

Breakthroughs for the Next Generation
of *Forestry GIS*

Peter Eredics, *Forestry Manager*
Esri

Agenda

- The Role of GIS in Forestry
- The Rapid Growth of GIS Technologies
- Returning our Focus to Maps
- Supporting the Global Forestry Community
- Forestry GIS Trends
- Looking Ahead



The Role of GIS in Forestry



Common Forestry Business Functions

Supporting the Forestry Enterprise

- Inventory, Management, Planning
 - Mapping / Charting / Survey Data Collection
 - Land Management / Permitting
 - Facility / Asset Management / Safety Security
 - Logistics (Field Crews and Products)
 - Regulation, Policy, Compliance
 - Research
- ... and more

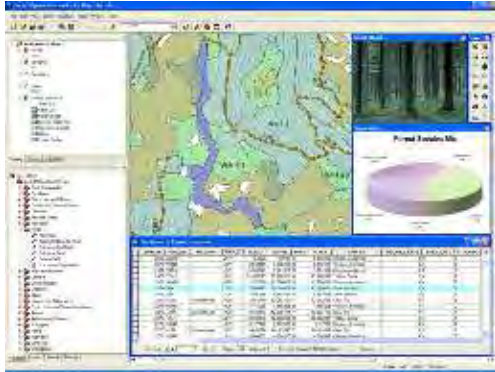
How GIS Supports Forestry Business Functions

Creating Maps for Planning and Regulatory Compliance

- Resources Inventory
- Strategic Forest Management
- Tactical Forest Management
- Operational Forest Management
- Land Management

Resources Inventory

Timber Inventory



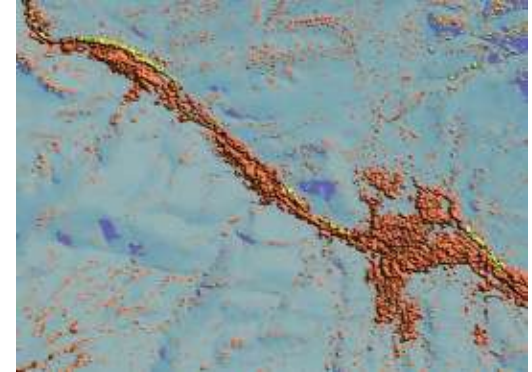
Alaska, USA

Land Cover / Land Use



Korea

Tree Height / Crown Closure



Germany

Streams



Ontario, Canada

Vegetation



Indonesia

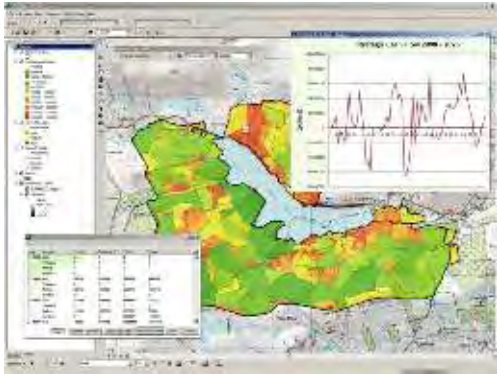
Wetlands



Minnesota, USA

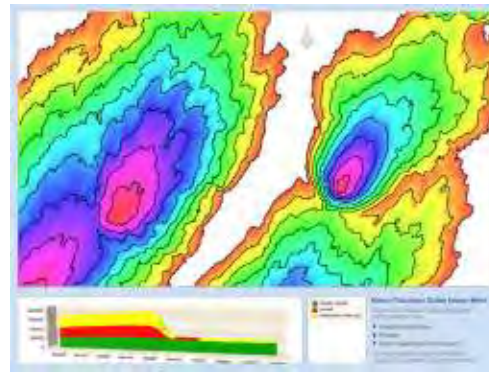
Strategic Forest Management

Cash Flow Analysis



United Kingdom

Carbon Balance



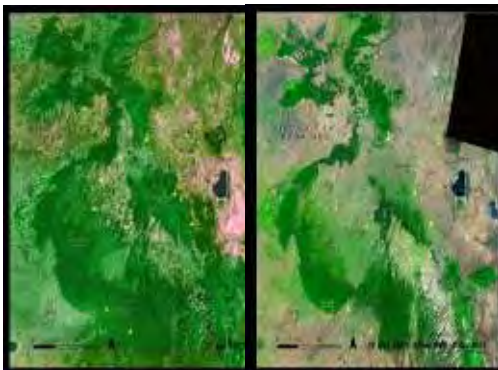
New Brunswick, Canada

Road Density



Borneo

Change Detection



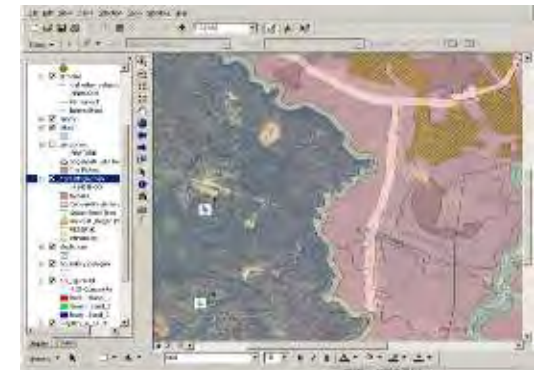
Kenya

Resource Assessment



Nevada, USA

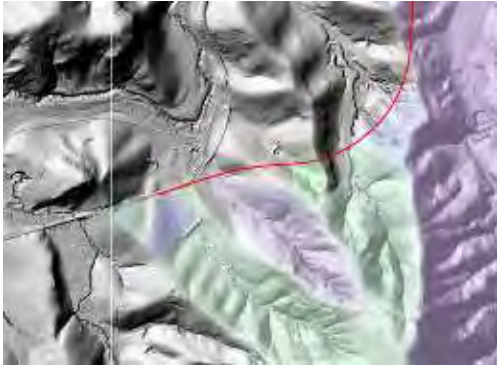
Multi-Year Planning



Alaska, USA

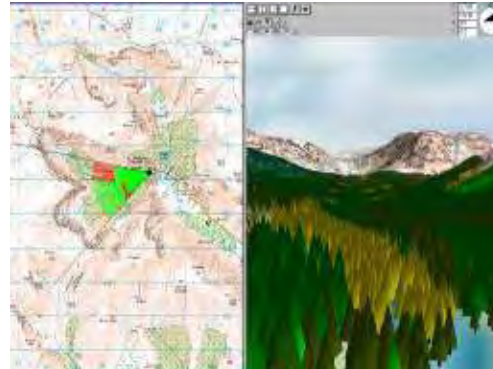
Tactical Forest Management

Road Design



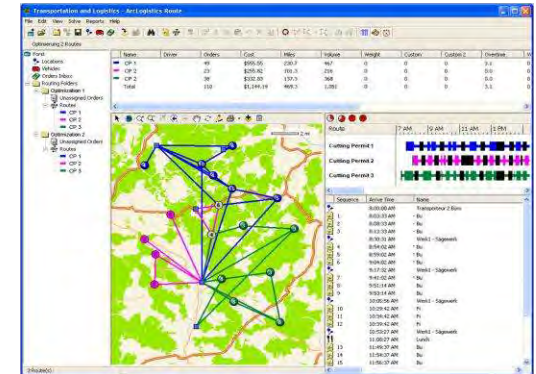
France

Stakeholder Consultation



United Kingdom

Logistics and Scheduling



Germany

Management Optimization



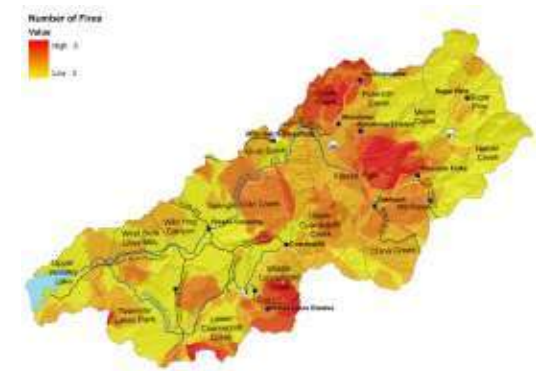
Ontario, Canada

Route Planning



Colorado, USA

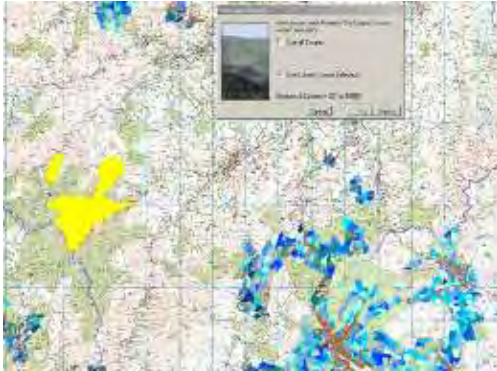
Wildfire Planning



California, USA

Operational Forest Management

Harvesting Plan



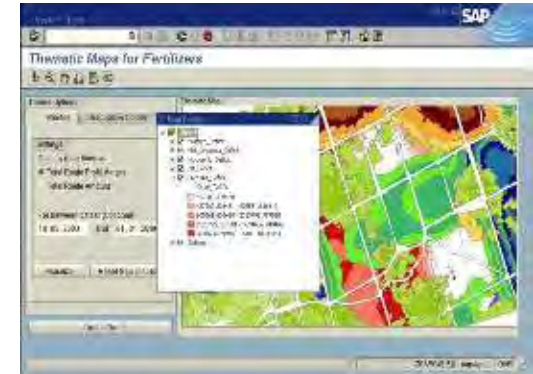
United Kingdom

Timber Stack Management



Oregon, USA

Treatment Scheduling



Brazil

Field Observations



California, USA

Workforce Scheduling



Virginia, USA

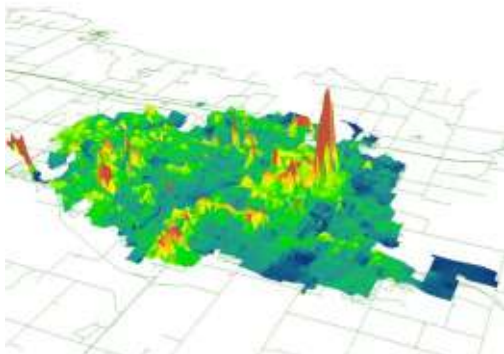
Wildfire Assessment



Oregon, USA

Land Management

Property Valuation



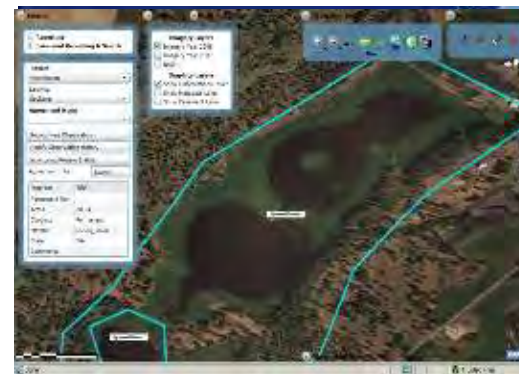
Kansas, USA

Legal Survey Management



Oregon, USA

Easements



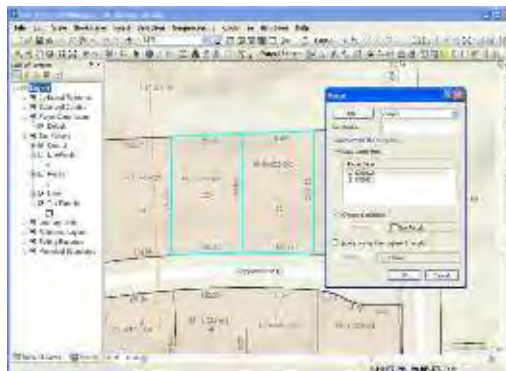
Washington, USA

Property Management



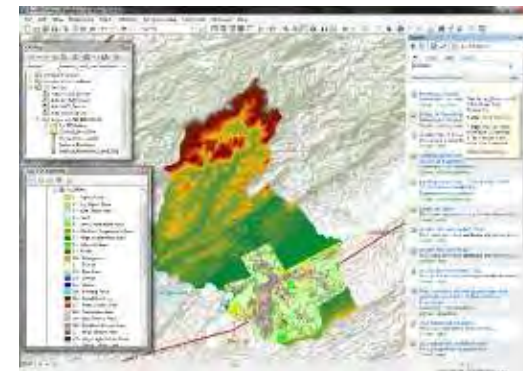
Maryland, USA

Tax Parcel Management



Michigan, USA

Property Research



Brazil

There's Still Many Areas Left Unexplored

... and Many Geographic Problems to Solve

- Highest and Better Use
- Shifts in Urbanization
- Sustainable Development
- Understanding the Role of Biodiversity
- Biomass / Biofuels
- Impact of Fire Suppression
- Ecosystem Conservation and Restoration
- Ecosystem Services
- Conversion of Natural Forests

... and more

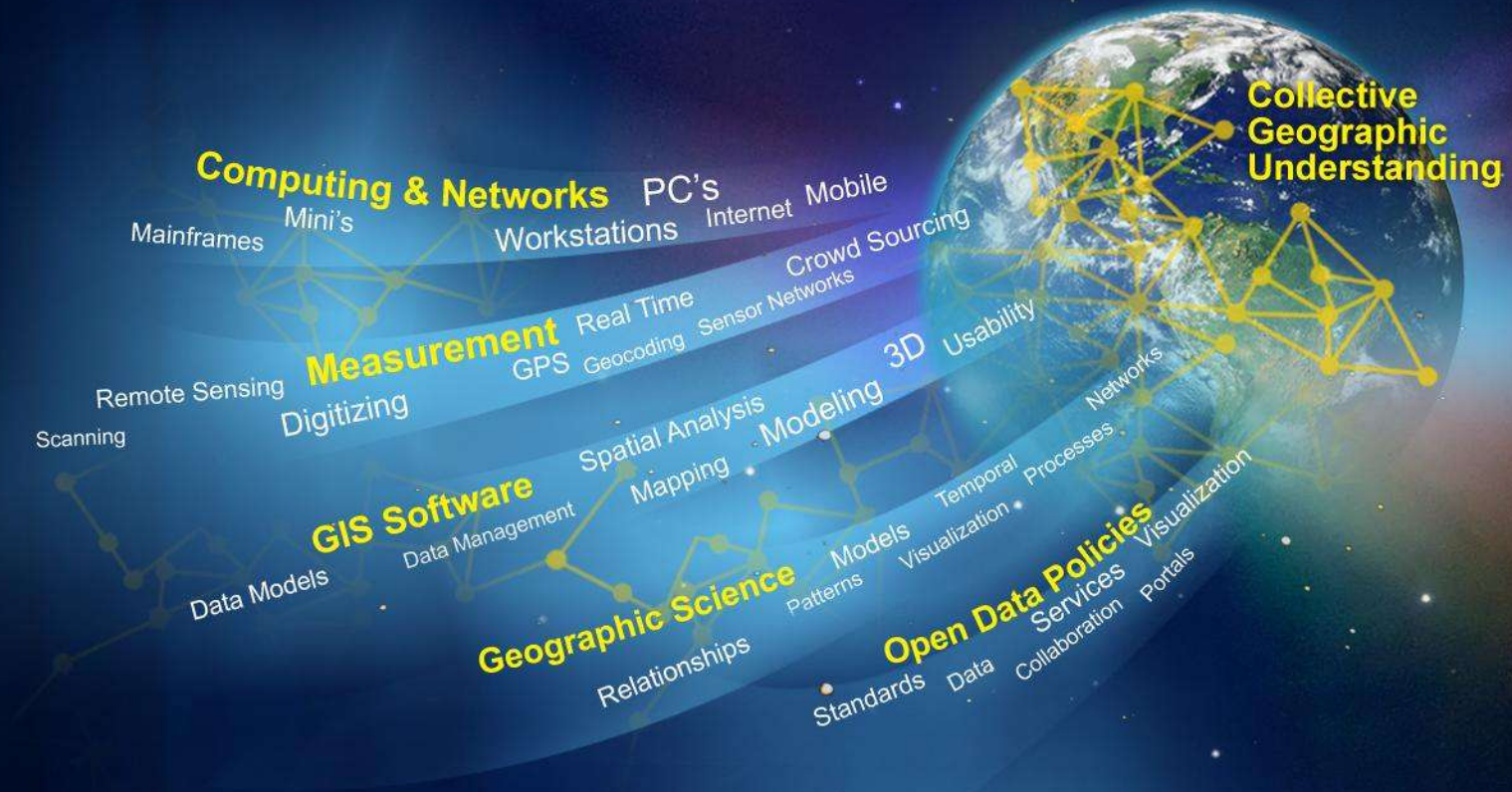
GIS Trends

The Rapid Growth of GIS Technologies



Many Forces are Converging

Enabling a Pervasive Geospatial Platform

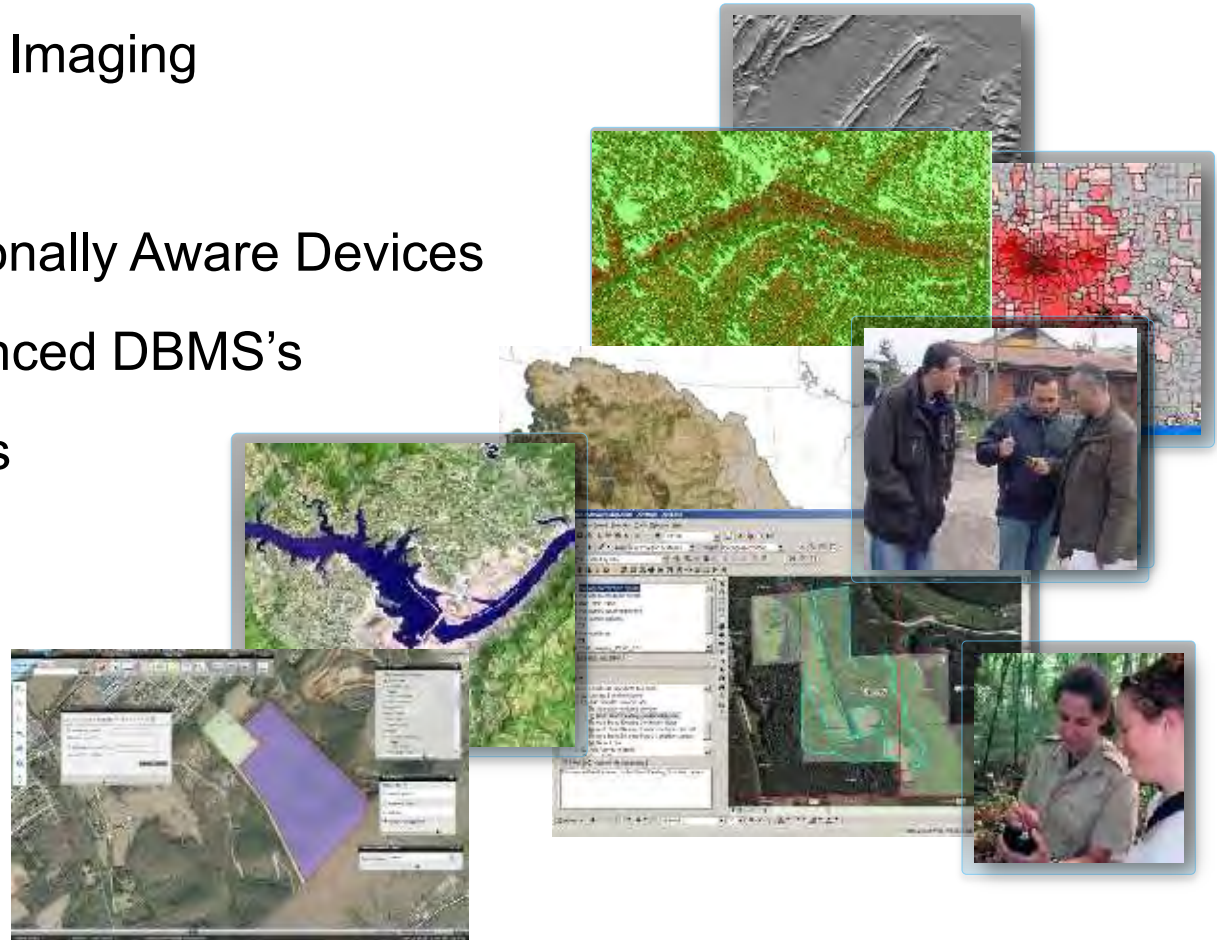


• ... Opening Our World to Everyone

Geospatial Data is Growing Rapidly

Supporting Many New Applications

- Satellite & Aerial Imaging
- LIDAR
- GPS and Locationally Aware Devices
- Spatially Referenced DBMS's
- Sensor Networks
- Crowd Sourcing



... Providing a Foundation for GIS

Technology is Advancing Rapidly

Making GIS Easier

Enhancing

- Mapping
- Spatial Analysis
- Data Management
- Image Integration
- Mobile Use
- Interoperability
- Enterprise Integration
- Web Services



... More Powerful and Integrated

ArcGIS Implementation Follows Common Patterns

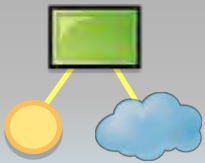
Easy, Accessible and Collaborative

New

Desktop

Individuals

- Ad Hoc Projects
- Analysis/Modeling
- Mapping



Server

Workgroups

- Shared Database
- Fixed Applications
- Transactions



Federated

Organizations

- Shared Services
- Integration
- Collaboration



Cloud / Web GIS



Device / Pervasive



... Internet Computer Resources – Available on Demand

GIS Web is A New Pattern

Supporting Enterprise and Pervasive Computing

Enabled By

- Computing and Networking
- Cloud Architecture
- Web Services
- Open Data Sharing Policies

... and GIS Software

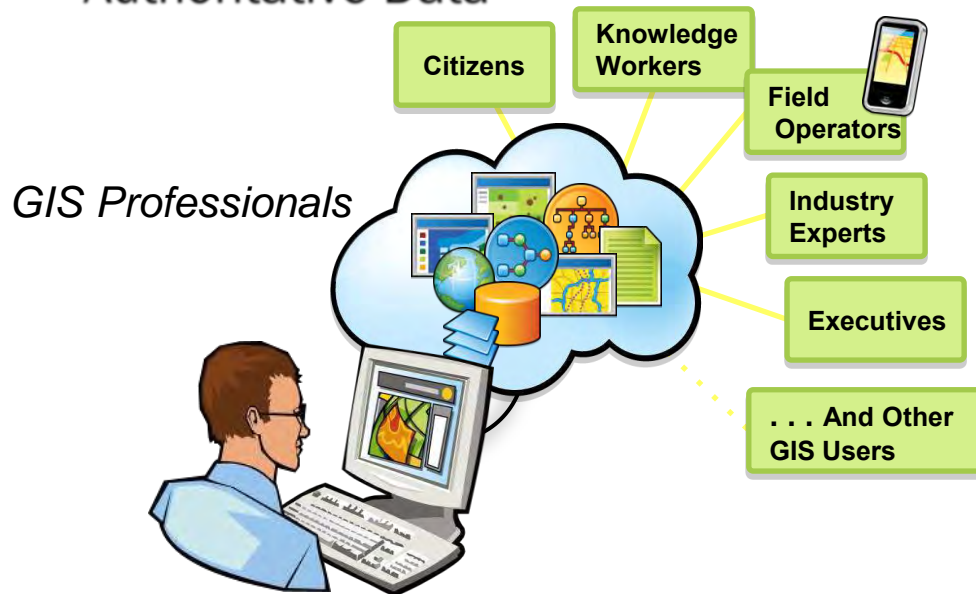


... *Connecting the GIS Professional with the Broader Web Community*

GIS Professionals Are Service Geographic Knowledge

Creating New Kinds of Applications

- Rich Applications
- High Quality Maps
- Analysis & Models
- Authoritative Data



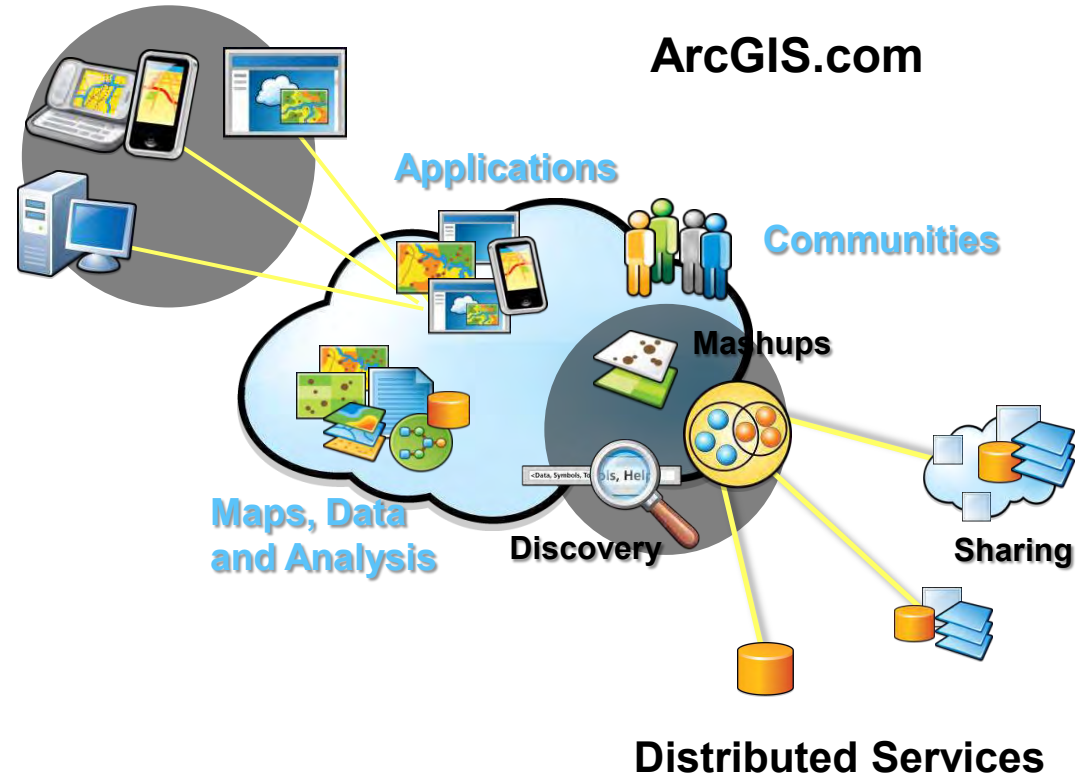
. . . Opening GIS to Everyone

Online Geospatial Platform is Emerging

Connecting All GIS Users

Any Client

- Maps and Apps
- Community Basemaps
- Open APIs
- Rich Applications
- Communities



... Opening GIS to Everyone – for Free!



Search Results

Show

72 results for 'forestry'

All Results

Maps

Applications

Tools

Related Searches

Find items published by Esri related to "forestry"

Find groups related to "forestry"

Relevance Title Owner Rating Views Date



Open Details

Urban Forestry Tree Canopy - Start- LAS Cruces

Urban Forestry Tree Canopy

Web Map by civicarcourt (last modified: September 30, 2010)

★☆☆☆☆ (0 ratings, 0 comments)



Open Details

rnfrc00_2

Layer Package by jlar (last modified: June 29, 2010)

★☆☆☆☆ (0 ratings, 0 comments, 0 downloads)



Open Details

Communities At Risk Of WildFire

Map Service by ivanhook (last modified: June 16, 2010)

★☆☆☆☆ (0 ratings, 0 comments)

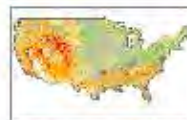


Open Details

USA Forest Fragmentation Map

Web Map by blackpoll (last modified: July 26, 2010)

★☆☆☆☆ (0 ratings, 0 comments)



Open Details

RFRS_Wildland Fire Potential

Wildland Fire Potential was developed to delineate and prioritize the wildland fire potential for the nation. The data is based on three primary sub-products: fuel potential, fire weather potential, fire occurrence potential.

Map Service by Federal_User_Community (last modified: July 8, 2010)

★☆☆☆☆ (0 ratings, 0 comments)



Open Details

Provincial Forest Tenures/Forest Management Areas (draft) - British Columbia, Canada (Data Basin Dataset)

A nationally compiled dataset containing provincial Forest Tenures/Forest Management Areas and other administrative areas where rights to establish, grow, harvest or remove timber from a particular area of land has been granted. Each province...

Layer Package by esri (last modified: September 8, 2010)

More Information

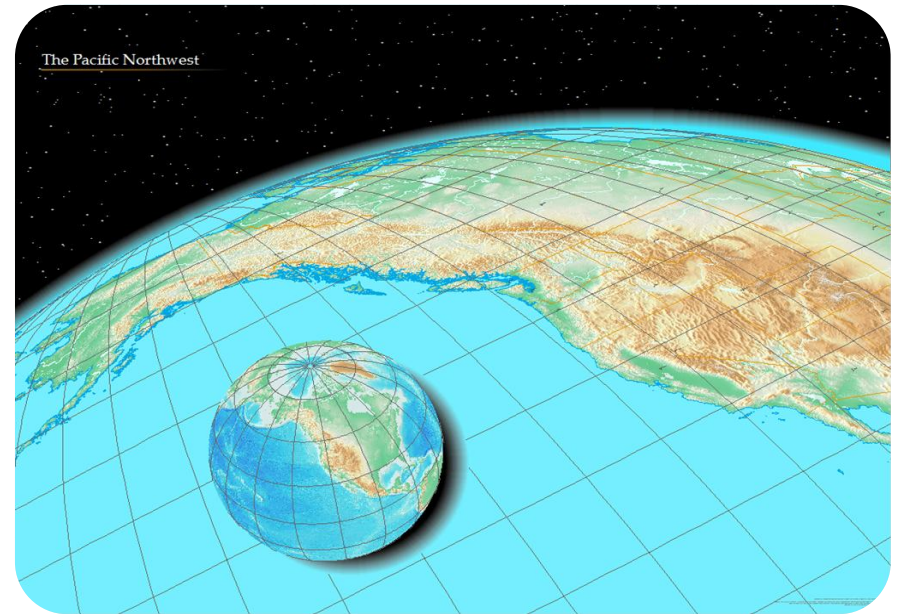
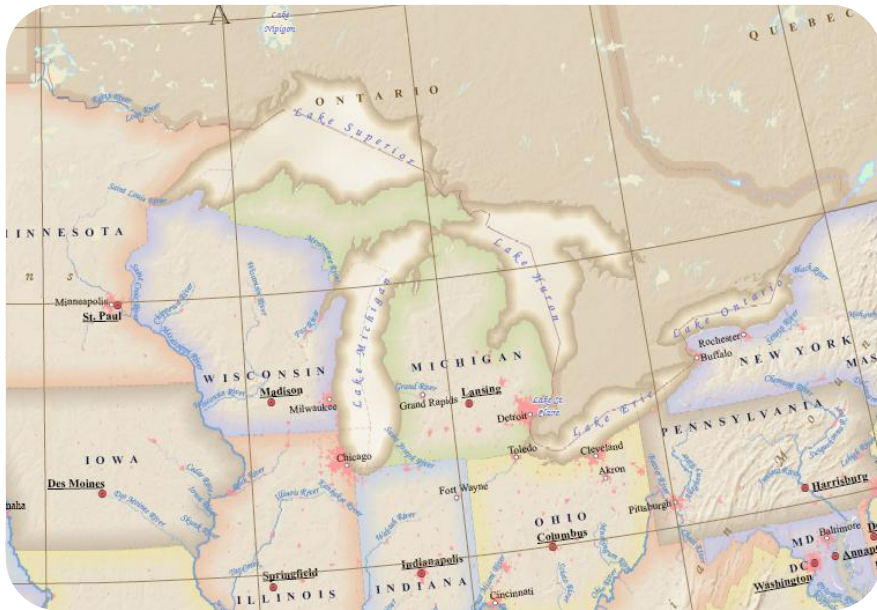
[What is a map?](#)[Learn to make a map](#)[Create your own map and save it online.](#)

Returning Our Focus to Maps



Esri is Focusing on Maps

ArcGIS 10 Makes it Easier for You to Create Better Maps



Rethinking our Approach to Cartography

...and Returning to Creating Better Maps

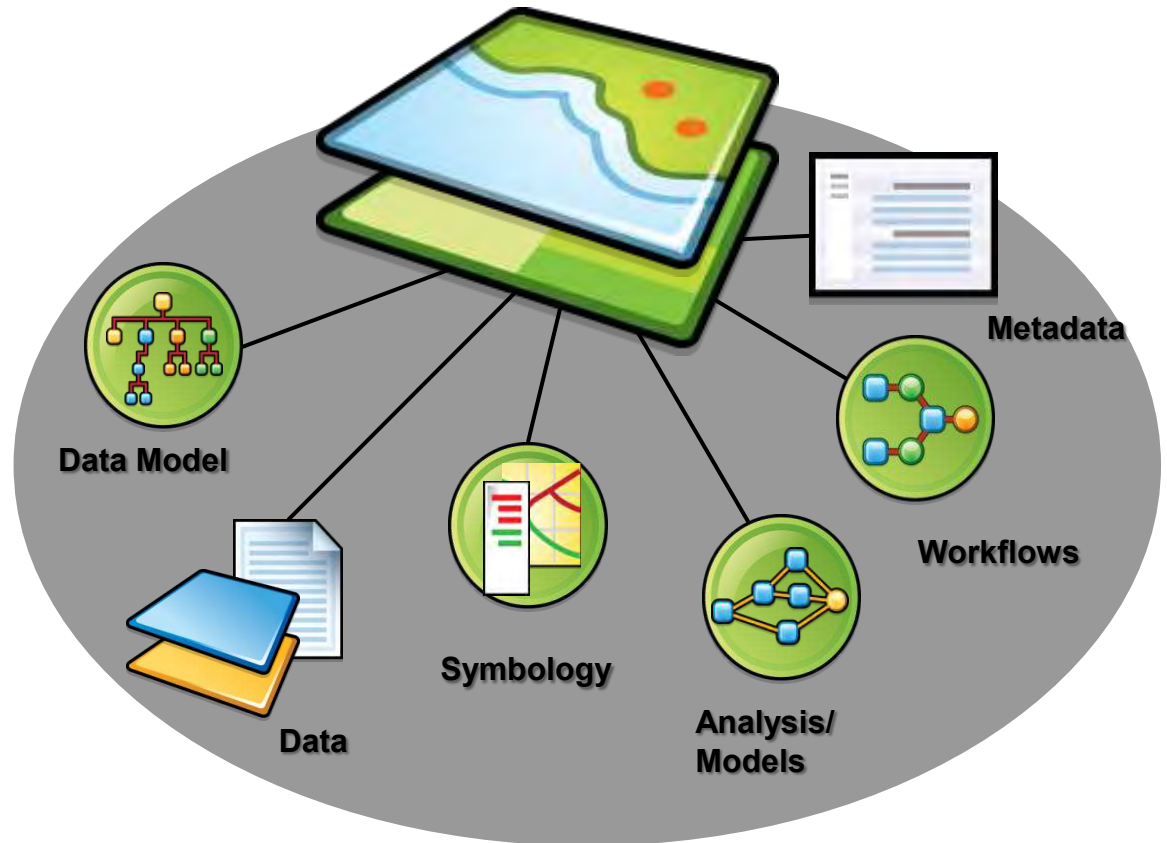
- Maps are the organizing principle for everything we do
- People understand maps
- People need maps
- Maps are what excites us as GIS professionals

The Map is the Focus

Simplifying Working with GIS

GIS Maps

- Interact
- Query
- Edit
- Share
- Analyze
- Combine



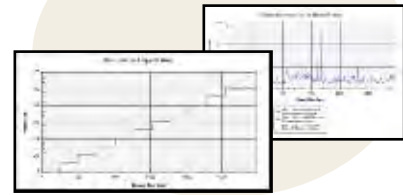
How is Esri Supporting Your Creation of Better Maps?

Creating a New Resource Center
Security
Strategy, Patterns, and Guidance

Application Architectures
Architectures & Implementations



Practices &

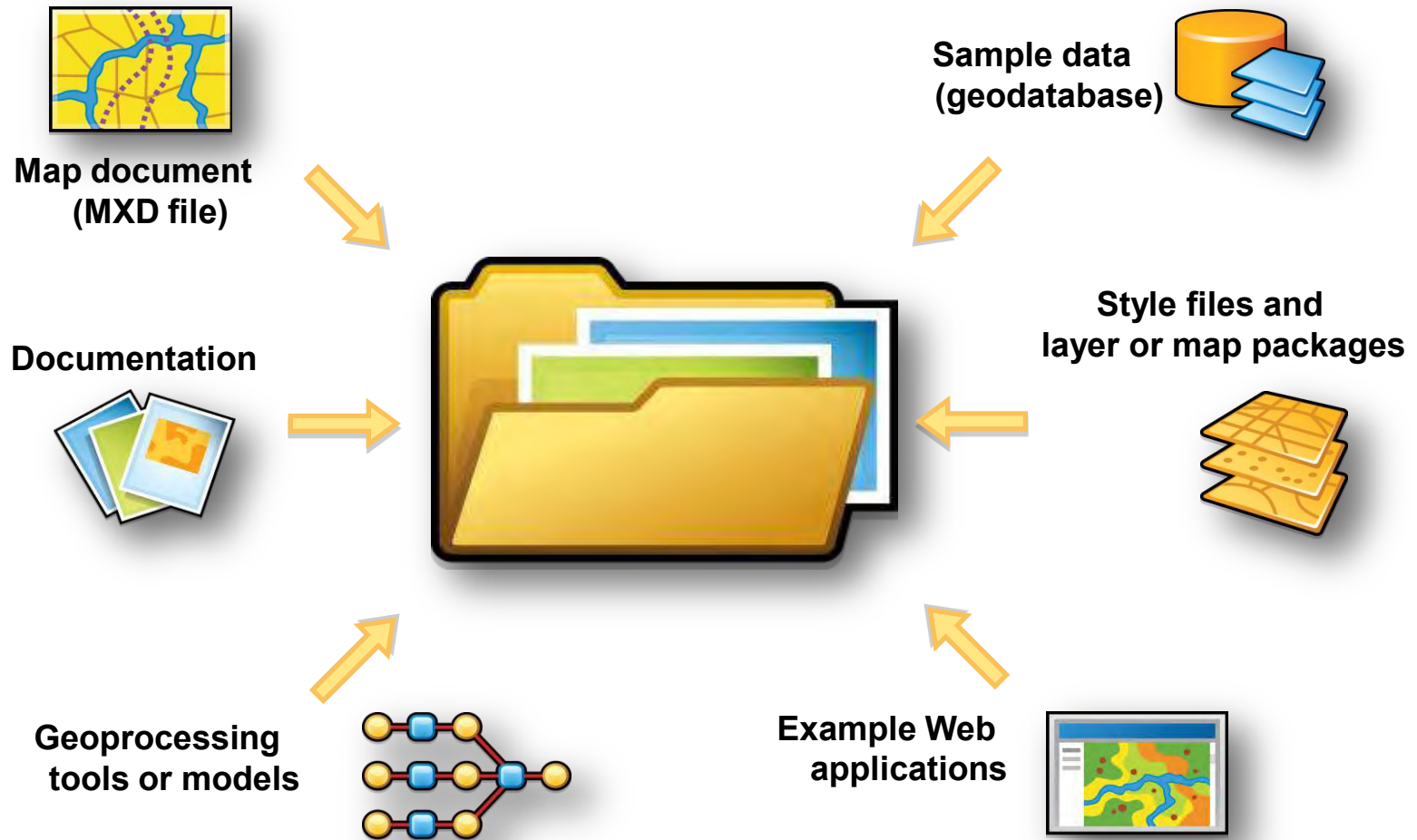


Standards & Interoperability
References, Patterns, and Guidance

	WMS	WFS	WCS
Map services	X	X	X
Capabilities services		X	X
Image services	X		X


What is a Map Template?

A Collection of Resources to Help You Create a Specific Map



How is Esri Supporting Your Creation of Better Maps?

Creating and Sharing Map Templates



The screenshot displays the Esri Map Template Gallery website. The main page shows a list of templates, including 'Topographic Map Template - Large Scales', 'Online Geologic Mapping Template', and 'Campus Basemap Template'. A detailed view of the 'Topographic Map Template - Large Scales' is shown in the foreground. This view includes a description, a small map thumbnail, a rating of 2 stars, and a 'Download Now' button. Below the description is a metadata table with the following information:

Author	ESRI Cartography Team
Date Submitted	12-03-2009
Date Last Updated	12-11-2009
Language	Templates
Product/Version	ArcGIS Desktop 9.3.1
Views	1470
Downloads	1147
License Type	ESRI Attribution and License Agreement

Below the table, there is a link for reporting inappropriate content: [Report Inappropriate Content](#): This Code Gallery is intended for the free exchange of code related to ESRI software products. Let us know if this entry is inappropriate (e.g., a download for a commercial product).

<http://resources.esri.com/maptemplates>

The Esri Forestry Community



Building a Forestry Community

The Esri Forestry Group (EFG)

- Created the group last year to offer support throughout the industry to share common experiences
- Now supports over 1,000 members
- Developing a wide variety of tools and information sources for members
- Conferences and events
- Transferring knowledge
- Raising the profile of forestry GIS

Supporting the Forestry GIS Community

- Newsletters

ESRI GIS and Mapping Software

ESRI Forestry Group Update

Thank you for your continued interest and participation in the ESRI Forestry Group (EFG). We would like to thank all of our members, partners, colleagues and friends for the tremendous feedback and enthusiasm you have shared since forming the ESRI Forestry Group less than a year ago.

There are now over 1,000 EFG members representing 52 countries! We are delighted to see such a significant interest in forestry GIS. As a result of this overwhelming demand, the EFG executive team has been working hard to develop an exciting new program for 2010 and beyond. In 2010 we will continue on with our commitment to building and supporting the ESRI global forestry GIS community.

The ESRI Forestry Group Survey

To better help the EFG planning team focus on topics of interest relevant to you, we are asking all members to participate in a brief but important survey. Through this survey you can help the EFG planning team select themes for upcoming webinars and events, as well as to help EFG identify resources necessary to support issues critical to you and your organization.

Please take a moment to [complete the survey](#).

NEW! ESRI Press Publishes the *Mapping Forestry Book*

The first ever forestry book from ESRI Press has just been published and in a few short months close to 10,000 copies have flown off the shelves. *Mapping Forestry* offers a look at

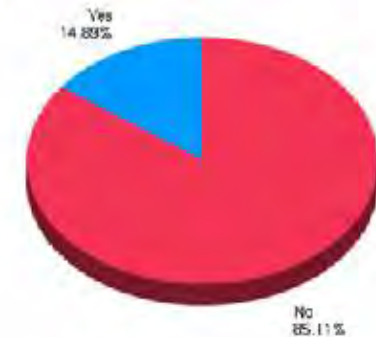
Quick Links

- EFG Survey
- EFG on LinkedIn
- EFG on Twitter
- ESRI Forestry Forum
- ESRI Forestry Group

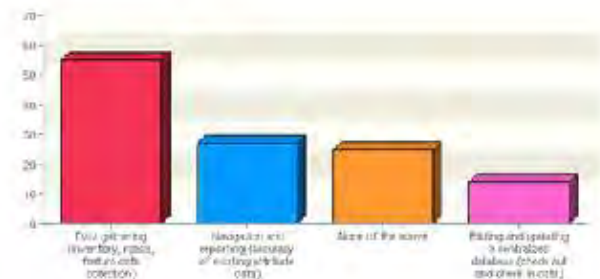
Links of Interest

- Mapping Forestry
- Forestry GIS Journal
- Southern Forests

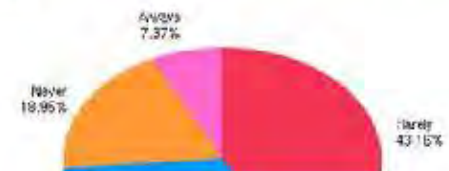
2. Is your organization using ArcGIS Server Advanced Enterprise?



3. How do you currently use your mobile solution?



4. How often is GPS with submeter accuracy required for your work?



Supporting the Forestry GIS Community - Publications

Forestry GIS Journal
ESRI • Summer 2009
GIS for Forestry and Timberland Management

Forestry Carbon Trading Opportunities Explored with GIS

By Barbara Stelmis, GIS Specialist

Forests in the United States sequester about 200 million metric tons of carbon annually. In its most recent U.S. Greenhouse Gas Inventory Report, the U.S. Environmental Protection Agency (EPA) notes that the country's forest sequesters 0.5 percent of the carbon dioxide released in the United States by the combustion of fossil fuels. Geographic Information Systems (GIS) can reliably measure, monitor, and verify carbon storage, assisting with forest management.

FORECON, Inc., a multidisciplinary forestry and natural resources management consulting firm, is using ESRI's ArcGIS software to develop a forest management application. GIS accessions and processing based on information, such as current forest inventories and

to establish inventory points, and deliver it as the company's database, which can view the data geographically. A geographic approach to forest

analyses underpins the approach developed to meet the needs of forest managers.

The project's success is due to the use of GIS and the information it provides.

In This Issue

ER and the Rest	p2
ER News	p3
Upgrade Statewide Forest Management Using the ArcGIS Server Image Extension	p4
Planning Forest Operations: A Rule-Based Spatial Data Workflow Model	p5

MAPPING FORESTRY

An ESRI® White Paper • April 2010

PETER EREDICS, editor



Lidar Analysis in ArcGIS® for Forestry Applications

Supporting the Forestry GIS Community

- Events



esri
Solutions for Forestry
 Esri European Forestry Group Conference 2010



ESRI GIS and Mapping Software

2009 Forestry Holistic Lab Testing

May 4 - 8, 2009
 ESRI Campus
 Redlands, California

You are invited to participate in the final Forestry Industry week of Holistic testing at our Redlands campus, May 4-8, 2009.

What is Holistic Testing?
 Holistic testing is part of the ESRI software development process. The tests software releases using real world workflows and datasets. By implementing user workflows as an integral part of ESRI's software testing strategy, software issues can be identified early and fixed prior to release of the final product. Holistic testing also helps increase ESRI's knowledge and understanding of your GIS workflows and scenarios.

This week of testing will not be focused on just one area of the software but will allow you to follow a number of these workflows in the forestry industry.

Who Should Attend?
 All business partners, commercial forestry companies, forestry consultants, government agencies, and more, should attend. If you have built and maintain a custom solution based on ESRI's technology, this week of testing can benefit you.

Why Should You Participate?
 This is your opportunity to test and validate workflows with the latest ESRI software prior to its being released. It is your opportunity to answer the question, "Will this next release do what I need it to do?" If not, part of the process is to identify your requirements so our development team can make changes and fixes prior to the release.

What Are the Benefits of Participation?

- Meet and work with ESRI development staff to answer questions and address issues found.
- Learn best practices and get information on new functionality and see what's coming.
- Test your own workflows with your data on software that is to be used. This means that issues found will most likely be



ESRI GIS Software that Gives You THE GEOGRAPHIC ADVANTAGE

Forestry Fall Webinar

See the Business Value of Mobile GIS

The ESRI Forestry Group (ESFG) invites you to join us for a live webinar on how mobile GIS is being used in the forestry industry. You will learn how others have integrated mobile GIS into their business systems to solve problems and improve decision making. This is a great opportunity to hear mobile GIS success stories firsthand from your colleagues.

Register Now

Wednesday, November 4
 10:00 a.m. PST

[Join the ESFG](#)
[Ask a Question](#)
[ESRI Events](#)
[Sign Up for ESRI Publications](#)
[ESRI Forestry Forum](#)

Webinar Speakers

- Mark Books, Chief Remote Sensing/GIS Forester and ESFG President, Fort A.P. Hill, VA
- Elizabeth Martinez, GIS/GIS/IT and ESRI Vice-President, [The Piedmont Group](#), Chapel Hill, NC
- Myles Suberland, Mobile Product Manager, [ESRI](#), Redlands, CA
- Christopher W. Gerecke, Director of Enterprise Solutions, [Timmons Group](#), Richmond, VA
- John Stearns, National Regional Sales Engineer, [Geosource](#), Yarmouth, ME



gis **own** **ESRI**
 Geography in action

2008 ESRI User Conference
Forestry SIG
 August 5, 2008

Forestry Special Interest Group

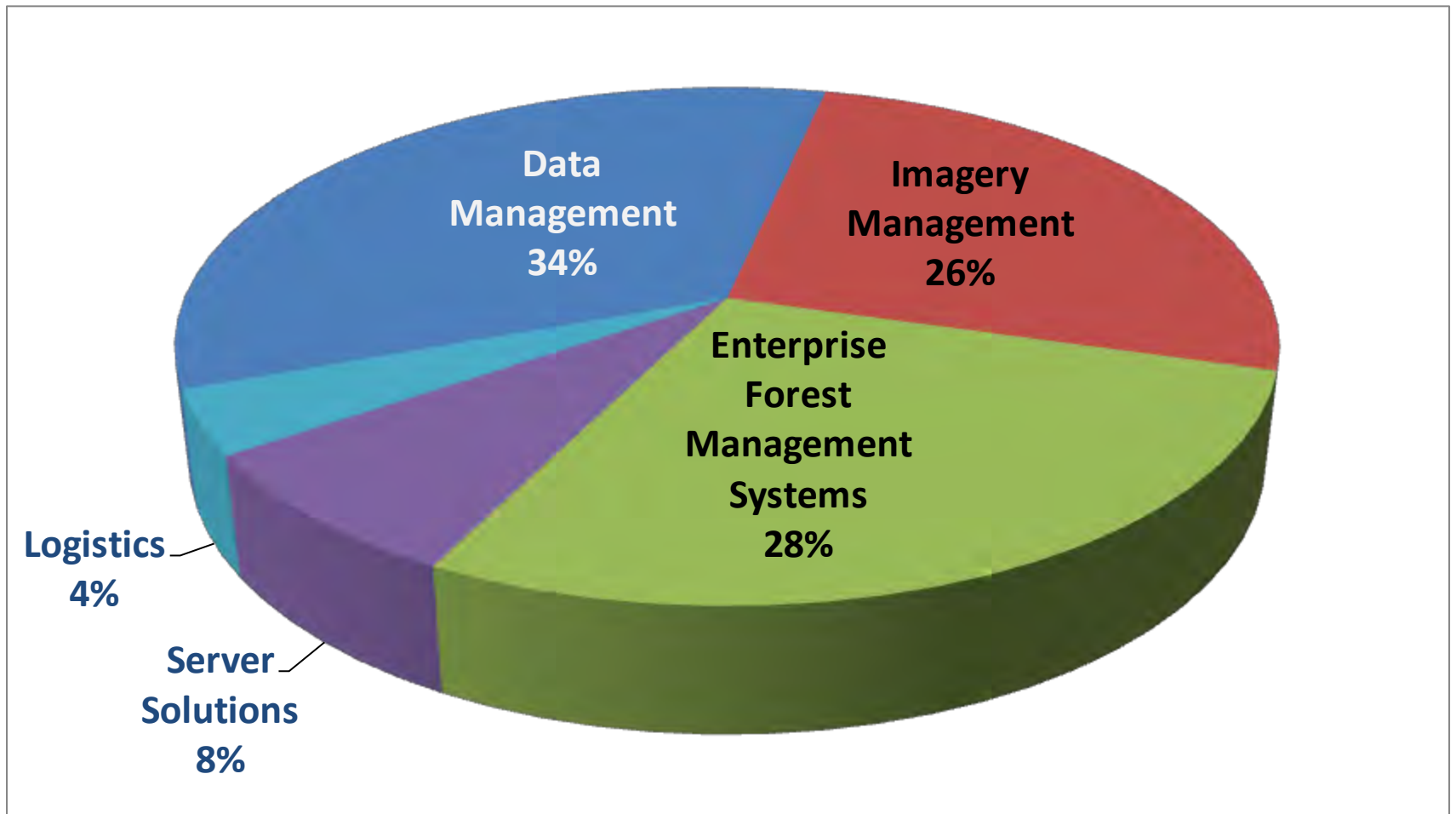
Forestry GIS Trends

Experiencing Unprecedented Change



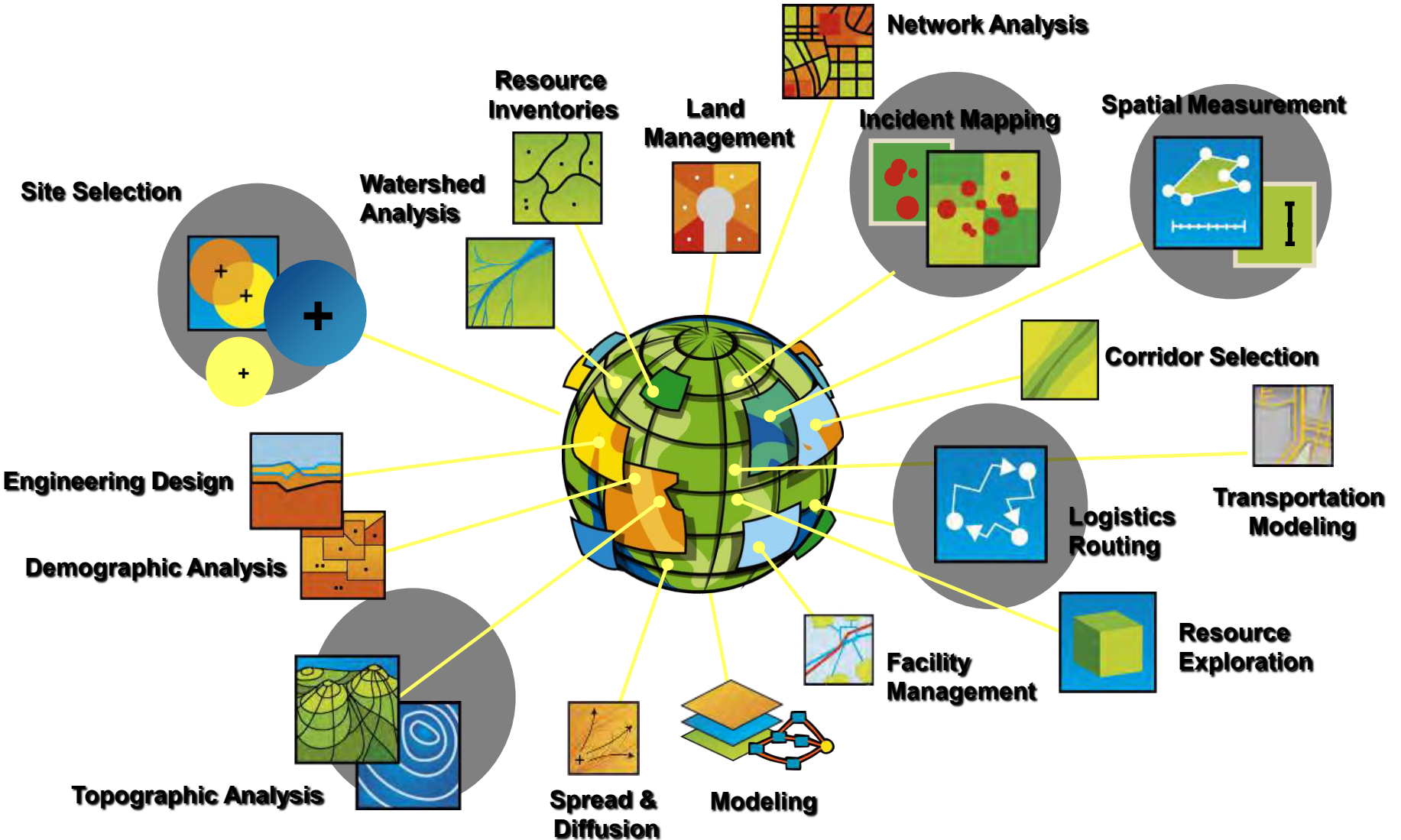
2010 User Survey

GIS Technologies Prioritized by the Global Forestry Community



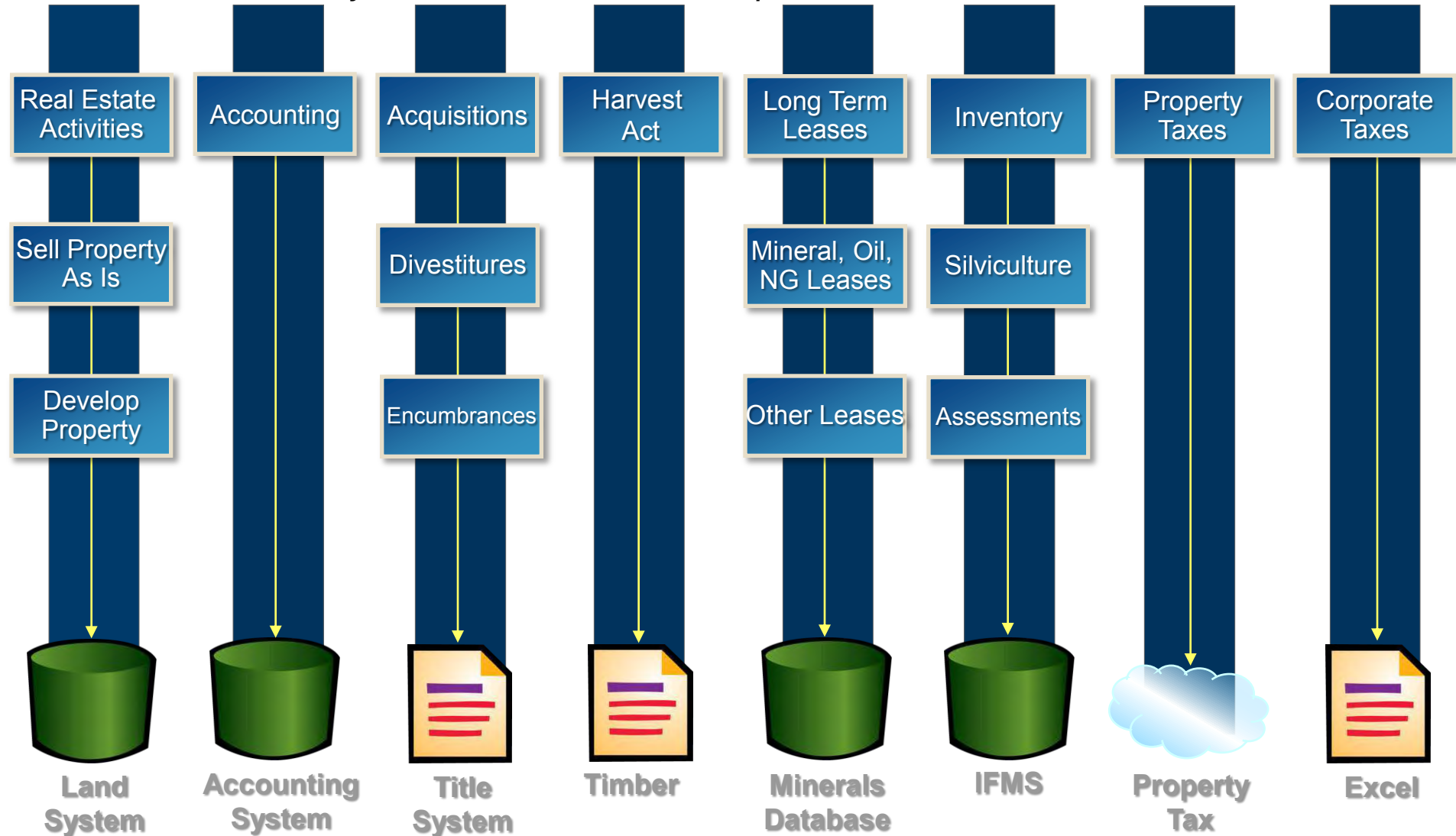
Trend #1: Increasing Focus on Data Management

Collecting Lots of Data but there is Still Little Useful Information

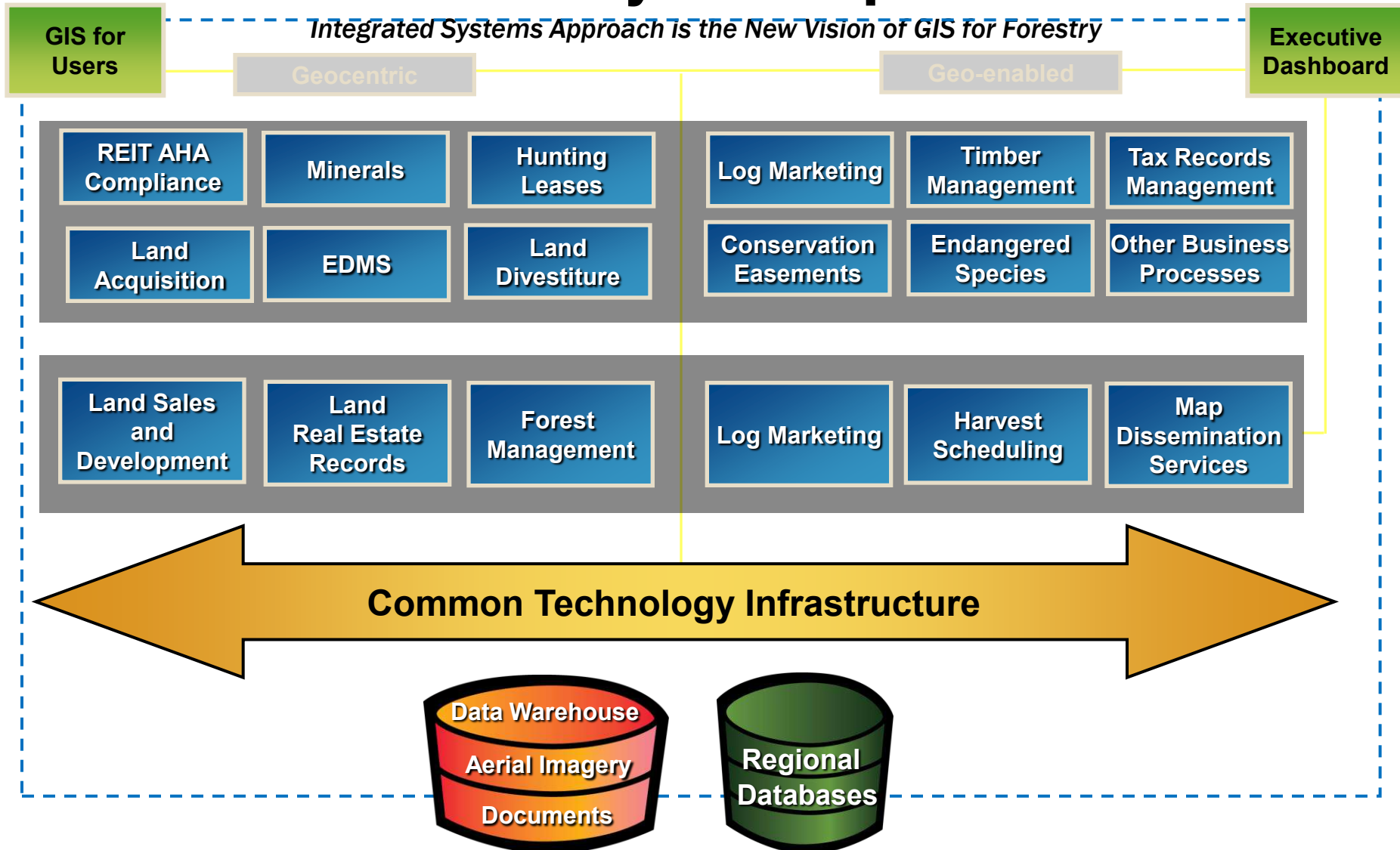


Trend #2: Increasingly Aware of Bottlenecks

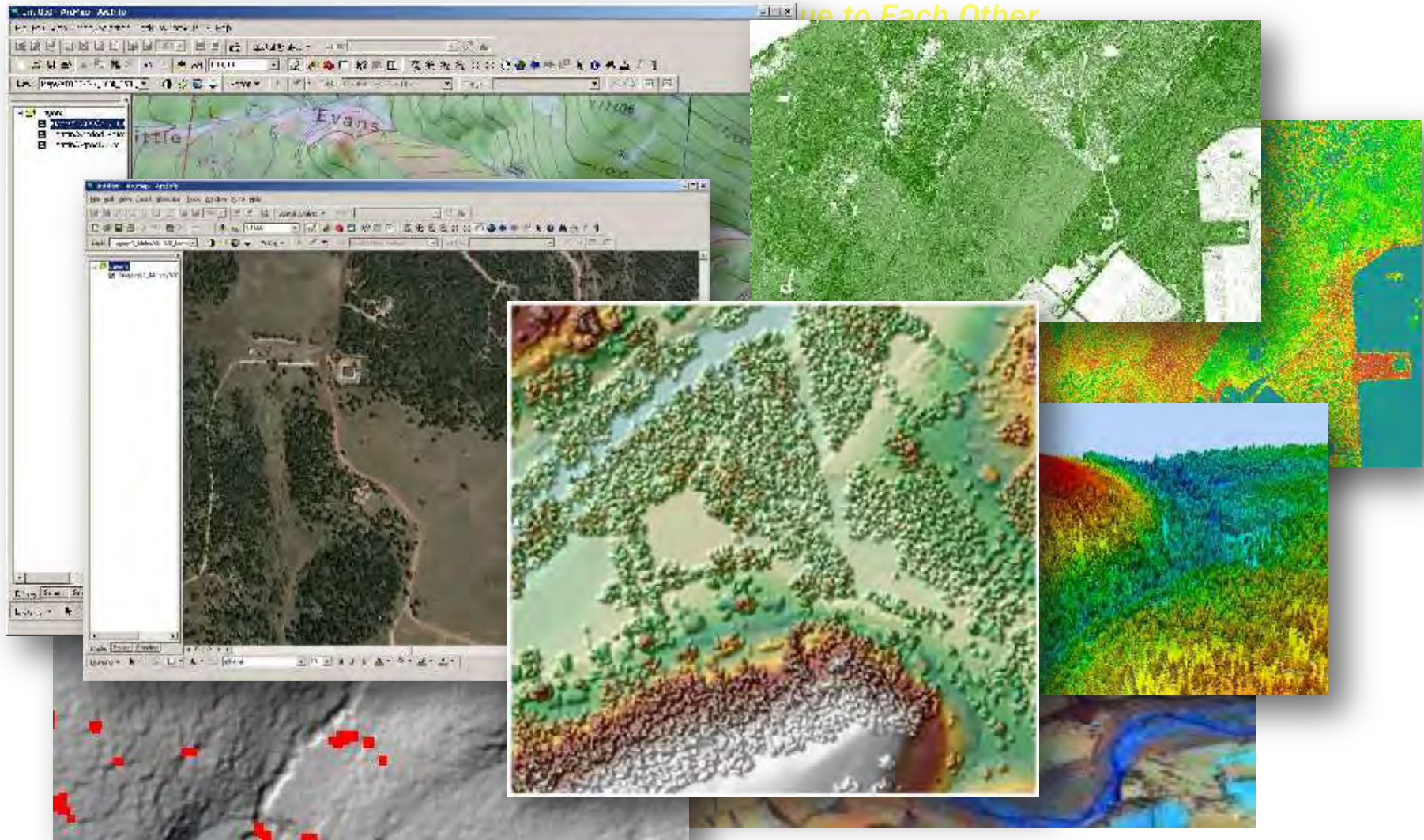
Systems Have Evolved Without Corporate Vision or IT Involvement



Trend #3: Evolving Vision for the Forestry Enterprise



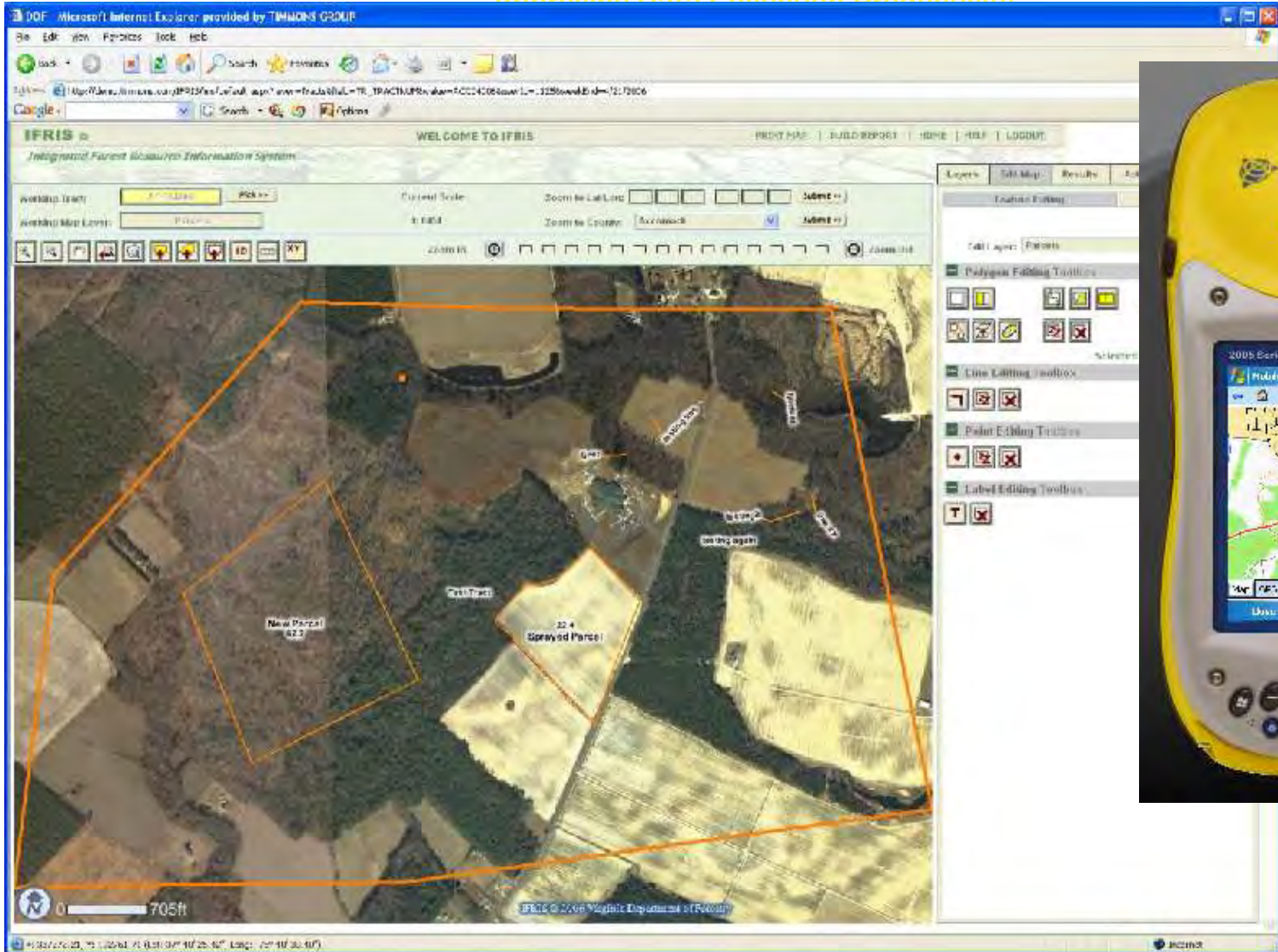
Trend #4: Imagery is Core to GIS



... Aerial Photographs, Satellite Images, Topographic Maps and Lidar Data

Trend #5: Field Mobility is a Priority

Improving Data Collection Productivity



Looking Ahead



Successful Implementation

Requires More than Technology

Successful Implementation Requires

- Vision and Leadership
- Understanding of How GIS Contributes
- Management Support
- Governance and Finance Model
- Planning
 - Technical Architecture
 - Data Models
 - Organization
- Implementation Work
- Good People



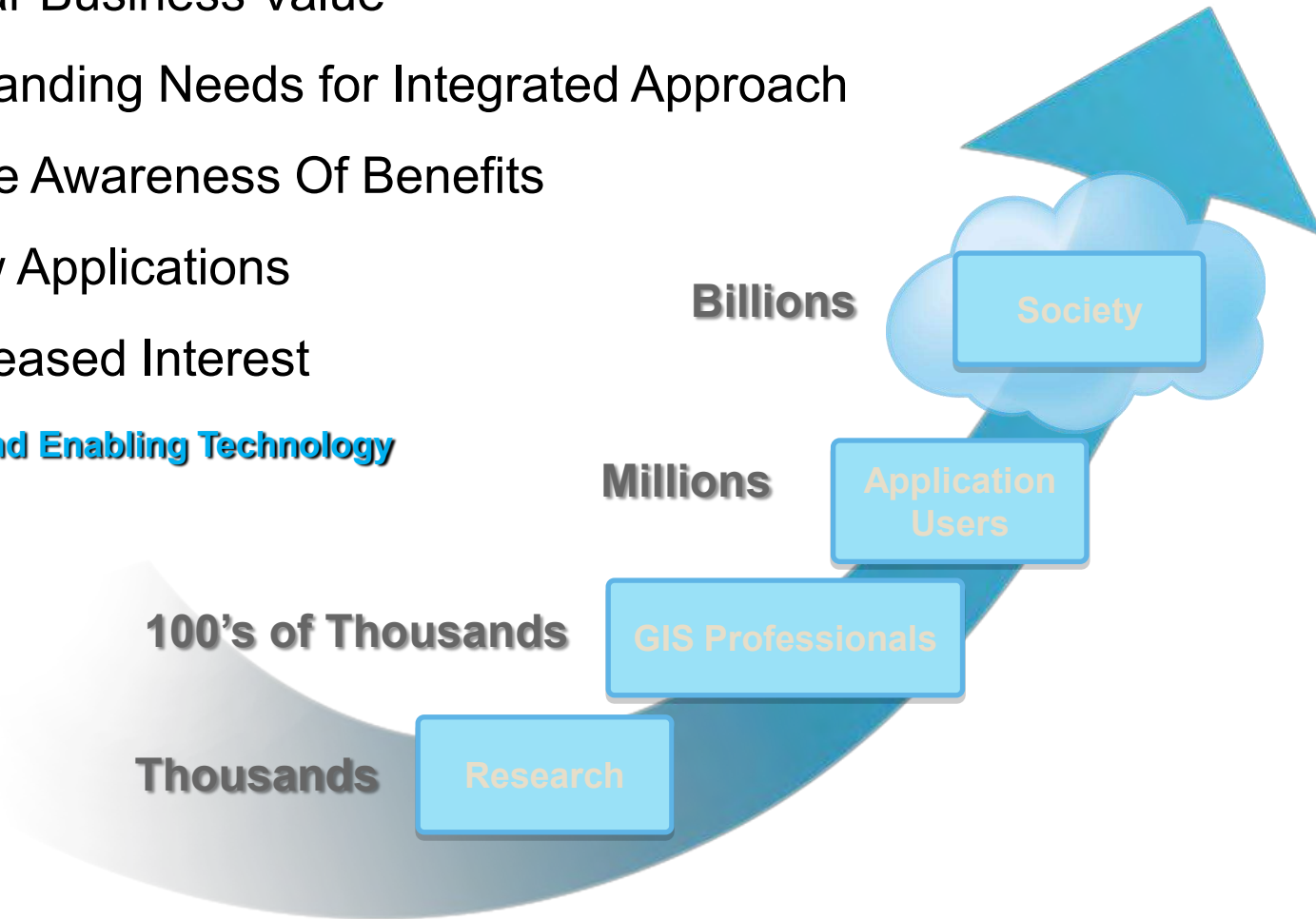
... And a Spirit of Collaboration

GIS Will Continue Expanding

Why?

- Clear Business Value
- Expanding Needs for Integrated Approach
- More Awareness Of Benefits
- New Applications
- Increased Interest

... And Enabling Technology



... GIS Organizations Will Implement And Support the Infrastructure

Questions?

