



1. Organizational Approach to GIT:

The Michigan Department of Natural Resources (DNR) (<http://www.michigan.gov/dnr/>) houses the Forest, Minerals, and Fire Management Division (FMFM) (http://www.midnr.com/Publications/pdfs/InsideDNR/ProgDesc/FMFMPD_2003.pdf), which is a major user of GIT. In regards to remote sensing (RS) use in state government, DNR has led the way through the Natural Resources Information Services Section (NRIS), which was recently moved administratively from DNR to the new Michigan Department of Information Technology (DoIT). The Section's 36 employees will continue to provide broad GIS and IT support for DNR. The Department has an inter-divisional GIT coordinating group, the Virtual Geographic Information Laboratory (ViGIL). ViGIL directs the Spatial Information Resource Center which provides GIT support to DNR field staff. ViGIL also solicits GIT project proposals from DNR staff and advocates these projects through the Department budget process. DNR is beginning to implement the system architecture and build the statewide network to support enterprise-wide GIS. This infrastructure, described in further detail below, will facilitate GIS use in DNR and Division offices scattered throughout Michigan and allow 250 personnel access to the system on a daily basis. Currently FMFM has three staff dedicated to GIT issues. The Program Leader for Forest Health, Inventory, and Monitoring has been a strong advocate of GIT usage in forest health monitoring, and leads GIT efforts in conjunction with DNR's Integrated Forest Monitoring, Assessment and Prescription (IFMAP) project, described below. GIT use in DNR and FMFM has been primarily a bottom-up approach, and therefore, no formal policies for its use are in place. This is exemplified by FMFM's Forest Health, Inventory, and Monitoring program, whose leader and staff supports the implementation of RS to monitor various problems, and the training of staff in GIS and GPS. Training field staff in GIT, providing GIT tools to remote locations, and educating upper-level state government leaders as to GIT needs are issues FMFM faces.

2. GIT Applications and Data Utilized:

FMFM has used GIT for several applications. FMFM, in conjunction with DNR's Wildlife Division, has acquired and processed LANDSAT data in compiling land cover data for Michigan's Upper Peninsula, and has recently completed a **land cover** assessment for Southern Lower Michigan. The remaining two thirds of the state will be completed by 2003. The satellite data were initially used to assist in **forest characterization** such as inventory, mapping, and related efforts. The assessment program was expanded to cover additional forestry applications such as **forest health**, including pest management efforts. Some attempts have been made to compare these data with land cover data that DNR had derived from aerial photography in the past. DNR also has worked closely with Space Imaging, formerly Pacific Meridian Resources, on an Integrated Forest Monitoring, Assessment and Prescription (IFMAP) project, which addresses GIT use for a wide range of forestry applications. One such application involves the use of LANDSAT Thematic Mapper (TM) imagery to develop a stratified inventory design. Satellite imagery will be coupled with a triple intensity grid for Michigan's efforts in the Forest Inventory Analysis (FIA) program. Imagery is currently being compiled, and once collected will provide estimates well before completion of the full inventory. The resulting IFMAP is the first project that will utilize the new data infrastructure mentioned above, which incorporates a centralized SDE, ARC 8 environment served through a windows terminal server environment and enhanced through Citrix MetaFrame. This infrastructure will allow for centralized data storage and data integrity, as well as fast GIS response in many DNR offices statewide. DNR is also working on implementation of a Geographic Decision Support Environment that will assist state forestry personnel in various aspects of forest management. DNR's website contains the DNR Spatial Data Library (www.dnr.state.mi.us/spatialdatalibrary) through which the public accesses both data and maps.

FMFM uses ESRI, IDRISI, and ERDAS Imagine GIS products and Trimble GPS products. For its remote sensing (RS) needs, FMFM relies upon medium format photography using state-owned aircraft, LANDSAT Thematic Mapper (TM), MSS, AVHRR, MODIS, IKONOS imagery, Space Imaging imagery, and EMERGE imagery. NRISS is the lead for processing statewide leaf-on digital orthophotos that will be a public resource for DNR and others. U.S. Geological Survey (USGS) digital orthophotos developed from 1992 black and white or 1998 color infrared photography are available statewide. The statewide vector base map used by FMFM is based on internal data compilation and is being significantly enhanced as part of the Michigan Geographic Framework. The framework serves as a standardized infrastructure of data at the 1:24,000 scale that is being used for multiple statewide applications. Vector data from the framework is being repositioned to the USGS digital orthophoto images and will become the base "map" for all state agencies.

3. Statewide and Other GIT Linkages:

The Michigan Information Center (MIC) (<http://www.state.mi.us/dmb/mic>) serves as the official lead for GI/GIT in state government. MIC is located in the Department of Information Technology (DoIT), and is developing the Michigan Geographic Framework, described above, in cooperation with other agencies (<http://www.state.mi.us/dmb/mic/census/geog/framework.htm>). As mentioned above, the central GIT organization in DNR, the Natural Resources Information Services Section (NRISS), has recently been moved to DoIT. FMFM is a co-founding agency of the Improving Michigan Access to Geographic Information Network (IMAGIN) Consortium, the state's GIT coordination group.

MIC and IMAGIN are working together to create an NSDI Clearinghouse Node for Michigan. The above efforts to make imagery available are complemented with those of Michigan State University's Center for Remote Sensing and GIS, which is developing an "Imagery Archive" of multiple sources of satellite and aerial imagery, including some useful for forestry.