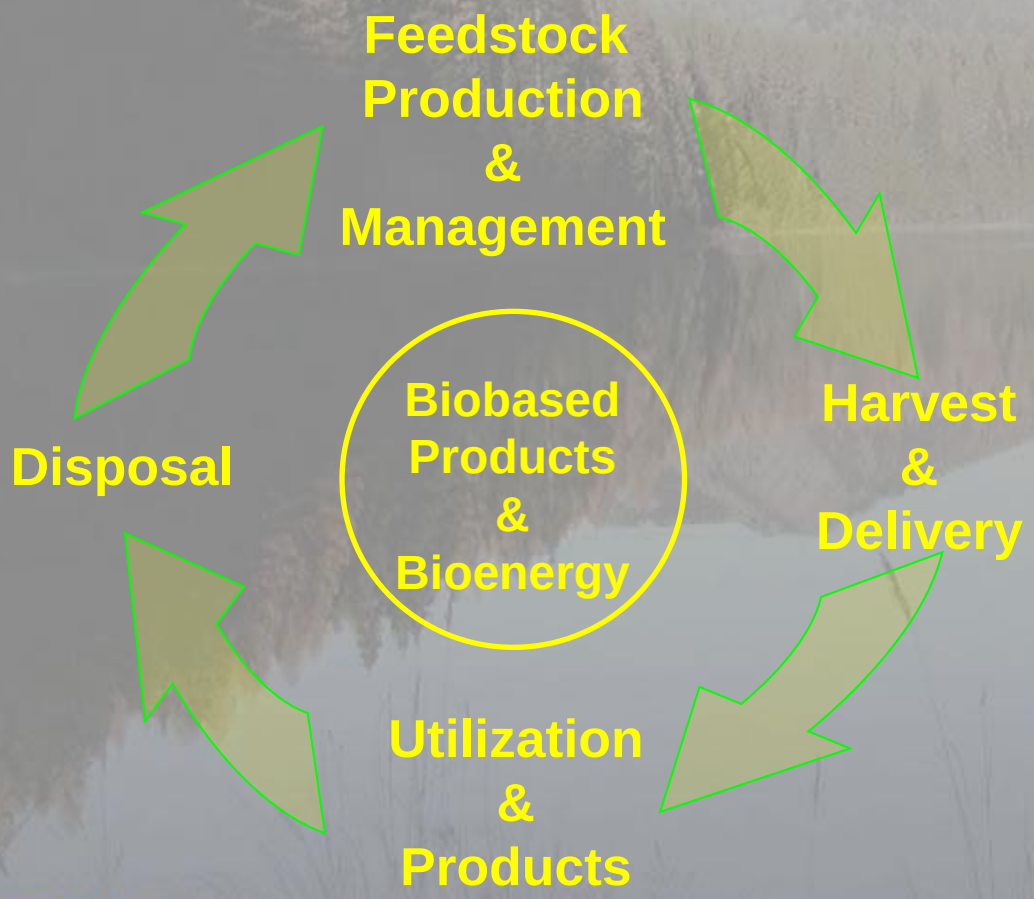
Electricity and Heat

Biobased Products
- Composites
- Specialty Products
- New Products
- Chemicals
- Traditional Products

Woody Biomass Utilization Strategy

- Goal 1: Build partnerships
- Goal 2: Develop science/technology
- Goal 3: Develop markets
- Goal 4: Facilitate supply

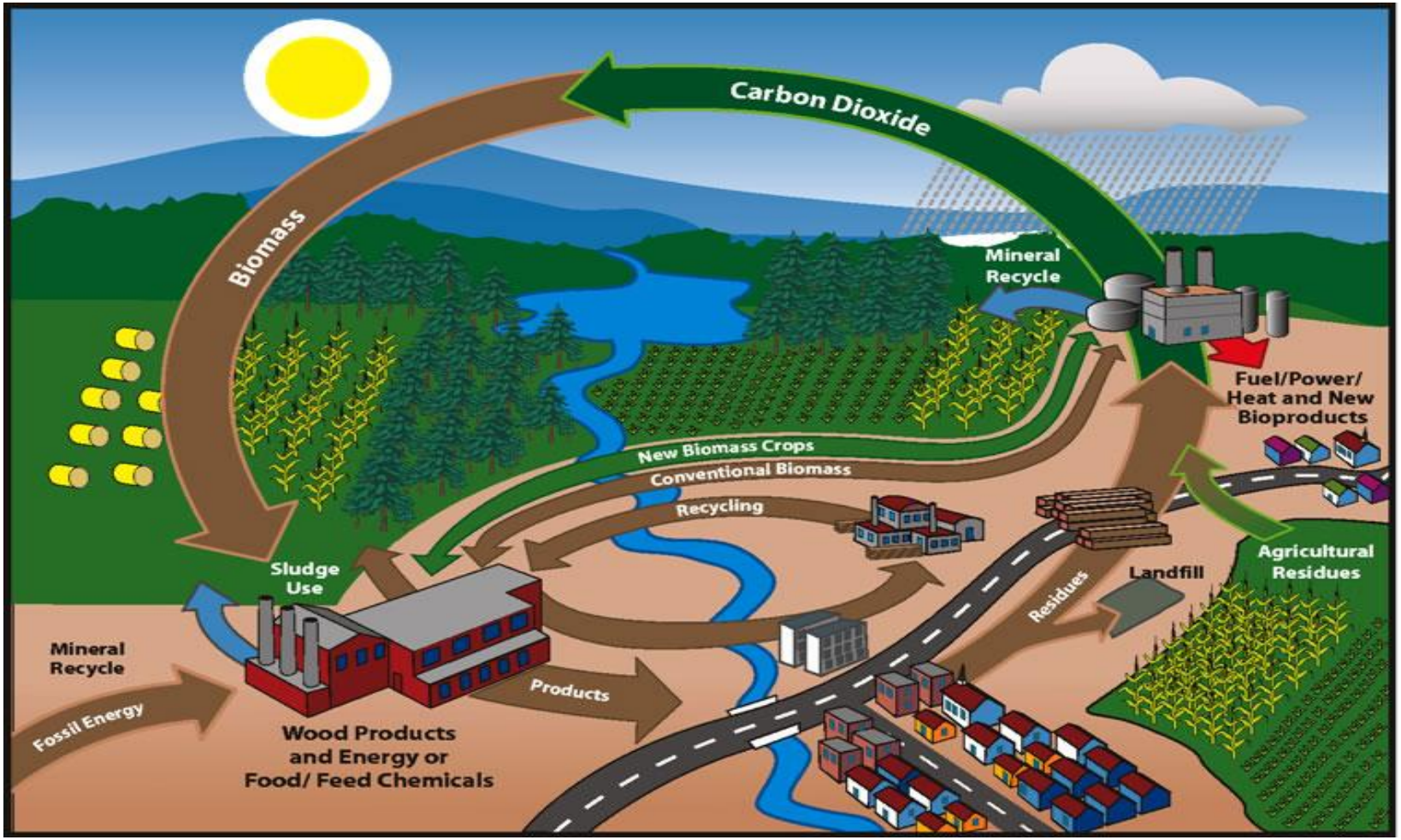
Integrated Biobased Products And Bioenergy Approach



- Research & Development
- Synthesis
- Development of
  - options
  - strategies
  - systems
  - practices
- Deployment

For sustainable goods, services, & values

Integrated Bioenergy Analysis Research

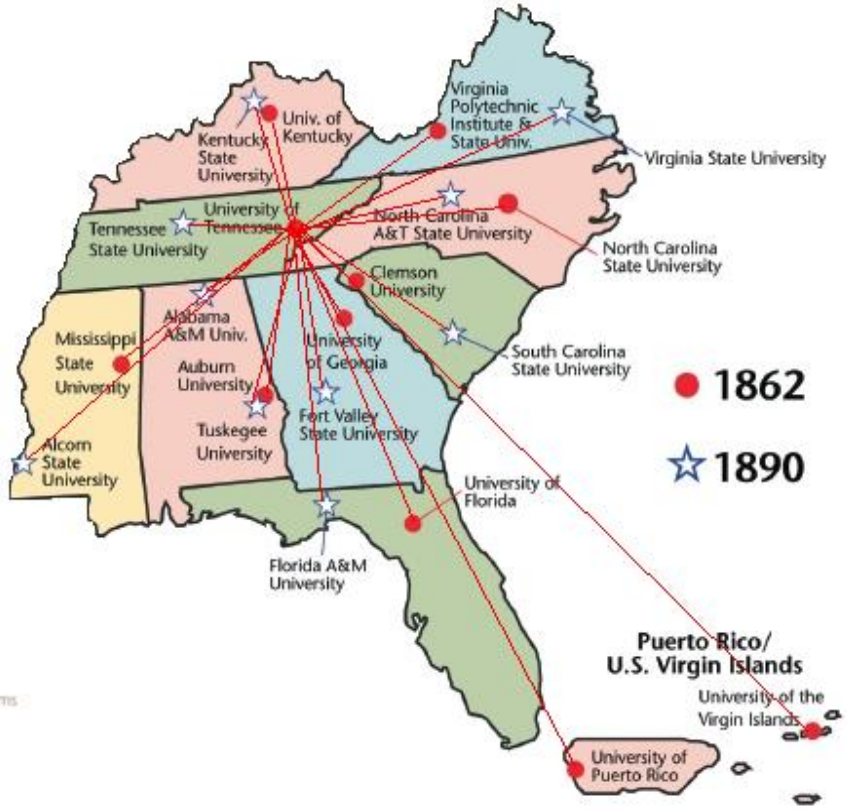


Feedstock Supply – the logistical intersection of Agriculture and Forest Biomass

Relationships, Research, and Resources

Southern Research Station Region

Southeastern Sun Grant Region

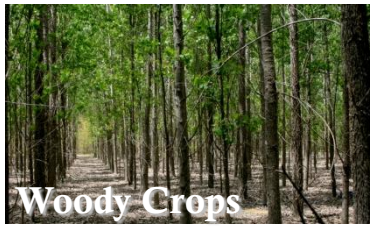


SunGrant INITIATIVE Southeastern Regional Center

NC STATE UNIVERSITY

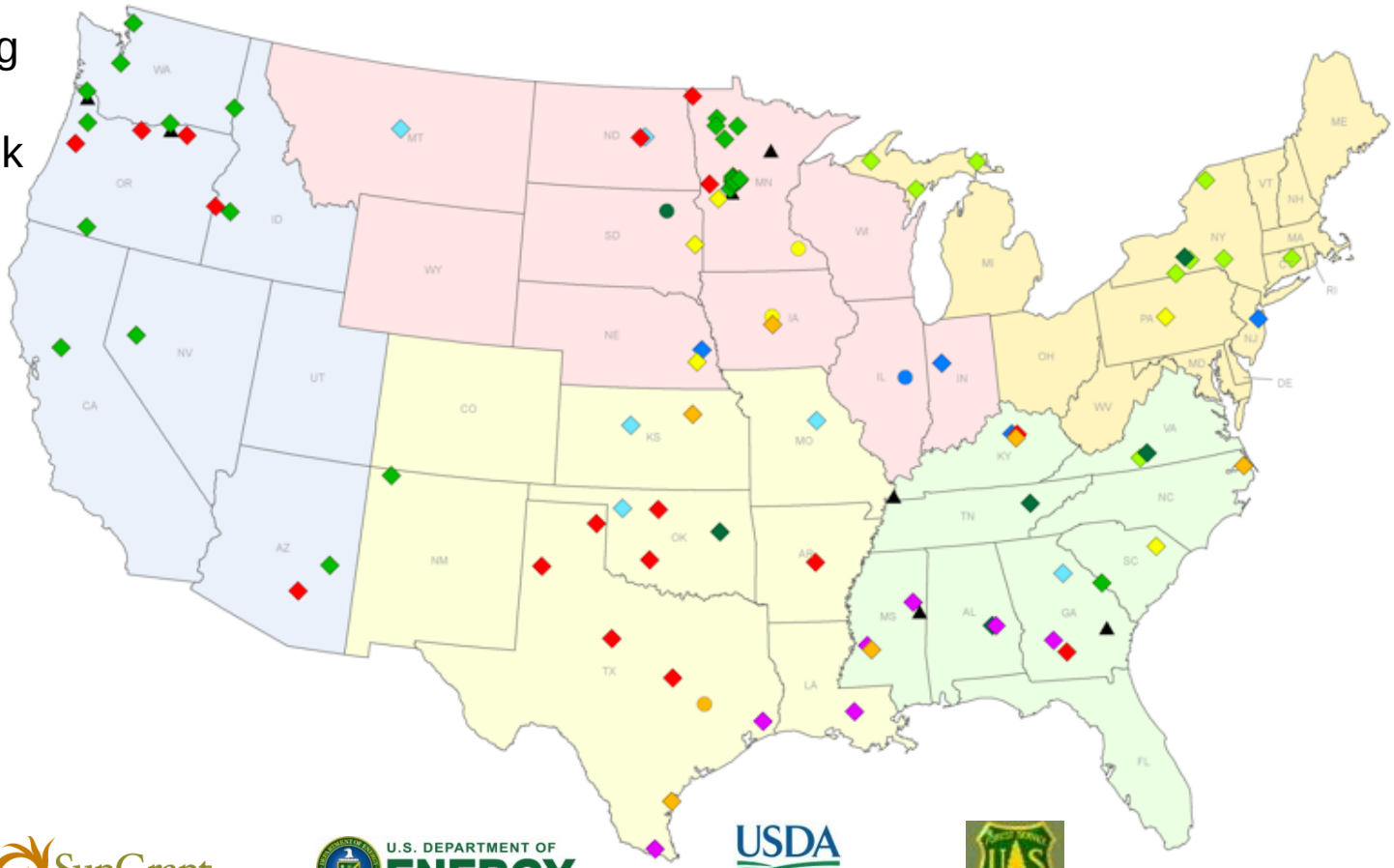
OAK RIDGE National Laboratory

Resource Development



- Studies addressing four sources of cellulosic feedstock
- 100 trials in 36 states
- Environmental evaluations at selected sites
- Data feeding KDF *(Knowledge Development Foundation)*

- Delivering residue removal guides
- Corn stover
- Ceral crop



SunGrant INITIATIVE

U.S. DEPARTMENT OF ENERGY

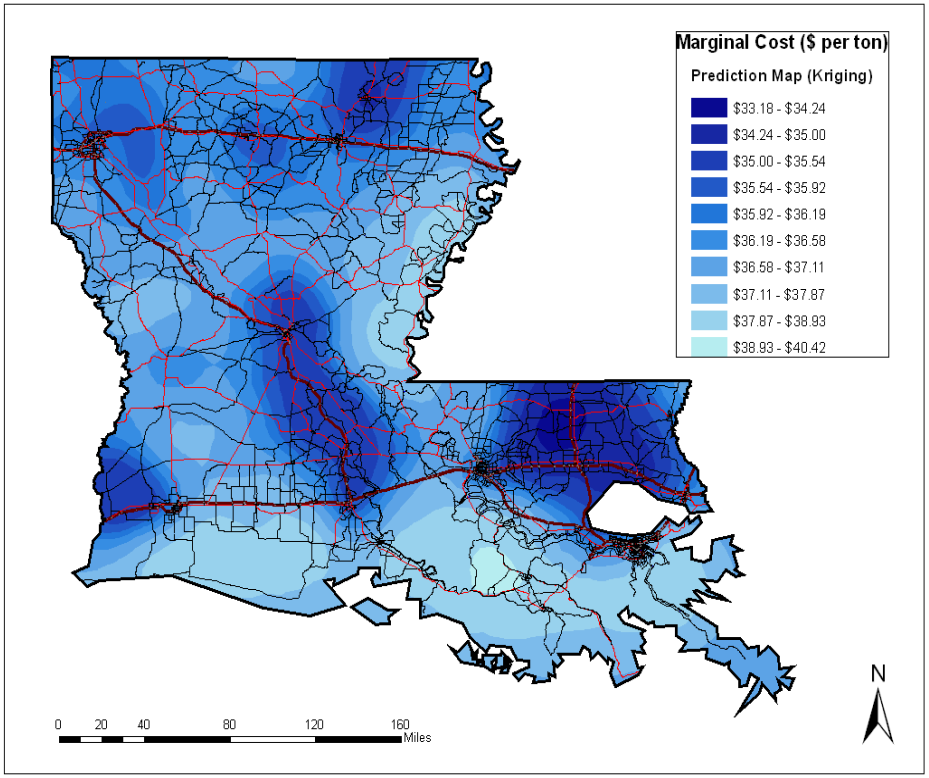
USDA

Seeking Dynamic and Durable Knowledge

- ***Supply chain cost and logistics from farm/forest gate to collection or conversion facility***
- ***Map and display up-to-date baseline data for public and business leaders***
- ***Assess the economic availability of woody and agricultural-derived biomass***
- ***Identify local market conditions***
- ***Reduce screening time in locating favorable sites for full business case due diligence***

BioSAT – helping quantify and value supply chain performance advantages

- ***Where is the biomass?***
- ***What are the biomass supply options and costs?***
- ***Have I chosen the right location?***
- ***What are the biomass locations' opportunities/ constraints?***
- ***What are my delivered resource supply costs?***



Map of marginal costs for total mill residues for Louisiana.

Biomass Site Assessment Tools (BioSAT)

BioSAT helps rapidly screen and identify least cost woody and agricultural biomass collection or processing demand centers by zip-code tabulation area for the **33 Eastern states.**

The tools will exist in the public domain at **www.BioSAT.net** with Phase 1 available for public use **in late 2009.**

SunGrant INITIATIVE Southeastern Regional Center

NC STATE UNIVERSITY

OAK RIDGE National Laboratory

Critical Research

- Sustainable and economical forest biomass management and production systems for public & private ownerships
- Competitive biofuels and biopower conversion technologies and bioproducts
- Information and tools for decision-making and policy analysis

Thank You

(Attached to this presentation are recommended websites to locate biomass, bioenergy, and bioproducts information, research, resources, and assistance.)

United States Department of Agriculture

USDA provides comprehensive information on energy related programs, funding opportunities, and technical support across all USDA agencies and offices

http://www.usda.gov/wps/portal/usdahome

Database of State Incentives for Renewable Energy (DSIRE)

DSIRE is a comprehensive source of information on state, local, utility, and federal incentives that promote renewable energy and energy efficiency.

http://www.dsireusa.org/

Bioenergy Feedstock Information Network

The Bioenergy Feedstock Information Network, (BFIN), is a gateway to a wealth of biomass feedstock information resources from the U.S. Department of Energy, Oak Ridge National Laboratory, Idaho National Laboratory, National Renewable Energy Laboratory, and other research organizations.

BFIN

http://bioenergy.ornl.gov/

The Sun Grant BioWeb

The Sun Grant BioWeb is a non-commercial educational website that provides current information about using biomass resources for bioenergy and bioproducts.

http://bioweb.sungrant.org/

Oak Ridge National Laboratory

At Oak Ridge National Laboratory scientists and engineers conduct R&D to create scientific knowledge and technical solutions that strengthen the nation's leadership in key areas of science; increase availability of clean, abundant energy; restore and protect the environment; and contribute to national security.

http://www.ornl.gov/

The Sun Grant Initiative

The Sun Grant Initiative is a national network of land-grant universities and federally funded laboratories working together to further establish a biobased economy.

SunGrant INITIATIVE

http://www.sungrant.org/

The U.S. Department of Energy

EERE develops technology for conversion of biomass to valuable fuels, chemicals, materials and power, so as to reduce dependence on foreign oil and foster growth of biorefineries

http://www1.eere.energy.gov/biomass/

National Renewable Energy Lab

NREL is the U.S. Department of Energy's premier laboratory for renewable energy research and development and a lead lab for energy efficiency R&D.

http://www.nrel.gov/biomass/

U.S. Forest Service – Forest Products Laboratory

The U.S. Forest Service, Forest Products Laboratory …**Celebrating 100 years of public service in 2010…** is dedicated to promoting healthy forest and forest-based economies through the efficient, sustainable use of our forest resources.

100 Years of Service
Forest Products Laboratory
1910 – 2010

http://www.fpl.fs.fed.us/

Energy Information Administration (DOE)

EIA provides policy-independent data, forecasts, and analyses to promote sound policy-making, efficient markets, and public understanding regarding energy and its interaction with the economy and the environment.

http://www.eia.doe.gov/

USDA Forest Service - Healthy Forest and Rangelands

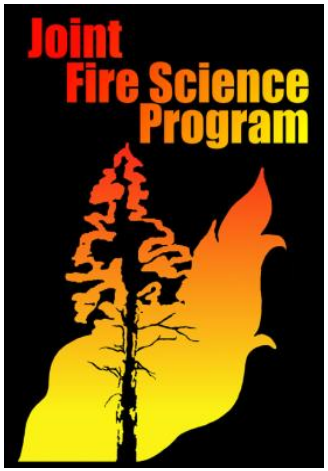
Healthy Forest and Rangelands provides fire, fuel, and land management information to government officials , land and fire management professionals, businesses, communities, and other interested organizations and individuals.

http://www.forestsandrangelands.gov/

Joint Fire Science Program

Joint Fire Science Program provides scientific information and support for fuel and fire management programs.

http://www.firescience.gov/



U.S. Forest Service - Southern Research Station

The U.S. Forest Service, Southern Research Station is dedicated to providing and developing scientific and technical knowledge aimed at improving our capability to protect, manage, and use forests and rangelands.

http://www.srs.fs.usda.gov/