

Forest Characterization

Forest characterization is generally accomplished through inventories such as the USFS Forest Inventory Analysis (FIA) program. Another method of describing the vegetative content of forested land is forest stand typing. GIT is being used for both of these efforts, although to varying degrees. The use of aerial photography for stand typing has been a well established practice for many years. However, the use of other RS data such as satellite imagery is just beginning to be used by many SFOs. Efforts to use satellite data to augment traditional field measurement inventory techniques are increasingly being explored. Satellite data use for timber inventories can provide distinct advantages over traditional field inventories, including reductions in time, expense, and sampling requirements, as well as in the number of required staff (Roller and Bergen 2000). Currently, at least 18 SFOs use GIS, 14 use GPS, and 12 use some form of RS data for forest characterization.



Minnesota

The Division of Forestry uses GIT as a key part of its work in the FIA program. Done in cooperation with the USFS, this effort includes simultaneous forest, forest health, and wildlife habitat inventories. Minnesota has invested more heavily in FIA than most states, resulting in accurate georeferencing and triple the density of plots than most states. The Division conducts much of the inventory work within the state's boundaries, while the USFS does the FIA work for Minnesota's National Forests. The Division's early initiation of satellite imagery use over traditional aerial photos for FIA played a significant role in influencing the USFS's adoption of this technique. The University of Minnesota's Remote Sensing and Geospatial Analysis Laboratory has been an active partner in this process. Implementation of operational satellite image analysis for FIA required development of an additional remote sensing laboratory at the Grand Rapids location of the Division's Resource Assessment and Inventory Section. This facility has been able to undertake other satellite-based projects in combination with FIA. In the process, the Division's collection of LANDSAT TM scenes has grown to be the largest in Minnesota.



Louisiana

The Louisiana Office of Forestry (LOF) is using GPS for forest characterization efforts in the Atchafalaya River Basin Project. The project is being conducted in conjunction with the U.S. Army Corps of Engineers, as well as several other agencies including the state's DNR. LOF's role is to conduct a baseline inventory of timber types and quantities within the basin. GPS is used to locate inventory plot centers.



South Carolina

The South Carolina Forestry Commission (SCFC) is a major partner with the USFS in its FIA program. SCFC has supplied four to six field crews statewide to help measure 3,840 FIA plots using military grade GPS units supplied by the USFS and digital orthophotos to locate plot centers. SCFC has provided this help in order to go from periodic measurement intervals of seven

to ten years, to an annual sampling system. SCFC will analyze the data using GIS once it is made available. The USFS compiles yearly efficiency ratios and rankings for all states in the Southern Region. For FY 2000, the FIA program for South Carolina ranked first in all categories and received the Director's Award for FIA excellence. Although SCFC is not currently using satellite imagery in its FIA work, its potential is recognized for future use.



Mississippi

The Mississippi Forestry Commission (MFC) has worked with Mississippi State University and the NASA Stennis Space Center on a forest inventory pilot project. This project used satellite and other imagery and is being expanded for wider use, including by the Mississippi Development Authority's Department of Economic Development.



Nebraska

Current forest inventory efforts by the Nebraska Forest Service have been undertaken with the aid of imagery provided by the USFS. Digital orthophotos and digitized aerial photos are used in conjunction with traditional aerial photos. GIS and GPS are used to direct field crews to sample plot locations and correct or record those locations.



Wisconsin

Automated forest compartment stand maps were completed for the six major state forests in Wisconsin by the Division of Forestry and the DNR's GIS Services Section in 1994. The automated maps were developed using SPOT satellite imagery and infrared aerial photography. Data were installed at field offices in each of the state forests with appropriate hardware and software. As a result, field foresters can verify and update the data and tabulate findings for individual stands. These changes are then uploaded to DNR's central database.



Michigan

The Forest, Minerals, and Fire Management Division (FMFM), in conjunction with DNR's Wildlife Division, has acquired and processed LANDSAT TM imagery to help prepare land cover data for Michigan's Upper Peninsula. These satellite data were initially used to assist in forest characterization efforts such as inventory and mapping. FMFM also recently completed a land cover assessment of Southern Lower Michigan. The remaining two thirds of the state will be completed by 2003.

DNR has worked closely with Space Imaging on an Integrated Forest Monitoring, Assessment and Prescription (IFMAP) project, which addresses GIT use for a wide range of forestry applications. One FMFM application as part of this effort involves the use of LANDSAT TM imagery to develop a stratified forest resources inventory. Classified imagery will be used to stratify the triple intensity grid of inventory plots in Michigan for the FIA program. Imagery

compilation has been compiled statewide, and image classification will be finished by January, 2003. Once the imagery is fully interpreted, this system will provide estimates of tree species type and stage of development well before completion of the full five cycles of inventory.

 *Kansas*

The Kansas Forest Service's (KFS) only use of GIT at this time is for its efforts with the USFS FIA program underway at the North Central Research Station. KFS is utilizing GPS in this effort, and will receive a copy of these data and the corresponding ArcView™ and ArcInfo™ maps for statewide use in future applications.