 ***Pennsylvania***

1. Organizational Approach to GIT:

The Pennsylvania Bureau of Forestry (http://www.dcnr.state.pa.us/forestry) within the Department of Conservation and Natural Resources (DCNR) (http://www.dcnr.state.pa.us/) is an active user of GIT. Other parts of DCNR also have GIT activities, as do several parts of the Department of Environmental Protection (DEP) (http://www.dep.state.pa.us/), which has provided some GIT services to other agencies. The Bureau uses GIT in an enterprise-wide approach, and contracts for custom development of applications and user interfaces to make the technology available to a wider range of employees. The Bureau out sources much of its data acquisition, digitizing and customization to Penn State, Shippensburg, and Indiana State universities, or private contractors such as ESRI. The Information Technology Section of the Bureau's Operations and Recreation Division has four full-time IT staff to support Bureau-wide GIT hardware and software installation and operating systems support.

Dedicated GIT positions are split between the Division of Resource Planning and Information, and the Division of Forest Pest Management. The Division of Resource Planning and Information has one full-time GIS position in each of its two sections. The first section is the Resource Planning and Information Section, which is located in the Bureau's main office and led by the Resource Planning and Information Section Chief. The Chief allocates about 60 percent of his time to GIT matters. He coordinates all GIS and GPS activities within the Bureau, directly supervises GIS users and two planners, conducts GIS analyses, administers GIS-related contracts, and creates data coverages during heavy workload periods. The Chief also acts as Bureau liaison to other organizations and committees, as described below. The second section is the Inventory and Analysis Section, led by the Inventory and Analysis Section Chief. This Section conducts GIS modeling and analysis and is located in a field office near State College. In addition, the Division of Forest Pest Management has two full-time GIS positions; one permanent and one temporary.

Although no formal policy exists for GIT, all work units within the Bureau are required to implement GIT, and the State Forester has been supportive in procuring staff and funding to this end. GIS will replace all forest type maps and eventually other paper copy mapping. In addition to GIT staff in the main office described above, field office staffs are making significant contributions toward GIT implementation. Bureau field office staffs include over 55 GIS users, over 80 GPS users, over 90 aerial photography users, and over 10 satellite imagery users. Most of these field staffs allocate 10-25 % of their time for GIT activities, and all field staffs are trained in ArcView ™ 3.2 and GPS use. In terms of benefits, GPS has resulted in a time savings of at least three-to-one for field surveys such as roads, trails, and timber sales. Office time savings are also substantial. Much of the work the Bureau is using GIS for, such as on-the-spot map generation and spatial analysis, could not be done by other methods. Problems encountered are primarily concerned with the lack of personnel dedicated to GIT, and the lack of acceptance by some staff.

2. GIT Applications and Data Utilized:

The Bureau works with several other entities to apply GIS, GPS, and remote sensing (RS) to a variety of applications, including tracking riparian buffers and **wetlands** with the Susquehanna River Basin Commission and the Chesapeake Bay Commission. In addition, the Bureau uses GIS, GPS and RS for the production of potable water from 2.1 million acres of forested state lands. It has been responsible for potable water leasing to state municipalities since the 1950s, and began using aerial photography for this purpose in the 1990s. The Bureau also uses GIS, GPS and RS for tracking threatened and endangered species including **wildlife** and plants with DEP, The Nature Conservancy and the Western Pennsylvania Conservancy. The Bureau also works with the U.S. Forest Service (USFS) on several applications including **forest health** issues such as insect and disease monitoring and suppression projects, on **forest**

characterization through Forest Inventory Analysis (FIA) with the USFS; and **land cover** applications such as ecological unit mapping with the USFS and surrounding states. Additional applications include resource **planning**, **recreation** projects, oil and gas **leasing** program for monitoring on **state lands**, general project tracking, and **fire** control. The Bureau's fire capabilities are limited to mapping at the present time. Some work with fuels modeling for fire has been done, but insufficient data has limited any practical application. Primary data types utilized are ArcInfo™ coverages and shape files used with ArcInfo ™, ArcGIS ™ and ArcView ™. Corvallis Microtechnology ™ (CMT) GPS units and their post-processing and editing software to produce shape files and coverages are also used.

Currently, the Bureau uses ArcGIS 8.2 and ArcView 3.2, as well as Sure™ raster maps and DeLorme ™ topoquads. All of these are available at the central office and over 20 field locations. The Bureau maintains three GPS reference stations for post processing, which are networked to all of its offices via a wide-area network. Bureau field staffs utilize CMT GPS units for surveying and data collection. Imagery used includes 9x9 false color infrared, which is contract flown by L. Robert Kimbal Inc., and digital orthophoto quads provided by the U.S. Geological Survey (USGS). The Bureau has in-house capability to fly 70mm vertical color photography. Most of the Bureau's data is either created, or modified in-house, using staff or contractors. Most data from outside sources comes from the USGS, DEP, the Department of Transportation (DOT), DCNR's Bureau of Parks, and DCNR's Bureau of Topologic and Geologic Survey.

3. Statewide and Other GIT Linkages:

Pennsylvania does not have a statewide GI/GIT coordination office. However, various agencies share a leading role for GI/GIT, including the Department of Conservation and Natural Resources (DCNR), and in particular its Bureau of Topographic and Geologic Survey; the Department of Environmental Protection (DEP); and the Pennsylvania Emergency Management Agency (PEMA). Pennsylvania has two leading statewide GI/GIT coordinating groups, the Pennsylvania Geospatial Information Council (PAGIC) and the Pennsylvania Mapping and Geographic Information Consortium (PaMAGIC). PAGIC serves as the focal point for statewide GI/GIT activities in state government and was created in an effort to improve the sharing of GI, develop management approaches to data development and sharing, and develop partnerships with public and private sector organizations, including local, other state, and Federal agencies (www.pagic.state.pa.us). PaMAGIC was formed by individuals from public, private, and academic sectors. The group now has about 250 members and has evolved to be the leading voice of localities and private industry in GI/GIT matters (www.pamagic.org). As described above, the Bureau works with several entities to apply GIT to a variety of applications, including with the Susquehanna River Basin Commission and the Chesapeake Bay Commission. The Bureau also actively participates with PaMAGIC individually and through DCNR. In addition, the Chief of the Resource Planning and Information Section participates in several other organizations and committees such as the DCNR GIS Committee, the DCNR Bureau of Topologic and Geologic Survey's Advisory Committee for Mapping, and the Imagine PA State Mapping Subcommittee. Imagine PA is a coordinated effort among state agencies to update IT systems for accounting, budgeting, human resources, payroll, and procurement functions.

The Pennsylvania Spatial Data Access (PASDA) program at Pennsylvania State University's Environmental Resources Research Institute has the most comprehensive set of statewide data and metadata, and is the state GI clearinghouse (http://www.pasda.psu.edu/). Largely funded by DEP, it is a node on the National Spatial Data Infrastructure (NSDI) and the National Biological Information Infrastructure (NBII) with the U.S. Geological Survey for fisheries and aquatic resources data. It also is a primary member of the Geography Network. In addition, PASDA provides strong support for metadata generation and has focused on K-12 education and watershed information.