DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION

Protecting Wisconsin's groundwater is a priority for the Department of Agriculture, Trade and Consumer Protection (DATCP). DATCP's major activities in this area include management of pesticides and nutrients, research, and funding of local soil and water resource management projects.

In compliance with Chapter 160, Wisconsin Statutes, DATCP manages pesticides and pesticide practices to ensure that established groundwater standards for contaminants are not exceeded. This may include prohibition of certain activities, including pesticide use. DATCP regulates storage, handling, use, and disposal of pesticides, as well as the storage and handling of bulk quantities of fertilizer. DATCP has authority to develop a statewide nutrient management program through section 92.05 Wis. Stats. The program includes compliance, outreach, and incentives.

Enforcement standards have been established in Wisconsin for many known and potential groundwater contaminants, including over 30 pesticides. DATCP helps landowners comply with these standards and the Groundwater Law.

FY 2016 Highlights

- Awarded the first-annual Producer Led Watershed Protection Grants to provide farmer-led groups incentives to address agricultural nonpoint contributions.
- Repeated the statewide statistical sampling survey of pesticides and nitrates in private wells for the first time since 2008, expanded to analyze close to 80 pesticide compounds

Details of Ongoing Activities

Nonpoint Source Activities

Pesticides

DATCP's primary effort related to nonpoint contamination of groundwater from pesticides continues to involve the herbicide atrazine. Several rule revisions have been made in response to additional detections of atrazine in groundwater with the latest revision being put into effect in April 2011. A set of maps for 101 prohibition areas is available from the Environmental Quality Section covering 1.2 million acres that have been incorporated into the rule. The maps were updated with new base mapping software in 2012 to 1) update roadway names and other manmade features that have changed over the years, and 2) provide a consistent look for maps that had been created using different map software since the early 1990s. Pesticide use surveys indicate that atrazine use has declined from peak levels in the late 1980's and is now holding roughly constant. The decline in use may have been a result of the atrazine management rule and concern about groundwater contamination.

In 2008, DATCP prohibited the use of a simazine, a triazine herbicide related to atrazine, in a small area of the Lower Wisconsin River Valley near Spring Green. DATCP continues to perform routine testing of private wells for simazine both inside and outside of atrazine prohibition areas to determine if additional actions are needed to protect groundwater from simazine.

Nutrients

Through its Land and Water Resource Management program, DATCP assists in the protection of water resources through nutrient management and related conservation practice implementation. The DNR's NR 151 rule on runoff management is intended to protect both groundwater and surface water and lays out the process by which DATCP identifies the practices and procedures for implementing and enforcing compliance with the agricultural performance standards, including nutrient management. In 2005, DATCP adopted the USDA-NRCS 590 Nutrient Management Standard via administrative rule, ATCP 50, to meet DNR's nutrient management performance standard.

A Wisconsin nutrient management (NM) plan is an annually updated record that follows NRCS's 590 Nutrient Management Standard. A NM plan accounts for all nitrogen, phosphorus, or potassium (N-P-K) nutrients applied, and planned to be applied, to each field over the crop rotation, as well as all crop management practices utilized. Soils need to be tested by a DATCP certified laboratory every 4 years, with each field sampled every 5 acres. A NM plan manages nutrient applications to maximize farm profitability while minimizing degradation of both surface water and groundwater.

The nutrient management rules apply to all Wisconsin farmers who engage in agriculture and mechanically apply N-P-K nutrients from manures or fertilizers to cropped fields or pastures. Under Wisconsin Statutes, cost-share funds must be made available to producers to compel compliance. However, as many as half of Wisconsin farms may be compelled to comply with nutrient management standards and other performance standards without cost-sharing because they are either:

- Concentrated Animal Feeding Operations (operations with 1,000 animal units or greater);
- Farms regulated by local manure storage or livestock siting ordinances; or
- Participants in Wisconsin's Farmland Preservation Program.

The objective of the 590 NM Standard is to decrease the opportunity for losses to occur, decrease the total residual amount of nutrients in the soil and to keep those residual nutrients within the soil-crop system by limiting the processes (leaching, runoff, erosion, and gaseous losses) that carry nutrients out of the system. The 590 NM Standard contains criteria for surface and groundwater protection that manages the amount and timing of all nutrient sources. Nutrients are managed according to:

- Soil nutrient reserves (soil test)
- Current crop and yield
- Previous crops and yields
- Soil types (e.g. sand, loam, clay)
- UW's recommendations for each crop and soil type
- Current and previous manure and fertilizer applications
- Location of potential surface or groundwater conduits
- Soil temperature
- Irrigation practices

- Draining/tiling practices
- Field slope
- Season (e.g., winter)
- The Phosphorus Index

The NRCS 590 Nutrient Management Standard was updated in 2015. This update was made mainly to address winter spreading risks, groundwater protection and improved management of nitrogen. Previously, the 2005 590 Standard focused on reducing the phosphorus losses to surface water systems but now addresses more loss pathways. A few of the new requirements that will further protect groundwater quality:

- Show adequate acreage and a winter spreading plan for all farms with mechanically applied manure or organic by-products.
- Account for N and P2O5 deposited by pastured or gleaning animals.
- Applications are prohibited on:
    - Concentrated flow channels; surface water; saturated soils; areas of active snow melt where water is flowing; land where vegetation is not removed.
    - Direct conduits to groundwater, a potable well, or within 8 feet of irrigation wells.
    - Areas near public water supplies within 1000 feet of a community potable water well; or areas within 100 feet of a non-community potable water well (church, school, and restaurant) unless manure is treated to substantially eliminate pathogens.
    - Areas locally delineated by the Land Conservation Committee or in a conservation plan as areas contributing runoff to direct conduits to groundwater unless manure is substantially buried within 24 hours of application.
- Limits on surface applications in Surface Water Quality Management Areas and over subsurface drainage.
- Additional limits for manure applications on frozen or snow-covered soils:
    - No applications in areas where DNR Well Compensation funds provided replacement water supplies for wells contaminated with livestock manure or where Silurian dolomite is within 60 inches of the soils surface.
    - No applications of manure within 300 feet of direct conduits to groundwater.
- Fertilizer applications on N restricted soils that include high permeability soils (P), or rock soils with less than 20 inches to bedrock (R), or wet soils with less than 12 inches to apparent water table (W):
    - Or if the soil depth is less than 5 feet over bedrock or the area is within 1,000 feet of a community potable water well, no commercial N applications in late summer or fall (exclusions apply).

  - Spring applications of N cannot exceed the crop recommendations of all N sources and on highly permeable soils additional N strategies must be followed to slow the release (i.e., inhibitor, controlled release fertilizers) or minimize the amount spread at once (i.e., split applications).

- Manure sources of nitrogen need to minimize the amounts spread on P, R, and W soils in accordance with the soil types, the amount of dry matter in the manure, the date and the soil temperature in order to decrease losses.

The 2005 590 Standard did include a number of practices to protect groundwater from the impacts of nutrient applications and these provisions still need to be met under the new standard, such as:

- Nutrient and manure application setbacks from karst features and other conduits to groundwater
- Nutrient applications must meet University of Wisconsin recommendations for crop production
- Application prohibitions or restrictions in waterways, Surface Water Quality Management Areas (SWQMA's), slopes in winter, buffers, fields exceeding tolerable soil loss, and non-cropped fields
- Irrigation management (inhibitors and split applications)

Like other agricultural performance standards, the nutrient management standard is "designed to achieve water quality standards by limiting nonpoint source water pollution" (Ch. 281.16 (3), Wis. Stats 'Nonpoint sources that are agricultural'). Requiring applications of nitrogen to meet University of Wisconsin recommendations for crop production, in conjunction with the other practices listed above, is meant to limit non-point pollution of groundwater. Currently, 31 percent of agricultural land in Wisconsin is covered by an approved nutrient management plan (Figure 2).

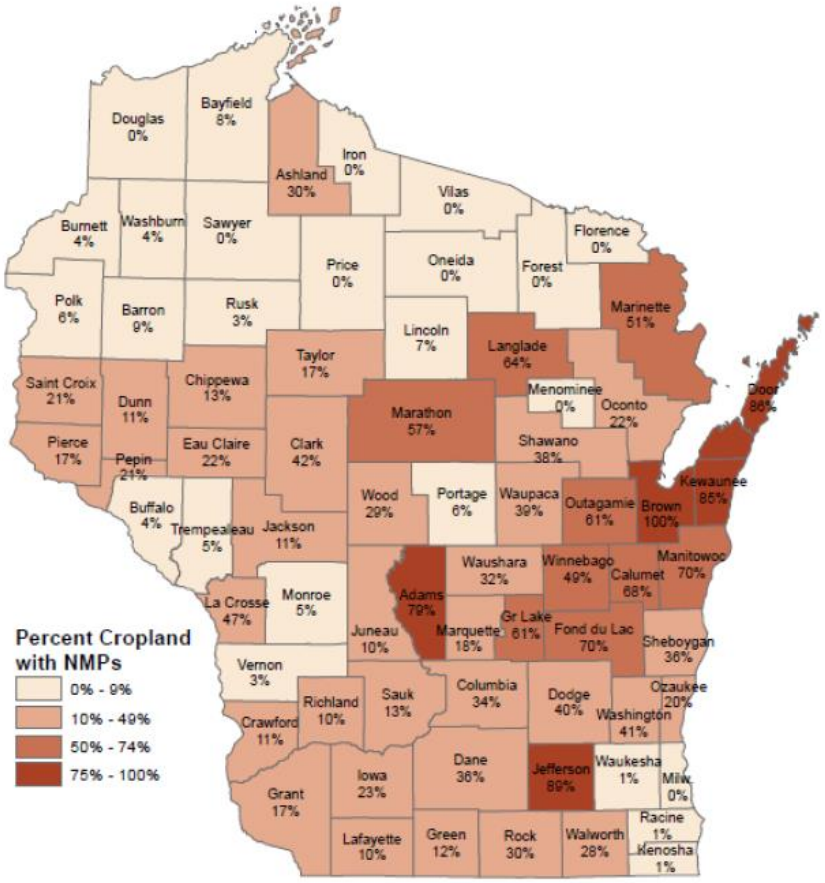

Figure 2. Percent of each county's cropland with a nutrient management plan in 2015 (calculated from county reported acres and 2012 National Agricultural Statistics Service of Wisconsin county cropland).

Increasing attention on the role of land use practices in achieving water quality goals was recognized in the 2008-2009 state budget. Funding for the land and water resource management program's cost-share allocation increased from $520,000 to $6.5 million in the second year of the 2008-2009 biennium, and although not maintained at those levels, cost-share funding has continued to remain in the $2-3 million range each of the subsequent biennium.

The allocation of DATCP's annual appropriation in the 2013-15 budget of $2.5 million in SEG funds "for cost-sharing grants and contracts under the soil and water resource management program under s 92.14" with an increase of $210,000, providing $2,710,000 available for allocation, $2,012,000 was provided to counties for landowner cost-sharing, $175,000 to fund grants for farmer training (Nutrient Management Farmer Education grant program), and the remainder of the $523,000 was awarded to supporting partners, including UWEX/CALS, which includes SnapPlus software support in addition to outreach and education support.

DATCP's annual appropriation in the 2015-17 budget of $3,027,200 in GPR funds and $5,711,900 in SEG funds "for support of local land conservation personnel under the soil and water resource management program." DATCP has no underspending from prior years that might be added to the funds appropriated for this allocation. DATCP would need an increase of about $3.0 million in its annual

appropriations to reach the statutory goal of funding 3 positions at 100, 70 and 50 percent. DATCP's 2016 final allocation plan under the Soil and Water Resource Management Grant Program is summarized in Table 1 below.

Table 1. Summary of Requests and Allocations for Grant Year 2016.

Funding Category	Total Requests	Unmet Requests	Final Allocations
County Staff/Support	$16,025,340	$7,286,240	$8,739,100
County LWRM Cost-Share	$7,146,000	$3,470,952	$3,675,048
NR 243 Reserve	$200,000	$0	$200,000
LWRM Cost-Share (SEG)	$2,643,900	$990,895	$1,653,005
Project Contracts (SEG)	$592,931	$45,800	$547,131
NMFE Training Grants (SEG)	$101,064	$0	$101,064
Total	**$26,709,235**	**$11,793,887**	**$14,915,348**

The majority of SEG grant funding directly benefits farmers by providing either cost-sharing or training. By dedicating a small portion of the SEG funds for support of projects focusing on training, outreach, and other DATCP priorities, DATCP is enhancing the statewide infrastructure fundamental to implementing state conservation activities, most importantly nutrient management planning.

In 2015, total requests from counties for SEG funds exceeded available funds by $3,534,292, this increased to $5,343,062 in 2016. The lack of sufficient funds has practical implications for our capacity to implement state and local priorities, including newly added farm runoff standards, and may impact conservation compliance efforts for farmers' participation in the Farmland Preservation Program.

DATCP nutrient management program staff train farmers, consultants, and local agencies on the principles of sound nutrient management, how to comply with performance standards, and how to use available tools to create and evaluate an ATCP 50-compliant nutrient management plan. The 2008-2009 state budget first allocated funds to DATCP for the creation of a Manure Management Advisory System (MMAS). This system is currently focused on helping farmers develop a clear understanding of field-specific soils and their ability to accept nutrients and manure for optimal crop production while protecting water quality. In order to accomplish this goal, new web-accessible tools have been developed, including: WI "590" Nutrient and Manure Application Restriction Maps, a map service for geographic information system (GIS) users, and the Runoff Risk Advisory Forecast (RRAF) model.

The RRAF provides Wisconsin's farmers with an innovative decision support tool which communicates the threat of undesirable conditions for manure and nutrient spreading for up to 10 days in advance. Developed with inter-agency collaboration, the RRAF model was validated against both edge-of-field observed runoff as well as small USGS gauged basin response. The model is updated three times daily and is hosted on the DATCP website. The encouraging results from this first generation tool are aiding State of Wisconsin officials in increasing awareness of risky spreading conditions to help minimize contaminated agriculture runoff from entering the State's water bodies.

The 590 Restriction maps have been available statewide to assist farmers in making sound decisions about how and where to apply nutrients on their cropland. The mapped data used to create the restriction maps are also available for GIS-users to download into their own mapping applications. In 2015, the restriction maps were integrated directly into the SnapPlus program allowing the software to automatically identify and import field information from the maps. This will allow plans to be written and updated faster and more accurately using better information that is updated at least annually and will also provide a better user experience by making data management easier. Early feedback from users was extremely positive and increases in compliance are expected to be seen in the 2016 Quality Assurance Team plan reviews.

Through these combined efforts, the total number of acres covered by over 6,700 nutrient management plans statewide in the 2015 crop year rose to over 2.8 million acres, see Figure 3.

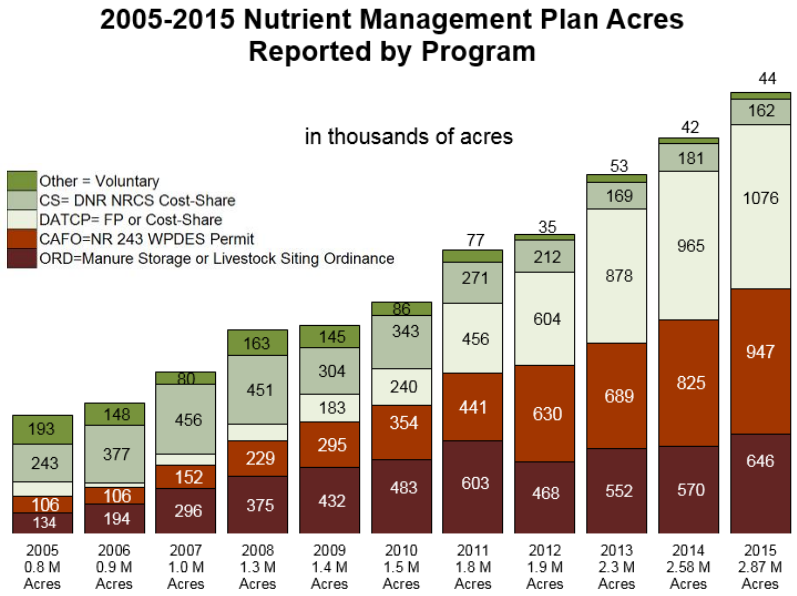

Figure 3. Acreage trends in nutrient management as reported to DATCP. Taken from DATCP's annual nutrient management report: http://datcp.wi.gov/uploads/Farms/pdf/NMUpdate2015.pdf

A New Program to Address Agricultural Nonpoint Contributions

The new Producer Led Watershed Protection Grant program was created to provide farmer-led groups financial incentives of up to $20,000 each from a $250,000 annual allocation (ATCP 52). The first awards were made in 2016 to 14 different groups around the state (see Figure 1). This financial incentive, combined with the requirement of working closely with neighbors and local conservation groups, will allow those most intimately involved with the local soil and water issues to tailor the best possible solutions to their unique, local challenges in a way that statewide requirements cannot.

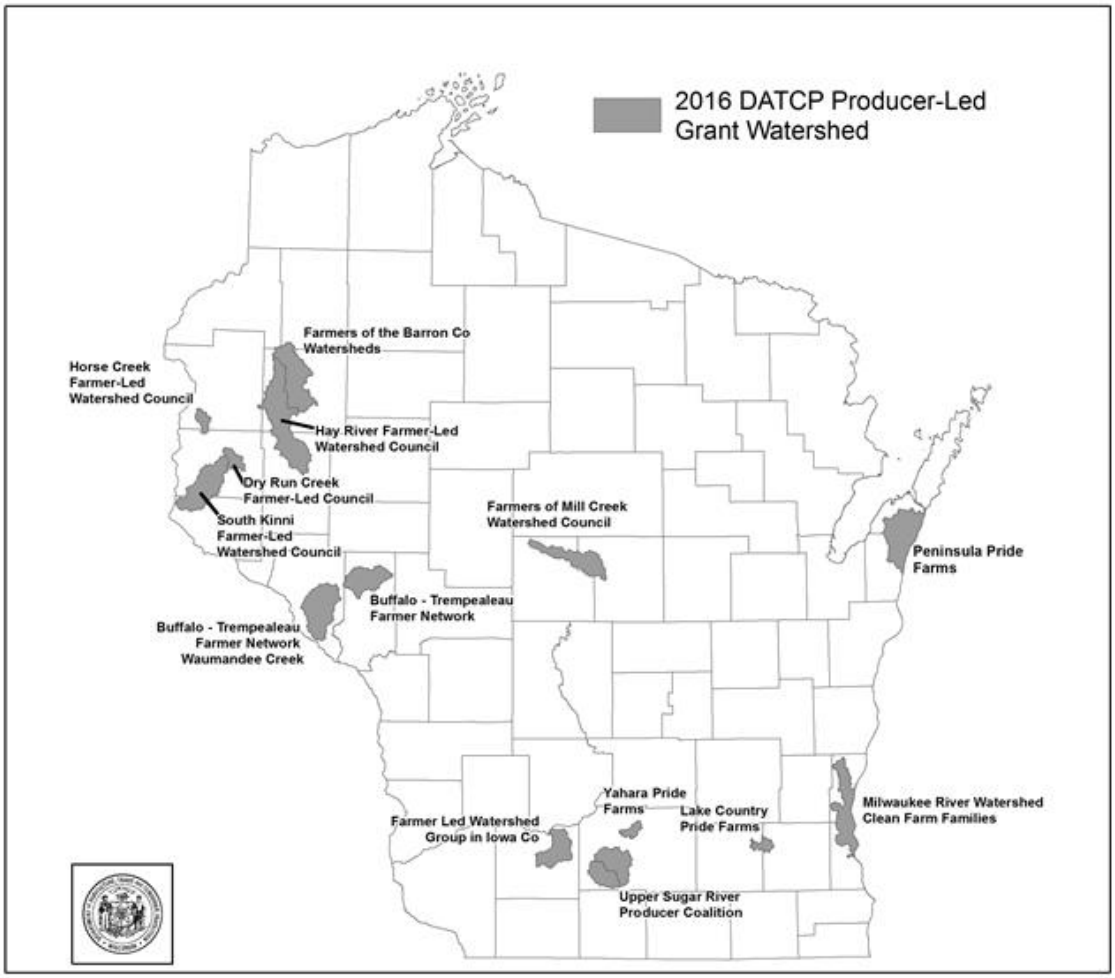

Figure 1. The location of the 14 first-annual Producer Led Watershed Protection Grant recipients for 2016.

Point Source Activities

Previous work by DATCP identified pesticide and fertilizer operations as possible point sources of groundwater contamination. Past problems included improper disposal of unwanted agricultural chemicals, lack of containment for spills, outdated product handling methods, and poor understanding by workers in the industry of how small actions, when continued over time, lead to large problems. DATCP has worked to address these problems through point source prevention. In cases where environmental degradation has already occurred, DATCP oversees environmental cleanup of contaminated soil and groundwater.

Since 1990, the Agricultural Clean Sweep grant program has helped farmers dispose of unwanted pesticides, farm chemicals, and empty pesticide containers. In 2004, DATCP began operating and managing the state's household hazardous waste grant program. In fall 2007, prescription drug collection was added to the grant and the annual program budget expanded to $1 million. In 2009 the program budget was reduced to $750,000 annually and program management reduced to 75 percent FTE.

In 2015, 87 grants were issued: 25 for agricultural waste, 37 for household hazardous waste and 25 for the collection of unwanted pharmaceutical wastes. There were 869 farmers and 9 agricultural businesses that brought in more than 149,000 pounds of agricultural wastes, an 11 percent increase from 2014. While fewer farmers participated, the weight per farmer increased. Farm participation can vary. Counties may not hold a farm collection each year, preferring to do it every other year or every few years. Farm participation seems to be holding steady overall, ranging between 100,000 and 150,000 pounds in recent years. However, many counties have been reporting declining collections as more farmers are using custom application and products are becoming more concentrated. Much of the old stockpiled pesticides from years ago have been collected during the early years of the program, although Clean Sweeps are still seeing old, banned or cancelled pesticides like DDT and chlordane. The amount of household hazardous waste collected continues to increase. More than 2 million pounds were collected in 2015 from nearly 56,000 residents. Lead and oil-based paints are the most common waste collected from households. In 2015, nearly 629,000 pounds were taken in for disposal. The next category is solvents and thinners with just over 170,000 pounds. Pesticides are the third-most collected waste with nearly 165,000 pounds. Drug collections netted just over 52,000 pounds of unwanted pharmaceuticals. Collections occurred through collection events or through permanent drug drop boxes located in police stations throughout Wisconsin.

Fourteen local DATCP specialists perform compliance inspections and work with facilities across the state to help keep them in compliance with the ATCP rules designed to protect the environment. Agency staff also educates facility managers and employees about how routine practices may affect the environment.

Since 1993, the Agricultural Chemical Cleanup Program (ACCP) addresses point sources of contamination and reimburses responsible parties for a portion of cleanup costs related to pesticide and fertilizer contamination. To date, more than 520 cases involving soil and/or groundwater remediation related to improper storage and handling of pesticides and fertilizers have been initiated at storage facilities. Over this same time period DATCP has assisted clean ups at well over 1,000 acute agrichemical spill locations. The ACCP has received more than 1,400 reimbursement applications for more than $41.3 million in reimbursement payments.

Groundwater Sampling Surveys

DATCP has conducted a number of annual surveys to investigate the occurrence of pesticides in groundwater resulting from nonpoint sources. The agency is currently conducting a statistically random sampling survey of private wells statewide. The results of this survey will be available in 2017, and will provide a comparison of pesticide and nitrate results to earlier statewide random surveys, the last of which was performed in 2008. The results of the 2008 survey and other well water surveys performed by DATCP are at: *http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuality/Pesticides.pdf*

Research Funding

Due to budget constraints, DATCP did not have funding for new pesticide research projects in FY 2015. DATCP currently funds fertilizer research at approximately $200,000 per year.

Groundwater Data Management

In 2011, DATCP received a grant from Department of Health Services (DHS) to merge two groundwater sample databases into one database. The new system combined data from the former drinking water well

and monitoring well databases. DATCP also created a geographic information system (GIS) web-mapping application that allows the user to search the database and plot maps that show data located within a user-defined geographic area. The new database was placed on-line in early 2012. It contains contact and location information, well characteristics, and pesticide and nitrate sample results for private and public drinking water wells and combines that data with monitoring well data collected from hundreds of agricultural chemical cleanup cases. The database includes samples analyzed by DATCP, Wisconsin State Lab of Hygiene (WSLH), as well as other public and private laboratories. DATCP's groundwater database currently contains information for over 62,000 wells and nearly 800,000 pesticide and nitrate-N sample analytical results.

DATCP uses GIS tools to analyze groundwater data and prepare maps for public hearings, DATCP board meetings, presentations, and other uses. DATCP prepares and maintains data in GIS of well locations, atrazine concentrations, atrazine prohibition areas, and other pesticide and nitrate-N data. This database information located in GIS is used to generate maps of statewide pesticide and nitrate-N detections in wells, as well as maps for chapter ATCP 30, Wis. Adm. Code (Pesticide Product Restrictions). For example, see Figure 1, "Private Wells Tested for Atrazine in Wisconsin", on page 3 of this report (*http://dnr.wi.gov/topic/groundwater/documents/GCC/GwQuality/Pesticides.pdf*). Other GIS analyses involve identifying groundwater wells that may be impacted by point sources of pesticide and nitrate-N contamination. DATCP also uses global positioning system receivers to locate and map wells and other features, such as agrichemical facilities and spill sites that may affect groundwater quality.

For further information

Visit the following web site (http://www.datcp.state.wi.us/)

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