2024 Surface Water Pesticide Monitoring Program

ANNUAL REPORT

Wisconsin Department of Agriculture, Trade and Consumer Protection
Agricultural Resource Management Division
Environmental Quality Unit
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Introduction

In 2024, the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), in cooperation with the Wisconsin Department of Natural Resources (DNR), continued the Surface Water Monitoring Program to evaluate effects of pesticide use at nearby agricultural fields on water quality of Wisconsin rivers and streams. Surface water samples were collected from 24 select locations between March and December and submitted to DATCP's Bureau of Laboratory Services (BLS) for chemical analysis. This document provides a narrative of the activities, summarizes the analytical data, and presents DATCP's proposed 2025 Surface Water Sampling Program plan.

A compilation of acronyms and definitions used throughout this document is provided in Appendix A.

Purpose of Surface Water Sampling

It is estimated that agriculture contributes over $100 billion annually to Wisconsin's economy (Wisconsin Department of Agriculture, Trade, and Consumer Protection, 2025b). Growers in Wisconsin use millions of pounds of pesticides and millions of tons of fertilizers annually to grow a wide variety of crops typically produced in one Wisconsin growing season. DATCP's Surface Water Sampling Program is one form of monitoring the agency performs to meet its statutory obligation to protect human health and the environment. Wisconsin's groundwater law, Wis. Stats. Chapter 160, requires state agencies to sample and monitor groundwater for substances related to facilities, activities, and practices under their jurisdiction that have a reasonable probability of entering the groundwater resources of the state, and to determine whether preventive action limits (PAL) or enforcement standards (ES) have been exceeded at points of standard application. The legislative intent of the Chapter 160, Wis. Stats, also states that "a regulatory agency may take any actions within the context of regulatory programs established in statutes outside of this chapter, if those actions are necessary to protect public health and welfare or prevent a significant damaging effect on groundwater or surface water quality for present or future consumptive or non-consumptive uses." In light of this statement, and considering that groundwater and surface waters are highly interconnected, DATCP initiated the Surface Water Sampling Program to further evaluate the quality of the waters of the state and to identify areas at risk for groundwater pollution. The Surface Water Sampling Program satisfies the following statutory monitoring requirement (Wis. Stats., Ch. §160.27):

1. Problem assessment monitoring, *to detect substances in the groundwater and to assess the significance of the concentrations of the detected substances*

The DATCP Surface Water Sampling Program was established in 2007, with the first monthly sampling occurring in 2008. Surface water samples are collected prior to the traditional pesticide application season (March and April), during the traditional pesticide application season (May, June, July), and after the traditional pesticide application season is over (August through December) to evaluate how the timing of pesticide application is related to surface water quality. During the 2024 sampling season, attempts were made to collect water samples each month from selected rivers and streams, depending on ice conditions and laboratory availability.

Selection Criteria and Sampling Procedures

Perennial streams and rivers selected for the annual sampling program have changed for multiple reasons in the past. Streams with a significant percentage of agricultural land in each watershed were selected for DATCP's program. Initially, streams were selected based on their inclusion in the DNR's "wadeable" stream sampling project (United States Environmental Protection Agency, 2016). Some years, the focus was sampling on rivers with large watersheds while others focused on streams with smaller watersheds.

Besides agricultural use, other criteria are considered when determining which flowing water body is to be included in the annual Surface Water Monitoring Program. Criteria are primarily based on local geology or environmental conditions, predominant crop types within the stream's watershed, or characteristics of the predominant pesticides used on crops in the watershed. Criteria may vary from year to year. Some criteria examples used for river or stream sampling in the past have included:

- The stretch of water needs to be accessible for sampling (i.e., locations with public access);
- The watershed is within an area susceptible to groundwater contamination due to geologic conditions like sandy soils with shallow groundwater, shallow depth to bedrock, or karst features;

- Areas where prior testing by others (federal government, university, other state agencies, etc.) identified high concentrations of nitrate, pesticides, or other unusual test results;
- Areas where the same crops are grown year after year on the same fields/area (e.g., corn, cranberry, ginseng, etc.) increasing the likelihood of repetitive pesticide use in the area;
- Areas where crops are grown typically require extensive chemical or fertilizer inputs and/or irrigation;
- Areas where pesticides with known characteristics of high mobility and resistance to degradation are used; and/or
- At the request of one of the partnering agencies.

Over the years, the Surface Water Monitoring Program has evolved into a mix of 1) continuous monthly sampling of long-term repeat locations; and 2) several "new" locations, added to the program each year. Program planning starts in the prior year, so sampling can start as soon as BLS completes annual maintenance and can accept samples, usually in March. Since DNR staff complete much of the sampling, time commitment and willingness to assist are necessary for the yearly program's planning and success. To this point, DATCP has not been limited in sampling selection locations based on this arrangement. Surface water program goals have been achieved through this collaborative effort.

2024 Program Locations

Since 2019, the program has generally consisted of collecting surface water samples from at least 10 locations; usually, 50% are repeat locations and 50% are new nine repeat locations and 15 new locations. Repeat locations include the following sites (the names of the stations are identical to those listed in the Surface Water Integrated Monitoring System [SWIMS] database):

- Sugar River Upstream of Hwy 69
- South Branch Tenmile Creek - Taft Rd (Site 7)
- Fourteen Mile Creek (Ditch # 7) - CTH D
- Leola Ditch at D and 3rd
- Mormon Coulee Creek #6 - Bridge at CTH YY
- South Fork Bad Axe River - Oliver Rd.
- Root River at 60th 3m (Bi Sur)
- Milwaukee River at Estabrook Park at Milwaukee, WI
- Nine Springs - Syene Springs

New locations for 2024 included the following:

- Vermont Creek at Michaelis Road
- Wendt Creek - Hwy 78
- Halfway Prairie Creek at Farm near Mazomanie, WI
- Wisconsin River -- Hwy 14 Boat Landing
- Mill Creek at CTH C
- Spring Brook - Before Eau Claire R at Nolan Rd.
- Eau Claire River CTY Y Upstream
- East Branch Eau Claire River -- Access
- Oldens Creek
- Tomorrow River at Clementson Rd near Nelsonville
- Honey Creek - Near Confluence With Menominee River
- Hay River at N Bridge St
- Red Cedar River 130ft N of CTH W Bridge
- RED Cedar River - CTH A & I Bridge - Downstream of Confluence w/ Chetek River
- Red Cedar River at CTH OO

A total of 23 perennial streams and rivers and one spring were selected for the 2024 sampling program. Between March and December 186 samples were collected for chemical analysis of pesticides and nitrate plus

nitrite as nitrogen (N). Monthly sampling was attempted (nine samples per location), but due to the winter closure of the DATCP BLS laboratory in early November, some stations were limited to fewer monthly samples. Only two samples were collected from the Wisconsin River location (in March and May, respectively). Due to that sampling location being on a high-order stream, concentrations of agrichemical contaminants were deemed likely to be low because of the volume of water in the river at that location. Additionally, the identification of contaminant sources would have been particularly challenging for this large watershed.

One sample was also collected from Syene Springs in order to continue monitoring pesticide concentration trends. Persistent contamination has been observed at Syene Springs from the pesticide atrazine and atrazine metabolites for several years now. This contamination is concerning because the source area for recharge to the groundwater that feeds the springs may be located within the Dane County atrazine prohibition area.

Table 1 lists the 2024 surface water sampling program locations, and Figure 1 shows the 24 locations relative to the State of Wisconsin and county boundaries. Table 2 summarizes the watershed size and simplified land use specific to each 2024 sampling location, using data provided by the U.S. Department of Agriculture's (USDA) National Agricultural Statistics Service (United States Department of Agriculture, 2025).

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Table 1: 2024 Surface Water Sampling Program Rivers and Streams

River / Stream Name	Figure 1 Label	SWIMS ID	County	Program Years	Samples Collected in 2024	Latitude	Longitude
Vermont Creek at Michaelis Road	1	10012507	Dane	1	9	43.11876	-89.756645
Wendt Creek - Hwy 78	2	10012609	Dane	1	9	43.175617	-89.768745
Halfway Prairie Creek at Farm near Mazomanie, WI	3	133413	Dane	1	9	43.182494	-89.7572955
Sugar River Upstream of Hwy 69	4	10009477	Dane	2	9	42.94916667	-89.5441667
Nine Springs - Syene Springs	5	10051662	Dane	6	1	43.01785	-89.39422
Wisconsin River -- Hwy 14 Boat Landing	6	10017905	Iowa	1	2	43.1685025	-90.0406101
Mill Creek at CTH C	7	10030075	Iowa	1	8	43.15409	-90.026985
Spring Brook - Before Eau Claire R at Nolan Rd.	8	373384	Marathon	1	8	45.050034	-89.26471
Eau Claire River CTY Y Upstream	9	10052249	Langlade	1	8	45.1257669	-89.2341599
East Branch Eau Claire River -- Access	10	10020426	Langlade	1	8	45.1975423	-89.2225243
Oldens Creek	11	10054699	Langlade	1	8	45.1398428	-89.2179792
Tomorrow River at Clementson Rd near Nelsonville	12	503169	Portage	1	9	44.52453	-89.3382
South Branch Tenmile Creek - Taft Rd (Site 7)	13	10009196	Portage	3	9	44.27169444	-89.5488889
Fourteen Mile Creek (Ditch # 7) - CTH D	14	013173	Adams	8	9	44.21998	-89.71866
Leola Ditch at D and 3rd	15	10049592	Adams	2	9	44.21376	-89.63753
Mormon Coulee Creek #6 - Bridge at CTH YY	16	10008928	La Crosse	4	8	43.76411	-91.12647
South Fork Bad Axe River - Oliver Rd.	17	10022633	Vernon	4	8	43.51921	-91.10715
Root River at 60th 3m (Bi Sur)	18	413667	Milwaukee	2	8	42.85555556	-87.9907222
Milwaukee River at Estabrook Park at Milwaukee, WI	19	413640	Milwaukee	12	8	43.099957	-87.90894
Honey Creek - Near Confluence With Menominee River	20	413006	Milwaukee	1	8	43.0440325	-88.0029132
Hay River at N Bridge St	21	173209	Dunn	1	7	45.0477401	-91.9110104
Red Cedar River 130ft N of CTH W Bridge	22	10037357	Dunn	1	9	45.0533	-91.71127
Red Cedar River CTH A & I Bridge - Downstream of Confluence w/ Chetek River	23	10029519	Barron	1	8	45.24767	-91.72431
Red Cedar River at CTH OO	24	033237	Barron	1	7	45.3509997	-91.7465876

Notes: *SWIMS - Surface Water Integrated Monitoring System*

Figure 1: 2024 Surface Water Sampling Program Rivers, Streams, and Spring Locations

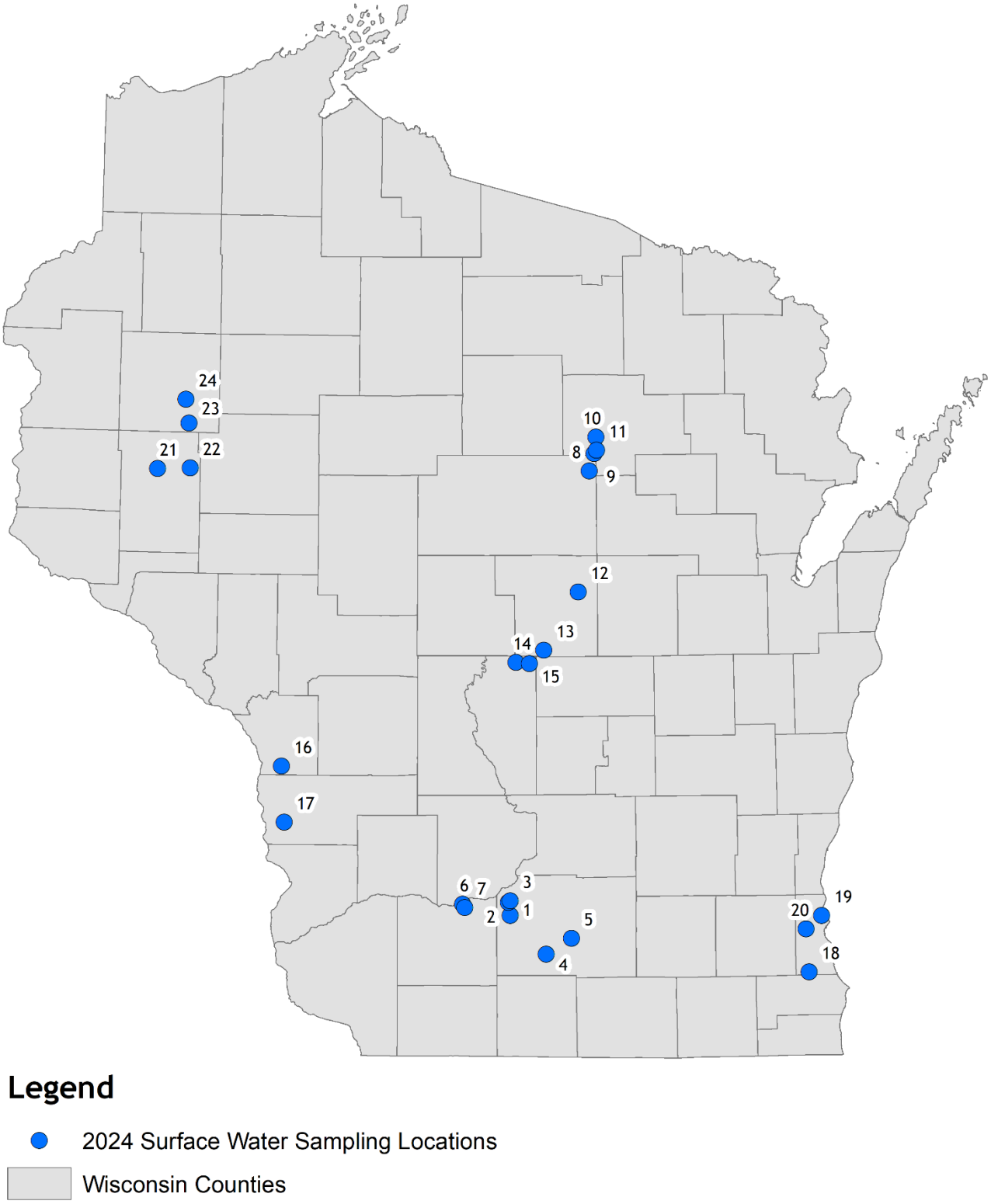

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Table 2: 2024 Surface Water Sampling Program Watershed Land Use Acreage Summary

River/Stream Name	Developed or Open	Wetland	Forest	Alfalfa, Grass, or Pasture	Corn	Soy or Dry Beans	Potatoes	Watershed or HUC10 Size (acres)
Vermont Creek	5,449 8%	755 1%	24,075 36%	18,125 27%	11,996 18%	5,518 8%	7 <1%	67,278
Wendt Creek								
Halfway Prairie Creek								
Sugar River	2,765 4%	1,467 2%	37,690 57%	16,422 25%	4,720 7%	3,019 5%	570 1%	66,182
Mill Creek	14,653 22%	609 1%	9,951 15%	18,275 27%	13,691 20%	7,134 11%	0 0%	67,342
Spring Brook	3,888 6%	4,200 7%	25,848 43%	4,870 8%	4,916 8%	3,764 6%	5,523 9%	60,509
Eau Claire River	6,297 5%	50,589 37%	48,511 35%	4,783 3%	5,473 4%	4,514 3%	3,838 3%	136,841
East Branch Eau Claire River								
Oldens Creek								
Tomorrow River	16,443 9%	24,413 13%	66,484 36%	29,975 16%	25,728 14%	10,241 6%	2,215 1%	184,332
South Branch Tenmile Creek	5,309 5%	6,542 7%	24,062 25%	17,347 18%	13,658 14%	12,880 13%	7,616 8%	97,980
Fourteen Mile Creek	5,117 9%	6,214 11%	17,173 31%	9,893 18%	3,155 6%	3,436 6%	4,642 8%	55,468
Leola Ditch								
Mormon Coulee Creek	3,393 3%	5,454 5%	25,522 24%	10,009 9%	4,479 4%	3,136 3%	0 0%	107,344
South Fork Bad Axe River	6,723 6%	873 1%	48,798 41%	33,383 28%	17,652 15%	11,807 10%	0 0%	120,346
Root River	43,150 51%	7,047 8%	6,916 8%	10,380 12%	4,051 5%	7,843 9%	0 0%	84,460
Milwaukee River	58,041 55%	12,332 12%	6,185 6%	16,509 16%	5,188 5%	3,346 3%	0 0%	106,354
Honey Creek	64,825 73%	7,093 8%	3,941 4%	7,039 8%	2,231 2%	2,748 3%	0 0%	89,293
Hay River	9,412 5%	7,229 4%	76,491 41%	44,707 24%	25,662 14%	17,452 9%	375 <1%	186,109
Red Cedar River	9,068 4%	4,227 2%	78,816 37%	45,930 22%	42,104 20%	26,360 13%	142 <1%	210,633
Syene Springs	Size of the capture zone is unknown.							

Sample Collection and Analysis

Surface water samples were collected using DNR standard protocols (Wisconsin Department of Natural Resources, 2018) and DATCP standard operating procedures (Wisconsin Department of Agriculture, Trade and Consumer Protection, 2021), designed to reduce bias to collect surface water samples with respect to flow, weather, and other factors. Each sample was collected in free-flowing, well-mixed areas of the rivers, streams, and springs.

Surface water samples were collected by directly filling one laboratory-provided, one-liter, amber-colored glass sampling bottle at the designated sampling location. Bottles were then placed in a cooler on ice. Packages were shipped to BLS using an overnight delivery service or hand delivered to BLS along with a completed sample collection record. There were no reported shipping issues or bottle breakages with the 2024 program. A summary of the analytical data for the 2024 program is included in Appendix B. Raw data can be downloaded through the EPA Water Quality Portal or by scanning the QR code at the end of Appendix B.

BLS performed surface water analytical testing using GC/MS/MS and LC/MS/MS methods in accordance with ISO 17025 accreditation standards. Each sample was tested for 112 pesticides or pesticide metabolites, and nitrogen as nitrate plus nitrite. The table in Appendix B lists the parameters and corresponding laboratory reporting limits. The laboratory reporting limit is the minimum analyte concentration that can be reliably quantified and reported by the laboratory. If the concentration of a certain compound is reported to be less than the respective laboratory reporting limit, we consider the compound ***not detected*** in the water sample. If the concentration of a certain compound is reported to be greater than the respective laboratory reporting limit, we consider the compound ***detected*** in the water sample.

Results

A total of 186 surface water samples were collected and submitted for chemical analysis as a part of the DATCP's 2024 Surface Water Sampling Program. The table in Appendix B summarizes the 2024 Surface Water Sampling Program results and provides comparative water quality standards. The surface water data is compared to benchmark values to assess the potential risk to human health and the environment. These risk-based values are sourced from the Wisconsin Administrative Code (Wis. Admin. Code) Ch. NR 140 public health groundwater quality standards[1] (NR 140.10 – Table 1), drinking water health advisory recommendations by the Wisconsin Department of Health Services (DHS), and a listing of the U.S. Environmental Protection Agency (EPA) Office of Pesticide Programs - Aquatic Life Benchmarks for Registered Pesticides.

Summary

Key findings are listed as bulleted items in the detection summary section. Figure 2 shows detection and surface/groundwater standard exceedance rates for the 25 most detected compounds in surface water samples 2024. A detailed narrative for the 2024 data follows.

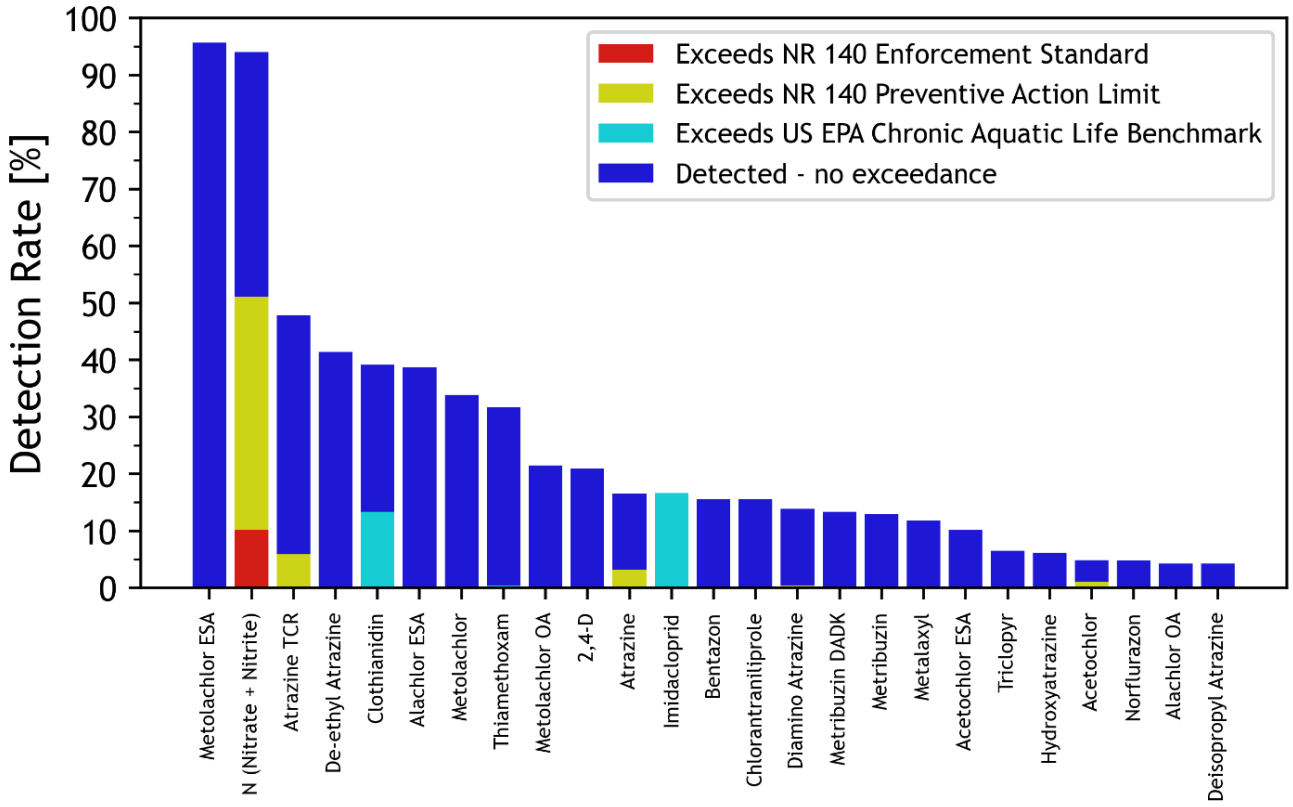
Summary of Detections

- Of the 112 pesticides included in the laboratory testing methods, 47 compounds were detected in 2024 surface water samples. Detections include 26 herbicides, 11 herbicide metabolites, five insecticides, and three fungicides.
- The maximum number of pesticides detected in a single sample was 18 individual pesticide compounds, sampled from the Root River on 5/22/2024.

[1] An essential part of Wisconsin's groundwater protection laws was the creation of water quality standards for different substances, outlined in Wis. Admin. Code Chapter NR 140. The DNR sets standards for substances of public health concern based on recommendations from DHS. The groundwater standards have two components: an enforcement standard (ES) and a preventative action limit (PAL). The ES is a concentration that, if exceeded, requires intervention from the appropriate authority. The PAL is a percentage of the ES; 10% of the ES for carcinogenic, mutagenic, or teratogenic properties, and 20% of the ES for the remaining substances. The intention of the PAL is for it to act as a trigger for intervention before a pollutant becomes a serious risk to public health or the environment.

- Metolachlor ESA was the most commonly detected compound, with a detection rate of 95.7%. This was slightly greater than the 94.1% detection rate for nitrogen as nitrate + nitrite. The next most detected pesticide compound was de-ethyl atrazine, with a detection rate of 41.4%.
- Atrazine Total Chlorinated Residue (TCR), i.e. the sum of atrazine parent material and its breakdown products (de-ethyl atrazine, de-isopropyl atrazine, and diamino atrazine), was detected in 47.8% of the samples collected.
- In 2024 neonicotinoid compounds were detected in samples from 16 streams and rivers: Spring Brook, Fourteen Mile Creek, South Branch Tenmile Creek, Leola Ditch, Root River, Sugar River, Vermont Creek, Wendt Creek, Halfway Prairie Creek, Mill Creek, Eau Claire River, Red Cedar River, Milwaukee River, Oldens Creek, East Branch Eau Claire River, and Honey Creek.
- The detection of pesticides during months outside the application season suggests that steady, baseline groundwater discharge is the major source of contamination, rather than runoff from overland flow.
- Two samples recorded no detections of any pesticide compounds or nitrogen (nitrate + nitrite). Both samples were collected from Honey Creek; the first sample was collected on 7/23/2024 and the second on 10/30/2024.

Figure 2: 2024 Detections and Exceedances of Surface and Groundwater Standards



Exceedance of Aquatic Life Benchmarks

EPA Office of Pesticide Programs - Aquatic Life Benchmarks for Freshwater Invertebrates were exceeded by three compounds. Other Aquatic Life Benchmarks were exceeded by four additional compounds (acetochlor, atrazine, halosulfuron methyl, and linuron) discussed later in this report.

- Imidacloprid was detected in 31 samples collected in 2024 at the South Branch Tenmile Creek, Leola Ditch, Root River, Fourteen Mile Creek, Wendt Creek, Eau Claire River, Spring Brook, and Honey Creek sampling locations at concentrations ranging from 0.0102 to 0.0564 µg/L. All imidacloprid detections exceeded the Chronic Aquatic Life Benchmark for invertebrates of 0.01 µg/L.
- Clothianidin was detected in 25 samples at concentrations ranging from 0.0558 to 0.237 µg/L at the South Branch Tenmile Creek, Leola Ditch, Root River, Fourteen Mile Creek, and Vermont Creek sampling locations. Clothianidin exceeded the 0.05 µg/L Chronic Aquatic Life Benchmark for invertebrates in all samples.
- Thiamethoxam was detected in one sample collected at Leola Ditch station in May. The concentration in this sample was 4.33 µg/L. It exceeded the 0.74 µg/L Chronic Aquatic Life Benchmark for invertebrates.

Exceedance of Groundwater Standards

- Nitrogen as nitrate plus nitrite was detected at concentrations exceeding the 10 mg/L Wis. Admin. Code Ch. NR 140 Enforcement Standard (ES) in 19 samples. These samples were collected from South Branch Tenmile Creek, Leola Ditch, and Syene Spring. Concentrations ranged from 11.7 mg/L to 15.5 mg/L.
- Atrazine TCR exceeded the 0.3 µg/L Wis. Admin. Code Ch. NR 140 Preventive Action Limit (PAL) in 11 samples. These samples were collected at Sugar River, Halfway Prairie Creek, Red Cedar River, Root River, Spring Brook, Honey Creek, and Syene Springs. Concentrations ranged from 0.3107 µg/L to 2.315 µg/L.
- Atrazine exceeded the 0.3 µg/L Wis. Admin. Code Ch. NR 140 PAL in six samples. These samples were collected at Root River, Honey Creek, Halfway Prairie Creek, and Red Cedar River. Concentrations ranged from 0.308 to 1.99 µg/L.
- Diamino atrazine exceeded the 0.3 µg/L Wis. Admin. Code Ch. NR 140 PAL in one sample collected at Syene Springs. It was detected at a concentration of 0.412 µg/L.
- Acetochlor exceeded the 0.7 µg/L Wis. Admin. Code Ch. NR 140 PAL in two samples collected in April and May at Root River at concentrations of 1.68 and 2.02 µg/L, respectively.

2024 Precipitation Measurements

Greater surface runoff usually correlates well with heavy precipitation events, especially when the ground surface is exposed due to a lack of vegetation and where the surficial soil is poorly drained. Variations in precipitation and surface runoff rates could result in fluctuations of pesticide concentrations found in surface water. Surface runoff may decrease or increase the likelihood of detecting pesticides in surface water. If surface runoff occurs during the traditional pesticide application season, a peak in pesticide concentration may be expected in surface waters downstream of agricultural fields. Conversely, if surface runoff occurs before or after the pesticide application season, pesticide concentrations may be diluted.

Wisconsin averaged 34.12 inches of precipitation annually between 1991 and 2020. In 2024, the state of Wisconsin as a whole experienced an average of 37.0 inches, marking an above-average year for precipitation. This made 2024 the 13th wettest year on record for Wisconsin (Wisconsin State Climatology Office, 2025). The annual average precipitation for 2024 was higher than 2023 (30.13 inches).

Figure 3 shows the statewide monthly precipitation departures from the 30-year average between 1991 and 2020 (NOAA National Centers for Environmental Information, 2025). From March to August and in November, precipitation levels were higher than the 1991 to 2020 baseline period, with increases ranging from 0.19 to 2.52 inches above the average. This indicates that greater-than-average precipitation occurred during the typical pesticide application season, particularly in May and June, as well as much of the growing season. In January, February, September, October, and December, precipitation levels were lower compared to averages from the 1991 to 2020 period, with particularly notable deficits in September and October. These decreases ranged from 0.02 to 2.18 inches below the average.

Figure 3: 2024 Average Monthly Precipitation Departures from 1991-2020 Average

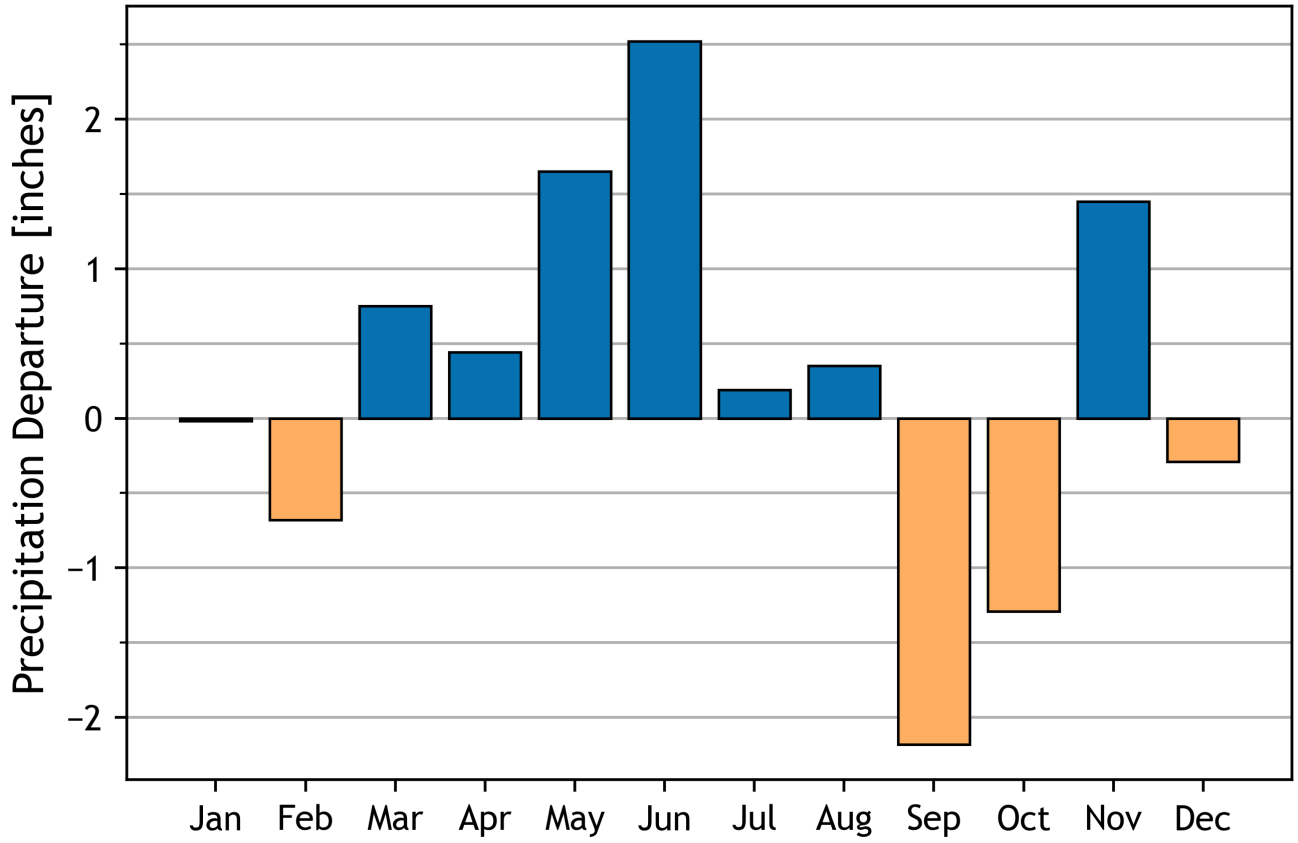


Figure 4 shows the total accumulated precipitation mapped across Wisconsin (Wisconsin State Climatology Office, 2025). Overall, the northern part of the state, apart from a few isolated areas, experienced between 30 and 40 inches of precipitation in 2024. Most of southern and central Wisconsin experienced greater amounts of precipitation (between 40 to 50 inches), and an area near Prairie du Sauk experienced 50 to 60 inches of precipitation.

Figure 4: 2024 Accumulated Precipitation in Wisconsin

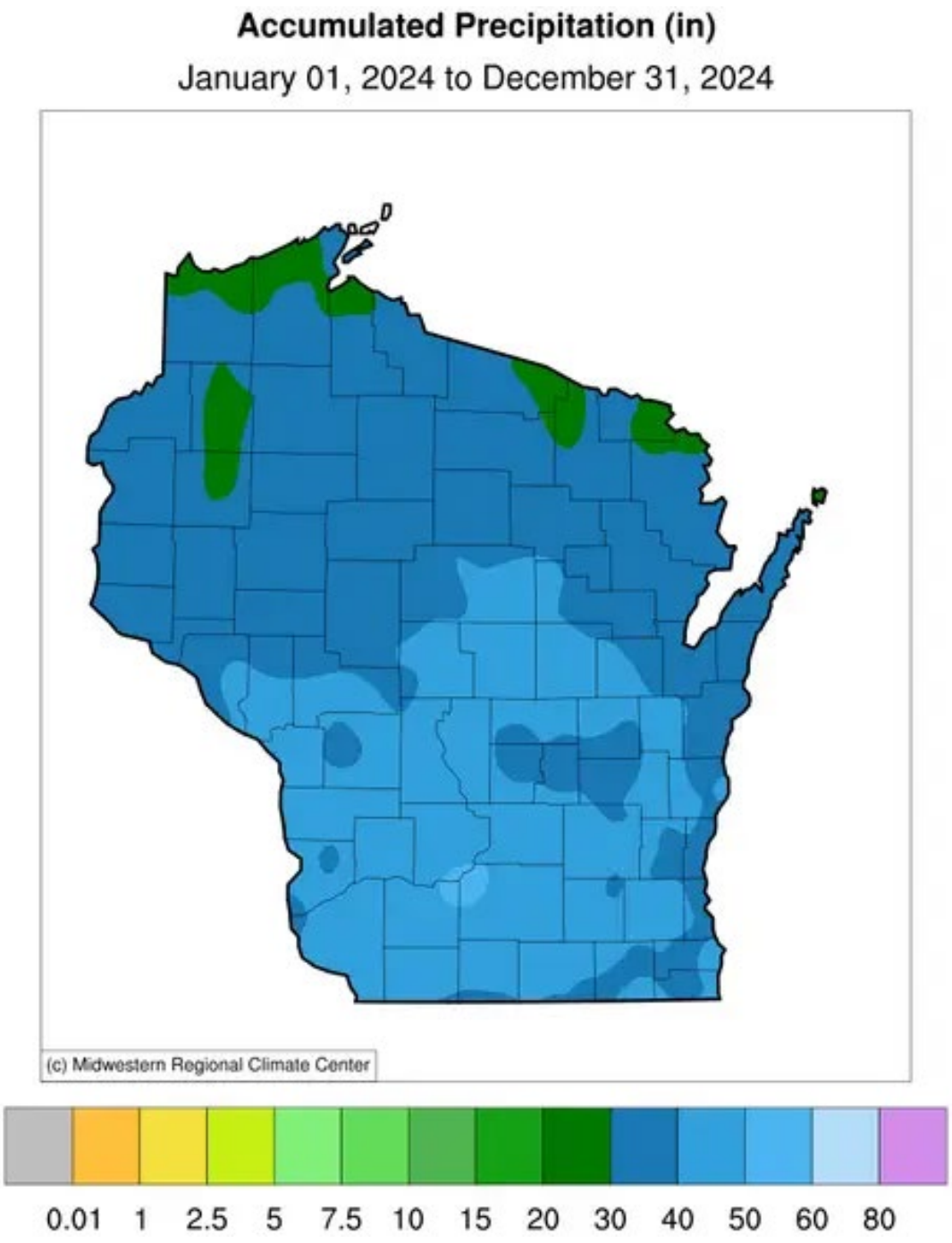
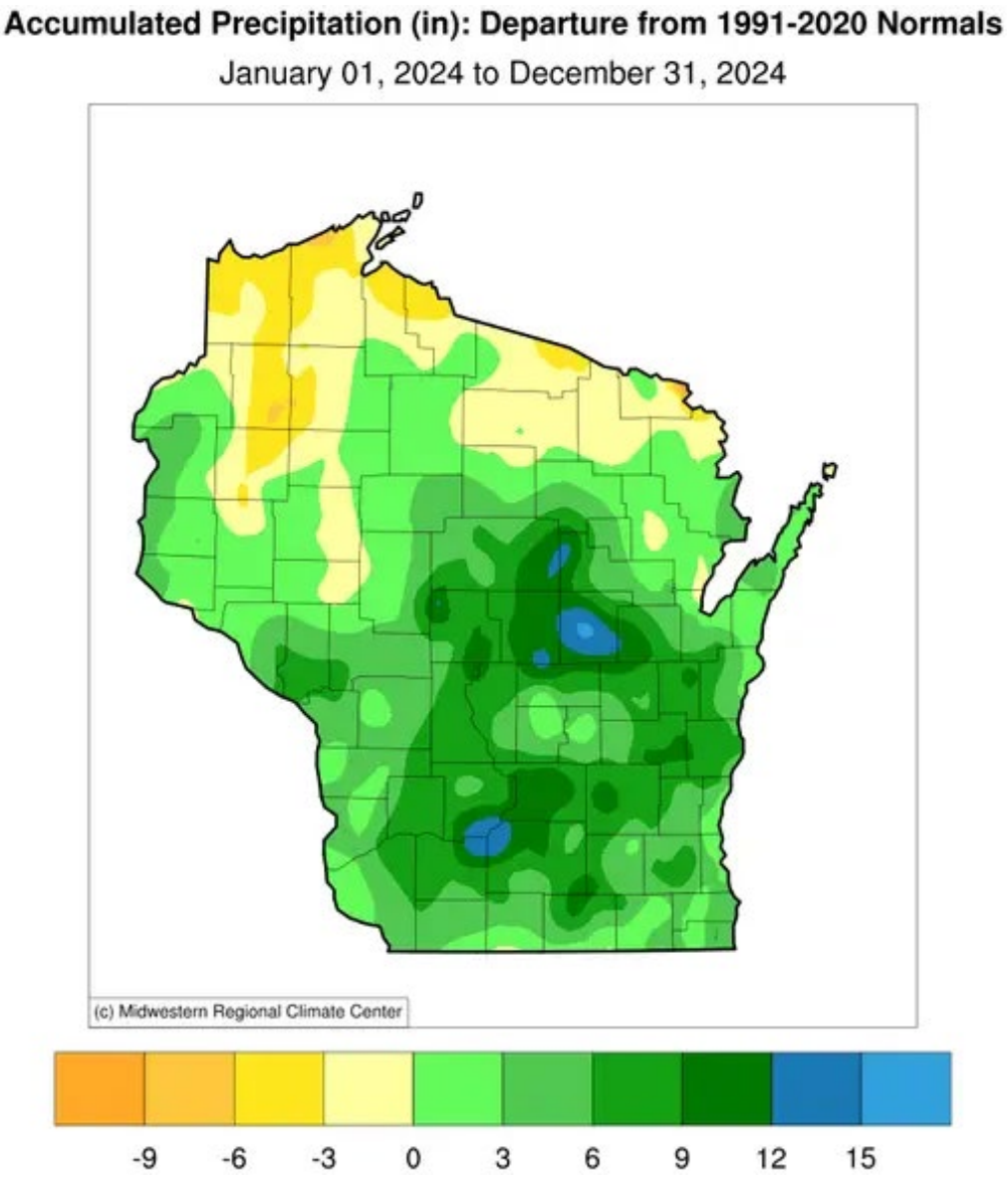


Figure 5 shows the geographic spread of 2024 precipitation departures (Wisconsin State Climatology Office, 2025). Positive deviations, shown in green and blue, signify regions where the annual precipitation exceeded the average. Conversely, negative departures, shown in yellow and orange, highlight areas with precipitation below average. Much of southern and central Wisconsin experienced more precipitation than the 1991 to 2020 norm, while much of northern Wisconsin experienced about the same or less precipitation than the norm.

Figure 5: 2024 Accumulated Precipitation Departures in Wisconsin



The wetter months of 2024 delivered a number of noteworthy precipitation events in Wisconsin. Throughout the spring and summer, several areas in the state saw more than 4 inches of rainfall over the course of a single day, and at least one instance of more than 2 inches of rain falling in one hour was recorded. Although it was not one of the wettest months of 2024, April saw record snowfall when a snowstorm early in the month dropped over 1.5 feet of snow in some areas over the course of two days.

Although 2024 was one of the wettest years in Wisconsin on record, there were several relatively rapid shifts in precipitation patterns when examining monthly averages. As Figure 3 shows, large differences in departure from monthly averages were noted from February to March, August to September, and October to November. With an average temperature of 47.6 °F, 2024 was also the warmest year on record, up from the prior record of 47.4 °F in 2012 (Wisconsin State Climatology Office, 2025).

Pesticide Detection Rates

Of the 112 pesticide analytes included in DATCP's Surface Water Sampling Program testing methodology, 47 individual pesticide compounds were detected in 2024 samples from all sites. The most frequently detected pesticide analyte was metolachlor ethanesulfonic acid (ESA). This is a breakdown product of metolachlor, an active ingredient in corn herbicides such as Dual, Halex GT, Lumax, and many others (Kelly Solutions, 2025). Metolachlor ESA concentrations were detected in 95.7% of the samples collected.

De-ethyl atrazine, a breakdown product of the active ingredient atrazine, was the second most frequently detected single compound, with a detection rate of 41.4%. Atrazine is a widely used herbicide for controlling broadleaf and grassy weeds in crops such as corn. Although atrazine TCR was calculated to be in 47.8% of the samples, it does not represent a single compound. Instead, it is the sum of atrazine and its three primary breakdown products (de-ethyl atrazine, de-isopropyl atrazine, and di-amino atrazine). The percentage indicates the proportion of samples that contained one or more atrazine metabolites and/or atrazine.

Clothianidin was the third most commonly detected pesticide compound, with a detection rate of 39.2%. Clothianidin is a type of neonicotinoid insecticide. Neonicotinoids are commonly deployed as prophylactic coatings on planted seeds.

Similar compounds were also found in groundwater, as reported in the DATCP 2023 statewide survey report (Wisconsin Department of Agriculture, Trade and Consumer Protection and United States Department of Agriculture, 2024). Metolachlor ESA is historically the most widely reported pesticide detected in private potable wells, with an estimated statewide detection rate of 36.1% in 2023. Clothianidin had estimated statewide detection rate of 5.1% in private potable wells in 2023.

Comparison with Prior Years

In 2024, 47 individual pesticide compounds were detected, compared to 24 different pesticides detected in 2023. A large number of pesticide compounds were detected in 2024 but not in 2023, including acetochlor oxanilic acid (OA), acifluorfen, alachlor oxanilic acid (OA), azoxystrobin, carbaryl, dicamba, dimethenamid, flumetsulam, linuron, MCPA, MCPP, metalaxyl, norflurazon, prometon, simazine, sulfentrazone, and triclopyr. The only compound detected in 2023 but not detected in 2024 was dinotefuran, a neonicotinoid insecticide. In 2024, DATCP tested for six new compounds: boscalid, hydroxyatrazine, pyroxasulfone, pyroxasulfone M1, sulfentrazone-3-carboxylic acid, and tebuconazole. Of these six compounds, three (boscalid, hydroxyatrazine, and pyroxasulfone) were detected for the first time. Other compounds detected for the first time in Wisconsin surface water in 2024 were carbaryl, fluroxypyr, and halosulfuron-methyl.

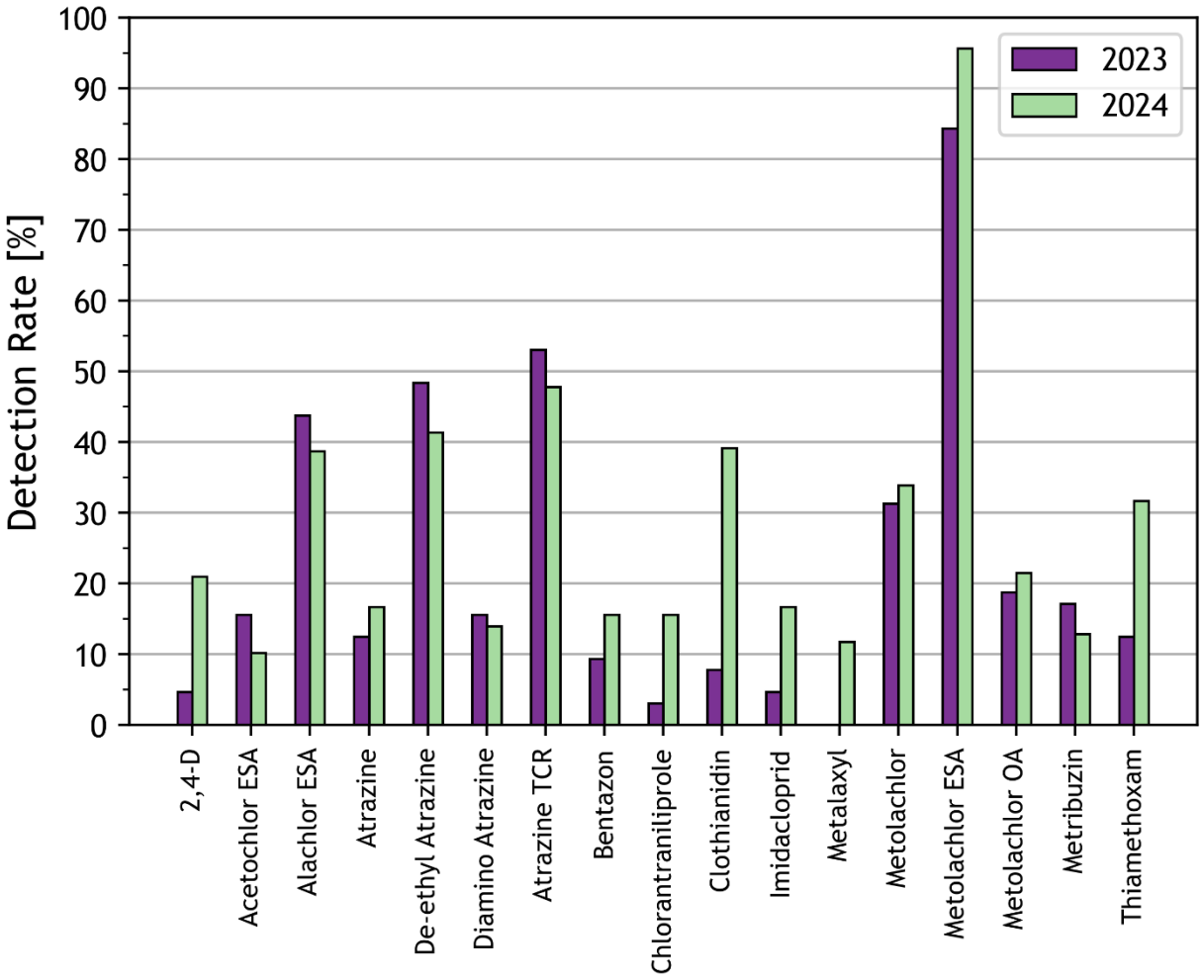
Figure 6 shows the pesticide detection rates[2] in percentage for 2024 and 2023. Only pesticides with a detection rate of 10% or higher in 2024 or 2023 are shown. As shown, some pesticide detection rates in 2024 were higher and some were lower. Although the detection rate for atrazine increased in 2024 compared to 2023, the detection rates for its metabolites de-ethyl atrazine and diamino atrazine decreased over the same period, along with the detection rate for atrazine TCR. Slight decreases in the detection rates of acetochlor ESA and alachlor ESA – metabolites of the herbicides acetochlor and alachlor, respectively – were also observed. There were several prominent detection rate increases between 2023 and 2024. The detection rate for metolachlor ESA, the most commonly detected pesticide compound in 2024, increased by more than 10%. The detection rate of the herbicide 2,4-D increased by more than 15% in 2024, more than quadrupling the 2023 detection rate. Detection rates for several neonicotinoid insecticides also increased dramatically from 2023 to 2024. The detection rates for thiamethoxam, imidacloprid, and clothianidin increased by factors of more than two, three, and five, respectively, between 2023 and 2024.

Changes in detection rates between 2023 and 2024 may be explained by a variety of factors. The surface water program expanded the number of sampling locations in 2024 to 24, adding 15 new locations while retaining nine locations that had been sampled in 2023. Many new sampling locations focused on areas of

[2] The detection rate (%) is calculated as follow: $\frac{number\ of\ detects}{total\ number\ of\ samples}\ x\ 100$

high agricultural land use, such as the Central Sands region, the Lower Wisconsin River Valley, and the area surrounding the city of Antigo. Compared to 2023, nearly triple the amount of samples were collected in 2024. Monthly sampling in 2024 was completed at most sampling locations between April and November, a frequency that was not achieved in 2023. As mentioned in the 2023 Surface Water Sampling Report, sampling in 2023 may have missed peak detections for some compounds due to this lower frequency of sampling (Wisconsin Department of Agriculture, Trade and Consumer Protection, 2024). Additionally, 2024 generally saw more precipitation in Wisconsin compared to 2023, particularly during the spring and summer pesticide application and growing seasons. This may have led to higher amounts of pesticide and nutrient runoff to surface waters.

Figure 6: Pesticides Detection Rates in 2024 Samples vs 2023 Samples



Monthly Pesticide Detections

One of the program's objectives is to evaluate the relationship between pesticide application and seasonal effects on surface water quality. For this reason, monthly samples are usually collected, and monthly pesticide data are evaluated to determine if concentrations are influenced by seasonal surface water flows or groundwater/aquifer discharge (base flow). For seasonal flow, fluctuating concentrations throughout the year would be expected. The highest concentrations would be expected during the pesticide application months (May through August), followed by a decline in September and October. This decline would continue over the winter months, until the cycle repeats during the next application season. For baseline aquifer flow, a consistent group of detected analytes and steady concentrations throughout the year would be expected. The baseline flow would reflect pesticide concentrations within the watershed aquifer as groundwater discharges to surface water throughout the year.

In 2024, monthly samples were collected between March and October from most sites. Sites on the Tomorrow River, South Branch Tenmile Creek, Leola Ditch, Fourteen Mile Creek, Mill Creek, Wendt Creek, Halfway Prairie Creek, Vermont Creek, Sugar River, Root River, Milwaukee River, and Honey Creek each had two samples collected in the month of October: one in early October and one in late October. The last sample was an attempt to collect a final round of samples before the DATCP BLS laboratory closed for winter maintenance. Not all sites were able to have a second October sample collected because of this closure.

The following is a summary of pesticides consistently detected in multiple samples and detected outside the pesticide application season. These results likely indicate baseline aquifer flow for the respective locations:

- East Branch Eau Claire River – Access
  - Metolachlor ESA was detected at concentrations ranging from 0.0784 to 0.342 µg/L. The lowest concentration was detected in May and the highest in October.
- Eau Claire River CTY Y Upstream
  - Clothianidin was detected at concentrations ranging from 0.0114 to 0.0176 µg/L. The lowest concentration was detected in March and the highest in June.
  - Metolachlor ESA was detected at concentrations ranging from 0.0555 to 0.367 µg/L. The lowest concentration was detected in May and the highest in October.
  - Thiamethoxam was detected at concentrations ranging from 0.0104 to 0.297 µg/L. The lowest concentration was detected in July and the highest in June.
- Fourteen Mile Creek (Ditch # 7) - CTH D
  - Alachlor ESA was detected at concentrations ranging from 0.144 to 0.417 µg/L. The lowest concentration was detected in March and the highest in June.
  - Bentazon was detected at concentrations ranging from 0.0587 to 0.0929 µg/L. The lowest concentration was detected in July and the highest in June.
  - Chlorantraniliprole was detected at concentrations ranging from 0.0917 to 0.492 µg/L. The lowest concentration was detected in October and the highest in April.
  - Clothianidin was detected at concentrations ranging from 0.0212 to 0.0738 µg/L. The lowest concentration was detected in April and the highest in June.
  - Imidacloprid was detected at concentrations ranging from 0.0102 to 0.0189 µg/L. The lowest concentration was detected in September and the highest in June.
  - Metolachlor was detected at concentrations ranging from 0.0668 to 0.167 µg/L. The lowest concentration was detected in September and the highest in June.
  - Metolachlor ESA was detected at concentrations ranging from 2.17 to 4.01 µg/L. The lowest concentration was detected in March and the highest in June.
  - Metolachlor OA was detected at concentrations ranging from 0.393 to 2.13 µg/L. The lowest concentration was detected in March and the highest in June.
  - Metribuzin DADK was detected at concentrations ranging from 0.287 to 0.769 µg/L. The lowest concentration was detected in October and the highest in August.
  - Norflurazon was detected at concentrations ranging from 0.055 to 0.196 µg/L. The lowest concentration was detected in October and the highest in April.
  - Thiamethoxam was detected at concentrations ranging from 0.0427 to 0.314 µg/L. The lowest concentration was detected in October and the highest in July.
- Halfway Prairie Creek at Farm near Mazomanie, WI
  - De-ethyl atrazine was detected at concentrations ranging from 0.0504 to 0.0986 µg/L. The lowest concentration was detected in April and the highest in July.
  - Diamino atrazine was detected at concentrations ranging from 0.175 to 0.198 µg/L. The lowest concentration was detected in May and the highest in October.
  - Metolachlor ESA was detected at concentrations ranging from 0.254 to 1.3 µg/L. The lowest concentration was detected in March and the highest in July.
- Hay River at N Bridge St
  - Metolachlor ESA was detected at concentrations ranging from 0.309 to 0.541 µg/L. The lowest concentration was detected in March and the highest in September.

- Honey Creek - Near Confluence with Menominee River
  - 2,4-D was detected at concentrations ranging from 0.0794 to 3.12 µg/L. The lowest concentration was detected in June and the highest in August.
- Leola Ditch at D and 3rd
  - Alachlor ESA was detected at concentrations ranging from 1.41 to 1.86 µg/L. The lowest concentration was detected in May and the highest in August.
  - Alachlor OA was detected at concentrations ranging from 0.29 to 0.407 µg/L. The lowest concentration was detected in May and the highest in August.
  - Bentazon was detected at concentrations ranging from 0.102 to 0.242 µg/L. The lowest concentration was detected in March and the highest in October.
  - Chlorantraniliprole was detected at concentrations ranging from 0.0765 to 0.145 µg/L. The lowest concentration was detected in August and the highest in October.
  - Clothianidin was detected at concentrations ranging from 0.0902 to 0.132 µg/L. The lowest concentration was detected in April and the highest in August.
  - De-ethyl atrazine was detected at concentrations ranging from 0.0537 to 0.0758 µg/L. The lowest concentration was detected in March and the highest in August.
  - Imidacloprid was detected at concentrations ranging from 0.0207 to 0.0313 µg/L. The lowest concentration was detected in October and the highest in March.
  - Metalaxyl was detected at concentrations ranging from 0.0643 to 0.077 µg/L. The lowest concentration was detected in October and the highest in March.
  - Metolachlor was detected at concentrations ranging from 0.0507 to 0.163 µg/L. The lowest concentration was detected in April and the highest in July.
  - Metolachlor ESA was detected at concentrations ranging from 4.8 to 5.91 µg/L. The lowest concentration was detected in March and the highest in October.
  - Metolachlor OA was detected at concentrations ranging from 0.977 to 4.02 µg/L. The lowest concentration was detected in March and the highest in October.
  - Metribuzin was detected at concentrations ranging from 0.109 to 0.18 µg/L. The lowest concentration was detected in March and the highest in August.
  - Metribuzin DADK was detected at concentrations ranging from 0.37 to 1 µg/L. The lowest concentration was detected in July and the highest in June.
  - Thiamethoxam was detected at concentrations ranging from 0.351 to 4.33 µg/L. The lowest concentration was detected in October and the highest in May.
- Mill Creek at CTH C
  - Alachlor ESA was detected at concentrations ranging from 0.0605 to 0.182 µg/L. The lowest concentration was detected in June and the highest in July.
  - Metolachlor ESA was detected at concentrations ranging from 0.108 to 2.88 µg/L. The lowest concentration was detected in March and the highest in July.
  - Metolachlor OA was detected at concentrations ranging from 0.295 to 1.29 µg/L. The lowest concentration was detected in September and the highest in July.
  - Thiamethoxam was detected at concentrations ranging from 0.0109 to 0.0568 µg/L. The lowest concentration was detected in September and the highest in July.
- Milwaukee River at Estabrook Park at Milwaukee, WI
  - 2,4-D was detected at concentrations ranging from 0.0568 to 0.154 µg/L. The lowest concentration was detected in April and the highest in May.
  - Metolachlor ESA was detected at concentrations ranging from 0.0739 to 0.765 µg/L. The lowest concentration was detected in March and the highest in July.
- Mormon Coulee Creek #6 - Bridge at CTH YY
  - De-ethyl atrazine was detected at concentrations ranging from 0.0673 to 0.0843 µg/L. The lowest concentration was detected in August and the highest in June.
  - Metolachlor ESA was detected at concentrations ranging from 0.113 to 0.277 µg/L. The lowest concentration was detected in March and the highest in July.

- Oldens Creek
  - Metolachlor ESA was detected at concentrations ranging from 0.0837 to 1.02 µg/L. The lowest concentration was detected in May and the highest in October.
  - Thiamethoxam was detected at concentrations ranging from 0.015 to 0.174 µg/L. The lowest concentration was detected in June and the highest in October.
- Red Cedar River 130ft N of CTH W Bridge
  - Acetochlor ESA was detected at concentrations ranging from 0.0504 to 0.126 µg/L. The lowest concentration was detected in September and the highest in June.
  - Alachlor ESA was detected at concentrations ranging from 0.0603 to 0.0961 µg/L. The lowest concentration was detected in May and the highest in September.
  - Metolachlor ESA was detected at concentrations ranging from 0.335 to 0.688 µg/L. The lowest concentration was detected in June and the highest in August.
- Red Cedar River at CTH OO
  - Metolachlor ESA was detected at concentrations ranging from 0.221 to 0.331 µg/L. The lowest concentration was detected in March and the highest in August.
- Red Cedar Criver CTH A & I Bridge - Downstream of Confluence w/ Chetek River
  - 2,4-D was detected at concentrations ranging from 0.061 to 0.181 µg/L. The lowest concentration was detected in October and the highest in August.
  - Alachlor ESA was detected at concentrations ranging from 0.0578 to 0.0878 µg/L. The lowest concentration was detected in March and the highest in April.
  - Metolachlor ESA was detected at concentrations ranging from 0.183 to 0.316 µg/L. The lowest concentration was detected in June and the highest in April.
- Root River at 60th 3m (Bi Sur)
  - 2,4-D was detected at concentrations ranging from 0.181 to 3.37 µg/L. The lowest concentration was detected in July and the highest in May.
  - Acetochlor ESA was detected at concentrations ranging from 0.0549 to 1.1 µg/L. The lowest concentration was detected in September and the highest in July.
  - Metolachlor ESA was detected at concentrations ranging from 0.0574 to 1.06 µg/L. The lowest concentration was detected in March and the highest in July.
- South Fork Bad Axe River - Oliver Rd.
  - Alachlor ESA was detected at concentrations ranging from 0.0795 to 0.101 µg/L. The lowest concentration was detected in July and the highest in April.
  - De-ethyl atrazine was detected at concentrations ranging from 0.078 to 0.0894 µg/L. The lowest concentration was detected in August and the highest in June.
  - Metolachlor ESA was detected at concentrations ranging from 0.12 to 0.166 µg/L. The lowest concentration was detected in March and the highest in July.
- Spring Brook - Before Eau Claire R at Nolan Rd.
  - Clothianidin was detected at concentrations ranging from 0.0302 to 0.0416 µg/L. The lowest concentration was detected in August and the highest in March.
  - Metolachlor ESA was detected at concentrations ranging from 0.239 to 0.741 µg/L. The lowest concentration was detected in June and the highest in July.
  - Thiamethoxam was detected at concentrations ranging from 0.0304 to 0.0989 µg/L. The lowest concentration was detected in September and the highest in June.
- Sugar River Upstream of Hwy 69
  - Alachlor ESA was detected at concentrations ranging from 0.0718 to 0.104 µg/L. The lowest concentration was detected in June and the highest in October.
  - Clothianidin was detected at concentrations ranging from 0.0107 to 0.0296 µg/L. The lowest concentration was detected in May and the highest in July.
  - De-ethyl atrazine was detected at concentrations ranging from 0.0501 to 0.0787 µg/L. The lowest concentration was detected in March and the highest in October.

- Diamino atrazine was detected at concentrations ranging from 0.158 to 0.248 µg/L. The lowest concentration was detected in March and the highest in October.
- Metolachlor ESA was detected at concentrations ranging from 0.3 to 0.793 µg/L. The lowest concentration was detected in March and the highest in July.

- South Branch Tenmile Creek - Taft Rd (Site 7)
  - Alachlor ESA was detected at concentrations ranging from 0.678 to 0.963 µg/L. The lowest concentration was detected in May and the highest in September.
  - Bentazon was detected at concentrations ranging from 0.103 to 0.243 µg/L. The lowest concentration was detected in July and the highest in April.
  - Chlorantraniliprole was detected at concentrations ranging from 0.0518 to 0.0675 µg/L. The lowest concentration was detected in July and the highest in April.
  - Clothianidin was detected at concentrations ranging from 0.146 to 0.229 µg/L. The lowest concentration was detected in July and the highest in March.
  - Dacthal di-acid was detected at concentrations ranging from 0.676 to 0.826 µg/L. The lowest concentration was detected in October and the highest in September.
  - De-ethyl atrazine was detected at concentrations ranging from 0.114 to 0.151 µg/L. The lowest concentration was detected in July and the highest in August.
  - Imidacloprid was detected at concentrations ranging from 0.0368 to 0.0564 µg/L. The lowest concentration was detected in October and the highest in April.
  - Metalaxyl was detected at concentrations ranging from 0.0938 to 0.117 µg/L. The lowest concentration was detected in July and the highest in March.
  - Metolachlor was detected at concentrations ranging from 0.262 to 0.376 µg/L. The lowest concentration was detected in October and the highest in April.
  - Metolachlor ESA was detected at concentrations ranging from 4.35 to 6.07 µg/L. The lowest concentration was detected in July and the highest in March.
  - Metolachlor OA was detected at concentrations ranging from 2.26 to 4.44 µg/L. The lowest concentration was detected in July and the highest in April.
  - Metribuzin was detected at concentrations ranging from 0.299 to 0.402 µg/L. The lowest concentration was detected in July and the highest in March.
  - Metribuzin DADK was detected at concentrations ranging from 0.417 to 0.917 µg/L. The lowest concentration was detected in October and the highest in June.
  - Thiamethoxam was detected at concentrations ranging from 0.0636 to 0.0891 µg/L. The lowest concentration was detected in July and the highest in April.
- Tomorrow River at Clementson Rd near Nelsonville
  - Alachlor ESA was detected at concentrations ranging from 0.073 to 0.142 µg/L. The lowest concentration was detected in March and the highest in October.
  - Metolachlor ESA was detected at concentrations ranging from 0.0824 to 0.303 µg/L. The lowest concentration was detected in May and the highest in October.
- Vermont Creek at Michaelis Road
  - Clothianidin was detected at concentrations ranging from 0.0115 to 0.0648 µg/L. The lowest concentration was detected in October and the highest in July.
  - Diamino atrazine was detected at concentrations ranging from 0.15 to 0.159 µg/L. The lowest concentration was detected in May and the highest in October.
  - Metolachlor ESA was detected at concentrations ranging from 0.0924 to 1.02 µg/L. The lowest concentration was detected in March and the highest in July.
- Wendt Creek - Hwy 78
  - De-ethyl atrazine was detected at concentrations ranging from 0.0543 to 0.072 µg/L. The lowest concentration was detected in October and the highest in July.
  - Diamino atrazine was detected at concentrations ranging from 0.152 to 0.202 µg/L. The lowest concentration was detected in May and the highest in October.

- Metolachlor ESA was detected at concentrations ranging from 0.206 to 1.69 µg/L. The lowest concentration was detected in March and the highest in July.

Comparison to Standards

Pesticide concentrations identified during DATCP's 2024 Surface Water Sampling Program were compared to the following three published environmental surface water/groundwater quality standards:

- Wis. Admin. Code Ch. NR 140 – PAL and ES for drinking water;
- DHS drinking water health advisories (for some pesticides for which ES and PAL are not established); and
- EPA's Office of Pesticide Programs - Aquatic Life Benchmarks for Pesticides for freshwater.

The table in Appendix B shows these three standards alongside the range of the detected pesticide concentrations identified as part of the 2024 Surface Water Sampling Program. As shown in the Appendix B table, several pesticides and their metabolites have no aquatic life benchmarks (23 out of 112) or established Wis. Admin. Code NR 140 ES and PAL standards (83 out of 112). DHS has established drinking water health advisory recommendations for 17 pesticide compounds that have no established Wis. Admin. Cody NR 140 ES or PAL.

EPA Office of Pesticide Programs - Aquatic Life Benchmarks for Pesticides for freshwater were exceeded for seven compounds as follows:

- Acetochlor
  - Acetochlor was detected in two samples, both collected from the Root River, at concentrations greater than the 1.43 µg/L Aquatic Life Benchmark for non-vascular plants. These samples were collected in April and May at concentrations of 1.68 and 2.02 µg/L, respectively.
- Atrazine
  - Atrazine was detected in two samples, both collected from the Root River, at concentrations greater than the 1 µg/L Aquatic Life Benchmark for non-vascular plants. These samples were collected in April and May at concentrations of 1.84 and 1.99 µg/L, respectively.
- Clothianidin
  - Clothianidin was detected in 25 samples collected from South Branch Tenmile Creek, Leola Ditch, Fourteen Mile Creek, Root River, and Vermont Creek at concentrations greater than the 0.05 µg/L chronic Aquatic Life Benchmark for invertebrates. These samples were collected between March and October at concentrations ranging from 0.0558 to 0.237 µg/L.
- Halosulfuron-methyl
  - Halosulfuron-methyl was detected in one sample collected from Vermont Creek at a concentration greater than the 0.042 µg/L Aquatic Life Benchmark for vascular plants. This sample was collected in July at a concentration of 0.0747 µg/L.
- Imidacloprid
  - Imidacloprid was detected in 31 samples collected from South Branch Tenmile Creek, Leola Ditch, Fourteen Mile Creek, Root River, Wendt Creek, Eau Claire River, Spring Brook, and Honey Creek at concentrations greater than the 0.01 µg/L chronic Aquatic Life Benchmark for invertebrates. These samples were collected between March and October at concentrations ranging from 0.0102 to 0.0564 µg/L.
- Linuron
  - Linuron was detected in two samples, both collected from Spring Brook, at concentrations greater than the 0.09 µg/L chronic Aquatic Life Benchmark for invertebrates. These samples were collected in June and August at concentrations of 0.257 and 0.246, respectively.
- Thiamethoxam
  - Thiamethoxam was detected in one sample collected from Leola Ditch at a concentration greater than the 0.74 µg/L chronic Aquatic Life Benchmark for invertebrates. This sample was collected in May at a concentration of 4.33 µg/L.

No pesticides or pesticide metabolites were detected at concentrations exceeding existing Wis. Admin. Code Ch. NR 140 ES values or any DHS health advisory levels. The Wis. Admin. Code Ch. NR 140 PAL was exceeded for three individual compounds and atrazine TCR in 20 samples as follows:

- Acetochlor (Wis. Admin. Code Ch. NR 140 PAL = 0.7 µg/L)
    - Acetochlor was detected in April and May samples collected from the Root River at concentrations of 1.68 and 2.02 µg/L, respectively.
- Atrazine (Wis. Admin. Code Ch. NR 140 PAL = 0.3 µg/L)
    - Atrazine was detected in April, May, and June samples collected from the Root River at concentrations of 1.84, 1.99, and 0.349 µg/L, respectively.
    - Atrazine was detected in the May sample collected from Honey Creek at a concentration of 0.677 µg/L.
    - Atrazine was detected in the June sample collected from Halfway Prairie Creek at a concentration of 0.318 µg/L.
    - Atrazine was detected in the June sample collected from the Red Cedar River (CTH W Bridge location) at a concentration of 0.308 µg/L.
- Diamino atrazine (Wis. Admin. Code Ch. NR 140 PAL = 0.3 µg/L)
    - Diamino atrazine was detected in the March sample collected at Syene Springs at a concentrations of 0.412 µg/L. This was the only sample collected from Syene Springs in 2024.
- Atrazine TCR (Wis. Admin. Code Ch. NR 140 PAL = 0.3 µg/L)
    - Atrazine TCR was calculated to be 0.6995 in the March sample collected at Syene Springs. This was the only sample collected from Syene Springs in 2024.
    - Atrazine TCR was calculated to be 1.9376, 2.315, and 0.4835 µg/L in the April, May, and June samples collected from the Root River, respectively.
    - Atrazine TCR was calculated to be 0.973 µg/L in the May sample collected from Honey Creek.
    - Atrazine TCR was calculated to be 0.4047 and 0.4218 µg/L in June and July samples collected at Halfway Prairie Creek, respectively.
    - Atrazine TCR was calculated to be 0.3607 µg/L in the June sample collected from Spring Brook.
    - Atrazine TCR was calculated to be 0.4044 µg/L in the June sample collected from the Red Cedar River (CTH W Bridge location).
    - Atrazine TCR was calculated to be 0.3156 and 0.3107 µg/L in two samples, both collected in October, from the Sugar River. The first sample was collected on 10/2/2024 and the second was collected on 10/28/2024.

Table 3 lists the pesticides and the metabolite exceedances for Wis. Admin. Code Ch. NR 140 ES and PAL standards.

Table 3: Summary of Pesticides and Metabolites Exceeding Wis. Admin. Code NR 140 Standards and DHS Drinking Water Health Advisory Recommendations

Compound	ES (µg/L)	PAL (µg/L)	Location	Date	Detection (µg/L)
Acetochlor	7	0.7	Root River	4/30/2024	1.68
				5/22/2024	2.02
Atrazine	3	0.3	Root River	4/30/2024	1.84
				5/22/2024	1.99
				6/19/2024	0.349
			Honey Creek	5/22/2024	0.677
			Halfway Prairie Creek	6/3/2024	0.318
			Red Cedar River (CTH W Bridge location)	6/19/2024	0.308
Diamino atrazine	3	0.3	Syene Springs	3/11/2024	0.412
Atrazine TCR	3	0.3	Syene Springs	3/11/2024	0.6995
			Root River	4/30/2024	1.9376
				5/22/2024	2.315
				6/19/2024	0.4835
			Honey Creek	5/22/2024	0.973
			Halfway Prairie Creek	6/3/2024	0.4047
				7/5/2024	0.4218
			Spring Brook	6/5/2024	0.3607
			Red Cedar River (CTH W Bridge location)	6/19/2024	0.4044
			Sugar River	10/2/2024	0.3156
				10/28/2024	0.3107

Notes: *ES - Wisconsin Administrative Code, Natural Resources 140 - Enforcement Standard*
PAL - Wisconsin Administrative Code, Natural Resources 140 - Preventive Action Limits
µg/L - micrograms per liter
Atrazine TCR - Total chlorinated residues of atrazine includes the sum of atrazine plus its metabolites de-ethyl atrazine, deisopropyl atrazine, and diamino atrazine
--- Indicates value not established

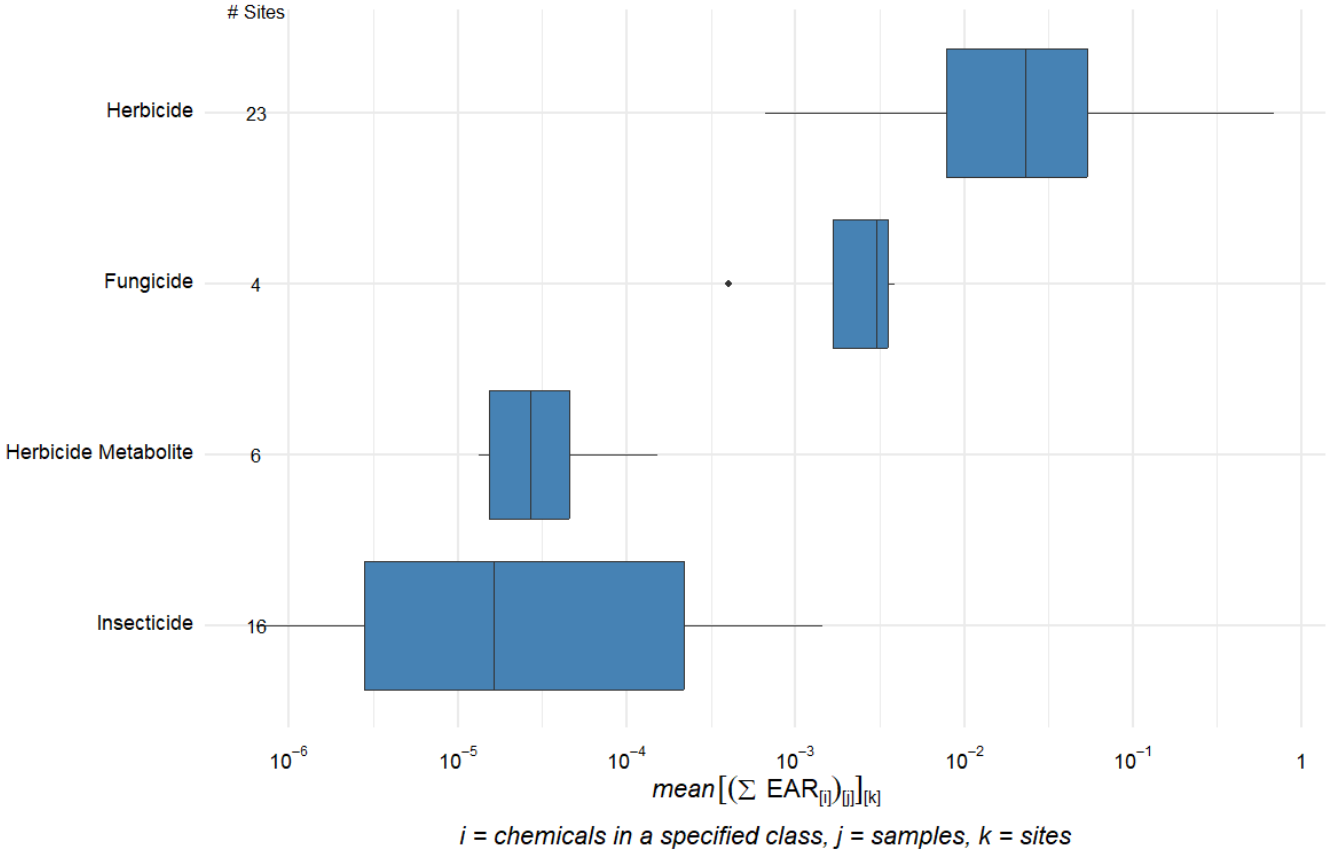
Comparing a detected pesticide (including metabolites) to the regulatory standards may not fully identify the total risk to human health and the environment. The majority of the published water quality standards or benchmarks are based on concentrations for the occurrence of a single compound. This approach does not account for potential cumulative risk and may underestimate toxicity.

Toxicity Evaluation

Toxicity Forecasting (ToxCast) is a research program by the U.S. Environmental Protection Agency (EPA) designed to evaluate the effects of thousands of chemicals on various biological pathways and targets (United States Environmental Protection Agency, 2024). In 2018, the USGS introduced ToxEval, an R package designed to facilitate the analysis and visualization of ToxCast data (DeCicco et al., 2024). ToxEval provides tools to assess chemical toxicity, compare chemical concentrations with ToxCast assay results, and generate summary plots and tables. One of its key features is the calculation of the Effective Activity Ratio (EAR), which determines whether the biological activity of specific chemicals in water bodies is above or below baseline levels. An EAR greater than 1 indicates that a compound exhibits activity exceeding the baseline or control level for the target being tested.

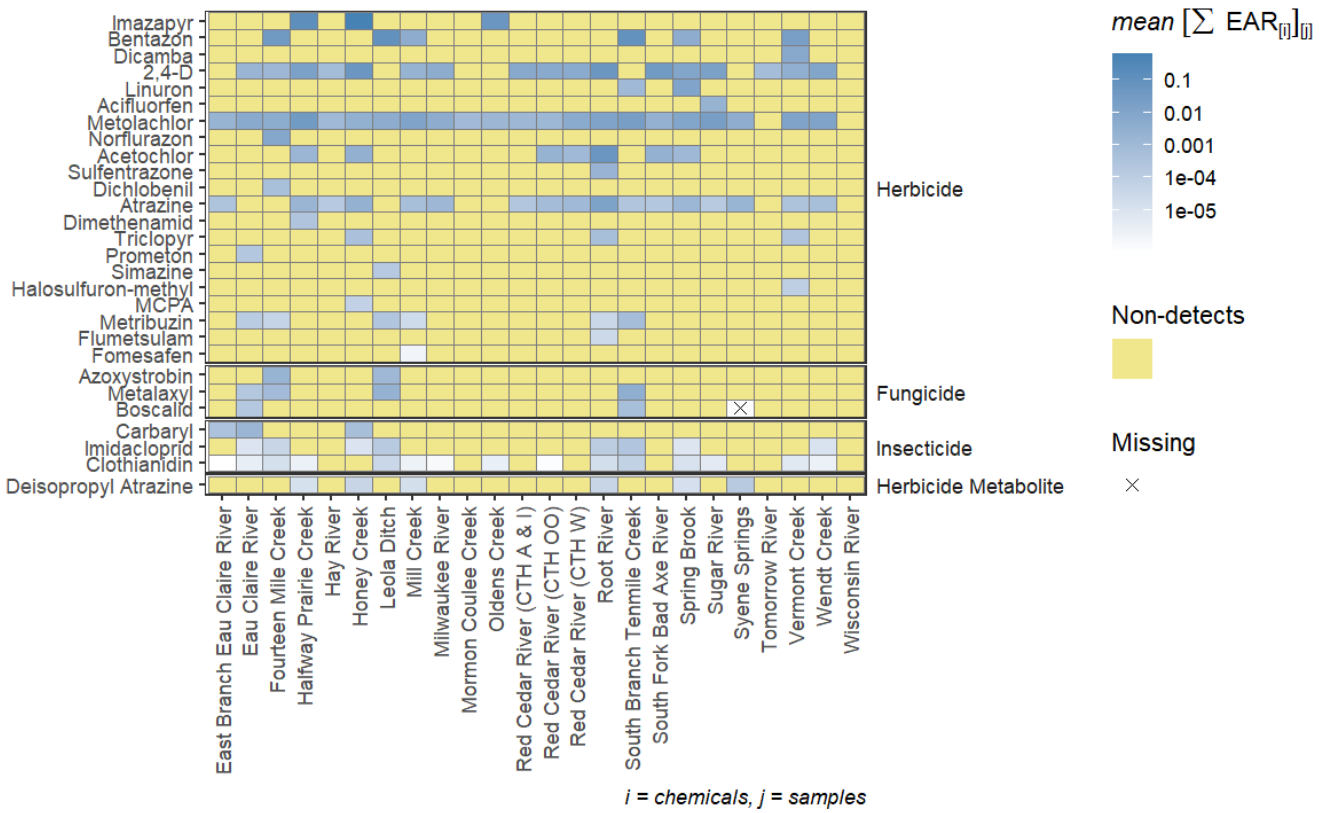
We analyzed data from the 2024 DATCP Surface Water program, focusing on the mean EAR rather than the maximum, to provide a general sense of the typical activity level of each compound. Figure 7 presents boxplots showing the mean EAR ranges for several pesticide groups (herbicides, fungicides, herbicide metabolites, and insecticides) detected in 2024 surface water samples at the various sites, along with the total number of sites where each pesticide group was detected. As shown, none of these groups had a mean EAR greater than 1.

Figure 7: Boxplots of Mean Effective Activity Ratio (EAR) for Pesticide Groups at Each Site Sampled



To further investigate non-negligible mean EARs for relevant pesticide compounds, we generated heat maps for each sampling site and relevant compound. As shown in Figure 8, the highest mean EARs were associated with compounds such as Imazapyr, Bentazon, and 2,4-D. However, none of these compounds had a mean EAR value greater than or equal to 1.

Figure 8: Heat Map of Mean Effective Activity Ratio (EAR) for Pesticide Compounds at Each Site Sampled



Other Notable Observations

Neonicotinoids

In recent years, there has been interest in the neonicotinoid class of insecticides due to possible adverse effects on pollinators (Van der Sluijs et al., 2013). They are present in insecticide products labeled for use on most crops grown in the state, including corn, soybeans, potatoes, and many other vegetables; as well as fruit crops and most small grains.

DATCP began testing for thiamethoxam in 2011. BLS now tests for six neonicotinoid compounds (acetamiprid, clothianidin, dinotefuran, imidacloprid, thiacloprid, and thiamethoxam). Three of these compounds (clothianidin, imidacloprid, and thiamethoxam) were detected in surface water samples collected in 2024. The remaining three neonicotinoid compounds were not detected in any surface water samples collected through the DATCP Surface Water Program. Because clothianidin, imidacloprid, and thiamethoxam are high solubility in water, their detection in groundwater and surface water is not unexpected.

Thiamethoxam was first detected at the Milwaukee River and at the Neenah Slough sampling locations in 2011. Since then, DATCP has recorded a total of 225 thiamethoxam detections in Wisconsin's surface waters. Of these, 185 were found within the Central Sands area since 2014. In 2024, thiamethoxam was detected in every sample collected from three of four sampling locations within the Central Sands region; specifically, it was detected at Fourteen Mile Creek, Leola Ditch at D and 3rd, and South Branch Tenmile Creek. Thiamethoxam was not detected in any samples collected from the fourth station (Tomorrow River near Clementson Rd) within the Central Sands region in 2024.

In 2024, thiamethoxam was consistently detected at several other locations. These include the Eau Claire River, Mill Creek, Oldens Creek, and Spring Brook. There were 26 detections of thiamethoxam across these locations in 2024. Detections tended to occur at these locations after May. Thiamethoxam detections in 2024 samples were below 1 µg/L at almost all sampling locations. However, one sample collected on 5/1/2024 from Leola Ditch detected thiamethoxam at a concentration of 4.33 µg/L, which is nearly an order of

magnitude greater than the next highest concentration detected in 2024. This high concentration may indicate that this sample was collected soon after the pesticide was applied at the land surface. Because the vadose zone is thin at this location, and groundwater discharges to Leola Ditch, the travel time from the surface to groundwater and then to surface water would be rapid.

Imidacloprid was first detected at Tenmile Creek in December 2014. Since then, DATCP has recorded a total of 108 imidacloprid detections in Wisconsin's surface waters. Of these detections, 90 were from within the Central Sands area since 2014. In particular, imidacloprid was detected in every sample collected from the Leola Ditch and the South Branch Tenmile Creek locations in 2024. Imidacloprid was detected on several occasions, primarily in June samples, at the Root River between 2018 and 2023. This trend continued in 2024; imidacloprid was detected in the April, May, June, and July samples collected from the Root River. Because the BLS detection reporting limit for imidacloprid is the same as the 0.1 µg/L EPA chronic Aquatic Life Benchmark for freshwater invertebrates, all 31 detections of imidacloprid in 2024 exceeded this benchmark.

Clothianidin was first detected in the Root River in June 2018. Since then, DATCP has recorded a total of 186 clothianidin detections in Wisconsin's surface waters. Of these detections, 73 were recorded in 2024 alone, and 101 were found within the Central Sands area since 2018. In 2024, clothianidin was detected in all 27 samples collected from Fourteen Mile Creek, Leola Ditch, and South Branch Tenmile Creek. Of these 27 detections, 21 exceeded the 0.05 µg/L EPA chronic Aquatic Life Benchmark for freshwater invertebrates. The 0.5 µg/L EPA chronic Aquatic Life Benchmark for aquatic invertebrates was also exceeded by Clothianidin in samples from the Root River and Vermont Creek in 2024. Clothianidin was also detected in the majority of samples from the Eau Claire River, Root River, Spring Brook, Sugar River sampling locations in 2024.

In 2024, one or more neonicotinoids were detected in 82 out of 186 samples, yielding a detection rate of 44%. This is an increase from 2023, when one or more neonicotinoids were found in 10 out of 64 samples, or a detection rate of 16%.

For more details on neonicotinoid concentrations exceeding EPA Aquatic Life Benchmarks and/or Wis. Admin. Code Ch. NR 140 ES and PAL values, please refer to the Comparison to Standards section of this document.

Atrazine

Atrazine is a restricted-use herbicide in Wisconsin. To protect groundwater, the use of atrazine is prohibited within 101 atrazine prohibition areas (PA's), covering approximately 1.2 million acres within the state (Wisconsin Department of Agriculture, Trade and Consumer Protection, 2025a). It is illegal to apply any pesticide containing the active ingredient atrazine within an atrazine PA. Outside of PAs, atrazine use is restricted but not prohibited. This means its application is subject to stricter regulations compared to federal guidelines.

Atrazine parent material concentrations were detected in 16.7% (31 samples) of the river, stream, or spring water samples collected in 2024, marking an increase in the rate of atrazine detections relative to the 2023 samples (12%).

Atrazine TCR (sum of atrazine and three of its metabolites) was detected in 47.8% (89 samples) of the river, stream, or spring water samples collected in 2024, marking a decrease in the atrazine TCR detection rate relative to the 2023 samples (53%).

Because most of the PAs have been in place for almost 30 years, it would be expected that atrazine and its metabolite concentrations in surface or spring water would be limited, or not present within the PAs. The Sugar River, Syene Springs, Wisconsin River, Mill Creek, and Tomorrow River sampling stations are located within PAs. The following is a summary of the atrazine or atrazine TCR findings for 2024 samples from stations located within a PA:

- In Mill Creek samples collected in June and July, atrazine parent material was detected at concentrations of 0.106 µg/L and 0.0685 µg/L, respectively; and de-ethyl atrazine was detected at concentrations of 0.0516 µg/L and 0.0784 µg/L, respectively. In the July sample, deisopropyl atrazine was detected at a concentration of 0.0586 µg/L. Diamino atrazine was not detected.
- In Sugar River samples collected in March, May, June, July, August, September, and October, de-ethyl atrazine was detected at concentrations ranging from 0.0501 to 0.0787 µg/L. In the July sample, atrazine parent material was detected at a concentration of 0.0581 µg/L. In samples collected in March, April, May, June, August, September, and October, diamino atrazine was detected at concentrations ranging from 0.158 to 0.248 µg/L. Deisopropyl atrazine was not detected.

- In the single sample collected from Syene Springs, atrazine parent material, along with de-ethyl atrazine, deisopropyl atrazine, and diamino atrazine were all present at detectable levels, leading to an atrazine TCR concentration of 0.6995 µg/L. Diamino atrazine in particular made up the bulk of this total, with a concentration of 0.412 µg/L. These concentrations fall squarely within concentration ranges reported for Syene Springs in the 2023 Surface Water Sampling Report (Wisconsin Department of Agriculture, Trade and Consumer Protection, 2024).

Syene Springs has been included in the DATCP Surface Water Monitoring Program since 2019, when atrazine was identified in a spring water sample as part of a Wisconsin Geological and Natural History Survey (WGNHS) project. Atrazine TCR was detected at a concentration of 0.78 µg/L at that time. Because this spring is located within a PA that was established in 1995, atrazine detections would not be expected. The single sample collected from this location in 2024 continued the historic trend of detecting atrazine parent material and metabolites' concentrations in excess of the 0.3 µg/L Wis. Admin. Code Ch. NR 140 PAL for atrazine TCR. Sustained concentrations of atrazine and its metabolites detected in monthly samples collected at Syene Spring since 2018 may be related to either 1) a nearby point source release of atrazine (e.g. from a spill); or 2) a slow but steady atrazine release from the aquifer matrix resulting from historic field use within the spring recharge area. Since pesticide concentrations appear to remain stable throughout the year, we plan to continue sampling in the spring in the future, in order to continue monitoring the concentrations of atrazine and its metabolites.

The following is a summary of the atrazine or atrazine TCR findings for 2024 samples for the remaining rivers or streams located outside of a PA:

- In South Branch Tenmile Creek samples collected in March, April, May, June, July, August, September, and October, de-ethyl atrazine was detected at concentrations ranging from 0.114 to 0.151 µg/L. In the sample collected in July, atrazine parent material was also detected at a concentration of 0.101 µg/L. No other metabolites were detected.
- In Leola Ditch samples collected in March, April, May, June, July, August, September, and October, de-ethyl atrazine was detected at concentrations ranging from 0.0537 to 0.0758 µg/L. No other metabolites or atrazine parent material were detected.
- In one sample collected from Fourteen Mile Creek in June, de-ethyl atrazine was detected at a concentration of 0.0515 µg/L. No other metabolites or atrazine parent material were detected.
- In Mormon Coulee Creek #6 samples collected in March, April, May, June, July, August, September, and October, de-ethyl atrazine was detected at concentrations ranging from 0.0673 to 0.0843 µg/L. No other metabolites or atrazine parent material were detected.
- In South Fork Bad Axe River samples collected in March, April, May, June, July, August, September, and October, de-ethyl atrazine was detected at concentrations ranging from 0.78 to 0.0894 µg/L. In the sample collected in July, atrazine parent material was also detected at a concentration of 0.0754 µg/L. No other metabolites were detected.
- In Honey Creek samples collected in April, May, and June, atrazine parent material was detected at concentrations ranging from 0.0619 to 0.677 µg/L. In the May and June samples, de-ethyl atrazine and deisopropyl atrazine were both detected at concentrations ranging from 0.0712 to 0.185 µg/L and from 0.0507 to 0.111 µg/L, respectively. Diamino atrazine was not detected in any samples.
- In Milwaukee River samples collected in May, June, and July, atrazine parent material was detected at concentrations ranging from 0.0896 to 0.213 µg/L. In the May and June samples, de-ethyl atrazine was also detected at concentration ranging from 0.0545 to 0.0749 µg/L. No other metabolites were detected.
- In one sample collected from East Branch Eau Claire River in June, atrazine parent material was detected at a concentration of 0.114 µg/L. De-ethyl atrazine was also detected at a concentration of 0.0547 µg/L in this sample. No other metabolites were detected.
- In Spring Brook samples collected in June, July, and August, atrazine parent material was detected at concentrations ranging from 0.0768 to 0.202 µg/L. In the June sample, both de-ethyl atrazine and deisopropyl atrazine were detected at concentrations of 0.104 µg/L and 0.0547 µg/L, respectively. Diamino atrazine was not detected.
- In Red Cedar River (CTH W Bridge location) samples collected in June and July, atrazine parent material was detected at concentrations of 0.308 µg/L and 0.0597 µg/L, respectively. In the June

sample, de-ethyl atrazine was also detected at a concentration of 0.0964 µg/L. No other metabolites were detected.

- In one sample collected from the Red Cedar River (CTH OO location) in June, atrazine parent material and de-ethyl atrazine were detected at concentrations of 0.214 µg/L and 0.0667 µg/L, respectively. No other metabolites were detected.
- In one sample collected from the Red Cedar River (CTH A & I Bridge location) in June, atrazine parent material was detected at a concentration of 0.0773 µg/L. No atrazine metabolites were detected.
- In one sample collected from the Hay River in June, atrazine parent material was detected at a concentration of 0.0515 µg/L. No atrazine metabolites were detected.
- In Root River samples collected in April, May, June, and July, atrazine parent material was detected at concentrations ranging from 0.207 to 1.99 µg/L. In these four samples, de-ethyl atrazine was also detected at concentrations ranging from 0.0822 to 0.211 µg/L. In the May and June samples, deisopropyl atrazine was detected at concentrations ranging from 0.0522 to 0.114 µg/L. Diamino atrazine was not detected. The April and May samples collected from the Root River had the two highest detections of atrazine TCR in 2024 surface water samples: 1.9376 µg/L in April and 2.315 µg/L in May.
- In Vermont Creek samples collected in March, April, May, and October, diamino atrazine was detected at concentrations ranging from 0.15 to 0.159 µg/L. In samples collected in June and July, atrazine parent material was detected at concentrations of 0.0768 µg/L and 0.0537 µg/L, respectively. In samples collected in June, July, and October, de-ethyl atrazine was detected at concentrations ranging from 0.0504 to 0.0598 µg/L. Deisopropyl atrazine was not detected.
- In Halfway Prairie Creek samples collected in March, April, May, June, July, August, September, and October, de-ethyl atrazine was detected at concentrations ranging from 0.0504 to 0.0986 µg/L. In the June and July samples, atrazine parent material was detected at concentrations of 0.318 µg/L and 0.269 µg/L, respectively. In the March, April, May, August, September, and October samples, diamino atrazine was detected at concentrations ranging from 0.175 to 0.198 µg/L. In the July sample, deisopropyl atrazine was detected at a concentration of 0.0542 µg/L.
- In Wendt Creek samples collected in May, June, July, August, September, and October, de-ethyl atrazine was detected at concentrations ranging from 0.0543 to 0.072 µg/L. In the June and July samples, atrazine parent material was detected at concentrations of 0.0591 µg/L and 0.147 µg/L, respectively. In the May, August, September, and October samples, diamino atrazine was detected at concentrations ranging from 0.152 to 0.202 µg/L. Deisopropyl atrazine was not detected.

For more details on atrazine and atrazine metabolites' concentrations exceeding EPA Aquatic Life Benchmarks and/or Wis. Admin. Code Ch. NR 140 ES and PAL values, please refer to the Comparison to Standards section of this document.

Nitrogen

In addition to pesticides, DATCP's Surface Water Sampling Program includes analyses for nitrate plus nitrite as N to evaluate how surface water quality is affected by agriculture. Nitrogen in groundwater and surface water is regulated by the DNR. However, DATCP includes nitrogen analyses as part of this program and shares results with DNR.

Nitrogen was detected in 175 of the 186 surface water samples collected between March and December for DATCP's 2024 Surface Water Sampling Program. The greatest nitrogen concentration observed in 2024 was 15.5 mg/L detected in a sample collected at South Branch Tenmile Creek in March.

The following is a summary of nitrogen results for 2024 river, stream, and spring samples:

- At Vermont Creek, nitrogen concentrations ranged from 1.67 to 2.56 mg/L. Samples collected in March, May, June, September, and October exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At Wendt Creek, nitrogen concentrations ranged from 1.98 to 3.48 mg/L. Samples collected in March, April, May, June, August, September, and October exceeded the Wis. Admin. Code Ch. NR 140 PAL.

- At Halfway Prairie Creek, nitrogen concentrations ranged from 1.44 to 3.71 mg/L. Samples collected in March, April, May, June, August, September, and October exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At the Sugar River, nitrogen concentrations ranged from 1.4 to 6.24 mg/L. Samples collected in March, April, May, June, August, September, and October exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At Syene Springs, the nitrogen concentration was measured as 10 mg/L in March. This concentration exceeds the Wis. Admin. Code Ch. NR 140 ES.
- At the Wisconsin River Hwy 14 boat landing station, nitrogen concentrations were measured as 1.25 mg/L in March and 2.11 mg/L in May. The May sample exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At Mill Creek, nitrogen concentrations ranged from 1.58 to 2.9 mg/L. Samples collected in June, July, August, September, and October exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At Spring Brook, nitrogen concentrations ranged from 1.38 to 5.26 mg/L. Samples collected in March, April, May, July, and October exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At the Eau Claire River, nitrogen concentrations ranged from non-detection to 1.99 mg/L. No samples collected at this location exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At the East Branch Eau Claire River, nitrogen concentrations ranged from 0.52 to 1.71 mg/L. No samples collected at this location exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At Oldens Creek, nitrogen concentrations ranged from non-detection to 2.22 mg/L. Samples collected in March and September exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At the Tomorrow River, nitrogen concentrations ranged from 0.865 to 3.87 mg/L. Samples collected in March, April, August, September, and October exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At South Branch Tenmile Creek, nitrogen concentrations ranged from 11.7 to 15.5 mg/L. All samples collected at this location exceeded the Wis. Admin. Code Ch. NR 140 ES.
- At Fourteen Mile Creek, nitrogen concentrations ranged from 1.52 to 6.83 mg/L. Samples collected in March, April, May, June, July, August, and September exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At Leola Ditch, nitrogen concentrations ranged from 11.8 to 14.2 mg/L. All samples collected at this location exceeded the Wis. Admin. Code Ch. NR 140 ES.
- At Mormon Coulee Creek #6, nitrogen concentrations ranged from 1.43 to 2.01 mg/L. The sample collected in October exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At the South Fork Bad Axe River, nitrogen concentrations ranged from 2.03 to 2.8 mg/L. All samples collected from this location exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At the Root River, nitrogen concentrations ranged from non-detection to 3.53 mg/L. Samples collected in April and May exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At the Milwaukee River, nitrogen concentrations ranged from 0.787 to 1.48 mg/L. No samples collected at this location exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At Honey Creek, nitrogen concentrations ranged from non-detection to 1.39 mg/L. No samples collected at this location exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- In the Hay River, nitrogen concentrations ranged from 1.74 to 2.85 mg/L. Samples collected in March, April, June, July, August, September, and October exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At the Red Cedar River CTH W Bridge location, nitrogen concentrations ranged from 0.662 to 2.32 mg/L. Samples collected in March and May exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At the Red Cedar River CTH A & I Bridge location, nitrogen concentrations ranged from non-detection to 1.72 mg/L. No samples collected at this location exceeded the Wis. Admin. Code Ch. NR 140 PAL.
- At the Red Cedar River CTH OO location, nitrogen concentrations ranged from 0.806 to 1.87 mg/L. No samples collected at this location exceeded the Wis. Admin. Code Ch. NR 140 PAL.

Table 4 includes a summary of the DATCP's 2023 Surface Water Sampling Program detections for nitrate plus nitrite as N.

Table 4: 2024 Surface Water Sampling Program Nitrogen (Nitrate + Nitrite) Analytical Results

Sample Station Name	Nitrate + Nitrite as Nitrogen Concentration Range (mg/L)
Vermont Creek at Michaelis Road	1.67 - 2.56
Wendt Creek - Hwy 78	1.98 - 3.48
Halfway Prairie Creek at Farm near Mazomanie, WI	1.44 - 3.71
Sugar River Upstream of Hwy 69	1.4 - 6.24
Nine Springs - Syene Springs	10
Wisconsin River -- Hwy 14 Boat Landing	1.25 – 2.11
Mill Creek at CTH C	1.58 - 2.9
Spring Brook - Before Eau Claire R at Nolan Rd.	1.38 - 5.26
Eau Claire River CTY Y Upstream	ND – 1.99
East Branch Eau Claire River -- Access	0.52 - 1.71
Oldens Creek	ND – 2.22
Tomorrow River at Clementson Rd near Nelsonville	0.865 - 3.87
South Branch Tenmile Creek - Taft Rd (Site 7)	11.7 - 15.5
Fourteen Mile Creek (Ditch # 7) - CTH D	1.52 - 6.83
Leola Ditch at D and 3rd	11.8 - 14.2
Mormon Coulee Creek #6 - Bridge at CTH YY	1.43 - 2.01
South Fork Bad Axe River - Oliver Rd.	2.03 - 2.8
Root River at 60th 3m (Bi Sur)	ND – 3.53
Milwaukee River at Estabrook Park at Milwaukee, WI	0.787 - 1.48
Honey Creek - Near Confluence with Menominee River	ND – 1.39
Hay River at N Bridge St	1.74 - 2.85
Red Cedar River 130ft N of CTH W Bridge	0.662 - 2.32
Red Cedar River CTH A & I BRIDGE – Downstream of Confluence w/ Chetek River	ND – 1.72
Red Cedar River at CTH OO	0.806 - 1.87

Notes: *mg/L - milligrams per liter*

ND – Non Detect, i.e., concentration not in excess of laboratory reporting limits

2025 Program Goals and Objectives

DATCP's Surface Water Sampling Program will continue in 2025. It is expected that the following tasks will be completed:

- Collection of monthly surface water samples from three streams and one spring in Wisconsin. These locations are:
  - Unnamed (892100) N of Williams Rd;
  - Larson Creek – Larson Creek at Elliason Rd;
  - Unnamed (WBIC 100300) at Sandy Bay Rd; and
  - Nine Springs – Syene Springs;

  These three streams will be sampled monthly in order to collect data to verify findings in two Wisconsin watersheds from the model used to determine newly proposed atrazine label revisions by the EPA. Syene Springs will be sampled monthly once again in order to continue monitoring its atrazine TCR concentration at a monthly resolution, as it was only sampled once in 2023.
- Collection of quarterly surface water samples from 36 streams in Wisconsin. In an effort to further develop partnership and cooperation with the Wisconsin DNR, stream biologists from DNR will assist DATCP in collecting quarterly samples at a wide range of stream locations throughout the state. These locations were chosen to capture a range of geographic locations, watershed land uses, and stream sizes. Although DATCP and DNR are interested in the overall water quality of Wisconsin surface water, neonicotinoid pesticides are of particular interest, and the goal of this group of sampling locations is to also further evaluate their prevalence in surface waters across the state.
- Prepare a 2025 Data Summary Report to be completed the second quarter of 2026; and
- Share report(s) with the DNR Bureau of Water Quality, surface water sampling team, and other appropriate stakeholders, and have the report(s) available to the public via the DATCP website.

New locations for DATCP surface water sampling in 2025 will include:

- Unnamed (892100) N of Williams Rd [Station ID: 10059770];
- Larson Creek – Larson Creek at Elliason Road [Station ID: 10010188];
- Unnamed (WBIC 100300) at Sandy Bay Road [Station ID: 10052498];
- Cochrane Creek at Cth OO [Station ID: 063020];
- Tamarack Creek – (Bridge) [Station ID: 623265];
- Parsons Creek Upstream Hickory Rd [Station ID: 203102];
- Sheboygan River at Hwy T [Station ID: 203096];
- Caves Creek at 5th Ave (DS of culvert) [Station ID: 10017030];
- Branch River at N Union Rd (2) [Station ID: 363299];
- Pine Creek – 200 Feet Downstream From Cth T [Station ID: 10020831];
- Ahnapee River at CTH H Forestville [Station ID: 152161];
- Moose Ear Creek 10 m Upstream of CTH W Culvert [Station ID: 10029349];
- White River -- Access at Pike River Rd [Station ID: 10019613];
- Bear Creek NE of Hwy 2/53 [Station ID: 10029779];
- Unnamed Trib (WBIC 5034477) at STH 14 [Station ID: 10059781];
- Bear Creek at STH 14 [Station ID: 10059780];
- Timber Coulee Creek – Upstream From Cth P [Station ID: 10010631];
- Billings Creek Station #3 Brg. On Cth F [Station ID: 10009007];
- Nichols Creek – DS of CTH N [Station ID: 10030491];
- Onion River at Cth E Or1 [Station ID: 603340];
- Watercress Creek – Upstream of Watercress Road [Station ID: 10008873];
- Honey Cr at 70th and Honey Cr Pkwy [Station ID: 10040002];
- KK River at South 16th Street [Station ID: 10059779];

- Willow Creek at Cth Y/Sth167 (25m Upstream) [Station ID: 10011279];
- Otter Creek: Klug Rd.(8 Ft West Of Bridge) [Station ID: 10012580];
- Kohlsville River – Upstream of Midland Drive [Station ID: 10022037];
- North Branch Cedar Creek – Upstream of CTHY NN [Station ID: 10022038];
- Mukwonago River (1) – Upstream of HWY 83 [Station ID: 10010534];
- Rock Creek at Owen Ave and Rock Creek Rd [Station ID: 10030170];
- Elk Creek at 35th Street [Station ID: 10030130];
- Cady Creek 1- Cth P [Station ID: 10009648];
- Wilson Creek North Branch – North Branch Wilson Creek [Station ID: 173243];
- Graham Creek – Station 1 Spruce Rd [Station ID: 10009825];
- Spring Brook Above Cth Hh [Station ID: 10022869];
- Unnamed Creek (1453200) above confluence with (5010052) [Station ID: 1453200];
- Eau Claire River at CTH Z [Station ID: 10028972];
- North Br. Trempealeau River – 30 Ft Below Bridge On Cain Rd. [Station ID: 10016096];
- Hoton Creek – Upstream Jacobson Road [Station ID: 10012172];
- Ditch 7 Upstream Sth 73 Site 8 [Station ID 10009161];

Acknowledgements

DATCP's Bureau of Agrichemical Management's (ACM) financial information includes the state fiscal year (FY) 2024. The state FY2024 started on July 1, 2023 and ended on June 30, 2024. ACM's federal cooperative agreement started on October 1, 2023 and ended on September 30, 2024. The primary sources of revenue for ACM are industry fees for licenses, permits, registrations, and tonnage under the feed, fertilizer, soil and plant additive, lime, and pesticide programs. In addition, DATCP has a cooperative agreement with the EPA that some funding that covers some annual pesticide program expenses. ACM recognizes these important partnerships with the industry and the federal government and works hard to maximize the use of this funding for the benefit of the industry, consumers, and the environment.

For any questions and clarifications, or to request data summarized in this report, please do not hesitate to reach out to us at DATCPGW@wisconsin.gov or at (608) 224-4503.

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Appendix A – Acronyms and Definitions

The acronyms and terminology included on this list are generic definitions intended to help understand the Surface Water Pesticide Sampling Program. Some of these terms are more specifically defined in various regulations.

Acronyms

µg/L _____ Micrograms per Liter
ACM _____ DATCP Bureau of Agrichemical Management
BLS _____ DATCP Bureau of Laboratory Services
CTH _____ County Highway
CTY _____ County Highway
DATCP _____ Wisconsin Department of Agriculture, Trade and Consumer Protection
DHS _____ Wisconsin Department of Health Services
DNR _____ Wisconsin Department of Natural Resources
EAR _____ Effective Activity Ratio
EPA _____ United States Environmental Protection Agency
ES _____ Enforcement Standard
ESA _____ Ethane Sulfonic Acid
GC _____ Gas Chromatography
ISO _____ International Organization for Standardization
LC _____ Liquid Chromatography
mg/L _____ Milligrams per Liter
MS _____ Mass Spectroscopy
N _____ Nitrogen
ND _____ No Detect – concentrations are less than laboratory reporting limits
NOAA _____ National Oceanic and Atmospheric Administration
OA_____ Oxanilic Acid
PA _____ Prohibition Area
PAL _____ Preventive Action Limit
Rd _____ Road
Hwy _____ State Highway
SWIMS _____ Surface Water Integrated Monitoring System
TCR _____ Total Chlorinated Resides (of atrazine)
USDA _____ United States Department of Agriculture
USGS _____ United States Geological Survey
WGNHS _____ Wisconsin Geological and Natural History Survey
Wis. Admin. Code _____ Wisconsin Administrative Code

Definitions

Analyte - A chemical substance that has a defined Chemical Abstract Service (CAS) number.

Aquatic Life Benchmarks - EPA-developed pesticide toxicity values for freshwater species. They are estimates of the concentrations below which pesticides are not expected to present a risk of concern for freshwater organisms.

Atrazine Prohibition Area - An area where atrazine use is currently prohibited under Administrative Code ATCP 30.

Chronic Exposure value - The highest concentration of a chemical to which the organism can be exposed without causing chronic toxicity to the organism in question.

Compound - A substance formed by the chemical union of two or more ingredients.

Detection - When an analyte has a concentration that can be quantified (i.e., a concentration greater than the Laboratory Reporting Limit).

Enforcement Standard (ES) - The Enforcement Standard (ES) is set to ensure that the concentration of a compound in groundwater does not exceed a specific level that could harm human health or the environment. If the ES for a certain compound in groundwater is exceeded, intervention from the appropriate authority is required.

Herbicide - A pesticide used to kill or inhibit the growth of plants, weeds, or grasses.

Insecticide - A pesticide used to kill or inhibit the growth of insects.

Metabolite or Residual compound or Breakdown product - A chemical substance left behind by a parent compound that has degraded through natural chemical breakdown and/or been metabolized by bacteria.

Neonicotinoids - Insecticides that target the neurological systems of insects. The neonicotinoid family includes acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram, nithiazine, thiacloprid, and thiamethoxam.

NR140 - Wisconsin administrative code which establishes groundwater quality standards and required responses when the standards are exceeded.

Perennial stream – A stream that has flowing water year-round.

Pesticide - Substance used to kill, repel, or control certain forms of plant or animal life that are considered to be pests. The pesticide category includes herbicides, insecticides, rodenticides, fungicides, and bactericides.

Preventive Action Limit (PAL) - The Preventive Action Limit (PAL) is a percentage of the Enforcement Standard (ES); 10% of the ES for carcinogenic, mutagenic, or teratogenic substances; and 20% of the ES for the remaining substances. The intention of the PAL is for it to act as a trigger for intervention before a pollutant becomes a serious risk to public health or the environment.

Reporting limit - The minimum analyte concentration that can be reliably quantified and reported by the laboratory.

Total chlorinated residues (TCR) of atrazine - Sum of atrazine and three atrazine metabolites (de-ethyl atrazine, de-isopropyl atrazine, and diamino atrazine).

Vadose zone – The area of soil that exists between the land surface and the water table.

Watershed – A land area that channels rainfall and snowmelt water into a specific waterbody (e.g., a creek, a stream, a river, etc.)

Wadeable - Refers to streams and rivers recognized as natural habitats that support a diversity of both aquatic and terrestrial species.

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Appendix B – 2024 Surface Water Sampling Program Analytical Results Summary

2024 Surface Water Sampling Program Results					Wisconsin Admin. Code Chapter NR 140		Wisconsin Department of Health Services	US EPA Office of Pesticide Programs - Aquatic Life Benchmarks for Pesticides (µg/L)					
Pesticide Name	Pesticide Class	Number Detects	Reporting Limit (µg/L)	Concentration Range (µg/L)	Wisconsin Admin. Code Chapter NR 140	Enforcement Standard (ES) (µg/L)	Drinking Water Health Advisory Recommendations (µg/L)	Acute (Fish)	Chronic (Fish)	Acute (Invert.)	Chronic (Invert.)	Non-vascular Plants	Vascular Plants
2,4-D	Herbicide	39	0.050	0.0515 - 2.315	7	70	--	--	--	12500	--	--	299.2
2,4-DB	Herbicide	ND	1.00	--	--	--	--	7150	1660	12500	1500	932	83
2,4-DP	Herbicide	ND	0.050	--	--	--	--	>45750	--	279000	100000	77	32000
2,4,5-T	Herbicide	ND	0.050	--	--	--	--	--	--	--	--	--	--
2,4,5-TP	Herbicide	ND	0.050	--	5	50	--	--	--	--	--	--	--
Acetamiprid	Insecticide	ND	0.010	--	--	--	--	>50000	19200	10.5	2.1	>1000	>1000
Acetochlor	Herbicide	9	0.050	0.0767 - 2.02	0.7	7	--	190	130	4100	22.1	1.43	3.4
Acetochlor ESA	Metabolite	19	0.050	0.0504 - 1.1	46	230	--	>90000	--	>62500	--	9900	--
Acetochlor OA or OXA	Metabolite	3	0.30	0.447 - 0.797	46	230	--	--	--	--	--	--	--
Acetochlor Metabolites	Sum of Acetochlor ESA and Acetochlor OA	19	--	0.0504 - 1.847	46	230	--	--	--	--	--	--	--
Acifluorfen	Herbicide	1	0.050	0.0623	--	--	--	--	--	--	--	--	--
Alachlor	Herbicide	ND	0.050	--	0.2	2	--	900	187	1250	110	1.64	2.3
Alachlor ESA	Metabolite	72	0.050	0.0557 - 1.86	4	20	--	>52000	--	>52000	--	3600	>120000
Alachlor OA	Metabolite	8	0.25	0.29 - 0.407	--	--	--	>50000	--	>47500	--	--	--
Aldicarb Sulfone	Insecticide	ND	0.050	--	--	--	--	21000	--	140	--	--	--
Aldicarb Sulfoxide	Insecticide	ND	0.071	--	--	--	--	3570	--	21.5	--	--	--
Aminopyralid	Herbicide	ND	0.150	--	--	--	--	>50000	1360	7500	102000	18000	>88000
Atrazine	Herbicide	31	0.050	0.0515 - 1.99	0.3	3	--	2650	5	360	60	<1	4.6
De-ethyl atrazine	Metabolite	77	0.050	0.0501 - 0.211	0.3	3	--	--	--	--	--	--	--
De-isopropyl atrazine	Metabolite	8	0.050	0.0507 - 0.114	0.3	3	--	--	--	--	--	--	--
Di-amino atrazine	Metabolite	26	0.150	0.15 - 0.412	0.3	3	--	--	--	--	--	--	--
Atrazine TCR	Sum of Atrazine and De-ethyl, De-isopropyl, and Di-amino metabolites	89	--	0.0515 - 2.315	0.3	3	--	--	--	--	--	--	--
Azoxystrobin	Fungicide	4	0.050	0.0574 - 0.139	--	--	--	235	147	130	44	49	3400
Benfluralin	Herbicide	ND	0.050	--	--	--	--	34.85	1.9	1090	15.5	>100	--
Bentazon	Herbicide	29	0.050	0.0587 - 0.358	60	300	--	95000	9830	31150	101200	4500	5350
Bicyclopyrone	Herbicide	ND	0.050	--	--	--	--	>46700	10000	>46650	103700	2000	13

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2024 Surface Water Sampling Program Results					Wisconsin Admin. Code Chapter NR 140		Wisconsin Department of Health Services	US EPA Office of Pesticide Programs - Aquatic Life Benchmarks for Pesticides (µg/L)					
Pesticide Name	Pesticide Class	Number Detects	Reporting Limit (µg/L)	Concentration Range (µg/L)	Wisconsin Admin. Code Chapter NR 140	Enforcement Standard (ES) (µg/L)	Drinking Water Health Advisory Recommendations (µg/L)	Acute (Fish)	Chronic (Fish)	Acute (Invert.)	Chronic (Invert.)	Non-vascular Plants	Vascular Plants
Bifenthrin	Insecticide	ND	0.005	--	--	--	--	0.075	0.04	0.0002465	0.00005	>290	>330
Boscalid	Fungicide	4	0.500	0.0508 - 0.0552	--	--	--	1350	116	<2665	790	1340	>3900
Bromacil	Herbicide	ND	0.050	--	--	--	--	18000	3000	60500	8200	6.8	45
Carbaryl	Insecticide	3	0.050	0.0501 - 0.194	4	40	--	110	6.8	0.85	0.5	340	1550
Carbofuran	Insecticide	ND	0.050	--	8	40	--	44	5.7	1.115	0.75	--	--
Chloramben	Herbicide	ND	0.32	--	30	150	--	--	--	--	--	--	--
Chlorantraniliprole	Insecticide	29	0.050	0.0518 - 0.492	--	--	16000	>6900	110	8.3	3.02	>1780	>2000
Chlorothalonil	Fungicide	ND	0.10	--	--	--	--	9	0.77	27	0.6	12	640
Chlorpyrifos	Insecticide	ND	0.050	--	0.4	2	--	0.85	<0.251	0.0069	<0.005	140	
Chlorpyrifos Oxon	Metabolite	ND	0.050	--	--	--	--	--	--	--	--	--	--
Clomazone	Herbicide	ND	0.050	--	--	--	--	1450	350	2700	2200	167	30200
Clopyralid	Herbicide	ND	0.100	--	--	--	--	51500	10000	116500	4700	6900	90300
Clothianidin	Insecticide	73	0.010	0.0101 - 0.237	--	--	1000	>50750	9700	11	0.05	64000	>280000
Cyantraniliprole	Insecticide	ND	0.050	--	--	--	--	>5000	10700	10.2	6.56	>10000	>12100
Cyclaniliprole	Insecticide	ND	0.20	--	--	--	--	>68.5	200	40.4	9.6	>99	>187
Cyfluthrin	Insecticide	ND	0.050	--	--	--	--	0.034	0.0042	0.0125	0.00012	>2	--
lambda-Cyhalothrin	Insecticide	ND	0.020	--	--	--	--	0.0145	0.031	0.00004	0.00022	>310	>0.508
Cypermethrin	Insecticide	ND	0.10	--	--	--	--	0.195	0.051	0.00028	<0.00005	25000	>1.62
Cyprosulfamide	Safener	ND	0.050	--	--	--	--	--	--	--	--	--	--
Dacthal	Herbicide	ND	0.050	--	14	70	--	15000	--	13500	--	>11000	>11000
Dacthal Di-acid	Metabolite	4	0.050	0.676 - 0.826	--	--	70	--	--	--	--	--	--
Dacthal Mono-acid	Metabolite	ND	0.050	--	--	--	70	--	--	--	--	--	--
Dacthal Total	Sum of Dacthal, Dacthal Di-acid, and Dacthal Mono-acid	4	0.05	0.676 - 0.826	--	--	70	--	--	--	--	--	--
Diazinon	Insecticide	ND	0.050	--	--	--	--	45	<0.55	0.105	0.17	3700	--
Diazinon Oxon	Metabolite	ND	0.050	--	--	--	--	--	--	--	--	--	--
Dicamba	Herbicide	1	0.250	0.372	60	300	--	14000	>9900	>50000	> 42000	61	1290
Dichlobenil	Herbicide	2	0.050	0.0563 - 0.271	--	--	--	2465	<330	3100	560	1500	30
Dimethenamid	Herbicide	1	0.050	0.208	5	50	--	3150	120	6000	1360	14	8.9

2024 Surface Water Sampling Program Results					Wisconsin Admin. Code Chapter NR 140		Wisconsin Department of Health Services	US EPA Office of Pesticide Programs - Aquatic Life Benchmarks for Pesticides (µg/L)					
Pesticide Name	Pesticide Class	Number Detects	Reporting Limit (µg/L)	Concentration Range (µg/L)	Wisconsin Admin. Code Chapter NR 140	Enforcement Standard (ES) (µg/L)	Drinking Water Health Advisory Recommendations (µg/L)	Acute (Fish)	Chronic (Fish)	Acute (Invert.)	Chronic (Invert.)	Non-vascular Plants	Vascular Plants
Dimethenamid ESA	Metabolite	ND	0.050	--	--	--	--	--	--	--	--	--	--
Dimethenamid OA	Metabolite	ND	0.050	--	--	--	--	--	--	--	--	--	--
Dimethoate	Insecticide	ND	0.050	--	0.4	2	--	3100	430	21.5	0.5	20000	>92600
Dinotefuran	Insecticide	ND	0.010	--	--	--	--	>49550	6360	>484150	>95300	>97600	>110000
Diuron	Herbicide	ND	0.050	--	--	--	--	660	26.4	87.5	0.83	3.08	0.13
EPTC	Herbicide	ND	0.050	--	50	250	--	7000	40	3250	800	1400	5600
Esfenvalerate	Insecticide	ND	0.025	--	--	--	--	0.071	0.017	0.000424	0.0000309	>5.6	>8.6
Ethalfluralin	Herbicide	ND	0.050	--	--	--	--	16	0.4	30	24	25	7.3
Ethofumesate	Herbicide	ND	0.050	--	--	--	--	5760	<306	17150	300	>2760	39000
Flumetsulam	Herbicide	1	0.050	0.135	--	--	10000	>146500	197000	127000	111000	3.21	3.1
Flupyradifurone	Insecticide	ND	0.050	--	--	--	--	--	--	--	--	--	--
Fluroxypyr	Insecticide	1	0.050	0.0973	--	--	--	7150	--	>50000	--	>100000	--
Fomesafen	Herbicide	1	0.050	0.0526	--	--	25	63000	9400	188000	50000	92	210
Halosulfuron methyl	Herbicide	1	0.050	0.0747	--	--	--	--	--	--	--	4.1	0.042
Hexazinone	Herbicide	ND	0.050	--	--	--	400	137000	17000	75800	20000	7	37.4
Hydroxyatrazine	Metabolite	10	0.050	0.0518 - 0.193	--	--	--	>1500	--	>2050	--	>10000	--
Imazapyr	Herbicide	4	0.050	0.0649 - 0.584	--	--	--	>50000	43100	>50000	97100	12200	24
Imazethapyr	Herbicide	ND	0.050	--	--	--	--	120000	97000	>500000	103000	4770	8.1
Imidacloprid	Insecticide	31	0.010	0.0102 - 0.0564	--	--	0.2	114500	9000	0.385	0.01	–	--
Isoxaflutole	Herbicide	ND	0.050	--	--	--	3	>850	80	>750	350	110	4.9
Isoxaflutole DKN	Metabolite	ND	0.050	--	--	--	3	>15300	--	>29800	--	5000	75
Isoxaflutole Total	Sum of Isoxaflutole and Isoxaflutole DKN	ND	--	--	--	--	3	--	--	--	--	--	--
Linuron	Herbicide	3	0.050	0.0558 - 0.257	--	--	--	1500	5.58	60	0.09	13.7	2.5
Malathion	Insecticide	ND	0.050	--	--	--	--	2.05	8.6	0.049	0.06	2040	24000
MCPA	Herbicide	2	0.050	0.0635 - 0.994	--	--	--	>34000	--	>92000	--	--	--
MCPB	Herbicide	ND	0.10	--	--	--	--	1960	<530	25100	2510	1370	200
MCPP	Herbicide	3	0.050	0.0801 - 0.278	--	--	--	>46500	--	>45500	50800	14	1300
Mesotrione	Herbicide	ND	0.10	--	--	--	--	>60000	11000	67000	3055	>820	4.8

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2024 Surface Water Sampling Program Results					Wisconsin Admin. Code Chapter NR 140		Wisconsin Department of Health Services	US EPA Office of Pesticide Programs - Aquatic Life Benchmarks for Pesticides (µg/L)					
Pesticide Name	Pesticide Class	Number Detects	Reporting Limit (µg/L)	Concentration Range (µg/L)	Wisconsin Admin. Code Chapter NR 140	Enforcement Standard (ES) (µg/L)	Drinking Water Health Advisory Recommendations (µg/L)	Acute (Fish)	Chronic (Fish)	Acute (Invert.)	Chronic (Invert.)	Non-vascular Plants	Vascular Plants
Metalaxyl	Fungicide	22	0.050	0.0552 - 0.117	--	--	800	65000	9100	14000	1200	--	85000
Methyl Parathion	Insecticide	ND	0.050	--	--	--	--	925	<10	0.485	0.25	15000	18000
Metolachlor	Herbicide	63	0.050	0.0507 - 2.89	10	100	--	1600	30	11750	3200	8	14
Metolachlor ESA	Metabolite	178	0.050	0.0555 - 6.07	260	1300	--	24000	--	>54000	--	>99450	43000
Metolachlor OA or OXA	Metabolite	40	0.27	0.293 - 4.44	260	1300	--	>46550	--	7700	--	57100	>95400
Metolachlor Metabolites	Sum of Metolachlor ESA and Metolachlor OA	178	--	0.0555 - 10.36	260	1300	--	--	--	--	--	--	--
Metribuzin	Herbicide	24	0.050	0.0607 - 0.555	14	70	--	21000	<3000	2100	1290	8.1	130
Metribuzin DA	Metabolite	4	0.10	0.114 - 0.174	--	--	--	--	--	--	--	--	--
Metribuzin DADK	Metabolite	25	0.12	0.148 - 1.0	--	--	--	--	--	--	--	--	--
Metsulfuron-methyl	Herbicide	ND	0.050	--	--	--	--	>75000	4500	>75000	--	31	0.36
Nicosulfuron	Herbicide	ND	0.050	--	--	--	--	>500000		>500000	43000	--	--
Norflurazon	Herbicide	9	0.050	0.055 - 0.196	--	--	--	4050	770	>7500	1000	6.03	59
Oxadiazon	Herbicide	ND	0.050	--	--	--	--	600	0.88	>1200	30	5.2	41
Pendimethalin	Herbicide	ND	0.050	--	--	--	--	69	6.3	140	14.5	5.2	12.5
Permethrin	Insecticide	ND	0.030	--	--	--	--	0.395	0.052	0.0033	0.0042	>4.4	>3.2
Picloram	Herbicide	ND	0.050	--	100	500	--	2750	550	17200	11800	950	2610
Prometon	Herbicide	1	0.050	0.16	20	100	--	9800	6530	12850	3450	98	160
Prometryn	Herbicide	ND	0.050	--	--	--	--	1455	620	4850	1000	1.04	11.9
Propiconazole	Fungicide	ND	0.050	--	--	--	--	425	15	2400	180	21	3500
Prothioconazole-desthio	Metabolite	ND	0.050	--	--	--	--	--	148	--	103	4.8	35
Pyroxasulfone	Herbicide	1	0.050	0.0687	--	--	--	>1100	2000	>2200	>1900	0.38	6
Saflufenacil	Herbicide	ND	0.050	--	--	--	460	>54000	997	4250	1330	42	87
Simazine	Herbicide	1	0.050	0.139	0.4	4	--	3200	60	500	40	6	67
Sulfentrazone	Herbicide	5	0.050	0.0523 - 1.34	--	--	1000	46900	2950	30200	200	31	28.8
Sulfometuron-methyl	Herbicide	ND	0.050	--	--	--	--	>74000	--	>75000	97000	4.3	0.45
Tebuconazole	Fungicide	ND	0.050	--	--	--	--	1135	11	1440	120	170	151
Tebupirimphos	Insecticide	ND	0.050	--	--	--	--	44.5	130	0.039	0.011	630	8800

2024 Surface Water Sampling Program Results					Wisconsin Admin. Code Chapter NR 140		Wisconsin Department of Health Services	US EPA Office of Pesticide Programs - Aquatic Life Benchmarks for Pesticides (µg/L)					
Pesticide Name	Pesticide Class	Number Detects	Reporting Limit (µg/L)	Concentration Range (µg/L)	Wisconsin Admin. Code Chapter NR 140	Enforcement Standard (ES) (µg/L)	Drinking Water Health Advisory Recommendations (µg/L)	Acute (Fish)	Chronic (Fish)	Acute (Invert.)	Chronic (Invert.)	Non-vascular Plants	Vascular Plants
Tembotrione	Herbicide	ND	0.10	--	--	--	--	>50000	604	24450	5100	310	5.2
Thiacloprid	Insecticide	ND	0.010	--	--	--	--	12600	918	18.9	0.97	45000	>95400
Thiamethoxam	Insecticide	59	0.010	0.0104 - 4.33	--	--	120	>57000	20000	17.5	0.74	>99000	>90200
Thiencarbazone-methyl	Herbicide	ND	0.050	--	--	--	10000	>52000	4800	>49300	3540	298	0.8
Triclopyr	Herbicide	12	0.050	0.0509 - 0.428	--	--	--	58500	--	66450	--	32500	--
Trifluralin	Herbicide	ND	0.050	--	0.75	7.5	--	9.25	1.9	125.5	2.4	21.9	49.7

Notes:

--- In column Concentration Range indicates that the concentration was found below Reporting Limits.
In columns Wisconsin Admin. Code Chapter NR 140 or Wisconsin Department of Health Services indicates that no standards or health advisory is established for that compound.
In column Aquatic Life Benchmarks for Pesticides indicates that no benchmark is established for that compound.

µg/L Micrograms per liter or parts per billion

TCR Total Chlorinated Residue for Atrazine. Sum of concentrations of atrazine and its three metabolites (de-ethyl, de-isopropyl and di-amino atrazine).

Indicates no detects in excess of laboratory reporting limits.

Indicates detects in excess of laboratory reporting limits, but not in excess of any Wisc. Admin. code Ch. NR 140 PAL and ES, Health Advisory levels or benchmark values.

Indicates detects in excess of Wisc. Admin. code Ch. NR 140 PAL, and/or in excess of any Aquatic Life benchmark values.

Indicates detects in excess of Wisc. Admin. code Ch. NR 140 ES, or Health Advisory levels

Website Used for EPA Aquatic Benchmarks for Registered Pesticides:
https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/aquatic-life-benchmarks-and-ecological-risk