Agricultural Chemicals and Groundwater Protection

Weld County Long Term – 2010 Groundwater Monitoring Report

The Agricultural Chemicals and Groundwater Protection Act (C.R.S. 25–8–205.5) took effect on July 1, 1990, and established the Groundwater Protection Program (Program). The goal of the Program is to reduce negative impacts to groundwater and the environment by improving management of fertilizer and pesticide (agrichemicals) and to assure that groundwater remains safe for domestic and livestock consumption by preventing contamination. A key component of the Program is to collect current, scientifically valid, data for the assessment of groundwater quality.

This report discusses monitoring history in the Weld County Long–Term well networks, sample collection and analysis information for the 2009 field season, as well as statistics and maps detailing laboratory results. Information pertaining to sampling frequency and purpose, sampling network development, laboratory methodology and protocol, Weld County location and character, and long–term history of the Program, is available in greater detail from these documents found on the Program webpage (http://www.colorado.gov/ag/gw):

- Agricultural Chemicals & Groundwater Protection in Colorado 1990–2006
- Program Monitoring Strategy 2007–2017
- Agricultural Chemicals & Groundwater Protection Program Sampling SOP Manual
- Groundwater Quality Database
- Colorado Dept. of Agriculture Groundwater Laboratory Analytical SOPs

Groundwater Quality Monitoring History

The Program's monitoring efforts in all of Colorado began with the 1992 and 1993 surveying of groundwater quality in the South Platte River Basin. Of the 96 wells sampled along the South Platte River from just north of Denver–metropolitan to Julesburg, 90 wells contained measurable nitrate–nitrogen (NO_3–N) concentrations with 33 wells measuring above the United State Environmental Protection Agency (EPA) drinking water standard of 10 milligrams per liter (mg L^{-1}) or parts per million (ppm). These results demonstrated that nitrate contamination was impacting some portions of the South Platte watershed. One particular area in Weld County stretching from just north of Brighton to Greeley, was found to have several wells >20 ppm NO_3–N with an average value above the EPA standard. The detection of pesticides in wells within this area, especially a detection of lindane exceeding the EPA standard of 0.2 micrograms per liter (µg L^{-1}) or parts per billion (ppb), further warranted the need to intensify sampling efforts.

In 1995 and 1996, a long–term monitoring effort was established in the South Platte aquifer from Brighton to Greeley in an attempt to better identify the extent of contamination and to provide a means for determining long–term contamination trends. The initial sampling design was a well–dispersed, integrated network of 20 monitoring wells sampling near the top of the water table, and 10 domestic and 60 irrigation wells collecting water from deeper portions of the aquifer. Some of the monitoring wells were originally installed by the United States Geologic Survey in 1993 and have since then been acquired by Central Colorado Water Conservancy District (Central). By establishing cooperation with Central in 1995, the Program has been able to collect samples from these wells on an annual basis. Results from the first two years of sampling showed median nitrate–nitrogen <10 ppm for domestic wells, 20 ppm for monitoring wells and slightly less than 20 ppm for irrigation wells. While both the monitoring and irrigation well networks had a similar number of wells over the EPA standard, the monitoring network had > 50% of its wells over 20 ppm compared to 38% in the irrigation network.

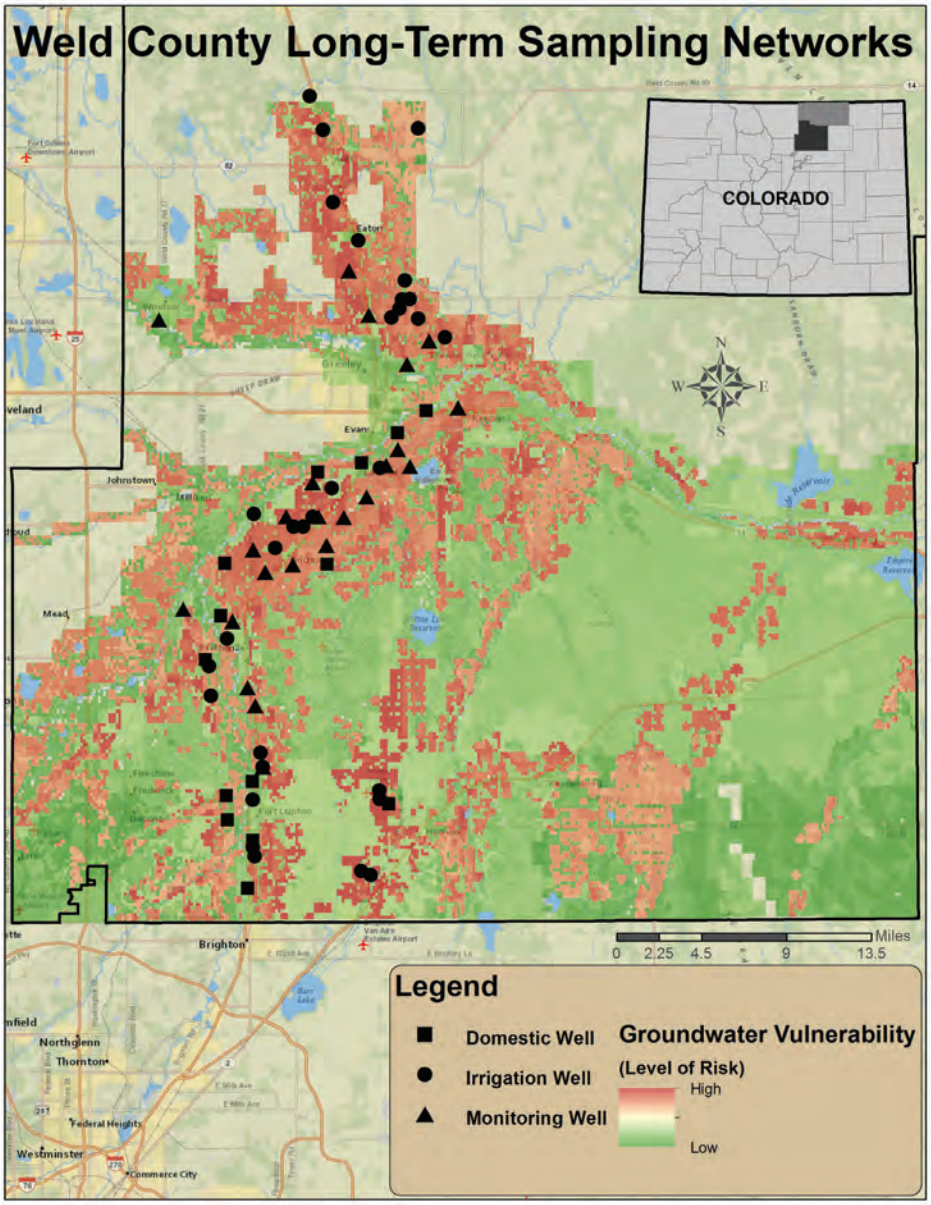

Figure 1. Distribution of domestic, irrigation, and quality monitoring wells comprising the Weld County Long-Term Sampling Networks. Well placement within areas that are vulnerable to groundwater contamination is important for collecting representative data.

The pesticides atrazine, prometon, DCPA, metolachlor, and bromacil were all detected in multiple wells in the study area. Ten atrazine detections in the 19 monitoring wells sampled in 1996 ranged 0.16–0.55 ppb. Desethylatrazine (DEA), an atrazine degradation product, was found in 13 monitoring wells at concentrations ranging 0.18–0.94 ppb. Detections of prometon and metolachlor were also reported with one metolachlor detection reaching 30.0 ppb. The EPA Lifetime Health Advisory Level for metolachlor is 70 ppb, so this was a significant detection at the time.

Subsequent annual sampling events, in Weld County, continue to show consistently high nitrate concentrations in the monitoring and irrigation well networks. Several monitoring wells have shown significant variability from year to year but the network as a whole does not appear to be trending in any one direction. Fifteen different pesticide compounds have been detected since 1995 in the monitoring wells, but atrazine, DEA, metolachlor, and prometon have accounted for 77% or more of all yearly detections.

These three networks in Weld County have undergone some changes over time mostly due to loss of wells to ownership changes or state mandated irrigation well shutdowns, but also through some additions made to the monitoring well network. At the beginning of the 2010 sampling season, the sampling networks are as follows: a 14 well domestic use network, a 24 well quality monitoring network, and a 30 well irrigation use network. **Figure 1** shows the layout of the three networks which lie nearly exclusively in areas of high vulnerability to groundwater contamination. All wells are sampled annually, whereas prior to 2007 domestic wells were only sampled every third year. Monitoring wells are analyzed for pesticides, nitrate, and nitrite; irrigation and domestic wells only for nitrate and nitrite.

2010 Sampling and Lab Analysis Notes

Sampling of the monitoring well network took place from June 16–29, 2010. Irrigation and domestic use wells were sampled together August 17–19, 2010. These sampling periods are consistent with previous years to account for potential seasonal changes in groundwater quality. All wells were sampled by the Program's Groundwater Monitoring Specialist.

Monitoring well samples were sent to the Program's Groundwater Laboratory in Denver, CO, where they were screened for 104 different pesticide compounds and also analyzed for nitrate and nitrite concentrations. It is important to note that compared to 2009 results, which were from the Montana Department of Agriculture's laboratory, the Program's laboratory utilized higher methods of detection (MOD) and looked for a slightly different suite of compounds. Thus, it is important to understand the differences in laboratory protocols when interpreting the results between these years. Further information on the Program's MOD for the various analytes tested for can be found on the Program's webpage. In addition, an opportunity to have a separate sample analyzed qualitatively for more than 600 pesticide compounds was presented

and seven samples were sent to the Center for Environmental Mass Spectrometry (CEMS) at the University of Colorado in Boulder, CO. A list of all quantitatively determined analytes screened for and their reporting limits is found in the Table 3 at the end of this report. For clarification, qualitative analysis shows the presence or absence of a compound, while quantitative analysis provides the concentration of a detected compound.

2010 Nitrate Results

The detection of nitrate–nitrogen over the EPA standard of 10.0 ppm in Weld County has occurred consistently since sampling began in 1992. Data from 2010 shows a slight deviation from that pattern. Table 1 demonstrates that the majority of wells sampled in the irrigation and monitoring networks contain nitrate–nitrogen at or above the EPA standard. A limited number of wells from these two networks were actually below the EPA standard as can be seen in the plot in Figure 2. The monitoring well network (installed at or near the top of the water table) had a 2010 median nitrate–nitrogen concentration that was three ppm lower than historically found because the concentrations of 19 of 24 wells were lower than 2009 values. Generally, results from past years have shown near equal numbers of increasing and decreasing concentration in the monitoring well network, and this widespread decrease was surprising. The monitoring well network annual median nitrate–nitrogen has been higher than the irrigation network's in all but three years from 1995 to 2009 which makes this year's results all the more surprising (Table 1). Since dissolved oxygen (DO) concentration was less than 2.0 mg/L (facilitating denitrification) in just six wells, and since DO decreased from 2009 to 2010 in only 14 of 24 wells, it is difficult to ascertain that the deviation in the historical nitrate concentration pattern occurred because of extensive natural attenuation through denitrification. Given that the lag time necessary for nitrate to move through the soil profile is not well–defined, it can only be assumed that either lower nitrogen inputs or lower percolation of residual soil nitrate by irrigation and precipitation is the reason why lower concentrations were discovered at the top of the water table in 2010.

2010 Nitrate-nitrogen Statistics			
	Monitoring	Irrigation	Domestic
Minimum	1.3	4.1	1.0
Q1 (25%)	11.7	11.2	6.4
Median	16.2	18.8	12.4
Average	22.7	18.8	15.3
Q3 (75%)	28.3	24.3	21.7
Maximum	95.1	47.8	53.9
STD	21.7	10.2	13.7
>10.0 ppm	19	20	8
N	24	25	14

Table 1. Nitrate-nitrogen statistics for samples collected from Weld County long-term sampling networks in 2010. BDL is below detection limit. Concentration units are mg L-1 or ppm.

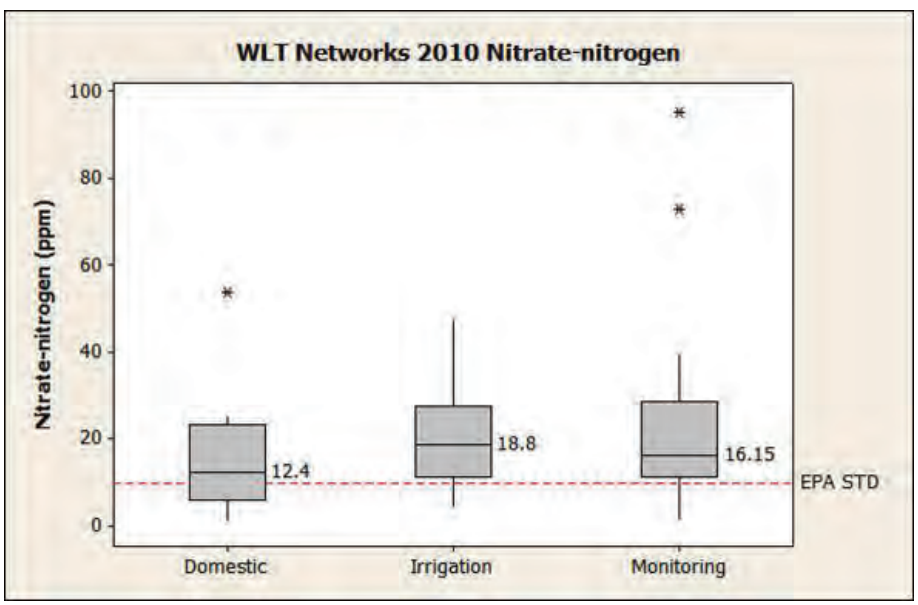

Figure 2. Box-whiskers plots of 2010 nitrate-nitrogen results from Weld County long-term domestic, irrigation, and monitoring well sampling networks. The boxed area contains 75% of the data. The median, or central tendency, is represented by the black horizontal line within the box. Asterisks represent values outside of the 99%. EPA STD is the nitrate-nitrogen primary drinking water standard of 10.0 ppm.

Trends in nitrate concentration are determined by the Program using Mann–Kendall, Sen's Slope, and Kendall's Tau trend analysis techniques with $\alpha = 0.05$ (95% confidence level) for statistical significance. Some wells having fewer than ten samples lack sufficient data for conducting accurate trend analysis with these techniques. Such wells belong mostly to the domestic network that was only sampled once every three years prior to annual sampling being implemented in 2007, but also to the monitoring network for wells that were newly installed or re–installed in 2008. In 2010, six irrigation wells in the long–term network were not sampled (wells 29, 124, 235, 242, 504, and 625 in Figure 3) due to year to year changes in irrigation well use in Weld County. This is common with this network.

The median confidence interval was

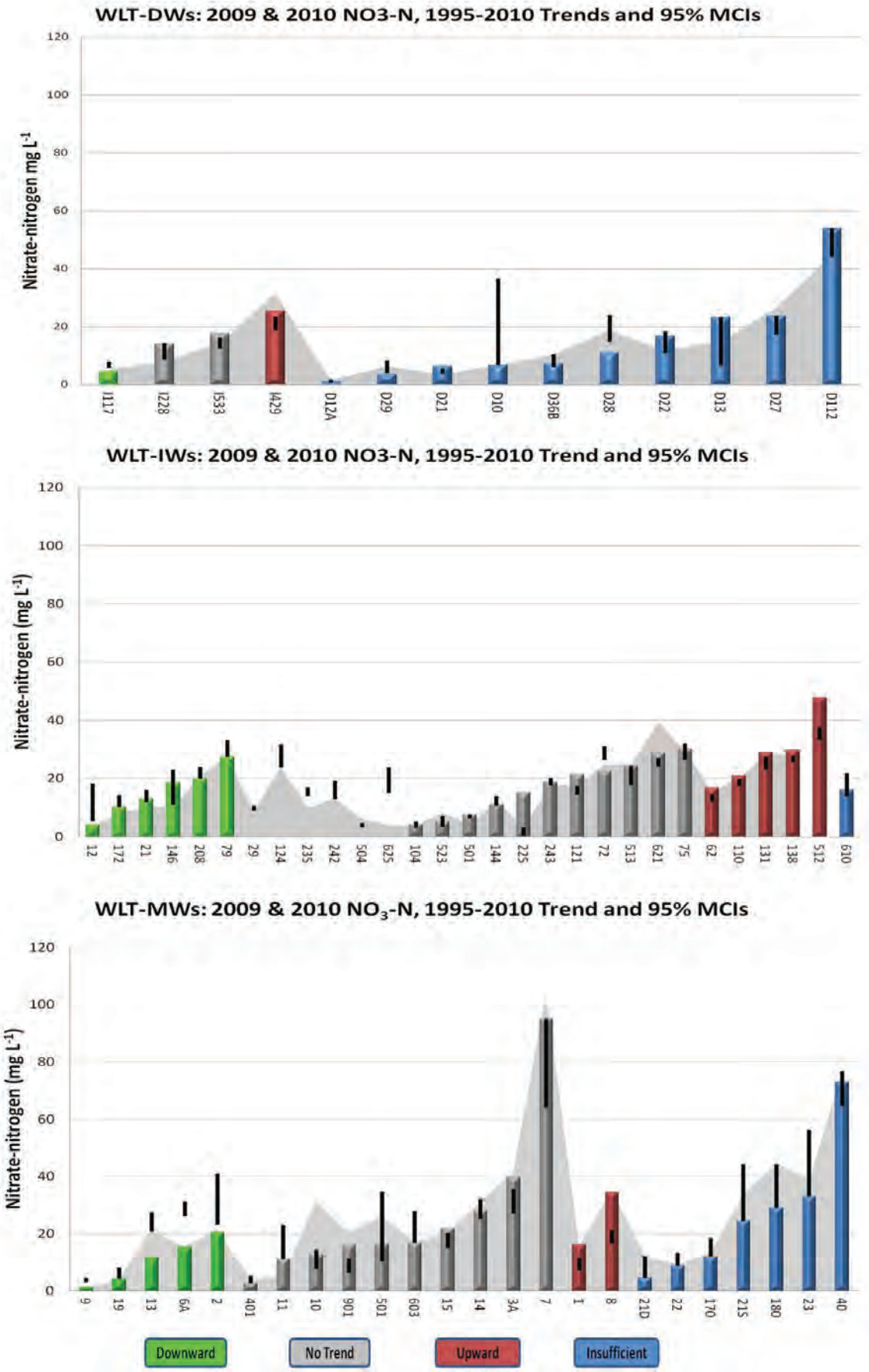

Figure 3. Nitrate-nitrogen concentration results for Weld County long-term wells in the domestic (WLT-DWs), irrigation (WLT-IWs), and monitoring (WLT-MWs) networks. Gray solid area represents 2009 concentration; value of colored bar represents 2010 concentration; color of bar represents long-term significant trends (P-val < 0.05); vertical black line represents 95% confidence interval around the median (MCIs) over the period 1995-2010. Wells with an insufficient number of samples (<10) cannot undergo accurate trend analysis.

calculated using the MINITAB statistical software package, for all available data over the period 1995–2010. A median confidence interval (MCI) is utilized with this type of environmental data primarily because the median is a better measure of the central tendency of the population in a skewed dataset instead of the mean, or average, which is most suitable for an equally distributed dataset. A wider MCI indicates more variability in concentration over the period, which is apparent in several of the monitoring wells sampled by the Program. As seen in **Figure 3,** most of the 2010 monitoring well nitrate concentrations were within, or very near, the 95% MCI (defined by vertical black line) except for monitoring wells with significant upward or downward trends. However, the response for these trending wells was in the direction of the defined trend which is a normal response for wells with a strongly significant trend. Irrigation and domestic wells tend to show less variability (shorter MCIs) because they are installed deeper in the saturated portion of the aquifer and are not as easily affected by the land–use practices and other surface management that may impact year to year groundwater quality. Additionally, irrigation wells usually extract a very high volume of water and have been known to impact groundwater up to a 1/4 mile away, so it is possible that shorter MCIs in irrigation wells could be due to dilution of nitrate-nitrogen concentrations. Nonetheless, nitrate concentrations in 2010 for domestic and irrigation wells with defined trends were nearly all in the direction of the trend which suggests a high degree of accuracy in defined trends in all three well networks.

The distribution of wells exceeding the EPA standard in 2010 is consistent with historical findings that show the greatest concentration of such wells in the area between Platteville and La Salle (**Figure 4**); however, every irrigation and monitoring well north of Greeley was also above the EPA standard in 2010. With the addition of 2010 nitrate data to the long–term trend analysis dataset, and after relabeling four domestic wells previously miss–categorized as irrigation wells, the significant downward trend observed of the irrigation well network in 2009, became insignificant. Therefore, no Weld County well network shows evidence of a significant trend in nitrate concentrations over time, upward or downward. The several individual monitoring and irrigation wells with significant trends, discussed earlier, are mapped in **Figure 5**. The same areas that have the largest collection of wells above the EPA standard in 2010 also contain the most individual wells with significant trends. While this is true it is important to point out that the irrigation wells north of Greeley with upward trends have had an increase of less than ten ppm since 1995 (**Figure 6**). In comparison four monitoring wells, two of which have an upward trend, have increased more than ten ppm in the area between Platteville and La Salle. The only other location with multiple wells showing increasing nitrate–nitrogen of more than ten ppm from 1995 to 2010 is around Fort Lupton. Only one of these wells has a defined trend. This is an area to pay close attention to as these results suggest there may be a tendency towards increasing nitrate concentrations.

There are multiple factors that can cause varying responses in nitrate contamination which include fertility management, crop rotation and tilling management, irrigation management, large precipitation and flooding events, and point source impacts from known nitrogen contributors like concentrated animal feeding operations and waste water treatment effluents. More research and analysis of land use practices and landscape changes are needed in these areas in order to understand the reasons behind these apparent trends.

2010 Pesticide Results

Seventy–seven detections of 18 different pesticide compounds were detected from the 24 monitoring well samples collected in 2010 (**Table 2**). Compared to 2009, the number of detections and number of pesticide compounds discovered decreased dramatically. Taking into account the differences in laboratory methodology from 2009 to 2010 (discussed earlier in the Sampling and Lab Analysis Notes) these results are not likely an indication of actual changes in groundwater quality. There are however, several notable observations in comparing data from the last two years.

Of the total pesticide detections, 49% and 78% of compounds detected in 2009 and 2010, respectively, are comprised of degradation products of a parent pesticide active ingredient. A few pesticide compounds have been found in groundwater samples collected in Weld County since sampling began in 1995 – atrazine, desethyl atrazine (atrazine degradation product), prometon, metolachlor, and two metolachlor degradation products. Since the metolachlor degradation products were first added to the analysis list by the Program in 2009, they have shown up consistently with some of the highest concentrations. The historical patterns of seeing the above mentioned compounds is apparent in the 2009 and 2010 data with 56% and 81% of total detections, respectively, being comprised of these compounds. Of the 77 total detections in 2010, 49% of them were of metolachlor constituents alone, and of the 30 detections of any compound at a concentration greater than 1.0 ppb, 80% of them involved the ESA or OA degradation product of metolachlor. Information available on metolachlor degradation suggests that the parent and degradation products are very persistent and stable in water which likely explains the higher concentrations encountered in these groundwater samples. Due to these findings is likely that the majority of metolachlor ESA and metolachlor OA compounds were derived from the parent compound prior to being leached into groundwater. While parent metolachlor has been given an EPA Lifetime Health Advisory Level of 70 ppb, the

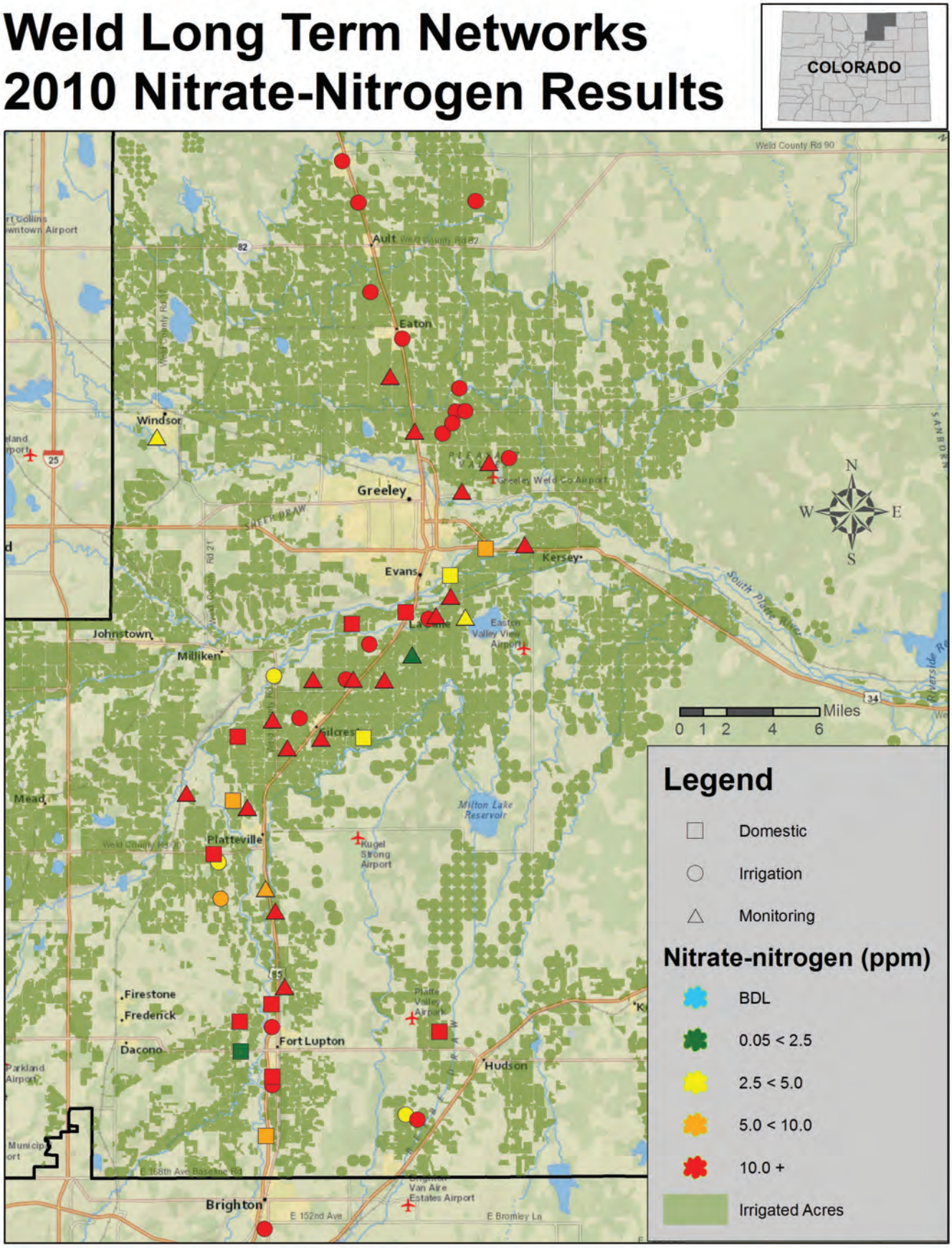

Figure 4. Nitrate-nitrogen results for 2010 samples collected from Weld County long-term domestic, irrigation, and monitoring well networks.

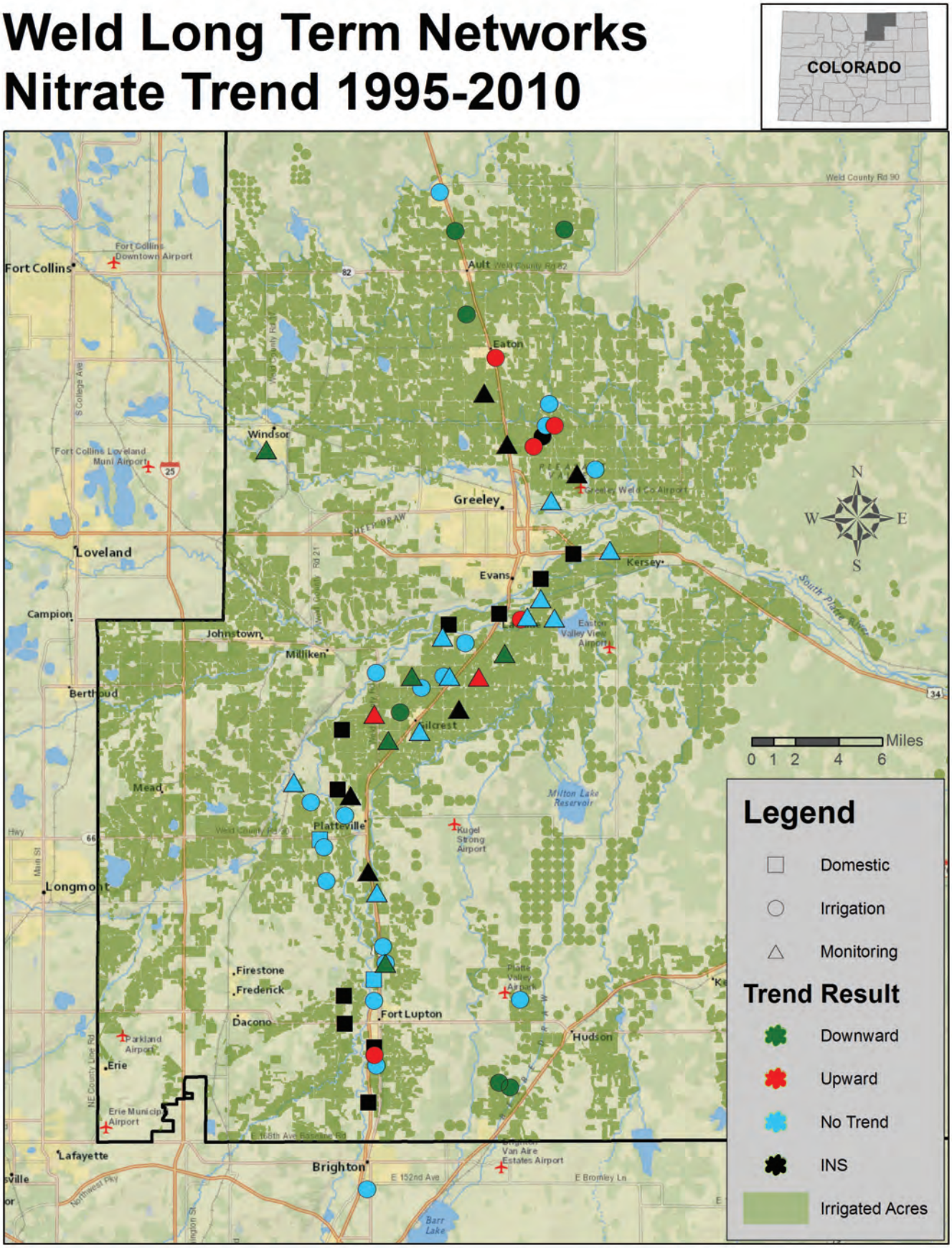

Figure 5. Weld County long-term well network trends in nitrate concentration over the period 1995-2010. Upward and downward trends significant at $\alpha = 0.05$. Trend result 'INS' indicates insufficient data available for accurate trend analysis (<10 samples).

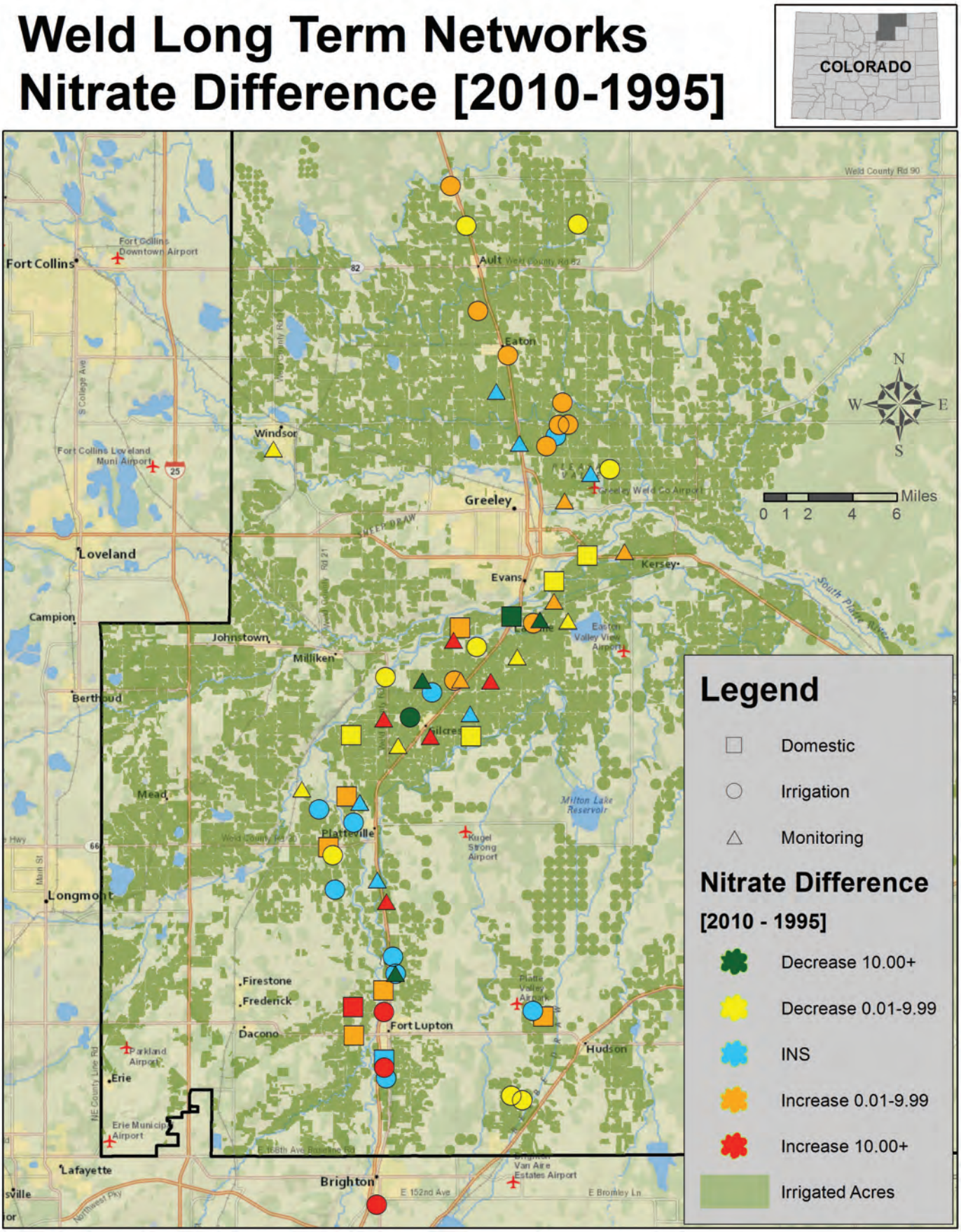

Figure 6. Difference in nitrate-nitrogen from 1995 to 2010 in Weld County long-term domestic, irrigation, and monitoring wells. Difference = 2010 Concentration - 1995 Concentration. Concentrations are in parts-per-million. INS indicates a well not sampled in 1995 or 1996 and unable to have the difference calculated.

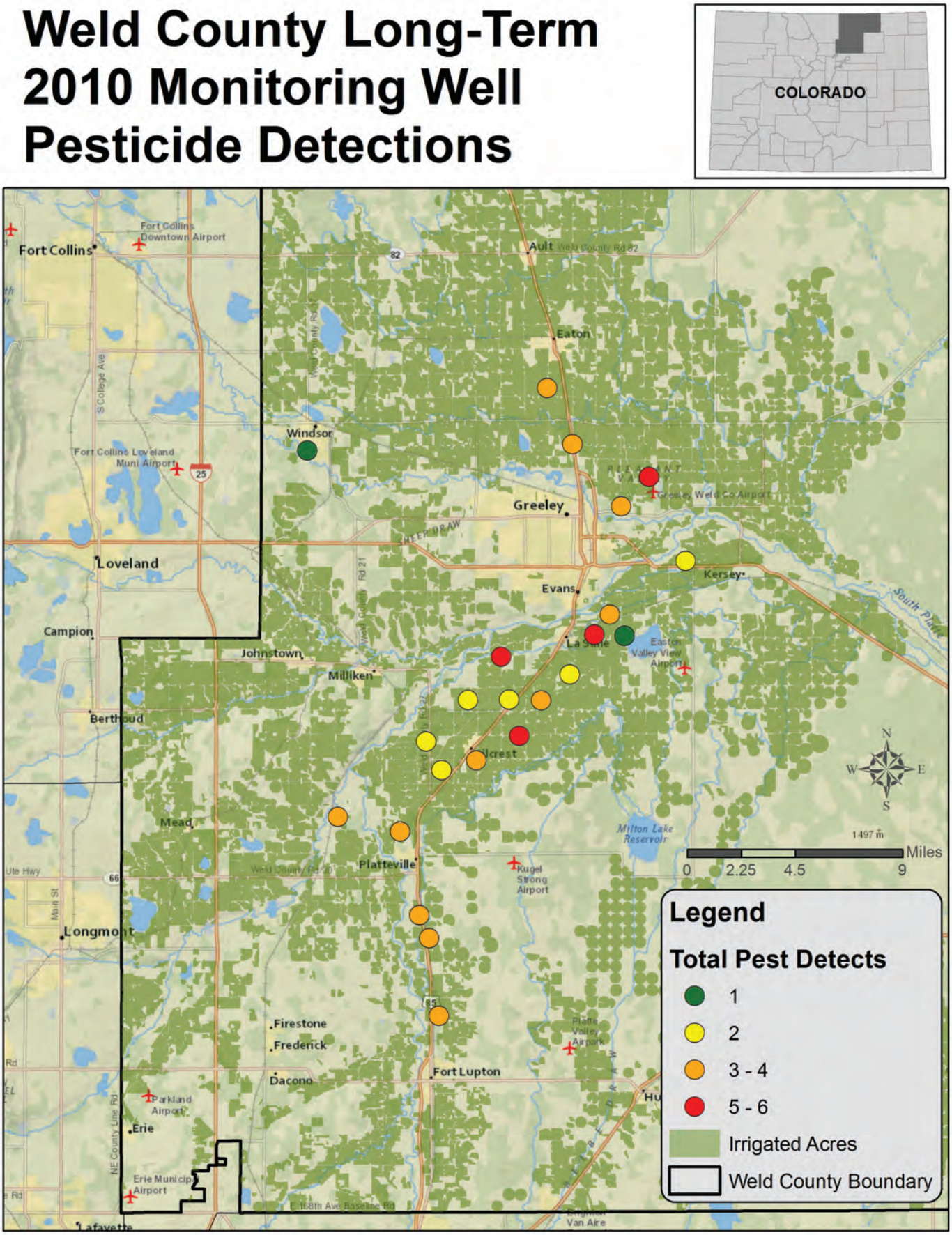

Figure 7. Distribution of pesticide detections per well for 2010 samples collected from Weld County long-term monitoring wells.

Weld County 2010 Pesticide Detections					
Pesticide	# Detects	Minimum	Median	Mean	Maximum
Acetochlor	3	0.71	1.06	0.97	1.13
Alachlor ESA*	3	0.30	0.85	0.80	1.24
Atrazine	3	0.10	0.10	0.10	0.11
Bentazon	1	3.87			3.87
Clopyralid	1	0.63			0.63
Deisopropyl atrazine*	2	0.39	0.48	0.48	0.58
Desethyl atrazine*	9	0.10	0.18	0.22	0.46
Dimethenamid ESA*	1	2.03			2.03
Dimethenamid OA*	1	0.31			0.31
Hydroxy atrazine*	8	0.17	0.27	0.30	0.43
Imazapyr	1	0.12			0.12
Metolachlor	3	0.31	0.41	0.38	0.42
Metolachlor ESA*	22	0.28	1.98	2.21	6.46
Metolachlor OA*	14	0.43	1.07	1.54	4.34
Metribuzin	2	0.18	1.79	1.79	3.40
Prometon	1	0.42			0.42
Propazine	1	0.22			0.22
Thiamethoxam	1	0.82			0.82

Table 2. Pesticides detected in Weld County Long-Term monitoring well samples in 2010. Concentrations are parts-per-billion. '*' indicates a pesticide degradation product. Atrazine has an EPA drinking water maximum contaminant level of 3.0 ppb. Metolachlor, metribuzin, and prometon have EPA Lifetime Health Advisory Levels of 70, 100, and 100 ppb, respectively.

metolachlor degradation products are not included in this standard so it is not known whether metolachlor ESA and metolachlor OA are better or worse for human or animal health.

Detections of atrazine or its degradation products (DEA, DIA, or HA) accounted for 29% of total detections, although the highest concentration was 0.6 ppb. In instances where DEA and the atrazine parent were discovered in the same well it was possible to calculate the DEA to atrazine ratio (DAR). This ratio shows whether residence time of atrazine in the soil has been sufficient for degradation to occur, or if leaching of atrazine into groundwater occurred too quickly for degradation. Only three wells contained both atrazine and DEA, and all three had a DAR greater than one, which suggests that detected atrazine constituents were a result of atrazine that had undergone significant degradation before reaching the water table. In 2009, DARs could be calculated for all 24 wells sampled because of MDA's lower detection limits. Two sites had a DAR less than one but the atrazine and DEA concentrations were all less than 0.2 ppb. Depth to groundwater at these two sites is on the shallower end at less than 15 ft below ground surface so it is plausible that applied atrazine could have infiltrated quickly; however these two sites also have the lowest electrical conductivity and lowest nitrate–nitrogen concentrations of the entire monitoring well network. There are likely several variables that explain this discrepancy, but what it does show is that the DAR calculation is not always accurate in determining how quickly atrazine may have moved through the soil and into groundwater. Similar to metolachlor degradation products, those for atrazine are not included in atrazine's EPA drinking water maximum contaminant level of 3.0 ppb, so the degradation product extent of impact on human or animal health compared to the parent compound is not documented.

Figure 7 shows a distribution of pesticide detections throughout the monitoring well network in 2010. Wells with the most diversity of compounds were located primarily in the Platteville to La Salle area and at a location east–northeast of Greeley. The only two wells with a single detection is at a site in Windsor – a former cultivated agriculture site that has since been made a town park – and a site within a third of a mile and down–gradient of Lower Latham Reservoir which may be causing significant dilution of contaminants. Both pesticide concentrations were less than 0.3 ppb. Due to the multitude of differences between detected compounds' degradation pathways, half–life, and sample site characterization it is difficult to ascertain what land–use practices are causing more or less pesticide compounds being detected in groundwater.

Results from seven samples sent to the CEMS laboratory confirmed the results from the program laboratory on the same samples, but also revealed the presence of additional pesticide compounds not currently being screened for in the Program's laboratory. Cyanazine acid or one of its degradation products, desethyl cyanazine acid and cyanazine amide, were discovered in three of the seven wells. One well contained all three compounds. These results substantiated the Program's decision to involve CEMS in sample analysis on a limited basis in order that the Program is testing

for an appropriate group of compounds in Colorado groundwater.

Summary

Laboratory results for nitrate and pesticide analysis in 2010 provided further evidence that groundwater quality in the South Platte alluvial groundwater of Weld County, is being impacted by agricultural chemical use. Several wells in each long–term network contained nitrate–nitrogen above the EPA standard which has been consistently discovered since sampling began in 1992. The vast majority of monitoring wells had lower nitrate concentrations when compared to 2009 data which is promising; however, the lack of a statistically significant network–wide trend from 1995 to 2010 shows the high variability of year to year concentrations. Several individual wells with significant trends exist primarily in the Platteville to La Salle area which is an area that also contains wells with detection of a diversity of pesticide compounds. Overall, total detections and types of pesticide decreased from 2009 numbers; however, differences in laboratory methodology are the likely cause rather than actual changes in groundwater quality. Results from the 2011 sampling season will be more comparable to 2010 values because laboratory methodologies will be similar. Other than concentrations detected for metolachlor ESA and metolachlor OA nearly all detected concentrations are less than one ppb. A majority of total detections being comprised of atrazine, metolachlor, and prometon constituents is consistent with historical findings in alluvial groundwater in Weld County since 1995. In general, it appears that management and land–use activities are doing a decent job of keeping dangerous levels of agrichemicals out of the groundwater, but continued diligence is necessary to ensure impacts stay low or are reduced in areas where pesticide compounds are frequently discovered.

For questions or comments on this report, or the Program in general, please contact Rob Wawrzynski (303-239-5704, rob.wawrzynski@ag.state.co.us) or Karl Mauch (303-239-5713, karl.mauch@ag.state.co.us).

Table 3. Reporting limits of analytes tested for in 2010 by the Biochemistry Laboratory of the Colorado Department of Agriculture. Concentrations are in micrograms per liter (µg L^{-1}) for fungicide, herbicide, nematicide and insecticide analyte types. Concentrations for inorganic analytes are in milligrams per liter (mg L^{-1}).

Reporting Limits for Analytes Tested - Sampling Year 2010

Analyte	Tradename[1]	Use	Reporting Limit	Analyte	Tradename	Use	Reporting Limit
Nitrate as nitrogen (mg L^{-1})			0.05	3-Hydroxy carbofuran	Metabolite	Insecticide	0.25
Nitrite as nitrogen (mg L^{-1})			0.05	Halofenozide	Mach 2	Insecticide	0.10
Acetochlor	Harness	Herbicide	0.20	Halosulfuron methyl	Permit	Herbicide	0.10
Acetochlor (ESA)	Metabolite[2]	Herbicide	0.10	Hexazinone	Velpar	Herbicide	0.20
Acetochlor (OA)	Metabolite	Herbicide	0.25	Hydroxy Atrazine	Metabolite	Herbicide	0.10
Acifluorfen	Storm	Herbicide	0.10	Imazamethabenz methyl ester	Assert	Herbicide	0.10
Alachlor	Lasso	Herbicide	0.20	Imazamox	Raptor	Herbicide	0.10
Alachlor (ESA)	Metabolite	Herbicide	0.10	Imazapic	Plateau	Herbicide	0.10
Alachlor(OA)	Metabolite	Herbicide	0.10	Imazapyr	Arsenal	Herbicide	0.10
Aldicarb	Temik	Insecticide	0.50	Imazethapyr	Pursuit	Herbicide	0.10
Aldicarb sulfone	Metabolite	Insecticide	0.25	Imidacloprid	Admire	Insecticide	0.25
Aldicarb sulfoxide	Metabolite	Insecticide	0.10	Isoxaflutole	Balance	Herbicide	0.10
Aminopyralid	Milestone	Herbicide	0.50	Kresoxim methyl	Cygnus	Fungicide	0.25
Atrazine	Aatrex	Herbicide	0.10	Lindane	Gammexane	Insecticide	0.20
Azoxystrobin	Amistar	Fungicide	0.10	Linuron	Afalon	Herbicide	0.20
Bentazon	Basagran	Herbicide	0.50	Malathion	Malathion	Insecticide	0.20
Bromacil	Hyvar X	Herbicide	0.10	MCPA	MCPA	Herbicide	0.10
Carbofuran	Furadan	Insecticide	0.20	MCPP	Kilprop	Herbicide	0.10
Chlorantraniliprole	Durivo	Insecticide	0.10	Metalaxyl	Allegiance	Fungicide	0.20
Chlorimuron ethyl	Classic	Herbicide	0.25	Metconazole	Caramba	Fungicide	0.10
Chlorothalonil	Bravo	Fungicide	0.20	Methomyl	Lannate	Insecticide	0.10
Chlorsulfuron	Glean	Herbicide	0.10	Metolachlor	Bicep	Herbicide	0.20
Clopyralid	Lontrel	Herbicide	0.50	Metolachlor (ESA)	Metabolite	Herbicide	0.25
Cyanazine	Bladex	Herbicide	0.20	Metolachlor (OA)	Metabolite	Herbicide	0.25
Cyproconazole	Alto	Fungicide	0.10	Metribuzin	Lexone	Herbicide	0.20
Cyromazine	Larvadex	Insecticide	0.25	Metsulfuron methyl ester	Ally	Herbicide	0.10
2,4-D	Weed B Gone	Herbicide	0.10	Nicosulfuron	Accent	Herbicide	0.10
2,4-DB	Butyrac	Herbicide	0.50	Norflurazon	Solicam	Herbicide	0.20
DCPA	Dacthal	Herbicide	0.20	Picloram	Tordon K	Herbicide	0.50
Deethyl atrazine	Metabolite	Herbicide	0.10	Prometon	Pramitol	Herbicide	0.20
Deisopropyl atrazine	Metabolite	Herbicide	0.25	Propazine	Milo-Pro	Herbicide	0.20
Dicamba	Banvel D	Herbicide	0.50	Propoxur	Baygon	Insecticide	0.10
Dichlobenil	Casoron	Herbicide	0.20	Prosulfuron	Peak	Herbicide	0.25
Dichlorprop	Patron	Herbicide	0.10	Pyrimethanil	Distinguish	Fungicide	0.10
Diflufenzopyr	Distinct	Herbicide	0.10	Quinclorac	Drive	Herbicide	0.10
Dimethenamid	Frontier	Herbicide	0.10	Simazine	Primatol S	Herbicide	0.20
Dimethenamid (ESA)	Metabolite	Herbicide	0.25	Sulfentrazone	Spartan	Herbicide	0.50
Dimethenamid (OA)	Metabolite	Herbicide	0.50	Sulfometuron methyl ester	Oust	Herbicide	0.10
Dimethoate	Cygon	Insecticide	0.10	Sulfosulfuron	Certainty	Herbicide	0.10
Dinotefuran	Safari	Insecticide	0.20	Tebuconazole	Elite	Fungicide	0.10
disulfoton	Disyston	Insecticide	0.20	Tebufenozide	Confirm	Insecticide	0.10
disulfoton sulfone	Metabolite	Insecticide	0.20	Tebuthiuron	Graslan	Herbicide	0.10
disulfoton sulfoxide	Metabolite	Insecticide	0.20	Thiamethoxam	Cruiser	Insecticide	0.25
Diuron	Karmex	Herbicide	0.25	Triadimefon	Amiral	Fungicide	0.10
Ethofumesate	Solera	Herbicide	0.25	Triallate	Avadex BW	Herbicide	0.25
Ethoprop	Mocap	Insecticide	0.20	Triasulfuron	Amber	Herbicide	0.10
Fenamiphos	Nemacur	Nematicide	0.20	Trichlorfon	Dylox	Insecticide	0.20
Fenamiphos sulfone	Metabolite	Nematicide	0.20	Triclopyr	Garlon	Herbicide	0.50
Flufenacet	Axiom	Herbicide	0.10	Triticonazole	Charter	Fungicide	0.10
Flumetsulam	Broadstrike	Herbicide	0.10	Vinclozolin	Curalan	Fungicide	0.20

1 - Tradenames used are strictly examples of products containing a particular analyte and does not suggest analysis of a specific product.
2 - 'Metabolite' is a degradation product of a parent pesticide.