



Washington

1. Organizational Approach to GIT:

The Department of Natural Resources (DNR) (<http://www.wa.gov/dnr>) is the state forestry organization in Washington. DNR has been involved in forest mapping since the agency was created from seven separate boards and agencies in 1957. Today, GIT is highly institutionalized within DNR. All ten DNR divisions and seven regional offices throughout Washington use GIT. All offices are connected to the DNR's centralized GIS databases and use this technology in their daily land management and regulatory work. Technical expertise in photogrammetry, cartography, and GIS analysis exists in all divisions and regions. DNR currently has over 30 staff dedicated to GIS in its IT Division, and they are the only dedicated GIT personnel in the department. In addition, there are an estimated 300 casual or part-time GIS users out of DNR's 1300+ employees. The Resource Mapping Manager supports traditional mapping and orthophotography functions, while the GIS Manager provides database maintenance, application development, and analysis functions for GIT projects. GIS activities and projects have been concentrated on building and maintaining a statewide GIS database. DNR has no policy in place regarding GIT at present, but is developing a strategy to deploy GIT throughout the organization in addition to the IT Division.

A key issue for DNR has been determining the best approach and infrastructure to deploy GIT in the field and to ground level users, particularly due to varying individual program levels and requirements, and the various platforms available for each of them. It is necessary to understand the various software and hardware packages available in order to make intelligent and cost effective decisions on what technology fits in what programs and with what staff, particularly with diminishing financial resources. A growing challenge is determining the most appropriate and best mix of personal computers, laptops, GPS devices, and personal data assistants (PDAs); "network" configurations including the Internet and internal infrastructures; and the various software packages, from an increasing array of remote sensing packages to various general GIS and forestry GIS software products. An additional but key issue concerns effective and timely data management, such as determining what data are tracked and quality assured given that there will be multiple opportunities for individuals needing to change and interpret data over time.

2. GIT Applications and Data Utilized:

DNR is responsible for the management of approximately five million acres of forest, agricultural and aquatic trust land. This land is managed on a sustainable basis to provide income to support state institutions, and to provide professional, forward-looking stewardship of these lands. DNR also has regulatory responsibilities for fire control suppression, forest practices permitting, and geology and earth resources permitting and restoration.

DNR's Resource Mapping Program was established in 1957 to produce a wide range of geographic products to support both the land management and regulatory work of DNR. An aerial photography program was developed in the 1950s to provide photography (1:12,000 scale) to assist in the inventory of state trust lands. An additional mapping photography program (1:63,360 scale) was also initiated in the 1960s. The department's first GIS, GRIDS (Gridded Resource Inventory Data System), was developed in the early 1970s to replace its Forest Type Map Inventory System. The state trust land inventory was expanded into a public lands mapping program at this time, plus an orthophoto mapping program was initiated. This program began the development of both a statewide orthophoto data base, and digital topographic data. The unique aspect of the aerial photography and mapping programs that were established in the 1950s to the 1970s was that they were cooperative endeavors between DNR, other government agencies and the private sector. These programs provided geographic products of all state and private regulated lands.

In 1975, the legislature changed the forest tax laws from an ad-valorem tax, to a tax based on the productivity of the land. This created the need to inventory, map and classify the soils for all forestlands in the state of Washington. DNR acquired its first CAD based mapping system to accomplish this work, which resulted in the development of near statewide coverages for soils, forest productivity, public land survey net, county boundaries and administrative boundaries (national park, national forest, etc.) data. In the 1980s, DNR's GRIDS and CAD based systems were converted to a topologically based GIS system. Much of the 1980s was spent converting or developing the base data layers and forest inventory data for this modern day GIS. The development of a GIS based forest practices permitting system in the late 1980s resulted in the development of transportation and hydrography databases. Several additional GIS applications are in use today by DNR. These include forest **planning** and tracking systems, and **regulation** of **private** lands in accordance with the Washington Forest Practices Act; **fire** suppression and map creation using GPS data from ground crews and helicopters, and **recreation**, where GPS data is used for trail locations and creation of maps for public use. DNR also uses GIS on state lands for the **assessment** of sustainable harvest level calculations and for **forest characterization** inventory of 3 million acres of forest and agricultural land; forest road management systems; **forest health** surveying; **watershed** planning; **wildlife** habitat inventory and conservation planning; salmon recovery analysis; environmental analysis and **ecosystem** planning. GIS is also used for **other natural resource** applications such as geologic mapping, aquatic ownership and lease management, and natural heritage inventory, as well as the automation of DNR's mapping and map publication processes. In addition, several key layers, transportation, cadastral and hydrography are being converted to newer ESRI data formats.

DNR first started using satellite data over 20 years ago, and conducted a LANDSAT forest inventory of western Washington in the mid 1970s as an operational feasibility test, and evaluated LANDSAT data for monitoring forest harvest activities on **state lands**. DNR is currently exploring LIDAR, RADAR and the use of airborne GPS and Inertial Measurement Units (IMUs) to collect geographically referenced aerial photography. Cooperative projects with other state and local agencies in the near future will explore the use of multi-spectral imagery, as agencies begin to recognize the additional information available in the imagery.

3. Statewide and Other GIT Linkages:

Statewide GI/GIT coordination roles in Washington are shared by the Department of Information Services (DIS) (<http://www.wa.gov/dis/>) and the DNR (<http://www.wa.gov/dnr/>). Neither one has been specifically authorized to serve as the official lead for GI/GIT in the state, though DNR was designated by the Legislature as the lead state agency in state government to develop a "statewide base mapping system" in 1973.

The Washington State Geographic Information Council (WAGIC) has been the lead statewide GI/GIT voluntary group since it was created by the director of the Department of Information Services (DIS) in 1990 to serve as a policy and coordinating forum for GI/GIT in the state (<http://www.wa.gov/gic>). DNR has been an active participant in, and at one point chaired WAGIC, and also actively participates in several interagency data development projects. Other GIT coordination groups existed in the 1980s, but were essentially absorbed by the Council soon after it was formed. A current reorganization will bring WAGIC under an executive official level committee formed under the State Information Services Board. This move will raise the Council's organizational level from a technical working group to a state executive official management level. A recent effort was the creation of the Washington State Remote Sensing Consortium to help coordinate and increase the compatibility of related multi-spectral data acquisition and usage. Their first acquisition was the statewide coverage of geo-processed LANDSAT-7 imagery, now being delivered by EROS Data Center.

WAGIC, in partnership with the University of Washington's Library, College of Forest Resources, and Olympic Natural Resource Center, as well as the Washington Department of Information Services, have

been providing NSDI clearinghouse services, including the Washington State NSDI Clearinghouse Node since August of 1996 (<http://metadata.gis.washington.edu/>). The Center also maintains the Olympic Peninsula NSDI Clearinghouse Node that complements the statewide site by serving this region (<http://www.onrc.washington.edu/clearinghouse/>). Information for over a thousand spatial data resources is available through these services. The clearinghouse supports spatial data discovery, and data descriptions in-turn point to on-line or manual data access methods. Recent strategic planning discussions have included the desire to upgrade clearinghouse platform and to investigate ways to integrate with other evolving data access initiatives like the Salmon and Watershed Information Management (SWIM) web portal project.