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WIRB Final Project Report

Project Name: **Silver Lake Project**

Project Number: 8005-002

Soil and Water Conservation District: Osceola

Reporting Period: 01/01/2009-12/31/2011

Date Report Prepared: May 13, 2014

Reporting Individual: John H. Wills

Preparers Signature: Jeff

SWCD Chairperson's Signature:
Web Kohn 6/4/14

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I. Financial Accountability

Summary: Amended Watershed Improvement Funds

Grant Agreement Budget Line Item	Total Funds Approved ($)	Total Funds Approved-Amended ($)	Total Funds Expended ($)	Available Funds ($)
Salary/Benefits	110,240	110,240	**110,132.68**	107.32
Travel/Training	700	700	**654.78**	45.22
Supplies	600	600	**120.24**	479.76
Information/Ed	5,000	5,000	**3,047.46**	1,952.24
Permanent WRP Easements	358,000	258,000	**0**	258,000
30-Year WRP Easements	0	50,000		50,000
Wetland Type CRP Incentive	0	50,000	**23,070**	23,790
Totals	474,540	474,540	**137,025.46**	334,374.54
Difference			(334,374.54)	

Funding Source	Cash		In-Kind		Total	
	Approved Application Budget ($)	Actual ($) Expended	Approved Application Budget ($)	Actual ($) Expended	Approved Application Budget ($)	Actual ($) Expended
WIRB	474,540	137,025.46	0	0	474,540	137,025.46
319/WSPF	60,770	10,283.14			60,770	10,283.14
NRCS/WRP	5,128,000		500	500.00	5,128,500	500.00
Local Partners**	27,250	27,675.73			27,250	27,675.73
Recipient	0	2,738.53			0	2,738.53
Totals	5,690,560	177,722.86	500	500	5,691,060	178,222.86

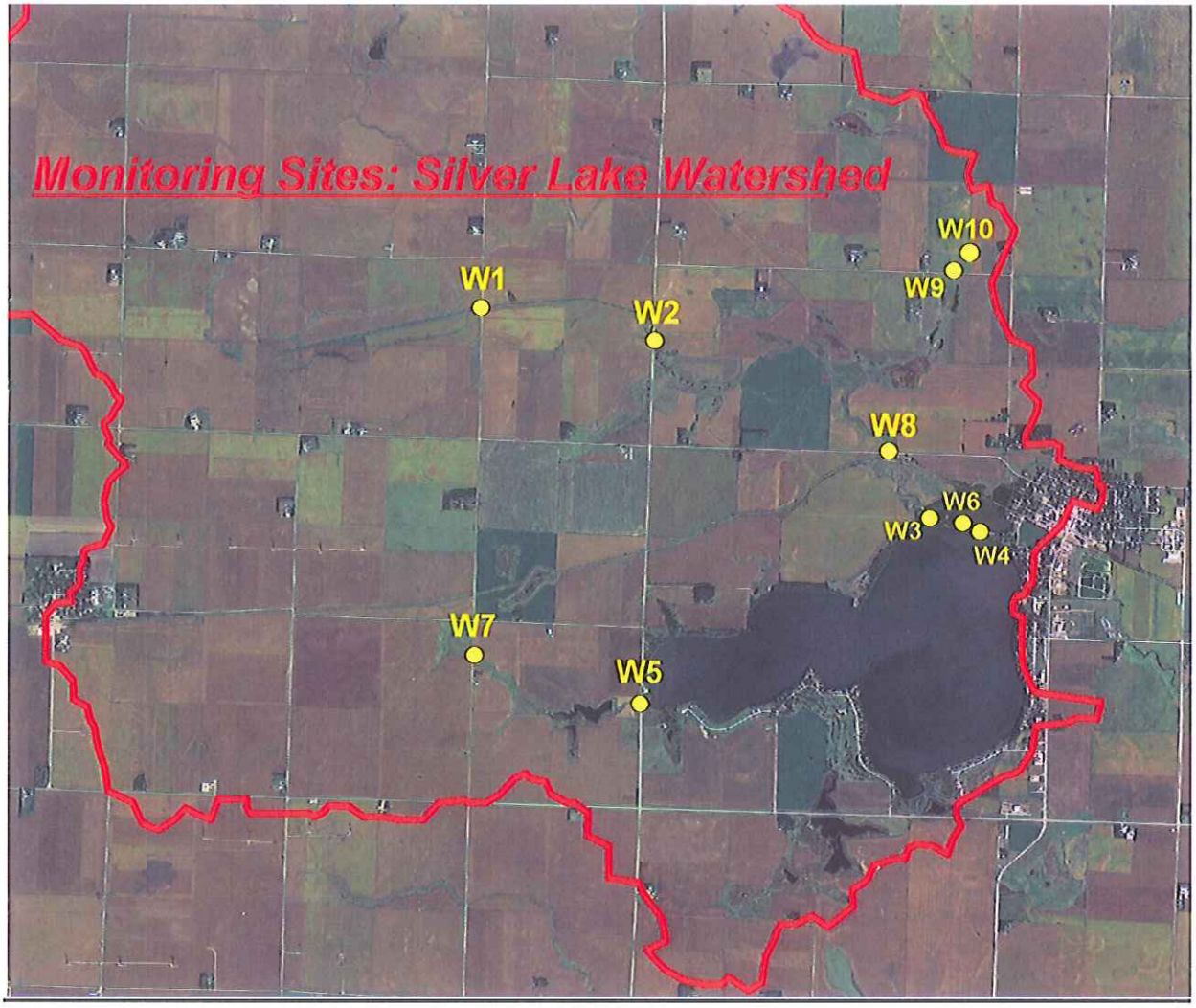
** Clean Water Alliance, Silver Lake Park, Pheasants Forever, Dickinson WQC

Application: 8% WIRB

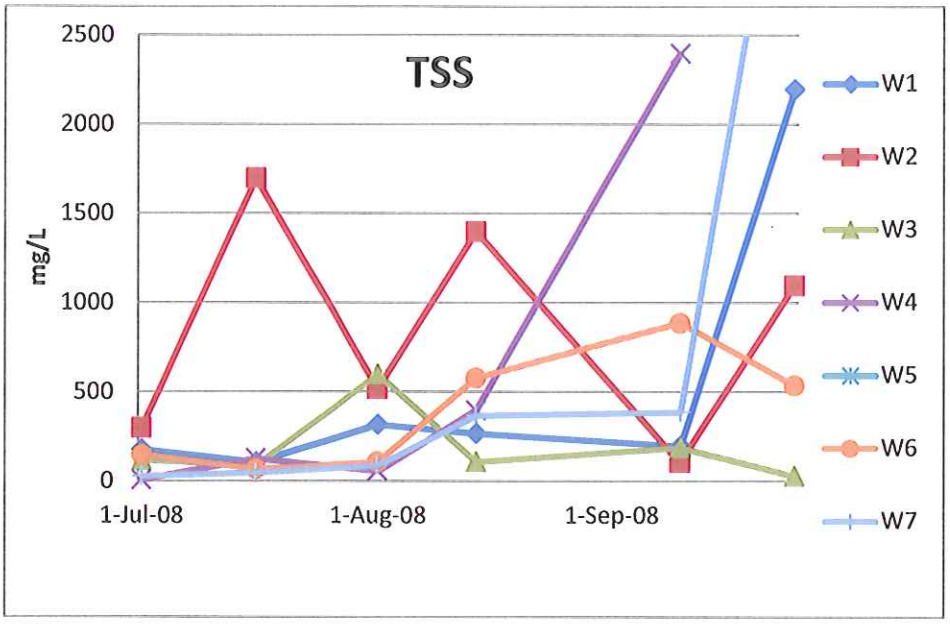
Actual 77% WIRB

II. Environmental Accountability

Water Sampling Data Results



2008


TSS
mg/L
2500
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1000
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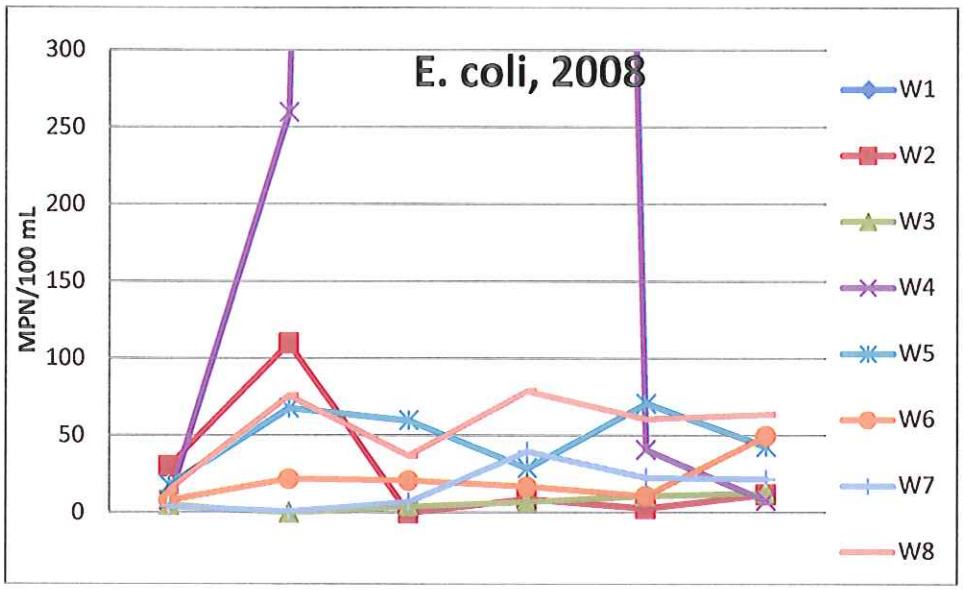
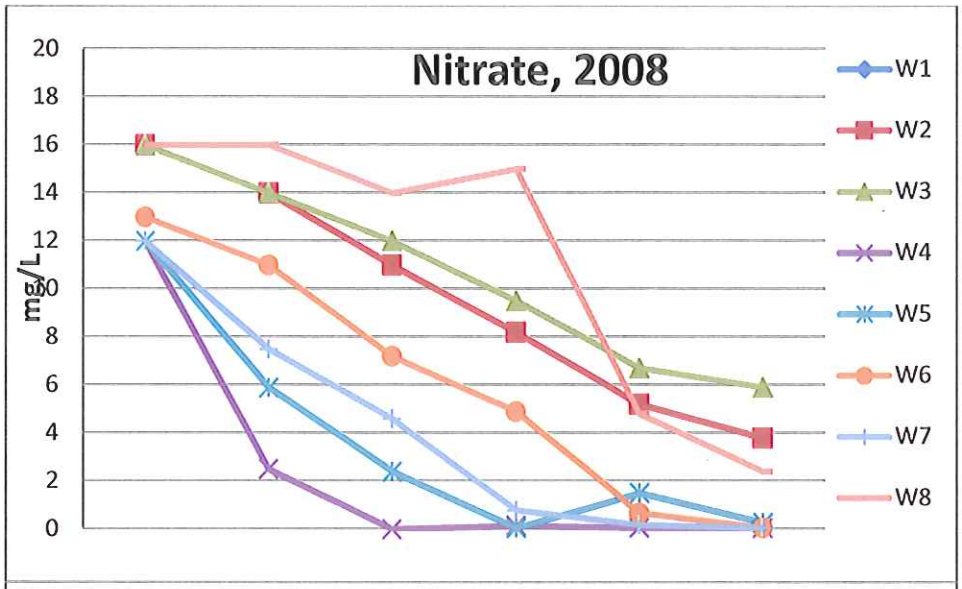
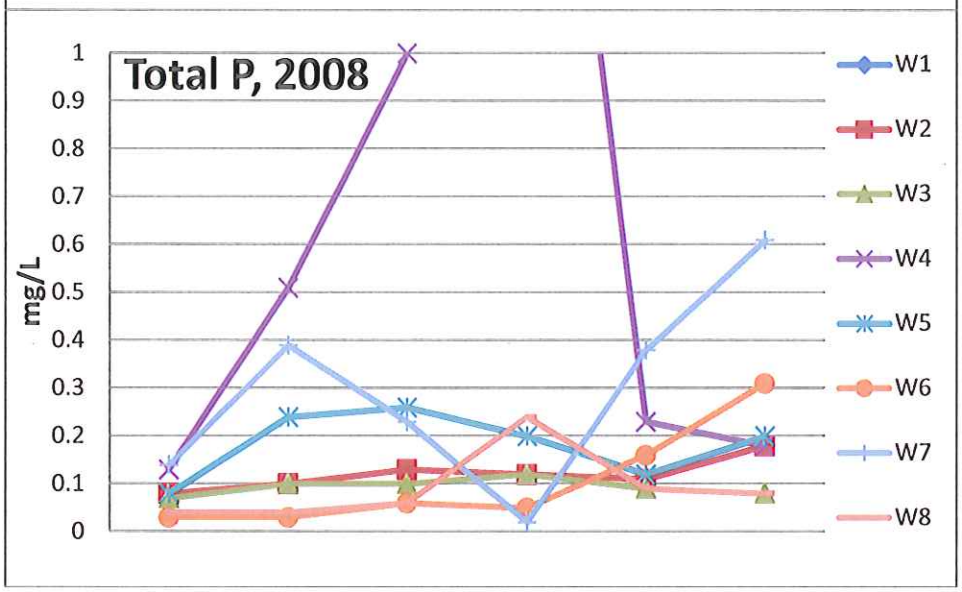
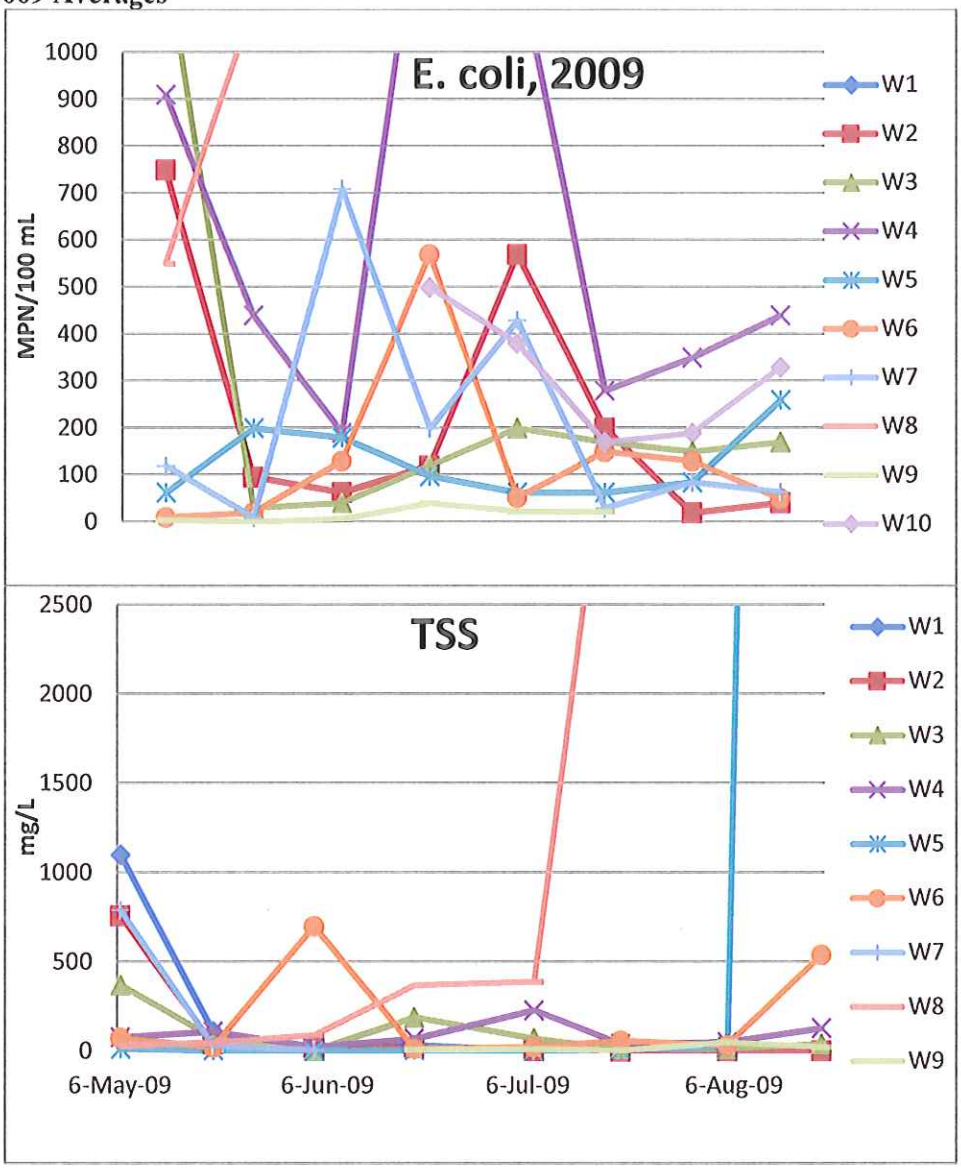
1-Jul-08
1-Aug-08
1-Sep-08
W1
W2
W3
W4
W5
W6
W7

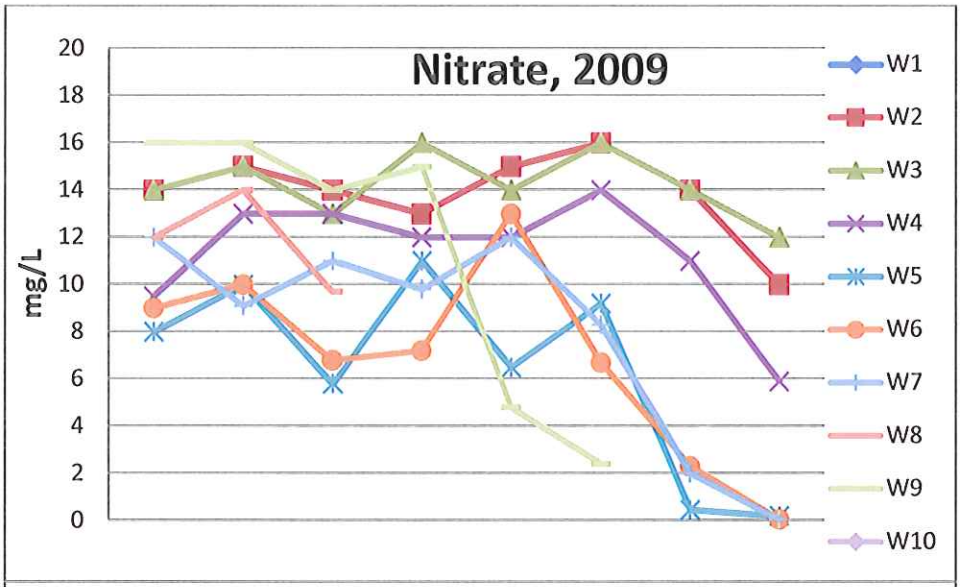

E. coli, 2008
MPN/100 mL
300
250
200
150
100
50
0
W1
W2
W3
W4
W5
W6
W7
W8

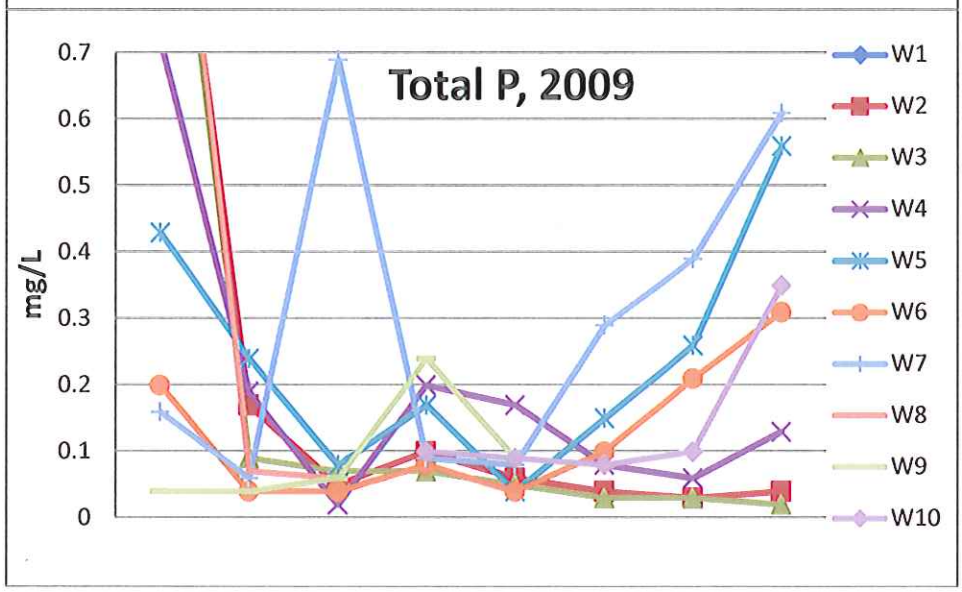

Nitrate, 2008
mg/L
20
18
16
14
12
10
8
6
4
2
0
W1
W2
W3
W4
W5
W6
W7
W8


Total P, 2008
mg/L
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
W1
W2
W3
W4
W5
W6
W7
W8

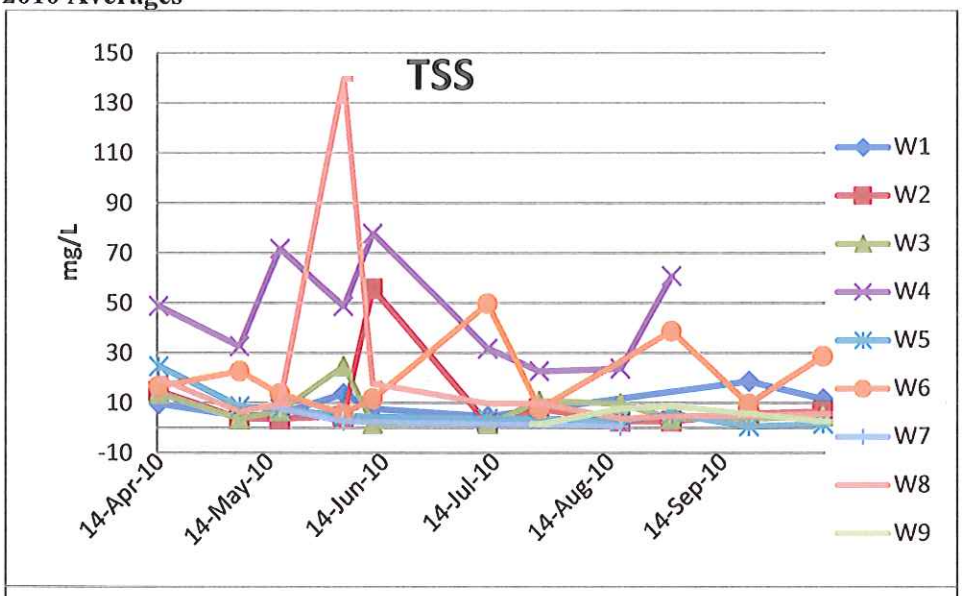
2009 Averages

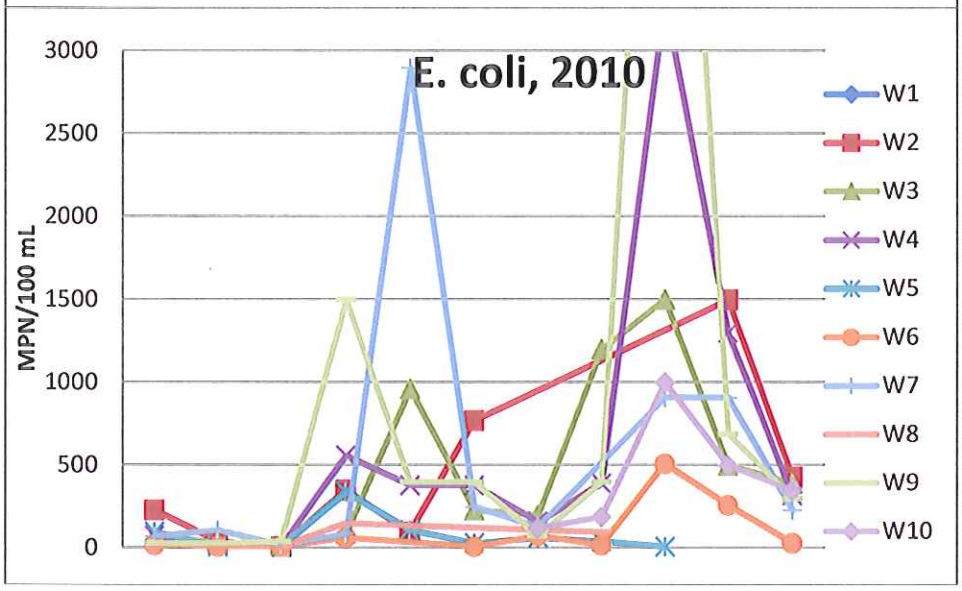


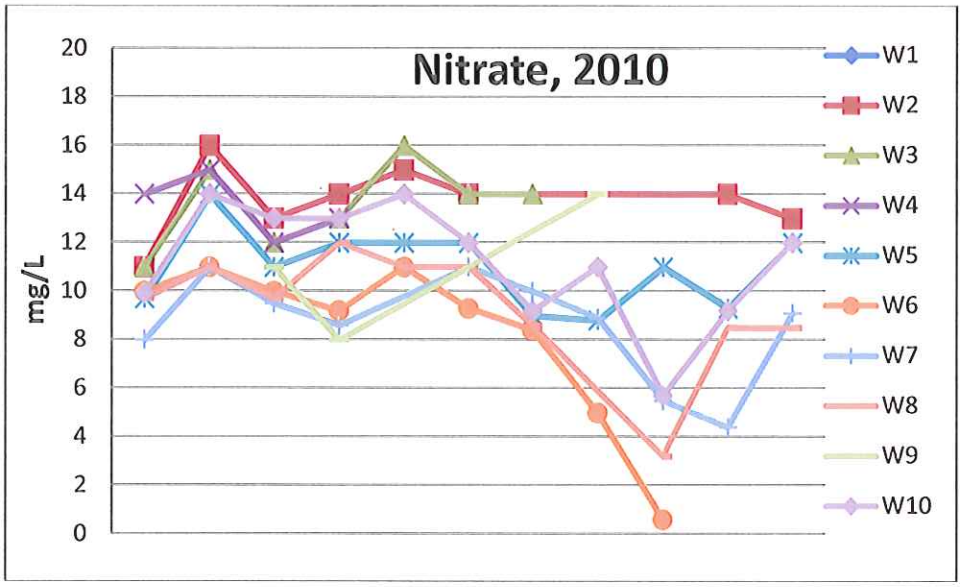

Nitrate, 2009
mg/L
20
18
16
14
12
10
8
6
4
2
0
W1
W2
W3
W4
W5
W6
W7
W8
W9
W10

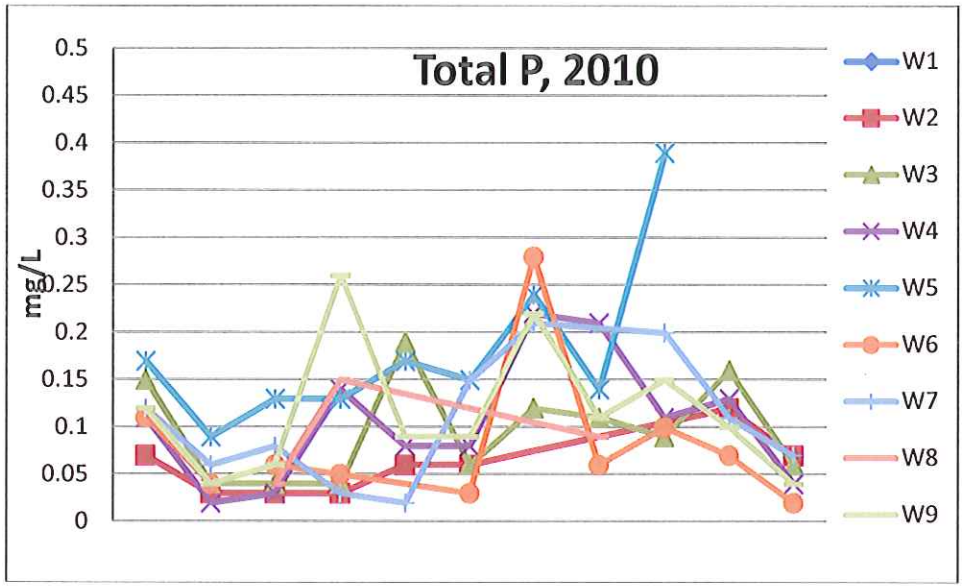

Total P, 2009
mg/L
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
W1
W2
W3
W4
W5
W6
W7
W8
W9
W10

2010 Averages

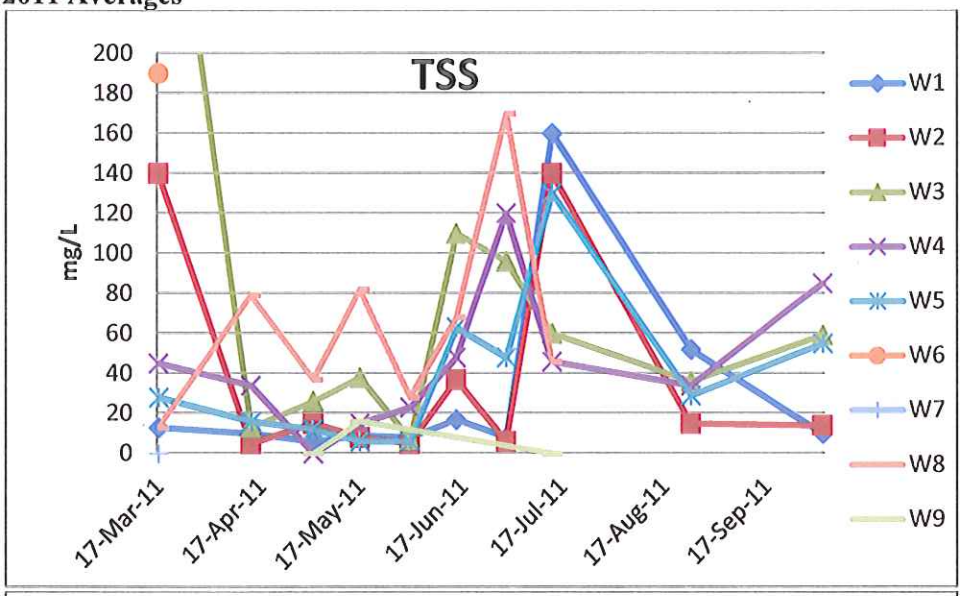


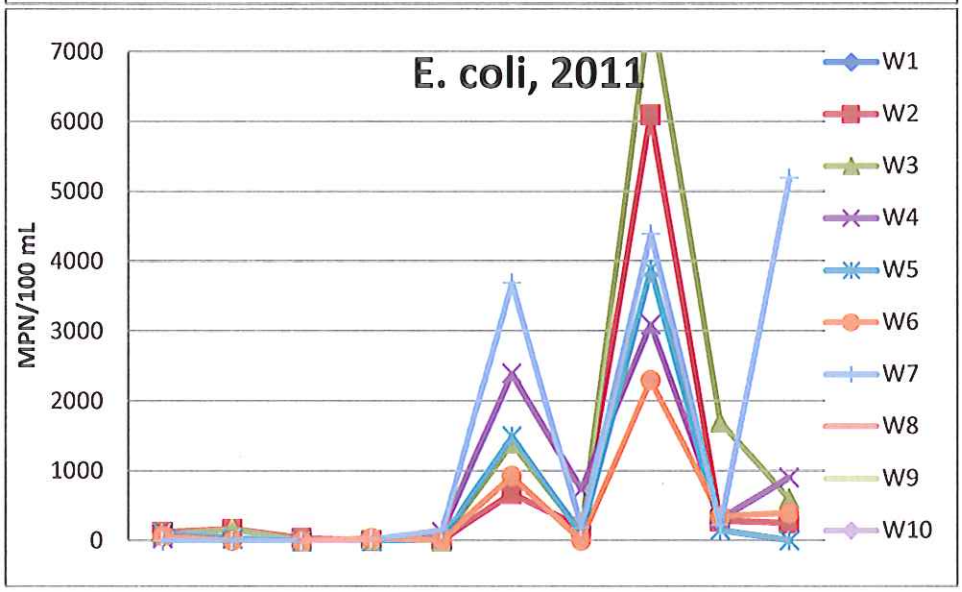


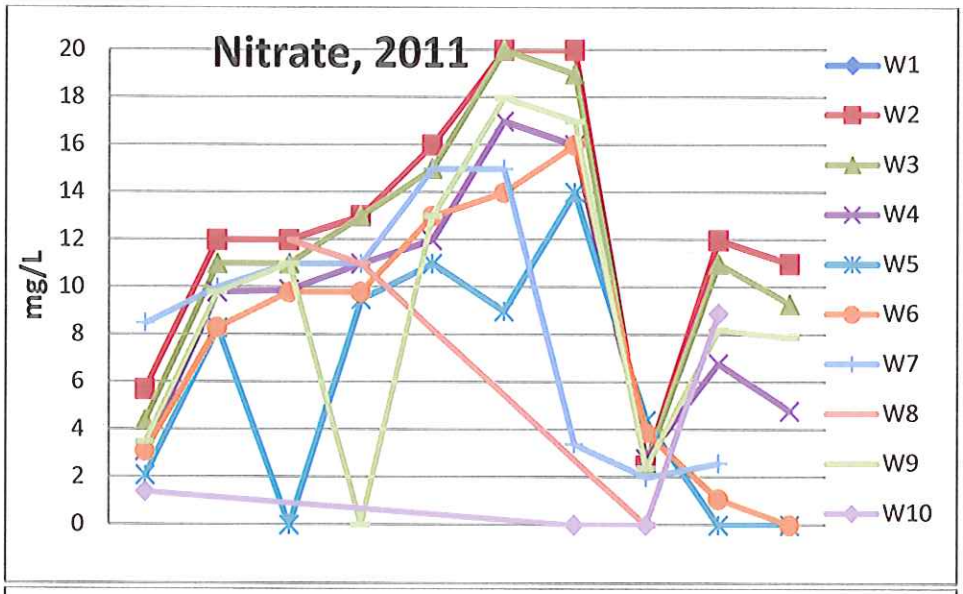

Nitrate, 2010
mg/L
20
18
16
14
12
10
8
6
4
2
0
W1
W2
W3
W4
W5
W6
W7
W8
W9
W10

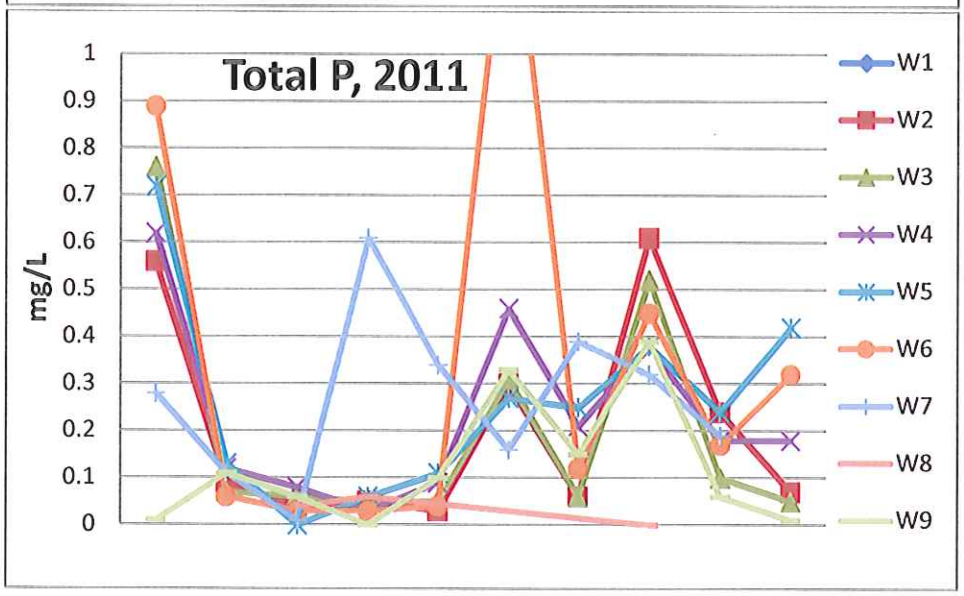

Total P, 2010
mg/L
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
W1
W2
W3
W4
W5
W6
W7
W8
W9

2011 Averages






Nitrate, 2011
mg/L
20
18
16
14
12
10
8
6
4
2
0
W1
W2
W3
W4
W5
W6
W7
W8
W9
W10


Total P, 2011
mg/L
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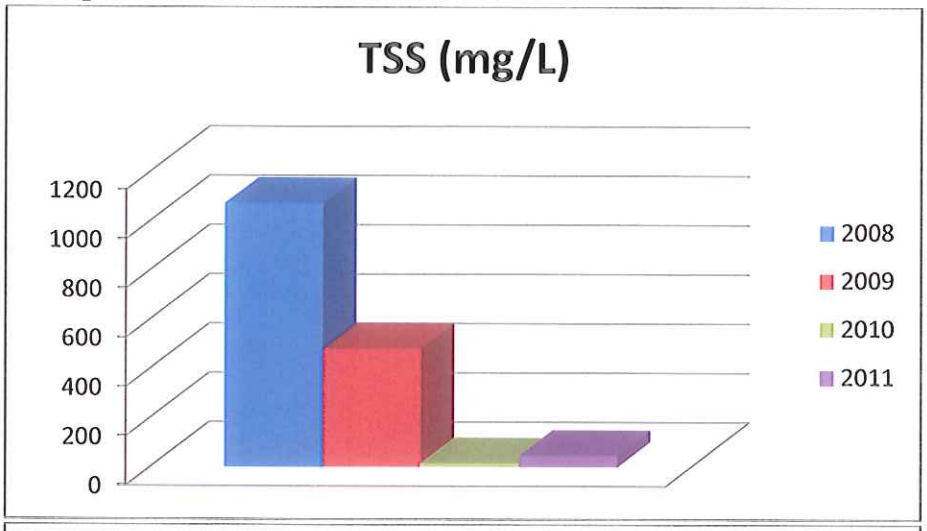
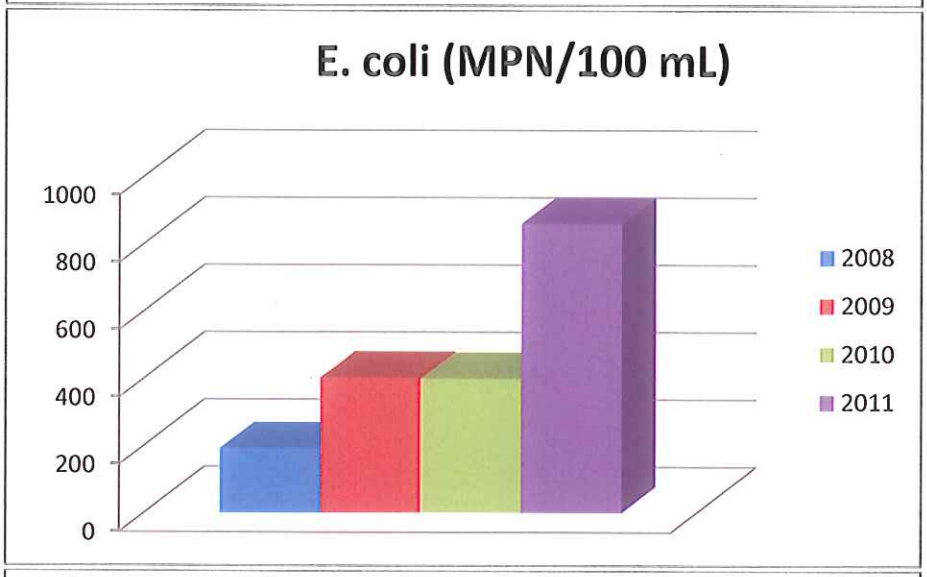
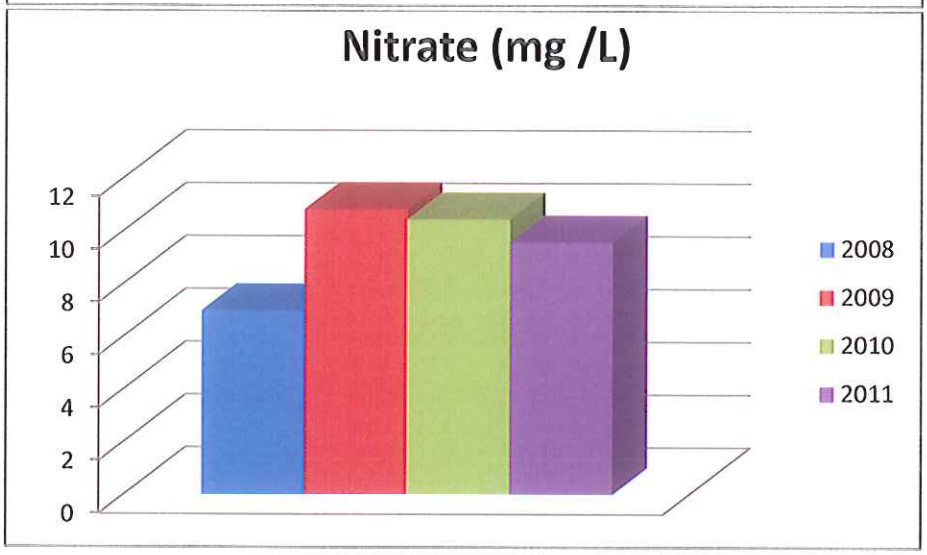
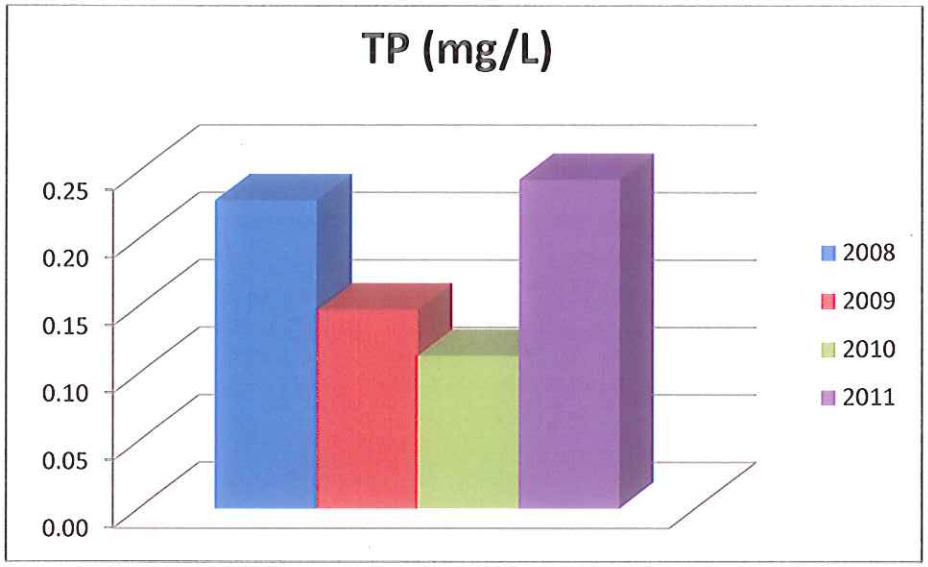
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
W1
W2
W3
W4
W5
W6
W7
W8
W9

Averages for watershed from 2008 to 2011









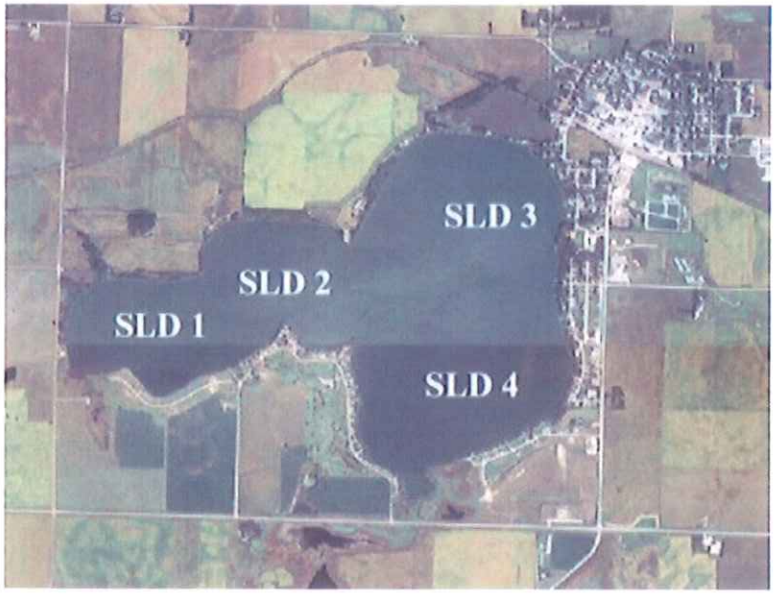
Water Sampling Data Interpretation

Water sampling has been conducted in the Silver Lake Watershed as part of the entire healthy watershed approach that is being taken with Silver Lake. Those samples have been taken widely since 2008 and continue through today. Water sampling of the lake itself has been going on for over 5 years through the Cooperative Lakes Area Monitoring Project (CLAMP).

CLAMP began in 1999 as a partnership between Iowa Lakeside Laboratory and the Friends of Lakeside Lab to take advantage of a rich tradition of volunteer involvement in the Iowa Great lakes region. Volunteers are organized and trained to monitor water quality on 9 lakes in northwest Iowa: Center, East Okoboji, Little Spirit, Lower Gar, Minnewashta, Silver, Spirit, Upper Gar, and West Okoboji. CLAMP focuses on monitoring nutrient levels (nitrogen and phosphorus), chlorophyll *a* (an indicator of algae abundance) and Secchi depth (water clarity). By monitoring these parameters, CLAMP volunteers provide an integrated measure of each lake's water quality.

Water sample results for Silver Lake from CLAMP can be found at http://www.continuetolearn.uiowa.edu/lakesidelab/documents/documents/Silver2010.pdf. The water conditions of Silver Lake over the past five years indicate "moderately poor" water clarity, "moderately high" algae abundance, and "high" nutrient levels. In 2010, the Iowa Great Lakes Region saw record snowfall, heavy rains, and warm summer temperatures. Along with windy days and busy boating weekends, these weather conditions can lead to an increase in nutrient levels, algae blooms, and turbid water.

Below is a map that shows the sampling location for the sites on Silver Lake. The CLAMP water samples for 2011 have not been released as of yet.



Silver Lake, Dickinson Co., Sample Locations

Part of the rich tradition of volunteerism involves the IOWATER water sampling process as well. IOWATER is not official samples by their very nature but they can tell us a story and give us ideas where to do more formal sampling to prove or disprove the fairly inconsistent volunteer sampling.

The sampling conducted by the Dickinson SWCD's staff, since 2008, has shown a reduction in Total Suspended Solids in the last two years. The reason for this reduction is unclear at this time. Even with some very heavy rain events, the results are fairly consistent. The greatest possibility is a more clear guidance and formalized methods in sampling the streams and water going into the lake. In addition, more professional equipment has been purchased and used in the process of collecting these samples.

E. coli has been shown in greater numbers during the 2011 growing season and this typically is an indicator of heavy rain falls. The feeling of the Dickinson/Osceola SWCD staff and the NRCS staff is that the two years (2009 and 2010) prior to 2011 were typical years and average amounts of E. coli. More sampling will tell us if this is true. It is still not certain where the E. coli bacteria are coming from and future sampling will attempt to locate the source of the bacteria.

Nitrate levels remain constant in the watershed despite years of heavy rain falls. Stalk testing conducted over the last two years have indicated a reduced level of Nitrate left in the stalk which indicates a shortfall in Nitrogen available for the plant. Without application records from the farmers indicating how much nitrogen was applied to the field we can't be certain that nitrogen is being under-applied or is simply being made unavailable to the corn plant in some way. In many instances that could mean the nitrogen is being released into the watershed through precipitation.

The final criteria that we have typically studied in the Silver Lake Watershed is total phosphorous. This indicator is important for the Silver Lake Watershed because it is phosphorous that is the primary culprit in the Silver Lake Watershed, growing algae and causing the excessive algae blooms in the lake. According to figures from the Total Maximum Daily Load written by the Iowa DNR, about 1 pounds of phosphorous per acre per year is entering the Silver Lake watershed. In addition, according to the TMDL written for Silver Lake, a significant amount of Phosphorous is entering the system via the atmosphere. When considering 1 pound of phosphorous can grow up to 1,000 pounds of algae under ideal conditions, this is a huge amount of phosphorous.

Data Conclusions

The data shows us some interesting data. First and foremost, the watershed modeling data and total suspended solids that were sampled in watershed samples suggests a regular amount of sediment entering the watershed through tile and drainage ditches. This sediment has a direct conduit to the lake via these drainage ditches. The bottom line is once a pollutant gets into one of the three main drainage ditches of the watershed, it doesn't have much to stop it along the way.

Total Suspended Solids tend to spike after a rain event and during periods of relative dryness the levels of suspended solids go down. There is always a supply of solids in the drainage ditches as high water tends to wash sediment in the bottom of these drainage ditches down toward the lake. As the ditch dries out, the sediment then settles to the bottom.

E. coli as discussed above is a problem but it is unclear where the problem originates. The district has had discussions this winter of conducting a brightener's test, to determine if the bacterium is originating from human or animal locations. Brighteners are found in water coming from septic tanks as humans use brighteners in detergents to keep clothing colors bright. If there are brighteners present in the samples this summer, then we know that the problem we have is one of septic tanks leaking or being directly connected to the drainage tiles. If there are no brighteners present then we need to seek an answer for an animal caused problem.

Nitrates are present in samples and really no surprise was discovered in the water samples pulled. During periods of rain, nitrogen is washed into drainage tile and drainage ditches. The nitrogen is then washed to Silver Lake. Because the algae found in Silver Lake typically neutralize the effects of nitrogen it is not considered a problem for Silver Lake, but that does not mean it could not be a problem in the future or a significant source to deal with.

Phosphorous is the principle pollutant that needs to be dealt with in the Silver Lake Watershed. The samples that have been taken in the watershed since 2008 prove there is a significant amount of phosphorous being brought to the lake through sediment delivery. In order to remove the lake from the impaired waters list both sediment and phosphorous need to be reduced to a level that reduces phosphorous to a point that algae to not propagate at an exponential manner.

III. Program Accountability

Financial

The project did not progress as well as hoped for when all is said and done. When planning the project, in its earliest stages, the landowners polled were in favor of conducting a project like this, but as the project was accepted and progressed, it became evident that land prices increased a great deal (almost 67 percent increase). In addition, commodity prices increased and held fairly high and steady through the end of this project.

As a result of the increase in land prices and the increase in commodity prices we saw farmers trying to farm as much land as possible and reluctant to tie their ground up in a long term agreement and especially a perpetual agreement. The overall attitude of the landowners and farmers in the watershed of Silver Lake was to farm as much ground as was possible. At many times this was in detriment to the conservation practices and the cultural practices that have been installed and used in the watershed in the past.

The CRP incentive that was provided for $23,070 was a Farmed Wetland Practice on 153 acres. The practice was seeded and wetland restored the fall of 2010. The pictures below show the new growth of native vegetation and water in the recently restored wetlands.

As can be seen above, there was an intense water sampling program that began even before the project was started and will carry forth after this project has been complete. The water samples continue to be fine-tuned and adjusted so the greatest amount of usable information can come from the samples. The sampling is a partnership between the Dickinson SWCD, Silver Lake Park Improvement Association, and the Dickinson County Water Quality Commission.

An intense I&E campaign was used to spread the word about how to reduce pollutants to Silver Lake. As this is the first project of its kind in the Silver Lake Watershed, there were many instances that could be used as teachable moments. Letters were sent to the landowners and operators of the watershed to explain the programs that were offered and provided. In addition, the letters detailed what the coordinator could do and accomplish. Newspaper advertisements were contracted to advertise the project goals. The ads were run in Dickinson County Newspapers and in an Osceola County newspaper. Radio advertisements and a radio show were also used to present the project to the people of the watershed. The advertisements gave "good farming practices" the nod and the radio show presented what it was that the project was doing.

The amount of $654.78 was spent on travel and training, for the coordinator to attend the Annual Water Quality Conference in Ames each year. These funds were used to ensure the coordinator was educated as to the best practices and science available and was able to network with other coordinators in Iowa. The conference provided valuable information and abilities to the coordinator that would have otherwise been unavailable.

Finally the coordinator of the project was paid the bulk of the funding in the form of salary. There was $121,264.00 spent for salary for the project coordinator. These funds were replaced by the 319/WSPF funds through the Iowa DNR and IDALS this final year of the project. The project coordinator left the project in July of 2011 and the Dickinson County Clean Water Alliance Coordinator filled the position until the end of the project. The final duties of the project were completed by the Dickinson County Clean Water Alliance Coordinator. Below see the salary and benefits breakdown for the project:

	WIRB	319/WPF
2009	$ 55,120.00	$ -
2010	$ 41,340.00	$ -
2011	$ 13,672.68	$ 10,283.14
Totals	$ 110,132.68	$ 10,283.14

Program

The original idea behind this WIRB grant was to offer financial incentives to producers who bid their property into the Wetland Reserve Program (WRP). The program had good support during the pre-grant efforts and surveys of the land owners in the area. Unfortunately, several problems cropped up during the project that affected the ability of the coordinator to enroll and get applicants accepted into the WRP program. The primary problem that was not anticipated is the reduction in acres and the changes in the WRP program that allowed fewer small fields to be selected for this program. Secondly, while the grain markets were expanding during the lead-up for this project, no one anticipated the strength in which grains would gain pricewise, or the expansion of rental rates and land prices during that same time.

In effect, the changes in WRP and the grain market explosion caused the landowners and operators of the watershed to turn away from programs that would tie up their land for extended lengths of time. The project met with resistance but did continue to receive and submit applications for WRP through NRCS. In addition, an application that would have received a lot of points in the WRP project was one landowner away from being accepted. Two landowners wished to participate in the program but a third did not and therefore the project could not move forward.

A survey released Wednesday 7 December 2011 shows the average price rose from $5,064 an acre to $6,708 an acre from November 2010 to November 2011. The highest land price on record when measured against inflation was in 1979 and was $5770 per acre. Right now we are dealing with record land values and record crop prices. It is the perfect storm, so to speak, in opposition to what was planned in the Silver Lake Watershed.

The increase in crop prices and in land values acted as a buffer against taking land out of production for the protection of the watershed and those who were interviewed previous to the project were no longer interested in doing project activities after the project was approved because of the increase in prices.

Because of this increase in both land values and crop values a request was made to modify the project to include adding Conservation Reserve Program (CRP) Incentives. That request was approved and there was immediately interest by several landowners and 153 acres of land was enrolled in a Farmable Wetland Program (FWP) CRP practices with an incentive.

Over the course of the program the project coordinator made 83 personal contacts with landowners and operators within the Silver Lake Watershed. Those meetings dealt with more than just WRP or restoration of wetlands, but discussions were held regarding all aspects of farming the land within the watershed of Silver Lake. The landowners/operators were given options as to federal, state, and project specific programs that would assist them to change practices.

A total of 3 WRP applications covering approximately 150 acres were submitted to NRCS. The lack of funding, poor point totals of the applications, and cost of the submitted properties caused none of the submitted applications to be accepted into the program. Each year of the project WRP either did not increase in funding or funding was cut from the program. The applicants did not score well for multiple reasons but the main reason is the size of fields offered for the WRP was small. WRP offers a premium in points for larger size areas. Because the land values and crop values increased, producers were not interested in putting large fields into the program, but rather small areas of their worst farm ground. In one instance, if an additional landowner had submitted an application it would have combined three properties and one extremely large wetland. That combined project would have scored extremely well in the WRP program.

The project coordinator sampled the watershed 2 times a month from March to September for all three seasons of the project and that is how the above sampling data was received. The samples were paid for through local donations and grants. The samples that were collected have yielded valuable information and provided guidance on where problem areas may exist. In the future these samples will be used to pinpoint specific sub-watersheds and locations to concentrate our work.

Three complete applications for CRP enrollment were received after an amendment was requested and approved to add a component to the project for CRP incentives. The first was for the enrollment of approximately 153 acres into the Farmable Wetlands Program (FWP). This project was completed in November 2010, and included the restoration of 4 pothole basins. These basins will effectively filter sediment and nutrients from 195 adjacent acres of row crop for a total of 348 acres being filtered through this project area.

Another application for 30 acres of CRP was received in May of 2010, but this landowner was forced to cancel the CRP application because of conflicts with another conservation program. A third application for 20 acres of FWP was secured in November 2010.

An intensive Information and Education program was initiated during the first year of this project. Radio advertisements, newspaper articles, and presentation to groups were done each year of the project. There were over 210 people who were impacted in a direct manner by personal presentations to groups within the watershed. These people were taught the value of clean water, how to reduce water pollutants, and what a watershed is.

In addition, the coordinator for the project became the subject matter expert for several groups within the watershed and developed a leadership role in various locally led projects. The Silver Lake Park Improvement Association is a good example of this leadership. The coordinator provided knowledge and technical information to the group so they could direct their efforts to help improve the lake through federal, state, and local programs.

Environmental

As mentioned previously, 83 landowners and operators were contacted by the project coordinator during the course of this project. The changes in cultural practices that came as a result of these personal contacts have yet to be determined. Many of the farmers in the watershed are in the process of looking at new technology and farming practices but not necessarily because of the project. A movement exists to strip till in NW Iowa as a whole as an alternative to no-till conservation tillage. This movement exists because the tillage passes and fertilizer costs are reduced more than a desire to conserve soil.

An estimated 626 tons/year of erosion reduction will be realized as a result of this restoration project. In addition, because not all sediment that is eroded is deposited into a water body it is estimated that 10 tons of sediment that would have been deposited in a water body will be removed. That will remove 59 pounds of phosphorous each year that this FWP exists. If 1 pound of phosphorous can grow up to 1,000 pounds of algae, then over 59,000 pounds of algae will have been prevented from polluting Silver Lake because of this one project each year.

Lessons Learned

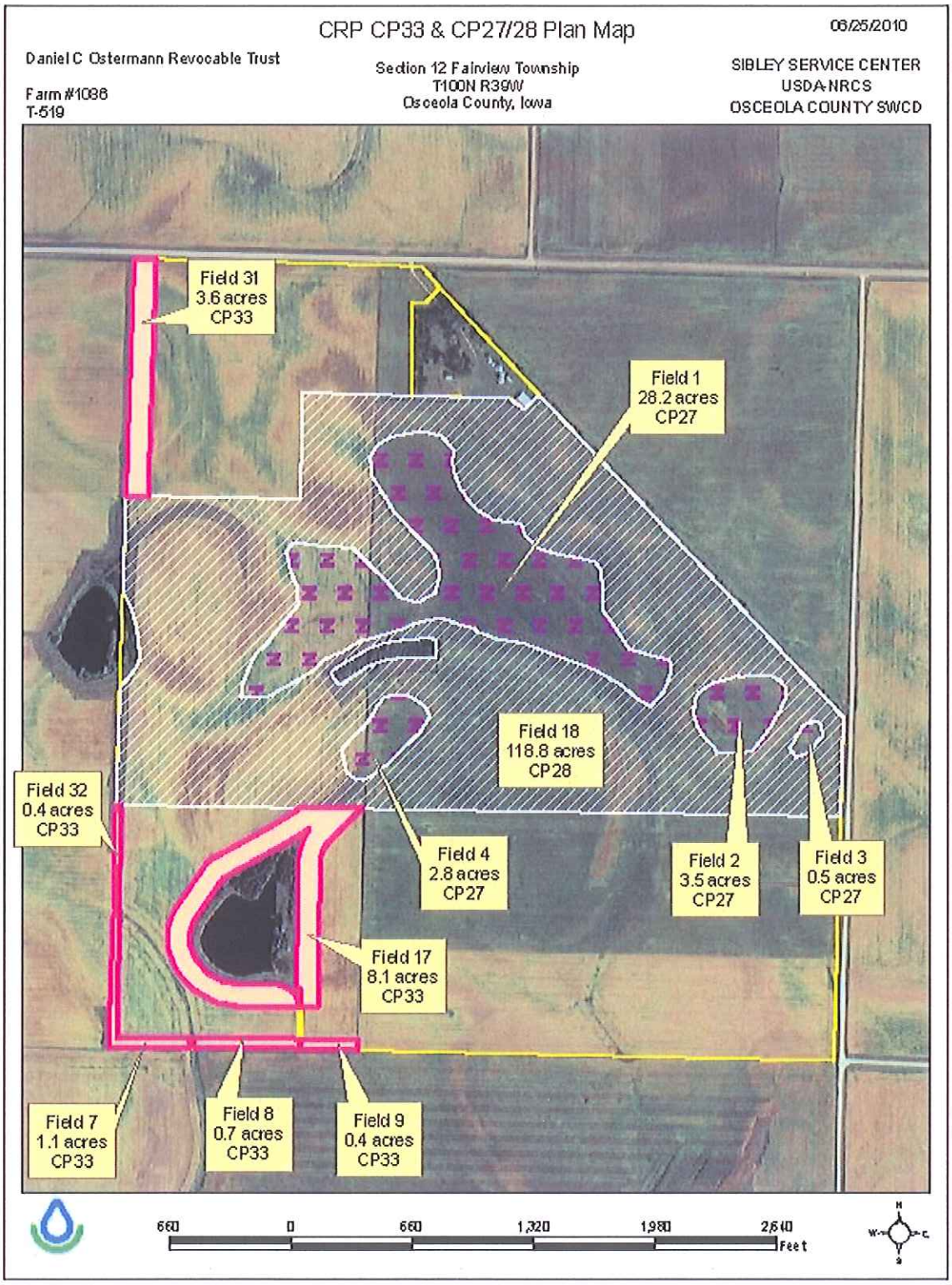
The project was hampered by several events that led to the conservation practices we are dealing with not being as attractive an option as they were previously to the project being funded. The crop prices and land values caused landowners and operators to look more closely at the bottom line financially in favor of getting the maximum number of acres into production and not "tying" their land up in permanent programs so they could potentially be sold if need be.

In retrospect, the project focus may have been too narrow and more options should have been allowed from the outset of the project. There should have been a greater number of "tools" the coordinator could have tapped into should the need arise. Unfortunately, we realized this too late and only one application was finalized with 153 acres of CRP because of this. If we would have had the CRP incentive from the first day of the project, it is likely we would have had a much greater level of participation.

By having a narrow focus on WRP incentives we left ourselves open to changes in the federal program, increase in land values, and inflated crop prices. All these factors caused a decreased desire by the landowners and operators to participate. That partnership is still in existence but there has been harm done because the project did not have the success that was touted.

The addition of a project coordinator was invaluable for this project. The addition of the coordinator allowed for much more personal contact and an increase in the information and education aspects. The coordinator also acted as a bridge between Osceola and Dickinson Counties.

Photos:


CRP CP33 & CP27/28 Plan Map
06/25/2010
Daniel C Ostermann Revocable Trust
Farm #1086
T-519
Section 12 Fairview Township
T100N R39W
Osceola County, Iowa
SIBLEY SERVICE CENTER
USDA-NRCS
OSCEOLA COUNTY SWCD
Field 31
3.6 acres
CP33
Field 1
28.2 acres
CP27
Field 18
118.8 acres
CP28
Field 32
0.4 acres
CP33
Field 4
2.8 acres
CP27
Field 2
3.5 acres
CP27
Field 3
0.5 acres
CP27
Field 17
8.1 acres
CP33
Field 7
1.1 acres
CP33
Field 8
0.7 acres
CP33
Field 9
0.4 acres
CP33
660
0
660
1,320
1,980
2,640
Feet


T100N
R38W
Osceola Co
Dickinson Co

Osterman's FWP site 4-11-2011

Osterman's FWP Site after with seeding coming up 6-1-2011

Osterman's FWP site, 6-8-2011 seeding and wetlands complete

Osterman's FWP Site 7-14-2011