

DATCP 2006

Land Information Modernization and Integration Plan



Wisconsin Department of Agriculture,
Trade & Consumer Protection

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DATCP 2006 Land Information Modernization & Integration Plan

I. EXECUTIVE SUMMARY

The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) has a statutory requirement (Wis. Stat. Sec. 16.967(6)) to provide the Wisconsin Department of Administration with an annual plan that describes its land information modernization and integration activities. This plan includes activities within DATCP, as well as coordination of land information modernization and integration initiatives with external partners. This plan is considered an appendix to the DATCP information technology (IT) plan.

Many DATCP programs collect, use, maintain, and share land information in a variety of formats. In 2005, DATCP implemented a centralized geographic information system (GIS) infrastructure that supports a shared, agency-wide GIS data repository and interactive web mapping applications. Programs are currently migrating existing GIS data and applications to the new infrastructure. DATCP acquires GIS base layers and images (e.g., legislative districts, roads, air photos) from county, state, and federal agencies, the University of Wisconsin, and other sources. These data are loaded into the GIS data repository and are available to all DATCP programs.

Design, acquisition, funding, and management of shared DATCP GIS resources are coordinated by DATCP's Agency GIS Coordinator and GIS Technical Committee. The GIS Technical Committee is comprised of members from each division. Coordination of GIS resources on an agency level mirrors the move toward integration of tabular data and databases within the department. For example, the Application Management and Data Automation (AMANDA) system houses licenses and related data for several DATCP divisions. DATCP programs also develop and maintain other shared databases to facilitate program integration and efficiency.

DATCP programs fund their specific land information activities. The Animal Health and Agriculture Resources Management divisions have acquired dedicated GIS staff and resources to create and manage program-specific data and applications. These two divisions have also integrated GIS data, tools and applications into their program planning, communication, management, and evaluation activities. DATCP's other divisions (i.e., Food Safety, Agriculture Development, Management Services, and Trade and Consumer Protection) are actively investigating use of GIS technology to support their business needs. The federal Wisconsin Agricultural Statistics Service, a cooperative effort between the U.S. Department of Agriculture and DATCP, also uses GIS tools to produce data and perform statistical analyses to support its business needs.

DATCP representatives actively participate on many land information and GIS related committees and work groups, including advisory work groups for the Wisconsin Geographic Information Officer, Wisconsin Enterprise GIS, and Shared Information Services efforts. DATCP works with other federal, state, county, and local agencies, utilities, industry, interest groups, and private sector entities to coordinate activities and achieve common land information modernization and integration goals. In addition, DATCP will continue to be an active participant in existing and future initiatives, such as the Working Lands Initiative and Natural Resources Portfolio, which promote analysis of land use options to maximize agricultural, environmental and economic returns.

Preparation of this plan was coordinated by the Agency GIS Coordinator (see contact information below) with review by GIS Technical Committee members and others.

Lisa Morrison
Agency GIS Coordinator
DATCP
P.O. Box 8911
Madison, WI 53708-8911

Phone: (608) 224-4819
Lisa.Morrison@datcp.state.wi.us

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II. ARCHITECTURES

Many DATCP programs collect, use and maintain land information to support their daily and long-term planning, communication, management, implementation, and evaluation activities. DATCP recognizes the need to (1) consolidate and share land information among its programs and with external partners, (2) utilize GIS technology, and (3) pool program resources to support agency GIS activities in order to:

- ✓ Reduce duplication of effort
- ✓ Provide more accessible, useable, complete, accurate, and timely information
- ✓ Improve analyses, decision support, and administration

DATCP divisions are the custodians of their data and applications. When appropriate, the abbreviation of the custodial DATCP division (see table below) is listed after land information application and data set names.

Division	Abbreviation
Agriculture Development	AD
Agriculture Resources Management	ARM
Animal Health	AH
Food Safety	FS
Management Services	MS
Trade and Consumer Protection	TCP
Wisconsin Agriculture Statistics Service	WASS

A. Applications Architecture

Some DATCP applications incorporate GIS data and tools for analysis and mapping, while others rely on tabular databases, paper maps, and/or land information in other formats. Within DATCP applications, land information may use one or more of the following referencing systems:

- ✓ Addresses
- ✓ Public Land Survey System (PLSS)
- ✓ Parcels
- ✓ X-Y coordinate system
- ✓ Other

1. Major Applications

DATCP's land information applications are used to track, plan, implement, manage, communicate, enforce, and/or evaluate program activities. All DATCP desktop and web mapping GIS applications have a customized, program-specific interface. The following DATCP applications incorporate land information and/or GIS technology. Specific details (e.g., resource requirements, project timelines) about "Future Initiatives" still to be determined.

GIS Applications

- **Animal Disease Response (AH):** Desktop GIS applications and a secured ArcIMS web mapping applications use livestock premises registration data, AMANDA data, and other tabular and GIS data to identify and respond to serious diseases of domestic animals and livestock, and to protect humans from animal diseases. *Future Initiatives: Coordinate development of a GIS-based model for animal carcass disposal with Natural Resources Conservation Service (NRCS), Wisconsin DNR, and other partners. Develop desktop and/or ArcIMS GIS applications to track animal movement*

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between livestock premises. Acquire laptop, portable drive and printer for emergency backup purposes (i.e., in cases of internet failure). Statistically assess the accuracy of address geocoded premises locations and identify ways to improve accuracy using local GIS data.

- **Aquaculture Program (AH):** Desktop GIS applications use AMANDA data and other tabular and GIS data to track aquaculture activities within the state. Environmental permitting associated with aquaculture is coordinated with Wisconsin DNR. *Future Initiatives: Develop and implement standard data collection procedures to improve the accuracy of aquaculture activity locations across the state.*
- **Humane Officers and Offices (AH):** Desktop GIS applications use tabular and GIS data to track trained and certified animal humane officers and their office locations.
- **Johne's Risk Assessment Program (AH):** Desktop GIS application uses AMANDA and GIS data to map the progress of the vaccination program for the Wisconsin milking herd population.
- **Deer and Elk Farms (AH):** Desktop GIS applications use AMANDA data and other tabular and GIS data related to deer and elk farming activities. Chronic Wasting Disease (CWD) activities are coordinated with Wisconsin DNR. *Future Initiatives: Coordinate consolidation of deer and elk farm permitting and licensing databases, including improvement and integration of farm location data for GIS purposes.*
- **Agrichemicals in Groundwater (ARM):** Desktop GIS applications use tabular and GIS data related to pesticides and nitrate in Wisconsin's private drinking water wells and DATCP monitoring wells. *Future Initiatives: Develop desktop and/or ArcIMS GIS applications* activities are coordinated with the U.S. Fish and Wildlife Service, Wisconsin DNR, Nature Conservancy *to allow staff to analyze and integrate data from multiple sources for more efficient program management and resource protection.*
- **Pesticide Management Areas and Use Prohibition Areas (ARM):** Desktop GIS applications use tabular and GIS data related to pesticide management areas and pesticide use prohibition areas in Wisconsin.
- **Regulatory Compliance at Agrichemical Sites (ARM):** Desktop GIS applications use tabular and GIS data related to regulated agrichemical customers and sites where staff conducts sampling, inspections, investigations, licensing and other compliance activities. *Future Initiatives: Develop desktop and/or ArcIMS GIS applications to allow staff to analyze and integrate data from multiple sources for more efficient program management and resource protection.*
- **Lead Arsenate Program (ARM):** Creation of tabular and GIS data related to former orchard locations where lead arsenate concentrations in soil may pose a health hazard. Internal ArcIMS web mapping application is under development, and will provide information, pictures, and maps to DATCP staff. *Future Initiatives: Develop an internet ArcIMS application to provide the same lead arsenate information to the public and external partners.*
- **Endangered Species (ARM):** Desktop GIS applications use tabular and GIS data related to pesticide management plans for endangered species and their habitats. Staff works with landowners and managers to develop plans, which promote modified pesticide use and application methods or alternative pest control. Program, University of Wisconsin-Extension, and others.
- **Farmland Preservation Program (ARM):** Minimal use of GIS tools to (1) map jurisdictions with exclusive agricultural zoning (EAZ) ordinances and (2) map areas covered by existing Farmland Preservation Agreements and track eligibility for tax credits for individual agreements. The

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program collects data from towns and counties regarding rezones out of EAZ areas, and stores this information in a tabular database. EAZ areas are referenced to PLSS (usually down to ¼-¼ section), but these location data lack consistency and are unreliable. The program also assists counties in the certification of their Agricultural Preservation Plans, and municipalities with EAZ in the certification of their EAZ ordinances, and currently accepts paper maps to fulfill statutory obligations for submission. *Future Initiatives: Identify ways to collect county Farmland Preservation planning and EAZ data in a GIS format. Develop desktop and/or ArcIMS GIS applications that allow staff to examine and compare old and new plan and ordinance maps for consistency to meet statutory standards and to identify acres removed from agricultural preservation. Require new Farmland Preservation Agreement applicants and municipalities with rezoned properties to submit parcel descriptions in a prescribed GIS format. Develop an ArcIMS application to make information about parcels with rezone notices, building permits, and conditional use permits available via the web. Develop GIS applications that compare existing and historical land use, Agricultural Preservation plans, EAZ areas, and related data for program planning, management, and evaluation. Use GIS tools to identify parcel acreages - e.g., parcels that are less than 35 acres and, thus, not eligible for farmland preservation tax credits.*

- **Conservation Reserve Enhancement Program (ARM):** Desktop GIS applications use tabular, GIS and GPS data related to areas enrolled in CREP. The CREP program is authorized under the federal Farm Bill, and allows states to submit an application to enroll up to 100,000 acres of land into conservation easements with up to \$200 million in federal funds from the Commodity Credit Corporation (CCC). The Land Management section administers the state portion of the CREP. Staff populates a database that tracks 2,500 contracts, and the conversion, transfer, buyout, violation and any incidental activity related to those contracts. This database is linked to WISMART to produce incentive, cost share and staged payments to participants. Forms and reports are generated from the database and used for GIS applications.
- **Livestock Facility Siting (ARM):** The program creates and uses tabular data, GIS data, and desktop GIS applications to manage the implementation of the Livestock Facility Siting program, and to improve communication with all stakeholders, especially producers and local governments. In cooperation with DATCP, the University of Wisconsin Extension developed and hosts an ArcIMS application to communicate local conditional use permit requirements to stakeholders, especially producers and local governments.
- **Land and Water Resource Management Program (ARM):** Desktop GIS applications use tabular and GIS data related to implementation of county land and water resource management plans. Tabular and spatial data are used to track and report conservation practices cost-shared through the Soil and Water Resource Management (SWRM) grant program. ArcSDE spatial views are used to link "real-time" tabular data with spatial data.
- **Nurseries and Christmas Trees (ARM):** Desktop GIS applications use AMANDA data and other tabular, GIS and GPS data to plan and track inspections, and manage the program that certifies that Wisconsin's nursery stock and Christmas trees are free from pests and diseases prior to export out of the state. *Future Initiatives: Use GIS data and tools to help redefine nursery inspector areas based on nursery locations.*
- **Gypsy Moth Program (ARM):** Desktop GIS applications use tabular, GIS and GPS data to monitor and control gypsy moth occurrences in Wisconsin. The Gypsy Moth program uses GIS and GPS technology and applications to track gypsy moth movement in Wisconsin and to assist in accurate treatment. The program coordinates data collection and analyses with the U.S. Forest Service, federal Animal and Plant Health Inspection Service, Wisconsin DNR, and UW-Madison.
- **Pest Survey Program (ARM):** Desktop GIS applications use tabular, GIS and GPS data to help monitor regulated pests. Surveys are conducted to (1) identify incidences and severities of plant

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disease and pest outbreaks, (2) pest population levels and trends, and (3) discover new diseases or exotic pests.

- **Potato Rot Nematode Program (ARM):** Desktop GIS applications use tabular, GIS and GPS data to manage the program responsible for inspecting harvested potato crops for nematode infestations. Potatoes must be certified nematode free to be used for seed purposes. Inspections are conducted at fields going into seed production for the first time and at fields already infested.
- **Maps (AD, FS, TCP):** Desktop GIS applications used to create maps of address geocoded AMANDA data or other tabular data to support a variety of program business needs. Most of these maps are requested by DATCP divisions without dedicated GIS staff or resources. *Future Initiatives: Identify GIS data, tools, applications, and staff resources need to meet program business requirements.*
- **Wisconsin Agricultural Statistics Service (WASS):** WASS is a cooperative statistics service between the U.S. Department of Agriculture (USDA) and DATCP. WASS collects information about agricultural production from sample individuals across the state, and provides analyses related to a broad range of agricultural issues. WASS also performs special statistical surveys, analyses and consultation services related to agriculture, trade and consumer protection issues. USDA analyzes these data to produce nationwide estimates of agricultural production, inventories and prices. WASS publishes statistics by county or WASS districts. Statistical analyses for a variety of agricultural activities such as crop production, number of livestock, and milk production are published annually by county in *Agricultural Statistics*. In addition, WASS publishes special reports related to specific topics. For example, the *Pesticide Use Report* is published once every five years and contains information by WASS district about crop acres, pesticide and nutrient use, and pesticide application methods. WASS uses USDA GIS, remote sensing, and image processing tools to help in its data analyses and publication functions. WASS also produces a statewide raster Cropland Data Layer (CDL) which classifies crop and land cover from satellite imagery to augment statistical methods. *Future Initiatives: Identify ways to improve CDL classification and accuracy via collection of "ground truth" data and "smoothing" techniques, and use the CDL layer to update the WisLAND land cover layer.*

Non-GIS Land Information Applications

- **Landscape Application Program:** ARM division administers the Landscape Application Program, which collects data about pesticide applications to lawns and landscapes. ARM database collects and manages property addresses. *Future Initiative: Create desktop and/or ArcIMS applications that allow staff to identify affected parcels and more efficiently communicate pesticide application information to neighbors with adjacent or neighboring parcels.*
- **Drainage District Program:** DATCP requires every drainage district in Wisconsin to submit maps of drains and ditch profiles. Landowners are responsible for maintaining drains. ARM currently collects and stores these maps in paper format. *Future Initiative: Convert drainage district maps to GIS format and/or require submission in a standard GIS format, and create desktop and/or ArcIMS applications that allow staff to analyze data and more efficiently manage the program.*
- **Agricultural Impact Program:** ARM division prepares required agricultural impact statements on public projects and has custodial responsibilities for the final reports generated by its assessments. Currently, staff manually compile data and information using a variety of referencing systems (e.g., addresses, public land survey system, parcels) and sources (e.g., databases, reports, paper maps) to complete these assessments. *Future Initiative: Create a desktop or ArcIMS application that allows staff to integrate and analyze data more efficiently.*

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- **Food Safety Division:** FS division enforces Wisconsin's food safety laws to ensure that the public food supply is safe and wholesome. The program regulates the entire food chain, from points of production to points of retail sale and consumption. Program staff investigate licenses and deceptive food advertising and labeling practices, and inspect many types of food handling and distribution facilities such as dairy farms, food warehouses, retail food establishments, food-processing plants, egg producers, breweries, and bulk milk tankers. Most FS licensing and related data are entered into the AMANDA database. Registered livestock premises IDs are also entered into AMANDA for some FS licenses in order to integrate the license and livestock premises registration processes. *Future Initiatives: Create FS specific GIS data layers (e.g., specialist and inspector areas, AMANDA data), and an ArcIMS application that allows staff to integrate and analyze FS and other DATCP data more efficiently!*
- **Trade and Consumer Protection Division:** TCP division enforces major consumer protection laws, including those related to deceptive advertising, unfair business practices, weights and measures fraud, and consumer product safety. Staff investigates consumer complaints of possible law violations and administers compliance and enforcement programs, and sample products for suspected safety hazards to ensure consumer product safety. Some TCP licensing and related data are entered into the AMANDA database. *Future Initiatives: Create TCP specific GIS data layers (e.g., specialist and inspector areas, AMANDA data), and an ArcIMS application that allows staff to integrate and analyze TCP and other DATCP data more efficiently!*

2. Integration Efforts

DATCP has taken steps to integrate both its tabular land information and GIS-based data sets and applications.

- **AMANDA:** DATCP's AMANDA database integrates license and related data for several DATCP divisions. AMANDA contains shared people, property, and "account" information, and allows DATCP staff to identify multiple licenses and program activities associated with a person, business, or property. Livestock Premises IDs from the Livestock Premises Registration database have also been linked to relevant AMANDA properties (e.g., dairy producers) to allow synchronization of AMANDA license renewal and premises registration notification. *Future Initiatives: Further standardize AMANDA data across DATCP programs to facilitate data integration and GIS applications.*
- **ARM Case Tracking:** The ARM division has created a database system to track the division's regulated agrichemical customers, and the sites where staff conduct sampling, inspections, investigations, and other compliance activities.
- **Program Data Assessment and Integration Efforts:** Several other DATCP programs have identified the need to assess their data assets, standardize data collection procedures, improve existing data accuracy and completeness, and integrate data among programs, where possible. This will remain an on-going effort.
- **GIS Data Repository:** DATCP maintains a centralized ArcSDE/SQLServer GIS data repository of base layers, images, and program data. All DATCP staff with desktop GIS tools and/or access to web mapping applications can use this repository.
- **Shared Information Services:** As a state agency, DATCP participates in, and is influenced by, activities and decisions associated with DOA's Shared Information Services (SIS) initiative.
- **WEGIS Participation:** DATCP's Agency GIS Coordinator is a member of an advisory group for DOA's geographic information officer (GIO). The GIO is responsible for identifying GIS sharing

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and integration opportunities among state agencies, and defining core GIS services that will be provided as part of the SIS initiative.

- **Shared GIS Infrastructure with Partner Agencies:** DATCP is exploring ways to share its GIS infrastructure with other state agencies (e.g., Department of Health and Family Services) via hosting services until DOA's WEGIS infrastructure is available.
- **Successful Data Sharing:** Programs like CREP, which involve county, state and federal agency partners, are making significant progress in promoting data sharing among different levels of government.

3. Comprehensive Planning

To date, DATCP has not developed any specific GIS tools or interfaces to assist local governments, counties, and/or regional planning commissions with comprehensive planning activities. However, several DATCP program use comprehensive plan data (e.g., agricultural, natural resources, land use, and implementation).

DATCP will continue to be an active participant in existing and future initiatives, such as the Working Lands Initiative and Natural Resources Portfolio, which promote analysis of land use options to maximize agricultural, environmental and economic returns.

4. Business Needs for WEGIS

DATCP has several business needs which could benefit from proposed WEGIS data, services, tools, and applications. These benefits assume, however, that WEGIS resources (1) are delivered in a timely and efficient manner, (2) support agency business needs, and (3) are affordable for agencies.

- **Shared GIS Data Acquisition, Access, and Storage:** One of the most important benefits of WEGIS would be a centralized repository of "official" GIS base layers and images with enterprise-level data sharing arrangements. WEGIS would acquire/create and manage these data sets on behalf of the state agencies, thereby reducing duplication of effort and confusion about which data sets are "official" for conducting State of Wisconsin business. A WEGIS data repository would save thousands of hours of agency staff time each year.
- **Shared GIS Infrastructure:** WEGIS infrastructure shared among state agencies would provide DATCP with access to additional "environments" (e.g., R&D, development, user acceptance testing, production, transactional versus warehouse) than it cannot currently maintain itself. In addition, an enterprise-level ESRI software license agreement would save each agency thousands of dollars on GIS software acquisition and maintenance each year.
- **Shared GIS Services:** Availability of affordable, effective, centralized WEGIS data, services, tools, and applications would make GIS available to all state agencies. WEGIS services could also develop policies and standards to simplify GIS-related processes such as address geocoding, application development, map production, cost/benefit analyses, data exchange, etc...

5. Business Needs for Parcel Mapping and Attributes

Several DATCP programs have current or future business needs for local parcel data (see specific application descriptions above). In general, a statewide parcel GIS layer would help:

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- ✓ Improve accuracies of address geocodes derived from tabular databases (e.g., AMANDA)
- ✓ Facilitate program activities associated with specific landowners and/or properties
- ✓ Mapping of current zoning statuses for all parcels within the state
- ✓ Identify grant, cost-share, and/or tax credit eligibility for specific landowners
- ✓ Resolve land ownership for more effective program communication and implementation

B. Information Architecture

1. Major Land Information Data Sets

Major land information data sets created by DATCP programs are stored and managed in spreadsheets, tabular databases (e.g., AMANDA, ARM Case Tracking, program databases), maps, and/or various GIS formats (e.g., ArcSDE geodatabase, ArcGIS personal geodatabase, shapefile). DATCP divisions are custodians of the data they create, regardless of format, and are responsible for ensuring the quality and integrity of the data content.

- **AMANDA (AH, ARM, FS, TCP):** The AMANDA database integrates license and related data for several DATCP divisions. AMANDA contains shared people, property, and account information to allow staff to identify multiple licenses and program activities associated with a person, business, or property. DATCP creates AMANDA GIS data sets by geocoding property addresses or collecting coordinates using GPS.
- **Livestock Premises (AH):** DATCP generates a GIS data set of registered livestock premises locations and attributes based on address geocodes from the Wisconsin Livestock Identification Consortium (WLIC) Livestock Premises Registration database. Livestock premises data are confidential, and access is restricted by federal and state laws. The data can be used only for animal health related activities and only by individuals authorized by DATCP.
- **Humane Offices (AH):** Tabular and GIS data layer of certified animal humane officers and their office locations.
- **Private Drinking Water Wells (ARM):** Well information and sample results compiled from many different sources, such as DATCP sampling programs, Wisconsin DNR Groundwater Retrieval Network, other sampling initiatives by federal, state, and local governments, pesticide manufacturer studies, and UW system. In most cases, well coordinates are geocoded from PLSS centroids. The Wisconsin Unique Well Number (WUWN) links attribute data to GIS well points. Staff produce statewide GIS data layers and metadata for private wells tested for pesticides and nitrate. Refer to DNR Source Water Protection guidelines on restricting access to detailed spatial data (http://www.dnr.state.wi.us/org/es/science/publications/SS_988_2003.pdf)
- **Monitoring Wells (ARM):** ARM division maintains several networks of groundwater monitoring wells, and is the custodian for monitoring site and sample data for its projects. DATCP reports construction log data generated during well installation to DNR as required by statute.
- **Atrazine Use Prohibition Areas (ARM):** Tabular and GIS data sets of atrazine use prohibition areas in Wisconsin. Staff produces annual statewide data and GIS layers along with metadata of atrazine use prohibition areas digitized from USGS 1:24,000-scale topographic maps.
- **Agrichemical Sites (ARM):** Tabular and GIS data sets for regulated agrichemical customers and sites. Tracked sites include farms, greenhouses, spill areas, nurseries, feedlots, commercial businesses, parks airports, golf courses, residential properties, landfills and dumps, soil and groundwater remediation sites and others. Site locations are geocoded from addresses or PLSS descriptions. Field staff is currently collecting coordinates for actively licensed pesticide business locations, pesticide dealers, feed manufacturers and fertilizer manufacturers using GPS.

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- *Endangered Species (ARM)*: Pesticide management plans for endangered species and their habitats. Staff use Wisconsin DNR Natural Heritage Inventory database to locate endangered and threatened species occurrences, and then collect and maintain program data, including PLSS locations or GPS coordinates, related to these sites. GIS layers are created and maintained using this information. All DNR data and some of DATCP's related data are confidential.
- *Gypsy Moth Treatment Sites and Trap Locations (ARM)*: Statewide traps are set each year and are located using GPS. GIS layers of trap locations and treatment sites are then created.
- *Nursery and Christmas Trees (ARM)*: Tabular, GIS and GPS data sets for licensed nurseries and Christmas tree plantations. Locations of nurseries and plantations are geocoded from addresses or PLSS descriptions, or collected using GPS.
- *Plant Diseases and Pests (ARM)*: Tabular, GIS and GPS data sets of plant diseases and pest outbreaks.
- *Farmland Preservation (ARM)*: Tabular and GIS data necessary to administer Wisconsin's Farmland Preservation Law. Staff track property by tax parcel identifier and PLSS, and maintain a statewide GIS layer of exclusive agricultural zoning authorities by county, town, and municipality and rezones by PLSS.
- *Conservation Reserve Enhancement Program (ARM)*: Tabular, GIS and GPS data necessary to administer Wisconsin's CREP. Staff track properties enrolled in this program by collecting coordinate data of easements using GPS receivers. PLSS data to the ¼-¼ section level are used for GIS applications and shared with external partners upon request. Business rules also require that GPS data for CREP conservation easements be submitted to DATCP and stored in WTM83/91 coordinates and linked to the database via matching contract and polygon ID numbers. Staff verify easements using Garmin 76 GPS receivers, and convert data to shapefiles using a free Minnesota DNR Garmin tool. These data are then used to create new features and otherwise geolocate CREP features.
- *Soil and Water Resource Management Grants (ARM)*: Tabular and GIS data layers of conservation practices funded by the Soil and Water Resource Management (SWRM) grant program. Data can be analyzed by county or watershed.
- *Wisconsin Agricultural Statistics Service (USDA)*: WASS generates the Cropland Data Layer (CDL) annually, and collects information about agricultural production from sample individuals across the state, and provides analyses related to a broad range of agricultural issues. The original data collected from individuals is confidential, while aggregated data is available to the public.

2. Access and Distribution

DATCP is currently developing data access, sharing, and distribution policies for internal and external land information and GIS data set requests. At this time, some DATCP tabular and GIS data are available upon request, and requests are handled by the custodial division. DATCP data and GIS metadata are distributed by CD, DVD, transfer to portable memory stick or hard drive (provided by requester), or emailed (depending on file size).

At this time, no DATCP land information data sets or metadata are available through its website, although a few static map files are available for viewing. Examples:

- http://www.datcp.state.wi.us/arm/agriculture/pest-fert/pesticides/atrazine/cnty_list.jsp

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- http://www.datcp.state.wi.us/arm/environment/insects/gypsy-moth/have_them.jsp
- http://www.datcp.state.wi.us/arm/agriculture/land-water/livestock_siting/pdf/march20/updated_map.pdf

Once adequate security policies and standards are in place, DATCP intends to make non-confidential GIS data sets and corresponding metadata available to many internal staff via intranet mapping applications. Secured intranet or internet applications will be developed for specific DATCP user groups with clearly-defined business needs for access to confidential GIS data sets.

Once adequate security policies and standards are in place, DATCP also intends to make some non-confidential GIS data sets and corresponding metadata available to external partners and customers via internet mapping applications and data download functions.

3. Policies and Standards

DATCP has developed draft technical standards for its *ArcSDE GIS Data Repository* and *ArcIMS Application Development*, and intends to have them internally reviewed and adopted by July, 2006. DATCP informally adheres to Wisconsin DNR *Locational Data Standards - version 1.1*, and intends to create a modified version of these standards for agency use by July, 2006. DATCP also plans to create technical *GPS Data Collection Standards* by July, 2006.

Several DATCP staff are members of interagency workgroups, committees, and associations that address land information, GIS and GPS standards issues. Finally, the Agency GIS Coordinator actively participates in WEGIS and emergency management GIS policy and standards development activities.

4. Data Sources and Integration with Other State Agencies

Several DATCP programs have an ongoing need for land information from various sources to support many different business needs and applications. DATCP acquires this information from external sources in a variety of formats (e.g., paper maps, text files, spread sheets, database, and GIS layers). Wisconsin DNR is DATCP's primary source for "base map" data sets. Other sources include (but are not limited to) local and county agencies, other state agencies, federal agencies, and UW/UWEX. DATCP does not redistribute these data sets or modify their metadata (if present). Instead, requesters are referred back to the source custodian. A few DATCP programs also access land information from other sources via internet mapping applications. Examples include (but are not limited to):

- ***Agricultural Impact Program (ARM)***: Acquires construction plans, paper maps, reports, and GIS road data sets from Wisconsin Department of Transportation (DOT) for utility project assessments
- ***Drainage Program (ARM)***: Acquires paper maps, plans and other documentation compiled from county drainage boards
- ***Groundwater Protection (ARM)***: Acquires Dane County water table paper maps, GIS data sets from the Wisconsin Geological and Natural History Survey (WGNHS), Portage County private well database, GIS data layers from the Portage County Planning and Zoning Office, and well data from University of Wisconsin - Stevens Point (UWSP) Central Task Force Laboratory compiled for groundwater protection activities. Also accesses NRCS internet soil mapping applications for program activities.
- ***Nutrient Management (ARM)***: Accesses NRCS internet soil mapping applications and Wisconsin DNR internet WebView application for program activities.

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- *Soil and Water Resource Management Grants (ARM)*: Grant recipients access Wisconsin DNR internet WebView application for soil and water grant administration requirements.
- *ArcSDE GIS Data Repository (all)*: Statewide GIS base layers (e.g., county boundaries, hydrography, legislative districts, roads, DOPs) from a variety of local, state, federal, and university sources.

In the future, land information integration among state agencies should, in part, be facilitated and coordinated by DOA's Geographic Information Officer (GIO). Currently, DATCP's *Agency GIS Coordinator* is on the team that advises the GIO about needed GIS data, tools, and services, as well as barriers to state agency land information integration and modernization. DATCP programs can usually acquire most of the land information they need, but some problems may occur, such as:

- *Non-existent land information*. Several statewide GIS data sets that would be very useful to DATCP regulatory and oversight programs are simply not available at this time. Examples: state-level soil survey map unit layer with simplified attribute table, statewide land parcel data, statewide geology data, statewide zoning data, statewide hydrogeology data, statewide wetlands data, statewide air photos of the same scale and timeframe.
- *Lack of efficient land information sharing arrangements*. Several useful statewide GIS data sets exist, but require formal data sharing agreements with other local, county or state agencies to access and use them. The workload involved in coordinating the review and management of a large number of data sharing agreements can be significant. GIO facilitation of enterprise GIS data sharing agreements among state agencies and with local, county and federal agencies would reduce redundancy and improve efficiency.
- *Lack of funding for land information*. Several useful statewide GIS data sets exist, but DATCP may not have the funds to purchase or cost-share the data. For example, DATCP and WASS identified a potential need to fund additional land cover and land use "ground truth" data in order to help expand the content and improve the usability of the cropland dataset.
- *Lack of standards*. The lack of standards for geospatial data models, data formats, and data transfer protocols can create problems for DATCP staff attempting to acquire and use land information from other sources. These problems include the inability to read data from a variety of media (e.g., tapes, diskettes, and email attachments), Internet connection and security issues, and the time spent manipulating acquired data so it can be used by DATCP programs (e.g., multitude of county coordinates systems, converting data for federal reporting).

External partners also need access to DATCP's land information! Requests for DATCP information and data come from partners and customers at all levels of government, universities, agricultural industry, private sector entities, and others. Recent initiatives, such as Homeland Security, Emergency Management, Livestock Premises Registration, Livestock Facility Siting, Working Lands Initiative, and the Governor's Bioconsortium initiative have resulted in an increasing number of requests.

5. Metadata

Metadata created by DATCP is developed to meet Federal Geographic Data Committee (FGDC) metadata standards. DATCP custodians use ArcCatalog to develop and maintain metadata for their data sets.

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C. Technology Architecture

1. Existing Hardware, Software, and Equipment

In late 2005, DATCP used grant funds from Office of Justice Assistance (OJA) and U.S. EPA to implement a centralized GIS technology infrastructure that supports a shared, agency-wide ArcSDE/SQLServer GIS data repository, ArcIMS web mapping applications, networked printers, and Centrus Desktop address geocoding software. Programs are currently migrating existing GIS data and applications to the new ArcSDE GIS data repository and ArcIMS framework.

Shared Hardware, Software, Equipment	Comments
4 HP Proliant BL20P servers	3 servers (development, intranet, internet); 1 server for ArcSDE/SQLServer
2 HP Proliant DL100 servers	2 servers for GIS data storage
3 ArcIMS 9.1 for Windows	dual-CPU licenses; ARM maintains one of the licenses
1 ArcSDE 9.1	dual-CPU license
1 SQLServer 2000 Standard Edition	database for ArcSDE with dual-CPU license
1 IBM ThinkPad laptop	for GIS demos and presentations
Centrus Desktop	address standardization/geocoding tool
Tape Backup System	
HP Designjet 1055CM Plus large format color printer	networked for agency-wide access
HP LaserJet 5550dtn small format color printers	networked for agency-wide access

In addition to the agency's shared GIS infrastructure, several DATCP divisions maintain their own GIS, GPS, and CAD software and equipment, such as printers, scanners, digitizing tables, and GPS receivers.

Program Hardware, Software, Equipment	Comments
5 ArcGIS 9.1 Desktop (ArcInfo license)	3 primary and 2 secondary licenses maintained by AH, ARM and MS divisions.
9 ArcGIS 9.1 Desktop (ArcView license)	2 primary and 7 secondary licenses maintained by ARM and MS divisions.
1 Spatial Analyst 9.1 Extension	maintained by ARM division
6 AutoCAD (various versions)	maintained by ARM division
1 HP Scanjet 7400C document scanner	maintained by ARM division
1 Altek large format digitizing table	maintained by ARM division
HP Designjet 1050C Plus large format color printer	maintained by ARM division
HP Deskjet 1220C small format color printer	maintained by ARM division
HP Color LaserJet 4600dn printer	maintained by ARM division
~25 Garmin 76 GPS receivers	maintained by ARM division
~50 Garmin eTrex GPS receivers	maintained by AH and FS divisions

2. Technology Architecture Vision

The number of DATCP programs utilizing GIS technology is steadily increasing. DATCP intends to conduct an agency-wide GIS/GPS needs assessment in 2006, and will evaluate options for making GIS/GPS data, applications, and tools accessible to all DATCP programs. It is anticipated that the vast majority of DATCP GIS users will ultimately rely on program-specific intranet or internet ArcIMS applications to support their program activities. More advanced ArcGIS analysis software and equipment will be acquired only when needed for a clearly defined business requirement.

As a state agency, DATCP is also affected by SIS and WEGIS activities and decisions. It is expected that both SIS and WEGIS will ultimately influence DATCP's future GIS technology architecture directions,

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especially if/when DOA enters into an enterprise license agreement with ESRI, and infrastructure and services are consolidated among state agencies.

D. Organizational Architecture

1. Internal GIS Organization

In 2005, DATCP hired its Agency GIS Coordinator to facilitate and coordinate GIS activities across the agency. This position is responsible for assessing needs, prioritizing activities, strategic planning, developing policies and standards, communicating options, designing infrastructure, and identifying funding for internal, agency-wide GIS activities. The Agency GIS Coordinator also produces GIS data and products for division without dedicated GIS staff and resources. In addition, the Agency GIS Coordinator participates on external work groups and committees, and helps identify opportunities for interagency collaboration and integration with external government partners and other public and private entities.

DATCP has also established a GIS Technical Committee, comprised of representatives from each division. This committee helps the Agency GIS Coordinator identify and prioritize agency-wide GIS needs, and promotes:

- Open communication about GIS issues
- Cooperative funding to acquire and maintain shared GIS resources
- Improved access to, and integration of, shared GIS resources
- Consistent and useful GIS training
- Standardization of GIS data, applications, and infrastructure
- Documentation of GIS data, applications, and infrastructure
- Formal recognition of staff GIS roles and responsibilities
- Collaborative GIS initiatives with federal, state, tribal, and local partners
- Elimination of costs for acquisition/maintenance of redundant GIS resources

Bureau of Information Technology Services (BITS) staff maintain DATCP's centralized GIS technology infrastructure, including server, backup, and network environments. In addition, AH and ARM divisions have professional GIS staff who develop and use GIS data, applications, and tools to support program-specific business needs.

The number of requests for GIS data, tools and applications from DATCP divisions without dedicated GIS staff or resources continue to increase. These requests are currently handled by the Agency GIS Coordinator. DATCP is considering additional GIS staff resources to assist the Agency GIS Coordinator fill these requests and provide other services within the agency.

2. Data Sharing

DATCP employs informal and formal data sharing techniques. Because the WEGIS data repository has never existed, DATCP staff, like staff in other state agencies, have developed informal data sharing arrangements with external land information partners and customers.

DATCP enters into formal land information sharing arrangements, as necessary, to acquire or provide data. Most of these data sharing agreements are with county, state, or federal agencies, and allow DATCP to acquire and use land information for internal purposes, while prohibiting DATCP from redistributing the information to other external partners or customers. For example, DATCP has data sharing agreements with several counties to use county DOPs, and with Wisconsin Public Service Commission (PSC) for transmission line data.

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3. Organizational Benefits of WEGIS

In the future, land information integration among state agencies should, for the most part, be facilitated, negotiated, and coordinated by the Wisconsin Geographic Information Officer (GIO) and WEGIS resources. Possible organizational benefits of WEGIS for DATCP are described below.

- A centralized WEGIS data repository, with enterprise-level data sharing agreements, would simplify DATCP's ability to access and use data from external local, state, tribal, and federal agencies.
- Consolidation of GIS infrastructure, data, tools, and services in WEGIS would reduce DATCP workload and resource needs assuming the chargeback mechanism for WEGIS is cost-effective for DATCP.
- WEGIS data, application, and service policies and standards could be adopted by, or serve as models for, DATCP. This would increase consistency and reduce confusion across state agencies.

4. Training

DATCP staff is trained for GIS and land information activities by external providers such as the UW Land Information and Computer Graphics Facility (LICGF), ESRI, other state agencies, and private vendors. DATCP staff attends training classes, or take computer-based training. DATCP would benefit from cost-effective GIS training coordinated for state agencies by DOA's GIO.

E. Security Architecture

DATCP uses industry-standard database, network, and application security measures to maintain secure IT and GIS infrastructure and systems, as appropriate. All DATCP internet pages include links to the agency's legal notice, privacy notice, and acceptable use policies. In addition, DATCP has several internal policies that are applicable to technology, application, and/or information access and security.

- Public Records Custodians (#141)
- Sale of Publications and Other Information Material (#145)
- Computer Software, Data Access, and Security Policy (#183)
- Office Automation Software Update (#184)

As with all state agencies, Wisconsin's Open Records regulations and other external and internal policies about public versus private data guide DATCP's data sharing and information security activities. Some information kept by DATCP is confidential by statute. By statute, confidential records generally include Wis. Stat. ss. 94.64(6m) (grades or amounts of fertilizer sold or distributed), 95.232 (information identifying owners of livestock herds infected or suspected of being infected with paratuberculosis), 95.51(5) (livestock premises registration information), 95.60(7) (information identifying the type or number of fish or fish eggs bought, raised or sold by a privately owned fish farm or the supplier or purchaser of those eggs), 97.22(10) (information that pertains to individual milk producer production, milk fat and other component tests and quality records), 126.84(1) (contractor financial statements and purchase, storage and procurement records under the agricultural producer security program), 94.50(6) (certain records relating to cultivated ginseng transactions), 94.68(6) (pesticide information which qualifies as a trade secret), 94.72(6)(a) (feed tonnage reports), 96.10(3) and 96.20(5) (individual business information obtained pursuant to a marketing order or marketing agreement), and 97.20(3m) (dairy plant producer lists). Access to legally protected land information and GIS data sets (e.g., livestock premises data) may be further restricted by statute, and/or data sharing, confidentiality or non-disclosure agreements.

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The DATCP Agency GIS Coordinator is also a member of the Wisconsin GIS Interagency Workgroup for Emergency Management. This workgroup is charged with identifying issues and activities associated with GIS data sharing in emergency situations. This workgroup recognizes that some GIS data sharing arrangements may need to be handled differently in emergency versus non-emergency situations.

DATCP intends to review its existing internal policies related to technology, application and information security in 2006. Many of these policies were adopted before DATCP had centralized GIS capabilities, and may need to be updated to address issues related to GIS data, technology, applications, and products. The agency intends to develop and document business rules, policies, and standards to clarify GIS-related security issues. The goal is to simplify access to GIS data sets within the agency, while, at the same time, protecting the information from unauthorized access, use, distribution, and/or disposition.