



South Carolina

1. Organizational Approach to GIT:

The South Carolina Forestry Commission (SCFC) (<http://www.state.sc.us/forest>) makes extensive use of remote sensing (RS) data and other forms of GIT. SCFC uses GIT for both individual and enterprise wide forestry applications. SCFC receives GIT assistance from several agencies and organizations, including imagery from the Water and Land Resources Division of the Department of Natural Resources (DNR); training from the State Mapping and Advisory Committee (SMAC); and technical assistance and data development from Clemson University's Department of Forestry and the University of South Carolina's Geography Department. SCFC has three dedicated GIT staff people: two on State Forests and one at the State Office. The State Office staff is SCFC's Dispatch and Forest Technology Coordinator, who coordinates forest fire dispatch technology development and implementation among SCFC's three administrative regions, its Fire Management staff and its Information Technology staff. The Coordinator also develops a prioritized and planned approach to the implementation of GIT for forest applications on a project basis, and spends a portion of his time keeping abreast of GIT developments and possible applications for SCFC. In addition, GIT is used by 32 Field Foresters, 36 Dispatchers and several other regional staff. One of the Field Foresters, located on a State Forest, is a leader in using GIS for creating and updating forest stand information. There is no formal policy regarding SCFC's use of GIT at this time. Use of GIT has provided SCFC increased accuracy and efficiency in several programs areas, and has increased the provision of forest and land resource information to field foresters, Best Management Practices (BMP) foresters, and wildfire managers. Problems for SCFC include the steep learning curve associated with most GIS programs and high post-training turnover rates. An additional issue is the high cost of aerial and satellite imagery.

2. GIT Applications and Data Utilized:

SCFC uses GIS, GPS and digital orthophotos for Computer-Aided Dispatch (CAD) for **fire**. GIS and GPS are also used for **forest characterization** inventories, **forest assessment** and monitoring on **state and private lands**, vegetation monitoring, landowner assistance, **urban forestry**, and mapping. MapInfo™ Professional 6.5, ArcView™ 3.2, and Maptitude™ GIS softwares are used at the state headquarters for data analysis work. SCFC field foresters primarily use Maptitude because it is more cost-effective due to greater ease of training and reduced staff turnover. Field foresters use Maptitude in combination with 1994 and 1999 digital orthophotos to develop forest management recommendations and prepare forest management maps for non-industrial private landowners and state lands. Field foresters also produce digital maps at offices for private landowners for the SCFC's landowner assistance programs. These maps are created after field checks are made using the most current aerial photography available. Fire managers are using Maptitude to identify high **fire** activity areas around urban areas and to prepare fire suppression activity maps. BMP foresters are using Maptitude, DeLorme Topo USA, and digital orthophotos to investigate compliance with water quality regulations and BMP implementation on **private lands**. Color infrared aerial photography has been in use since the early 1990's statewide. The SCFC also uses various brands of GPS equipment. In addition, SCFC uses color infrared aerial photography for survey and detection work in **forest health** activities. However, there is no major use of GIS for forest health at this time.

GIT is being extensively used by SCFC in its Statewide CAD System for Wildfire. A custom CAD system was developed around MapInfo™ Professional to plot controlled burns and wildfires, locate fire suppression resources, and monitor wildfire activity. Staffing and response times are being analyzed with GIT to identify problem areas. The SCFC hopes to acquire "911" quality street and address data for the entire state from the Research and Statistics Division of the State Budget and Control Board. Plans are to make a digital orthophoto layer available to dispatchers and fire managers through the CAD system. In

addition, Maptitude can import 1994 digital orthophotos, which serve as a base layer to develop maps and delineate forest stands.

In addition, SCFC is a major partner with the USFS in its Forest Inventory and Analysis (FIA) program. In this **forest characterization** effort, SCFC has supplied four to six field crews statewide to help measure 3,840 FIA plots using military grade GPS units supplied by 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. Each year the USFS compiles efficiency ratios and rankings for all states in the Southern Region, and for FY 2000, the FIA program for South Carolina ranked first in all categories and received the Director's Award for FIA Excellence. SCFC is not currently using satellite imagery in its FIA work, but recognizes the potential for future use.

SCFC also carried out the South Carolina Forestry Commission's Post Hurricane Hugo Aerial Photography program in 1991. This program utilized the same specifications and standards of the U.S. Geological Survey's (USGS) 1989 National Aerial Photography Program (NAPP); therefore, frame by frame comparisons could be made of timber stand conditions before and after Hurricane Hugo. The event drastically changed one third of South Carolina's landscape, rendering the 1989 NAPP photography for those areas almost useless. Major products were contact prints and 1:15,840 scale enlargements for use in the field to assist in making forest management and reforestation recommendations. Currently, a cooperative agreement between SCFC, DNR (<http://www.dnr.state.sc.us/>) and the U.S. Army Corps of Engineers is being used to develop statewide color digital orthophotos from the 1999 NAPP, which is the most recent aerial photography of the state. This second generation of digital orthophotos will compliment the 1994 digital orthophotos, many of which were produced in black and white only. In addition, it is anticipated that the Land and Water Resources Division of DNR will make products and data from the Gap Analysis Program (GAP) available through its website clearinghouse in the spring 2002 to assist in land use planning at county and state levels for identification of areas of unique habitat that should be targeted for protection.

SCFC is also involved in several efforts to research the use of satellite imagery. These efforts include work with DNR to evaluate the usefulness of satellite imagery and GIS in forest resources management. It also has worked with the U.S. Forest Service (USFS) to investigate the use of RS and GIS in fire and smoke behavior models to identify potential smoke sensitive areas near prescribed fires and wildfires. Further, SCFC worked with the proposed USGS Hazard Support System to test a wildfire satellite detection system that was under development in the late 1990's. SCFC was the only agency known by the USGS with a statewide, centralized CAD system networked together that could quickly receive and filter satellite detection messages against known burning notifications or wildfires in real time. Satellite imagery was used by various entities to help determine forestry conditions before and after Hurricane Hugo. SCFC is also evaluating satellite imagery for forest health applications such as insect monitoring, management and mitigation.

3. Statewide and Other GIT Linkages:

South Carolina does not have an official lead statewide office or coordinator concerning GI/GIT. The Budget and Control Board recently established an Office of the Chief Information Officer (CIO) in 2000 with responsibilities over statewide information technology (IT) planning and procurement. The CIO provides networking support to the Governor's Information Resources Council (IRC), whose Standing Committee on Geographic Information (SCGI), which completed a study of statewide GIS needs and a strategic plan for the coordination of geographic data development and GIT in 2000 (<http://www.scgs.state.sc.us/smac/1134.SP5%20FINAL%20Vol%20I.htm>). Two groups officially exist in South Carolina concerning GI/GIT, including the SCGI (<http://www.state.sc.us/irc/committees/gis>), and the State Mapping Advisory Committee (SMAC) (<http://www.state.sc.us/scgs/smac.htm>). SCFC has

active representation on the SCGI and is an original member and is actively represented on the SMAC. It also receives some GIT assistance from both the SCGI and SMAC. In addition, a NAPP Steering Committee was formed from members of SMAC to coordinate statewide efforts with USGS in acquiring current aerial photography under this program in 1989, 1994 and 1999. This Steering Committee was headed up by the Land Resources Department of DNR, and the SCFC was a major financial contributor to the program and coordination effort.

Data access and dissemination approaches are handled on an agency by agency basis for their data holdings. The Department of Natural Resources (DNR), which is the largest user of GIT in state government, provides Internet access to all of its data holdings and constitutes the major clearinghouse in the state (<http://www.dnr.state.sc.us/>). The Clearinghouse provides vector-based GIS data (15 layers) in Arc export format, statewide digital elevation models (DEMs), digital raster graphics (DRGs), and digital orthophotos for approximately 25% of the state. Classified LANDSAT Thematic Mapper (TM) data will be included in the Clearinghouse in mid 2002. This data is from the GAP analysis done by the Land and Water Resources Division of DNR, and included classification at county and state levels to assist in land use planning for the identification of areas of unique habitat that should be targeted for protection. The classification data may also be useful in identifying high fire potential areas for wildfire dispatch operations. SMAC sponsors a mapping network page (<http://www.scmapping.net/>) that was recently implemented to serve as a site to facilitate data exchange, networking, and the use of standards in South Carolina's GIS community. In addition, the University of South Carolina's Geography Department offers a web based Geospatial Data Clearinghouse and portal (<http://www.cla.sc.edu/gis/>).