

Wisconsin Department of Natural Resources 2008 Plan to Integrate Land Information

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I. EXECUTIVE SUMMARY

This plan is submitted by the Wisconsin Department of Natural Resources (WDNR). Preparation of this plan was coordinated and prepared by Bureau of Technology Services, GIS Services Section:

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WDNR is required by statute to provide an annual Plan to Integrate Land Information to the Wisconsin Department of Administration (WDOA). The WDNR 2008 Land Information Integration Plan follows the standard format called for by the DOA. An electronic (.pdf-format) version of this Plan can be accessed on the WDNR Internet website, at: <http://dnr.wi.gov/maps/gis/liip.html>.

Preparation of this plan was led by staff in the WDNR Bureau of Technology Services, GIS Services Section, with input from other WDNR program GIS application and data owners.

New Directions in Land Information-Related Initiatives at the WDNR

- **GIS Server Upgrades in the DNR/DET Shared Information Services (SIS) Environment** – In FY08 WDNR, working with WDOA’s Division of Enterprise Technology (DET), successfully upgraded WDNR’s GIS server software (ArcSDE, ArcIMS, ArcGIS Server and related components in Development, User Acceptance/Test and Production environments) to version 9.2. This was the first major upgrade of GIS server software since completion of the comprehensive migration of all server-based technology used by WDNR programs to the DET SIS environment in FY07. Transitions in WDNR GIS server infrastructure architecture and services are expected to continue during FY08 and FY09 as the agency optimizes use of the new SIS environment.
- **Establishment of a DNR/DET SIS Research & Development GIS Environment** –At WDNR’s request, DET provided a virtualized R&D GIS server environment during the first half of FY08 to test GIS server software upgrades from version 9.1 to 9.2. Use of the R&D environment to practice upgrade procedures helped minimize disruptions to ongoing GIS activities in WDNR’s Development, User Acceptance and Production server environments during the 9.2 upgrade. Because the R&D GIS server environment utilized temporary ESRI software licenses, it was discontinued in mid-FY08. WDNR has identified several initiatives involving new GIS database and server functionality at version 9.2 and soon-to-be-released version 9.3 for which continued use of an R&D environment would be very useful, provided that the necessary software licenses and server hardware can once again become available through WDOA/DET services.
- **Office of the Information Geographic Information Officer (OGIO), and Wisconsin Enterprise GIS Services** Following the appointment of a new state Geographic Information Officer (GIO) in mid-FY08, WDNR staff are participating in discussions and planning to expand enterprise-level geospatial support services to all collaborating agencies within Wisconsin State Government. DNR is a partner in inter-agency efforts to reach agreement on an enterprise licensing agreement for ESRI GIS software and services, establish a statewide Wisconsin GIS Coordinating Council (WIGICC), participate in the State Agency GIS Council (SAGIC), and to advocate for establishment of an enterprise R&D GIS server environment. The extent of FY09 efforts and resource allocations by WDNR towards OGIO, WIGICC and SAGIC activities will depend on availability of WDNR resources, and work plan agreements made between WDOA and WDNR.
- **Transition to Geodatabase from GIS File-Based Formats** – In FY08 WDNR/BTS staff completed the loading of statewide 2005 National Agricultural Imagery Program (NAIP) digital aerial photography into ArcSDE. Use of geospatial imagery in an ArcSDE raster geodatabase rather than in compressed file formats provides substantially improved image quality, performance, and server stability. WDNR plans to load additional statewide geospatial imagery into ArcSDE in FY08 and FY09 for use by WDNR web mapping applications and staff using desktop GIS software. This will be a major step towards achieving the agency’s strategic transition from use of GIS file-based formats to ArcSDE geodatabases.
- **Sunsetting of ArcView 3.x and Deployment of ArcWorks** – ArcView version 3.x is desktop GIS software which has been widely used at WDNR for many years. DNRview is a custom WDNR-produced extension for ArcView 3.x which many staff have found helpful for finding and using DNR geospatial data. ESRI has designated ArcView 3.x as being in “mature” support, and users are strongly recommended to actively migrate their applications to ArcGIS version 9.x. ArcView 3.x is also used by many other government units within Wisconsin and the federal government, all of whom must face the eventuality that the software will no longer work with future hardware and

software, and must be replaced. WDNR/BTS has advised staff that ArcView 3.x will become a “sunset” technology as of July 2008. During FY08, WDNR/BTS is providing information and guidance to help staff migrate from ArcView 3.x to ArcGIS 9.x. To assist with this transition, BTS/GIS has developed ArcWorks, a custom extension for use with ArcGIS 9.x which includes many of the functions provided by DNRview. ArcWorks is designed to improve efficiency in creating quality GIS products, and will serve as a platform for releasing new tools in the future. During FY09, BTS/GIS staff will continue to work with staff to facilitate the transition to ArcGIS 9.x with ArcWorks. GIS Services staff also plans to evaluate alternative desktop GIS solutions which can help meet user needs.

- **GIS Infrastructure Services and Cost Recovery in WDNR/BTS** – During FY08, funding for a major portion of GIS Services Section’s infrastructure support continued to be resourced through an agency-wide cost-recovery process. Depending on available staff resources, in FY09 the GIS Services Section may further pursue cooperative project work from external agencies and partners.
- **GIS Data Sharing** – WDNR/BTS GIS Services continues to review its GIS data access activities, and to streamline and improve efficiencies in data sharing. BTS/GIS continues to seek to investigate and implement new ways to make the WDNR’s core GIS Data Repository content available to customers, partners and the public via Internet web services.
- **GIS Data Development** – FY08 WDNR/BTS GIS data development-related activity accomplishments were less than anticipated, primarily due to staff resource vacancies that occurred during the year. Nevertheless, GIS Services staff achieved some significant improvements in the agency’s geospatial data infrastructure. These activities included the acquisition and conversion of digital orthophotography to standardized formats; development of tools to support Global Positioning System (GPS) data collection; and improvement of several core GIS Data Repository data sets. The current state budget situation and the hiring freeze on some positions in WDNR during the remainder of FY08 and into FY09 may impact our future progress in these activities.
- **Wisconsin Forest Inventory & Reporting System (WisFIRS)** – WisFIRS is a web-based, integrated system featuring ArcGIS Server technology, which will allow foresters to visually track and report on a variety of forestry practices. WisFIRS will enable foresters to store data collected in the field, plan and track completed forest management practices (e.g. timber sales), report accomplishments, calculate the financial aspects of the programs (e.g. millions of dollars collected and dispersed to towns and counties), and track Managed Forest Law lands open for such activities as hunting and recreation. WisFIRS will serve hundreds of DNR staff and our partners (county forests and cooperating foresters). WisFIRS is being implemented in a series of releases that are being delivered to its users in a step-by-step manner. The First release (Release 1) went into production on June 4, 2007, and focused on forest stands, treatments and planning on state and county lands.

II. THE FIVE TECHNOLOGY ARCHITECTURES

A. Applications Architecture

A.1. Identify and characterize the major applications which incorporate land information or GIS/LIS.

➤ **Web Mapping Services Overview**

Over the past several years, additional new WDNR web mapping applications have been developed and can be accessed on the agency’s Intranet and Internet websites. The demand for web mapping applications continues to grow as GIS and land information technology are increasingly utilized by a broad range of internal and external customers.

The following WDNR web mapping services can be accessed via the “List of GIS Interactive Web Applications” page on the WDNR Internet website: <http://dnr.wi.gov/maps/gis/applist.html> :

- **Air Monitoring Network (“WISARDS”):** <http://dnrmaps.wisconsin.gov/imf/imf.jsp?site=wisards>
- **Boat and Developed Shore Fishing Access Sites:** <http://dnr.wi.gov/org/land/facilities/boataccess/index.html>
- **Chronic Wasting Disease Status Maps:** http://dnrmaps.wisconsin.gov/imf/imf.jsp?site=cwd_imf
- **DNR-Managed Lands Interactive Web Mapping Tool:**
http://dnr.wi.gov/org/land/facilities/dnr_land_mapping.html
- **WDNR Bureau of Remediation & Redevelopment Sites Map:** <http://dnr.wi.gov/org/aw/rr/gis/>
- **DNR WebView – Online GIS Data Viewer:** Includes Digital Orthophoto Tracker, Geodata Download, and Digital Raster Graphics (scanned topographic maps) Download themes:
<http://dnr.wi.gov/maps/gis/appwebview.html>
- **GIS Registry of Closed Remediation Sites:** <http://dnrmaps.wisconsin.gov/imf/imf.jsp?site=brts.gisregistry>
- **Stewardship Grant Acquisitions:** <http://dnr.wi.gov/org/caer/cfa/LR/Stewardship/mapping.html>
- **Surface Water Data Viewer:** <http://dnrmaps.wisconsin.gov/imf/imf.jsp?site=SurfaceWaterViewer>
- **Watershed Management - Dam Safety:**
<http://dnrmaps.wisconsin.gov/imf/imf.jsp?site=SurfaceWaterViewer.damsafety>
- **Watershed Management - Floodplain Analysis Database:**
<http://dnrmaps.wisconsin.gov/imf/imf.jsp?site=SurfaceWaterViewer.floodplain>

➤ **Air Monitoring Network**

Wisconsin’s ambient air quality monitoring network provides the public with timely access to air quality information, supports planning for air quality improvements, and establishes a mechanism for program accountability. Our network focuses on EPA’s list of the most serious health-related air pollutants: ozone, particle pollution, sulfur dioxide, nitrogen dioxide, and carbon monoxide. Using continuous monitoring data, WDNR informs the public quickly when air pollution concentrations reach certain thresholds. Based on these notices, people sensitive to air pollution may adjust their daily activities to minimize adverse health effects.

➤ **Boat and Developed Shore Fishing Access**

The WDNR created a statewide inventory containing over 2,000 identified public boat access sites and over 100 developed shore fishing sites. Currently, approximately half these sites have been verified by WDNR staff and are available for viewing. We provide our inventory information visually through a mapping application and through a text listing by County.

➤ **Chronic Wasting Disease (CWD) Web Mapping Application**

WDNR’s Bureau of Wildlife Management sponsors the CWD web mapping application, which allows the public and WDNR staff to find up-to-date information on the status of the disease in Wisconsin. The application integrates ArcIMS, ArcSDE, and Oracle technologies to help meet a critical public information need.

➤ **Distributed GIS / DNRview Migration to ArcWorks**

DNRview consists of an ArcView3.x-based extension and associated components that help staff throughout the agency use desktop GIS technology to support their program business needs. Developed and supported by BTS/GIS Services, DNRview has been used successfully at WDNR for over eight years. To help DNR staff transition from ArcView 3.x to ArcGIS 9.x, GIS Services initiated a project to develop software components called “ArcWorks”. ArcWorks provides users of ArcGIS 9.x with the core data discovery and data loading functions provided by DNRview. In FY08 DNR ArcWorks version 1.0 was officially released and made available to agency staff. ArcWorks is designed to improve efficiency in creating quality GIS products, and will serve as a platform for releasing new desktop GIS tools in the future.

➤ **Forestry GIS**

Forestry GIS (fGIS) is compact desktop GIS software which includes tools for shapefile editing, digitizing and GIS data query. Designed for operational field managers such as foresters and wildlife biologists, fGIS is used to customize layered views including aerial photos and other imagery, draw map objects, query and search spatial data, annotate maps for printing, and much more.

- **Wisconsin Forest Inventory & Reporting System (WisFIRS)**
WisFIRS is a web-based, integrated system featuring ArcGIS Server technology, which will allow foresters to visually track and report on a variety of forestry practices. The initial WisFIRS release (Release 1) went into production on June 4, 2007, and focused on forest stands, treatments and planning on state and county lands. During FY08 and FY09 the Division will continue to work on the establishment of a mapping portal (Release 2) to capture spatial content (e.g., Forest Stands / Completed Treatments) and link that content to existing or new business records (e.g., Forest Stand Condition). This Forestry GIS portal intends to use a number of ancillary layers to help field foresters determine various boundaries for forest management activities.
- **Wisconsin Continuous Forest Inventory (CFI)**
WDNR is currently collaborating with the USDA Forest Service Forest Inventory and Analysis (FIA) Program to double the intensity of the annual forest inventory of all forest lands in Wisconsin. The goal is to modify an existing Forest Service Oracle database to store and analyze forest inventory data for state forests. The Spatial Intersection Tool allows users to spatially select FIA plots using ArcView selection tools or via a polygon layer (and optionally raster layers). Once selected, the plot IDs and optionally an attribute from the polygon layer are passed to the web interface (similar to WisFIRS desktop solution). The web interface then filters the data by the passed-IDs and all subsequent querying and reporting is done on the web.
- **GIS Registry of Closed Remediation Sites**
WDNR's Bureau of Remediation and Redevelopment (RR) sponsors this project, which provides Intranet and Internet access to information about closed sites with groundwater contamination remaining above chapter NR 140 enforcement standards. A goal of this project is to integrate the closed remediation site information with related information in the Bureau of Remediation & Redevelopment Tracking System (BRRTS) Oracle database.
- **Real Estate Program – DNR-Managed Lands Updates**
WDNR's Real Estate (RE) Program has implemented a transactional versioned ArcGIS/ArcSDE application which allows multiple users to simultaneously edit data within a geodatabase. This framework allows users to create versions of the geodatabase for different project "states", reconcile differences between versions, and update the master version of the geodatabase. The general public can then see all updates in real time mode via an ArcIMS mapping system: http://dnr.wi.gov/org/land/facilities/dnr_lands_mapping.html.
- **Surface Water Integration System (SWIS) Embeddable Locator Tool (eLT)**
The Embeddable Locator Tool (eLT) is a web based locational data editing tool developed as part of the SWIS initiative. This tool has been incorporated into seven applications in the Water Division to provide users with a better method for capturing water-related location information.
- **Source Water Assessment Program (SWAP) Mapping Applications**
WDNR's Bureau of Drinking Water and Ground Water (DG) worked with BTS to develop three internal DNR business applications to support the needs of the Source Water Assessment Program (SWAP):
 1. *The ArcView VA (Vulnerability Assessment) Tool* was developed to allow the SWAP staff to digitize potential contaminant sources.
 2. *The SWAP/VA Form* automatically creates a map of the site area to enable SWAP staff to complete SWAP Assessments as well as Vulnerability Assessments.
 3. *The Drinking Water Intranet Mapping Application* allows SWAP staff to quickly view wells, contaminant sources, and source water areas.
- **Surface Water Integrated Monitoring System (SWIMS) / Surface Water Assessment, Tracking and Electronic Reporting System (WATERS)**
SWIMS and WATERS are managed by WDNR's Water Division. SWIMS is a water monitoring data system which holds primarily surface water monitoring results and various program-related datasets including Rivers, Lakes and Nonpoint Source Grant data, Watershed and Fisheries station locations, sensitive area designations and aquatic invasive infestation sites.

The Water Assessment, Tracking and Electronic Reporting System (WATERS) is also a tabular/GIS integrated assessment database which supports watershed planning and implementation , as well as water quality reporting under the federal Clean Water Act. WATERS holds:

- Water Division Objectives, Goals, Performance Measures, and Success Stories
- Clean Water Act Use Designations and Classifications (NR102, NR104)
- Outstanding and Exceptional Resource Waters Designations (NR102)
- Clean Water Act assessment data, including decisions regarding a waterbody meeting its attainable use or whether or not the waterbody is considered "impaired"
- Fisheries Trout Classifications (Administrative Code, NR 1.02(7))
- Watershed Planning

- **Waterbody Assessment Display & Reporting System (WADRS) / Surface Water Integration System (SWIS)**
WADRS and SWIS are managed by WDNR's Water Division. SWIS has several components, including a geographic query interface which, in conjunction with the 1:24,000-scale Hydrography database, enables a set of common queries and analyses to be performed on any water-related data sets. SWIS is intended to provide the "framework" for integrating the department's water data, and tools for linking program data to the 1:24,000-scale Hydrography layer.

WADRS is an integrated assessment database currently under development to support implementation and reporting under the federal Clean Water Act. This database holds Clean Water Act Section 305b and 303d data, designated uses, codified uses, and other data describing the quality of Wisconsin's rivers, lakes, and Great Lakes shoreline.

- **Wetlands Digital Data Compilation using an Ortho-Rectified Base**
WDNR's Bureau of Watershed Management (WT) sponsors this project to re-compile wetland information onto digital orthophotography. A goal of this project is to modernize processes and improve data quality to create a statewide seamless digital Wetlands database.

A.2. Include a discussion of high-level and agency-wide land information integration efforts.

➤ **Data Management**

A major ongoing activity of BTS/GIS Services is to update, manage, and provide access to WDNR's GIS Data Repository. This centralized repository contains collections of standardized enterprise geographic framework data that support a wide range of business needs related to: resource management, compliance monitoring and enforcement, permitting, public health and safety; outdoor recreation; wildlife management, Smart Growth and Comprehensive Planning; and U.S. EPA and Forest Service activities. WDNR's enterprise geographic data management activities promote data integration and integrity within the agency, and provide WDNR staff, partners, and customers with reliable access to core GIS Data Repository contents, in standardized formats. The contents of the GIS Data Repository include framework geographic data, non-spatial tables containing attributes of geographic data, non-spatial reference tables containing standard codes and information used by multiple WDNR programs, metadata, supporting documents, and related materials.

The WDNR has undertaken a multi-year transition from agency use of file-based GIS data structures to ArcSDE geodatabases. Although most of the WDNR's core GIS data sets reside in ArcSDE and are accessed in ArcSDE by web mapping applications and desktop clients, many staff lacking a reliable network connection continues to rely on file-based GIS data sets (i.e., shapefiles and MrSID files).

In FY08 WDNR/BTS staff completed the loading of statewide 2005 National Agricultural Imagery Program (NAIP) digital aerial photography into ArcSDE. Use of geospatial imagery in an ArcSDE raster geodatabase rather than in compressed file formats provides substantially improved image quality, performance, and server stability. WDNR plans to load additional statewide geospatial imagery into ArcSDE in FY08 and FY09 for use by WDNR web mapping applications and staff using desktop GIS software.

Improving metadata consistency among various formats (i.e., ArcSDE geodatabases and shapefiles) of the same data sets is an ongoing goal for WDNR/BTS. In addition, WDNR is moving toward use of ArcSDE/Oracle feature classes as the source for several standardized code systems (e.g., water management unit codes, watershed codes) used within the agency. This will eliminate the need to maintain non-spatial code tables separately from ArcSDE feature classes.

➤ **Data Administration**

Reliance on ArcSDE by WDNR's GIS and Oracle users and applications continues to increase. Data administration for both non-spatial and geographic (spatial) data requires the development, implementation, and maintenance of core architecture components and related activities. Data Administration goals for FY08-09 include the research, development, and implementation of standards, policies, guidance, and best practices for new functionality available in ArcSDE version 9.2.

➤ **WDNR Land Use Team**

Several laws give the Wisconsin WDNR responsibility and authority to address land use issues. The agency is authorized to directly purchase and manage land for purposes of resource conservation, environmental protection, or recreation. Sections 30.26, 30.27, and 30.275, Wisconsin Statutes give WDNR the responsibility to preserve, protect, and enhance urban and wild and scenic rivers. Activities carried out under this chapter have land use implications. WDNR's Land Use Team integrates the agency's land use related policy activities, to ensure that all department actions promote and work toward the achievement of sound land use. For more information, see WDNR's Community Planning and Land Use Management web pages: <http://dnr.wi.gov/org/es/science/landuse/>.

WDNR is involved in a variety of planning efforts. Making the link between these state agency planning activities and local community planning efforts can enhance local resource stewardship and foster intergovernmental cooperation. Example activities include: Statewide Forest Planning, WDNR Property Master Planning, Land Legacy, Sewer Service Area Planning, Wellhead Protection Planning, Source Water Assessment, Wisconsin Statewide Comprehensive Outdoor Recreation Plan, Wisconsin State Trails Network Plan, Landfill Siting, Nonmetallic Mining Reclamation, and Metallic Mine Permitting.

Additionally, WDNR Land Use staff coordinates with the State Agency Resource Working Group (SARWG) to provide support for comprehensive planning. SARWG is comprised on many state agencies with an interest in the Comprehensive Planning Law sometimes referred to as "Smart Growth". The SARWG group conducts training, writes guidance and provides technical support for local units of government, their consultants and citizen planning groups.

A.3. Identify any major GIS/LIS application interfaces developed at the WDNR.

This information is provided in Section I.A.1.

A.4. Identify business needs which can benefit from the proposed Wisconsin Enterprise GIS capabilities. In particular, identify agency business needs for leveraging local governments' investment in Parcel Mapping and Parcel Attributes.

WDNR programs have a need for access to up-to-date, statewide framework GIS data in standardized formats and accompanied by data documentation (metadata). These framework GIS data sets include Administrative & Political Boundaries, Digital Orthophotos, Elevation, Land Cover, Land Ownership (parcels), Public Land Interests, Soils, and Transportation. Shared access to these framework data sets in a Wisconsin enterprise spatial data repository would be very helpful in meeting WDNR program business needs.

In specific regard to Land Parcel Mapping and Parcel Attribute data, in FY08 over 30 WDNR staff from more than a dozen programs completed the Wisconsin Land Information Association (WLIA) Parcel Task Force Survey. Responses from these and other agencies will be used to build the business case for an integrated statewide view of

parcel mapping, locally generated and maintained, and synthesized for statewide use; a WLIA report on this is forthcoming. As examples, the DNR Forestry, Remediation and Redevelopment and Wildlife Management programs could benefit greatly from access to statewide parcel attribute data.

The WDNR Wildlife Management's (WM) Chronic Wasting Disease (CWD) management involves land managers annually contacting landowners within certain CWD zones for purposes of information sharing and land access. WDNR/WM currently acquires the needed land ownership (parcel) data from individual counties, and integrates the varying county standards into one multi-county layer to meet this need. County restrictions on the use of these data limit WDNR's use of the data, and prohibit the WDNR from re-distributing the parcel data outside of the agency.

The WDNR Remediation and Redevelopment program oversees the investigation and cleanup of contaminated properties. As part of public notification, they maintain a map-based website of showing properties in Wisconsin which are or were contaminated. Due to the implications for property owners, staff may use county based web mapping systems showing parcel boundaries to assist them in accurately geo-locating a site.

The WDNR Forestry program's mission is to work in partnership to protect and sustainably manage Wisconsin's forest ecosystems to supply a wide range of ecological, economic and social benefits for present and future generations. As part of this mission, the Division is developing a web based application which will be used to help WDNR staff and our partners identify areas of the state where the planning and implementation of sustainable management activities are occurring on state, county and private properties. When working cooperatively with county partners our goal is to (whenever possible) integrate local data to ensure that field foresters are making informed decisions, and that any financial impacts on landowners (through programs such as the Managed Forest Law) are being associated with the proper land owners.

B. Information Architecture

B.1a Identify the major land information data sets, and the corresponding metadata, developed, enhanced, or currently used within your agency. Particularly, identify any land information for which your agency has assumed custodianship.

WDNR/BTS GIS Services manages an extensive GIS Data Repository to help meet the business needs of WDNR programs. The GIS Data Repository includes data obtained from data producers and partners outside of the agency, as well as data for which WDNR programs are the custodians. Additional information is posted on WDNR/BTS Internet web pages: <http://dnr.wi.gov/maps/gis/dataoverview.html>.

An ongoing task of WDNR/BTS is to develop and maintain metadata for the contents of the WDNR GIS Data Repository. As metadata becomes available, it accompanies requested data sets. Examples of these metadata are also accessible on the WDNR Internet site: <http://dnr.wi.gov/maps/gis/metadata.html>. In some cases, metadata describing WDNR program GIS data is also available on web pages maintained by the custodial WDNR program elsewhere on WDNR's website. The following is a description of land information for which WDNR has custodial responsibilities:

County Forests

The WDNR Division of Forestry (FR) is the custodian for the state's county forest GIS layer, which was created by extracting quarter-quarter sections from the 1:24,000-scale Landnet data layer. An ORACLE database identifies PLSS quarter-quarter-sections containing County Forests. Due to the fact that Fractional and Government lots are not identified by Quarter-Quarter section in the ORACLE database, it was not possible to include them in this layer. These excluded areas account for approximately 2% of the total County Forest areas. For additional information, contact:

Janel Pike, FR/4; Janel.Pike@Wisconsin.gov, 608.266.2050

Dams Inventory

The WDNR Bureau of Watershed Management (WT) is the custodian for the state's dam inventory, which is maintained in a state-wide relational database. For additional information contact:

Meg Galloway, WT/3; Meg.Galloway@Wisconsin.gov, 608.266.7014.

WDNR -Managed Lands

The WDNR Bureau of Facilities and Lands (LF) is the custodian for DNR-Managed Lands data. For more information, contact:

Jeffrey Walters, LF/6; Jeffrey.Walters@Wisconsin.gov, 608.264.8558.

Fire Occurrences

The WDNR Division of Forestry (FR) has been working on collecting the location of each fire occurrence as represented by a point at either, (1) the center of the "forty" (quarter-quarter section) in which the fire occurred, (2) the center of the section in which the fire occurred where the WDNR, Division of Forestry has primary fire suppression responsibilities. For additional information, contact:

Janel Pike, FR/4; Janel.Pike@Wisconsin.gov, 608.266.2050.

Forest Tax

The purpose of Wisconsin's forest tax laws is to encourage sustainable forestry on private lands by providing property tax incentives to landowners. For additional information, contact:

Janel Pike, FR/4; Janel.Pike@Wisconsin.gov, 608.266.2050.

Floodplain Zoning

The WDNR Bureau of Watershed Management (WT) is the custodian for the state's Floodplain Zoning data. For more information about floodplain and shoreland zoning data. For additional information, contact:

Amanda Schwoegler, WT/3; Amanda.Schwoegler@Wisconsin.gov, 608.267.2376.

Hydrography from 1:24,000 Scale Sources

A statewide 1:24,000-scale Hydrography GIS data layer was completed in 2001 as the result of a cooperative project initiated by WDNR. Version 6 of the 24K Hydrography layer was released in January 2008. Current plans are to release the next version of hydro in geodatabase format some time in FY09. WDNR is currently evaluating the federal National Hydrography Database (NHD), recently completed nationwide at 1:24,000 scale. WDNR continues to work with federal partners (USGS and USFS) to determine a long-term plan for maintaining a statewide hydrography layer for Wisconsin. Contact information and user documentation for this data layer is posted on the DNR website:

<http://dnr.wi.gov/maps/gis/datahydro.html>. For more information, contact:

Ann Schachte, DG/2; Ann.Schachte@Wisconsin.gov, 608.267.2301.

Landnet

BTS/GIS Service is the custodian for the Landnet geographic data layer, which is a representation of the Public Land Survey System (PLSS), automated primarily from sources compiled at 1:24,000 scale. Technical documentation for the 1:24K Landnet data set can be downloaded from the following DNR web page:

<http://dnr.wi.gov/maps/gis/datacd.html>. For additional information, contact:

John Laedlein, ET/1; John.Laedlein@Wisconsin.gov, 608.264.8914.

Natural Heritage Inventory

The WDNR Bureau of Endangered Resources (ER) Program plays a critical role in the development and maintenance of data on Wisconsin's rare resources. ER's Natural Heritage Inventory (NHI) program leads the Bureau's efforts to collect, store and interpret these data. For additional information, contact:

Julie Bleser, ER/4; Julie.Bleser@Wisconsin.gov, 608.266.7308

Recreational Trails

The WDNR Bureau of Parks and Recreation (PR) is the custodian for Recreational Trails data. WDNR/PR is in the process of updating locational information for state trails, but no statewide GIS data layer representing existing and proposed recreational trails in Wisconsin is available at this time. For information about the potential availability of Wisconsin recreational trails GIS data, or additional information, contact:

Brigit Brown, PR/6; Brigit.Brown@Wisconsin.gov, 608.266.2183.

State Natural Areas

The WDNR Bureau of Endangered Resources' State Natural Areas Program tracks and maintains a wide assortment of Natural Areas' data including management history, information on plant and animal species, rigorous baseline data, site inspection information, research and educational project data, acquisition information, and GIS project and site boundaries. For additional information about State Natural Area data, contact:

Dawn Hinebaugh, ER/6; Dawn.Hinebaugh@Wisconsin.gov, 608.266.5243

Wildlife Management

The WDNR Bureau of Wildlife Management (WM) is the custodian for several statewide data layers: Deer Management Units (DMUs), Bear Management Zones (BMZs), Turkey Management Zones (TMZs), and management units related to Chronic Wasting Disease (CWD). In addition, WDNR/WM also collects and maintains the statewide sampling results for CWD Deer Sampling data. For additional information, contact:

William Ceelen, ET/1; William.Ceelen@Wisconsin.gov, 608.267.7690.

Watersheds

The WDNR Statewide Watershed Boundary Geographic Data Layer was developed cooperatively by the DNR Bureau of Watershed Management and the GIS Services Section. The data custodian is the WDNR Bureau of Watershed Management (WT). For additional information about this data set, contact:

Jeff Kreider, WT/3; Jeff.Kreider@Wisconsin.gov, 608.266.0856.

WISCLAND Land Cover

The WISCLAND Land Cover data layer was the result of a 5-year work effort to interpret the state's land cover (primarily vegetation) from 1992-1993 satellite images. The WISCLAND data and documentation can be accessed on the BTS web pages: <http://dnr.wi.gov/maps/gis/datalandcover.html>. For additional information, contact:

John Laedlein, ET/8; John.Laedlein@Wisconsin.gov, 608.264.8914.

Wisconsin Wetland Inventory

The WDNR Bureau of Watershed Management (WT) is the custodian and sole distributor for the Digital Wisconsin Wetland Inventory (WWI) geographic data layer. WT has implemented a process using Orthomapper software to create digital orthophotos from the interpreted aerial photos, using existing digital orthophotography for control. During 2007, WWI data viewing was added to the Surface Water Data Viewer application for 60 Wisconsin Counties. For information about the distribution policy, license agreement, and data sharing fee structure for WWI data, contact:

Lois Simon, WT/4; Lois.Simon@Wisconsin.gov, 608.266.0756.

Other Geographic Data Managed by the WDNR Water Division

In addition to the major data sets described above, the WDNR Water Division has custodial responsibilities for several other water-related data. For information about potential points of contact for these data layers, refer to the DNR Water Division web pages: <http://dnr.wi.gov/environmentprotect/water.html>

- Contaminant Source Inventory (sources located inside delineated protection areas around public wells ONLY!)
- Designated Use Classifications
- Eurasian Water Milfoil sites
- Monitoring Stations (Watershed, Fisheries)
- Fish Contaminant/ Advisory sites
- Impaired waters (303d)

- Landspreading sites
- Outstanding and Exceptional Resource Waters (NR102)
- Sediment Contamination sites
- Subwatersheds (statewide, patchwork created for Non-Point Priority watershed project areas)
- Variance Waters (NR104)
- Waste Water Outfalls
- Water Quality Monitoring stations
- Waterway and Wetland Permits (Chapter 30)
- Wells – Private, public, and monitoring wells
- Wisconsin Wetlands Inventory
- Water Boundary Data – in 2007, newly delineated 12-digit Hydrologic Unit Codes were certified. HUC 10 digit and HUC 12 digit boundaries were also derived.
- Zebra Mussel infestation sites

Other Geospatial Data Managed by the WDNR Forestry Division

In addition to the data sets described above, the WDNR Forestry Division has custodial responsibilities for several other forest-related data, some of which are available for download from our website. For information about potential points of contact for these data layers, refer to the WDNR Forestry Division web pages:

<http://dnr.wi.gov/forestry/GIS/Data%5FMaps/data%5Fdownload/> .

- Dispatch Groups
- Fire Response Units
- Fire Protection Areas
- National Fire Danger Rating Fuel Model
- WDNR Lookout Towers
- Communities at Risk
- Spatial Analysis Project

Geospatial Data Available through WDNR Science Services and Research

As part of ongoing research to evaluate web-based and desktop tools to support comprehensive land use planning, natural resources management, and watershed planning, WDNR Science Services and Research have investigated and made available a suite of data resources. WDNR Forestry and Watershed Management have also participated in investigating these data resources:

- National Land Cover Data – 1992, 2001, 2001: % Impervious, 2001 % Canopy, 1992-2001 Change Product
- National Hydrologic Data Plus – Enhanced 100,000-scale NHD with catchments around every reach; land cover; temperature; precipitation attributes for water catchments, flow direction and flow accumulation grids.
- USDA National Agricultural Statistical Service Cropland Data Layer – 2006, 2007: derived from Indian Remote Sensing Satellite AWIFS, detailed agricultural land cover classes augmented with NLCD 2001 data.
- USGS NED 30m derivatives – statewide % Slope and Aspect Grids.

B.1b. Identify mechanisms of access or distribution of land information and metadata, e.g., via the Internet, WISCLINC, standard or custom CD-ROM products, FTP (file transfer protocol), zip file, etc.

- Metadata accessible on the WDNR website: <http://dnr.wi.gov/maps/gis/metadata.html>
- Standard data sharing DVDs: <http://dnr.wi.gov/maps/gis/dataacd.html>
- FTP (file transfer protocol) the ftp addresses to use to download GIS data from the DNR external ftp site is provided in the Data Distribution Section of the metadata files: <http://dnr.wi.gov/maps/gis/metadata.html>. The direct address for the external FTP site used for GIS data sharing is: <ftp://dnrftp01.wi.gov/geodata/>. Expanded use of FTP to provide access to DNR GIS data is possible in the future, depending on available resources.
- Internet Map Service-based data download: This is currently being provided through the Geodata Download theme in DNR WebView – Online GIS Data Viewer: <http://dnr.wi.gov/maps/gis/appwebview.html>
- BTS has provided copies of geospatial metadata to WISCLINC in the past, and will do so in the future as requested.

B.1c. Identify all major land information or metadata, if any, that your agency makes available through your agency web site(s), and any land information data or metadata your agency plans to make available later either through your agency web site(s) or through WISCLINC. Include a discussion of that land information necessary for local comprehensive planning under Wisconsin ss. 66.1001(2).

BTS GIS Services currently provides access to a variety of agency land information data through FTP, CD/DVD, the BTS/GIS web pages (<http://dnr.wi.gov/maps/gis/>), and through web mapping services such as WDNR WebView (see Section II.A.1).

B.1d. Identify any policies, content or technical standards your agency utilizes for the collection and use of land information or metadata.

- The WDNR’s “Locational Data Standards” are posted on the DNR Internet site: <http://dnr.wi.gov/maps/gis/location.html>
- WDNR also maintains the following documents for internal use: “ArcSDE User Guide” and “ArcSDE Database Objects: Naming and Structure Conventions”.
- Other documents intended to help WDNR programs collect locational data using Global Positioning Systems (GPS) technology can also be accessed on the BTS web pages (<http://dnr.wi.gov/maps/gis/>). Individual WDNR programs may develop their own procedures for data collection and use to meet their business needs.
- WDNR’s de facto standard for geographic metadata is the “Content Standards for Digital Geospatial Metadata” (CSDGM) of the U.S. Federal Geographic Data Committee; <http://www.fgdc.gov/metadata/contstan.html>. In cases where CSDGM metadata are not available from WDNR custodial programs, available informal documentation accompanies requested data.
- WDNR defined the de facto statewide coordinate system used by all state agencies, Wisconsin Transverse Mercator, based on the 1991 adjustment to the North American (Horizontal) Datum of 1983. This coordinate system, known as WTM83, NAD83 (1991), has been registered with the European Petroleum Survey Group, and is a standard part of the suite of ESRI ArcGIS products. See <http://www.dnr.state.wi.us/maps/gis/wtm8391.html> .

B.1e. Identify major land information that may relate to or depend upon other State Agency land information (from yours or another agency) for technical integration.

BTS GIS Services frequently shares requested land information with federal, state, and county or regional government agencies for purposes of technical integration. Commonly requested WDNR land information include those data cited in Section II.B.1c.

Individual WDNR programs may have technical relationships with other government agencies which involve integration of land information to meet programs' business needs. Information about these relationships can be obtained by contacting the responsible WDNR program directly (for contact information, refer to the listing of WDNR custodial data in Section II.B.1a, or to the WDNR Internet site: <http://dnr.wi.gov>).

A major example involves the WDNR Bureau of Drinking Water and Groundwater, which is the agency's lead program for Wisconsin's Source Water Assessment Program (SWAP). The overall goal of SWAP is to gather and utilize meaningful information to assist source water protection efforts and the overall drinking water program in the state. Existing information from numerous state and federal programs (i.e., locations of significant potential sources of contamination) are integrated with SWAP-collected data to produce information about public water susceptibility to contamination. For more information, contact:

Jeff Helmuth, Source Water Protection Team Leader, Bureau of Drinking Water and Groundwater, DG/2
Jeffrey.Helmuth@Wisconsin.gov, 608.266.5234.

B.1f. Identify and describe land information from outside sources, for which the agency has a need and requires access to carry out day-to-day responsibilities, functions and statutory requirements. Identify any barriers or obstacles to accessing such data. This may include federal, state, regional, local, tribal or municipal data. Include a discussion of the agency's intended use and application for such data.

BTS GIS Services seeks to obtain land information from sources outside WDNR needed to help agency programs meet their business requirements. BTS plays a key role in converting externally produced land information to standardized formats that facilitate integration with WDNR program data.

An ongoing obstacle is a lack of funding to acquire the data from producing agencies which view the sale of land information as a revenue source. BTS/GIS's ability to obtain these data from federal agencies, state agencies, regional planning commissions, tribal governments, and local units of government depends on data sharing or other inter-agency cooperative relationships. Federal agencies are currently preparing national level data sets (NRCS soils as an example) that can be distributed and used collectively by state agencies in the future. Further cooperation through the OGIO and related coordination groups should advance these efforts. In many cases, BTS has been successful in building inter-agency data sharing relationships as a means of obtaining needed data so that it can be made available throughout the WDNR and to partners and other customers. Information exchanges also take place between other WDNR programs and local governments. Examples of land information needed by WDNR and produced by outside sources include:

- **Digital Orthophotos (DOPs)**
- **Elevation**
- **Land Parcels**
- **Structures**
- **Soils**
- **Census Data**
- **Transportation Data**
- **Address Data / Centralized address geo-coding services**
- **Minor Civil Divisions (dynamically updated to reflect incorporations, etc.)**

At this time, the future level of resources available to BTS to support spatial data acquisition, conversion and management on behalf of the WDNR, its partners and customers, is unknown.

B.2. Identify the software used to develop and provide access to geospatial metadata (e.g., ArcCatalog, Spatial Metadata Management Software (SMMS), U.S. Geological Survey-developed tools,...). State whether the software generates metadata consistent with the FGDC Content Standard for Digital Geospatial Metadata, adopted by WLIP.

Software used to develop and provide access to geospatial metadata varies within WDNR, but include: ArcCatalog; Microsoft Word, and Notepad. BTS encourages WDNR programs to develop, maintain and provide access to geospatial metadata in a consistent form (i.e., CGDSM-compliant) regardless of the tools used.

B.3. For any metadata or land information on the agency's web site(s), please provide the title, Internet URL's, which include the CSDGM abstract, and the purpose. For metadata not accessible via the agency's web site(s) or Internet, please provide a list of all major metadata and the access method that is or would be applied for outside-agency use.

Metadata for much of the WDNR GIS Repository data can be accessed on the DNR Internet site: <http://dnr.wi.gov/maps/gis/metadata.html> .

In many cases, metadata describing WDNR program geospatial data is available elsewhere on the WDNR website, on web pages maintained by the custodial WDNR program. A large quantity of WDNR metadata for natural resources-related information has also been entered into the Wisconsin EcoAtlas (<http://ecoatlas.wiatri.net>) as part of the Aquatic and Terrestrial Resources Inventory (ATRI). Refer to Section II.A.1.d for ATRI contact information.

B.4. Identify the agency's plans for future metadata collection and maintenance.

BTS will continue to promote metadata collection and consistency. BTS seeks to standardize use of ArcCatalog for metadata authoring, update, management and access. Depending on available resources, BTS also intends to use ArcIMS Metadata Services to provide broader access to agency geospatial metadata in the future.

The Aquatic and Terrestrial Resources Inventory (ATRI) will continue to work with data custodians to create and collect metadata for natural resources related information. These metadata are inventoried and updated through the ATRI Wisconsin EcoAtlas.

WDNR is committed to promoting and populating the Ramona GIS inventory system. Metadata from Ramona can also be harvested by the Wisconsin Land Information Clearinghouse and Geospatial One Stop. <http://wi.gisinventory.net/> . For more information related to Ramona GIS Inventory System, see: <http://www.nsgic.org/blog/labels/ramona.html> .

C. Technology Architecture

Address the agency's approach to GIS technology implementation and include a discussion of the agency's vision of future technology architecture, software purchases and upgrades. Include a discussion of Enterprise-standard GIS/LIS workstation/desktop software, and related software.

WDNR's GIS technology architecture provides the foundation that supports land information development and use throughout the agency. The Department's vision of technology architecture for GIS implementation provides for:

- Multi-tier levels of functionality and capability appropriate for staff needs.
- More web-based and distributed architecture.
- User-authentication capability, to grant levels of use and access permissions.
- Expanded ability to access geographic data and functions with a variety of interfaces, including GIS clients, web browsers and other lightweight clients.
- Acceptable performance serving large GIS data sets and digital map data to the standard desktop.
- Enterprise database serving and management to enable staff access to current data from remote locations.
- Adequate performance when linking GIS data with Oracle data tables from the standard desktop.
- Improved data management options which implement effective transactional update capabilities for geographic and related data.

DNR Strategic Planning for Technology Services and Infrastructure & Architecture

Following the Shared Information Services (SIS) migration during 2006-2007, WDNR's server-based IT resources are now substantially managed by the WDOA Division of Enterprise Technology (DET). This has effectively resulted in the outsourcing of most of the networking and server components of the agency's architecture to an enterprise oriented services. These operational changes have required WDNR to comply with policies and procedures set for the state enterprise by DET, as well as relinquishing considerable control over its capacity to change the architecture to meet its business needs. A new Technology Discovery Framework process to identify and evaluate future technologies use within the agency is also under development.

During the past year, BTS's Technology Services Section (TSS) has been further realigned to provide increased network support coordination and productivity response support to agency staff, and served as intermediary on technical problem resolution activities that relate to enterprise server and network performance capabilities. The role of the BTS Infrastructure & Architecture Section (I&AS) has continued to become increasingly important as the agency moves from individual technology solutions to "architected" solutions designed to be stable and improve the technology infrastructure of the state enterprise. This will require I&AS - in conjunction with the other sections of BTS and WDNR programs - to continue providing leadership in defining technology directions and standards for the agency that will enable the WDNR to maximize the capacity of IT to satisfy its business needs within the restrictions imposed by reliance on a state enterprise architecture. This will be accomplished based on strategic initiatives already started that include realignment of staff and other resources, and in close cooperation with and integration of the architecture standards defined by DET. Likewise, within these standards, I&A will continue to work with DET to achieve implementation of any changes in the enterprise architecture needed to meet WDNR's IT requirements.

Within BTS, the I&A Section will align itself closely with the Systems Development Framework of the Systems Services Section and with the Technical Services section in its new roles and responsibilities. It also will integrate the GIS activities of the agency and enterprise GIS resources into WDNR's architecture and support processes.

Standard GIS/LIS Workstation/Desktop Software.

Professional desktop GIS software consist of the ESRI products ArcInfo Workstation and ArcView. ArcInfo Workstation users were successfully upgraded to ArcGIS 9.2 in the Spring months of 2007. ArcView users may continue to use ArcView 3.x, but that software is scheduled for sunseting (anticipated end-of-use) and will no longer be supported by WDNR as a standard software tool as FY09 begins. Many agency users of Arcview 3.x will be upgraded to desktop ArcGIS 9.2, or will transition to alternative web-based GIS tools such as ArcExplorer.

GIS Server-based Software

1. **ArcSDE** - ESRI Spatial Database Engine (ArcSDE) is WDNR's enterprise geographic data service. Following the WDNR SIS migration, WDNR currently runs ArcSDE on Windows blade servers, with links to the Oracle 9i database on Unix servers. Separate "development", "user acceptance test" (UAT) and "production" SDE/Oracle database instances are maintained. WDNR upgraded to ArcSDE version 9.2 during the winter months of 2007-2008. Upgrade to Oracle 10g is planned for early in FY09.

2. **ArcIMS** - ESRI ArcIMS Internet map serving software is used for new web mapping application development. ArcIMS utilizes SDE for geospatial data serving. The standard clients for ArcIMS have been desktop web browsers. WDNR will continue researching the utility of using standard desktop GIS software as clients to the ArcIMS server. WDNR upgraded to ArcIMS version 9.2 during the winter months of 2007-2008.
3. **ArcGIS Server (AGS)** - ESRI ArcGIS Server is a GIS enterprise application server that provides geospatial analysis and mapping capabilities throughout the organization while maintaining centralized data management and application support.
4. **Upgrades** - All WDNR server-based ESRI software was successfully upgraded from version 9.1 to version 9.2 during the winter months of 2007-2008. Upgrade to version 9.3 is expected in FY09.

Address Geo-coding software

Centrus address geo-coding software (a product of Pitney-Bowes Group 1 Technologies) is used for address standardization and geo-coding.

Image processing/remote sensing tools

1. **GeoExpress** - This software (a product of LizardTech, Inc.) is used for scanned airphoto mosaicking, compression, and re-projection. Digital orthophotos in Multi-Resolution Seamless Image Database (MrSID) compressed image format are used extensively by WDNR staff using desktop GIS software.
2. **OrthoMapper** - This software (a product of Image Processing Software, Inc.) is used for soft-copy photogrammetry by the WDNR Wetlands Inventory program.
3. **ERDAS** - Some limited use of ERDAS Imagine software is applied to remote sensing image interpretation and conversion.

GPS (Global Positioning Systems) tools

BTS/GIS Services continues to promote the effective use and integration of field data collection, global positioning systems (GPS) and other devices into the technology infrastructure. Trimble Pathfinder GPS desktop software is used for post-processing and analysis. Staff training and enhanced technical consulting support services have been provided to WDNR programs during the last year. Basic information about GPS tools and technology can be accessed on the BTS GPS web page: <http://dnr.wi.gov/maps/gis/gps.html>. BTS/GIS has developed additional tools such as the WDNR Garmin GPS Tool, which allow WDNR staff to upload and download GPS data in WTM coordinates. BTS intends to continue to support agency development and use of mobile GPS tools as WDNR program user requirements for this technology continue to grow.

Large-format plotting/other output capabilities tools

Hewlett-Packard large format roll-feed plotters and various color laser printers are in use.

Metadata-collection tools

This information is provided in Section B.1f.2 .

D. Organizational Architecture

D.1 Identify the Agency's plans for GIS/LIS training and include a discussion of any specific GIS/LIS-related training activities you wish to see offered for State employees.

GIS training-related issues and trends at WDNR include:

- A need for more affordable GIS training.
- A need for GIS instructors from ESRI and other geospatial technology vendor training services.
- Use of Wisconsin WDNR land information as part of the training.
- Requests from WDNR staff for GIS training that is customized to meet their specific business needs.
- Staff who do receive training often do not have an opportunity to use it in a timely manner to retain skills learned.
- Staff are making increasing use of on-line or computer-based training.

Other prospects for GIS training for WDNR staff are unknown at this time. The BTS I&A section has strategic plans for including a Technology Learning Architect position to assist in identifying training needs and options within WDNR.

D.2 Describe any formal or informal land information sharing or development agreements your agency currently supports or is a party to (e.g., Memoranda of Understanding/Agreement, other cooperative agreements, consortia agreements, etc.). Include a description of potential partners and mutual projects of this nature, which your agency either plans to pursue or would be interested in pursuing.

Formal Data Sharing Agreements & Consortia:

- Memorandum of Agreement between WDNR, the Wisconsin Department of Transportation, and Wisconsin Power and Light: "Natural Resource Regulatory Permitting & Information"
- 1999 Memorandum of Agreement between WDNR and the Department of Administration "to ensure optimal accuracy of Geographic Information Systems (GIS) data between the agencies and to develop procedures for resolving errors in data".
- Agreements between WDNR and various Counties in which WDNR acknowledges restrictions that the Counties have placed upon their digital orthophotography or other data products.
- Agreements between the WDNR Bureau of Wildlife Management or the WDNR Bureau for Remediation and Development, and various Counties for land ownership (parcel) data.
- WISCLAND (the Wisconsin Initiative for Statewide Cooperation on Landscape Analysis and Data, a partnership of public and private organizations seeking to facilitate landscape GIS data development and analysis). Although the WISCLAND consortium has been largely inactive since completion of the statewide Land Cover data set several years ago, WISCLAND remains a potential mechanism for cooperative inter-agency GIS/LIS data development or improvement.
- During 2001, a Cooperative Technical Partners Memorandum of Agreement between WDNR and the Federal Emergency Management Agency (FEMA) for Digital Flood Insurance Map data was initiated.
- In 2005, the WDNR became a participant in the WisconsinView consortium: <http://www.wisconsinview.org/>. WisconsinView is one of several "StateView" members of AmericaView, a nationwide program that focuses on remote sensing and related geospatial technologies in support of applied research, K-16 education, workforce development, and technology transfer.

Cooperative & Collaborative Arrangements:

The DNR BTS and GIS Services Sections maintain informal data sharing arrangements with:

- Federal Agencies: These include the USGS, USDA/NRCS, US EPA, US Park Service, and the USFWS.
- State Agencies: These include the Wisconsin Departments of: Administration; Agriculture, Trade and Consumer Protection; Emergency Management; Health and Family Services; Public Service Commission; Transportation.
- Departments & Programs of the University of Wisconsin System: These include the UW-Madison Department of Forestry; UW Land Information and Computer Graphics Facility; UW Environmental Remote Sensing Center (ERSC); UW-Milwaukee American Geographical Society Collection; Wisconsin Geological & Natural History Survey
- Wisconsin Regional Planning Commissions
- The Wisconsin State Cartographer's Office

DNR is an active participant in interagency and intergovernmental data sharing and standards development efforts.

Groups in which DNR participates and intends to continue to pursue GIS/LIS integration and cooperation include:

- Wisconsin Land Information Program: WDNR is an active participant in the activities of the Wisconsin Land Council, and the Wisconsin Land Information Association (WLIA).
- WLIA Workgroups: WDNR actively participates in the Digital Elevation Task Force and Wisconsin County Coordinate Systems Task Force of WLIA.
- WISCLAND: WDNR was a co-founder, active participant, and supporter of WISCLAND (the Wisconsin Initiative for Statewide Cooperation on Landscape Analysis and Data), a partnership of public and private organizations seeking to facilitate landscape GIS data development and analysis. WISCLAND is currently inactive.
- USGS/FGDC: Potential participant in standards and framework data development for metadata and transportation data models, and geodetic, cadastral, and transportation framework data for the National Spatial Data Infrastructure (NSDI).
- Wisconsin State Agency Geographic Information Coordination Group (SAGIC): Interagency GIS coordination meetings and common interest activities, fostering cooperative efforts and knowledge sharing.
<http://gis.wi.gov/section.asp?linkid=1179&locid=121>
- Wisconsin Geographic Information Coordination Council (WiGICC): Creation of a Wisconsin Geographic Information Coordination Council (WiGICC) provides a new opportunity for geographic information governance and sharing. WDNR GIS has participated in the WiGICC planning team efforts during 2007-2008, and will continue to support this important activity into the future.
<http://www.sco.wisc.edu/wigicc/>

WDNR's Division of Forestry participates in a Wisconsin partnership that developed the Landtype Association (LTA) layer of the National Hierarchical Framework of Ecological Units (NHFEU) for the entire state.

Given the Natural Heritage Inventory exemption from the Wisconsin Open Records Law, the program is only able to share specific locational information through data sharing agreements, such as Cooperative Agreements and License Agreements. The Heritage Program currently averages 20-30 active agreements with various state, local, and federal government agencies as well as limited agreements with several state utility companies.

Interagency workshops are conducted regularly for planners from local units of government, consulting firms and citizen planners to impart information on data and resources important for completion of comprehensive plans from each respective agency. Participating agencies include: WDNR, WDATCP, WDOT, WDOR, PSC, WNHS, UW-LICGF. The list of participating agencies continues to grow.

D.3 Identify any internal agency GIS/LIS-related groups.

- WDNR/BTS staff participate in bi-monthly WDNR GIS User Group Meetings in cooperation with other WDNR programs active in GIS/LIS. An annual Wisconsin DNR GIS Day of activities was renewed during November 2007, and is again being planned for November 2008.
- WDNR Regional GIS User Groups meet periodically.
- The WDNR Land Use Team provides access to land use-related publications and other information about WDNR activities with land use implications: <http://dnr.wi.gov/org/es/science/landuse/plan/pubs.htm> .

D.4 Identify any other organizational needs you anticipate.

- There is an ongoing need to align GIS/LIS and Information Technology budgets with agency business requirements; the information provided in the Land Information Plans should be used to re-prioritize land information funds to accomplish this alignment across State Agencies.

E. Security Architecture

E.1 Provide any policy or statutory provisions related to privacy, cost recovery, liability, legal disclaimers, copyright or licensing related of land information, mapping, data distribution, usage, and the Internet. Address any open records laws issues that relate to the data distribution needs of the agency.

- WDNR reviews and maintains its overall IT security model, including security components related to its Oracle databases (including SDE) and application development and deployment procedures. As WDNR develops more Internet-based applications, including those that allow external update of internal databases, its security model must take additional steps to protect data from unauthorized access and use.
- BTS is also increasing its security resource staff to play a more active role in security coordination, implementation and enforcement, and will increase the number of staff working on security issues under current plans.
- A 2004 WDOA Draft Information Classification Standard established security categories for Wisconsin information assets and information systems. This standard is adapted from the ‘Standards for Security Categorization of Federal Information and Information Systems’ (FIPS PUB 199) published by the National Institute of Standards and Technology (NIST) in December 2003.
- The draft standard identified the need for Wisconsin state agencies to review and classify the confidentiality, integrity and access requirements for data and applications. Security categories assigned to information assets and information systems are to be used in conjunction with risk assessment information to ensure the implementation of appropriate security controls to protect those assets. If implemented, this standard would be a major component of a future architecture that would apply to GIS and other IT functions at the DNR.
- WDNR is continuously evaluating and addressing “Homeland Security” concerns as new data sets and applications are built or existing ones are enhanced.
- WDNR complies with the Open Records Law when handling requests for data and applications, including those involving land information. Depending on the context, WDNR uses various disclaimers to notify users of appropriate uses of and support for requested data and applications. The legislature has granted Open Records Law exemptions to certain WDNR that manage environmentally sensitive information, such as the Natural Heritage Inventory of rare and endangered species, and the Wisconsin Wetlands Inventory. Under

these exemptions, the custodial program may be allowed to restrict access to certain information, or to charge fees.

- WDNR adheres to all legal and other requirements for computer matching of personally identifiable information; Act 88 “opt out” related to facility contacts, recreational licenses, park vehicle admissions, and boat, ATV, and snowmobile registrations; and other applicable state and federal laws and rules designed to protect the privacy of individuals and the habitats of endangered species.
- WDNR employs standard database administration practices, through the use of virus-checking software, password-protected logins, and establishment of an Internet firewall, to establish secure systems as appropriate.
- WDNR/BTS GIS Services includes a statement of legal information with all BTS distributions of WDNR geographic data to requesters outside of the agency. The legal information statement was downloaded from the following DNR Internet Legal Notices web page: <http://dnr.wi.gov/org/legal/>.