# DATCP 2011

# Geographic Information Integration Plan

**Wisconsin Department of Agriculture, Trade and Consumer Protection**

*March 2011*

# Contents

## 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 geographic information modernization and integration activities. This plan includes activities within DATCP, as well as coordination with external partners.

Many DATCP programs collect, use, maintain, and share geographic information in a variety of formats. DATCP has a centralized geographic information system (GIS) infrastructure that supports a central data repository and interactive web mapping applications. Major initiatives in 2010 included the upgrade of all ESRI server and desktop software to ArcGIS 10, implementation of GeoCortex Essentials, and development of several web mapping applications.

Major activities planned for 2011 include:

- Review and update of GIS repository data and metadata
- Research and testing of GeoCortex Essentials SilverLight API
- Development of web mapping applications using GeoCortex Essentials ADF and/or SilverLight API
- Collaboration with other state agencies to simplify data sharing among government entities

Design, acquisition, funding, and management of shared DATCP GIS resources are coordinated by the DATCP Agency GIS Coordinator. Coordination of GIS resources on an agency level mirrors the move toward integration of tabular data and databases within the department. Whenever possible, DATCP also coordinates geospatial activities with partners, and continues to work with other state agencies to identify and promote common business needs and possible solutions to the DOA Geographic Information Officer.

Several DATCP divisions have dedicated GIS professionals and have incorporated geospatial data, tools and applications into program planning, communication, management, and evaluation activities. The Division of Management Services supports the GIS and GPS needs of divisions without dedicated GIS staff. The federal Wisconsin Agricultural Statistics Service, a cooperative effort between the U.S. Department of Agriculture and DATCP, also uses geographic information and GIS tools to support its business needs.

DATCP representatives actively participate on many geographic information and GIS related committees and work groups, including the State Agency Geographic Information Coordination (SAGIC) team. DATCP works with federal, state, county, and local agencies, utilities and industry, and interest groups, academic, and private sector entities to coordinate activities and achieve common geographic information goals.

Preparation of this plan was coordinated by the Agency GIS Coordinator (see contact information below) with review by division GIS and program staff.

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# II. ARCHITECTURES

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

- Reduce duplication of effort
- Provide more accessible, useable, complete, accurate, and timely data
- Improve program analyses, decision support, communication, and administration
- Reduce costs related to geospatial data and technology

DATCP divisions are the custodians of their geographic information and applications. The abbreviation of the custodial DATCP division (table below) is listed after data and applications, where applicable.

| Division | Abbreviation |
|---|---|
| Agriculture Development | DAD |
| Agriculture Resources Management | DARM |
| Animal Health | DAH |
| Food Safety | DFS |
| Management Services | DMS |
| Trade and Consumer Protection | DTCP |
| Office of the Secretary | OS |
| Wisconsin Agriculture Statistics Service | WASS |

## A. Applications Architecture

DATCP maintains several web mapping and desktop applications and other GIS-related web services that incorporate geographic information from tabular databases, GIS layers, GPS, maps, or other sources. Specific details for *Future Initiatives* are to be determined.

#### WEB MAPPING APPLICATIONS

DATCP maintains several web mapping applications accessible to one of three audiences – for internal users only, shared with partner government agencies, open to the public. DATCP maintains .NET ArcGIS Server and ArcSDE/SQLServer environments for the development, testing and deployment of web mapping applications and associated GIS web services. Currently, GeoCortex Essentials ADF is used to develop all DATCP web mapping applications. Once a reasonably robust GeoCortex/SilverLight development interface is available, DATCP will migrate some less complex GeoCortex ADF applications to the SilverLight API.

#### Web Mapping Applications for the Public

*1. Wisconsin Drainage Districts (DARM):* Boundaries and status of drainage districts in Wisconsin and associated drainage board contact information. DATCP regulates the drainage district program under ch. 88 (Wis. Stats.) and s. ATCP 48 (Wis. Adm. Code). Creating the statewide drainage district GIS layer required coordination with county planning, engineering, zoning, land conservation, and LIO departments, as well as county drainage boards and private consultants. DATCP maintains the statewide layer as it receives new information. Drainage districts are necessary for local

comprehensive planning, and a shapefile of statewide drainage districts can be downloaded via the web mapping application "FTP Info" button. https://datcpgis.wi.gov/DrainageDistricts/

*2. Livestock Siting (DARM):* Local government zoning or licensing ordinances that require permit approval to expand or build a new livestock facility. DATCP participates in livestock siting activities under ch. 93.90 (Wis. Stats.) and s. ATCP 51 (Wis. Adm. Code). DATCP created and maintains the statewide livestock siting ordinance layer based on information provided by local sources. https://datcpgis.wi.gov/livestock/

*3. Clean Sweep (DARM):* Annual event location and contact information for pharmaceutical, household and agricultural "clean sweeps" funded through a DATCP grant program. https://datcpgis.wi.gov/CleanSweep/Help/Disclaimer.htm

*4. 590 Manure Management (DARM):* Interactive application to support s. ATCP 50 (Wis. Adm. Code) and NRCS standard 590 related nutrient management planning activities. The web mapping application mimics much of the functionality of GeoPDFs currently created by NRCS, but allows users to map areas larger than a section. In addition to the web mapping application (https://datcpgis.wi.gov/590/), DATCP also maintains other web services that include several key GIS layers useful for 590 mapping using desktop GIS tools (see links on http://www.manureadvisorysystem.wi.gov/).

*5. DriftWatch (DAD/DARM):* DATCP provides Wisconsin GIS data to DriftWatch, a Google-based application that aggregates data from several states within U.S. EPA Region 5. Driftwatch is a voluntary portal that allows agricultural producers to identify fields containing sensitive crops, and pesticide applicators to identify if they are working near sensitive crops in order to modify their pesticides or application techniques to minimize potential damage. *Future Initiative: Work with Purdue University to incorporate Wisconsin data via WMS or WFS.* http://wisconsin.agriculture.purdue.edu/

*6. Specialty Meats (DAD):* Wisconsin establishments that perform custom meat processing and/or sell specialty meat products to the public. http://datcpgis.wi.gov/SpecialtyMeats

*7. Pesticide Management Areas (DARM):* Pesticide use prohibition areas and management areas in Wisconsin. Will also provide links to official atrazine prohibition area maps adopted in s. ATCP 30 (Wis. Adm. Code). *Anticipated production deployment summer 2011…*

*8. Working Lands (DARM):* DATCP manages the Working Lands program under ch. 91 (Wis. Stats). The application will include statewide Agricultural Enterprise Areas (AEAs), farmland preservation plans, farmland zoning ordinances, Purchase of Agricultural Conservation Easements (PACE), and related information. It will also provide information about parcels eligible for tax credits associated with these programs. Many Working Lands data layers are necessary for local comprehensive planning, and are provided to DATCP by counties. *Anticipated production deployment fall 2011…*

*9. Food Safety Contacts (DFS):* This application will combine food and food-facility related inspection and emergency response contact information from multiple agencies (e.g., DATCP, DNR, DHS, Commerce, counties, agents) into one application. *Anticipated production deployment fall 2011…*

**Web Mapping Applications Shared with Partners**

*10. Well Logs (DARM):* Application to select and view pre-1990 well construction reports obtained from the Wisconsin Geologic and Natural History Survey (WGNHS) to support groundwater quality and quantity related programs. This application is shared with other state agencies and WGHNS.

*11. Terrorist Incident GIS Enhanced Response (TIGER) System (DARM):* Prototype application allows regulatory users (local, state, federal) to view various GIS reference layers (e.g., DATCP food inspectors, county emergency management contacts) and information about facilities involved in food

terrorism events. Facility information is entered by both regulators and industry, and includes the status of sampling, cleanup, inventory, and regulatory and other activities at potentially affected facilities. The application is only accessible to approved regulatory participants via the FoodSHIELD/TIGER portal (general FoodShield information: http://www.foodshield.org/).

*12. Monitoring and Drinking Well Samples (DARM):* DATCP has received a grant from the Wisconsin DHS to combine two existing tabular databases containing agrichemical sample results from monitoring and drinking water wells into one database, and then create a secured web mapping application for regulatory partners to generate sample reports for wells in areas of interest. *Anticipated production deployment summer 2011…*

**Web Mapping Applications for Internal Users**

*13. Farm Center Resource Finder (DAD):* Internal application that integrates data about assistance resources (e.g., financial advisors, mental health, vocational training) so that Farm Center staff can more easily provide information to the public. *Future Initiatives: Convert to a public-facing web mapping application.*

*14. Animal Disease Response (DAH):* Secured application integrates livestock premises registration, AMANDA, other tabular, and geospatial data to identify and respond to serious livestock diseases, and to protect humans from animal diseases. Application is accessible in the Emergency Operations Center (EOC). *Future Initiatives: Integrate with new EOC GIS Viewer when available. Use GPS and local data (e.g., parcels, livestock) to improve the accuracy of livestock premises locations.*

*15. Environmental Enforcement Specialists (DARM):* Application used by central office staff to assign Environmental Enforcement Specialist inspectors and supervisors to inspections and investigations associated with agrichemical activities at farms and regulated facilities. The application is also used to provide contact information in response to inquiries from partner agencies and the public.

*16. Worker Protection (DARM):* Application used by central office and field staff to target pesticide related worker protection inspections. *Anticipated production deployment summer 2011…*

**DESKTOP APPLICATIONS**

Many DATCP programs create, maintain and use ArcGIS Desktop software and extensions for data integration, spatial analyses, and map production. These applications support various program planning, communication, management, implementation, and evaluation activities. These desktop applications also help staff to create and manage associated geospatial data (see **Section II.B**).

**NON-GIS APPLICATIONS**

Some DATCP programs rely on geographic information in a variety of other "non-GIS" formats such as address lists and paper maps. For example, the Landscape Application Program (DARM) collects information about pesticide application to lawns and landscapes by address as part of a public notification process. Many field staff uses plat books, Gazetteers, county maps, and other tools for field navigation and activity planning, although use of GPS for navigation and web mapping applications for workload planning is increasing.

**INTEGRATION EFFORTS**

DATCP continually strives to integrate both its tabular and GIS-based geographic information and applications. This includes internal integration and integration with external partners. DATCP programs continue to assess their business needs, standardize data collection procedures, improve existing data accuracy and completeness, and integrate data among programs, where possible.

*DATCP GIS Data Repository:* DATCP maintains a centralized ArcSDE/SQLServer GIS data repository of base map layers, imagery and program data. All internal desktop application and all web mapping applications use this repository.

*GIS, IT and Program Coordination:* DATCP GIS, IT and program staff work together on many teams involved in the development of applications with a geospatial component, as well as on GIS infrastructure issues.

*AMANDA:* The AMANDA database integrates license and related data for several DATCP divisions. Livestock Premises IDs from the Livestock Premises Registration database have also been linked to relevant AMANDA licensed properties (e.g., dairy producers) to streamline AMANDA license renewal and premises registration notification. GIS layers based on tabular AMANDA data are used by programs across DATCP.

*DARM Case Tracking System (CTS):* DARM's CTS tracks regulated agrichemical customers and the sites where staff from various programs conduct sampling, inspections, investigations, and other compliance activities. GIS layers based on tabular CTS data are used by programs across DATCP.

*SAGIC Participation:* The DATCP Agency GIS Coordinator chairs the State Agency Geographic Information Coordination (SAGIC) team and actively participates in SAGIC discussions and events. SAGIC promotes and improves the collaboration, communication, quality, and sharing of best practices among state agency users and developers of geospatial data and technologies.

*State Agency Data Sharing Issues:* The Agency GIS Coordinator is leading an effort to streamline the process by which state agencies acquire data from counties, including development of a standard data sharing agreement that covers all state agencies that agree to sign. This effort currently involves GIS and legal staff from several state agencies.

*Geographic Information Office (GIO):* DATCP collaborates with other state agencies to identify shared geospatial business needs and options for needed services which are then presented to the GIO.

**COMPREHENSIVE PLANNING**

DATCP has not developed specific GIS tools to assist local governments, counties, and/or regional planning commissions with comprehensive planning activities under ch. 66.1001(2) Wis. Stats. Several DATCP programs use comprehensive plan data (e.g., agricultural, natural resources, land use, and implementation), or are involved in reviewing agricultural related plans. DATCP also manages the Drainage District and Working Lands programs, which promote analysis of land use options to maximize agricultural, environmental and economic returns. Both of these programs create and maintain GIS layers associated with Comprehensive Planning activities. A statewide drainage district data layer is available via the DATCP FTP site (see *Wisconsin Drainage Districts* in **Section II.A**). In addition, GIS layers for the Working Lands program are also being developed and are expected to be made available in 2011 (see **Section II.A**).

## B. Information Architecture

### GEOGRAPHIC INFORMATION

Data sets containing geographic information are created by many DATCP programs and are stored and managed in various formats (e.g., spreadsheets, databases, maps, GIS layers, GPS). DATCP divisions are custodians of the data they create, and are responsible for ensuring the quality and integrity of the data content. As mentioned above, most the geographic information described below is also related to one or more desktop GIS applications created and managed by the associated program area. Geographic information is referenced to one or more systems – e.g., address, Public Land Survey System (PLSS), parcel ID, x-y coordinates (e.g., WTM91, latitude/longitude). Major DATCP geographic information data sets are described below.

*AMANDA (DAH, DARM, DFS, DTCP, DAD):* AMANDA tabular database integrates license and related data for DATCP divisions, and identifies multiple licenses associated with a licensee or property. AMANDA property addresses are geocoded or GPSed to create corresponding GIS layers. Data for specific licensing programs are described in relevant sections below.

*Livestock Premises (DAH):* DATCP generates a GIS layer of registered livestock premises from the tabular Wisconsin Livestock Identification Consortium (WLIC) Livestock Premises Registration database. Premises locations are address geocoded or GPSed. Livestock premises data are confidential and access is restricted by state law to individuals authorized by DATCP. Users must sign a confidentiality agreement to access site-specific livestock premises data which is used for animal health emergencies only. However, some data may be aggregated to the county or township/range level upon request.

*Animal Markets, Truckers and Dealers (DAH):* Tabular (Amanda) and GIS data for livestock markets and transporters.

*Humane Offices (DAH):* Tabular and GIS data for trained and certified animal humane officers and office locations.

*Import Feedlots (DAH):* Tabular (Amanda) and GIS data for import feedlots where livestock coming into Wisconsin may be kept until certified by a veterinarian.

*Aquaculture (DAH)*: Tabular data (Amanda) and GIS data for aquaculture activities within the state. Related environmental permitting is coordinated with Wisconsin DNR.

*Johne's Risk Assessment Program (DAH):* Tabular (Amanda) and GIS data for progress of the Johne's vaccination program in the Wisconsin milking herd population.

*Deer and Elk Farms (DAH):* Tabular (Amanda) and GIS data for deer and elk farming activities, including permitting and licensing. Chronic Wasting Disease (CWD) activities are coordinated with Wisconsin DNR.

*Inspectors, Compliance Officers, and Veterinarian Services (DAH):* Tabular and GIS data for animal health inspector, compliance officer, veterinarian, and veterinarian tech headquarters and operations. Data is used primarily for work planning and emergency response activities.

*Animal Health Emergency Management Operations (DAH):* Tabular and GIS data associated with animal health emergency planning, response and management activities.

*Private Drinking Water Wells (DARM):* Tabular and GIS data for Wisconsin private drinking water wells and well samples tested for pesticides and nitrate. DATCP compiles data from multiple sources (e.g., DATCP, WI DNR, pesticide manufacturer studies, UWEX, and UW) into a statewide database and GIS layers. Most well coordinates are geocoded from PLSS centroids. The Wisconsin Unique Well

Number (WUWN) links attribute and spatial data. DNR Source Water Protection guidelines discuss data access issues (http://www.dnr.state.wi.us/org/es/science/publications/SS_988_2003.pdf). Related web mapping application in development (see Section II.A).

*Monitoring Wells (DARM):* Tabular and GIS data for monitoring wells and well samples tested for pesticides and nitrate. DARM 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. DATCP also compiles data from multiple sources (e.g., WI DNR, pesticide manufacturer studies, UWEX, UW, consultants) into a statewide database and GIS layers. Related web mapping application in development (see Section II.A).

*Atrazine Use Prohibition Areas (DARM):* Tabular and GIS data for atrazine use prohibition areas in Wisconsin. Official maps are included in s. ATCP 30 (Wis. Adm. Code). Related web mapping application in development (see Section II.A).

*Agrichemical Case Tracking System (DARM):* Tabular and GIS data for locations of, and regulatory activities (e.g., inspection, investigation, monitoring, and compliance) at, agrichemical facilities and sites. 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. GPS is used to collect coordinates for some license types. Data also used for emergency management activities.

*Endangered Species (DARM):* 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. Activities are also coordinated with UWEX.

*Nursery and Christmas Trees (DARM):* Tabular, GIS and GPS data for licensed nurseries and Christmas tree plantations. Locations of nurseries and plantations are geocoded from addresses or PLSS descriptions, or collected using GPS. Data are used 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.

*Gypsy Moth Program (DARM)*: Tabular and GIS data associated with monitoring and controlling 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, USDA Animal and Plant Health Inspection Service, WI DNR, and UW-Madison. Statewide traps are set each year and located using GPS. GIS layers of trap locations and treatment sites are then created.

*Emerald Ash Borer (DARM):* Tabular and GIS data to manage Emerald Ash Borer program sampling and detection activities.

*Pest Survey Program (DARM)*: Tabular, GIS and GPS data of plant disease and pest outbreaks. Data are used to monitor regulated plant pests. Surveys are conducted to (1) identify (1) incidences and severities of plant disease and pest outbreaks, (2) pest population levels and trends, and (3) new diseases or exotic pests.

*Potato Rot Nematode Program (DARM)*: Tabular and GID data associated with the inspection of 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.

*Farmland Preservation (DARM):* Tabular and GIS data to administer Wisconsin's Farmland Preservation Law. Properties are identified by tax parcel ID and PLSS. DATCP maintains a statewide GIS layer of jurisdictions (county, town, municipality) with exclusive agricultural zoning, as well as areas covered by Farmland Preservation Agreements (FPAs) and rezones by PLSS. Related web mapping application in development (see Section II.A). *Future Initiatives: Farmland Preservation Programs have been consolidated under the Working Lands Program which requires Farmland Plan and Zoning data to be submitted in GIS format. A project is underway to redesign and consolidate tabular databases into one Working Lands Information System (WLIS), including GIS functionality to help staff compare planned and zoned areas and identify parcels eligible for tax credits.*

*Conservation Reserve Enhancement Program (DARM):* Tabular, GIS and GPS data necessary to administer Wisconsin CREP and generate maps and descriptions of land under CREP contracts. Tabular database includes conversion, transfer, buyout, violation and any incidental activity related to those contracts, and is linked to WISMART to produce incentive, cost share and staged payments to participants. GPS data of easement boundaries for enrolled properties is collected and submitted to DATCP. Staff verify easements using GPS and GIS tools. PLSS data to the ¼-¼ section level are used for GIS applications and shared with external partners upon request.

*Livestock Facility Siting (DARM):* Tabular and GIS data for the Livestock Facility Siting program, including county and local ordinances, businesses and facilities. Related web mapping application described in Section II.A.

*Manure Storage and Animal Waste Management (DARM):* Tabular and GIS data for tracking county manure storage and animal waste management ordinances, including permitting requirements, fees, more stringent standards, and local implementation of agricultural performance standards.

*Land and Water Resource Management Program (DARM):* Tabular and GIS data for tracking county land and water resource management plans, including annual reporting of conservation practices cost-shared through the Soil and Water Resource Management (SWRM) grant program. Data analyzed by county or watershed.

*Agricultural Impact Program (DARM):* Tabular and GIS data assists in the development of Agricultural Impact Statements prepared on public projects, such as pipelines and transmission lines, involving eminent domain. DATCP has custodial responsibilities for the final reports generated by its assessments.

*Drainage District Program (DARM):* Tabular, GIS and other design and specification data for Wisconsin drainage districts. Related web mapping application described in Section II.A.

*Food and Dairy Programs (DFS):* Tabular (Amanda) and GIS data for regulated food and dairy processing facilities, food warehouses, retail food establishments, milk producers, and milk haulers. GIS data for inspector, supervisor, dairy specialist, graders, and other "territories" covered by DATCP staff. The data is used to help identify inspector and supervisor areas, assign workload, identify local retail food agents, and many other activities. Data are also used for emergency management and response.

*Meat Programs (DFS):* Tabular (Amanda) and GIS data for regulated meat facilities, as well as rendering, slaughtering, animal food processing, and other activities. GIS data for inspector, supervisor, and veterinarian areas covered by DATCP staff. Data are used for program management and emergency management and response.

*Trade and Consumer Protection Division (DTCP):* Tabular and GIS data associated with consumer complaints used to generate an annual report. GPS used to locate inspected vehicle scales. Data is also used to create maps of licensed businesses inspected by Weights and Measures programs and milk and vegetable contractor programs.

*Agricultural Development (DAD):* Tabular and GIS data associated with a wide variety of agricultural development projects, such as Something Special *from* Wisconsin™ , Buy Local – Buy Wisconsin, specialty dairy (e.g., goat), biofuels, organic crops, etc…

*Office of the Secretary (OS):* Tabular and GIS data supports DATCP homeland security and emergency response activities, and are used to create maps of agricultural infrastructure and production areas for decision making and planning.

*Wisconsin Agricultural Statistics Service (WASS):* A cooperative statistics service between USDA and DATCP, WASS collects and analyzes agricultural production information and publishes statistics by county or WASS districts. WASS also performs special statistical surveys. GIS, remote sensing, and image processing tools are used for data analyses and publication functions. WASS generates the Cropland Data Layer (CDL) annually, collects agricultural production data from sample individuals across the state, and provides analyses related to a broad range of agricultural issues. Original data collected from individuals is confidential, while aggregated data is available to the public. *Future Initiatives: Identify ways to improve CDL classification and accuracy via collection of "ground truth" data and "smoothing" techniques. Work with the UW and other state agencies to produce an updated Wisconsin land cover dataset.*

**ACCESS & DISTRIBUTION**

Most external requests for DATCP GIS data are handled via "Open Records" processes by the Agency GIS Coordinator, in cooperation with the custodial division. Metadata accompanies GIS layers provided to external requestors. Depending on file size and other considerations, DATCP geospatial data (with metadata) is distributed by email, DVD or FTP.

Information about DATCP geographic information has been entered into the "Ramona" GIS Inventory (http://gisinventory.net/). At this time, DATCP GIS data (with metadata) is **not** currently available through the agency's Internet site (http://datcp.wi.gov/). However, a few GIS data layers are available through web mapping applications (e.g., *Wisconsin Drainage Districts*) or web map services (e.g., *590 Manure Management*) as described in **Section II.A**.

Requests for DATCP's geographic information come from partners and customers at all levels of government, universities, agricultural industry, private sector entities, the public, and others. The number of requests for DATCP data continues to increase. One of DATCP's major 2011 initiatives will involve review and update of all geospatial data and metadata in its ArcSDE/SQLServer repository. This will involve development of separate databases to support web mapping applications and desktop applications, as well as development and implementation of new naming conventions and an internal catalog system to help users find data more easily. Once data and metadata are updated, DATCP intends to make more of its geospatial data available via FTP download, WMS and other web services in 2011.

**POLICIES & STANDARDS**

DATCP has formally or informally adopted the following policies and standards related to geographic information.

- *ArcSDE GIS Repository Standards:* Naming and structure standards for the DATCP ArcSDE/SQLServer GIS data repository

- *Global Positioning System (GPS) Best Practices:* Standard GPS configuration settings and data collection procedures used by all DATCP programs.

- *WI DNR Locational Data Standards:* Standard geographic data elements and domains. DATCP intends to create a modified version of these standards for agency use in the future.

- *Federal Geographic Data Committee (FGDC) Metadata Standards:* Standards for the structure and content of GIS metadata.

- *GIS Data Sharing Agreement Process:* Documented process for entering into GIS data sharing arrangements with external parties.

Several DATCP staff members participate on interagency workgroups and committees that address geographic information, GIS and GPS standards issues. The Agency GIS Coordinator actively participates on state agency and inter-agency workgroups that develop GIS policies and standards.

**DATA SOURCES & INTEGRATION WITH OTHER STATE AGENCIES**

Several DATCP programs work with, and acquire geographic information from, external sources to support business needs and applications. DATCP acquires this information in a variety of formats (e.g., paper maps, text files, spread sheets, database, GIS layers, Internet mapping applications). Wisconsin DNR and DOT are 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, utilities, UW, and UWEX. DATCP does not redistribute these data sets; requests are referred back to the source.

DATCP programs can usually acquire most of the geographic information they need, but some significant problems still exist:

*Non-existent Geographic Information:* Several statewide GIS data sets that would be extremely useful for DATCP regulatory and oversight programs are simply not available at this time. Examples:

~ Parcels
~ Accurate road network with addresses
~ Updated land use and land cover
~ Wisconsin master address list
~ More accurate PLSS layers
~ County and local zoning

*Lack of efficient land information sharing arrangements:* Several useful 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 (e.g., 72 different agreements for county parcels) is significant. DATCP is leading an effort to identify options for resolving this issue.

*Lack of standards:* The lack of standards for geospatial data models, data formats, and exchange/transfer/load (ETL) processes creates problems for DATCP staff attempting to acquire and integrate land information from local sources and integrate that data into statewide "views" that are useful for state agency level programs.

**METADATA**

DATCP data custodians and creators use ArcCatalog tools to create and maintain metadata for their data layers. In general, DATCP does not create metadata for layers acquired from external sources that have no metadata attached. DATCP will, however, ask for metadata if it is needed to understand the content of a layer. DATCP attempts to meet Federal Geographic Data Committee (FGDC) metadata standards. DATCP tries to ensure that full metadata is attached to all data layers it provides to data requestors.

## C. Technology Architecture

### CURRENT TECHNOLOGY ARCHITECTURE COMPONENTS

DATCP has a centralized GIS technology infrastructure that supports a shared GIS data repository, web mapping applications, web map services (WMS), ArcGIS Desktop users, and networked printers. All ESRI server and desktop software is at version 10. Concurrent ArcGIS Desktop licenses are shared among division GIS users via a license server. In addition, some DATCP divisions maintain single-user ArcGIS Desktop licenses, AutoCAD, GPS receivers, and other geospatial technology to support their specific program needs.

Components of DATCP's geospatial technology include:

*Web Mapping & RDBMS*

- ArcGIS Server 10 on agency-managed physical servers at Femrite Data Center
- ArcSDE 10/SQLServer 2005 on agency-managed virtual servers at Femrite Data Center
- GeoCortex Essentials ADF 3.x

*Desktop GIS*

- ArcGIS Desktop 10 (6 concurrent-use ArcInfo; 5 concurrent-use ArcView; 4 single-use ArcView)
- ArcGIS Desktop Extensions (2 concurrent-use Spatial Analyst; 1 concurrent-use Network Analyst; 1 concurrent-use GeoStatistical Analysis)
- Shared laptop for GIS field work and presentations
- Server-based storage for ArcGIS Desktop data (e.g., MrSIDs, project geodatabases) not maintained in ArcSDE/SQLServer

*Address Geocoding*

- 1 Centrus Desktop license for batch address standardization and geocoding

*CAD (Computer-Aided Design)*

- AutoCAD (5 AutoCad Civil 3D 2011 network licenses; 1 AutoCAD 2011 stand-alone license)

*Global Positioning System (GPS)*

- 100+ Garmin GPS receivers (several navigational, recreational, and mapping grade models)
- Minnesota DNRGarmin GPS Application (to upload/download files) http://www.dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRGarmin/DNRGarmin.html

*Output Capabilities and Tools*

- 2 large format HP Design Jet plotters (36" and 48")

Costs for Centrus Desktop, GeoCortex Essentials, ESRI server software, SQLServer, all concurrent-use ArcInfo licenses, and one single-use ArcView license are shared equally among all divisions via the IT budget. The remaining ArcView and ArcGIS desktop extension licenses, AutoCAD licenses, and GPS receivers are maintained by the programs that use them. Large format plotters are shared by GIS users, as well as AutoCAD users and DATCP graphic artists. Programs generally replace plotter paper and ink if they use a large amount for a specific project.

The number of DATCP programs utilizing geospatial technology continues to grow, and DATCP continues to evaluate options for making geospatial data, applications, and tools accessible to them. One trend is an increase in requests for internal program-specific web mapping applications to support specific business areas. More advanced ArcGIS analysis software and equipment is acquired only when needed for clearly defined business requirements.

DATCP has made begun to make its GIS data and maps available to external partners and the public via its Internet site, web mapping applications, and a public FTP site. DATCP is now able to "get" files from counties and other state agencies, as well as "put" files on the public FTP site for others to retrieve. Enhancement of the agency's FTP capabilities has significantly improved the speed and accuracy with which DATCP staff can exchange very large GIS and CAD data files with partners and customers.

#### TECHNOLOGY ARCHITECTURE VISION

DATCP will continue to maintain the technology architecture components it currently has, and does not intend to purchase any new components in the next year. Other than continuing to develop web mapping applications and keeping up with software patches/upgrades, DATCP's next big technology initiative involves investigating the GeoCortex SilverLight API. We are currently waiting for a more robust development interface for this API to be released by GeoCortex.

DATCP is also developing a strategic plan for its GIS server infrastructure. The DATCP Bureau of Information Technology Services (BITS) is currently investigating options to migrate some servers back to DATCP from the Femrite Data Center due to cost and technical issues. Our physical ArcGIS/GeoCortex servers at the Femrite Data Center will need to be replaced in a couple of years. We also continue to have some performance issues using ArcSDE/SQLServer on virtual servers at the Data Center. This plan will propose options for our next generation of GIS server infrastructure.

## D. Organizational Architecture

#### INTERNAL GIS ORGANIZATION

The DATCP Agency GIS Coordinator facilitates and coordinates geospatial 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 geospatial activities. The Agency GIS Coordinator also produces GIS data and map products for divisions without dedicated GIS staff and resources, 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. This position reports directly to the DMS administrator.

In addition, DATCP has four full-time GIS professional positions that support GIS and GPS users in their program areas, as well as coordinate applicable activities with the Agency GIS Coordinator:

- one supports Agrichemical programs and develops web mapping applications (DARM)
- one supports Plant Industry programs (DARM)
- one supports Animal Health programs (DAH)
- one supports DATCP GIS infrastructure and develops web mapping applications (DMS)

DATCP has approximately 30 ArcGIS Desktop users and 100+ Garmin GPS users. The Agency GIS Coordinator is in the process of organizing a DATCP GIS/GPS User Group. This group will meet 2-4 times per year to discuss geospatial issues affecting the agency. Each meeting will also include a "Helpful Hints" section and a presentation by a different GIS user or user group.

Dedicated GIS staff maintains DATCP desktop and centralized GIS server software and SQLServer databases. However, GIS staff also works closely with Bureau of Information Technology Services (BITS) staff that manages server hardware, desktop images, backups, network issues, and other IT activities that directly affect GIS technology infrastructure.

Requests from DATCP divisions for projects involving geospatial data, tools and applications continue to increase. These requests are currently handled by the Agency GIS Coordinator and vetted through the Geographic Information Technology (GIT) team. GIT is comprised of the Agency GIS Coordinator and GIS infrastructure and application support staff from DMS and DARM. GIS staff also participates on teams for IT projects that include a geospatial component.

**DATA SHARING & DEVELOPMENT**

DATCP enters into various informal and formal arrangements when acquiring data from external sources. When possible, DATCP tries to coordinate data acquisition and development with partners. For example, DATCP is working informally with NRCS and DNR to develop a process for aggregating soil attributes statewide and developing statewide soil attribute layers for use by agricultural and natural resource programs.

DATCP signs formal data sharing arrangements, as necessary, to acquire data. Most of these data sharing agreements are with county 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 for parcels, and with Wisconsin Public Service Commission (PSC) for transmission line and pipeline data. DATCP has documented the process by which data sharing agreements with external parties are signed, in order to ensure consistency and coordination within the agency.

Unresolved data sharing issues continue to hinder the ability of DATCP and other state agencies to create, use and maintain statewide GIS layers (e.g., parcels) that aggregate information from the local level into standardized statewide layers. In an attempt to address this issue, the DATCP Agency GIS Coordinator is leading a team of GIS and legal staff from several state agencies to identify data sharing issues and potential solutions. Once state agencies agree to a coordinated approach, the team will reach out to GIS partners at other levels of government.

**TRAINING & INTERNS**

DATCP staff participates in geospatial training in a variety of ways. Some use on-line training. Others attend instructor lead training classes held by DATCP GIS staff, UW, ESRI, other state agencies, and private vendors. DATCP has also hired contractors to provide in-house training on various technical GIS topics, and, in one case, invited other state agency staff to participate. When possible, DATCP attempts to coordinate training with other state agencies. DATCP would benefit from cost-effective geospatial training coordinated for state agencies by the GIO.

DATCP also actively supports GIS internships associated with the UW-Madison GIS Certificate Program, as well as interns and students from other academic institutions and programs. Interns are paired up with business area experts and the Agency GIS Coordinator to develop and work on their projects. 2010 intern and student projects for DATCP included:

- *Spatial Relationship between Wisconsin Agricultural Interests and Feral Swine: A Risk Analysis*
- *Working Towards a More Efficient System of Food Inspection in Wisconsin*
- *Determine the Optimal Assignment of Wisconsin Food Safety Inspectors*

**OTHER ORGANIZATIONAL NEEDS**

DATCP is an active participant in SAGIC, WIGICC and WLIA, and, in principle, believes that coordination of geospatial activities could provide benefits such as:

- Enterprise-level data sharing agreements would simplify the ability to acquire data from external sources and reduce workload associated with data sharing agreements.

- A centralized data repository containing "official" statewide data layers would simplify the ability to acquire data from external sources and reduce workload associated with DATCP developing and maintaining these layers.

- Development/acquisition of cost-effective geospatial services that support business needs (e.g., address standardization and geocoding) would generally reduce DATCP's workload and resource needs.

- Adopt policies and standards that increase consistency among state agencies and reduce workload and resources associated with data exchange, transfer and conversion, data sharing during emergency situations, etc.

In order to realize these benefits, DATCP believes the GIO must take a more active leading role in determining the shared geospatial needs of state agencies, identifying options for supporting these shared geospatial needs, and offering cost-effective, legally-effective, and technically-effective solutions.

## E. Security Architecture

DATCP uses state and industry standard database, network, user account, application, and other security measures to maintain secure IT and GIS infrastructure, systems and data, as appropriate. All DATCP internet pages include links to the agency's legal notice, privacy notice, and acceptable use policies.

As with all state agencies, Wisconsin's "Open Records" regulations and other external and internal policies guide DATCP's geospatial data sharing and information security activities. DATCP provides geospatial data for which it is the owner or custodian free of charge. DATCP does not redistribute geospatial data acquired from other sources, referring requestors back to the data source instead.

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. Some information kept by DATCP is confidential by statute, and generally includes the following:

- Wis. Stat. ss. 94.64(6m) - grades or amounts of fertilizer sold or distributed
- Wis. Stat. ss. 95.232 - information identifying owners of livestock herds infected or suspected of being infected with paratuberculosis
- Wis. Stat. ss. 95.51(5) - livestock premises registration information
- Wis. Stat. ss. 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
- Wis. Stat. ss. 97.22(10) - information that pertains to individual milk producer production, milk fat and other component tests and quality records
- Wis. Stat. ss. 126.84(1) - contractor financial statements and purchase, storage and procurement records under the agricultural producer security program
- Wis. Stat. ss. 94.50(6) - certain records relating to cultivated ginseng transactions
- Wis. Stat. ss. 94.68(6) - pesticide information which qualifies as a trade secret

- Wis. Stat. ss. 94.72(6)(a) - feed tonnage reports
- Wis. Stat. ss. 96.10(3) and 96.20(5) - individual business information obtained pursuant to a marketing order or marketing agreement
- Wis. Stat. ss. 97.20(3m) - dairy plant producer lists