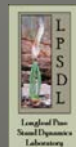


Geo-Spatial Resources



And Their Use in Forest Tree Seedling Production



Becky Barlow, Alabama Cooperative Extension Specialist
John Gilbert, Research Associate, Longleaf Pine Stand Dynamics Lab
John Kush, Research Fellow, Longleaf Pine Stand Dynamics Lab
Auburn University School of Forestry and Wildlife Sciences

Questions

- ✎ How many of you have ever used a Global Positioning System (GPS)?
- ✎ How many of you have ever used a Geographic Information System (GIS)?
- ✎ How many of you have ever used Map Quest or maybe Google Earth?
- ✎ Think about what you have heard about GIS/GPS. What do you think it can do for you?

A history of natural resource decision making

- ✎ Geo-spatial technologies (GIS, GPS, etc.) have been part of natural resource management for over 20 years
 - Maps
 - Harvest scheduling
 - Silvicultural prescription decision support
- ✎ Aid in understanding the location and condition of land resources, which is critical for
 - Making long-term management decisions
 - Responding to short-term environmental and economic changes
- ✎ *If you don't know where it is on the ground, and how it is growing, it's difficult to make accurate management decisions!*

How it can help you

- ✧ Geo-spatial technologies can be used to better facilitate decision-making from the nursery to the forest stand.
- ✧ This talk will highlight the availability and application of geo-spatial technology and associated resources available for nursery managers.
 - What are geo-spatial technologies?
 - What associated resources are available?
 - How can this technology be used in tree seedling production?
 - Professional maps and beyond!

The new source of power is not money in the hands
of few, but information in the hands of many



--John Naisbitt

What are geo-spatial technologies?

- ✎ GIS and GPS used to create a map.
- ✎ A map can be a truly valuable product of GIS and one of the most commonly thought of product.
- ✎ However, it is so much more.....

What are geo-spatial technologies?

- ⌘ Managing *information* of any kind based on where it is located.
- ⌘ Goes beyond mapping, spreadsheets, and databases!
- ⌘ Gives you the ability to reference natural resource inventory and condition information to a physical location.
 - Acres
 - Land cover
 - Stand age
 - Volume
 - Species
 - Condition

GIS

- ✎ According to ESRI a Geographical Information System (GIS) is defined as
 - “...an integrated system of computer hardware, software, data, and workflow procedures for collecting, storing, analyzing, and disseminating information about areas of the earth.”
- ✎ GIS = Tabular Data + Spatial Data
- ✎ Can be used with and without GPS

GPS

- ✧ Satellite navigation system
- ✧ Maintained by the US Government
 - All weather
 - 24 hour
 - Worldwide
- ✧ Available free to the public



GPS

- ✧ Radio signals sent from orbiting satellites to earth
- ✧ Measures receiver-to-satellite distance
 - How long the signal took to get to your receiver
- ✧ GPS units receive and convert signals to position, speed, and time information

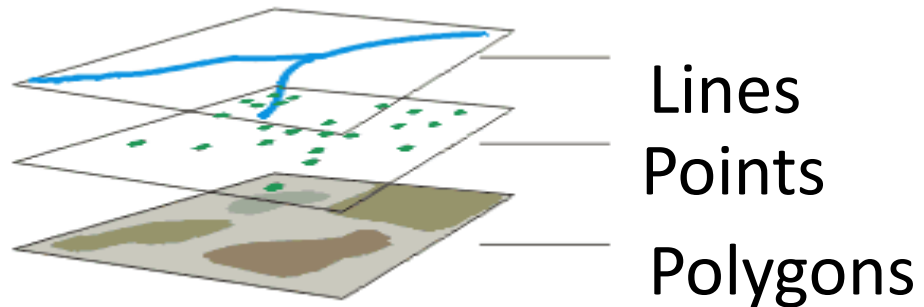


Beyond the Pretty Map!

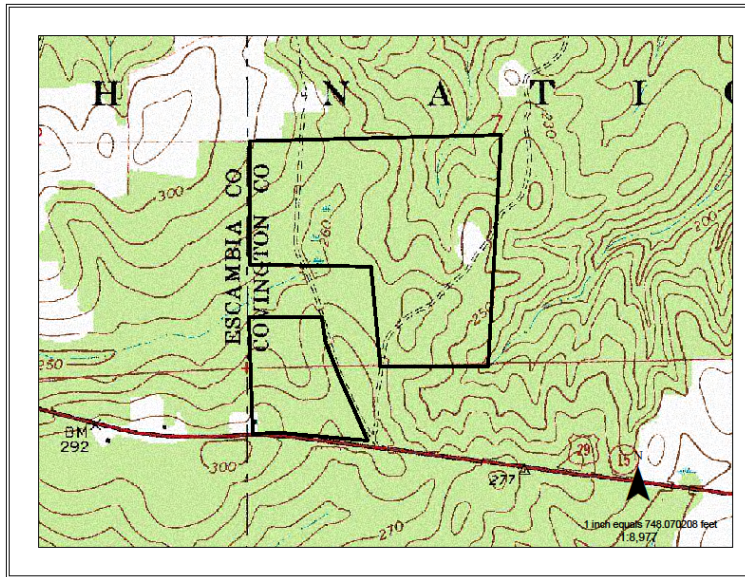
- ✎ Geo-spatial technology is used for the visualization, measurement, and analysis of the Earth's features.
- ✎ Ties information about a location to its physical spot on the ground.
 - It is NOT just a pretty map!
 - It is NOT just for research!
- ✎ To make it really work for you as a decision support tool, **GOOD and ACCURATE DATA** must go into it!

How it works

- ☞ Maps are graphical representations of the world.
- ☞ Real-world objects are represented with
 - Points – locations of fire stations, churches, and schools
 - Lines – roads, bridges, and creeks
 - Polygons – larger areas such as National Forests, city parks, and forest stands.
 - Rasters or Grids – layers of equal sized grid cells that represent values on the ground such as slope, aspect, and vegetation cover
- ☞ Paper maps provide limited information using
 - shapes
 - colors
 - patterns
 - labels



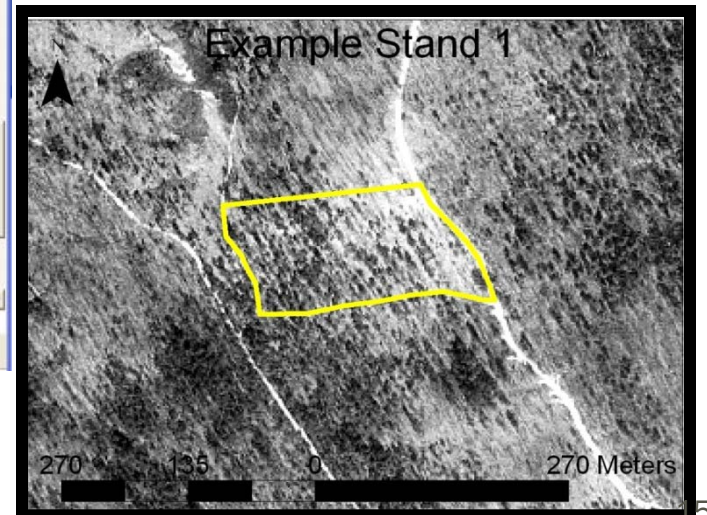
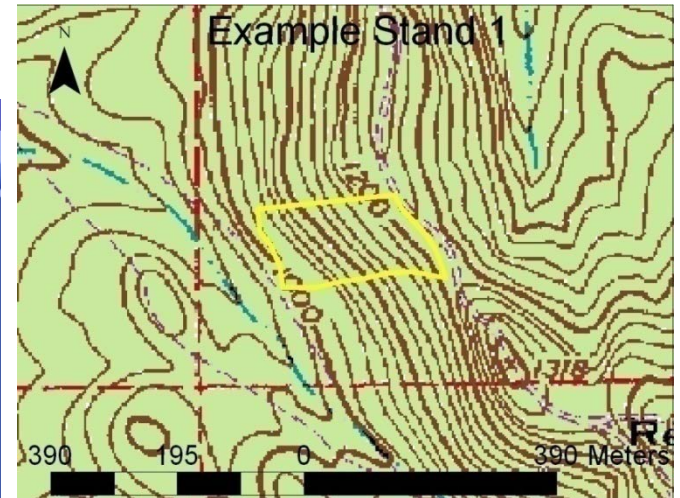
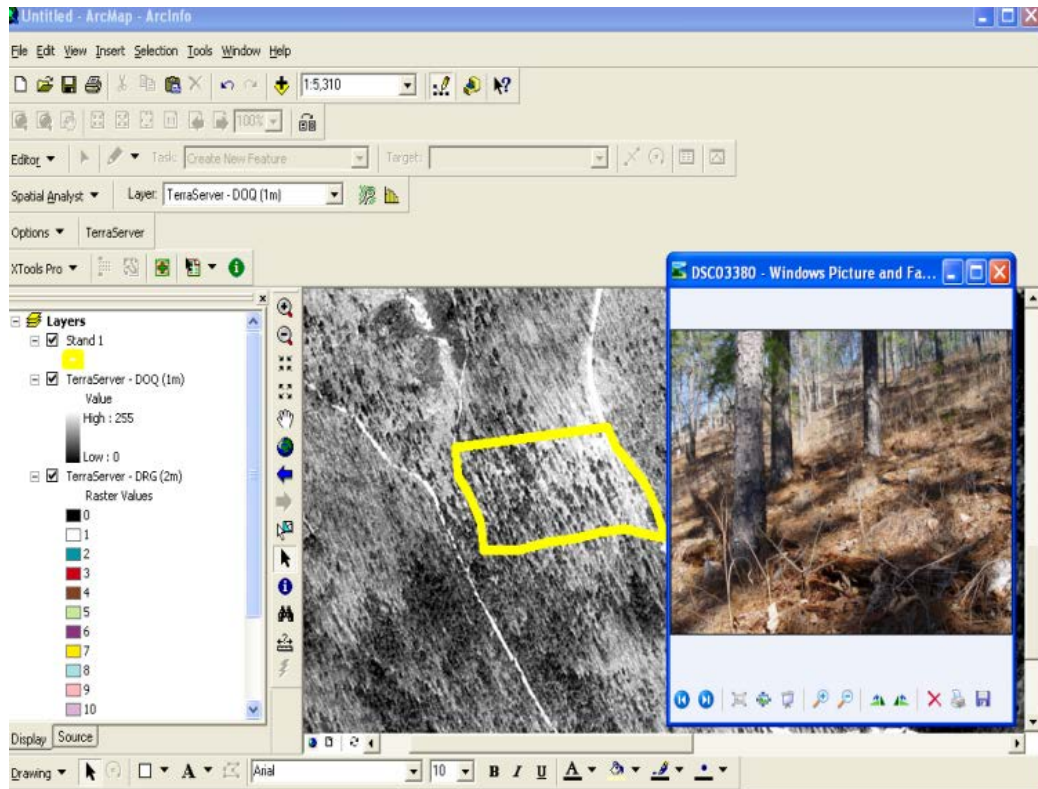
In other words....



or ?

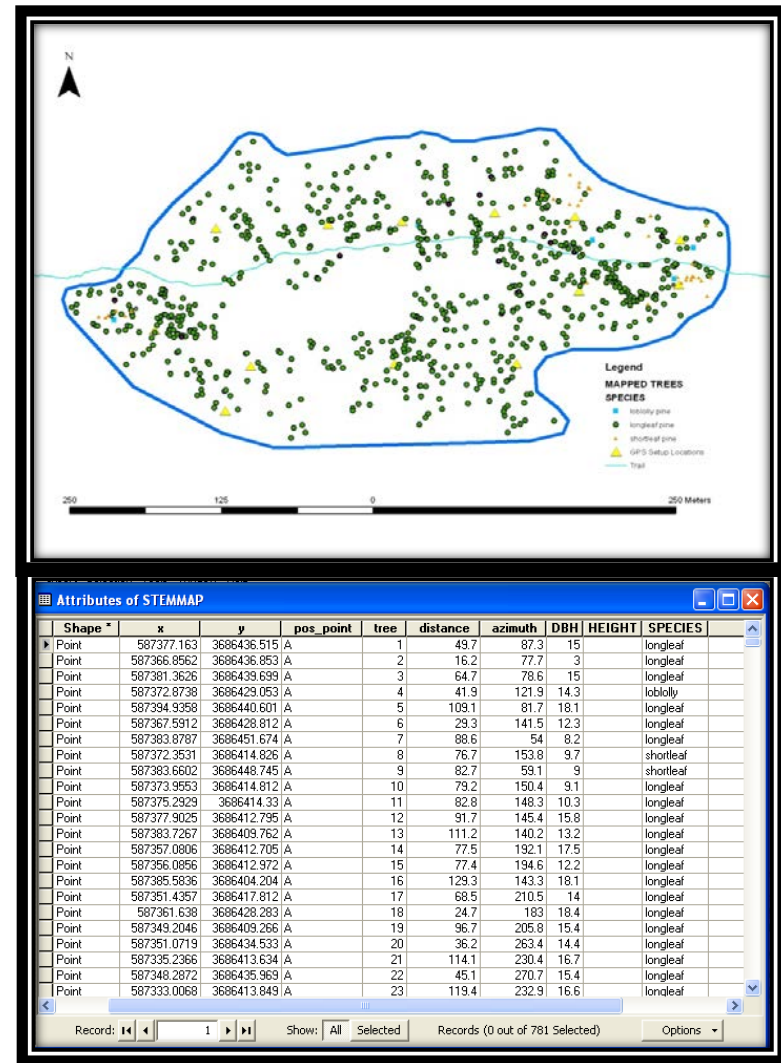


How it works



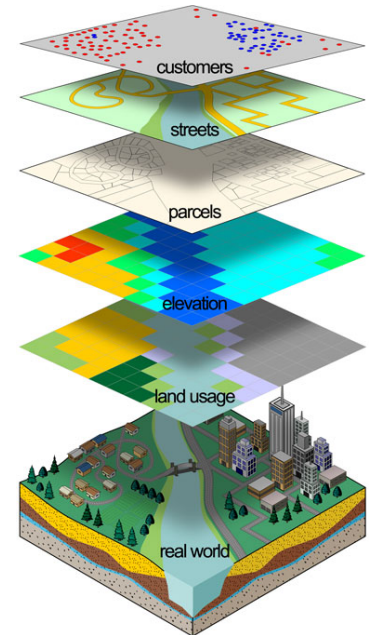
How it works

- ☞ Data behind the map is the true power of the system
- ☞ Can be as or more important than the map!
- ☞ Used for maps descriptions, analyses, reporting, etc.



How it works

- ✎ With geo-spatial technologies the amount of information is almost limitless!
- ✎ Because the information is
 - Linked to a specific stand or location
 - Dynamic
 - Query-able
 - Flexible
- ✎ Your management objectives and the information you need will determine how it can best work for you.



A decision is as good as the information
that goes into it



-John F. Bookout Jr.

Resources available to get started

- ✂ GIS programs
- ✂ USDA Geospatial Data Gateway
 - Aerial imagery
- ✂ USDA Web Soil Survey
- ✂ Other sources
 - Planting zones
 - Drought monitor
 - Weather
 - Pests and disease

Example GIS Software Packages

☞ ArcGIS

- <http://www.esri.com/software/arcgis/arcview/index.html>

☞ Tatuk

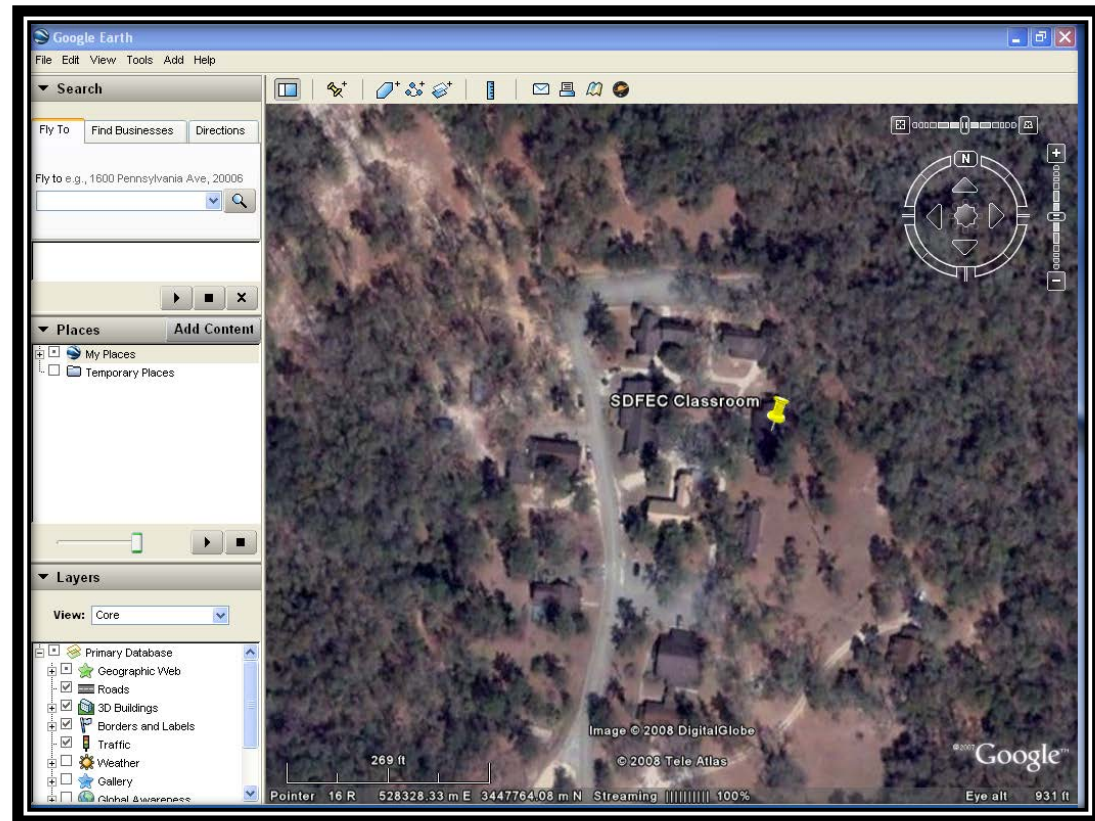
- <http://www.tatukgis.com/>

☞ Quantum GIS (Free!)

- <http://www.qgis.org/>

Google Earth

- View satellite imagery
- Create maps and directions
- Draw stand boundaries
- Measure distance and areas (with upgrade)



USDA Geospatial Data Gateway

USDA:NRCS:Geospatial Data Gateway:Home - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://datagateway.nrcs.usda.gov/

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USDA:NRCS:Geospatial Data Gateway:Home

USDA United States Department of Agriculture
Natural Resources Conservation Service

GEOSPATIAL DATA GATEWAY

Home Login Check Order Status Maps News Data Policy FAQ Help Admin Contact Us

You are here: Home

Welcome to GDG

the one stop source for environmental and natural resource data

The Geospatial Data Gateway (GDG) is the One Stop Source for environmental and natural resources data, at anytime, from anywhere, to anyone. The Gateway allows you to choose your area of interest, browse and select data from our catalog, customize the format, and have it downloaded or shipped on CD or DVD.

This service is made available through a close partnership between the three Service Center Agencies (SCA); Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA), and Rural Development (RD).

System Status

Please Note:
10/8/2010 1:31:43 PM MST:
Soil orders that have already been placed are taking an extremely long time due to a large backlog. No new orders for Soil data will be taken until the backlog is cleared.

6/2/2010 9:29:07 AM MST:

Search

Go

Browse by Subject

- Natural Resources
 - Conservation Service
- Farm Services Agency
- Rural Development
- National Cartography & Geospatial Center (NCGC)
- Aerial Photography Field Office (APFO)
- Web Soil Survey
- Soil Data Mart
- Geospatial One Stop
- APFO Customer Order Entry System
- USGS Maps, Imagery and Publications
- National Atlas
- National Map Viewer 2.0
- US Census Bureau
- Geography
- Download 2009 TIGER/Line Shapefiles
- eFOTG

I Want To...

- Order by County / Counties
- Order by State
- Order by Place
- Order by Bounding Rectangle (Latitude and Longitude)
- Order by Interactive Map - Custom Area Of Interest (AOI)
- Find Available Data for the U.S.
- Check Status of an Existing Order

GET DATA

GEOSPATIAL DATA GATEWAY

Place a Data Order GDG

Done

Geospatial Data Gateway

The screenshot shows the USDA NRCS Geospatial Data Gateway web application running in Mozilla Firefox. The browser's address bar displays the URL `http://datagateway.nrcs.usda.gov/GDGOrder.aspx`. The page features a header with the USDA logo, the text "United States Department of Agriculture Natural Resources Conservation Service", and the title "GeoSpatialDataGateway". Below the header is a navigation bar with links for "Home", "Status Maps", "Help", "FAQ", and "Contact Us", along with a "Last Modified: 9/14/2010 11:49:12 AM" timestamp and a zoom control.

The main content area is divided into three columns. The left column, titled "1- WHERE", contains instructions for selecting a state and counties, and a "Submit Selected Counties" button. The middle column, titled "WHERE", contains a link to change the selection method and a "Order by County/Countries" section with a dropdown menu showing a list of US states and territories, with "Alabama" selected. The right column, titled "YOUR ORDER", contains fields for "Order Area (Where)", "Order Map Layers (What)", "Order Format (How)", "Order Projection (How)", "Order Inclusion (How)", "Order Delivery Method (How)", and "Order Recipient (Who)".

At the bottom of the page, there is a navigation bar with links for "2-WHAT", "3-HOW", "4-WHO", and "5-REVIEW".

Geospatial Data Gateway

USDA:NRCS:Geospatial Data Gateway:Order Data - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://datagateway.nrcs.usda.gov/GDGOrder.aspx

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United States Department of Agriculture
Natural Resources Conservation Service

GeoSpatialDataGateway

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1- WHERE

Order by County/Countries

Using the panel in the middle select the state for your order. A list of available counties for that state will then be displayed. Select one or more items from the **Available Counties**. The **shift** and **ctrl** keys are used for multiple selections. Once chosen, use the **>>>** button to move those counties to the **Selected Counties** list. You may remove these items by using the **<<<** button. Once you are satisfied with your selected counties list use the **Submit Selected Counties** button to move them to the **YOUR ORDER** panel on the far right.

WHERE

If you wish to change the method for selecting the order area, click [HERE](#).

Order by County/Countries

Select State for order:

Select County or Countries

Autauga
Baldwin
Barbour
Bibb
Blount
Bullock
Butler
Calhoun
Chambers
Cherokee
Chilton
Choctaw
Clarke
Clay
Cleburne

Available Counties

<<<

>>>

Lee

Selected Counties

YOUR ORDER

Order Area (Where): None

Order Map Layers (What):

Order Format (How): None
Order Projection (How): None
Order Inclusion (How): None
Order Delivery Method (How): None

Order Recipient (Who):

2-WHAT

3-HOW

4-WHO

5-REVIEW

Done

Geospatial Data Gateway

USDA:NRCS:Geospatial Data Gateway:Order Data - Mozilla Firefox

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http://datagateway.nrcs.usda.gov/GDOrder.aspx

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Natural Resources Conservation Service

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1-WHERE
2-WHAT

The list in the middle pane indicates the available map layers for your area of interest. The number of maps and total size of the map layers are listed next to the description. Clicking on the **i** icon will provide a pop-up window with that map layer's description. Use the **+** icon to get a list of individual maps for that map layer. Within the list of maps, use the **m** icon to get metadata for the specific map and the **p** icon for an individual map preview. You may collapse this map list with the **-** icon. Your selections will be added to the YOUR ORDER Panel on the far right.

You may change your map layers after this step but 1 of the subsequent choices made for your order will be removed.

3-HOW
4-WHO
5-REVIEW

WHAT

Here are the available map layers for your selected area of interest.

Topographic Images

- ☐ Digital Raster Graphic County Mosaic by NRCS, 1 map 97.958 MB **i** **+**

Map Indexes

- ☐ Quadrangle Index 1:12,000, 1 map 0.025 MB **i** **+**
- ☐ Quadrangle Index 1:24,000, 1 map 0.008 MB **i** **+**
- ☐ Quadrangle Index 1:100,000 by State, 1 map 0.036 MB **i** **+**
- ☐ Quadrangle Index 1 Degree by State, 1 map 0.013 MB **i** **+**
- ☐ Quadrangle Index 1:250,000 by State, 1 map 0.010 MB **i** **+**

Elevation

- ☐ National Elevation Dataset 10 Meter, 24 maps 198.289 MB **i** **+**
- ☐ National Elevation Dataset 30 Meter (60 meter AK), 1 map 50.905 MB **i** **+**

Ortho Imagery

- ☐ Digital Ortho County Mosaic of 7.5' quads by APFO, 1 map 139.949 MB **i** **+**
- ☐ DOQ Multi-County Mosaic by NRCS, 1 map 519.350 MB **i** **+**
- ☐ Digital Ortho 7.5' quads, 24 maps 243.025 MB **i** **+**
- ☐ NAIP NCGC Derivative Mosaic, 1 map 583.478 MB **i** **+**
- ☐ 2005 National Ag. Imagery Program Mosaic, 1 map 113.354 MB **i** **+**
- ☐ 2006 National Ag. Imagery Program Mosaic, 1 map 734.933 MB **i** **+**
- ☐ 2009 National Ag. Imagery Program Mosaic, 1 map 583.504 MB **i** **+**

Geographic Names

- ☐ Geographic Names - Populated Places, 1 map 0.060 MB **i** **+**
- ☐ Geographic Names - Non-Populated Places, 1 map 0.299 MB **i** **+**

Land Use Land Cover

YOUR ORDER

Order Area (Where): Lee County, Alabama

Order Map Layers (What):

Order Format (How): None
Order Projection (How): None
Order Inclusion (How): None
Order Delivery Method (How): None

Order Recipient (Who):

CONTINUE

Done

start | lanmctg 2010 | Microsoft PowerPoint ... | USDA:NRCS:Geospati... | Search Desktop | 7:31 PM

Geospatial Data Gateway

USDA:NRCS:Geospatial Data Gateway:Order Data - Mozilla Firefox

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http://datagateway.nrcs.usda.gov/GDGOrder.aspx

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1-WHERE

2-WHAT

3-HOW

4-WHO

5-REVIEW

Based on the map layers of the order the options for format, projection, and inclusion will be available in the center panel. The delivered format for image layers is indicated in the format column of the **Status Maps** page. For information about the Inclusion options, see the **Inclusion Table**. Some formats are not available for some map layers. If you do not see your format listed you may wish to remove map layers and place separate orders.

Please note that there is a charge for physical media for non-USDA personnel.

HOW

FORMAT

PROJECTION

INCLUSION

DELIVERY

Image map layers will be delivered in their **Native Format**.

There is only one projection available for the map layers requested and it has been chosen automatically. See the **YOUR ORDER** panel to the right for details.

The Data Inclusion option indicates how much geographical area will be delivered with a selected map layer. This is similar to a "clipping" option for the map layers. Due to the limitations for your selected area of interest (Where) the inclusion will be **Standard** (the entire data set will be delivered for the order area chosen).

For a list of what to expect for geographical coverage for each map layer in your order, see this **Inclusion Table**.

Please select a delivery option for the order. Available delivery options are based on map layers chosen. USDA personnel may obtain data on optical media (DVD,CD) without incurring a cost. Other agencies and the private sector are charged: **FIFTY DOLLARS (\$50.00 US) FOR EACH CD and ONE-HUNDRED DOLLARS (\$100.00 US) FOR EACH DVD**.

☒ FTP Estimated completion in: 1 Minute. [Click to see a download time chart.](#)
☐ CD This order will require 1 CD(s) for a total of \$50.00 US.
☐ DVD Requested data will not exceed CD size capacity.

For additional delivery options please click [Here](#)

CONTINUE

YOUR ORDER

Order Area (Where): Lee County, Alabama

Order Map Layers (What):

- Digital Raster Graphic County Mosaic by NRCS 97.958 Megabytes, 1 Map

Order Format (How): Native
Order Projection (How): AutoUTM to county
Order Inclusion (How): Standard
Order Delivery Method (How): FTP

Order Recipient (Who):

Done

start | ilancmg 2010 | Microsoft PowerPoint ... | USDA:NRCS:Geospati... | Search Desktop | 7:33 PM

Geospatial Data Gateway

USDA:NRCS:Geospatial Data Gateway:Order Data - Mozilla Firefox

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Natural Resources Conservation Service

GeoSpatialDataGateway

Last Modified: 9/14/2010 11:49:12 AM Home Status Maps Help FAQ Contact Us A⁺ A⁻ AA =

1-WHERE

2-WHAT

3-HOW

4-WHO

Please enter your contact information. It is very important to enter a valid email address as this will be the address that a completion email will be sent to when your order is complete.

Your delivery and contact information will be saved as a browser cookie unless you uncheck this box:

☒ SAVE CONTACT DATA

Please review our [PRIVACY POLICY](#) for our policies regarding data collected in this application.

5-REVIEW

WHO

You must enter a valid email address to receive a completion email indicating that your order is finished. Fields indicated with a "*" are required.

* First Name	Becky		
* Last Name	Barlow		
* Contact Email	becky.barlow@auburn.edu		
* Confirm Email	becky.barlow@auburn.edu		
Organization/TSP ID	-		
* Address	3301 School of Forestry and Wildlife Sciences		
Address	-		
* City	Auburn		
* State/Foreign Country	AL	* Zip	36849
* Contact Phone	3348441019	Fax	-

CONTINUE

YOUR ORDER

Order Area (Where): Lee County, Alabama

Order Map Layers (What):

- Digital Raster Graphic County Mosaic by NRCS 97.958 Megabytes, 1 Map

Order Format (How): Native
Order Projection (How): AutoUTM to county
Order Inclusion (How): Standard
Order Delivery Method (How): FTP

Order Recipient (Who):

Geospatial Data Gateway

USDA:NRCS:Geospatial Data Gateway:Order Data - Mozilla Firefox

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http://datagateway.nrcs.usda.gov/GDGOrder.aspx

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1- WHERE	REVIEW
2- WHAT	
3- HOW	
4- WHO	
5- REVIEW	

Please check over the details of your order. If you wish to change anything, use this left control panel to traverse the steps to make corrections. When you are ready press the button below to place your order.

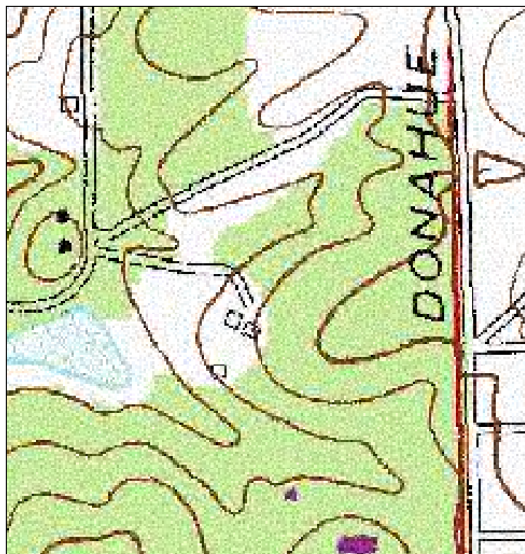
Estimated time to complete your order:
1 Minute

Place your order with this button:
PLACE ORDER

Order Area(Where):	Lee County, Alabama
Order Map Layers(What):	<ul style="list-style-type: none">Digital Raster Graphic County Mosaic by NRCS, 1 map 97.958 MB
Order Delivery Specifics(How):	Format: Native Projection: AutoUTM to county Delivery: FTP Inclusion: Standard
Final Order Size:	97.958 megabytes
Order Recipient(Who):	Becky Barlow 3301 School of Forestry and Wildlife Sciences Auburn, AL 36849 becky.barlow@auburn.edu 3348441019

Done

Geospatial Data Gateway

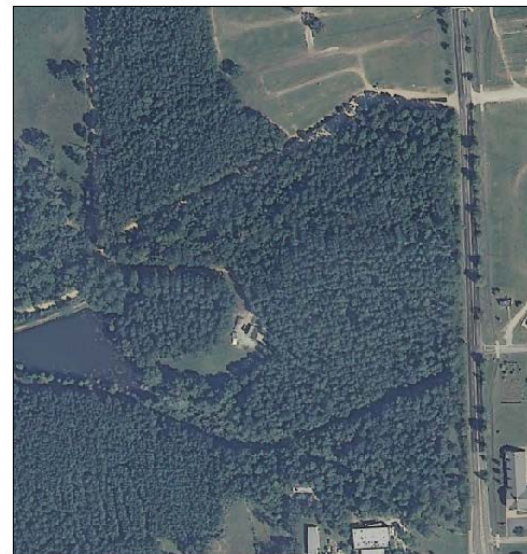


Donahue Drive Forestry Plots
Auburn University

Lee County, AL

Map Created: Feb 2010

0 175 350 700 Feet



Donahue Drive Forestry Plots
Auburn University

Lee County, AL

Map Created: Feb 2010

0 175 350 700 Feet

USDA Web Soil Survey

Web Soil Survey - Home - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

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Web Soil Survey - Home



USDA United States Department of Agriculture Natural Resources Conservation Service

Web Soil Survey

Home About Soils Help Contact Us

You are here: Web Soil Survey Home

Search

Enter Keywords

All NRCS Sites

Browse by Subject

- Soils Home
- National Cooperative Soil Survey (NCSS)
- Archived Soil Surveys
- Status Maps
- Official Soil Series Descriptions (OSD)
- Soil Series Extent Mapping Tool
- Soil Data Mart
- Geospatial Data Gateway
- eFOTG
- National Soil Characterization Data
- Soil Geochemistry Spatial Database
- Soil Quality
- Soil Geography
- Geospatial One Stop

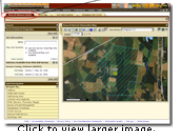
The simple yet powerful way to access and use soil data.

START WSS

Welcome to Web Soil Survey (WSS)

Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

Three Basic Steps

- 1 Define.**
Area of Interest (AOI) Use the **Area of Interest** tab to define your area of interest.

Click to view larger image.
- 2 View/Explore.**
Soil Map Click the **Soil Map** tab to view or print a soil map, or click the **Soil Data Explorer** tab to access soil data for your area and determine the suitability of the soils for a particular use. The items you want saved in a report can be added to your shopping cart.


I Want To...

- Start Web Soil Survey (WSS)
- Know the requirements for running Web Soil Survey
- Know whether Web Soil Survey works in my web browser
- Know the Web Soil Survey hours of operation
- Find what areas of the U.S. have soil data


Announcements/Events

- Web Soil Survey Release History

I Want Help With...

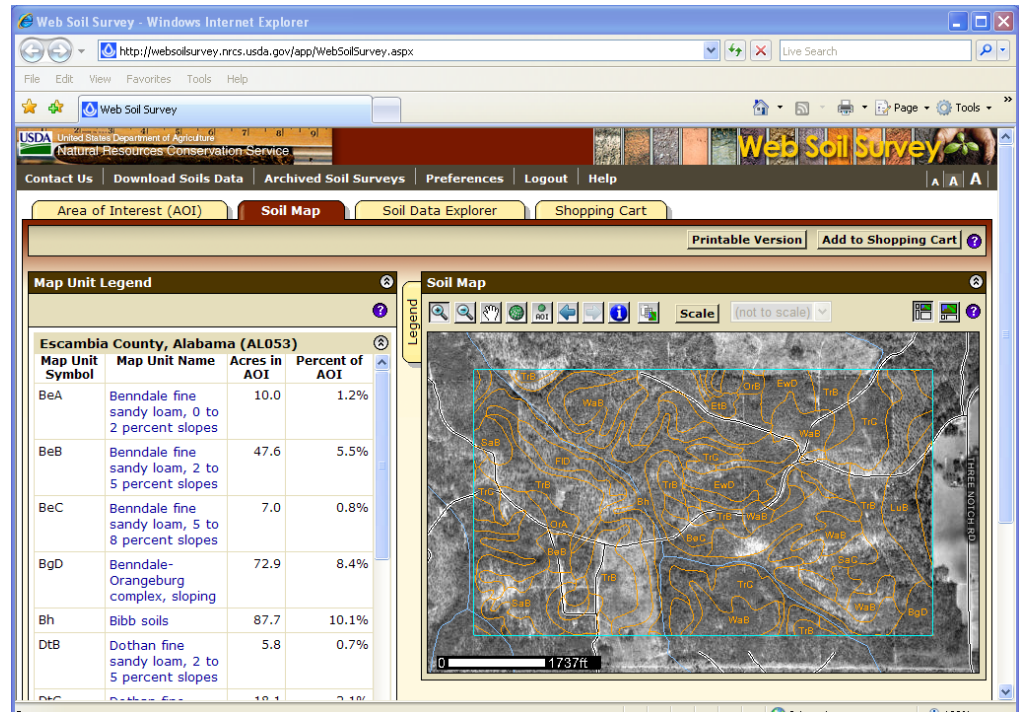
- How to use Web Soil Survey
- How to use Web Soil Survey Online Help
- Known Problems and Workarounds
- Frequently Asked Questions
- Citing Web Soil Survey as a source of soils data

Tips & Shortcuts WSS



Soil Maps and Tabular Data

- Available from NRCS
- Obtain online soil surveys
- Create soil maps for a selected area



Soil Information

- Soil productivity
- Texture
- Site preparation information
- Suitability for hand planting
- Common species
- Site index
- Drainage class
- Slope

Description — Mechanical Site Preparation (Surface)

The ratings in this interpretation indicate the suitability for use of surface-altering soil tillage equipment during site preparation in forested areas. The ratings are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

The ratings are both verbal and numerical. Rating class terms indicate the degree to which the soils are suited to this aspect of forestland management. The soils are described as "well suited," "poorly suited," or "unsuited" to this management activity. "Well suited" indicates that the soil has features that are favorable for the specified kind of site preparation and has no limitations. Good performance can be expected, and little or no maintenance is needed. "Poorly suited" indicates that the soil has one or more properties that are unfavorable for the specified kind of site preparation. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. "Unsuited" indicates that the expected performance of the soil is unacceptable for the specified kind of site preparation or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

Forest Productivity

Description — Forest Productivity (Tree Site Index)

The "site index" is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this attribute, only the representative value is used.

Rating Options — Forest Productivity (Tree Site Index): longleaf pine (USDA 1929 (580))

Units of Measure: feet

Tree: longleaf pine

Site Index Base: USDA 1929 (580)

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Vegetative Productivity

Crop Productivity Index

Forest Productivity (Cubic Feet per Acre per Year)

Forest Productivity (Tree Site Index)

[View Description](#)

[View Rating](#)

View Options

Map ☒

Table ☒

Description of Rating ☒

Rating Options ☒

☐ Detailed Description

Basic Options

Tree longleaf pine USDA

Advanced Options

Iowa Corn Suitability

Range Production (F

Range Production (M

Range Production (U

longleaf pine
American sycamore
cherrybark oak
eastern cottonwood
green ash
loblolly pine
longleaf pine
slash pine
southern red oak
sweetgum
water oak
white oak
yellow poplar

[View Rating](#)

Conservation Tree and Shrub Group

The screenshot shows the 'Web Soil Survey' application running in a Windows Internet Explorer browser. The address bar displays the URL: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. The toolbar shows various navigation and utility icons, including a search bar with 'Live Search'.

The main content area is divided into two panels. The left panel, titled 'Web Soil Survey', contains a list of categories and options:

- Building Site Development
- Construction Materials
- Disaster Recovery Planning
- Land Classifications
 - Conservation Tree and Shrub Group**
 - [View Description](#)
 - [View Rating](#)
- View Options
 - Map ☒
 - Table ☒
 - Description of Rating ☒
 - Rating Options ☒
 - ☐ Detailed Description
- Advanced Options
 - [View Description](#)
 - [View Rating](#)
- Ecological Site ID
- Ecological Site Name
- Farmland Classification
- Forage Suitability Group ID (Component Table)
- Hydric Rating by Map Unit
- Irrigated Capability Class
- Irrigated Capability Subclass
- Nonirrigated Capability Class

The right panel, titled 'Description — Conservation Tree and Shrub Group', contains the following text:

Each tree and shrub species has certain climatic and physiographic limits. Within these parameters, trees and shrubs may be well suited or poorly suited to a given environment because of climate or site or soil characteristics. On the basis of the performance of individual species to specific conditions of soil, climate, physiography, and management, Conservation Tree and Shrub Groups (CTSGs) have been developed. Individual soils have been grouped with similar soils into one of the 10 main CTSGs. Most of these main groups are further divided into subgroups.

This interpretation provides guidance in selecting the species best suited to each of the groups of soils within each vegetative zone. It also can be used for predicting survival, height, growth, species attributes, and effectiveness and for selecting species for windbreaks, riparian plantings, recreation and wildlife plantings, and ornamental or environmental plantings.

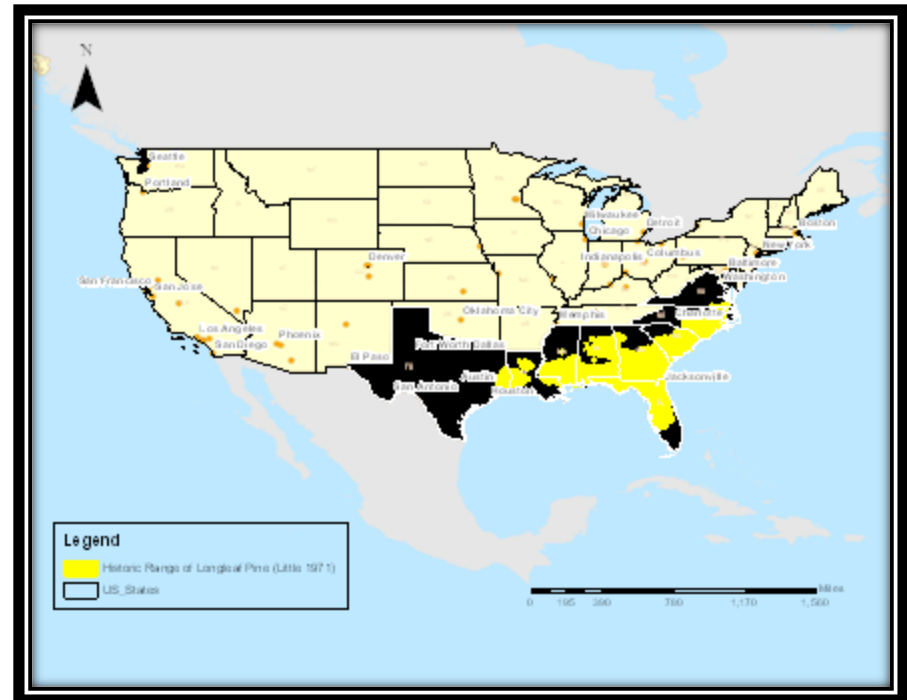
Tree and shrub species associated with each CTSG are broken down by vegetative zones (rainfall zones). These lists are available in the local office of the USDA, Natural Resources Conservation Service, or on the Web in the electronic Field Office Technical Guide. Because vegetative zones are rather large, climatic differences within a zone should be considered when species are recommended for planting. For example, some species adapted to the eastern end of a zone may be inadequately adapted to the western end. Care must be taken to ensure that conditions on individual sites are considered when species suitability and performance are determined. A case-by-case decision may be necessary to determine which CTSG is most appropriate when an individual site has characteristics that differ from those of the CTSG in which it occurs. These differences occur because of inclusions of other soils, site modifications (such as leveling and drainage manipulation), soil pH (calcareous sites), irrigation, soil amendments, or other factors.

Potential for Seedling Mortality Rating

Tables — Potential for Seedling Mortality — Summary By Map Unit						
Summary by Map Unit — Lee County, Alabama						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
21	Kinston silt loam, 0 to 1 percent slopes	High	Kinston (85%)	Wetness (1.00)	0.1	0.1%
			Mantachie (5%)	Wetness (1.00)		
24	Marvyn loamy sand, 1 to 6 percent slopes	Low	Marvyn (75%)		62.7	82.7%
			Uchee (5%)			
			Marlboro (5%)			
			Cowarts (4%)			
25	Marvyn loamy sand, 6 to 10 percent slopes	Low	Marvyn (80%)		11.6	15.3%
			Uchee (5%)			
			Cowarts (5%)			
W	Water	Not rated	Water (95%)		1.4	1.8%
Totals for Area of Interest					75.8	100.0%

Other types of spatial information

- Species natural ranges
- Seed collection zones
- Planting zones
- Drought ratings
- Adverse weather events
- Pest and pathogen outbreaks.



Longleaf Pine Seed Collection and Planting Zones

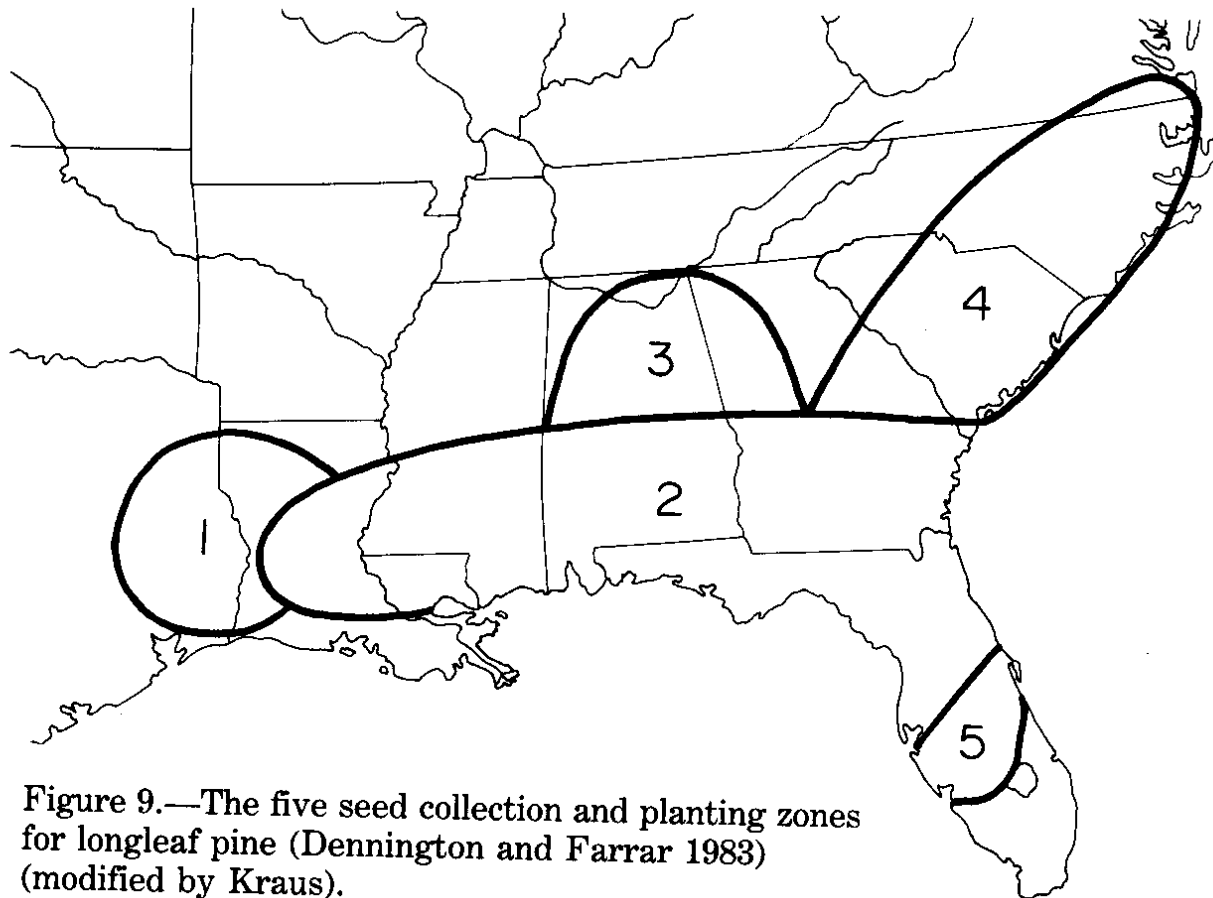


Figure 9.—The five seed collection and planting zones for longleaf pine (Dennington and Farrar 1983) (modified by Kraus).

Loblolly Pine Planting Zones

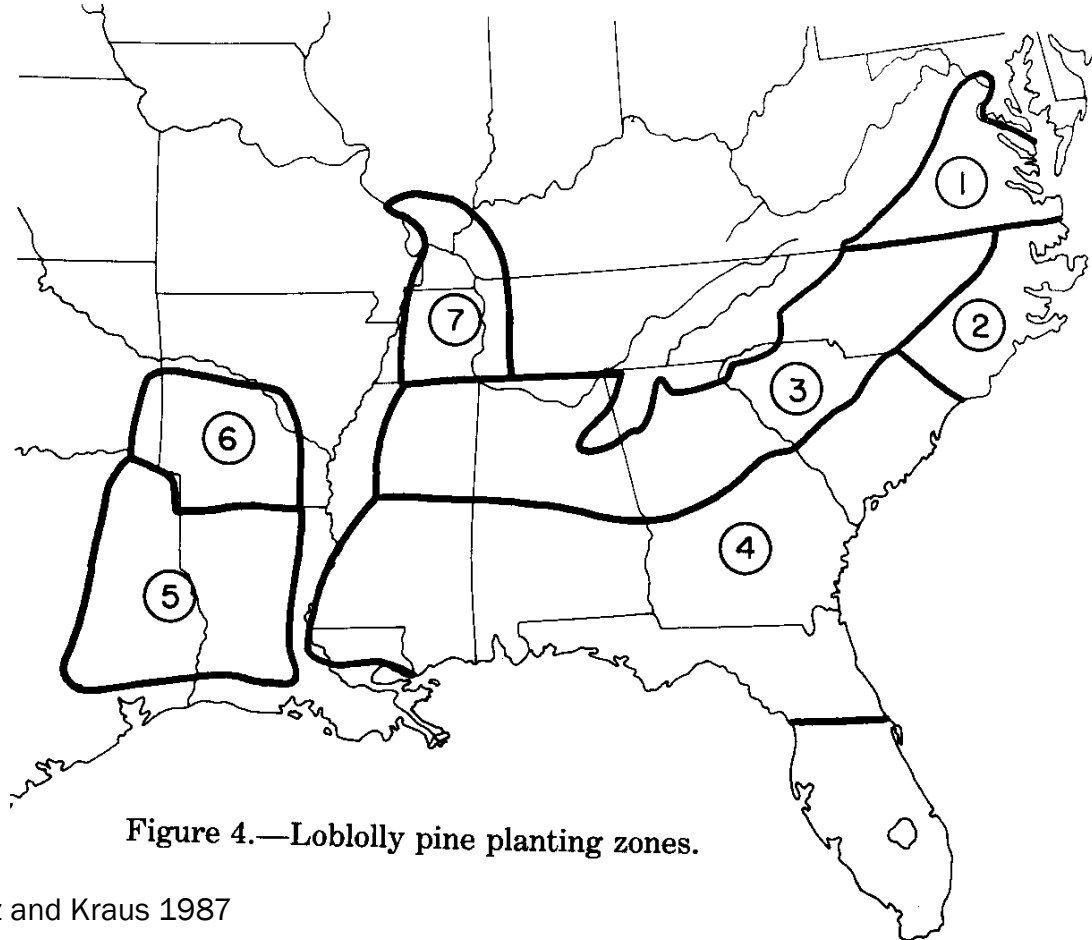
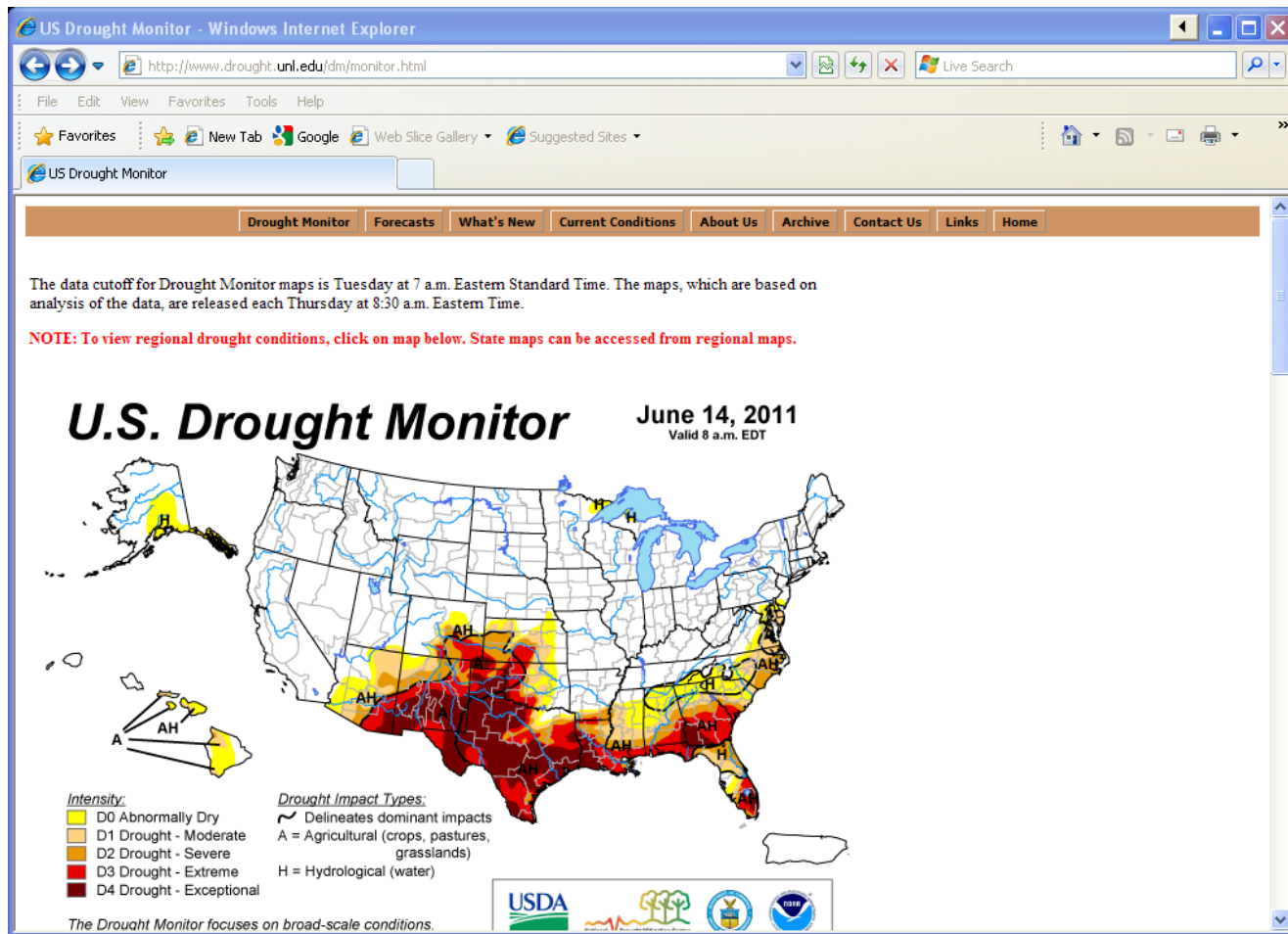


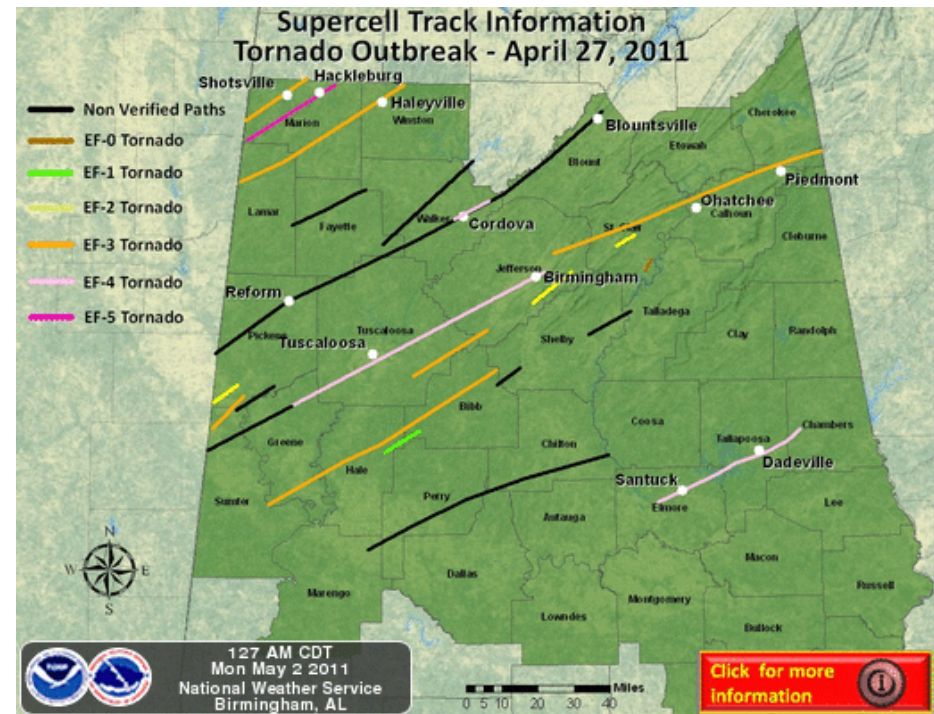
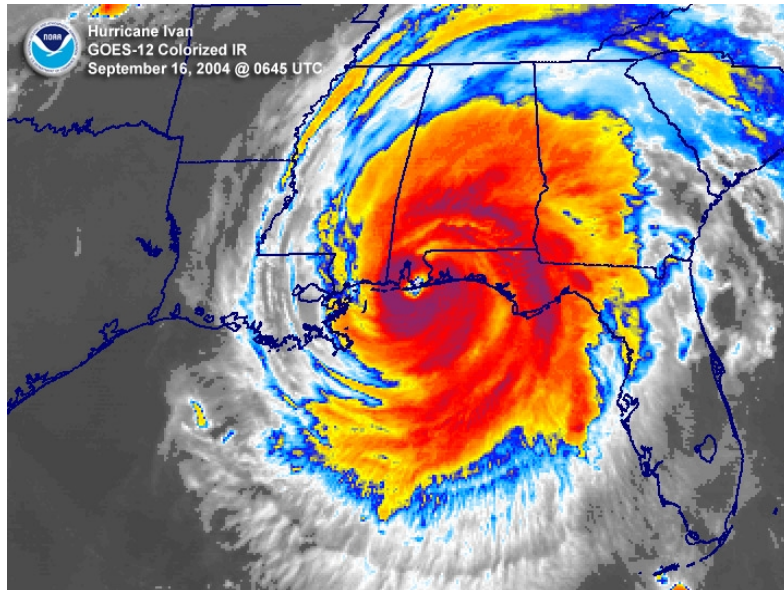
Figure 4.—Loblolly pine planting zones.

Lantz and Kraus 1987

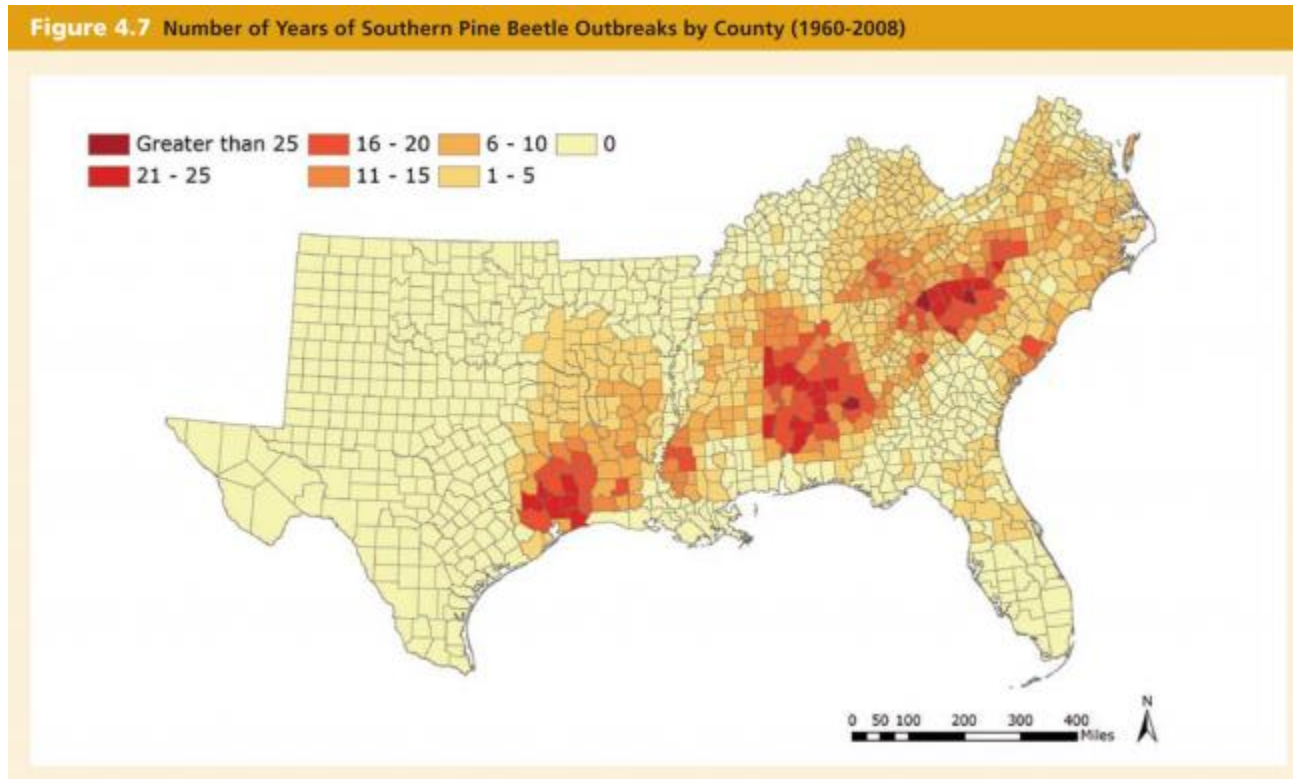
US Drought Monitor



Adverse Weather Conditions



South Pine Beetle Outbreak by County and Year



Source: Southern pine beetle outbreaks by county (USDA Forest Service 2009), administrative boundaries (ESRI Data and Maps 9.3.1, ESRI 2008).

<http://www.seesouthernforests.org/discover-southern-forests/drivers-change/drivers-change>

Complex Analyses and Databases

- ✂ Online resources and views can provide a great deal of information and useful products.
- ✂ Use a combination of online resources and data from your site to customize your GIS.

Few things are harder to put up with than the
annoyance of a good example



-Mark Twain

Examples of what you can do

☞ Planning - Utilize available data to make informed management decisions

- Soils data
- Topographic maps
- Aerial photos
- Elevation information

☞ Tracking - On site

- Field nursery locations
- Seed orchards
- Seed sources
- Herbicide/pesticide treatments
- Future stands



☞ Public Relations!

Planning

Field nurseries

- Past
- Present
- Future



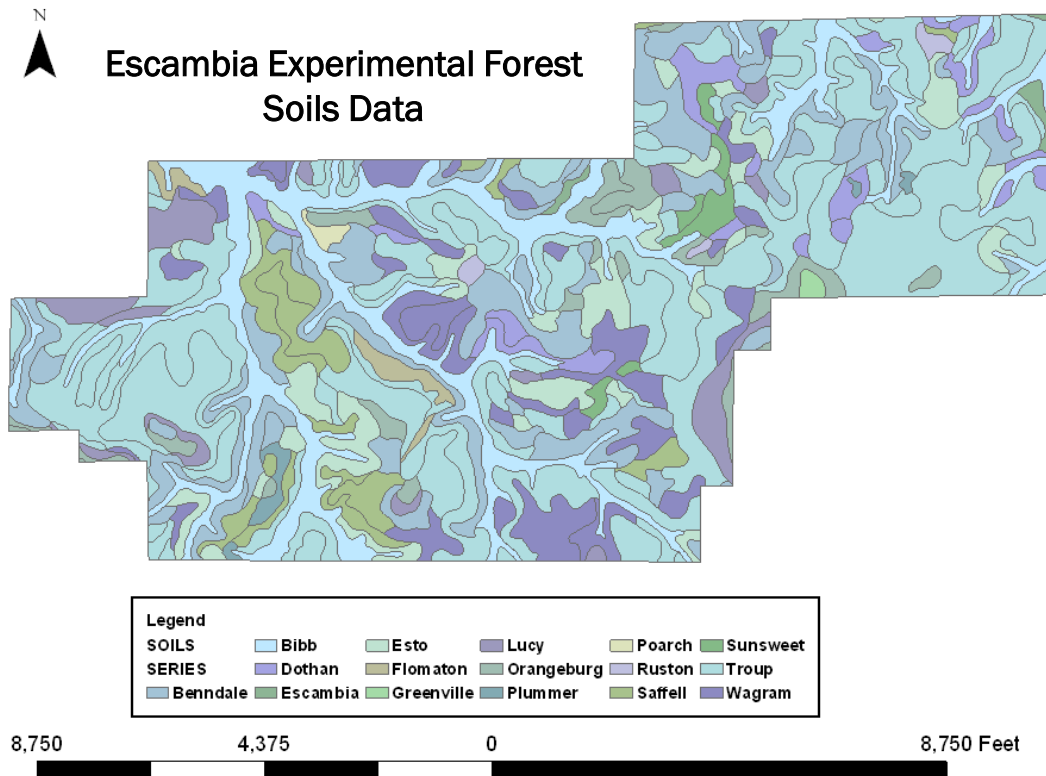
Planning

∞ Assisting landowners

- Planting locations
- Site preparation tips
- Planting methods



Planning



Attributes of Soils Layer

compname	plantscina	plantcomna	siteindex1
Fuquay	Pinus elliotii	slash pine	90
Troup	Pinus palustris	longleaf pine	70
Springhill	Liquidambar styraciflua	sweetgum	90
Troup	Pinus palustris	longleaf pine	70
Cowarts	Pinus palustris	longleaf pine	75
Cowarts	Pinus elliotii	slash pine	90
Troup	Pinus palustris	longleaf pine	70
Springhill	Liquidambar styraciflua	sweetgum	90
Troup	Pinus palustris	longleaf pine	70
Bonifay	Pinus palustris	longleaf pine	75
Troup	Pinus palustris	longleaf pine	70
Lucy	Pinus palustris	longleaf pine	70
Compass	Pinus elliotii	slash pine	90
Troup	Pinus palustris	longleaf pine	70
Springhill	Liquidambar styraciflua	sweetgum	90
Springhill	Liquidambar styraciflua	sweetgum	90
Nankin	Pinus palustris	longleaf pine	70
Troup	Pinus palustris	longleaf pine	70
Nankin	Pinus palustris	longleaf pine	70
Cowarts	Pinus palustris	longleaf pine	75
Cowarts	Pinus elliotii	slash pine	90
Orangeburg	Pinus elliotii	slash pine	90
Cowarts	Pinus elliotii	slash pine	90
Troup	Pinus palustris	longleaf pine	70

Record: 0 Show: All Selected Records (

Tracking

☞ Seedling information

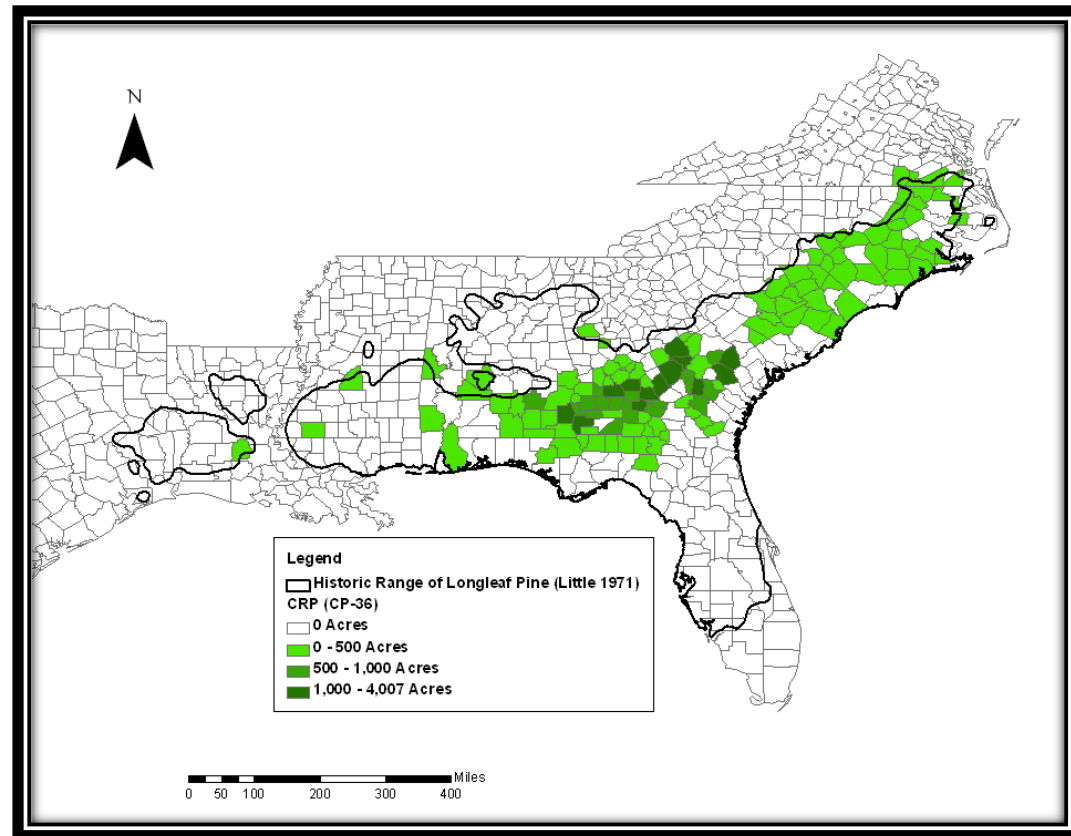
- Seedling production by site and species
- Seed sources
- Chemical applications
- Seedling sales and planting locations
- Successes and failures

☞ Meetings and outreach activities as vendors

- Professional meetings
- Workshops
- Landowner field days

Tracking - Cost-Share Programs

- Eligible counties by program
- Combine with tracking seedling information
- Used for public relations and distribution of outreach material

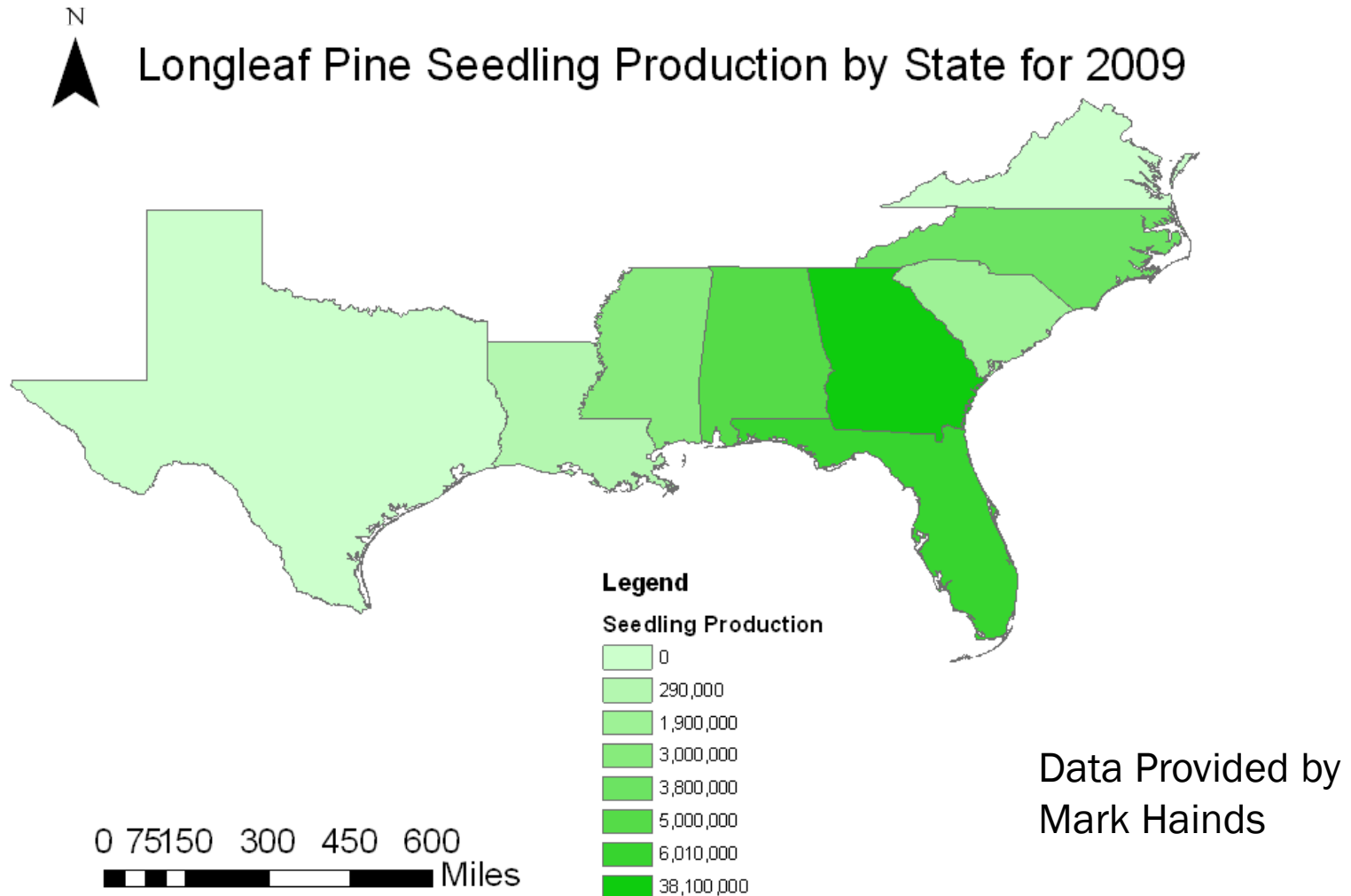


Tracking - Seedlings to the Stand

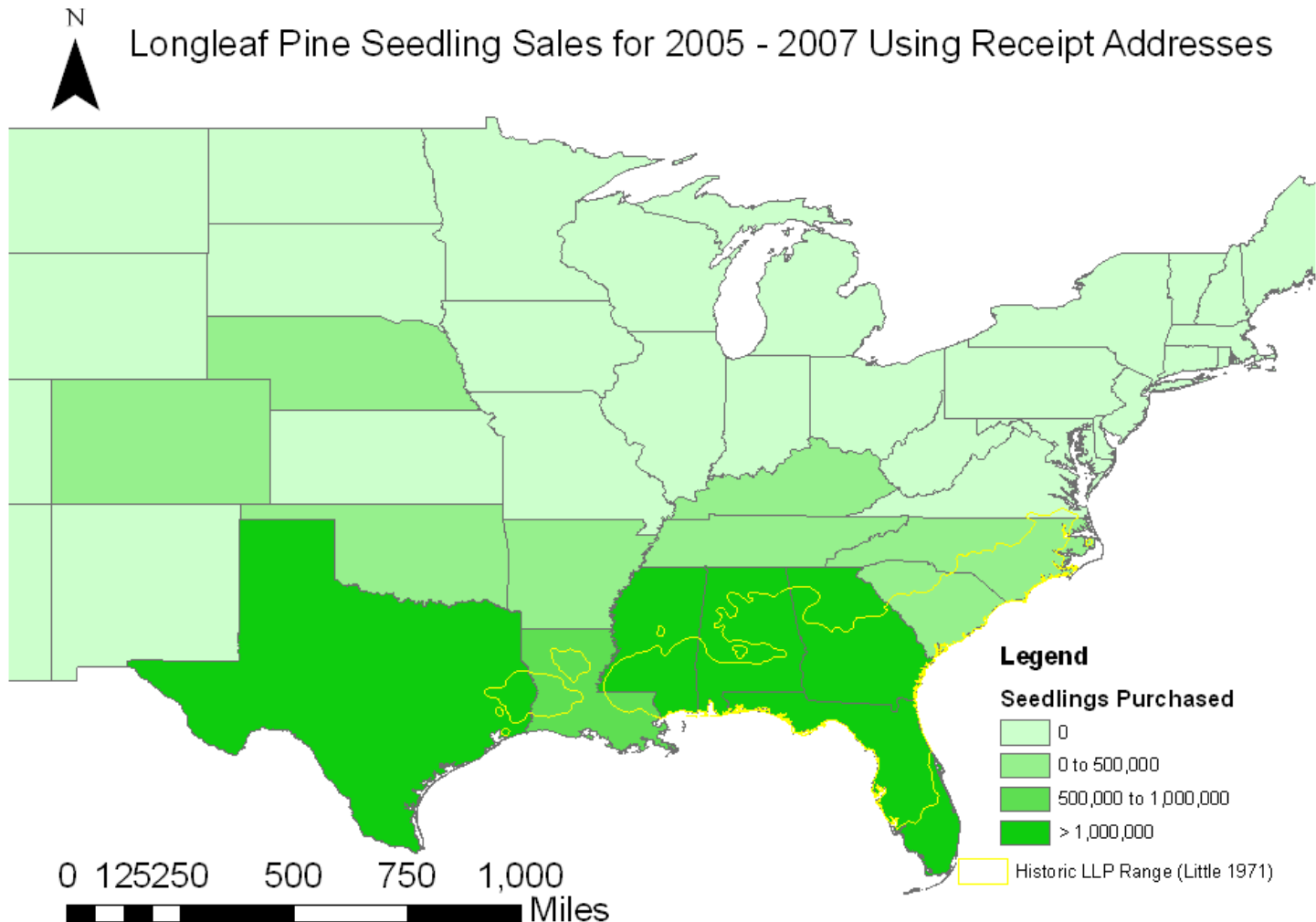
- Track from seedling production
- Track seedling sales
- Contact landowners through the nursery



Tracking - Seedling Production by State



Tracking - Seedlings Purchases



Tracking - Longleaf Pine GIS Database

- ✂ Previous information came from W.G.Boyette's Survey of Longleaf Pine Restoration Efforts 1996
- ✂ The current effort was initiated with the Longleaf Pine Stand Dynamics Laboratory and the Longleaf Alliance in 2007. Is gathering information about:
 - Location and size of planting
 - Seed source
 - Planting densities
 - Seedling type
 - Stand condition
 - Site preparation methods
 - Burn history
 - Additional comments
 - Success and failures – site prep, planting methods, time of year, etc.

Tracking - Longleaf Pine GIS Database

- Working with conservation professionals and landowners from all types of ownership
- As part of this effort
 - Contact those doing the planting, especially nonindustrial private landowners,
 - Attempting to track restoration from the seedlings to the stands
- Nursery managers have been and continue to be an integral part of this effort.

Planting and Existing Stand Forms

Over 3,500 acres of collected data in one planting season

The Longleaf Alliance Mapping Longleaf Pine Project – Planting Information

Please fill out as much information as possible.

Location of planting:
 State: _____
 County: _____
 Legal Description (example: Section Township Range) or GPS Location:

Acres planted: _____

Number of seedlings: _____

Row Spacing: _____

Site Preparation: _____

Bare Root or Container (**circle**) - if planting both, please specify acreage and spacing for each

Cutover or old field (**circle**) - if planting both, please specify acreage and spacing for each

Cost Share Program: Please list if applicable - _____

Landowner Type: Private Landowner Industry NGO Agency Consultant Forester (**circle**)
 If not a private landowner please specify organization: _____

Contact Information
 Name: _____
 Phone: _____
 Email: _____
 Address: _____

For more information or questions contact:

John Gilbert
 School of Forestry and Wildlife Sciences
 602 Duncan Drive
 Auburn University, AL 36849-5418
 gilbejo@auburn.edu
 334-329-0236 Lab
 334-844-1084 Fax

The Longleaf Alliance Mapping Longleaf Pine Project – Existing Stand Information

Please fill out as much information as possible.

Location of Stand(s):
 State: _____
 County: _____
 Legal Description (example: Section Township Range) or GPS Location:

Acres: _____

Planted or Natural: _____

If Planted:
 Bare Root or Container (**circle**) - if planting both, please specify acreage and spacing for each

Cutover or old field (**circle**) - if planting both, please specify acreage and spacing for each

Density (trees per acre or basal area per acre): _____

Comments (any additional information like site preparation techniques, burn history, etc.):

Cost Share Program: Please list if applicable - _____

Landowner Type: Private Landowner Industry NGO Agency Consultant Forester (**circle**)
 If not a private landowner please specify organization: _____

Contact Information
 Name: _____
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Tracking - Longleaf Pine GIS Database

- ☞ Ongoing effort
- ☞ Over 1.5 million acres of stand data
- ☞ Can be used by nursery managers
- ☞ Can be expanded to other species and topics of interest

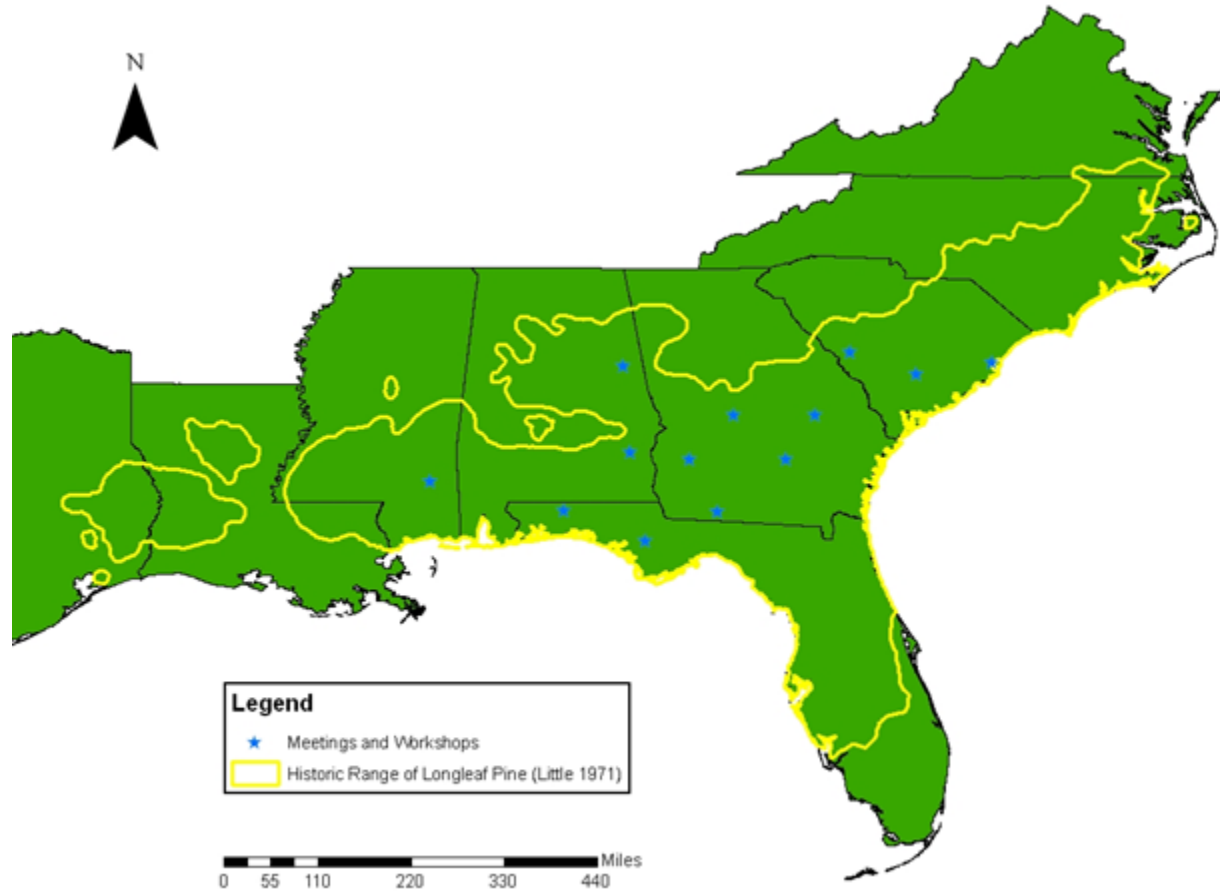


Public Relations

- 🌀 Reports
- 🌀 Maps
- 🌀 Online sharing
- 🌀 Advertising
- 🌀 Add to the current state of knowledge



Public Relations



Be the change you want to see in the world



- Mahatma Gandhi

Building Your Own GIS Database

- ☞ Take small steps from the data you currently collect
- ☞ Adding the spatial component or geocoding existing data
- ☞ Provides more information and the ability to make better decisions
- ☞ You can add to the current state of knowledge and help nursery production and success planting into the future

For More Information about GIS

Numerous online options

Often free applications

Demos and free trials

Take a continuing education course

Online tutorials

Online classes

Short courses

Sources of (FREE!) resources

☞ Google Earth

- <http://www.google.com/earth/index.html>

☞ TatukGIS Viewer

- <http://www.tatukgis.com/getdoc/3e0de4ce-5b19-4a9a-ac30-e686bc5ee7f3/Viewer-%28Free%29.aspx>

☞ FGIS

- <http://www.landmarkspatialolutions.com/support/mappingsoftware.htm>

☞ Geospatial Data Gateway

- <http://datagateway.nrcs.usda.gov/>

☞ Web Soil Survey

- <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

Example GIS Software Packages

☞ ArcGIS

- <http://www.esri.com/software/arcgis/arcview/index.html>

☞ Tatuk

- <http://www.tatukgis.com/>

☞ Quantum GIS (Free!)

- <http://www.qgis.org/>

Future Courses (TBA)

- ✂ Online Spatial Resources for Private Forest Landowners and Natural Resource Professionals (brochure and short course)
- ✂ Advanced Online Spatial Resources for Private Forest Landowners and Natural Resource Professionals

Future Courses (TBA) continued

- ∞ Advanced ArcGIS Applications with Vector Data for Forestry and Other Natural Resource Applications
- ∞ Introduction to GPS for Forestry and Other Natural Resources Applications
- ∞ Advanced GPS for Forestry and Other Natural Resource Applications

For More Information

- Contact:
 - Dr. Rebecca Barlow at becky.barlow@auburn.edu (334)844-1019
 - John Gilbert gilbejo@auburn.edu 334-329-0236
 - Dr. John Kush kushjoh@auburn.edu 334-844-1065

Good decisions for a better tomorrow

