



Biomass R&D Technical  
Advisory Committee  
Meeting  
Orlando, FL  
February 14, 2007



# SFRP Mission

- **“To foster collaborative relationships that provide new and revised research knowledge to enable the southeast to remain competitive in the global forestry market while enhancing the forest landscape and assuring that this natural resource will be sustained indefinitely.”**



# SFRP Vision

- ◆ **The South's forests will be healthy working forests that provide societal benefits, ecosystem services, and products, both traditional and new.**



# SFRP Objectives

- ◆ **Provide a structure to respond to and address regional, landscape scale, forest resources issues**
- ◆ **Assemble best available team of scientists and TT specialists to address topical issues irrespective of political and organizational boundaries and structures**
- ◆ **Expand fiscal support for southern forest resources research and technology transfer (grants and contracts)**



# SFRP Operation

- ◆ **501 (c)(3) with Elected Officers**
- ◆ **Director**
- ◆ **Board & Executive Committee**
- ◆ **Development Committee**
- ◆ **Science Committee**



# SFRP's Current Research / TT Priorities

- ◆ **Carbon Management**
- ◆ **Water Quality and Yield**
- ◆ **Southern Forest Resources  
Economics --- Includes Tourism**
- ◆ **Biomass / Biofuels**
- ◆ **Biodiversity**



# Carbon Activities

## Carbon Conference:

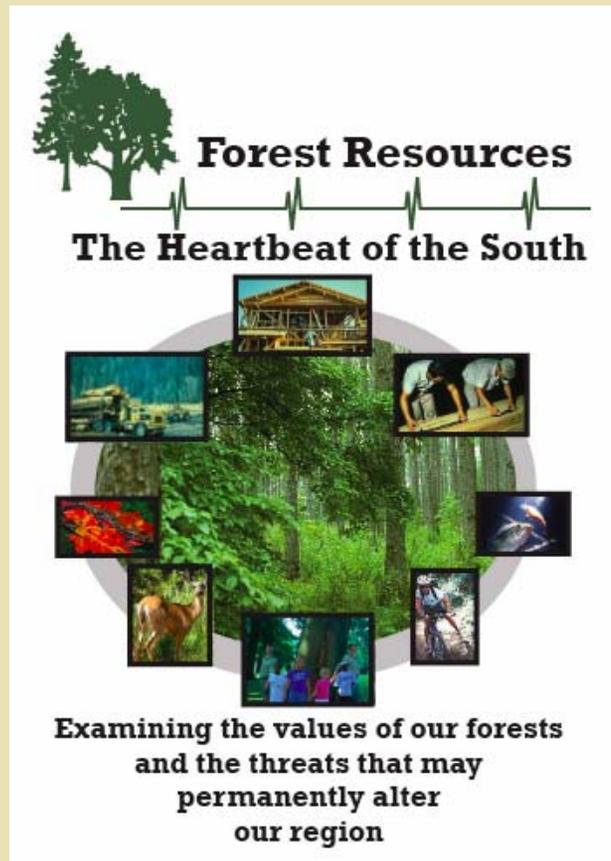
### *Critical Processes and Properties Regulating Carbon Cycling in Southern Forests*

*May 31 – June 2, 2006*

*Asheville, NC*

Southern Forest Research Partnership, Inc.

# Economic Development Overtures



- ◆ Southern Governor's Association
- ◆ Southern Growth Policies Board
- ◆ Southern Economic Development Council
- ◆ Southern Center for Rural Development



# Biodiversity

- ◆ **USDA Biodiversity (Weedy Invasive Species) --- A FINALIST --- 2006**
  - Potential award \$500,000



# Biomass: Issues and Opportunities Facing the South

- ◆ The South provides 60% of the US timber supply
- ◆ Many rural communities are:
  - Richly endowed with forest resources
  - Heavily dependent on forestry
  - Socially and economically disadvantaged
- ◆ Recent setbacks in pulpwood markets
- ◆ Urgent need to diversify utilization of forest resources
- ◆ Potentially large resource of underutilized biomass
  - Small diameter, dense stands
  - Stands posing high fire risk
  - Harvest residues
  - Manufacturing residues
- ◆ Bioenergy and biobased products are:
  - Timely and viable option



# The Big Change: The Forest Biorefinery

- ◆ **Consists of three parts:**
  1. **Sustainable Forest Productivity**
  2. **Extracting Value Prior to Pulping**
  3. **New Value Streams from Residuals and Spent Pulping Liquors**
- ◆ **Traditional tree growing, liberation of fibers, and recovery boilers become old technology**
- ◆ **Replaced by the extracting of fiber, fuel, chemicals, and power streams valued by society and the marketplace**
- ◆ **Evolves chemical pulp mills into forest biorefineries— preserving infrastructure, jobs, and supply chains**



# The Big Change: The Forest Biorefinery (continued)

- ◆ **Provides outlets for millions of tons of currently unusable forest biomass**
- ◆ **Helps reduce fuel loading and improves forest health and conditions**
- ◆ **Reduces dependency on foreign oil**
- ◆ **Sustainable supply of feedstocks for the production of energy and materials**



# SFRP: Forest Biomass Training Grant

- ◆ \$1 million grant
- ◆ 4 phases
  - Encyclopedia: review and synthesize literature – publish synthesized material in Forest Encyclopedia Network
  - Training Material (fact sheets, power points, etc. and web based learning center)
  - Conduct Train-the-Trainer Programs
  - Support and fund “end user training”



# The Process

- ◆ Forest Encyclopedia Content Development
  - Literature Review and Synthesis, Content Development (Synthesized material), Peer Review, Final Edit, Publish, Update
- ◆ Product Development
  - Content Development (Fact Sheets, Power Points), Peer Review, Final Edit, Publish, Update
- ◆ Delivery
- ◆ Evaluation



# The Principals

- ◆ Phase 1: TX A&M Univ.; Univ. GA; U.S. Forest Service – So. Station; So. Regional Extension Forester
- ◆ Phase 2: TX A&M; UGA, UT, SREF
- ◆ Phase 3: TX A&M; UGA, UT, SREF, USFS
- ◆ Phase 4: So. Universities; So. State Foresters; SREF; USFS; State Forestry Assoc.; Logger Assoc.; NRCS; RDA; etc.



# The Audiences

- ◆ Materials targeted to:
  - State forestry, wildlife and fishery persons; consulting and industry foresters and biologists, timber harvesters, etc.
  - Community & economic development professionals
  - Energy, Transportation, Petroleum Persons, and
  - **Forest landowners.**
- ◆ Materials delivered through: Educators – conventional processes and distance learning:
  - University Extension, State and Federal Agencies, NGO Community, etc.

Welcome

Bridging the Gap between

**Knowledge &  
Application**

HELP | SEARCH | INDEXES | CREDITS | FEEDBACK

 FOREST ENCYCLOPEDIA NETWORK

[www.forestencyclopedia.net](http://www.forestencyclopedia.net)



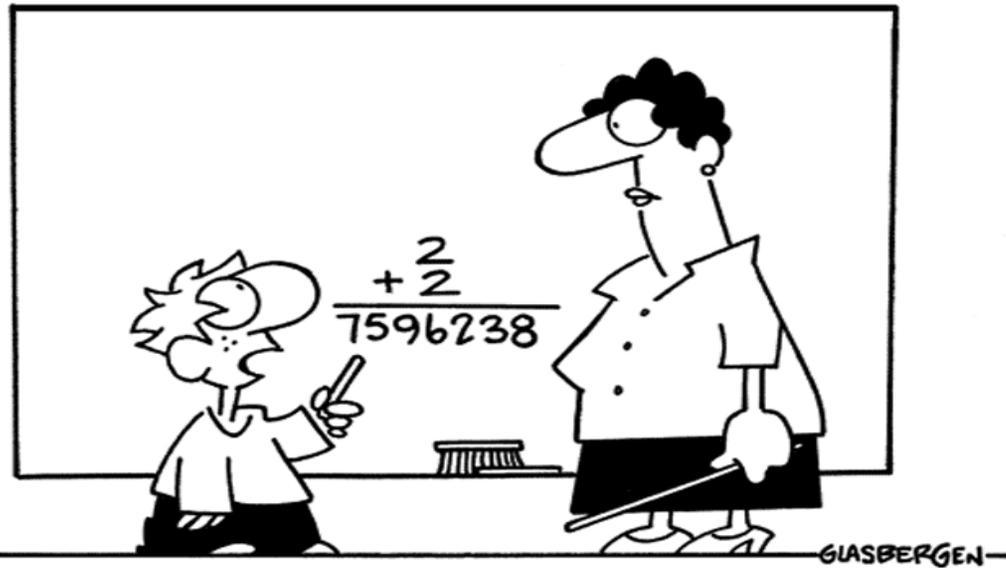
## The Biomass Forest Encyclopedia Network (FEN): Product Development and Delivery

### Real Time Scientific Knowledge for Forest Practitioners

Southern Regional Extension Forestry

# A new approach to an old problem:

Copyright 2005 by Randy Glasbergen. [www.glasbergen.com](http://www.glasbergen.com)



**“In an increasingly complex world, sometimes old questions require new answers.”**

# Forest Encyclopedia

Encyclopedia of Southern Bioenergy - Microsoft Internet Explorer

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Address http://forestencyclopedia.net/Encyclopedia/bioenergy Go Links

Welcome Bridging the Gap between Knowledge & Application

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FOREST ENCYCLOPEDIA NETWORK

SEARCH  GO

Southern Bioenergy

Home » Southern Bioenergy

## Encyclopedia of Southern Bioenergy

WELCOME TO THE ENCYCLOPEDIA OF SOUTHERN BIOENERGY RESOURCES

The **objective** of this encyclopedia is to synthesize the available scientific and technical knowledge on improved systems for sustainably managing, harvesting, processing, and utilizing woody biomass in the southern United States.

**Getting Started:** Before learning about southern bioenergy resources, new users of this site might want to learn more about what an online encyclopedia consists of. **A user may return to the home page of the Bioenergy Encyclopedia at any time by placing the cursor over the Encyclopedia Collections Link in the upper right hand corner and selecting it.** [Background information](#) is available for those readers unfamiliar with scientific content management systems such as ours and who wish to know more about them. [User Help](#) is available for those unfamiliar with how to browse and search our site to find what they need. [Author Help](#) is available for those wishing to submit new scientific content. If you wish to know who is developing these encyclopedias, click the CREDITS link at the top of each page. If you have questions or wish to make a comment, please feel free to use the **FEEDBACK** link at the top of each page to communicate with us. Familiarity with this administrative background material, will make using the forest encyclopedia network easier and faster.

The forest ecosystems of the South serve many purposes including the production of bioenergy. This encyclopedia consists of a synthesis of the best available scientific knowledge concerning the ecologically sustainable, economically viable, and socially acceptable production and use of bioenergy products in Southern forest ecosystems. We are certainly not suggesting that all existing forests should be tapped for energy production. Forest biomass for energy can and must be managed as simply one of a large number of goods and services that can be produced ([IEA Bioenergy Task 31, 2000](#)).

Worldwide summary data from 1997 show that about 85 percent of global bioenergy consumption is in the form of firewood and charcoal to address heating and cooking needs. Most of the remaining 15 percent is black liquor, a



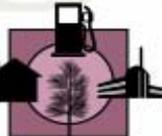
Author: H. M. Rauscher  
Encyclopedia Id (EID): 3050. Last modified 03/09/2006

Done Internet



# Forest Encyclopedia Materials

- ◆ 229 Pages of Material
- ◆ 280 Images
- ◆ 416 Citations



# Sustainable Forestry for Bioenergy and Bio-based Products



DRAFT

A TRAINING PROGRAM  
PRODUCED BY



SOUTHERN FOREST  
RESEARCH PARTNERSHIP

FEBRUARY 2007



# Biomass Curriculum – Training Notebook

- ◆ Table of Contents
- ◆ History of the Project
- ◆ Module Topics
- ◆ Using the Encyclopedia of Southern Bioenergy
- ◆ Introduction to the National Web Based Learning Center for Forest Owners

# Module 1 Fact Sheets

- ◆ What is Biomass?
- ◆ Global Utilization of Biomass
- ◆ Benefits of Biomass Utilization

Sustainable Forestry for Bioenergy and Bio-based Products 



## MODULE I: UNDERSTANDING BIOENERGY RESOURCES

### Using this Module

Biomass is the most important renewable energy source used in the world today. It is used mostly in solid form and, to a lesser extent, in the form of liquid fuels and gas. Despite many factors favoring bioenergy, the utilization of bioenergy has increased at only a modest rate in modern times. Large scale utilization of biomass for energy is still limited to a few countries. In the United States, the forest products industry is probably the largest user of forest biomass, using it to generate more than 70% of its energy needs. Climate change, forest health, wildfires, rural development, and energy security are problems facing the United States today. The increased utilization of forest biomass can help solve these problems. Energy, economic, and environmental benefits can be

derived from the use of biomass for bioenergy and bio-based products.

#### UNDERSTANDING BIOENERGY RESOURCES MODULE CONTENT

This introductory module provides a brief overview of the status and trends of global and U.S. bioenergy resources. It provides information relating to the fact that biomass is one of the most important renewable energy sources, comprising 10.4% of the total use of renewable energy globally. It outlines the uses of woody biomass and the energy products made from this biomass in both developed and developing countries. In addition, this section discusses the significant amount of forest



# Module 2 Fact Sheets

- ◆ Woody Biomass and the Southern United States
- ◆ Availability of Woody Biomass in the South
- ◆ Sungrant Fact Sheets

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## Fact Sheet 2.1: Woody Bioenergy and the Southern United States

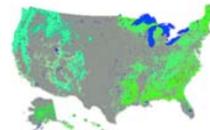


Photo: © USDA Forest Service, Southern Research Station  
Forest Service, Southern Research Station

*Figure 2.1.1 Forest cover in the United States*

**INTRODUCTION**

Forests are among the South's most abundant resources. Over 214 million acres of forest land cover the region (Figure 2.1.1). Approximately 69% of the forest land is owned by non-industrial private forest landowners. These forest ecosystems provide a variety of resources including wildlife habitat, watershed protection, recreational areas, and timber production. Over 60% of the U.S. wood supply is found in the South along with over 1/3 of the wood products jobs in the U.S.

**NEEDS AND OPPORTUNITIES**

The influence of forest resources is most noticeable in the rural South. Over 60% of the counties and parishes in the South are considered rural. Even though the urban population is growing, more than one-quarter of the population still lives in rural areas. These rural communities tend to have economies dominated by forest industry. Recent downturns in pulpwood markets, resulting in mill closures, job losses, and decreased wood products markets, have negatively impacted many of these rural communities. As a result, these communities want to develop alternatives to traditional wood products based economies. With the abundant forest resource, it is only natural that individuals and communities are seeking alternative sources of income from the forest.

According to the Energy Information Administration, the thirteen southern states consumed over 39 quadrillion Btus of energy in 2001. With the forecasted population increase, the amount of energy consumed will also increase exponentially. Total energy consumption is expected to increase at a rate of 1.1% per year until the year 2030. Fuel consumption is forecasted to increase by 43%. Fuel use for light-duty vehicles, including most passenger vehicles, will increase by 42%. Current energy and fuel sources will be unable to keep pace with the increased demand. Therefore, alternative energy and fuel sources need to be explored and utilized.

The forest can provide a renewable natural energy source, while continuing to provide traditional wood products. If the trees and sawmill residues in the South now being used to produce wood pulp were instead converted to ethanol, approximately 6.5 billion gallons of transportation fuel would be added to the nation's supply of transportation fuel.

Authors: Chyrel Mayfield Texas A&M University • C. D. Foster Texas A&M University



# Module 3 Fact Sheets

- ◆ Forest Mgmt. for Bioenergy Products
- ◆ Bioenergy Production Among Common Southern Forest Types
- ◆ Bioenergy Production in Planted Pine Forests

Module 3: Bioenergy Production from the Southern Forest | Fact Sheet 3.3

## Fact Sheet 3.3: Bioenergy Production in Planted Pine Forests

**INTRODUCTION**

Pine plantations are rapidly becoming a common sight in the South. For several decades the number of planted pine acres has steadily increased and are expected to account for approximately 25% of the Southern acreage by 2040. This increase in acreage has been primarily propelled by the demand for fiber for various forest products. Sawtimber and veneer quality trees are the most valuable products of these forests. However thinning in the developmental stages of a plantation are necessary. With pulpwood markets decreasing across the South, it is important that another market be developed for owners of pine plantations. The creation of a bioenergy market would provide an outlet for wood being displaced through the loss of pulp markets.

**OPPORTUNITIES FOR BIOMASS PRODUCTION IN PLANTED PINE FORESTS**

Highly productive bioenergy systems involve intensive management and many of these plantations are already part of an intensive management system, so harvesting for bioenergy can easily be integrated into the management operations. The most significant opportunities are associated with residue harvesting following clearcutting operations. Pre-commercial thinnings and woody weed control can provide additional sources of biomass, in addition to wood that is no longer being sent to pulp markets.

Harvesting clearcut residues can reduce site establishment costs and reduce the risk of fire. In Sweden, research has shown that site establishment costs have been reduced by 3-7%. The removal of slash and stumps, in addition to traditional harvesting techniques, increased productivity in Finland. While these examples are international in scope, similar results are feasible in the South.

Improving stand growth rates may also assist in making more biomass available from a given stand. Typical responses to intensive silvicultural practices are shown in *Table 3.3.1*. Direct biomass opportunities largely arise from harvesting current residues, while indirect opportunities arise from improved long-term productivity per acre. The most promising practices include using improved genetic material, good planting stock, fertilizing to overcome deficiencies, weed control, and draining wet sites. Care must be taken to ensure that the energy gained is greater than the energy required to produce the additional biomass.

*Image 3.3.1 - Planted pine forests are located throughout the Southern United States.*

Authors: C.D. Foster Texas A&M University • Chryd Mayfield Texas A&M University

# Module 4 Fact Sheets

- ◆ Conventional Harvesting Systems
- ◆ Small-Scale Harvesting Systems
- ◆ Pre-Processing and Drying
- ◆ Transportation and Delivery
- ◆ Storage
- ◆ Cost Factors

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## MODULE 4: INTRODUCTION TO HARVESTING, TRANSPORTATION, AND PROCESSING

### Using this Module

Timber harvesting technology adapts constantly to new product opportunities and challenges, most recently the recovery of woody biomass for feedstock. Woody biomass harvesting systems fell and recover woody biomass and transport it to a central location where it can be processed or directly loaded onto trucks for transport to a biomass-using facility. This can be done concurrent with a conventional timber harvest or as a separate

harvest operation. A number of timber harvesting systems are physically capable of harvesting and recovering woody biomass. To be feasible though, they must also be safe for the operator, socially acceptable, as environmentally benign as possible, and cost effective. Harvesting operations designed to recover, process and deliver woody biomass typically involve several different phases: 1) harvesting or felling, 2) pre-processing



# Module 5 Fact Sheets

- ◆ Wood Processing Residues
- ◆ Wood Properties
- ◆ Technology Process: Bio-chemical
- ◆ Technology Process: Thermochemical
- ◆ Bioenergy
- ◆ Ethanol
- ◆ Biodiesel
- ◆ Energy Basics
- ◆ Chemical Products
- ◆ Bio-based Products
- ◆ Ash Content

Module 5: Utilization of Biomass :: Fact Sheet 5.3

## Fact Sheet 5.3: Technological Processes: Bio-chemical

**INTRODUCTION**

Woody biomass is converted into useful forms of energy (i.e. solid, liquid, or gaseous fuels) as well as useful products (e.g. polymers, bio-plastics, chat, pellets, and acids) using a number of different technological processes. Bio-chemical production processes depend on biological and chemical processes as a means of extracting or creating products and energy. This fact sheet briefly covers the three main bio-chemical conversion and production processes employed today for obtaining bio-based energy and products from woody biomass.

**AEROBIC DIGESTING (COMPOSTING).** Sawdust and wood chips are the most common types of woody biomass used in aerobic digestion. In this process, organic wastes from mill lagoons, where naturally occurring bacteria use oxygen to convert the waste into carbon dioxide, water, energy, and more bacteria, are collected. Additional feedstock and water mix with aerators daily to ensure constant turnover of the sludge. This process can be expensive as well as energy demanding because of the need for constant mixing. Nutrient-rich fertilizers and composts are the major product that results from aerobic digestion of woody biomass. (Figure 5.3.1)

Figure 5.3.1 - Aerobic Digestion Schematic

Authors: P. Daniel Cassidy USDM - CSREES • Sarah F. Ashton Southern Regional Extension Forestry

# Module 6 Fact Sheets

- ◆ Woody Biomass Supply: Location and Availability Factors
- ◆ The Economics of Forest Biomass Production and Use
- ◆ Forest Bioenergy Production and Rural Economic Development
- ◆ Bioenergy Policy Incentives

Sustainable Forestry for Bioenergy and Bio-based Products



## MODULE 6: ECONOMICS OF FOREST BIOMASS AND BIOENERGY

### Using this Module

Economics is a key factor influencing decisions on biomass and bioenergy production and consumption. This module introduces the economics and policy aspects of the production and utilization of woody biomass for bioenergy and other bio-products. After completing this module, one is expected to understand how economic considerations will affect decisions on biomass and bioenergy production and to be able to incorporate economic criteria into their decision-making regarding biomass and bioenergy development.

**ECONOMICS OF FOREST BIOMASS AND BIOENERGY MODULE CONTENT**

This module addresses the socio-economic issues associated with forest biomass and bioenergy development. The information presented here is intended to aid forest

landowners and practitioners in understanding the economic potential and barriers to forest biomass and bioenergy production and relevant policies. It contains four components: supply of forest biomass, cost competitiveness, community impacts, and policy factors and incentive programs.

It first describes factors affecting supply, sources and quantity of supply, location of supply, and uncertainty and the long-term supply. The ability for forest biomass and bioenergy to realize a greater share of energy and other products markets will largely depend on their cost competitiveness relative to their substitutes. The second part of this module delves into the production costs of forest biomass and bioenergy and their cost competitiveness with similar products on the market. The production cost of secondary



# Module 7 Fact Sheets

- ◆ Adaptive Forest Management
- ◆ Forest Bioenergy Certification
- ◆ Conserving Soils
- ◆ Water Conservation
- ◆ Biodiversity
- ◆ Environmental Sustainability

Sustainable Forestry for Bioenergy and Bio-based Products



MODULE 7:  
ENVIRONMENTALLY  
SUSTAINABLE  
BIOENERGY  
PRODUCTION SYSTEMS  
Using this Module

One of the challenges facing modern forest management is producing forest products, including bioenergy and bio-based products, from southern forests in a sustainable manner. Defining sustainability and sustainable forest management has been difficult because of complexity in relevant scientific concepts and the state of current technical progress that might have practical application for land managers. Definitions related to sustainability

have also eluded precise clarity and consensus because of the highly politically charged atmosphere that characterizes ongoing debates about forest management practices and land tenure involving landowners, forest industry, environmental conservation organizations, aboriginal peoples, the general public, and public agencies at local to national and international levels.





# PowerPoint Presentations

- ◆ Complement the Encyclopedia and Fact Sheets
- ◆ One PowerPoint per Module
- ◆ Each slide has lecture notes
- ◆ Available on CD and online

# Module 4: Introduction to Harvesting, Transportation, and Processing



# Recovering Woody Biomass

- ◆ Logging residue represents great potential
- ◆ 41 million dry tons of logging residue
- ◆ Needs to be augmented by other wood sources



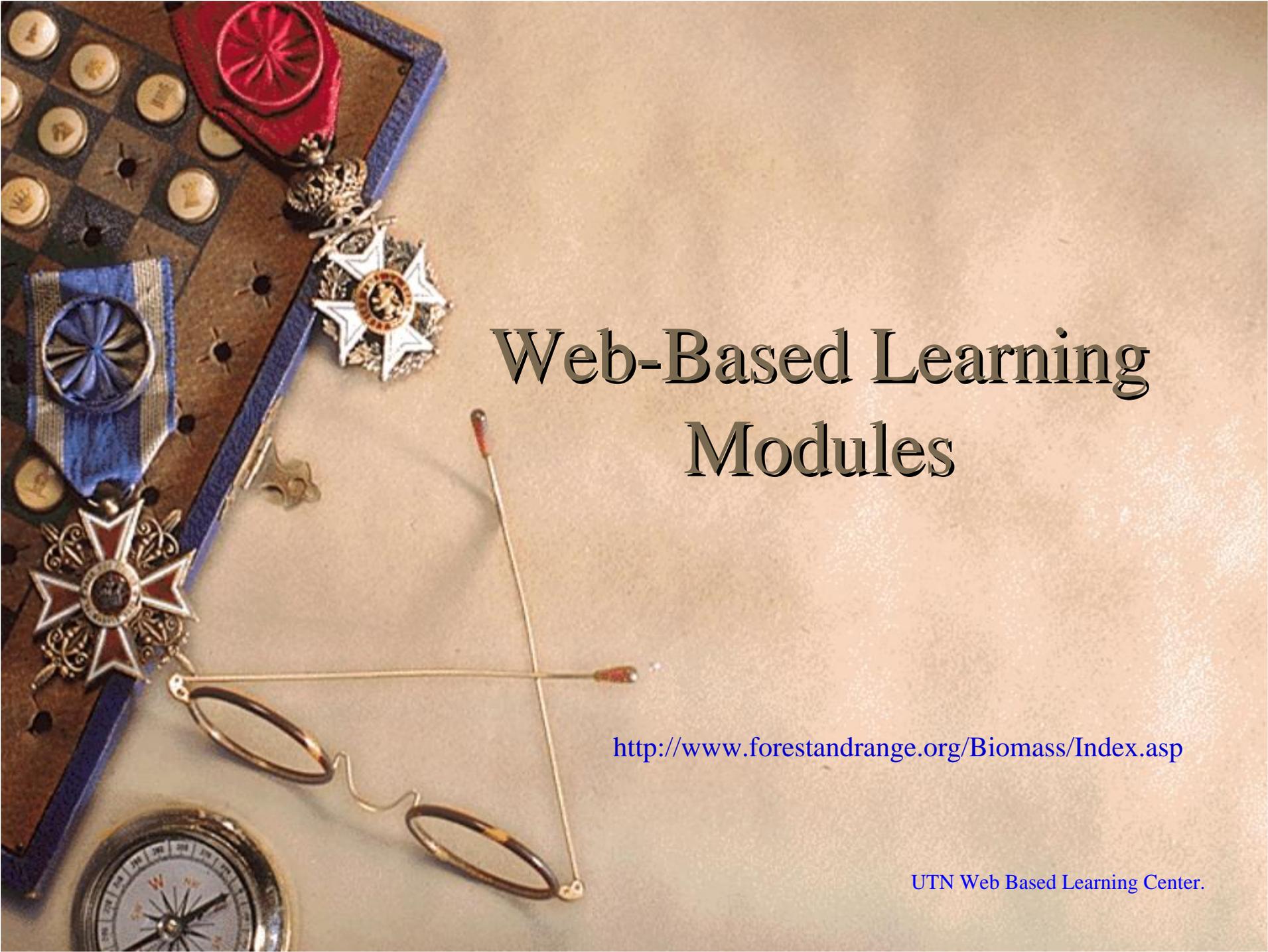
Module 4: Introduction to Harvesting, Transportation, and Processing

# Recovering Woody Biomass with Timber Harvesting Technology

- Similar technology
- ◆ Similar processes
  - Felling and recovery
  - Pre-processing and drying
  - Transportation and delivery
  - Storage



Module 4: Introduction to Harvesting, Transportation, and Processing

A collection of historical artifacts is displayed on a light-colored surface. In the top left, a portion of a chessboard with a checkered pattern and several chess pieces is visible. Below it, a blue ribbon with a circular emblem is attached to a silver star-shaped medal. To the right, a red ribbon with a similar emblem is attached to another silver star-shaped medal. In the bottom left, a circular compass with a white face and black markings is shown. A pair of gold-rimmed glasses with thin temples lies across the center of the image. The background is a plain, light-colored surface.

# Web-Based Learning Modules

<http://www.forestandrange.org/Biomass/Index.asp>

UTN Web Based Learning Center.



# Sustainable Forestry

## Bioenergy and Bio-products



<a href="#">Glossary</a>	<a href="#">Modules</a>	<a href="#">Ext. Agent Resources</a>	<a href="#">SFRP Home</a>	<a href="#">Credits</a>
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forestandrange > SFBB > Modules

**The Southern Bioenergy Resource**

**Forest Management for Bioenergy Production**

**Harvesting Biomass for Bioenergy Production**

**Biomass Utilization**

**Economics of Bioenergy Production**

**Environmental Sustainability of Bioenergy Production**



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"A program of the Cooperative Extension Service funded by the Renewable Resources Extension Act"



A product of the National Learning Center for Private Forest and Range Landowners and in collaboration with the University of Georgia, Texas A&M University, University of Tennessee, SFRP, and USDA.



### icon Harvesting Biomass for Bioenergy Production

Home	<b>Glossary</b>	<b>Modules</b>	<b>Ext. Agent Resources</b>	<b>SFRP Home</b>	<b>Credits</b>
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Credits
1. Forms of Woody Biomass <ul style="list-style-type: none"><li>• <b>Unconsolidated Woody Biomass</b></li><li>• Comminuted Biomass Materials</li><li>• Composite Residue Logs</li></ul>
2. Conventional Biomass Harvesting Systems
3. Small-scale Biomass Harvesting Systems
4. Processing and Drying
5. Transport and Delivery
6. Storage
7. Costs
Additional Materials
References

forestandrange > SFBB > Modules > Harvesting > Unit 1 > **Lesson 1**

### Unconsolidated Woody Biomass



Unconsolidated Woody Biomass  
Source: Ben Jackson

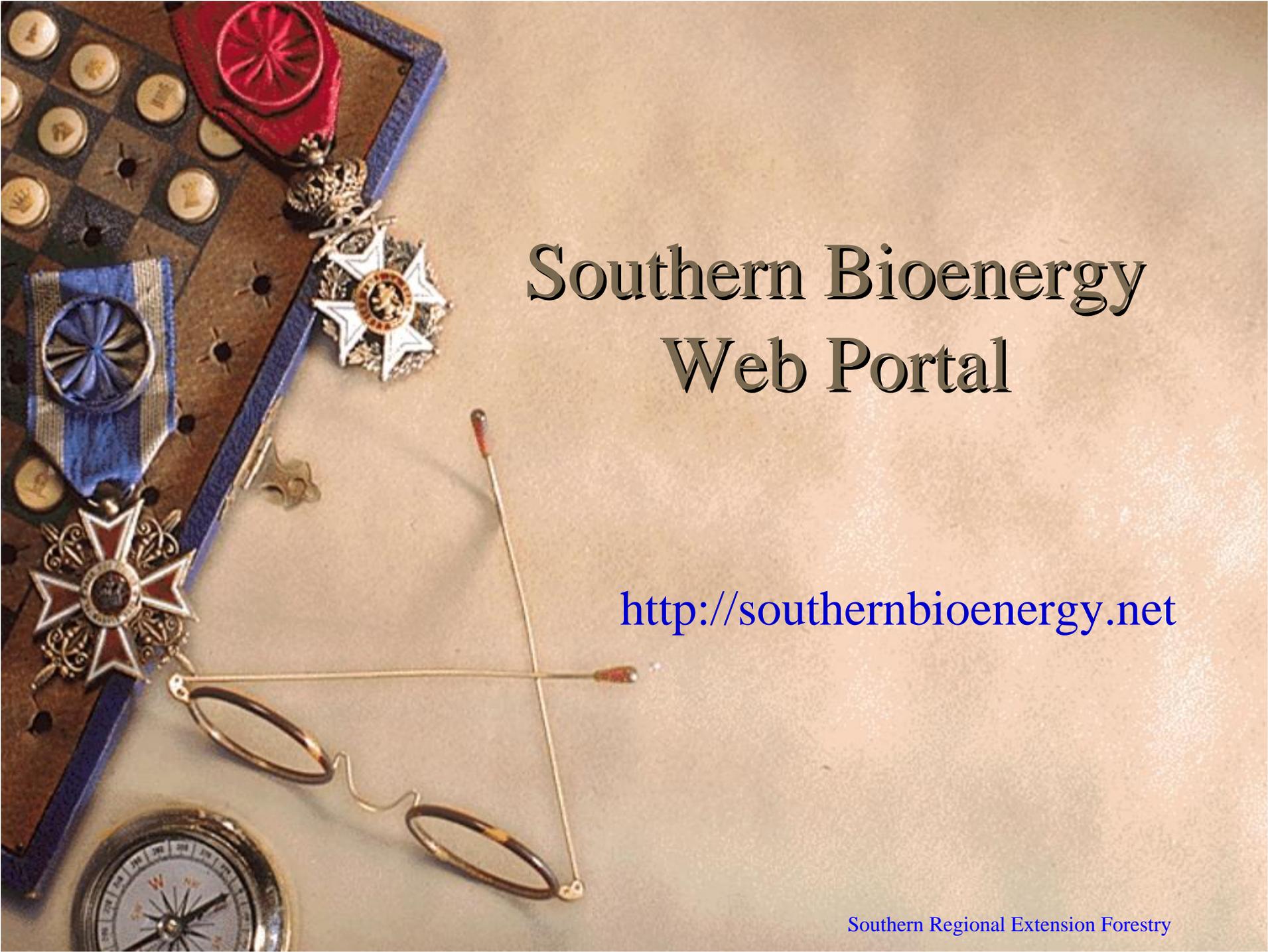
Unconsolidated slash is woody biomass in its raw form after it has been removed from the bole of the tree. Historically, this material was considered unmerchantable. In most southern harvesting operations, unconsolidated slash is left in place on the logging site or concentrated at the landing. While not commonly practiced, this slash can be transported to a biomass-using facility by conventional logging trucks, log trailers, or specialized containers on trailers. Because unconsolidated material is bulky with lots of air space, efforts have been made to compress this material to allow

for more biomass to be transferred per load. In most cases, however, compression has not proven operationally feasible.

Transporting forest biomass from the woods to a utilization site is often difficult. As this figure shows, the method by which the biomass is prepared for transport makes a large difference in how much can go into one truckload. The volumes of material at right all have the same weight. When utilizing biomass, careful consideration must be taken for transport issues.

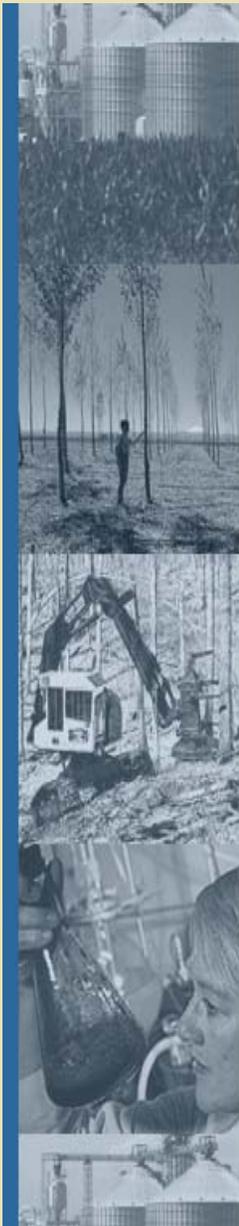


Volume differences of the same weight material by different product types  
Source: USDA Forest Service Forest Product Laboratory

A collection of historical artifacts is displayed on a light-colored surface. On the left, a portion of a wooden chessboard with a checkered pattern and several chess pieces is visible. Next to it are two ornate medals: one with a red ribbon and a white star, and another with a blue ribbon and a white star. A small red circular object with a radial pattern is also present. In the bottom left corner, there is a circular compass with a white face and black markings. A pair of gold-rimmed glasses with thin temples is positioned in the center. The background is a plain, light-colored surface.

# Southern Bioenergy Web Portal

<http://southernbioenergy.net>



# SOUTHERN BIOENERGY

*Sustaining Our Future With Renewable Resources...*

 search

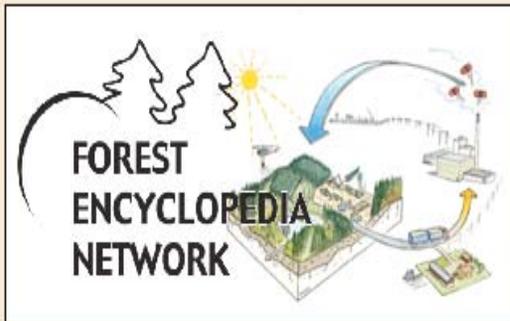
- HOME
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- IMAGES
- TRAINING MATERIALS

## Welcome to Southern Bioenergy



The Southern Bioenergy website is designed for information sharing among natural resource management and extension professionals as well as community planning and development professionals. It is one of several products resulting from the [Southern Forest Research Partnership](#) bioenergy training initiative. The site is a repository of information related to biomass product use designed such that members can easily upload and the public can easily download relevant biomass-related information. The gateway includes publications, presentations, additional links, events, and images.

Future plans for the website include the addition of case studies, activities, videos, and other educational tools designed to help users of the portal better understand the subject matter themselves and better convey subject matter information to their audiences.



Information and knowledge for the bioenergy training initiative relies heavily on a relatively new technology called the online hypertext Forest Encyclopedia Network or FEN. FEN was developed by scientists and technology transfer specialists with the USDA Forest Service and Cooperative Extension Service - [Southern Regional Extension Forestry](#) office in 2001. FEN is a content management system (CMS) designed to allow the forestry and natural resources community as well as others to participate in online knowledge management and learning. Information and knowledge generated by scientists and technology transfer specialists is incorporated into the online encyclopedia



# SOUTHERN BIOENERGY

*Sustaining Our Future With Renewable Resources...*

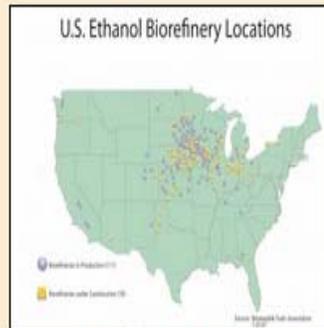
 search

- HOME
- NEWS
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- PUBLICATIONS
- IMAGES
- TRAINING MATERIALS

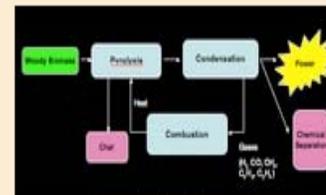
## Images

Below you will find a collection of images related to biomass management, harvesting, and utilization.

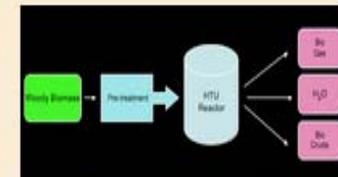
### New Images



Biorefinery Locations  
Renewable Fuels Association 1/25/07



Pyrolysis Schematic



Hydrothermal Upgrading Schematic

Click a category below to view more images:

- [Harvesting \(31\)](#)
- [Management \(1\)](#)
- [Utilization \(11\)](#)



# Forest Biomass Training Program Testing

- ◆ **Encyclopedia Site:**  
<http://www.forestencyclopedia.net>  
– February 1 – 2, 2006 College Station, TX
- ◆ **Train-the-Trainer Pilot Program –**  
[Atlanta, GA, February 2007](#)
- ◆ **Train-the-Trainer Final:** [Summer 2007](#)
- ◆ **End User Training,** [Fall 2007 and beyond](#)



# Conclusions

- ◆ There is a substantial biofuels opportunity in the Southern U.S.
- ◆ The U.S. is the world's largest and most demanding marketplace
- ◆ The forest industry is uniquely positioned (resources and infrastructure) to provide improved and sustainable products and energy opportunities for the benefit of the Nation and Society



# Follow-Up Actions

- ◆ Add Additional Modules
  - Policy and Legislation
- ◆ Sustain the Bioenergy Encyclopedia
  - USDA has an investment in this information technology --- need to sustain the investment
- ◆ Follow-up Conferences/Workshops/Seminars
  - “Understanding Relationships Between Biomass/Biofuels Production and Biodiversity”



## Follow-up Actions (cont.)

- ◆ Forestry Biomass Language in Forest, Energy and Research Titles of the forthcoming Farm Bill
- ◆ Funding for Title II of the Healthy Forest Restoration Act



# Comments and Questions