



Minnesota

1. Organizational Approach to GIT:

The Division of Forestry (<http://www.dnr.state.mn.us/forestry>), located within the Minnesota Department of Natural Resources (DNR) (<http://www.dnr.state.mn.us/>), is the largest user of remote sensing (RS) in DNR. The Division incorporates GIT in both individual and enterprise-wide approaches. Although the Division's abilities allow it to function independently in regards to GIT, it takes advantage of opportunities to work with other agencies, including other parts of DNR, to carry its use further. Currently, there are three full-time Division employees dedicated to GIT activities, and the majority of staff utilizes GIT on a regular basis. The Division's Wildland Urban Interface Consultant primarily serves to direct GIT towards practical forestry applications. However, it is anticipated that this role will be filled by a new position in the near future. Central and regional office GIT use is enhanced by the acquisition of laptop docking stations that allow staff increased access to data in the field. Although there are no formal policies regarding the Division's use of GIT per se, its mission statement mandates the sharing of information technology and understanding. Important issues regarding GIT concern the acquisition of additional staff, training and the increased usability and simplification of software.

2. GIT Applications and Data Utilized:

The Division uses GIT in **forest characterization** and conducts a regular Forest Inventory and Analysis (FIA) survey. This survey, done in cooperation with the U.S. Forest Service (USFS), covers forest inventory; **forest health**, including insects and disease; and **wildlife** habitat inventory. FIA is a nationwide program and is based upon a dense, intensively measured array of permanently established field plots. Minnesota has invested more heavily in FIA than most states and conducts much of the inventory work within its boundaries. The Division's initiation of satellite imagery use over traditional aerial photos for FIA has played a significant role in the USFS's adoption of the technique. The University of Minnesota's Remote Sensing and Geospatial Analysis Laboratory has been an active partner in this process (<http://rsl.gis.umn.edu/index.html>). 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 (Resource Assessment Unit). This facility has been able to undertake other satellite-based projects in combination with FIA. In the process, its collection of LANDSAT Thematic Mapper (TM) scenes has grown into the largest in Minnesota. The Unit has also employed satellite imagery for emergency response mapping, and its satellite image products are now routinely used in Minnesota as a mapping base for annual aerial forest damage mapping. In addition, the Unit has, in cooperation with NASA, the University of Minnesota and the Minnesota Forest Resources Council, established the ForNet website (<http://www.ra.dnr.state.mn.us/>). The site provides access to LANDSAT TM images for multiple dates, full-coverage aerial photography of state forested land, the entire DNR forest inventory on 5 million acres of state-managed land, satellite-based change detection maps, and up-to-date information on statewide forest fire activity.

Other initiatives currently underway are the Minnesota portion of the Gap Analysis Program (GAP) to determine critical area habitats, for which the Division serves as lead agency, and the utilization of satellite imagery for emergency response mapping, including **fire** and wind damage, and as a base for annual aerial forest damage mapping. The Division's Firewise project is a heavy user of GIT. Fuel Hazard Risk Models are generated from GAP data, which are based on a multi-temporal data set that has been qualified using 1:15,840 scale fall color infrared photography. Working cooperatively with the USFS and the National Fire Plan, home sites are mapped using GIS and given a basic defensible space rating based on digital orthophotos. Over 45,000 homes were mapped in the first six months of this project using volunteers, firefighters, high school students, and DNR staff.

Forest health monitoring is aided through the creation of aerial sketch maps for the entire state, overlaid onto 1:100,000 topographic maps, which are then digitized. In addition to the Division's work, DNR is a very active user of GIT, including involvement in the Minnesota GAP program, and actively distributes data, as described below.

The Division also uses GIT for **forest assessment** and **planning** such as vegetation monitoring, **environmental** analysis, and road planning; **recreation** and **other natural resource** management; **ecosystem** planning; **riparian** forest monitoring; silvicultural activity and road maintenance tracking on **state lands**; and **private lands** management. In mid-2000 the Division's Resource Assessment (RA) Unit initiated the first stages of legislatively mandated forest monitoring along Minnesota lakeshores and streams. GIT is used on state and private lands to monitor the effectiveness of forest practices guidelines in Riparian Management Zones (RMZs). Data types for these efforts include, but are not limited to, digitized aerial photography, digital orthophotos, and field collected GPS data.

The Division has also developed FORIST (Forestry Information System), a suite of interlocking and overlapping programs and custom applications that support daily Division operations. These elements work in concert to form a corporate data system that processes data about land, timber, management and protection, and administrative processes. Additionally, DNR and the Land Management Information Center (LMIC), described below, have developed EPIC, a proprietary GIS designed as an easy to use interface for making maps, performing sophisticated analysis, and managing map-based data. EPIC can reclassify data, generate two-layer models, perform five layer cross-tab analysis, import Public Land Survey or GPS point data, model uniform and directional buffers, and interpolate a continuous surface from point data.

3. Statewide and Other GIT Linkages:

The Land Management Information Center (LMIC) (<http://www.lmic.state.mn.us>) is the lead state government GI/GIT organization. LMIC is a division of the Office of Strategic and Long-Range Planning, known as Minnesota Planning, where LMIC's role focuses on GIS coordination. LMIC also advocates GIT standards; provides GIS data and project/technical services; is the lead agency for the Minnesota Geographic Data Clearinghouse, described below; and supports the Minnesota Governor's Council on Geographic Information (GCGI) (<http://www.gis.state.mn.us>). The GCGI is the primary state coordinating group and helps promote coordinated and efficient development of GIT within Minnesota. It fosters communication among GIT users and producers, collaborates with similar groups, and works to improve access to GI/GIT. An additional group is the GIS/LIS Consortium (<http://www.mngislis.org/>), which is a nonprofit organization established in 1988 in response to growing GIS use within Minnesota. It publishes a newsletter, sponsors an annual conference, and organizes workshops. The Division works with LMIC directly in the course of daily operations, and with the GCGI indirectly, through a DNR representative.

LMIC maintains the statewide GIT clearinghouse (www.lmic.state.mn.us/chouse/index.html), and serves to manage, archive and distribute data, and provide technical assistance. LMIC maintains an FGDC compliant clearinghouse node and helps other organizations create additional nodes, all searchable through the Minnesota GeoGateway. In addition, the DNR's Data Deli (<http://deli.dnr.state.mn.us/>) offers a direct link to departmental data distributed by the Department of Natural Resources and the MetroGIS Datafinder (www.datafinder.org) is a portal to data offered by metropolitan organizations.