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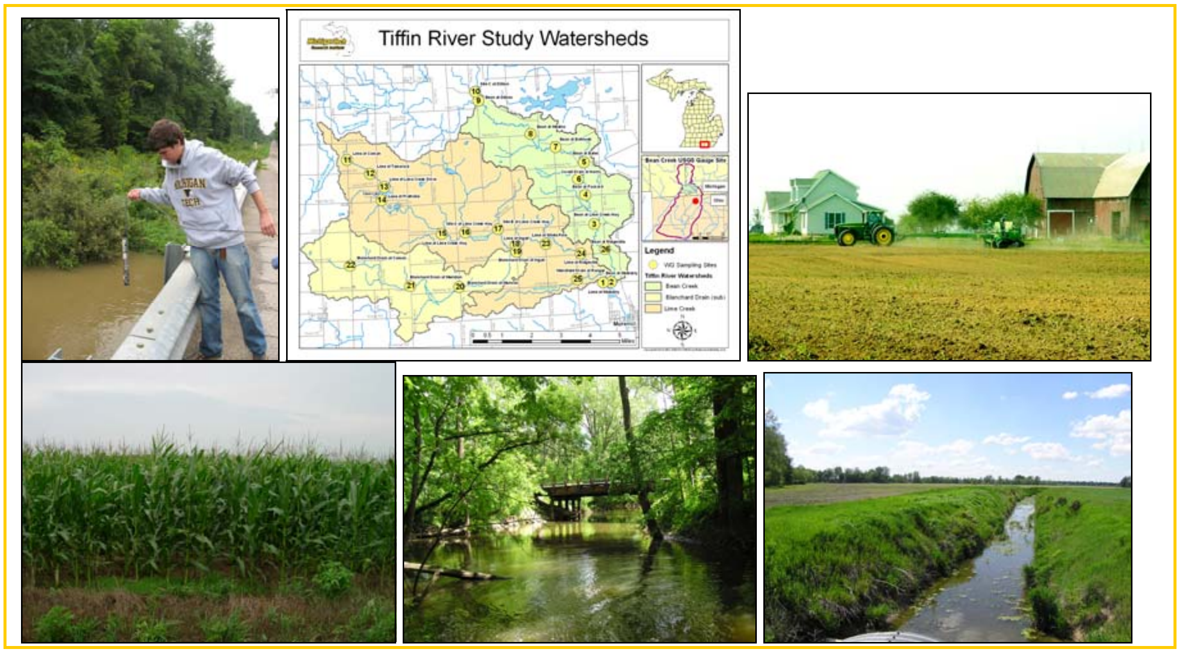

Report on In-situ Water Quality Monitoring over Three Years in the Upper Tiffin River, Michigan

C. Brooks, C. Hatt, T. Dajos, L. Liversedge, M. Wienert, and R. Shuchman

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Section 1: Executive Summary

The purpose of this study was to characterize the water quality of the Upper Tiffin River, to recommend a cost-effective and time-efficient measurement procedure, and to understand the relationship between land use and water quality in an agriculturally-dominated river system in southeastern Michigan. The 36,000 acre study area, comprised of Lime Creek and an 8-mile stretch of Bean Creek, was a focus for the NRCS because it was one of 24 national Conservation Effects Assessment Project (CEAP) study areas, and has listed impairments for several issues, including siltation, habitat alteration, and low dissolved oxygen levels.

We collected 32 monthly water collects from April 2005 to December 2007 along with six storm events using a Horiba U-22 highly portable water quality instrument. The instrumented collected 10 different water parameters, seven of which were relevant to freshwater ecosystems – pH, conductivity, turbidity, Dissolved Oxygen (DO), temperature, total dissolved solids (TDS), and Oxidation Reduction Potential (ORP). We selected an intensive survey of 26 sampling sites, placed along the creeks, which could be sampled in one day. These data formed a collection of over 40,000 records which organized in a logical and documented relational database.

We analyzed the water quality parameter statistics for all 3 years (2005, 2006, and 2007) without the storms (to understand the baselines value) as well the average, maximum, minimum, and standard deviation values for the seven parameters after the measured storm events. Our baseline characterization shows that turbidity is typically below values associated with harm to aquatic life (<25 NTU) but increases an average of 4 times and up to 10 times the baseline values after storm events. Dissolved oxygen levels are, on average, above the 7 mg/L Michigan state standard both in the baseline statistics and after storms, but low values potentially harmful to aquatic life do occur (in the 2-4 mg/L range) for all sites, particularly during the summer. In investigating changes in water quality parameters after storms, our analysis shows that measuring before and particularly after storms is important to monitoring water quality in agricultural river systems.

Focusing on measuring storm events is part of our recommended measurement procedure for the NRCS on future water quality studies. We recommend that turbidity, DO, and conductivity are the most important parameters to measure, particularly for storm events, with pH also being important for year-round trends. Selecting easily accessible locations (such as from bridges and culverts), spaced up to three miles apart, and including a mix of perennial and intermittent sites will lead to effective water quality characterization in watersheds similar to the Upper Tiffin River area. Including small side tributaries in measurement plans will lead to improved understanding of water quality issues. For the study area, these recommendations mean that about 13 points would suffice for monitoring, a significant reduction from the 26 we used. In addition to a sample of storm events, about four to five seasonal monitorings will suffice to effectively track water quality issues after a monthly baseline has been established. In 2007, we measured water quality after four storm events in addition to the 12 regularly monthly collects; our recommendation means that about 8 or 9 collects would be sufficient, rather than the 17 we collected last year.

In investigating the relationship between land use and water quality, we found the strongest relationships to be between particular crop types and turbidity, with pH and DO also being important. Using seasonal averages, corn silage was associated with higher turbidity levels in the Spring, when runoff is normally at its peak in this area. Larger amounts of corn in areas near the stream and in the entire upstream watershed were associated with significantly lower DO levels. Soybeans and corn were associated with increased acidity in Bean and Lime Creeks.

These results indicate that the NRCS can effectively monitor and understand water quality using instruments that collect a focused set of water quality parameters at reasonable cost, using only one field day per collect to measure a targeted number of sampling locations. With this measurement procedure, the NRCS can help farmers, researchers, agencies, and other stakeholders understand how to manage important agricultural landscapes and also improve water quality.

Section 2: Introduction

The Bean and Lime Creek watersheds (Figure 2-1) form part of the Upper Tiffin River in southeastern Michigan, a landscape dominated by farming focused on corn, wheat, soybeans, and alfalfa. As defined by the CEAP study watershed, the Upper Tiffin River study area (outlined in green below) forms all of Lime Creek and its watershed, as well as an 8-mile stretch of Bean that continues southward towards the Maumee River, which flows into Lake Erie. The Bean Creek watershed also continues 15 miles upriver of the study area, but this was not part of the CEAP study area. The total study area outlined below is approximately 36,000 acres (14,600 hectares or 56 square miles). Lime Creek also includes one major tributary, Blanchard Drain, which is also known as Toad Creek.

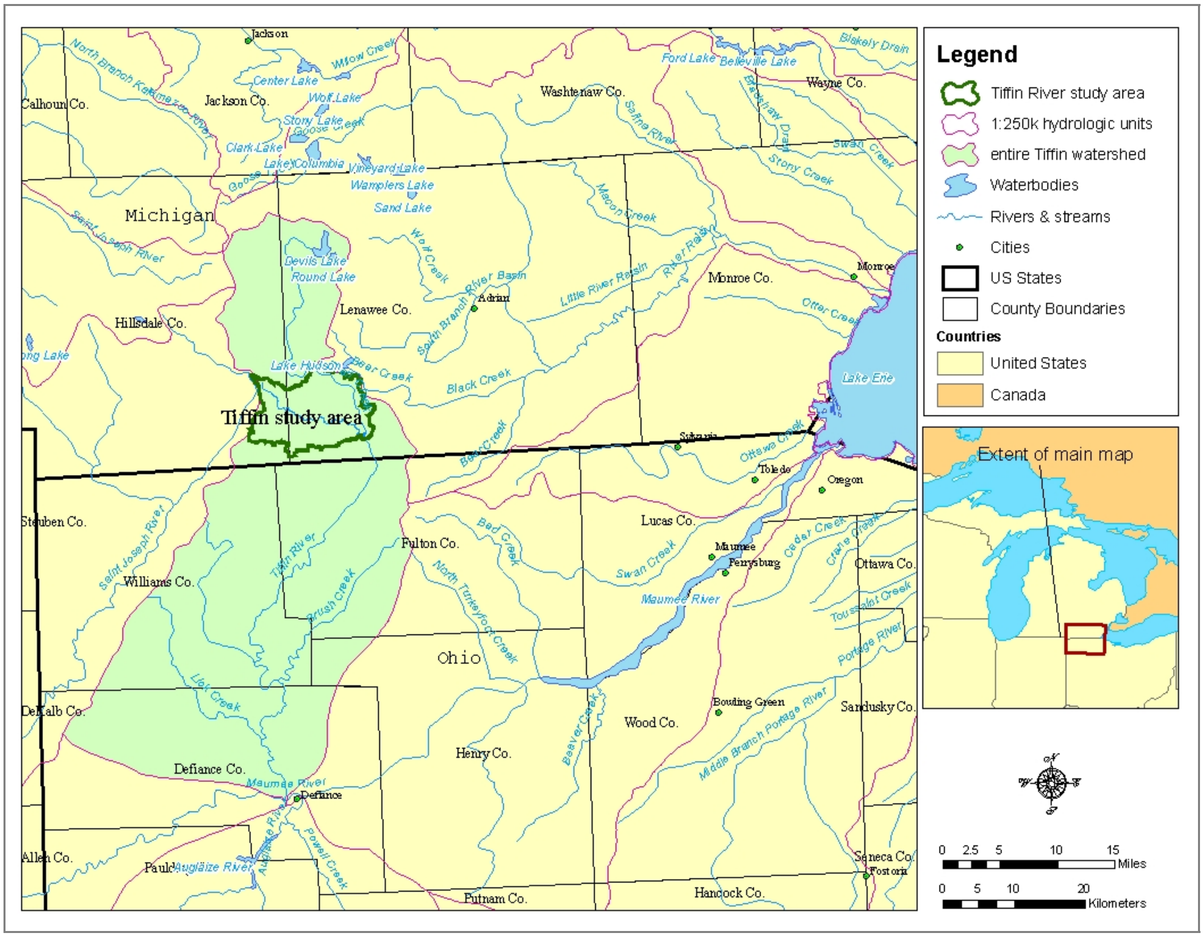


Figure 2-1: Location of the Upper Tiffin River Watershed study area relative to southeastern Michigan and the Great Lakes.

Lime Creek is over ¾ agricultural, while Bean Creek is approximately 1/3 farmland, 1/3 grassland / Conservation Reserve Program (CRP) land, and 1/3 other land cover such as forest and shrubland. Bean Creek as Total Maximum Daily Loads (TMDLs) published for pathogens, is listed as impaired under 303d rules for siltation, habitat alteration, low dissolved oxygen, and nutrients.

Because of these environmental issues, as well as being one of 24 CEAP study watersheds in the U.S., we designed a program to effectively study and characterize the water quality of the Upper Tiffin River CEAP study area. Starting in April of 2005 and ending in December of 2007, we collected monthly water quality data, along with representative storm events (and one night event) to understand the water quality issues in detail. From this, we designed methods to understand what water quality parameters were the most important to collect, where they should be collected, and where they should be collected. By using satellite imagery for multiple dates in the 2005 and 2006 growing seasons (roughly April – September), were able to map land cover for these time periods. We then applied statistical techniques to understand what relationships existed between water quality and land use / land cover in this study area. The paper that follows details this research investigation.

Section 3: Methods

One of the central goals of this project was to characterize the water quality within the Tiffin River Watershed. Specifically, we were interested in documenting the local spatial and temporal variability that exists within the Bean and Lime Creek sub-watersheds. This goal was accomplished through a water quality sampling scheme that included making water quality measurements to test our hypothesizes on the effects of outside forcing factors in the watershed.

The water quality sampling scheme included a series of measurements at 26 sites in the Upper Tiffin River, with sites along part of the Bean Creek and all along Lime Creek and its sub-watersheds. Sampling locations were selected in order to obtain spatially complete coverage of the fluvial systems within each sub watershed. Sites were located at road/creek intersections for ease of access at regular intervals along the major tributaries and near the point of confluences with the main stem for smaller tributaries.

Sampling was conducted April 2005 to December 2007 to establish a baseline dataset. A Horiba U-22XD multi-parameter water quality monitoring device, a product of Horiba, Ltd, was used to collect water quality data. Figure AA shows two examples of the Horiba U-22XD instrument in use in the study area. This 46mm diameter sensor probe simultaneously measured ten water quality parameters within 20 seconds and stored the collected data for later retrieval and analysis. The Horiba U-22XD probe measured the following parameters:

- pH
- Dissolved oxygen (DO)
- Conductivity
- Salinity
- Total dissolved solids (TDS)
- Seawater specific gravity
- Temperature
- Turbidity
- Depth
- Oxygen reduction potential (ORP)

Figure 3-1: Two examples of the Horiba U-22XD instrument being used by MTRI interns to collect water quality data in the Tiffin River study area. *The photo in the left shows the instrument about to collect data in a turbid segment of Bean Creek; the photo on the right shows the instrument being used to actively collect data along part of Lime Creek*

Several different types of sampling occurred during the study period. The twenty six sites were sampled monthly from April, 2005 though December, 2007 during typical monthly flow conditions. In addition to this baseline characterization, sites were also sampled after a significant precipitation event in July of 2005, May of 2006, and March, April, July and August of 2007. There was also an additional sampling event in June, 2005 during the night-time hours which occurred within 24 hours of the June, 2005 baseline data collection.

The supplementary Horiba sampling events were prompted by varying field observations and a desire to capture water quality variations as a result of specific, outside forcing factors. The night-time sampling was conducted after observing unusually high DO levels (indication of good water quality) at sites where in previous months we detected lower DO. A diel (day-night) sampling scheme was developed to either corroborate or disprove our hypothesis that the high DO levels we were observing during the daytime would fall to near-zero DO during the nighttime hours. We had suspected that the high DO levels were the result of excessive photosynthesis leading to oxygen (a product of photosynthesis) super saturation. In order to test our hypothesis, we needed to collect data in the absence of sunlight when photosynthesis stops and respiration continues (a process that consumes oxygen).

The storm event sampling was conducted in order to be able to quantify the effects of a large input of water on the sub watershed systems. The Bean and Lime Creek watersheds are both located in areas of high agricultural land use where erosion and nutrient inputs (both accelerated by precipitation) are water quality concerns. To determine specifically how a precipitation event affects our study systems and to what degree, we conducted a before and after sampling of the watersheds.

The Tiffin study area can be broken into three portions; Bean Creek, Lime Creek and Blanchard Drain (Fig. 3-2) (for many of our analyses, we included Blanchard as part of Lime). The Bean Creek subwatershed extends north past the designated Tiffin study area, so only the lower 7 miles of the creek, accounting for 10 sampling locations, were examined during the 32 month program. The entire Bean subwatershed is approximately 41.5% agricultural land, 17.5% forested and 26.9% Conservation Reserve Program (CRP) and other grassland, using MTRI's 2006 land cover classification of the study area as our base. Typically, Bean Creek has a wider riparian area than either Lime Creek or Blanchard Drain. Lime Creek has 72.7% agricultural land cover and 13.2% grassed CRP, while Blanchard Drain is 81.5% agriculture and 7.1% CRP. These two streams account for 12 and 4 sampling sites respectively. Photo example of all the sampling points shown in Figure 3-2 are included in Appendix E.

Five of the twenty-six sampling sites are for small sub-watersheds to the three main waterways that we studied, and were likely to show baseline statistics and trends different from other sites on the same stream. This is because they are located not on the main stem of the stream but on a side tributary that is likely under different influences, since it is contained in a 'mini-subwatershed' apart from the larger stream basin. Figure 3-3 shows the upstream areas of these outlying points, compared with their corresponding watershed. The sites are: 6, "Covell Drain at Harris"; 10, "Site C at Dillion"; 16, "Site A at Lime Creek Highway"; 17, "Site B at Lime Creek Highway"; and 25, "Mansfield Drain at Ranger".

Of the ten parameters collected during each sampling, seven were reviewed to determine both typical levels at each site over the three year period and the types of changes that take place after storm events. Those parameters are: pH, conductivity, turbidity, dissolved oxygen, temperature, total dissolved solids, and oxidation reduction potential. Salinity and the specific gravity of seawater where not included since the study area is a freshwater site, and depth was not analyzed as a water quality variable but could be used for other studies.

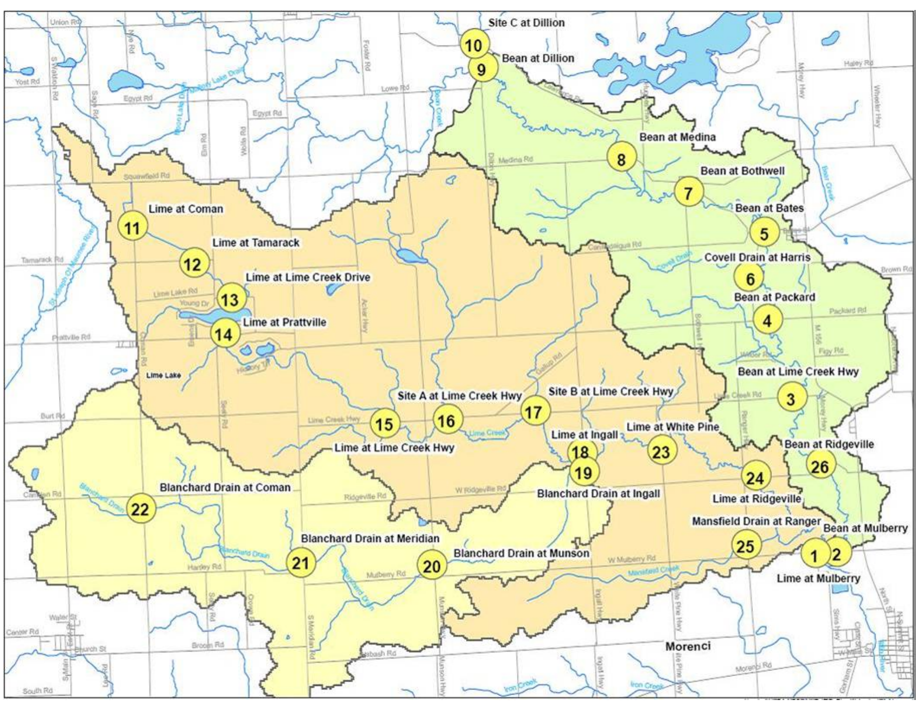


Figure 3-2: Tiffin study area. Green indicates Bean Creek, orange Lime Creek and yellow Blanchard Drain

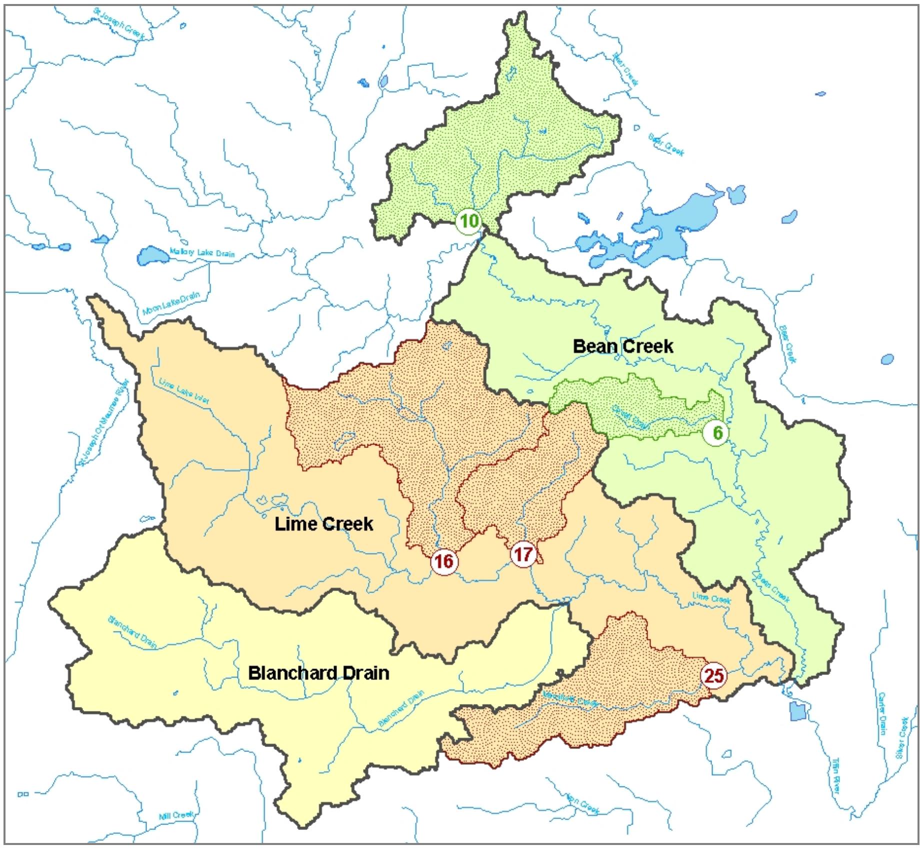


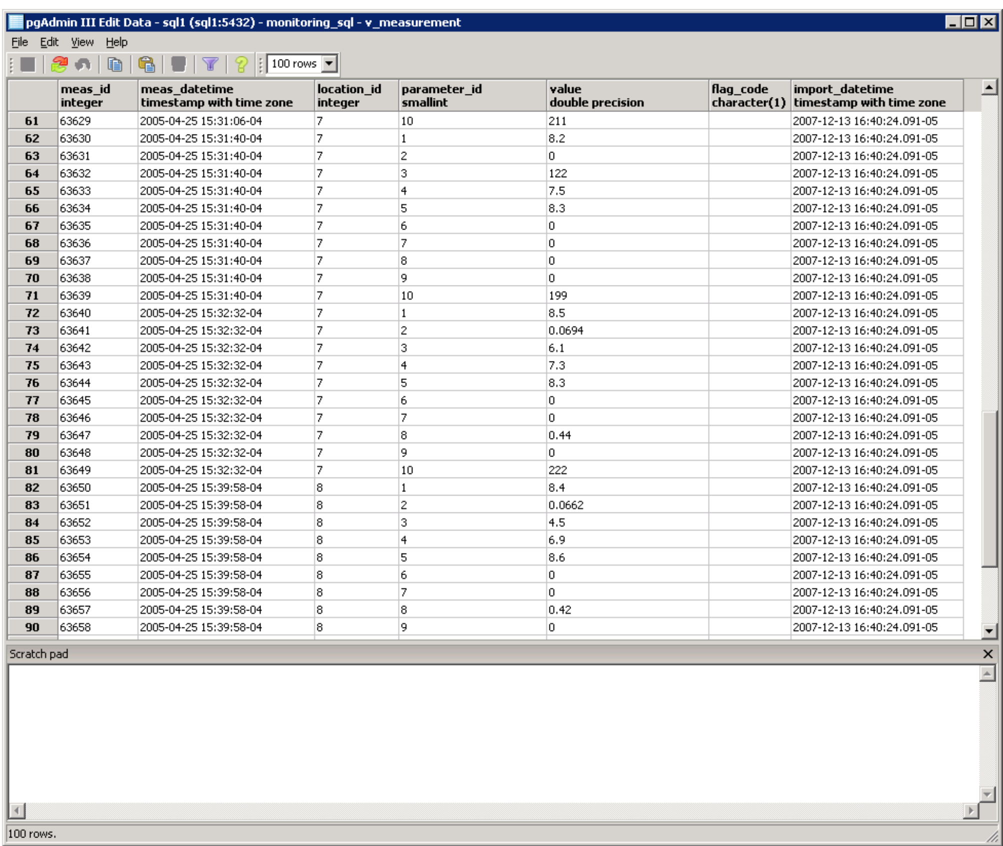
Figure 3-3: Drainage area represented by sampling points for sub-watersheds entering the Bean Creek, Lime Creek, and Blanchard Drain parts of the study areas. *Site 10 is Site C at Dillion (which drains 3,152 acres); Site 6 is Covell Drain at Harris (which drains 898 acres), Site 16 is Site A at Lime Creek Highway (which drains 3,723 acres), Site 16 is Site B at Lime Creek Highway (draining 1,503 acres), and Site 25 is Mansfield Drain (draining 2,268 acres).*

Section 4: Water Quality Characterization

Water Quality Database

Water quality measurements collected using the Horiba U-22XD were downloaded, formatted and prepared into a series of Structured Query Language (SQL) compatible records and added to a project database managed in PostgreSQL . The PostgreSQL database is an advanced, powerful, open source, object-relational database management system, which runs on all major operating systems. The database allows users to query the desired data and has many other sophisticated features that can be used for analysis. Figure 4-1 gives an example of the water quality measurements stored in the database. The data can be queried directly in the database or exported to be used in Microsoft Access or Excel for analytical and sharing purposes. It can then be linked to GIS software such as ESRI Desktop ArcGIS, using the PostGIS extension.

A Microsoft Access-based version, with documentation, is being delivered to the Michigan NRCS in June of 2008. This will include all the fields of the main database, including time and date, parameters values (turbidity, DO, temperature, etc.), and sampling location. These form 40,251 records collected over the 32-month period, providing a detailed overview of the water quality of the study area. A data model of the database is described in Appendix D to help the NRCS understand its tables, fields, and structure.



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62	63630	2005-04-25 15:31:40-04	7	1	8.2		2007-12-13 16:40:24.091-05
63	63631	2005-04-25 15:31:40-04	7	2	0		2007-12-13 16:40:24.091-05
64	63632	2005-04-25 15:31:40-04	7	3	122		2007-12-13 16:40:24.091-05
65	63633	2005-04-25 15:31:40-04	7	4	7.5		2007-12-13 16:40:24.091-05
66	63634	2005-04-25 15:31:40-04	7	5	8.3		2007-12-13 16:40:24.091-05
67	63635	2005-04-25 15:31:40-04	7	6	0		2007-12-13 16:40:24.091-05
68	63636	2005-04-25 15:31:40-04	7	7	0		2007-12-13 16:40:24.091-05
69	63637	2005-04-25 15:31:40-04	7	8	0		2007-12-13 16:40:24.091-05
70	63638	2005-04-25 15:31:40-04	7	9	0		2007-12-13 16:40:24.091-05
71	63639	2005-04-25 15:31:40-04	7	10	199		2007-12-13 16:40:24.091-05
72	63640	2005-04-25 15:32:32-04	7	1	8.5		2007-12-13 16:40:24.091-05
73	63641	2005-04-25 15:32:32-04	7	2	0.0694		2007-12-13 16:40:24.091-05
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75	63643	2005-04-25 15:32:32-04	7	4	7.3		2007-12-13 16:40:24.091-05
76	63644	2005-04-25 15:32:32-04	7	5	8.3		2007-12-13 16:40:24.091-05
77	63645	2005-04-25 15:32:32-04	7	6	0		2007-12-13 16:40:24.091-05
78	63646	2005-04-25 15:32:32-04	7	7	0		2007-12-13 16:40:24.091-05
79	63647	2005-04-25 15:32:32-04	7	8	0.44		2007-12-13 16:40:24.091-05
80	63648	2005-04-25 15:32:32-04	7	9	0		2007-12-13 16:40:24.091-05
81	63649	2005-04-25 15:32:32-04	7	10	222		2007-12-13 16:40:24.091-05
82	63650	2005-04-25 15:39:58-04	8	1	8.4		2007-12-13 16:40:24.091-05
83	63651	2005-04-25 15:39:58-04	8	2	0.0662		2007-12-13 16:40:24.091-05
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85	63653	2005-04-25 15:39:58-04	8	4	6.9		2007-12-13 16:40:24.091-05
86	63654	2005-04-25 15:39:58-04	8	5	8.6		2007-12-13 16:40:24.091-05
87	63655	2005-04-25 15:39:58-04	8	6	0		2007-12-13 16:40:24.091-05
88	63656	2005-04-25 15:39:58-04	8	7	0		2007-12-13 16:40:24.091-05
89	63657	2005-04-25 15:39:58-04	8	8	0.42		2007-12-13 16:40:24.091-05
90	63658	2005-04-25 15:39:58-04	8	9	0		2007-12-13 16:40:24.091-05

Figure 4-1: Example of a sample of records being displayed in the Tiffin Water Quality Database.

Characterization of the Tiffin River Study Area using the MTRI Water Quality Database

MTRI has characterized the nearly three years of water quality data that it collected at 26 locations in the Tiffin River Study Area from April 2005 to December 2007. The purpose of collecting these data where to help the NRCS understand how much data would need to be collected in order to effectively characterize the water quality of Tiffin-sized study areas. This would include how often data needed to be collected, at how many locations, what variables where key to effective monitoring, and if monitoring after weather events was important. This section of the report describes the three years of data, including highlighting important trends seen after six major storm events that were collected by MTRI researchers. A day-night collection analysis is also included. A later section, "Recommended Measurement Procedures", describes the analysis of how often, and where data should be collected based on our analysis

We reviewed the 32 months of water quality data, including removing obviously erroneous data prior to analysis. As a reference, Appendix A contains the entire Horiba water quality sampling record. This same dataset will be delivered in documented Microsoft Access format to the Michigan NRCS office in April of 2008. A representative demonstration of the data is also available at the Tiffin River Study Area ArcIMS Viewer, available on-line to the Michigan NRCS at http://maps.mtri.org/website/NRCS_UTM/.

Table 4-1 below shows an example of the data that was collected monthly at each site, in this case for the "Site C at Dillion" point, which is near the mouth of a small, 3,151 acre tributary that connects to the main stem of Bean Creek southeast of Hudson, MI. Typically, three readings were taken at each site for each individual parameter using the Horiba instrument, in order to reduce the impact of sampling variability and to get the most accurate data possible. In Table 4-1, empty locations show where erroneous data were removed before analysis, and the three records per site represent the three samples taken on that day at that particular location. Included in the figure are examples of six regular monthly collections, one storm event, and the night-time sample.

Table 4-1: Example of Horiba data format and points used after erroneous values were eliminated.

Site	Name	Date	pH	Cond (S/m)	Turb (NTU)	DO (mg/L)	Temp (°C)	TDS (g/L)	ORP (mV)	Event
10	Site C at Dillion	4/25/2005	8.2	0.0715	126	6.8	11.6	0.46	225	Monthly
10	Site C at Dillion	4/25/2005	8.2	0.0712	6.8	6.5	11.6	0.46	230	Monthly
10	Site C at Dillion	4/25/2005	8.2	0.0712	5.1	6.7	11.6	0.46	225	Monthly
10	Site C at Dillion	5/31/2005	8.12	0.0687	0	8.66	15.1	0.44	157	Monthly
10	Site C at Dillion	5/31/2005	8.11	0.0687	0	8.53	15.1	0.44	156	Monthly
10	Site C at Dillion	5/31/2005	8.11	0.0687	0.6	8.4	15.1	0.44	154	Monthly
10	Site C at Dillion	6/29/2005	8.31	0.0754	192	7.4	23.3	0.48	232	Monthly
10	Site C at Dillion	6/29/2005	8.31	0.0758		7.43	23.3	0.48	234	Monthly
10	Site C at Dillion	6/29/2005	8.32	0.0758	67.6	7.47	23.2	0.49	236	Monthly
10	Site C at Dillion	6/30/2005	8.15	0.0738	100	5.7	20.7	0.47	55	Night
10	Site C at Dillion	6/30/2005	8.13	0.0739	66.1	5.41	20.7	0.47	36	Night
10	Site C at Dillion	6/30/2005	8.1	0.0737		5.18	20.7	0.47	-38	Night
10	Site C at Dillion	7/1/2005	8.28	0.0728	56.1	6.44	20.5	0.47	247	Storm
10	Site C at Dillion	7/1/2005	8.27	0.0729	19.5	6.47	20.5	0.47	243	Storm
10	Site C at Dillion	7/1/2005	8.28	0.0729	60.8	6.46	20.5	0.47	245	Storm
10	Site C at Dillion	7/26/2005	7.93	0.0767	29.3	4.39	22.5	0.49	236	Monthly
10	Site C at Dillion	7/26/2005	7.92	0.0767	37.8	4.38	22.5	0.49	235	Monthly
10	Site C at Dillion	7/26/2005	7.75		89.4	4.41	22.5		242	Monthly
10	Site C at Dillion	8/19/2005	7.98	0.0946	4.2	7.07	20	0.61	205	Monthly
10	Site C at Dillion	8/19/2005	7.98	0.0935	4.2	7.14	20	0.6	206	Monthly
10	Site C at Dillion	8/19/2005	7.98	0.0949	3.9	6.95	20	0.61	204	Monthly
10	Site C at Dillion	9/26/2005	7.61	0.0809	10.3	7.04	17.5	0.52	234	Monthly
10	Site C at Dillion	9/26/2005	7.61	0.0814	38.2	7.06	17.5	0.52	236	Monthly
10	Site C at Dillion	9/26/2005	7.62	0.0802	97.2	7.07	17.5	0.51	240	Monthly

Overall Baseline Statistics

Our first task in characterizing the water quality database was to calculate the baseline statistics of the 26 sampling sites, based on the 24,790 records representing regular monthly collects (with storm & night event data, there are 30,180 in the database). For the seven main parameters applicable to freshwater systems, we calculated the average, standard deviation, minimum and maximum for all sampling events, excluding storms and the night reading, for each of the 26 sites. Table 4-2 shows the resulting statistics for the seven parameters, including Turbidity, Dissolved Oxygen, pH, Conductivity, Temperature, Oxidation Reduction Potential (ORP), and Total Dissolved Solids.

Turbidity

The maximum measured turbidity at all sites sampled exceeded the state standard of <25 NTU. The largest values were 910 NTU at Site 11 and 737 NTU at Site 18, both part of Lime Creek. The next highest value obtained was only 347 NTU, a difference of 563 and 390 NTU respectively. The lowest maximum values seen were in Bean Creek at Sites 9 (39 NTU) and 6 (35.7 NTU). There were eight sites whose average turbidity over the 32 months exceeded the state standard. These were 21 (32.8 NTU) and 20 (26.7 NTU), which are positioned on Blanchard Drain; 11 (61.8 NTU), 12 (26.2 NTU), 13 (31.3 NTU), 15 (27.1 NTU), 16 (42 NTU), and 17 (34.4 NTU), which are part of Lime Creek. Although Bean Creek had maximum values above state standards at every site, none of the overall averages exceeded the 25 NTU limit.

Dissolved Oxygen

The average dissolved oxygen was above the Michigan Department of Environmental Quality (MDEQ) minimum of 7 mg/L for the Great Lakes and connecting waters at all sites sampled. The lowest average, 7.14 mg/L, was seen in Lime Creek at Site 14 (Lime at Prattville) while the highest, 9.5 mg/L was at Site 11 (Lime at Coman).

pH

All sites sampled over the 32 month period had maximum pH values not greater than 9.0, the maximum value allowable by the Michigan Department of Environmental Quality. The highest recorded value was 8.91 and all averages were between a pH 7.0 and 8.0. The minimum allowable pH is 6.5 and all sites had minimum measurement values less than this (the lowest being 5.19 at Site 12).

Conductivity

The state standard for conductivity is a range between 0.01 and 0.13 S/m. None of the sites in our study fell outside this range.

Temperature

The maximum temperature of a body of water for aquatic health is considered to be 22º C. All the sites sampled in the Tiffin had maximum values that exceeded this limit. The highest values were at Sites 21 (30.4 º C), 20 (30.6º C), and 12 (30.5º C). These high water temperatures were observed in June of 2005.

Oxidation Reduction Potential

Oxidation reduction potential should range from 300 to 400 mV in natural waters for optimal water quality. All averages at the sites tested below 300 mV. The lowest average, 150 mV, occurred at Site 11 and the highest, 249 mV, occurred at Site 9. All sites had extremely low minimum values, with the lowest being -123 mV at Site 14. Maximum values ranged from 320 mV to 423 mV.

Total Dissolved Solids

Average total dissolved solids over the sampling period exceeded the MDEQ monthly average standard of 0.5 g/L in state waters at three sites. These were 6, "Covell Drain at Harris" (.59 g/L); 11, "Lime at Coman" (.63 g/L); and 12, "Lime at Tamarack" (.55 g/L).

Table 4-2: 32 Month* Baseline Statistics for All Sampling Sites

	Turbidity (NTU)				Dissolved Oxygen (mg/L)				pH				Conductivity (S/m)				Temperature (°C)				Oxidation Reduction Potential (mV)				Total Dissolved Solids (g/L)			
	MEAN	STDEV	MIN	MAX	MEAN	STDEV	MIN	MAX	GEO MEAN	STDEV	MIN	MAX	MEAN	STDEV	MIN	MAX	MEAN	STDEV	MIN	MAX	MEAN	STDEV	MIN	MAX	MEAN	STDEV	MIN	MAX
10 Site C at Dillion	20.2	34.7	0.0	193.0	8.08	2.11	3.55	12.83	7.56	1.12	5.70	8.42	0.067	0.018	0.042	0.117	11.4	7.6	0.6	23.3	236	99	0	371	0.43	0.11	0.27	0.70
9 Bean at Dillion	10.7	12.3	0.0	39.0	8.57	2.12	3.20	13.79	7.68	1.13	5.66	8.63	0.064	0.014	0.001	0.094	11.6	8.0	0.0	24.1	249	102	11	399	0.41	0.08	0.29	0.60
8 Bean at Medina	12.0	14.8	0.0	59.3	8.33	1.99	3.50	13.72	7.73	1.13	5.79	8.60	0.064	0.011	0.045	0.090	11.7	7.6	0.1	24.1	245	97	11	374	0.41	0.07	0.29	0.55
7 Bean at Bothwell	12.9	17.5	0.0	104.0	8.73	2.11	3.37	14.12	7.71	1.13	5.70	8.61	0.065	0.016	0.045	0.129	11.9	8.1	0.0	25.0	247	96	14	376	0.41	0.10	0.29	0.80
5 Bean at Bates	13.5	16.7	0.0	88.3	8.34	1.97	3.83	13.83	7.75	1.12	5.83	8.50	0.067	0.016	0.045	0.134	11.5	7.8	0.0	24.2	239	94	14	373	0.43	0.11	0.29	0.90
6 Covell Drain at Harris	9.1	10.6	0.0	35.7	8.47	2.06	4.37	14.50	7.62	1.12	5.68	8.44	0.092	0.035	0.047	0.245	11.6	7.1	0.2	24.2	244	97	18	369	0.59	0.22	0.30	1.60
4 Bean at Packard	13.7	16.6	0.0	69.0	8.34	2.02	3.62	14.03	7.72	1.13	5.49	8.60	0.066	0.016	0.046	0.137	11.5	7.8	0.0	24.2	248	95	17	383	0.43	0.11	0.30	0.90
3 Bean at Lime Creek Hwy	14.3	16.0	0.0	66.3	8.47	2.12	3.16	13.88	7.66	1.13	5.56	8.50	0.067	0.018	0.001	0.137	11.5	7.8	0.0	24.2	247	98	20	381	0.43	0.11	0.30	0.90
26 Bean at Ridgeville	17.8	23.8	0.0	127.0	8.51	2.07	3.37	13.57	7.59	1.13	5.46	8.50	0.067	0.017	0.046	0.137	11.5	7.8	0.0	24.2	246	101	22	389	0.43	0.11	0.30	0.90
2 Bean at Mulberry	19.1	20.5	0.0	78.0	8.44	2.33	3.26	13.88	7.37	1.13	5.28	8.38	0.067	0.018	0.001	0.133	11.5	7.9	0.0	24.2	220	100	9	423	0.43	0.11	0.30	0.90
22 Blanchard Drain at Coman	23.2	48.0	0.0	347.0	8.70	2.86	3.25	14.48	7.61	1.11	5.66	8.55	0.070	0.028	0.033	0.163	14.0	7.8	2.1	29.6	187	115	-175	357	0.45	0.18	0.21	1.00
21 Blanchard Drain at Meridian	32.8	38.0	0.0	180.0	9.12	2.36	3.81	14.46	7.44	1.14	5.33	8.39	0.068	0.023	0.000	0.145	14.4	8.6	1.0	30.4	215	88	-2	385	0.44	0.14	0.21	0.90
20 Blanchard Drain at Munson	26.7	25.1	0.0	142.0	9.01	2.58	3.40	14.84	7.54	1.13	5.27	8.44	0.070	0.019	0.035	0.122	14.8	9.1	1.3	30.6	217	88	3	364	0.45	0.12	0.23	0.80
19 Blanchard Drain at Ingall	20.0	27.4	0.0	126.0	8.71	2.17	3.74	14.06	7.67	1.12	5.67	8.55	0.067	0.021	0.001	0.143	13.6	7.8	0.7	26.5	191	107	-131	320	0.43	0.13	0.01	0.90
11 Lime at Coman	61.8	157.9	0.0	910.0	9.50	3.83	3.60	19.99	7.46	1.09	5.62	8.20	0.098	0.099	0.052	0.916	13.6	8.1	0.0	29.8	150	112	-25	381	0.63	0.63	0.33	5.80
12 Lime at Tamarack	26.2	25.2	0.0	93.8	9.26	3.67	3.46	19.99	7.43	1.14	5.19	8.54	0.085	0.027	0.052	0.189	13.1	8.4	0.8	30.5	183	91	21	364	0.55	0.18	0.33	1.20
13 Lime at Lime Creek Drive	31.3	28.2	0.0	107.0	8.81	2.28	3.94	13.52	7.63	1.13	5.32	8.50	0.077	0.026	0.005	0.161	13.5	8.6	0.0	28.7	194	91	11	352	0.49	0.16	0.03	1.00
14 Lime at Prattville	23.8	37.9	0.0	213.0	7.14	2.93	2.09	14.25	7.61	1.13	5.61	8.76	0.056	0.032	0.030	0.194	14.2	9.2	1.5	28.6	196	106	-123	366	0.36	0.20	0.19	1.20
15 Lime at Lime Creek Hwy	27.1	32.8	0.0	198.0	9.35	2.62	3.48	15.14	7.72	1.14	5.74	8.80	0.050	0.008	0.033	0.068	14.0	8.8	1.3	27.8	209	97	1	361	0.32	0.05	0.22	0.43
16 Site A at Lime Creek Hwy	42.0	71.8	0.0	333.0	8.14	2.94	2.19	15.78	7.32	1.15	5.70	8.91	0.059	0.019	0.000	0.109	13.8	8.6	1.6	24.7	156	105	0	342	0.39	0.11	0.23	0.70
17 Site B at Lime Creek Hwy	34.3	120.2	0.0	737.0	8.68	2.28	4.11	13.76	7.63	1.12	5.72	8.46	0.077	0.021	0.055	0.143	13.4	8.1	1.4	26.6	214	95	1	356	0.49	0.14	0.35	0.90
18 Lime at Ingall	17.2	26.5	0.0	148.0	8.12	1.85	4.05	13.24	7.63	1.12	5.73	8.59	0.063	0.012	0.039	0.090	12.0	7.7	0.1	24.4	227	85	-1	344	0.40	0.07	0.26	0.56
23 Lime at White Pine	15.2	15.9	0.0	55.4	8.55	1.94	4.43	13.70	7.70	1.13	5.64	8.50	0.063	0.011	0.038	0.094	13.0	7.7	0.1	25.2	221	89	0	340	0.41	0.07	0.25	0.60
24 Lime at Ridgeville	13.7	14.9	0.0	66.5	7.82	1.95	3.86	13.29	7.67	1.12	5.74	8.48	0.066	0.012	0.039	0.094	12.4	7.6	1.1	24.7	234	90	0	359	0.42	0.08	0.25	0.60
25 Mansfield Drain at Ranger	13.8	16.6	0.0	62.3	8.36	1.85	3.92	13.42	7.59	1.11	5.82	8.36	0.071	0.022	0.041	0.161	12.6	7.1	1.7	23.4	225	89	5	363	0.45	0.14	0.27	1.00
1 Lime at Mulberry	16.2	17.8	0.0	74.8	8.18	2.11	3.81	13.63	7.59	1.13	5.31	8.42	0.067	0.018	0.039	0.129	12.7	8.5	0.0	25.9	228	84	26	337	0.43	0.11	0.25	0.80

* Dissolved Oxygen for October through December of 2007 was not used to calculate statistics due to poor values resulting from a malfunctioning probe.

Weather and streamflow data

Figure 4-2 compares the daily discharge in cubic feet per second with pH, dissolved oxygen, and turbidity for the sites representing the mouths of each of the three main stream systems sampled (i.e,. the furthest downstream point of each sampled creek). These are Site 2, Bean Creek at Mulberry, Site 1, Lime at Mulberry, and Site 19, Blanchard Drain at Ingall.

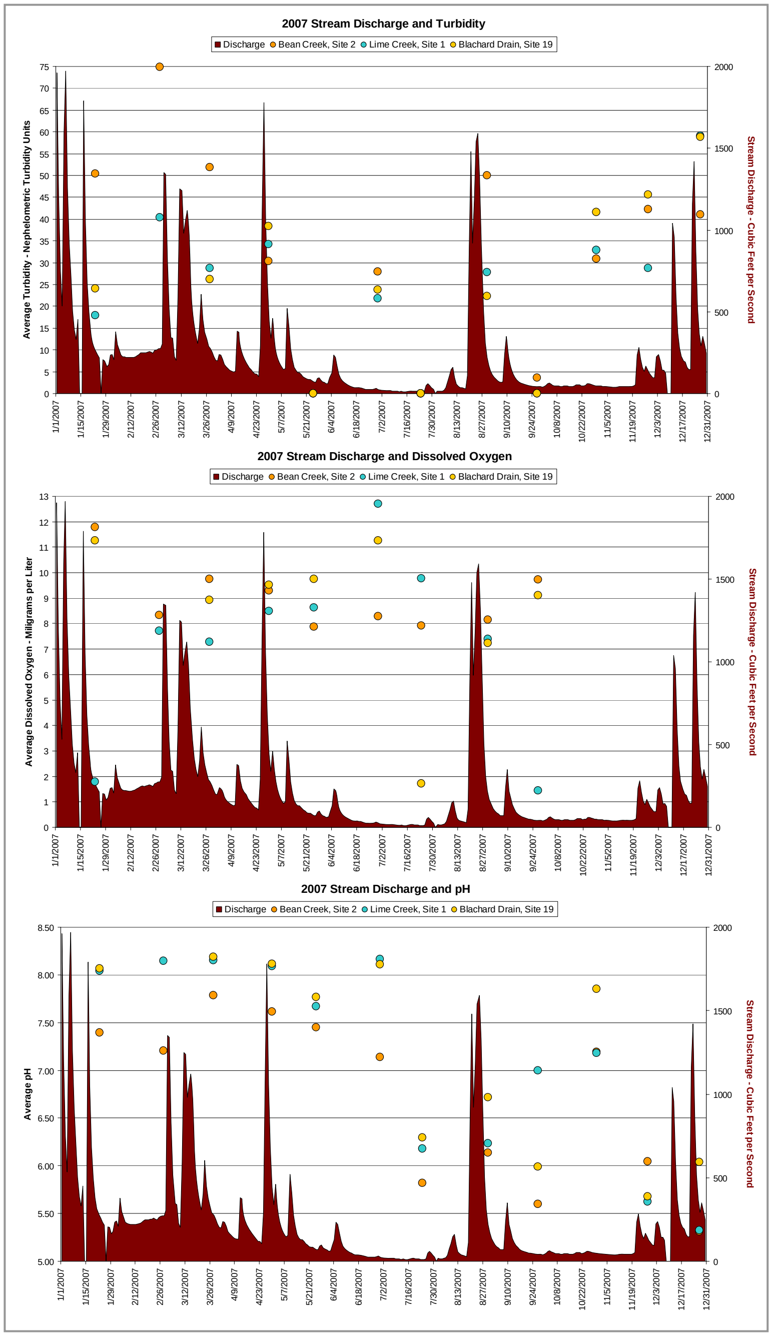


Figure 4-2: Daily discharge and average turbidity, dissolved oxygen and pH at points furthest downstream.

Monthly Trends Analysis

Each parameter was also analyzed statistically by month for each year. From this, it can be determined if there are seasonal variances in the data. Appendix A contains the tables detailing these statistical values, from which graphs were created using combined values for the three years by month (Appendix B). Of the seven parameters graphed, the monthly pH, turbidity and dissolved oxygen averages were perhaps the most interesting. In Bean Creek, the pH sees a dramatic drop in July and drops again in December. This decrease can also be easily seen in Lime Creek and Blanchard Drain (Figure 4-3).

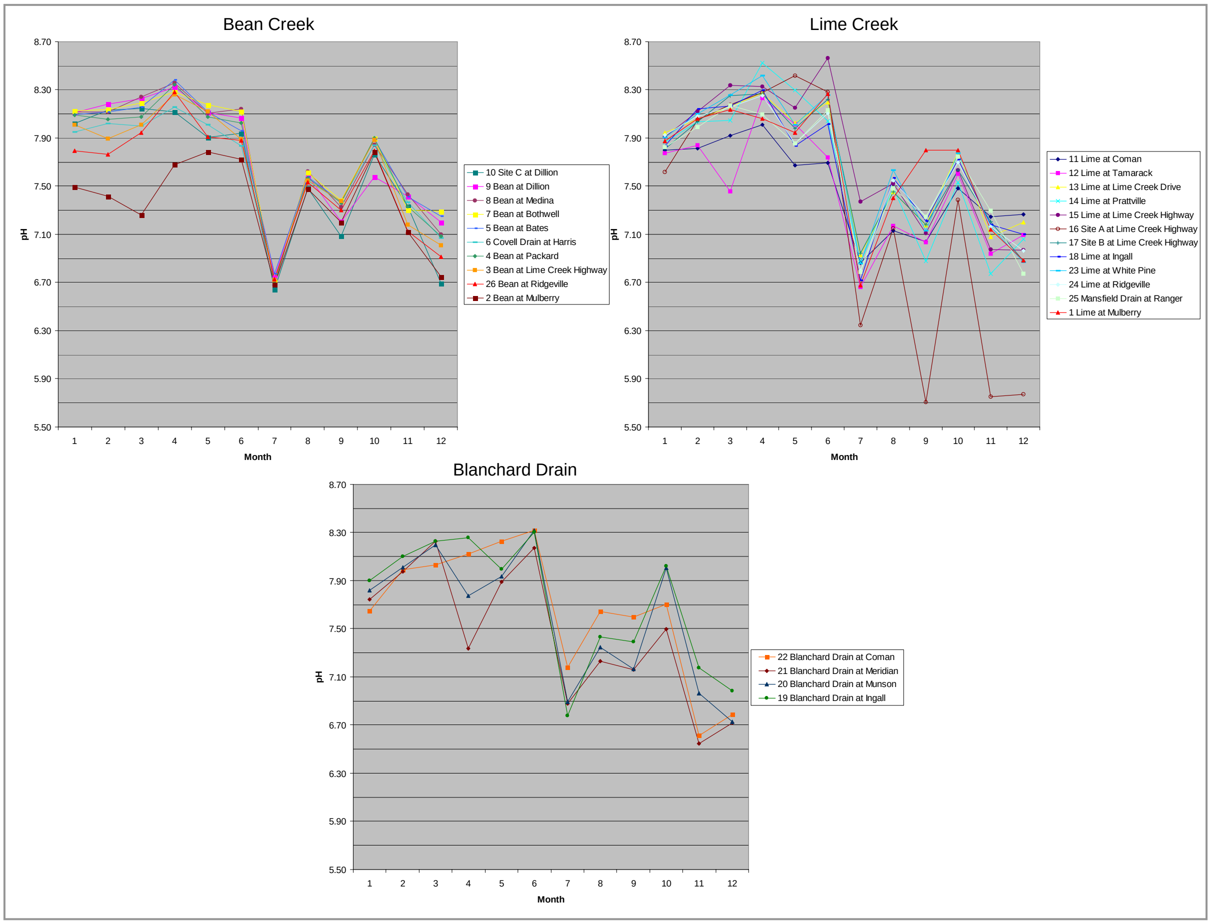


Figure 4-3: Average monthly pH trends for all sites on Bean Creek, Lime Creek and Blanchard Drain. *An obvious decrease in pH across all sites can be observed in the month of July.*

Bean Creek and Blanchard Drain also had similar trends in turbidity (Figure 4-4). Both showed increases in turbidity in June. In Bean Creek, the largest increase can be seen at Site 26. In Blanchard Drain, the increase is noted at three of the four sites. There are also significant increases observed in March for many sites on Bean Creek as well as in April for one site at both Bean and Blanchard.

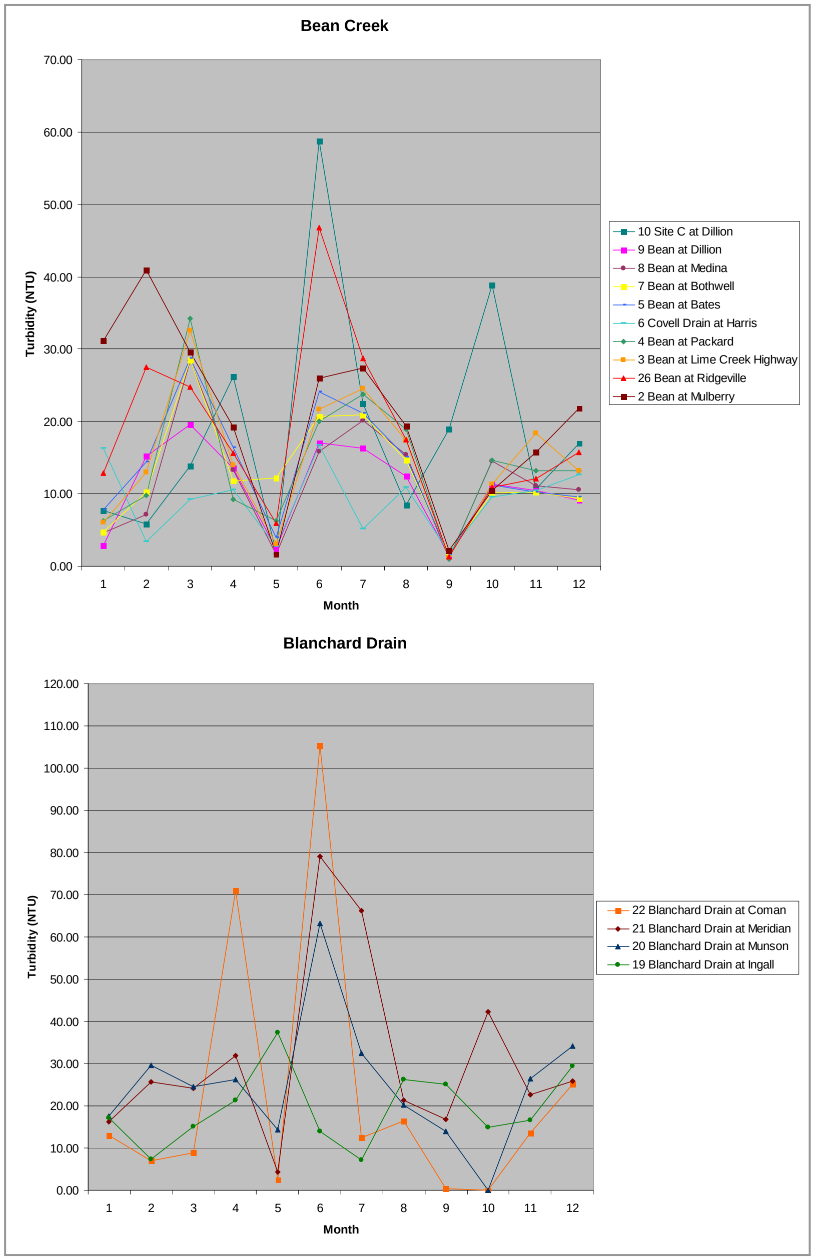


Figure 4-4: Average monthly turbidity trends for all sites on Bean Creek and Blanchard Drain. *Sharp increases can be noted in March, April, and especially June, for multiple sites on both stems.*

While Lime Creek also experienced increases in turbidity in April and June, the most dramatic changes can be seen in September and October for Site 11 and in July for Sites 16 and 17 (Figure 4-5). The values in these months are much greater than those at any other site on this creek. The next greatest average turbidity value after these four high data points is 87.16 (Site 14, in August). This is a difference of 62.38 to 216.24 NTU.

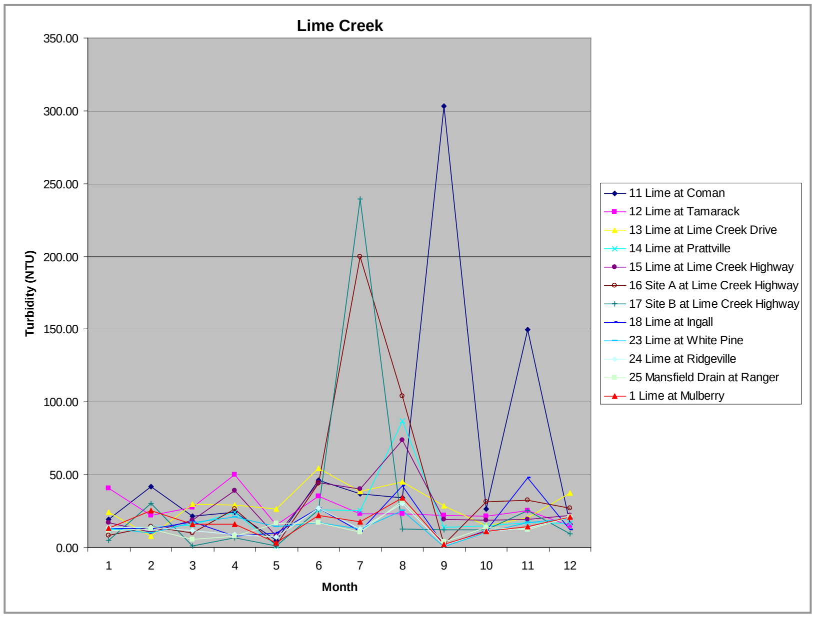


Figure 4-5: Average monthly turbidity trends for all sites on Lime Creek. *Three sampling sites, 11, 16 and 17, show extremely large turbidity values at various points when compared with the remaining sites on the stream.*

The three streams sampled showed varying trends in dissolved oxygen (Figure 4-6). In Bean Creek and Blanchard Drain, all sampling sites displayed a decrease in dissolved oxygen in April. A second decrease can be seen in Bean Creek in July, while the second round came to Blanchard Drain in August. Lime Creek is less consistent between sampling sites, but a decrease at most sites can be seen in April and July/August. Sites 11 and 12 show an increase in March, out of sync with the other sampling sites.

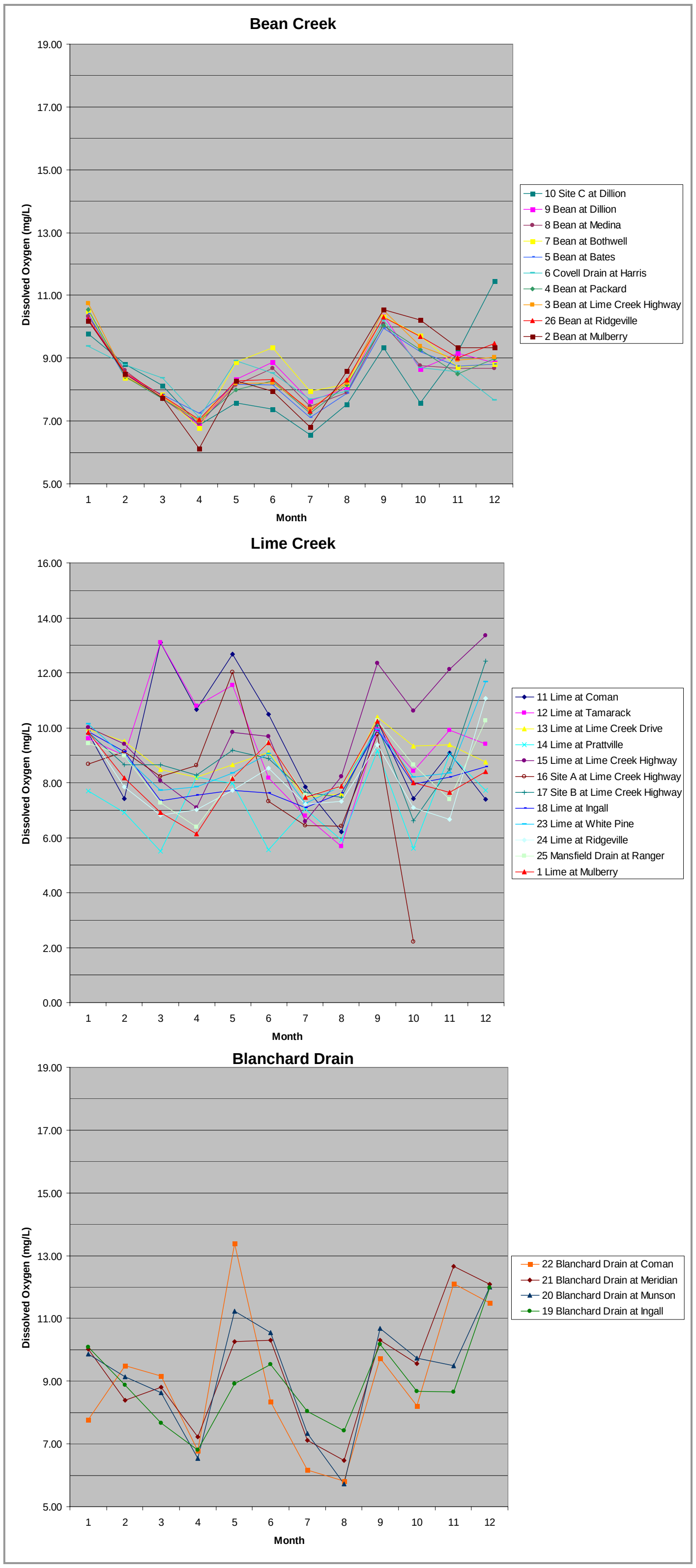


Figure 4-6: Average monthly dissolved oxygen trends for all sites on Bean Creek, Lime Creek and Blanchard Drain. Decreases in April and July/August can be seen across all streams.

Storm Analysis

To gain insight into the effects of increased water input during rain events, samples were taken during or immediately after periods of significant precipitation. Those dates were 7/1/2005, 5/15/2006, 3/2/2007, 4/27/2007, 7/27/2007, and 8/21/2007. To analyze change due to storms, the closest regular sample conducted prior to an event was used as our 'before storm' reading. A hydrograph for each year (Figure 4-7) shows where our storm collects fell in relation to rainfall and discharge rates.

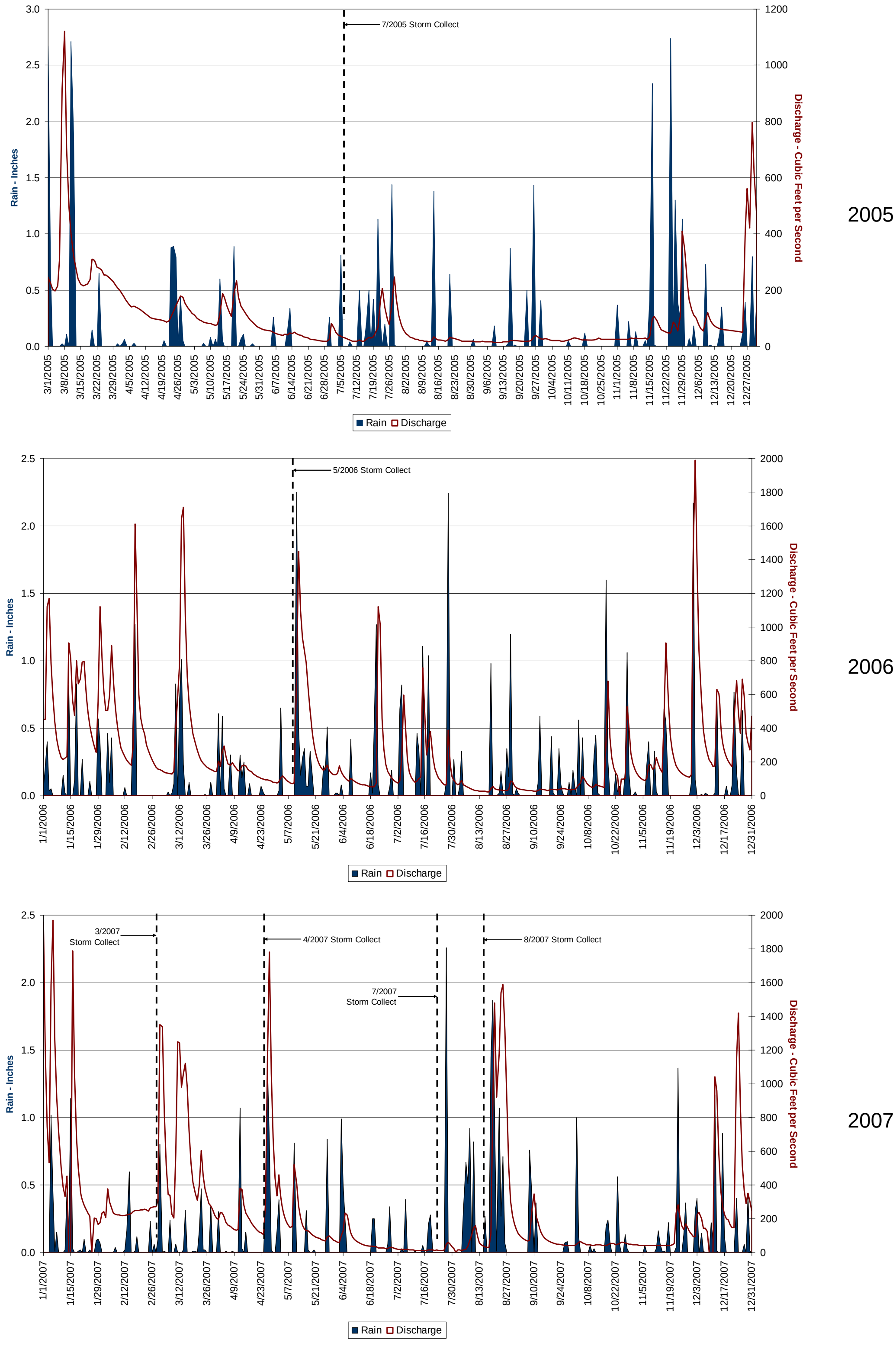


Figure 4-7: Daily rainfall and discharge for 2005-2007. *Dates streams were sampled after storms are marked with arrows.*

For each of the three portions of our sampling area, the parameter values for all before and after samplings were averaged and an the trend over the three years observed (Table 4-3). All parameters saw the same trend over the three study areas except temperature, whose average after storms increased only in Bean Creek. The dissolved oxygen reading taken during the 5/15/2006 storm event has been separated out of the overall average because it appeared to be anomalous when compared to the other readings. While all other storm events resulted in a decrease in dissolved oxygen, this event resulted in a very large increase.

Storms appear to affect a decrease in pH, conductivity, dissolved oxygen (typically), total dissolved solids and oxidation reduction potential. The increase during storms is observed in turbidity, which sees tremendous increases with increased runoff.

Table 4-3: Average before and after storm values by sub watershed. *Run indicates a downward trend after a storm, blue indicates upward.*

Overall Averages With Trends						
	Bean Creek		Lime Creek		Blanchard Drain	
Parameters	**Before**	**After**	**Before**	**After**	**Before**	**After**
pH	7.67	7.65	7.66	7.58	7.80	7.61
Conductivity	0.0621	0.0476	0.0771	0.0448	0.0705	0.0418
Turbidity	23.41	124.78	26.35	125.10	38.42	102.48
DO 2005/2007	8.87	8.09	8.27	7.64	8.85	7.65
DO 5/15/2006	3.45	10.55	4.08	8.56	3.70	9.48
Temperature	13.43	14.40	15.58	13.97	17.17	14.26
TDS	0.40	0.31	0.49	0.29	0.45	0.27
ORP	287.64	223.92	250.90	222.44	253.46	235.91

Appendix C contains data on parameter change seen after each individual storm. However, the most dramatic changes after storm events were seen in turbidity (Table 4-4). The average change after storms equaled an increase in turbidity of up to 176.75 times the levels taken before the storm event. For individual storms, almost all sites experienced greater turbidity after a rain event. Some exceptions are: Site 14, (Figure 4-8), Site 21, and Site 20, (Figure 4-9), on 7/1/2005.

Table 4-4: Turbidity values before and after each storm event.

	Bean Creek			Lime Creek			Blanchard Drain		
	Before Avg	*After Max/Min*	After Avg	*Before Avg*	*After Max/Min*	After Avg	*Before Avg*	*After Max/min*	After Avg
2005	15.06	462.00	184.03	20.99	378.00	168.93	47.43	0.00	31.64
2006	21.08	62.80	51.86	19.77	153.00	75.08	11.48	103.00	89.59
3/2007	30.31	178.00	129.91	34.36	277.00	137.98	44.95	340.00	166.38
4/2007	51.48	195.00	117.56	34.73	229.00	132.76	31.50	214.00	149.50
7/2007	0.91	556.00	160.49	23.35	311.00	155.56	70.19	169.00	77.70
8/2007	0.91	195.00	137.12	23.35	167.00	110.91	70.19	123.00	87.67

The decreased effect storms have on turbidity at Site 14 is likely due to its position in relation to Lime Lake. In all Lime Lake turbidity storm graphs for which there was sufficient data, turbidity increases as the points move downstream from Site 11 to Site 13. At Lime Lake, the area between Sites 13 and 14, there is a tremendous decrease in turbidity. The effect Lime Lake has as a settling pond means that at Site 14 storm turbidity values are generally near baseline values. Past Site 14, one can again see the cumulative effect of storm water flow on turbidity as the points move downstream.

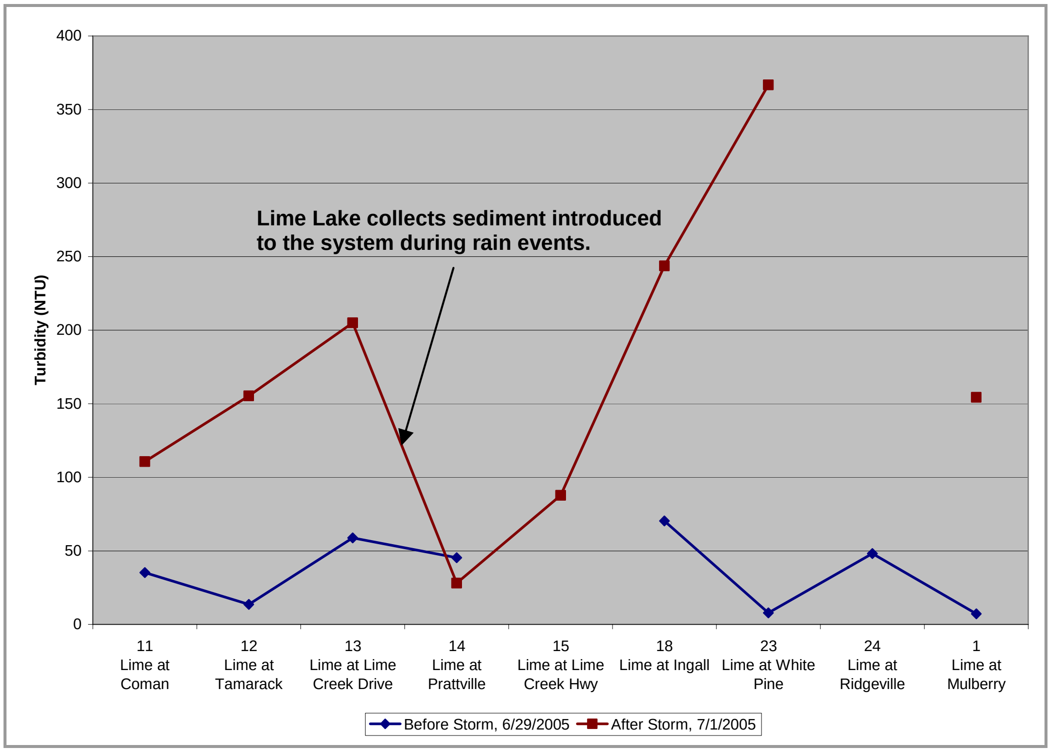


Figure 4-8: Lime Creek turbidity before and after 2005 Storm Event. *Readings at all but Site 14 coincide with the typical increase in turbidity observed after storm events.*

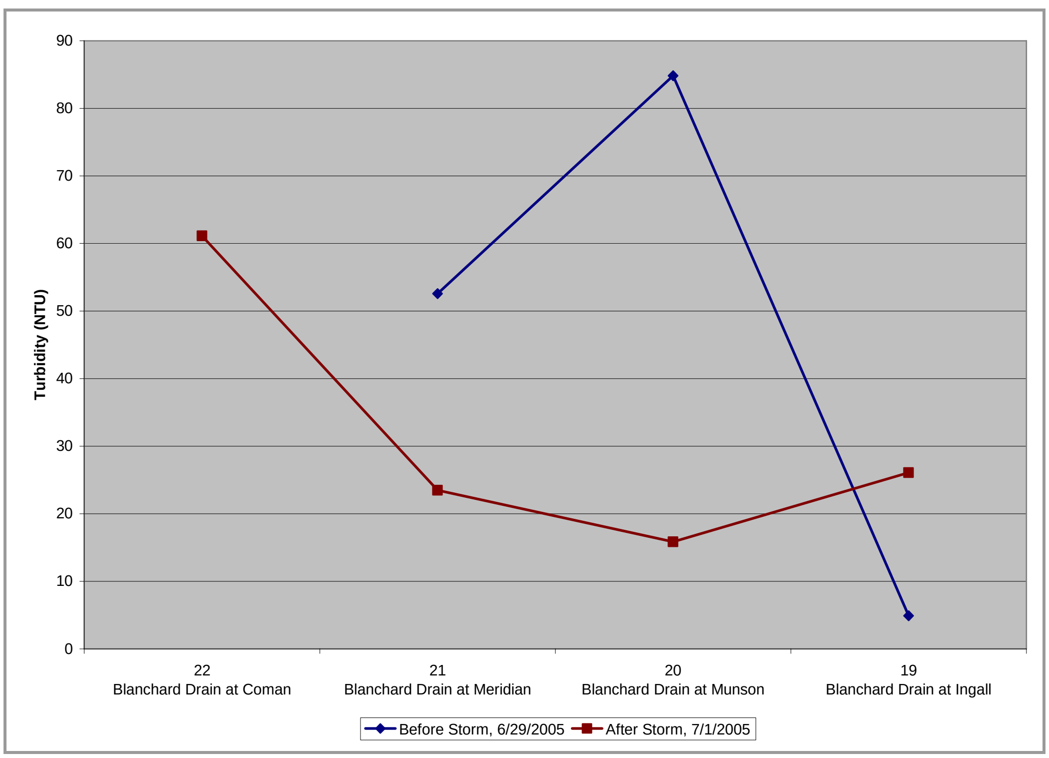


Figure 4-9: Blanchard Drain turbidity before and after 2005 Storm Event. *At sites 21 and 20, turbidity decreased after the storm. This is in contrast to typical observations in which turbidity greatly increased after an event*

Recommendation of Most Critical Water Quality Parameters to Measure

Michigan NRCS staff expressed a strong interest in knowing which of the water quality parameters were the most important to collect, based on our analysis. A more limited set of water quality parameters would be more cost-efficient to collect. The Horiba U-22 instrument we used cost $12,000 in 2005 and recorded 10 parameters. We performed a Principal Components Analysis (PCA) to discover which parameters explained the greatest variation in the data collected from 2005 to 2007. This analysis was designed to identify which parameters we would recommend to effectively capture how the water quality of largely agricultural watersheds changes seasonally.

Based on the PCA methods, turbidity, conductivity, and Dissolved Oxygen are the most important parameters to measure to characterize, particularly for storm-related water quality. In Table 4-5 below, this is shown by the first and second Principal Component (PC) parameters highlighted in bold (Turbidity = 0.535 for the first PC; Conductivity = 0.633 and DO = -0.560 for the second PC). These explain the largest amount of variance in the measured water quality data. Beyond the second PC, very little variance is explained, so we did not consider those. As can be seen from the PC values, all parameters are responsive to storm events, but those three should be targeted as the priority. Additionally, they are simpler to measure with less expensive optical instruments, while pH and ORP require instruments that are typically more expensive and challenging to calibrate effectively.

Table 4-5: Statistics showing the most important water quality parameters to measure to characterize the changes in water quality due to storm events in the Upper Tiffin River study area, based on Principle Components Analysis

	1st PC	2nd PC	3rd PC	4th PC	5th PC		Variance Score	Variance Weight
pH	0.492	-0.426	0.040	0.300	0.696	**1st PC**	**3.017**	0.603
Conductivity	-0.350	**0.633**	0.277	0.480	0.412	**2nd PC**	**1.392**	0.278
Turbidity	**0.535**	0.208	-0.125	0.627	-0.513	**3rd PC**	0.410	0.082
DO	-0.365	**-0.560**	0.573	0.382	-0.281	**4th PC**	0.182	0.036
ORP	0.465	0.248	0.760	-0.376	-0.059	**5th PC**	0.000	0.000

We applied the same PCA statistical methods to looking at the year-round non-storm data, as well as investigating the importance of the water quality parameters for each of the 26 sites individually. For the year-round analysis, ph, conductivity, and DO were the most important to measure. Turbidity was not as significant as variation was lower on a month-to-month basis as compared to before and after storm events. For the site-by-site analysis, DO, conductivity, and then turbidity were the most important to measure based on their contribution to the first three Principal Components.

Section 5: Recommended Measurement Procedure

Our Tiffin River Watershed analysis provided significant insight into developing and executing a water quality measurement procedure. Specifically, we found that careful design of a sampling scheme is essential to the overall success of the program, and most importantly, time must be spent upfront outlining goals and objectives of the project. Once the purpose of measurement is determined we found that sampling site selection, frequency of sampling, and water quality parameters to measure are more straightforward and easy to determine. The following paragraphs provide insight, based upon our Tiffin analysis, into developing a measurement procedure.

Sampling sites selection should begin in the office with a detailed map of the watershed. This map must include the road network in addition to all aquatic resources (rivers, lakes, streams, drains, etc.) within the watershed. At this point it is important to identify the main stem of the river system as this will be the focus of measurement. The main stem is the portion of the river system that is continuous throughout the entire watershed and that receives smaller river sections as contributing tributaries. For this reason, the main stem starts with a small volume of water at the top of the watershed but ends with the largest volume at the bottom of the watershed.

Sites should be selected where river and road segments intersect. This will reduce sampling time by allowing the sampling teams to collect data from bridge and culvert crossings. A sampling team should consist of at least two team members for safety and efficient data collection.

For our Tiffin sampling it made sense to have sampling teams of two. One person was responsible for driving and taking field notes. The other person was responsible for operating the water quality probe. For field notes, we developed a data collection form for the field teams to complete. We found that the form standardized the type of data recorded in the field and organized the field data collection so no sites were inadvertently skipped.

For our Tiffin River Watershed study we had a total of 26 sampling sites. This high density of sites was selected to over-sample our area of interest to then mathematically deduce the minimum number of sites necessary to obtain the desired information. From our calculations, we determined that sites should be selected at a maximum of three-mile intervals, but may occur closer to one another if large contributing tributaries or lake systems are present.

The number of sites in a sampling scheme will depend on the size of the watershed and the goals and objectives of the study. In developing a list of sites, the first site should be the furthest downstream river/road intersection. From this point move approximately three miles upstream on the main steam and look for another river/road intersection to serve as the second site. This procedure should be continued until you reach the top of the watershed. Depending on measurement and analysis goals, this list of potential sites may be sufficient. If a more in-depth analysis is needed, you will want to consider contributing tributaries and/or lake systems within the watershed. For both contributing tributaries and lakes, a site located both above and below the point where the feature enters the main stems may be necessary. If this tactic is employed, the next regular site should be a half mile upstream from the above feature site. If a contributing tributary is large it may make sense to include several sampling sites in the sub-watershed.

After a list of the proposed sampling sites is developed, a visual survey of the sites should be conducted during low flow conditions (typically mid to late summer). The purpose of this survey is to determine if water is present and flowing in the river channel year-round. Based upon this survey, the list of proposed sites should be divided into two categories: year-round flow and intermittent flow.

When to conduct measurements and what to measure depends on the hydrology of the site. From our Tiffin analysis, we found that many of our sites had intermittent flow. This included periods of time when no water was in the channel or when water was present but only occurred in stagnant pools. For sites with year-round flow, measurements should be taken during lowest flow conditions, highest flow conditions, and before and after storm events. For sites with intermittent flow, measurements should be taken before and after storm events. Measurements taken during the highest and lowest flow serve to capture baseline characterization data during periods of extreme conditions. Measurements taken before and after storm events also capture a period of extreme conditions, but this type of data provides information on land use and land use practices within the watershed rather than baseline characterization.

Determination of highest and lowest flow conditions are best accomplished using a hydrograph. A hydrograph graphically displays discharge of a river as a function of time. The USGS provides discharge data and hydrographs for their gauge stations, which are located all over the United States. If a USGS gauge station is located in or near the watershed of interest, this should be used as a reliable data source. Additionally, USGS gauge stations typically have multiple years of record, which is useful for determining the average timeframe of high and low flow periods.

For the Tiffin River Watershed project we were able to utilize USGS gauge data from a station located on the Bean Creek just south of the Michigan/Ohio border. The station was not physically located within our watershed boundary, but its downstream location provided valuable data for our study. For example, discharge data is provided real-time on the USGS site, and using the information from the Bean Creek station, we were able to accurately determine the river stage after a significant precipitation event and then conduct our after storm sampling at or near peak discharge.

Section 6: The Connection between Water Quality and Land Use

Background to water quality and land use

Previous studies have indicated patterns and relationships between water quality and land use. Representative examples in the literature include Osborne and Wiley (1988), Lowrance et al. (1997), Johnes et al. (1997), Sheridan et al. (1999), Tong and Chen (2002), and Buck et al. (2004). Our hypothesis was there would be a measurable effect of the Tiffin River study's land use and land cover on water quality data, using our 2005 to 2007 data collection. We were particularly interested to see if there would be a relationship between the amounts of different agriculture and the post-storm water quality measured during the six storm events. For example, would having more corn silage in a watershed result in higher turbidity after a storm than a watershed that was mostly in corn grain? Would having a relatively high prevalence of soybeans or alfalfa be related to having a relatively low pH or dissolved oxygen level? Does having agriculture relatively near streams appear related to water quality issues? Would having more CRP land or grassland be associated with better quality? Or would water quality be primarily related to other variables, such upstream soil types and stream geomorphology. If these relationships could be discerned from our data, then the NRCS could consider recommendations for program management in agricultural watersheds such as the Tiffin that are known to have sediment and other environmental concerns.

Our input land cover data was the 2005 and 2006 agriculture-focused land cover that MTRI created for NRCS using multiple dates of growing-season satellite imagery and object-based image classifications techniques (see Brooks 2006 and our 2008-dated NRCS Land Cover report for more information). These land cover layers had agricultural land cover mapping accuracy of 83.5% for the 2005 layer and 90.4% for the 2006 layer. Due to the availability of a late-season (September) Landsat image in 2005, we are able to successfully differentiate corn grain (harvested later) from corn silage (harvested earlier). We used this ability to investigate differing impacts of corn grain, where a high level of crop residue is left in fields, from corn silage, which has almost all residue removed during harvest.

Methods for Analyzing Water Quality and Land Use

We used several geospatial analysis techniques to understand the relationships between land use and water quality in the Upper Tiffin River watershed. For watershed-level statistics, we used USGS 30-m Digital Elevation Model (DEM) data and the tested and documented ArcHydro extension to ESRI ArcGIS to calculate the watershed area upstream of each of the 26 sampling locations (see this site for more information on ArcHydro:
http://support.esri.com/index.cfm?fa=downloads.dataModels.filteredGateway&dmid=15).
Figure 6-1 shows an example of one of the watersheds we calculated with ArcHydro, for the "Site A at Lime Creek Highway" location, which is a small (3,723 acre) tributary to Lime Creek.

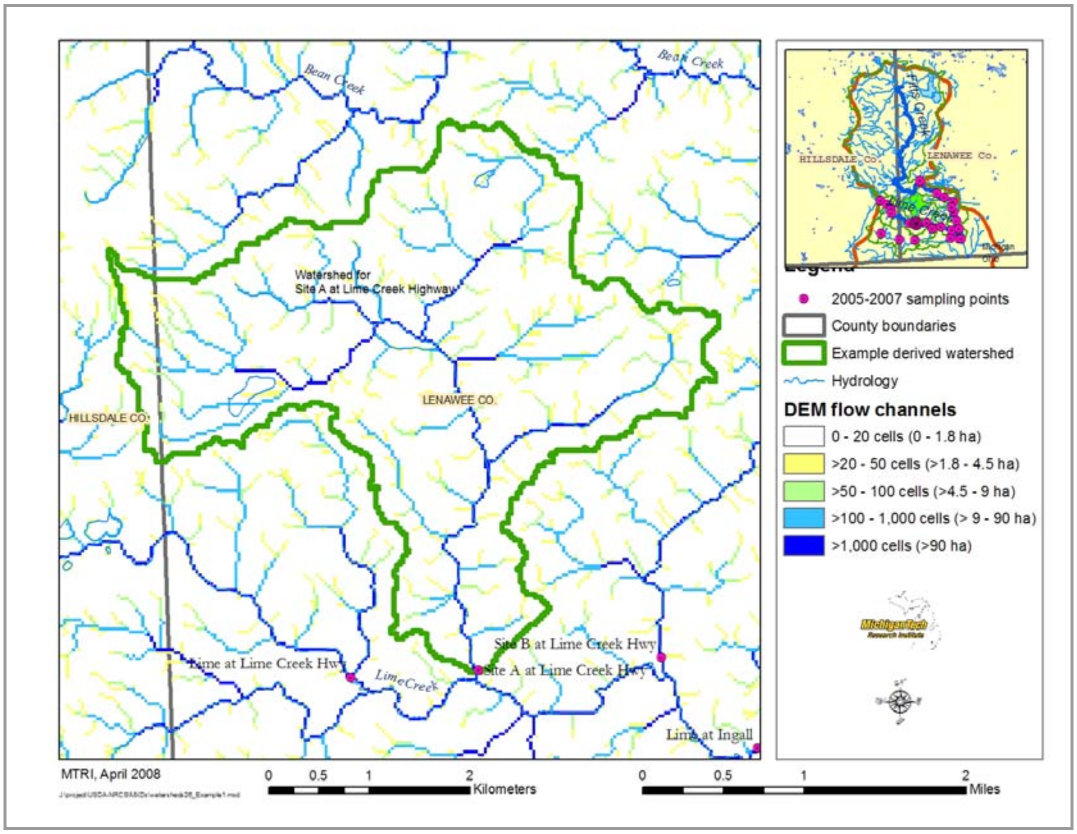
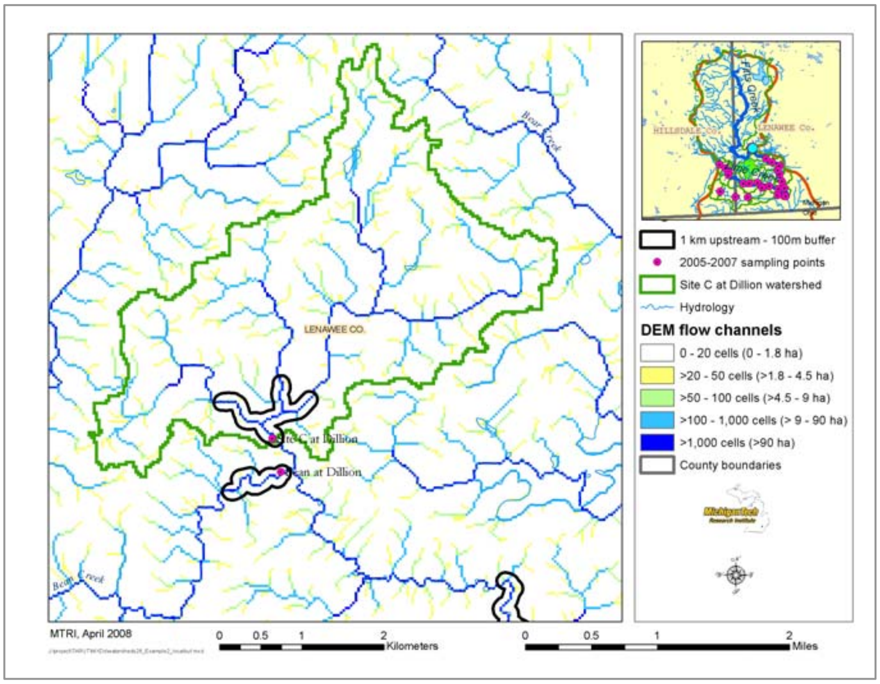
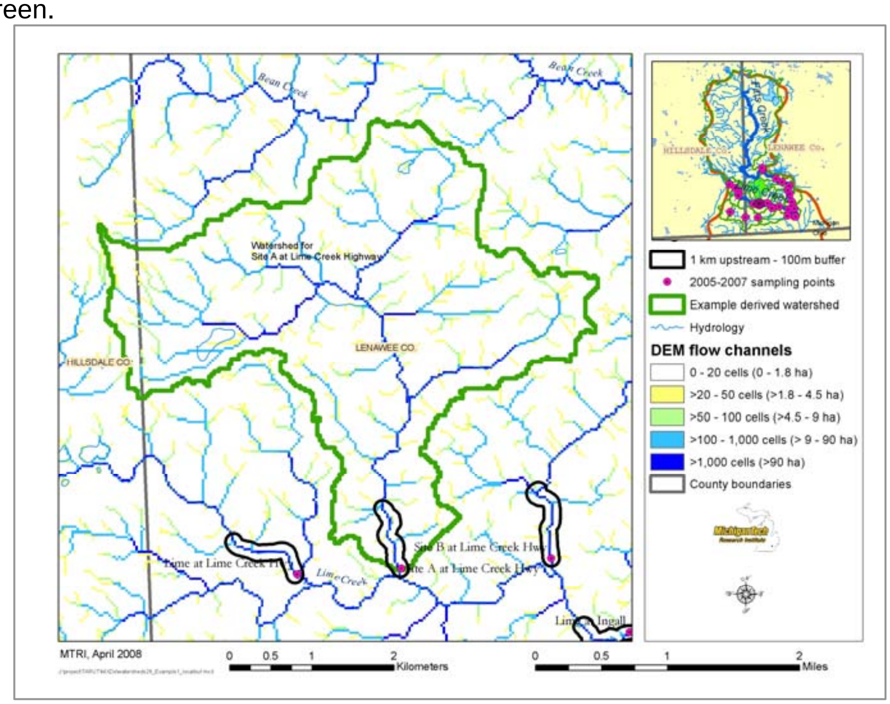


Figure 6-1: Example of watershed derived for one of the 26 sampling locations, using the ESRI ArcHydro extension and USGS 30-m DEM data. *The colored flow channels show water flow locations (streams and ditches) calculated with the DEM, which show more detail than standard GIS streams layers and enables more accurate delineation of watershed boundaries.*

For calculating the impacts of land-use for near-stream areas, we selected the parts of the streams that were 1 kilometer upstream of each of the 26 sampling locations. We selected the 1-km distance because in previous research, one of the researchers (C.Brooks) had found this to be a reasonable distance characterizing the "near upstream" areas of rivers and creeks (see Opperman et al. 2005). We used a routine for ArcView 3.x in the "RouteSurvey" extension called "Buffer upstream a distance" that enabled us to select the 1-km distance, and then buffer out on each side by 100-meters. In our previous work for NRCS, we had determined that 100-m on each side of a stream effectively captured the riparian of streams in the Upper Tiffin River area. One key aspect of the RouteSurvey extension is that it captures the "true" upstream distance of all the upstream hydrology network – if a side tributary is reached after a certain distance (say 700 m), then in addition to selecting the next 300 m of the main stem, it will also select the needed distance of the side tributary (also 300 m). Figures 6-2a and 6-2b shows how this translates into actual areas for the "local upstream buffer" of Site A and Lime Creek Highway and Site C at Dillion. Site C at Dillion has two small tributaries that come into its main stream before the creek empties into the main stem of Bean Creek.



6-2a: Site C at Dillion upstream buffer example, with entire watershed analysis area for this site outlined in green.



6-2b: Site A at Lime Creek Highway upstream buffer example, with entire watershed analysis are for this site outlined in green.

Figure 6-2a and 6-2b: An example of the areas selected for the "local upstream buffer" at Site A at Lime Creek Highway (Figure 6-2a) and Site C at Dillion (Figure 6-2b), with 1km of stream reach upstream of the point selected and then buffered by 100m on each side.

With watersheds and 1-km upstream buffer areas available for each of the 26 study sites, we were able to extract the 2005 and 2006 land cover profiles for both of these areas for all study sites. Figure 6-3 shows an example of the 2005 land cover profile for the main study area; 2006 land cover was similar except for having only a single type of "corn" land cover class because of the lack of a cloud-free late growing season Landsat scene.

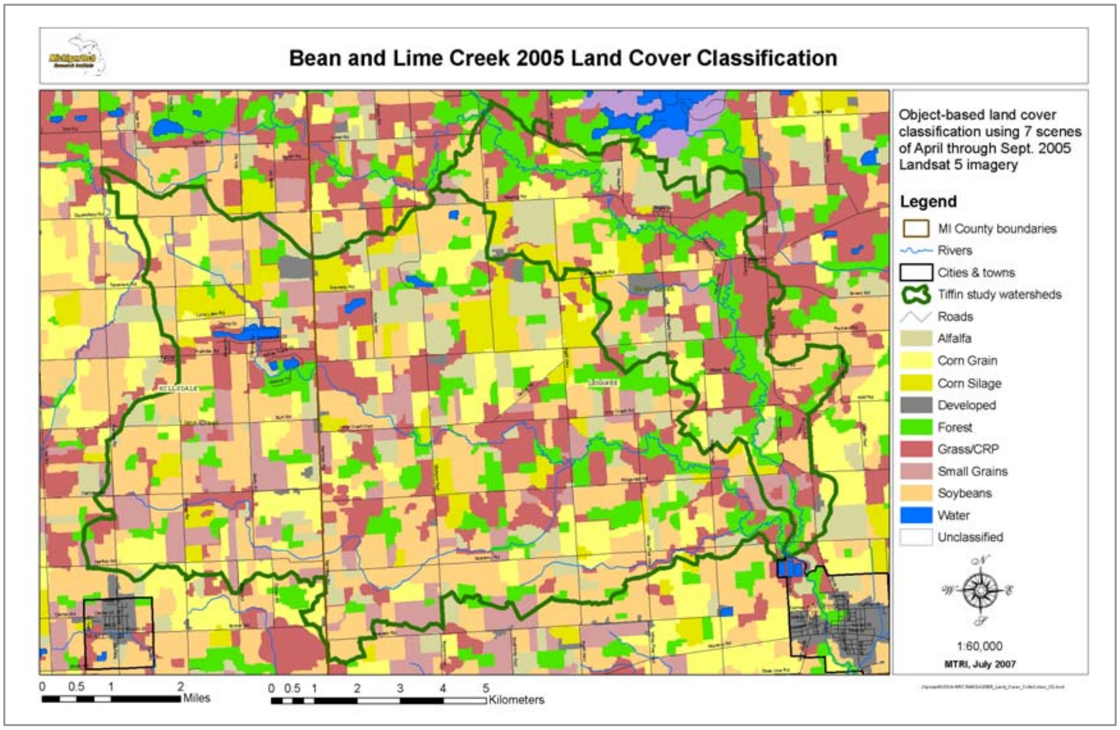


Figure 6-3: 2005 land cover for the Upper Tiffin River study area. *We calculated land cover for the entire Bean Creek area upstream of the study area so we could capture the land cover profiles for the entire watersheds of Bean Creek sampling points. We also calculated equivalent 2006 land cover, also using multiple growing season Landsat scenes to capture crop phenology.*

Figure 6-4 shows the result of intersecting the watersheds we calculated for each of the 26 sampling sites with the 2005 land cover. To intersect the watersheds and 1-km upstream buffers for the 26 sampling points, we used the "Tabulate Areas" functionality of ArcGIS and processed the results into percentages of land cover types using Microsoft Excel. Using this method, each sampling site watershed and 1-km upstream buffer had a land cover profile for it. For example, in 2005, the 288.9-ha (713-.9 acre) Lime at Coman watershed was 53.7% soybeans, 25.3% corn grain, 12.1% small grains (wheat or oats), 8.3% grassland / Conservation Reserve Program (CRP) land, 0.5% alfalfa, 0.1% forested, with no corn silage or detectable water bodies, and 91.6% active agricultural land during that growing season. The same type of profile data was calculated for the 1-km upstream buffer areas so we could investigate if the local buffer or watershed scale was having a stronger impact on water quality.

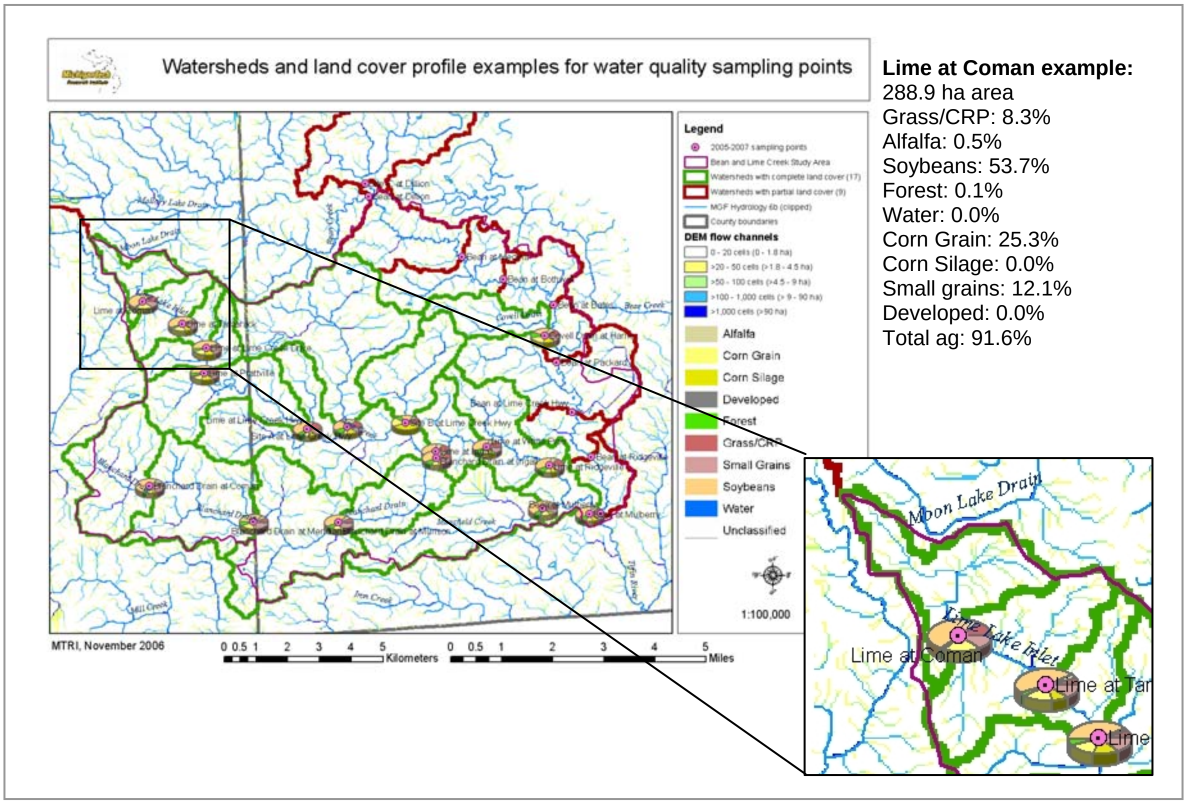


Figure 6-4: Example land cover profiles for the 2005 Lime Creek-area sampling point watersheds.

In investigating the relationship between land use and water quality for our study area, we focused on turbidity, as it consistently had the strongest response based on storm event analysis. However, we investigated all seven of the Horiba freshwater parameters to look for significant land use / land cover and water quality trends.

As an exploratory measure, we also intersected the high-resolution SSURGO soils data with the watersheds and upstream buffer areas to investigate soil and water quality relationships. Additional potential significant impacts on water quality variables we investigated included upstream slope (stream gradient, for a 1-km upstream reach) and degree of sinuosity. We used the elevation values at the sampling point and at the 1-km upstream distance to calculate gradient, and extracted the values by using the Identify tool in ArcMap 9.2. To calculate sinuosity, we used the ratio between the length of stream in the 1-km upstream distance and the the straight-line distance between the beginning and ends of the 1-km distance, a typical method for extracting this variable.

To extract the relationships between all these variables and water quality, we constructed multiple linear regression models that related the land cover profile (watershed and upstream buffer) to each of the seven freshwater Horiba water quality parameters. Using MATLAB software, we were able to calculate the r^2 value between the land cover profile and the individual water quality parameter. A higher r^2 value would indicate that the water quality parameter could be reliably predicted based on land cover. In other words, high r^2 values would mean that land cover was having a significant impact on that parameter. We researched the difference between the generally smaller Lime Creek watersheds and the larger Bean Creek watersheds (which extended upstream beyond the study area) by constructing separate linear regression models for each set of watersheds, and comparing them to treating the watersheds together.

With these regression equations available, we are able to research further the land use / land cover and water quality connections in the study area. We calculated what the impact would be of replacing all corn grain with corn silage and estimated using recalculated regression equations how turbidity and other parameters would change. We also investigated the relative contribution of land cover parameters to changes in water quality parameters. This last method would enable us to understand which land cover type was having the most significant (largest) impact on the regression equations.

Finally, we calculated the average distance to agriculture within the 1-km upstream, 100-m each side buffer areas for all 26 locations. This variable could reveal if it was simply how close agriculture was to streams, rather than the amount of agriculture, that was most significantly impacting water quality. We calculated this variable by calculating the distance from the 1-km reaches to all 30x30m raster land cover cells within the buffer area, and then average the distance of all agricultural cells to the stream reach. This produced a more informative "distance to agriculture" value than just using the value of the nearest agriculture raster cell, and was based on methods developed by Brooks for agricultural land cover analysis (as published in Heaton and Merenlender 2000).

Results and Discussion

Table 6-1 shows the r^2 values we calculated between the land cover profiles and the water quality parameters from the storm events. The first column of r^2 values shows the relationship just using the Lime Creek watersheds; the second column shows the relationship using just the Bean Creek watersheds; the last column treats both sets of watersheds together. The upper part of the table describes the r^2 values for the watershed area of analysis, while the lower part of the table uses the local buffer land cover profiles.

Table 6-1: The relationship between land cover profiles and water quality parameters, using r^2 regression equation values for watersheds vs. upstream buffers and Lime Creek vs. Bean Creek vs. All Sites analysis divisions.

Watershed	Lime Creek Sites	Bean Creek Sites	All Sites
pH	0.584	**0.975**	*0.367*
conductivity	**0.741**	0.721	*0.396*
turbidity	**0.999**	**0.961**	*0.729*
DO	0.718	**0.988**	*0.319*
temperature	**0.966**	0.914	*0.198*
TDS	**0.734**	0.703	*0.388*
ORP	0.570	**0.974**	*0.634*
Local Buffer			
pH	**0.732**	0.972	*0.269*
conductivity	0.558	**0.928**	*0.409*
turbidity	0.977	0.584	*0.311*
DO	**0.866**	0.937	*0.637*
temperature	0.336	**0.967**	*0.235*
TDS	0.555	**0.930**	*0.416*
ORP	**0.895**	0.731	*0.676*

The r^2 values are nearly always higher for the analysis separating out Bean Creek from Lime Creek, showing that these are very different watersheds and should not be treated as being the same. This makes intuitive sense in light of Lime Creek being a relatively small tributary to Bean Creek, while 8 of the 10 Bean Creek sampling point watersheds drain approximately 35,000 additional acres upriver of the study area.

Strong correlations between land cover and water quality parameters exist for the separated stream data sets. These are highlighted in blue above for those r^2 values above 0.85. For Lime Creek at the watershed scale, turbidity and temperature are most strongly associated with land cover. For Bean Creek at the watershed scale, pH, turbidity, DO, temperature, and ORP are all strongly correlated with land cover. At the local buffer scale for Lime Creek, turbidity, DO, and ORP are strongly correlated with land cover, while for Bean Creek local buffers, pH, conductivity, DO, temperature, and TDS can be accurately predicted with land cover data. Of particular interest is that turbidity has a clearly strong relationship with land cover for both Lime and Bean Creek watersheds; this holds true for Lime Creek turbidity at the local buffer scale as well. DO r^2 values are high for both Lime and Bean at the local buffer scale. We believe this strengthens the recommendation that turbidity and DO are critical parameters for the NRCS to measure and track for agriculturally intensive areas like the Upper Tiffin River.

Also of note is that the local buffer scale more frequently has stronger associations with land cover than the watershed scale, which was not true in the California-focused Opperman et al. (2005) work. In that paper, it was consistently the watershed scale that had the strongest relationship with water quality. Further research would reveal if this is due to Michigan’s flatter and more agricultural landscape than the coastal range oak woodlands where Opperman’s work took place, which is our current theory.

Figure 6-5 shows four examples of the regression models for turbidity and DO, at both the watershed and local buffer scales of analysis. Using the storm event water quality data, these figures depict how well these parameters can be predicted using the land cover area profiles we extracted using the intersection method described previously. For example, at the whole watershed scale, the DO values are more scattered, equating with a lower (0.71818) r^2 value as compared to the local buffer scale (r^2 = 0.86577). This means that DO can more reliably be predicted with land cover data at the local buffer scale (100-m each side of the 1-km stream reach).

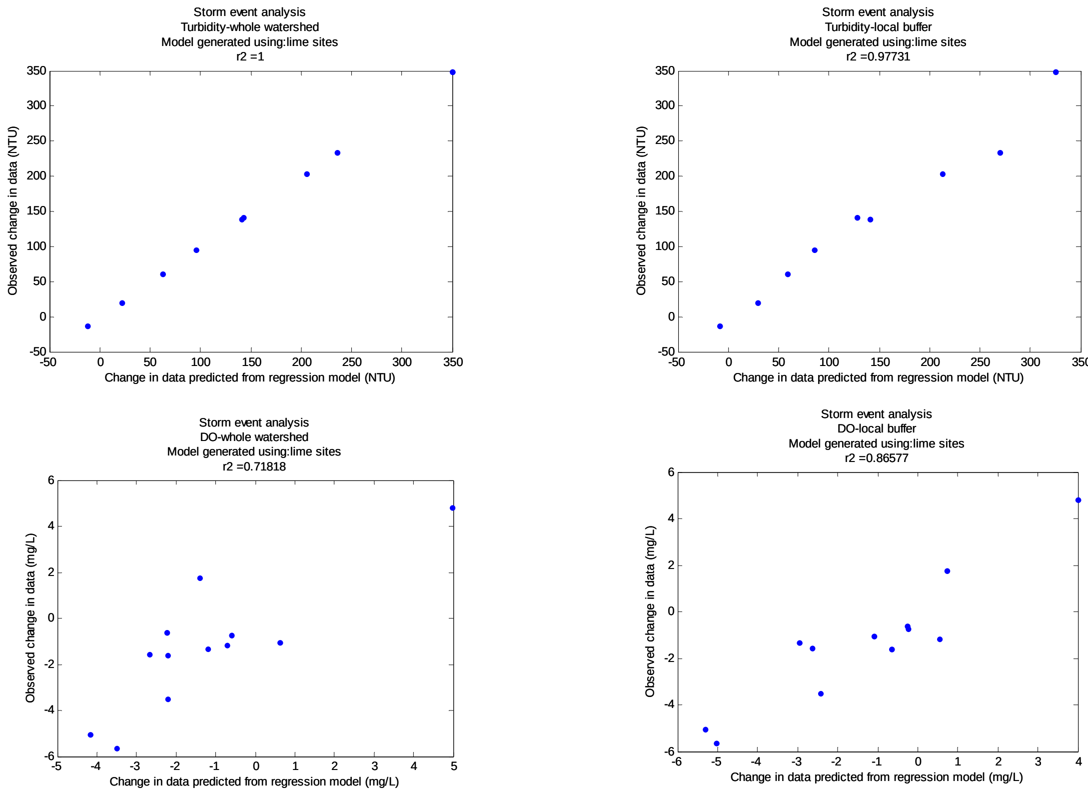


Figure 6-5: Examples of the regression models displayed graphically for turbidity and DO for the local buffer and watershed scales. *Stronger relationships between water quality parameters can be seen with straighter lines, which equal higher r^2 values. Turbidity is consistently strongly associated with land cover at both the watershed and local buffer scales, while DO is more strongly associated with land cover at the local buffer scale.*

With these regression equations calculated, we were able to see if specific land cover types were associated with changes in water quality parameters. Figure 6-6 shows an example for DO for this parameter analysis, while figure 6-7 shows an example for pH; these were calculated for all parameters. In Figure 6-6, the two emphasized peaks show that higher DO values are most strongly associated with larger amounts of shrubland, while lower DO values were strongly associated with larger amounts of corn in the watershed. In figure 6-7, soybeans, shrubland, and particularly corn are associated with increased acidity (values below 0) while small grains, CRP/grassland, forest, and alfalfa are associated with decreased acidity. In the same analysis and looking at the data for an entire year, higher turbidity was associated with soybeans and corn grain; the latter was surprising since corn grain has higher crop residue levels. Alfalfa, corn silage (again surprising because of lower residue values), small grains, and forest were associated with lower turbidity values.

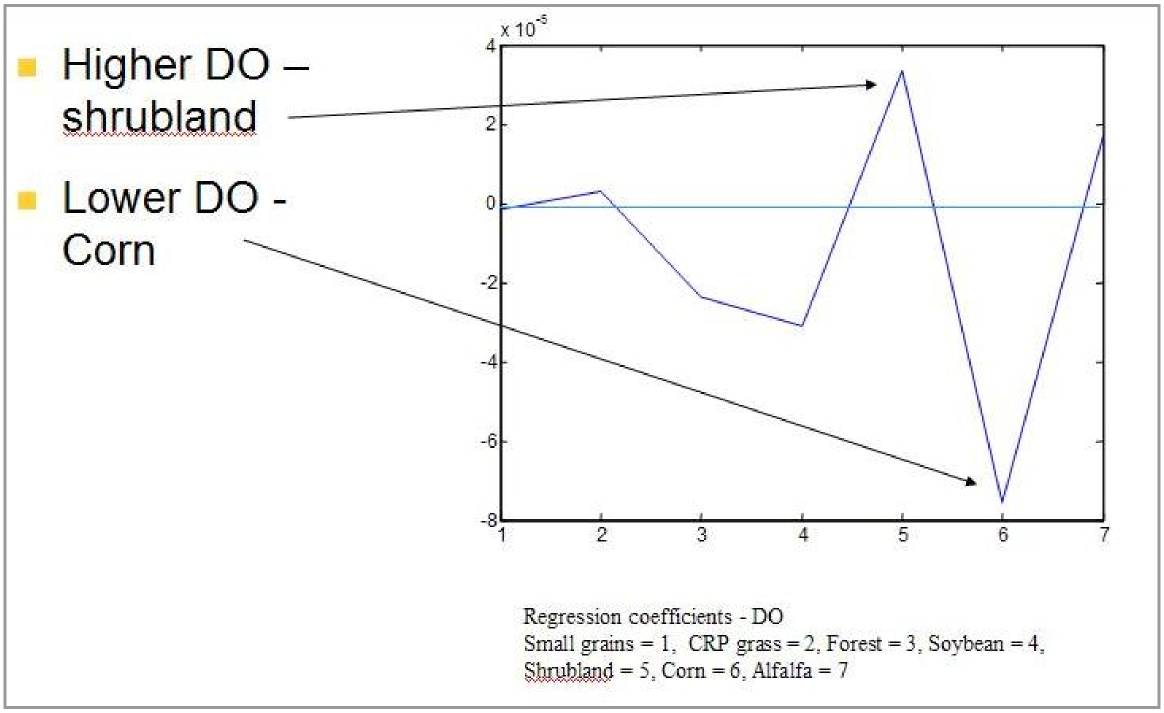


Figure 6-6: Graph of the relative contribution of land cover variables on variation in regression model for Dissolved Oxygen. *Relatively high or low values indicate that a particular land cover variable is having a greater impact on the water quality variable, and in a particular direction. In this example, shrubland (land cover type 5) is associated with higher DO levels, while corn (land cover type 6) is associated with lower DO values.*

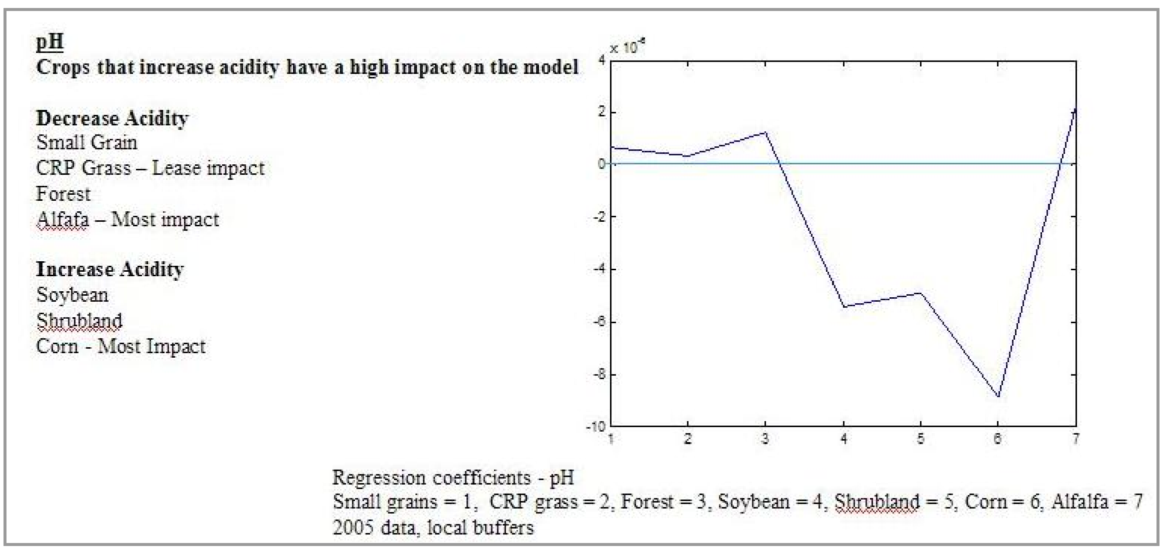


Figure 6-7: Graph of the relative contribution of land cover variables on variation in regression model for pH. *In this example, soybeans, shrubland, and corn are associated with increased acidity (lower pH) based on Horiba water samples in 2005.*

Investigating the surprising corn grain/silage and turbidity findings, we researched further any potentially different seasonal relationships. In the Spring (April-May), corn grain was associated with lower turbidity values and corn silage with higher turbidity, which was different than when considering all of a year's data at one time. Figure 6-8 shows this by mapping the seasonal change in regression coefficient values for April – September (the growing season). With snow melt and intensive Spring rains on unplanted corn fields in this time period, this more expected relationship makes logical sense. We suspect that sediment runoff from corn silage fields in the spring forms the greatest amount of total runoff, which our seasonal analysis hints at. This point is in need of confirmation in future research.

In analyzing the relationship between soil types and water quality variables, only conductivity's regression model was improved by including soil data such as soil series, soil order, and soil great-group. All other water quality variables were not improved by including soil data, indicating that soils do not appear to be strongly correlated with water quality in this river system. With much of the landscape already converted to agriculture, it appears that the potential contribution from soils with higher erodability is not as significant as the land use / land cover upstream of our sampling points.

Similarly, including stream gradient or sinuosity for the 1-km upstream reach (from all 26 sampling points) did not impact the regression equations significantly. This would appear to indicate that these are not significantly impacting on water quality variables. A relationship might have been expected to exist for turbidity, where sediment could have been settling more in areas with lower stream gradient or higher sinuosity, but this does not appear to be the case in the Upper Tiffin River. Again, our conclusion is that land cover types (in particular, amounts of different agricultural land uses) are having the greatest impact on water quality.

We had the same result with our "distance to agriculture" analysis. The average distance to agriculture within the upstream buffer analysis areas did not significantly alter the regression equations that included land cover amounts. Our interpretation of this result is that it is the amount of agriculture, not the proximity of agriculture, which is having the largest impact on water quality upstream of the 26 sampling locations.

For the potential management scenario, we had tested to see what the regression equations would predict if all corn grain was replaced with corn silage in the Lime Creek basin. Turbidity values would increase, which we believe is tied to the association of corn silage in the Spring with higher turbidity values, described previously. DO levels are predicted to increase (generally considered an improvement in water quality), while temperature, conductivity should decrease. If the NRCS were recommending tillage practices to reduce sediment load in this river system, encouraging higher-residue corn grain farming would be conducive to lower turbidity levels.

Section 7: Concluding Remarks and Potential Next Steps

Our analysis methods revealed several interesting relationships between agriculture and water quality, as represented in our Bean/Lime study creeks that form the Upper Tiffin River watershed. First and foremost, we were able to build strong regression models that showed that agricultural land use can be used to predict water quality parameters. Secondly, storm events are where the most significant responses occur in water quality, particularly for turbidity. This is an important point to consider since the Tiffin River has a 303d impairment listing for sediment. For NRCS monitoring programs, measuring water quality after storm events is the most effective way to understand water quality issues in this type of agricultural river system. To understand the storm impacts, a baseline monthly survey of water quality is helpful, but after this, seasonal monitoring (about five times a year) plus major storm events would be sufficient.

The connection between land use and water quality in the Upper Tiffin River is most clearly seen with how corn grain is associated with lower turbidity in the Spring time period. Over an entire year, the relationship between corn and turbidity is less clear, however, alfalfa and small grains (along with forest) appear to decrease turbidity while soybeans increase turbidity. Soybeans and corn increase acidity (lower pH), while corn lowers Dissolved Oxygen levels and increased amounts of shrubland lead to higher DO levels. In a modeled scenario, our analysis shows that encouraging more conservation tillage type of practices, such as more corn grain and less corn silage, are associated with lower turbidity levels.

For analyzing data, our methods showed that separating out sampling locations that are on larger main stems (such as Bean Creek) from smaller tributary locations (such as Lime) enable water quality data to be more interpretable. Once separated, Principal Components Analysis reveals that turbidity, DO, and conductivity are the most important parameters to measure to characterize water quality in this type of area. The advantage of choosing these three parameters is that they can be accurately captured with lower-cost instruments than using ones that capture all 10 parameters that our Horiba instrument recorded.

Other key features that we recommend for NRCS water quality monitoring programs include choosing sampling points at river and road intersections for ease of access (both physically and permission-wise). Sampling locations should be no more than three miles apart, but do not need to be the ½ mile to one mile distances we used in our intensive 2005-2007 water quality survey. Also important is including points that represent smaller side tributary channels, and including points above and below these locations to understand how they may be altering water quality. Including sites that are both year-round and intermittent will reveal how some of the lower-flow areas may be more impacted by parameters such as Dissolved Oxygen. If USGS stream gauges or other monitoring devices are not available, then the first year of monthly monitoring can be used to establish what sites are more impacted by low-flow conditions. For the 34,600 acre study area, these recommendations translate into recording data at about 13 locations, rather than the 26 we measured. Our monitoring program was designed so that the water quality parameters could be collected in a single day for all locations in a watershed this size, which is met with the above recommended measurement procedure. This collection of data can also be effectively managed in a documented relational database, accessible to NRCS staff and potentially other interested parties through web mapping sites.

Several next steps exist for these data sets and analysis results, based on this paper. One logical next step would be to investigate and describe in greater detail connections between land use / land cover and quality in terms of agricultural practices. For example, we saw turbidity, DO, and pH trends related to amounts of specific land cover types; why are these occurring and do they translate into specific farm practices that the NRCS should be encouraging? With the recommended measurement procedure we have described, we would look forward to the opportunity of working with the NRCS on monitoring new systems using cost-effective measurement methodologies. Finally, the large amount of data and promising analyses lend themselves to being shared via a peer-reviewed publication that we would write with Michigan NRCS staff. We particularly look forward to that outreach opportunity and following up on this idea with the NRCS.

Acronym List

CEAP	Conservation Effects Assessment Project
COOP	Cooperative Observer Program
CRP	Concervation Reserve Program
DEM	Digital Elevation Model
DO	Dissolved Oxygen
ESRI	Environmental Systems Research Institute
GIS	Geographic Information System
MDEQ	Michigan Department of Environmental Quality
MTRI	Michigan Tech Research Institute
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resource Conservation Service
NTU	Nephelometric Turbidity Units
ORP	Oxidation Reduction Potential
PC	Principle Components
PCA	Principle Components Analysis
SQL	Structured Query Language
SSURGO	Soil Survey Geographic Database
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
USGS	United States Geological Survey

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Appendix A: 32 Month Baseline Statistical Analysis

32 Month Baseline Statistical Analysis
April 2005 - December 2007
All Sites by Month

Conductivity (S/m)

January

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		0.057	0.045		1.2E-04	7.6E-10		0.057	0.045		0.057	0.045
9 Bean at Dillion		0.064	0.048		5.0E-05	0.0E+00		0.064	0.048		0.064	0.048
8 Bean at Medina		0.064	0.049		5.8E-05	5.8E-05		0.064	0.049		0.064	0.049
7 Bean at Bothwell		0.064	0.049		5.8E-05	7.6E-10		0.064	0.049		0.064	0.049
5 Bean at Bates		0.065	0.049		1.1E-09	5.8E-05		0.065	0.049		0.065	0.049
6 Covell Drain at Harris		0.081	0.055		5.8E-05	7.6E-10		0.081	0.055		0.081	0.055
4 Bean at Packard		0.065	0.049		5.8E-05	0.0E+00		0.065	0.049		0.065	0.049
3 Bean at Lime Creek Hwy		0.065	0.049		1.1E-09	5.8E-05		0.065	0.049		0.065	0.049
26 Bean at Ridgeville		0.065	0.049		1.1E-09	1.0E-04		0.065	0.049		0.065	0.049
2 Bean at Mulberry		0.065	0.050		1.1E-09	1.2E-04		0.065	0.050		0.065	0.050
22 Blanchard Drain at Coman		0.056	0.040		7.6E-10	5.8E-05		0.056	0.040		0.056	0.040
21 Blanchard Drain at Meridian		0.060	0.042		5.8E-05	0.0E+00		0.060	0.042		0.060	0.042
20 Blanchard Drain at Munson		0.064	0.046		0.0E+00	5.8E-05		0.064	0.046		0.064	0.046
19 Blanchard Drain at Ingall		0.065	0.047		5.8E-05	0.0E+00		0.065	0.047		0.065	0.047
11 Lime at Coman		0.082	0.061		2.6E-04	1.2E-04		0.082	0.061		0.082	0.061
12 Lime at Tamarack		0.083	0.064		1.1E-09	5.8E-05		0.083	0.064		0.083	0.064
13 Lime at Lime Creek Drive		0.082	0.062		1.1E-09	5.8E-05		0.082	0.062		0.082	0.062
14 Lime at Prattville		0.055	0.039		7.6E-10	5.4E-10		0.055	0.039		0.055	0.039
15 Lime at Lime Creek Hwy		0.056	0.037		1.2E-04	5.8E-05		0.056	0.037		0.056	0.037
16 Site A at Lime Creek Hwy		0.067			5.8E-05			0.067			0.067	
17 Site B at Lime Creek Hwy		0.080	0.061		5.8E-05	1.1E-09		0.080	0.061		0.080	0.061
18 Lime at Ingall		0.066	0.046		5.8E-05	0.0E+00		0.066	0.046		0.066	0.046
23 Lime at White Pine		0.066	0.047		5.8E-05	0.0E+00		0.066	0.047		0.066	0.047
24 Lime at Ridgeville		0.066	0.047		5.8E-05	5.8E-05		0.066	0.047		0.066	0.047
25 Mansfield Drain at Ranger		0.061	0.041		4.1E-03	5.4E-10		0.059	0.041		0.066	0.041
1 Lime at Mulberry		0.066	0.047		1.1E-09	5.8E-05		0.066	0.047		0.066	0.047

February

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		0.061	0.056		5.8E-05	5.8E-05		0.061	0.056		0.061	0.056
9 Bean at Dillion		0.060	0.052		5.8E-05	5.8E-05		0.060	0.052		0.060	0.052
8 Bean at Medina		0.061			5.8E-05			0.061			0.061	
7 Bean at Bothwell		0.061	0.052		5.8E-05	7.6E-10		0.061	0.052		0.061	0.052
5 Bean at Bates		0.061	0.051		1.1E-09	1.1E-09		0.061	0.051		0.061	0.051
6 Covell Drain at Harris		0.083	0.070		0.0E+00	1.7E-04		0.083	0.070		0.083	0.070
4 Bean at Packard		0.062	0.052		5.0E-05	5.8E-05		0.062	0.052		0.062	0.052
3 Bean at Lime Creek Hwy		0.062	0.053		5.8E-05	7.6E-10		0.062	0.053		0.062	0.053
26 Bean at Ridgeville		0.062	0.053		0.0E+00	0.0E+00		0.062	0.053		0.062	0.053
2 Bean at Mulberry		0.062	0.055		5.8E-05	1.2E-04		0.062	0.054		0.062	0.055
22 Blanchard Drain at Coman		0.072			1.5E-09			0.072			0.072	
21 Blanchard Drain at Meridian		0.071	0.061		5.8E-05	5.8E-05		0.071	0.061		0.071	0.062
20 Blanchard Drain at Munson		0.073	0.062		0.0E+00	5.8E-05		0.073	0.062		0.073	0.062
19 Blanchard Drain at Ingall		0.072			1.1E-09			0.072			0.072	
11 Lime at Coman		0.083	0.068		5.8E-05	5.8E-05		0.083	0.068		0.083	0.068
12 Lime at Tamarack		0.087	0.068		5.8E-05	5.8E-05		0.087	0.068		0.087	0.068
13 Lime at Lime Creek Drive		0.087			1.5E-09			0.087			0.087	
14 Lime at Prattville		0.055	0.039		5.8E-05	5.8E-05		0.055	0.039		0.055	0.039
15 Lime at Lime Creek Hwy		0.060	0.000		0.0E+00	0.0E+00		0.060	0.000		0.060	0.000
16 Site A at Lime Creek Hwy		0.066			3.8E-04			0.065			0.066	
17 Site B at Lime Creek Hwy		0.081	0.058		5.8E-05	7.6E-10		0.081	0.058		0.081	0.058
18 Lime at Ingall		0.069	0.051		1.0E-04	5.8E-05		0.068	0.051		0.069	0.051
23 Lime at White Pine		0.070			5.8E-05			0.070			0.070	
24 Lime at Ridgeville		0.070	0.055		5.8E-05	7.6E-10		0.070	0.055		0.070	0.055
25 Mansfield Drain at Ranger		0.059	0.054		0.0E+00	5.8E-05		0.059	0.054		0.059	0.054
1 Lime at Mulberry		0.069	0.054		1.1E-09	7.6E-10		0.069	0.054		0.069	0.054

March

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		0.064	0.049		5.8E-05	1.5E-04		0.064	0.049		0.064	0.049
9 Bean at Dillion		0.062	0.048		1.2E-04	2.1E-04		0.062	0.048		0.062	0.049
8 Bean at Medina		0.063	0.050		0.0E+00	1.1E-03		0.063	0.049		0.063	0.051
7 Bean at Bothwell		0.063	0.048		5.8E-05	1.5E-04		0.063	0.048		0.063	0.048
5 Bean at Bates		0.062	0.048		1.2E-03	5.8E-05		0.061	0.048		0.063	0.048
6 Covell Drain at Harris		0.087	0.076		5.8E-05	7.1E-03		0.087	0.069		0.087	0.083
4 Bean at Packard		0.063	0.048		5.8E-05	3.8E-04		0.063	0.048		0.064	0.049
3 Bean at Lime Creek Hwy		0.063	0.048		1.0E-04	1.0E-04		0.063	0.048		0.064	0.048
26 Bean at Ridgeville		0.064	0.047		0.0E+00	7.6E-10		0.064	0.047		0.064	0.047
2 Bean at Mulberry		0.064	0.047		5.8E-05	5.8E-05		0.064	0.047		0.064	0.047
22 Blanchard Drain at Coman		0.071	0.053		5.8E-05	2.3E-04		0.071	0.053		0.071	0.053
21 Blanchard Drain at Meridian		0.070	0.052		0.0E+00	5.8E-05		0.070	0.052		0.070	0.052
20 Blanchard Drain at Munson		0.073	0.052		5.8E-05	5.8E-05		0.073	0.052		0.073	0.053
19 Blanchard Drain at Ingall		0.073	0.052		0.0E+00	5.8E-05		0.073	0.052		0.073	0.052
11 Lime at Coman		0.082	0.062		1.5E-09	3.1E-04		0.082	0.062		0.082	0.063
12 Lime at Tamarack		0.084	0.061		1.5E-09	1.2E-04		0.084	0.061		0.084	0.062
13 Lime at Lime Creek Drive		0.085	0.062		5.8E-05	5.8E-05		0.085	0.062		0.086	0.062
14 Lime at Prattville		0.055	0.042		0.0E+00	1.2E-04		0.055	0.042		0.055	0.042
15 Lime at Lime Creek Hwy		0.060	0.043		5.8E-05	0.0E+00		0.060	0.043		0.060	0.043
16 Site A at Lime Creek Hwy			0.043			1.0E-04			0.043			0.043
17 Site B at Lime Creek Hwy		0.079	0.055		1.5E-09	1.5E-04		0.079	0.055		0.079	0.055
18 Lime at Ingall		0.068	0.047		5.8E-05	1.5E-04		0.068	0.047		0.068	0.047
23 Lime at White Pine		0.069	0.048		1.1E-09	5.8E-05		0.069	0.048		0.069	0.048
24 Lime at Ridgeville		0.071	0.049		5.5E-05	1.0E-04		0.071	0.049		0.071	0.049
25 Mansfield Drain at Ranger		0.063	0.043		5.8E-05	1.2E-04		0.063	0.043		0.063	0.043
1 Lime at Mulberry		0.071	0.049		5.8E-05	7.6E-10		0.071	0.049		0.071	0.049

April

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.071	0.072	0.042	1.7E-04	1.1E-09	7.6E-10	0.071	0.072	0.042	0.072	0.072	0.042
9 Bean at Dillion	0.067	0.067	0.045	1.1E-03	1.1E-09	7.6E-10	0.066	0.067	0.045	0.068	0.067	0.045
8 Bean at Medina	0.069	0.067	0.045	1.0E-03	5.8E-05	0.0E+00	0.066	0.067	0.045	0.069	0.067	0.045
7 Bean at Bothwell	0.069	0.066	0.045	2.1E-04	0.0E+00	0.0E+00	0.069	0.066	0.045	0.069	0.066	0.045
5 Bean at Bates	0.069	0.065	0.045	9.7E-04	0.0E+00	7.6E-10	0.067	0.065	0.045	0.071	0.065	0.045
6 Covell Drain at Harris	0.080	0.090	0.047	2.4E-03	3.0E-04	1.0E-04	0.078	0.090	0.047	0.082	0.090	0.047
4 Bean at Packard	0.069	0.066	0.046	3.2E-04	1.1E-09	7.6E-10	0.069	0.066	0.046	0.070	0.066	0.046
3 Bean at Lime Creek Hwy	0.062	0.067	0.045	2.3E-02	5.8E-05	7.6E-10	0.001	0.067	0.045	0.069	0.067	0.045
26 Bean at Ridgeville	0.069	0.067	0.046	1.8E-03	1.1E-09	5.8E-05	0.067	0.067	0.046	0.074	0.067	0.046
2 Bean at Mulberry	0.059	0.067	0.046	2.8E-02	1.0E-04	1.1E-09	0.001	0.067	0.046	0.071	0.067	0.046
22 Blanchard Drain at Coman	0.071	0.073	0.033	7.3E-03	5.8E-05	5.8E-05	0.063	0.073	0.033	0.078	0.073	0.033
21 Blanchard Drain at Meridian	0.052	0.072	0.055	4.5E-02	5.8E-05	1.4E-03	0.000	0.072	0.054	0.079	0.072	0.057
20 Blanchard Drain at Munson	0.084	0.076	0.051	4.0E-04	0.0E+00	2.5E-04	0.084	0.076	0.051	0.085	0.076	0.051
19 Blanchard Drain at Ingall	0.055	0.072	0.046	4.6E-02	1.1E-09	7.0E-04	0.001	0.072	0.045	0.082	0.072	0.047
11 Lime at Coman	0.087	0.084	0.055	5.5E-04	2.0E-04	2.3E-04	0.086	0.084	0.055	0.087	0.084	0.055
12 Lime at Tamarack	0.084	0.084	0.056	1.8E-03	1.0E-04	0.0E+00	0.082	0.084	0.056	0.085	0.084	0.056
13 Lime at Lime Creek Drive	0.073	0.081	0.057	1.6E-02	5.8E-05	5.8E-05	0.054	0.081	0.057	0.084	0.081	0.057
14 Lime at Prattville	0.056	0.053	0.038	3.1E-03	7.6E-10	0.0E+00	0.054	0.053	0.038	0.060	0.053	0.038
15 Lime at Lime Creek Hwy	0.060	0.058	0.050	2.1E-03	5.8E-05	1.5E-04	0.058	0.058	0.050	0.063	0.059	0.050
16 Site A at Lime Creek Hwy	0.048		0.052	4.2E-02		1.5E-04	0.000		0.052	0.081		0.053
17 Site B at Lime Creek Hwy	0.075	0.078	0.058	6.8E-03	1.1E-09	3.2E-04	0.067	0.078	0.058	0.079	0.078	0.059
18 Lime at Ingall	0.068	0.067	0.052	1.6E-04	5.8E-05	1.3E-03	0.068	0.067	0.051	0.068	0.067	0.054
23 Lime at White Pine	0.073	0.068	0.048	2.0E-04	0.0E+00	1.7E-04	0.073	0.068	0.048	0.073	0.068	0.049
24 Lime at Ridgeville	0.073	0.070	0.050	1.8E-04	5.8E-05	3.8E-04	0.073	0.070	0.049	0.074	0.070	0.050
25 Mansfield Drain at Ranger	0.073	0.075	0.058	5.5E-04	0.0E+00	3.6E-03	0.073	0.075	0.055	0.074	0.075	0.062
1 Lime at Mulberry	0.074	0.069	0.050	2.0E-04	1.1E-09	4.5E-04	0.073	0.069	0.049	0.074	0.069	0.050

May

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.069	0.073	0.069	0.0E+00	5.8E-05	1.5E-04	0.069	0.073	0.069	0.069	0.073	0.069
9 Bean at Dillion	0.048	0.069	0.062	3.1E-02	1.1E-09	1.5E-04	0.001	0.069	0.062	0.064	0.069	0.062
8 Bean at Medina	0.063	0.069	0.063	4.0E-04	5.8E-05	3.8E-04	0.063	0.069	0.062	0.064	0.069	0.063
7 Bean at Bothwell	0.063	0.068	0.059	7.8E-04	1.7E-03	1.5E-04	0.062	0.066	0.059	0.064	0.069	0.059
5 Bean at Bates	0.064	0.069	0.086	1.5E-04	1.1E-09	1.3E-02	0.064	0.069	0.074	0.064	0.069	0.100
6 Covell Drain at Harris	0.091	0.091	0.226	9.2E-04	0.0E+00	2.9E-02	0.090	0.091	0.193	0.092	0.091	0.245
4 Bean at Packard	0.064	0.069	0.072	4.8E-04	0.0E+00	5.1E-03	0.064	0.069	0.067	0.065	0.069	0.078
3 Bean at Lime Creek Hwy	0.064	0.069	0.066	1.3E-04	5.8E-05	6.4E-03	0.064	0.069	0.062	0.065	0.069	0.074
26 Bean at Ridgeville	0.064	0.070	0.066	1.7E-04	5.8E-05	7.4E-04	0.064	0.070	0.065	0.065	0.070	0.066
2 Bean at Mulberry	0.064	0.071	0.065	8.2E-05	0.0E+00	2.0E-04	0.064	0.071	0.065	0.065	0.071	0.066
22 Blanchard Drain at Coman	0.067	0.074		5.8E-05	0.0E+00		0.067	0.074		0.067	0.074	
21 Blanchard Drain at Meridian	0.074	0.076	0.060	2.1E-04	0.0E+00	5.8E-05	0.073	0.076	0.060	0.074	0.076	0.060
20 Blanchard Drain at Munson	0.070	0.073	0.067	1.4E-03	5.8E-05	1.1E-03	0.069	0.073	0.066	0.071	0.073	0.068
19 Blanchard Drain at Ingall	0.069	0.063	0.068	1.2E-03	0.0E+00	1.0E-03	0.067	0.063	0.067	0.070	0.063	0.068
11 Lime at Coman	0.081	0.082	0.068	8.3E-04	9.2E-04	1.0E-03	0.080	0.081	0.067	0.082	0.083	0.069
12 Lime at Tamarack	0.073	0.077	0.078	1.1E-09	5.8E-05	3.3E-03	0.073	0.077	0.074	0.073	0.077	0.080
13 Lime at Lime Creek Drive	0.075	0.082	0.068	2.5E-04	1.5E-09	1.0E-03	0.075	0.082	0.068	0.076	0.082	0.069
14 Lime at Prattville	0.048	0.055	0.131	1.0E-04	7.6E-10	2.9E-02	0.048	0.055	0.098	0.048	0.055	0.155
15 Lime at Lime Creek Hwy	0.055	0.058	0.048	1.1E-09	7.6E-10	1.5E-04	0.055	0.058	0.048	0.055	0.058	0.048
16 Site A at Lime Creek Hwy	0.050	0.065		5.8E-05	0.0E+00		0.050	0.065		0.051	0.065	
17 Site B at Lime Creek Hwy	0.073	0.089	0.115	0.0E+00	1.5E-09	2.1E-03	0.073	0.089	0.113	0.073	0.089	0.117
18 Lime at Ingall	0.063	0.063	0.072	5.8E-05	0.0E+00	3.7E-03	0.063	0.063	0.068	0.063	0.063	0.075
23 Lime at White Pine	0.065	0.063	0.061	4.4E-04	0.0E+00	1.0E-03	0.064	0.063	0.060	0.065	0.063	0.062
24 Lime at Ridgeville	0.067	0.070	0.073	5.0E-05	0.0E+00	2.3E-03	0.067	0.070	0.070	0.067	0.070	0.075
25 Mansfield Drain at Ranger	0.072	0.075	0.068	5.8E-05	5.8E-05	2.4E-03	0.072	0.075	0.066	0.072	0.076	0.071
1 Lime at Mulberry	0.067	0.072	0.062	1.1E-09	5.8E-05	8.2E-04	0.067	0.072	0.061	0.067	0.072	0.063

June

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.076	0.047	0.115	2.3E-04	0.0E+00	2.5E-03	0.075	0.047	0.112	0.076	0.047	0.117
9 Bean at Dillion	0.069	0.065	0.066	1.2E-03	0.0E+00	6.6E-04	0.068	0.065	0.065	0.070	0.065	0.066
8 Bean at Medina	0.070	0.063	0.067	5.8E-05	5.2E-04	8.9E-04	0.070	0.063	0.066	0.070	0.064	0.068
7 Bean at Bothwell	0.069	0.063	0.062	1.5E-04	1.1E-09	5.8E-05	0.069	0.063	0.062	0.069	0.063	0.062
5 Bean at Bates	0.069	0.063	0.074	5.8E-05	7.2E-04	1.1E-02	0.069	0.062	0.062	0.069	0.064	0.084
6 Covell Drain at Harris	0.093	0.050	0.126	1.4E-03	5.8E-05	4.7E-03	0.092	0.050	0.121	0.094	0.050	0.130
4 Bean at Packard	0.070	0.063	0.065	3.6E-04	0.0E+00	1.2E-03	0.069	0.063	0.065	0.070	0.063	0.067
3 Bean at Lime Creek Hwy	0.069	0.063	0.067	5.8E-05	0.0E+00	4.9E-03	0.069	0.063	0.063	0.070	0.063	0.072
26 Bean at Ridgeville	0.070	0.063	0.069	3.6E-04	0.0E+00	4.8E-03	0.070	0.063	0.066	0.071	0.063	0.075
2 Bean at Mulberry	0.071	0.063	0.066	1.6E-03	2.3E-04	2.6E-03	0.070	0.063	0.063	0.073	0.063	0.068
22 Blanchard Drain at Coman		0.056			7.6E-10			0.056			0.056	
21 Blanchard Drain at Meridian	0.072	0.061	0.074	1.5E-04	1.5E-04	3.5E-03	0.072	0.061	0.070	0.073	0.061	0.077
20 Blanchard Drain at Munson	0.065	0.068	0.087	1.2E-04	0.0E+00	6.3E-03	0.065	0.068	0.081	0.065	0.068	0.093
19 Blanchard Drain at Ingall	0.065	0.068	0.057	3.1E-04	5.8E-05	6.1E-04	0.065	0.068	0.057	0.066	0.068	0.058
11 Lime at Coman	0.080	0.087	0.108	6.9E-03	1.5E-04	2.1E-02	0.075	0.087	0.089	0.088	0.087	0.131
12 Lime at Tamarack	0.079	0.082	0.088	1.8E-03	1.1E-09	1.3E-03	0.077	0.082	0.087	0.080	0.082	0.089
13 Lime at Lime Creek Drive	0.076	0.082	0.059	1.2E-03	0.0E+00	1.0E-04	0.075	0.082	0.059	0.077	0.082	0.059
14 Lime at Prattville	0.049	0.050	0.109	2.9E-04	7.6E-10	2.1E-02	0.049	0.050	0.097	0.049	0.050	0.133
15 Lime at Lime Creek Hwy		0.054	0.000		7.6E-10	0.0E+00		0.054	0.000		0.054	0.000
16 Site A at Lime Creek Hwy		0.049			7.6E-10			0.049			0.049	
17 Site B at Lime Creek Hwy	0.060	0.069	0.065	9.2E-04	1.1E-09	3.8E-04	0.059	0.069	0.064	0.061	0.069	0.065
18 Lime at Ingall	0.070	0.055	0.080	5.7E-03	5.8E-05	1.1E-03	0.067	0.055	0.079	0.077	0.055	0.081
23 Lime at White Pine	0.067	0.056	0.062	3.6E-04	2.9E-04	6.7E-04	0.067	0.056	0.062	0.068	0.057	0.063
24 Lime at Ridgeville	0.070	0.057	0.073	4.2E-04	5.8E-05	2.2E-03	0.069	0.057	0.071	0.070	0.057	0.076
25 Mansfield Drain at Ranger	0.074	0.086	0.076	5.8E-05	5.8E-05	3.2E-03	0.074	0.086	0.073	0.074	0.086	0.080
1 Lime at Mulberry	0.069	0.057	0.071	2.5E-04	1.1E-09	1.9E-03	0.069	0.057	0.070	0.069	0.057	0.073

July

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.077	0.046	0.088	0.0E+00	7.6E-10	5.7E-03	0.077	0.046	0.081	0.077	0.046	0.091
9 Bean at Dillion	0.069	0.057	0.069	5.8E-05	7.6E-10	1.3E-03	0.069	0.057	0.067	0.069	0.057	0.070
8 Bean at Medina	0.068	0.055	0.067	1.2E-04	5.8E-05	3.6E-03	0.068	0.055	0.063	0.068	0.055	0.070
7 Bean at Bothwell	0.068	0.056	0.061	5.8E-05	7.6E-10	3.4E-04	0.068	0.056	0.061	0.068	0.056	0.062
5 Bean at Bates	0.068	0.055	0.068	5.8E-05	5.8E-05	4.3E-03	0.068	0.055	0.065	0.068	0.055	0.073
6 Covell Drain at Harris	0.103	0.060	0.112	5.8E-04	5.8E-05	5.8E-04	0.103	0.060	0.111	0.104	0.060	0.112
4 Bean at Packard	0.067	0.056	0.063	1.1E-09	7.6E-10	5.9E-04	0.067	0.056	0.063	0.067	0.056	0.064
3 Bean at Lime Creek Hwy	0.065	0.056	0.064	5.8E-05	1.0E-04	1.5E-04	0.065	0.056	0.064	0.066	0.056	0.064
26 Bean at Ridgeville	0.065	0.055	0.062	0.0E+00	7.6E-10	2.9E-04	0.065	0.055	0.062	0.065	0.055	0.062
2 Bean at Mulberry	0.065	0.054	0.128	1.5E-04	7.6E-10	7.0E-03	0.064	0.054	0.120	0.065	0.054	0.133
22 Blanchard Drain at Coman	0.098	0.066		5.8E-05	1.1E-09		0.098	0.066		0.098	0.066	
21 Blanchard Drain at Meridian	0.077	0.065	0.114	5.8E-05	1.1E-09	2.9E-03	0.077	0.065	0.111	0.078	0.065	0.116
20 Blanchard Drain at Munson	0.071	0.062	0.116	1.1E-09	0.0E+00	4.9E-03	0.071	0.062	0.113	0.071	0.062	0.122
19 Blanchard Drain at Ingall	0.070	0.062	0.069	1.5E-04	1.1E-09	5.8E-05	0.069	0.062	0.069	0.070	0.062	0.069
11 Lime at Coman	0.093	0.078	0.349	5.3E-04	1.7E-04	1.4E-01	0.092	0.077	0.237	0.093	0.078	0.500
12 Lime at Tamarack	0.100	0.079	0.184	5.8E-05	1.1E-09	4.0E-03	0.100	0.079	0.182	0.100	0.079	0.189
13 Lime at Lime Creek Drive	0.091	0.078	0.100	0.0E+00	1.1E-09	2.5E-03	0.091	0.078	0.098	0.091	0.078	0.103
14 Lime at Prattville	0.044	0.039	0.172	7.6E-10	7.6E-10	1.9E-02	0.044	0.039	0.160	0.044	0.039	0.194
15 Lime at Lime Creek Hwy	0.045	0.047	0.000	5.8E-05	0.0E+00	0.0E+00	0.045	0.047	0.000	0.045	0.047	0.000
16 Site A at Lime Creek Hwy		0.048			1.2E-04			0.048			0.048	
17 Site B at Lime Creek Hwy	0.077	0.065	0.131	1.0E-04	1.1E-09	1.2E-02	0.077	0.065	0.119	0.077	0.065	0.143
18 Lime at Ingall	0.061	0.053	0.068	5.8E-05	5.8E-05	2.1E-04	0.061	0.053	0.068	0.061	0.053	0.068
23 Lime at White Pine	0.063	0.056	0.073	5.8E-05	7.6E-10	2.6E-04	0.063	0.056	0.073	0.063	0.056	0.073
24 Lime at Ridgeville	0.065	0.056	0.074	1.5E-04	5.8E-05	1.0E-04	0.065	0.056	0.073	0.065	0.056	0.074
25 Mansfield Drain at Ranger	0.085	0.074	0.076	1.5E-04	0.0E+00	3.6E-04	0.085	0.074	0.076	0.085	0.074	0.076
1 Lime at Mulberry	0.066	0.056	0.072	5.8E-05	5.1E-04	8.6E-04	0.066	0.055	0.071	0.066	0.056	0.073

August

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.094	0.063	0.047	7.4E-04	5.8E-05	2.1E-04	0.094	0.063	0.047	0.095	0.063	0.047
9 Bean at Dillion	0.086	0.053	0.051	2.6E-03	7.6E-10	4.0E-04	0.084	0.053	0.050	0.089	0.053	0.051
8 Bean at Medina	0.083	0.053	0.049	1.1E-03	5.8E-05	1.2E-04	0.082	0.053	0.049	0.084	0.053	0.049
7 Bean at Bothwell	0.080	0.053	0.049	1.0E-04	7.6E-10	1.5E-04	0.080	0.053	0.049	0.080	0.053	0.050
5 Bean at Bates	0.082	0.053	0.050	1.1E-09	1.1E-09	1.0E-04	0.082	0.053	0.049	0.082	0.053	0.050
6 Covell Drain at Harris	0.108	0.065	0.053	1.5E-09	5.8E-05	3.8E-04	0.108	0.065	0.052	0.108	0.065	0.053
4 Bean at Packard	0.081	0.051	0.049	1.0E-04	0.0E+00	2.5E-04	0.080	0.051	0.049	0.081	0.051	0.049
3 Bean at Lime Creek Hwy	0.082	0.055	0.049	4.0E-04	0.0E+00	2.5E-04	0.082	0.055	0.049	0.083	0.055	0.049
26 Bean at Ridgeville	0.081	0.054	0.047	5.5E-04	7.6E-10	5.8E-05	0.080	0.054	0.047	0.081	0.054	0.047
2 Bean at Mulberry	0.080	0.054	0.047	3.6E-04	1.1E-09	0.0E+00	0.080	0.054	0.047	0.080	0.054	0.047
22 Blanchard Drain at Coman		0.051	0.118		1.1E-09	8.5E-03		0.051	0.109		0.051	0.126
21 Blanchard Drain at Meridian		0.044	0.033		1.2E-04	3.8E-04		0.044	0.033		0.045	0.034
20 Blanchard Drain at Munson	0.098	0.043	0.035	8.0E-04	0.0E+00	5.8E-05	0.097	0.043	0.035	0.099	0.043	0.035
19 Blanchard Drain at Ingall	0.084	0.043	0.036	1.4E-03	7.6E-10	5.4E-10	0.082	0.043	0.036	0.085	0.043	0.036
11 Lime at Coman	0.090	0.052	0.070	1.5E-09	1.5E-04	1.9E-03	0.090	0.052	0.068	0.090	0.052	0.072
12 Lime at Tamarack	0.099	0.052	0.060	1.5E-09	5.8E-05	2.9E-04	0.099	0.052	0.060	0.099	0.052	0.060
13 Lime at Lime Creek Drive	0.095	0.052	0.058	2.1E-04	7.6E-10	2.5E-04	0.095	0.052	0.058	0.095	0.052	0.058
14 Lime at Prattville	0.095	0.031	0.030	5.0E-03	0.0E+00	5.8E-05	0.090	0.031	0.030	0.100	0.031	0.030
15 Lime at Lime Creek Hwy		0.039	0.033		5.4E-10	5.4E-10		0.039	0.033		0.039	0.033
16 Site A at Lime Creek Hwy	0.070		0.035	9.5E-04		2.3E-04	0.069		0.035	0.071		0.036
17 Site B at Lime Creek Hwy	0.076	0.056	0.056	1.0E-04	7.6E-10	5.8E-05	0.075	0.056	0.056	0.076	0.056	0.056
18 Lime at Ingall	0.073	0.046	0.039	6.4E-04	7.6E-10	5.8E-05	0.073	0.046	0.039	0.074	0.046	0.040
23 Lime at White Pine	0.072	0.045	0.038	3.0E-04	0.0E+00	5.8E-05	0.072	0.045	0.038	0.072	0.045	0.038
24 Lime at Ridgeville	0.076	0.044	0.039	6.5E-04	5.8E-05	5.8E-05	0.076	0.044	0.039	0.077	0.044	0.039
25 Mansfield Drain at Ranger	0.087	0.046	0.057	5.8E-05	5.8E-05	9.2E-04	0.087	0.046	0.057	0.087	0.046	0.058
1 Lime at Mulberry	0.076	0.040	0.039	5.8E-05	5.4E-10	5.8E-05	0.076	0.040	0.039	0.076	0.040	0.039

September

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.081	0.065	0.063	6.0E-04	5.8E-05	3.8E-04	0.080	0.065	0.062	0.081	0.065	0.063
9 Bean at Dillion	0.093	0.057	0.059	1.1E-03	7.6E-10	5.8E-05	0.092	0.057	0.059	0.094	0.057	0.060
8 Bean at Medina	0.084	0.056	0.060	5.5E-04	7.6E-10	5.8E-05	0.083	0.056	0.060	0.085	0.056	0.060
7 Bean at Bothwell	0.082	0.055	0.060	3.5E-04	7.6E-10	5.8E-05	0.082	0.055	0.060	0.082	0.055	0.061
5 Bean at Bates	0.083	0.058	0.061	3.0E-04	0.0E+00	1.1E-09	0.082	0.058	0.061	0.083	0.058	0.061
6 Covell Drain at Harris	0.100	0.076	0.077	0.0E+00	5.8E-05	1.0E-03	0.100	0.076	0.076	0.100	0.076	0.078
4 Bean at Packard	0.087	0.058	0.061	3.7E-03	7.6E-10	5.8E-05	0.083	0.058	0.061	0.090	0.058	0.061
3 Bean at Lime Creek Hwy	0.085	0.058	0.061	1.3E-03	7.6E-10	1.1E-09	0.084	0.058	0.061	0.086	0.058	0.061
26 Bean at Ridgeville	0.084	0.058	0.061	2.1E-04	7.6E-10	1.1E-09	0.084	0.058	0.061	0.085	0.058	0.061
2 Bean at Mulberry	0.085	0.058	0.061	3.8E-04	7.6E-10	1.1E-09	0.085	0.058	0.061	0.086	0.058	0.061
22 Blanchard Drain at Coman	0.110	0.060		1.5E-03	0.0E+00		0.108	0.060		0.111	0.060	
21 Blanchard Drain at Meridian	0.104	0.054	0.063	1.5E-09	5.8E-05	6.4E-04	0.104	0.054	0.062	0.104	0.055	0.063
20 Blanchard Drain at Munson	0.098	0.052	0.065	2.1E-04	7.6E-10	5.8E-05	0.098	0.052	0.065	0.098	0.052	0.065
19 Blanchard Drain at Ingall	0.079	0.057	0.063	1.7E-03	0.0E+00	1.0E-04	0.077	0.057	0.062	0.081	0.057	0.063
11 Lime at Coman	0.104	0.064	0.068	5.8E-04	5.8E-05	4.9E-04	0.104	0.064	0.067	0.105	0.064	0.068
12 Lime at Tamarack	0.104	0.064	0.067	5.8E-04	4.0E-04	1.0E-04	0.103	0.064	0.067	0.104	0.064	0.067
13 Lime at Lime Creek Drive	0.101	0.058	0.032	1.5E-09	0.0E+00	5.8E-05	0.101	0.058	0.032	0.101	0.058	0.032
14 Lime at Prattville		0.033	0.034		5.8E-05	1.2E-04		0.033	0.034		0.033	0.034
15 Lime at Lime Creek Hwy		0.042	0.046		0.0E+00	7.6E-10		0.042	0.046		0.042	0.046
16 Site A at Lime Creek Hwy			0.048			5.8E-05			0.048			0.048
17 Site B at Lime Creek Hwy	0.075	0.066	0.068	1.2E-04	1.5E-04	5.8E-05	0.075	0.066	0.068	0.075	0.067	0.068
18 Lime at Ingall	0.078	0.053	0.058	5.1E-04	7.6E-10	5.8E-05	0.078	0.053	0.058	0.079	0.053	0.058
23 Lime at White Pine	0.077	0.058	0.059	8.0E-04	0.0E+00	0.0E+00	0.077	0.058	0.059	0.078	0.058	0.059
24 Lime at Ridgeville	0.087	0.059	0.059	1.9E-03	5.8E-05	5.8E-05	0.085	0.059	0.059	0.088	0.059	0.059
25 Mansfield Drain at Ranger	0.095	0.061	0.064	5.7E-04	0.0E+00	5.8E-05	0.094	0.061	0.064	0.095	0.061	0.064
1 Lime at Mulberry	0.076	0.058	0.064	1.5E-04	5.8E-05	2.9E-04	0.076	0.058	0.063	0.076	0.058	0.064

October

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.098	0.061	0.078	5.8E-04	5.8E-05	5.8E-05	0.097	0.061	0.078	0.098	0.061	0.078
9 Bean at Dillion	0.082	0.056	0.067	4.9E-04	7.6E-10	1.1E-09	0.081	0.056	0.067	0.082	0.056	0.067
8 Bean at Medina	0.082	0.056	0.066	1.0E-04	7.6E-10	5.8E-05	0.082	0.056	0.066	0.082	0.056	0.066
7 Bean at Bothwell	0.079	0.056	0.066	2.6E-04	7.6E-10	0.0E+00	0.079	0.056	0.066	0.080	0.056	0.066
5 Bean at Bates	0.081	0.056	0.067	1.2E-04	5.8E-05	1.1E-09	0.081	0.056	0.067	0.081	0.057	0.067
6 Covell Drain at Harris	0.122	0.073	0.092	0.0E+00	5.8E-05	1.5E-09	0.122	0.073	0.092	0.122	0.073	0.092
4 Bean at Packard	0.080	0.056	0.067	1.5E-04	5.8E-05	5.8E-05	0.080	0.056	0.067	0.080	0.057	0.067
3 Bean at Lime Creek Hwy	0.080	0.056	0.067	0.0E+00	5.8E-05	5.8E-05	0.080	0.056	0.067	0.080	0.057	0.067
26 Bean at Ridgeville	0.080	0.056	0.067	1.5E-04	5.8E-05	0.0E+00	0.080	0.056	0.067	0.080	0.056	0.067
2 Bean at Mulberry	0.079	0.056	0.066	5.8E-05	7.6E-10	8.6E-04	0.079	0.056	0.065	0.079	0.056	0.067
22 Blanchard Drain at Coman		0.058			5.8E-05			0.058			0.058	
21 Blanchard Drain at Meridian		0.064	0.085		1.2E-04	6.7E-04		0.064	0.084		0.064	0.086
20 Blanchard Drain at Munson		0.063			1.1E-09			0.063			0.063	
19 Blanchard Drain at Ingall	0.094	0.065	0.075	1.2E-04	1.1E-09	5.9E-04	0.094	0.065	0.074	0.094	0.065	0.075
11 Lime at Coman	0.096	0.070	0.087	1.5E-04	1.1E-09	3.2E-04	0.096	0.070	0.086	0.096	0.070	0.087
12 Lime at Tamarack	0.102	0.077	0.090	0.0E+00	5.8E-05	1.0E-04	0.102	0.077	0.090	0.102	0.077	0.090
13 Lime at Lime Creek Drive	0.102	0.073	0.040	0.0E+00	0.0E+00	5.8E-05	0.102	0.073	0.040	0.102	0.073	0.041
14 Lime at Prattville		0.038	0.041		7.6E-10	0.0E+00		0.038	0.041		0.038	0.041
15 Lime at Lime Creek Hwy		0.050	0.056		5.8E-05	7.6E-10		0.050	0.056		0.050	0.056
16 Site A at Lime Creek Hwy	0.108		0.072	5.8E-04		1.0E-04	0.108		0.072	0.109		0.072
17 Site B at Lime Creek Hwy	0.088	0.069	0.105	3.2E-04	5.8E-05	5.8E-04	0.088	0.069	0.105	0.088	0.069	0.106
18 Lime at Ingall	0.081	0.059	0.070	4.9E-04	0.0E+00	1.5E-04	0.081	0.059	0.070	0.082	0.059	0.071
23 Lime at White Pine	0.084	0.061	0.072	5.3E-04	5.8E-05	5.8E-05	0.083	0.061	0.072	0.084	0.061	0.072
24 Lime at Ridgeville	0.087	0.062	0.073	1.1E-03	1.1E-09	5.8E-05	0.086	0.062	0.073	0.088	0.062	0.073
25 Mansfield Drain at Ranger	0.092	0.063	0.077	1.7E-04	1.1E-09	5.8E-05	0.092	0.063	0.077	0.092	0.063	0.077
1 Lime at Mulberry	0.087	0.062	0.072	2.1E-04	5.8E-05	3.5E-04	0.086	0.062	0.072	0.087	0.062	0.073

November

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.102	0.055	0.081	0.0E+00	7.6E-10	3.5E-04	0.102	0.055	0.081	0.102	0.055	0.082
9 Bean at Dillion	0.086	0.054	0.078	0.0E+00	7.6E-10	4.0E-04	0.086	0.054	0.077	0.086	0.054	0.078
8 Bean at Medina	0.085	0.054	0.079	3.1E-04	5.8E-05	1.2E-04	0.085	0.054	0.079	0.086	0.055	0.079
7 Bean at Bothwell	0.086	0.055	0.129	1.2E-04	5.8E-05	2.2E-09	0.086	0.055	0.129	0.086	0.055	0.129
5 Bean at Bates	0.086	0.055	0.134	5.8E-05	2.1E-04	5.8E-04	0.086	0.055	0.133	0.086	0.055	0.134
6 Covell Drain at Harris	0.125	0.070	0.164	5.8E-04	1.1E-09	2.6E-03	0.125	0.070	0.162	0.126	0.070	0.167
4 Bean at Packard	0.086	0.055	0.137	5.8E-05	5.8E-05	5.8E-04	0.086	0.055	0.136	0.086	0.055	0.137
3 Bean at Lime Creek Hwy	0.087	0.055	0.136	5.8E-05	0.0E+00	5.8E-04	0.087	0.055	0.136	0.087	0.055	0.137
26 Bean at Ridgeville	0.087	0.055	0.137	1.5E-09	1.1E-09	5.8E-04	0.087	0.055	0.136	0.087	0.055	0.137
2 Bean at Mulberry	0.087	0.056	0.088	1.2E-04	7.6E-10	1.6E-03	0.087	0.056	0.086	0.087	0.056	0.089
22 Blanchard Drain at Coman		0.059	0.158		5.8E-05	4.4E-03		0.059	0.155		0.059	0.163
21 Blanchard Drain at Meridian		0.060	0.143		0.0E+00	2.0E-03		0.060	0.141		0.060	0.145
20 Blanchard Drain at Munson	0.110	0.061	0.091	1.5E-09	0.0E+00	1.6E-03	0.110	0.061	0.090	0.110	0.061	0.093
19 Blanchard Drain at Ingall	0.102	0.061	0.142	0.0E+00	1.1E-09	1.0E-03	0.102	0.061	0.141	0.102	0.061	0.143
11 Lime at Coman	0.107	0.062	0.176	5.8E-04	3.0E-04	2.6E-03	0.107	0.062	0.173	0.108	0.063	0.178
12 Lime at Tamarack	0.112	0.065	0.166	1.5E-09	1.1E-09	1.0E-03	0.112	0.065	0.165	0.112	0.065	0.167
13 Lime at Lime Creek Drive	0.108	0.065	0.160	5.8E-04	1.1E-09	1.0E-03	0.108	0.065	0.159	0.109	0.065	0.161
14 Lime at Prattville		0.039	0.068		5.8E-05	1.1E-03		0.039	0.067		0.039	0.069
15 Lime at Lime Creek Hwy		0.045	0.067		0.0E+00	6.2E-04		0.045	0.067		0.045	0.068
16 Site A at Lime Creek Hwy			0.070			3.8E-04			0.070			0.071
17 Site B at Lime Creek Hwy	0.104	0.063	0.141	5.8E-04	0.0E+00	5.8E-04	0.103	0.063	0.140	0.104	0.063	0.141
18 Lime at Ingall	0.083	0.053	0.075	3.7E-03	1.1E-09	1.5E-04	0.079	0.053	0.075	0.086	0.053	0.075
23 Lime at White Pine	0.085	0.056	0.079	7.6E-03	5.8E-05	3.5E-04	0.079	0.056	0.079	0.094	0.056	0.079
24 Lime at Ridgeville	0.093	0.057	0.080	1.3E-03	5.8E-05	2.6E-04	0.091	0.057	0.080	0.094	0.057	0.080
25 Mansfield Drain at Ranger	0.101	0.053	0.160	5.8E-04	7.6E-10	1.0E-03	0.101	0.053	0.159	0.102	0.053	0.161
1 Lime at Mulberry	0.082	0.056	0.128	1.1E-02	7.6E-10	1.0E-03	0.074	0.056	0.127	0.095	0.056	0.129

December

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		0.051	0.050		1.1E-09	3.4E-04		0.051	0.049		0.051	0.050
9 Bean at Dillion	0.090	0.051	0.056	1.5E-09	7.6E-10	3.1E-04	0.090	0.051	0.055	0.090	0.051	0.056
8 Bean at Medina	0.090	0.051	0.055	1.5E-09	5.8E-05	9.6E-05	0.090	0.051	0.055	0.090	0.051	0.055
7 Bean at Bothwell	0.090	0.051	0.058	1.5E-09	0.0E+00	3.5E-04	0.090	0.051	0.057	0.090	0.051	0.058
5 Bean at Bates	0.090	0.051	0.057	1.5E-09	7.6E-10	4.5E-04	0.090	0.051	0.057	0.090	0.051	0.058
6 Covell Drain at Harris	0.120	0.065	0.100	0.0E+00	0.0E+00	2.1E-03	0.120	0.065	0.098	0.120	0.065	0.102
4 Bean at Packard	0.090	0.052	0.070	1.5E-09	7.6E-10	1.8E-02	0.090	0.052	0.060	0.090	0.052	0.090
3 Bean at Lime Creek Hwy	0.090	0.052	0.097	1.5E-09	7.6E-10	1.0E-03	0.090	0.052	0.096	0.090	0.052	0.098
26 Bean at Ridgeville	0.090	0.052	0.092	1.5E-09	7.6E-10	5.8E-04	0.090	0.052	0.092	0.090	0.052	0.093
2 Bean at Mulberry	0.090	0.052	0.092	1.5E-09	0.0E+00	1.5E-09	0.090	0.052	0.092	0.090	0.052	0.092
22 Blanchard Drain at Coman		0.057	0.043		5.8E-05	2.3E-04		0.057	0.043		0.057	0.043
21 Blanchard Drain at Meridian		0.059	0.048		1.0E-04	2.1E-04		0.058	0.048		0.059	0.049
20 Blanchard Drain at Munson		0.060	0.049		0.0E+00	2.1E-04		0.060	0.049		0.060	0.050
19 Blanchard Drain at Ingall		0.060	0.050		0.0E+00	7.6E-10		0.060	0.050		0.060	0.050
11 Lime at Coman	0.110	0.060	0.348	1.5E-09	4.4E-04	4.9E-01	0.110	0.060	0.063	0.110	0.061	0.916
12 Lime at Tamarack	0.100	0.067	0.075	0.0E+00	1.1E-09	6.1E-04	0.100	0.067	0.075	0.100	0.067	0.076
13 Lime at Lime Creek Drive	0.110	0.067	0.028	1.5E-09	1.1E-09	2.9E-02	0.110	0.067	0.005	0.110	0.067	0.061
14 Lime at Prattville	0.050	0.040	0.046	0.0E+00	5.8E-05	4.5E-04	0.050	0.040	0.046	0.050	0.040	0.046
15 Lime at Lime Creek Hwy		0.045	0.046		5.8E-05	7.6E-10		0.045	0.046		0.045	0.046
16 Site A at Lime Creek Hwy			0.047			5.8E-05			0.047			0.047
17 Site B at Lime Creek Hwy		0.062	0.061		5.8E-05	2.5E-04		0.062	0.061		0.062	0.062
18 Lime at Ingall	0.090	0.052	0.051	1.5E-09	7.6E-10	1.4E-04	0.090	0.052	0.051	0.090	0.052	0.051
23 Lime at White Pine		0.055	0.050		5.8E-05	5.8E-05		0.055	0.050		0.055	0.050
24 Lime at Ridgeville		0.055	0.054		7.6E-10	5.8E-05		0.055	0.054		0.055	0.054
25 Mansfield Drain at Ranger		0.046	0.052		7.6E-10	5.8E-05		0.046	0.052		0.046	0.052
1 Lime at Mulberry	0.100	0.054	0.104	0.0E+00	5.8E-05	5.8E-04	0.100	0.054	0.103	0.100	0.054	0.104

32 Month Baseline Statistical Analysis
April 2005 - September 2007
All Sites by Month

Dissolved Oxygen (mg/L)

January

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion		8.97	1.66		0.04	0.01		8.87	1.66		8.94	1.67
9 Bean at Dillion		9.25	11.82		0.06	0.25		8.94	11.65		9.60	12.11
8 Bean at Medina		8.85	11.78		0.06	0.04		8.82	11.74		8.92	11.81
7 Bean at Bothwell		8.95	12.53		0.08	0.05		8.88	12.10		9.40	12.11
5 Bean at Bates		8.91	11.92		0.09	0.09		8.86	11.82		9.10	11.97
6 Covell Drain at Harris		8.23	1.54		0.06	0.04		8.15	1.50		8.27	1.58
4 Bean at Packard		8.87	12.28		0.01	0.07		8.80	12.21		8.81	12.34
3 Bean at Lime Creek Hwy		8.87	12.67		0.06	0.10		8.83	12.49		8.94	12.69
26 Bean at Ridgeville		8.87	11.59		0.06	0.07		8.81	11.52		8.91	11.65
2 Bean at Mulberry		8.59	11.79		0.09	0.19		8.49	11.59		8.67	11.96
22 Blanchard Drain at Coman		7.43	8.13		0.03	0.05		7.40	8.90		7.45	8.19
21 Blanchard Drain at Meridian		8.87	11.24		0.12	0.08		8.69	11.15		8.93	11.31
20 Blanchard Drain at Munson		8.55	11.17		0.05	0.04		8.50	11.12		8.60	11.20
19 Blanchard Drain at Ingall		8.93	11.26		0.04	0.07		8.90	11.20		8.97	11.34
11 Lime at Coman		9.87	9.76		0.04	0.04		9.83	9.73		9.90	9.81
12 Lime at Tamarack		8.82	1.43		0.06	0.03		8.77	1.38		8.89	1.43
13 Lime at Lime Creek Drive		9.20	1.86		0.03	0.12		8.99	1.78		9.40	11.00
14 Lime at Prattville		7.34	8.63		0.06	0.07		7.29	8.00		7.40	8.14
15 Lime at Lime Creek Hwy		8.98	11.33		0.06	0.04		8.92	1.99		9.30	11.60
16 Site A at Lime Creek Hwy		8.67			0.06			8.61			8.71	
17 Site B at Lime Creek Hwy		8.83	1.86		0.06	0.05		8.77	1.80		8.88	1.90
18 Lime at Ingall		8.88	1.87		0.04	0.03		8.85	1.85		8.93	1.90
23 Lime at White Pine		8.94	11.33		0.08	0.03		8.86	11.31		9.10	11.36
24 Lime at Ridgeville		8.91	1.75		0.08	0.03		8.85	1.73		9.00	1.78
25 Mansfield Drain at Ranger		8.68	1.17		0.12	0.06		8.61	1.11		8.81	1.22
1 Lime at Mulberry		8.87	1.79		0.02	0.15		8.85	1.65		8.89	1.95

February

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion		8.92	8.68		0.05	0.03		8.87	8.66		8.96	8.71
9 Bean at Dillion		8.77	8.21		0.03	0.04		8.75	8.16		8.80	8.24
8 Bean at Medina		8.61			0.03			8.58			8.64	
7 Bean at Bothwell		8.76	7.96		0.09	0.10		8.66	7.86		8.84	8.60
5 Bean at Bates		8.73	8.63		0.08	0.07		8.68	8.10		8.82	8.14
6 Covell Drain at Harris		8.16	9.42		0.04	0.06		8.13	9.36		8.21	9.47
4 Bean at Packard		8.63	8.15		0.05	0.08		8.54	8.60		8.65	8.20
3 Bean at Lime Creek Hwy		8.61	8.26		0.06	0.05		8.55	8.21		8.66	8.31
26 Bean at Ridgeville		8.66	8.42		0.08	0.07		8.57	8.36		8.71	8.50
2 Bean at Mulberry		8.64	8.34		0.05	0.08		8.60	8.27		8.70	8.42
22 Blanchard Drain at Coman		9.49			0.02			9.48			9.51	
21 Blanchard Drain at Meridian		9.35	7.45		0.01	0.13		9.34	7.33		9.36	7.58
20 Blanchard Drain at Munson		9.14	9.16		0.04	0.01		9.10	9.15		9.18	9.17
19 Blanchard Drain at Ingall		8.88			0.04			8.85			8.92	
11 Lime at Coman		9.66	5.18		0.09	0.14		9.55	5.80		9.73	5.34
12 Lime at Tamarack		1.43	7.57		0.04	0.04		1.37	7.52		1.45	7.59
13 Lime at Lime Creek Drive		9.51			0.05			9.46			9.55	
14 Lime at Prattville		8.47	5.45		0.02	0.07		8.39	5.37		8.43	5.51
15 Lime at Lime Creek Hwy		9.41			0.02			9.40			9.43	
16 Site A at Lime Creek Hwy		9.14			0.08			9.50			9.19	
17 Site B at Lime Creek Hwy		8.85	8.46		0.04	0.11		8.82	8.34		8.89	8.54
18 Lime at Ingall		8.79	9.46		0.02	0.06		8.77	9.41		8.81	9.52
23 Lime at White Pine		8.95			0.08			8.90			9.50	
24 Lime at Ridgeville		8.62	7.83		0.08	0.13		8.53	6.96		8.68	7.22
25 Mansfield Drain at Ranger		8.53	9.46		0.03	0.04		8.50	9.43		8.56	9.51
1 Lime at Mulberry		8.66	7.72		0.01	0.06		8.65	7.67		8.67	7.79

March

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion		5.99	1.26		0.02	0.01		5.97	1.26		6.00	1.27
9 Bean at Dillion		5.72	9.91		0.05	0.01		5.68	9.90		5.77	9.92
8 Bean at Medina		5.72	9.73		0.07	0.05		5.65	9.66		5.79	9.76
7 Bean at Bothwell		5.80	9.87		0.05	0.01		5.75	9.87		5.84	9.88
5 Bean at Bates		5.88	9.80		0.08	0.03		5.80	9.78		5.96	9.83
6 Covell Drain at Harris		5.97	1.79		0.01	0.01		5.96	1.78		5.97	1.80
4 Bean at Packard		5.75	9.66		0.01	0.05		5.75	9.63		5.76	9.71
3 Bean at Lime Creek Hwy		5.78	9.71		0.03	0.02		5.76	9.70		5.81	9.73
26 Bean at Ridgeville		5.79	9.83		0.01	0.02		5.78	9.79		5.80	9.82
2 Bean at Mulberry		5.73	9.75		0.03	0.01		5.68	9.74		5.73	9.76
22 Blanchard Drain at Coman		8.67	1.32		0.02	0.01		7.98	1.32		8.20	1.33
21 Blanchard Drain at Meridian		8.26	9.35		0.04	0.01		8.23	9.35		8.30	9.36
20 Blanchard Drain at Munson		8.43	8.83		0.02	0.01		8.41	8.82		8.45	8.84
19 Blanchard Drain at Ingall		7.22	8.93		0.03	0.01		7.19	8.90		7.25	8.10
11 Lime at Coman		8.31	17.91		0.03	0.38		8.29	17.59		8.35	18.33
12 Lime at Tamarack		9.69	16.52		0.03	0.03		9.66	16.49		9.71	16.55
13 Lime at Lime Creek Drive		7.19	9.79		0.02	0.03		7.17	9.77		7.21	9.82
14 Lime at Prattville		6.12	4.91		0.05	0.03		6.70	4.89		6.17	4.95
15 Lime at Lime Creek Hwy		6.71	9.42		0.00	0.01		6.71	9.42		6.71	9.43
16 Site A at Lime Creek Hwy			8.22			0.01			8.21			8.23
17 Site B at Lime Creek Hwy		7.28	1.30		0.03	0.04		7.26	1.00		7.31	1.70
18 Lime at Ingall		6.52	8.18		0.03	0.09		6.49	8.80		6.54	8.26
23 Lime at White Pine		7.29	8.13		0.01	0.03		7.28	8.10		7.30	8.15
24 Lime at Ridgeville		6.52	7.29		0.05	0.06		6.46	7.24		6.59	7.35
25 Mansfield Drain at Ranger		6.61	7.94		0.02	0.04		6.59	7.90		6.63	7.98
1 Lime at Mulberry		6.54	7.28		0.00	0.03		6.54	7.25		6.54	7.31

April

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion	6.67	3.56	1.38	0.15	0.02	0.01	6.50	3.55	1.37	6.80	3.58	1.39
9 Bean at Dillion	7.40	3.24	9.93	0.40	0.05	0.02	7.00	3.20	9.89	7.80	3.29	9.93
8 Bean at Medina	7.26	3.54	9.29	0.25	0.04	0.02	6.90	3.50	9.27	7.60	3.58	9.30
7 Bean at Bothwell	7.33	3.39	9.59	0.15	0.03	0.01	7.20	3.37	9.59	7.50	3.43	9.60
5 Bean at Bates	7.60	3.86	9.55	0.19	0.04	0.01	7.30	3.83	9.55	7.80	3.91	9.56
6 Covell Drain at Harris	6.53	4.42	1.39	0.21	0.06	0.02	6.30	4.37	1.37	6.70	4.48	1.41
4 Bean at Packard	7.38	3.63	9.24	0.23	0.01	0.02	6.90	3.62	9.23	7.60	3.63	9.26
3 Bean at Lime Creek Hwy	7.49	3.23	9.29	0.13	0.07	0.02	7.20	3.16	9.27	7.60	3.29	9.31
26 Bean at Ridgeville	7.49	3.38	9.34	0.27	0.01	0.03	7.10	3.37	9.32	7.80	3.39	9.37
2 Bean at Mulberry	5.95	3.33	9.30	0.62	0.08	0.00	4.80	3.26	9.30	6.40	3.39	9.30
22 Blanchard Drain at Coman	6.97	3.43	9.92	0.90	0.19	0.03	6.10	3.25	9.90	7.90	3.62	9.95
21 Blanchard Drain at Meridian	6.80	3.84	11.10	0.26	0.03	0.03	6.50	3.81	1.98	7.00	3.87	11.40
20 Blanchard Drain at Munson	6.17	3.74	9.74	0.50	0.05	0.06	5.70	3.69	9.68	6.70	3.78	9.79
19 Blanchard Drain at Ingall	7.13	3.78	9.53	0.55	0.04	0.02	6.60	3.74	9.51	7.70	3.81	9.54
11 Lime at Coman	6.97	5.47	19.99	0.90	0.06	0.00	6.10	4.99	19.99	7.90	5.10	19.99
12 Lime at Tamarack	7.97	4.46	19.99	1.25	0.05	0.00	6.70	4.42	19.99	9.20	4.51	19.99
13 Lime at Lime Creek Drive	7.13	3.98	13.47	0.35	0.04	0.04	6.80	3.94	13.45	7.50	4.10	13.52
14 Lime at Prattville	6.90	3.51	14.20	0.36	0.01	0.06	6.50	3.50	14.14	7.20	3.52	14.25
15 Lime at Lime Creek Hwy	7.67	3.51	1.67	0.51	0.04	0.01	6.50	3.48	1.66	7.50	3.55	1.68
16 Site A at Lime Creek Hwy	7.10		1.14	0.56		0.01	6.50		1.13	7.60		1.15
17 Site B at Lime Creek Hwy	7.30	4.14	13.36	0.35	0.05	0.02	6.90	4.11	13.34	7.50	4.20	13.38
18 Lime at Ingall	8.50	4.63	9.65	0.13	0.02	0.03	7.80	4.50	9.61	8.20	4.80	9.67
23 Lime at White Pine	8.46	4.44	9.41	0.24	0.01	0.02	7.90	4.43	9.39	8.70	4.45	9.42
24 Lime at Ridgeville	7.56	3.87	8.60	0.37	0.01	0.01	6.90	3.86	8.59	7.90	3.88	8.61
25 Mansfield Drain at Ranger	6.90	3.92	8.34	0.40	0.00	0.02	6.50	3.92	8.32	7.30	3.92	8.35
1 Lime at Mulberry	6.10	3.83	8.50	0.61	0.02	0.03	5.40	3.81	8.47	6.50	3.84	8.53

May

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion	8.53	7.77	6.41	0.13	0.01	0.04	8.40	7.76	6.38	8.66	7.78	6.45
9 Bean at Dillion	8.74	8.64	7.42	0.02	0.01	0.01	8.72	8.64	7.41	8.77	8.65	7.43
8 Bean at Medina	8.58	8.29	7.41	0.16	0.02	0.01	8.44	8.28	7.40	8.80	8.31	7.42
7 Bean at Bothwell	9.31	9.12	8.30	0.04	0.02	0.01	9.26	9.10	8.20	9.35	9.13	8.40
5 Bean at Bates	8.35	8.60	7.53	0.07	0.01	0.13	8.28	8.59	7.38	8.45	8.61	7.62
6 Covell Drain at Harris	9.84	8.73	8.16	0.11	0.01	0.01	9.71	8.73	8.15	9.93	8.74	8.17
4 Bean at Packard	8.18	8.33	7.38	0.13	0.01	0.01	8.80	8.32	7.37	8.35	8.34	7.39
3 Bean at Lime Creek Hwy	8.53	8.25	7.70	0.15	0.01	0.02	8.41	8.24	7.68	8.74	8.26	7.71
26 Bean at Ridgeville	8.64	8.29	7.81	0.08	0.01	0.02	8.58	8.28	7.80	8.76	8.29	7.83
2 Bean at Mulberry	8.57	8.39	7.87	0.08	0.03	0.01	8.49	8.36	7.80	8.66	8.41	7.81
22 Blanchard Drain at Coman	13.75	13.40		0.77	0.01		12.94	13.30		14.48	13.50	
21 Blanchard Drain at Meridian	9.31	1.33	11.13	0.20	0.08	0.04	9.90	1.26	11.10	9.47	1.42	11.17
20 Blanchard Drain at Munson	11.70	1.38	11.61	0.32	0.02	0.06	11.39	1.36	11.55	12.20	1.40	11.67
19 Blanchard Drain at Ingall	8.83	8.21	9.74	0.05	0.04	0.02	8.78	8.18	9.72	8.87	8.26	9.76
11 Lime at Coman	11.82	14.96	11.81	0.61	0.41	0.15	1.96	14.68	11.67	12.59	15.43	11.97
12 Lime at Tamarack	13.18	11.49	9.98	0.02	0.01	0.02	13.16	11.48	9.96	13.19	11.49	9.99
13 Lime at Lime Creek Drive	8.60	8.73	8.67	0.08	0.02	0.04	8.51	8.71	8.63	8.66	8.74	8.71
14 Lime at Prattville	7.42	1.62	5.85	0.02	0.00	0.03	7.41	1.62	5.82	7.44	1.62	5.87
15 Lime at Lime Creek Hwy	8.89	9.57	11.97	0.02	0.01	0.05	8.87	9.50	11.50	8.90	9.52	11.15
16 Site A at Lime Creek Hwy	15.51	8.55		0.36	0.02		15.11	8.53		15.78	8.56	
17 Site B at Lime Creek Hwy	9.79	9.88	7.91	0.02	0.01	0.09	9.77	9.87	7.83	9.80	9.89	8.10
18 Lime at Ingall	7.70	8.11	7.34	0.05	0.01	0.03	7.63	8.10	7.32	7.74	8.12	7.37
23 Lime at White Pine	8.48	8.43	8.51	0.04	0.02	0.01	8.43	8.30	8.51	8.53	8.60	8.52
24 Lime at Ridgeville	7.20	7.70	8.48	0.03	0.01	0.01	7.17	7.69	8.47	7.23	7.71	8.49
25 Mansfield Drain at Ranger	7.93	8.48	8.43	0.04	0.03	0.02	7.88	8.45	8.30	7.96	8.51	8.70
1 Lime at Mulberry	8.70	8.34	8.63	0.03	0.01	0.04	8.50	8.33	8.30	8.10	8.35	8.10

June

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion	7.43	7.50	7.23	0.04	0.01	0.14	7.40	7.49	7.90	7.47	7.51	7.37
9 Bean at Dillion	8.36	8.86	9.39	0.26	0.04	0.02	8.80	8.82	9.37	8.59	8.89	9.40
8 Bean at Medina	8.22	8.56	9.26	0.15	0.01	0.03	8.60	8.55	9.23	8.36	8.56	9.28
7 Bean at Bothwell	8.93	8.75	1.34	0.12	0.00	0.00	8.84	8.75	1.34	9.60	8.75	1.34
5 Bean at Bates	7.49	8.66	8.29	0.04	0.01	0.02	7.45	8.65	8.28	7.52	8.66	8.31
6 Covell Drain at Harris	8.22	8.30	9.29	0.57	0.04	0.04	7.65	8.00	9.24	8.79	8.70	9.31
4 Bean at Packard	7.62	8.47	8.69	0.05	0.02	0.01	7.57	8.45	8.68	7.66	8.49	8.69
3 Bean at Lime Creek Hwy	7.77	8.45	8.42	0.05	0.00	0.01	7.74	8.45	8.41	7.83	8.45	8.43
26 Bean at Ridgeville	8.33	8.51	8.43	0.83	0.02	0.02	7.60	8.50	8.41	8.61	8.54	8.44
2 Bean at Mulberry	7.50	8.55	8.28	0.06	0.02	0.08	6.98	8.54	8.21	7.90	8.57	8.36
22 Blanchard Drain at Coman		8.35			0.02			8.34			8.37	
21 Blanchard Drain at Meridian	11.43	9.39	1.63	0.33	0.02	0.05	11.50	9.37	1.20	11.66	9.41	1.11
20 Blanchard Drain at Munson	8.76	11.89	11.20	2.08	0.01	0.03	6.37	11.89	1.99	1.15	11.90	11.50
19 Blanchard Drain at Ingall	8.60	9.30	11.25	0.13	0.00	0.03	7.91	9.30	11.23	8.16	9.30	11.29
11 Lime at Coman	8.35	1.87	13.67	0.54	0.12	0.39	7.95	9.96	12.61	8.97	1.19	13.38
12 Lime at Tamarack	1.51	8.78	5.24	0.56	0.01	0.06	9.87	8.77	5.18	1.88	8.79	5.29
13 Lime at Lime Creek Drive	7.63	8.74	1.93	0.17	0.01	0.03	7.44	8.74	1.90	7.75	8.75	1.96
14 Lime at Prattville	3.12	11.34	2.19	0.26	0.01	0.14	2.89	11.34	2.90	3.40	11.35	2.35
15 Lime at Lime Creek Hwy		9.67			0.01			9.67			9.68	
16 Site A at Lime Creek Hwy		7.33			0.03			7.30			7.35	
17 Site B at Lime Creek Hwy	7.47	7.95	11.19	0.06	0.03	0.02	7.40	7.92	11.18	7.51	7.97	11.21
18 Lime at Ingall	6.40	8.73	8.77	0.26	0.01	0.14	5.89	8.60	8.61	6.34	8.80	8.89
23 Lime at White Pine	6.78	8.57	11.83	0.05	0.02	0.01	6.74	8.55	11.82	6.83	8.58	11.84
24 Lime at Ridgeville	5.98	8.24	11.39	0.19	0.03	0.03	5.85	8.21	11.36	6.20	8.27	11.41
25 Mansfield Drain at Ranger	7.17	9.87	12.17	0.14	0.04	0.05	7.30	9.50	11.97	7.30	9.13	12.70
1 Lime at Mulberry	6.99	8.64	12.71	0.15	0.01	0.02	6.82	8.63	12.70	7.90	8.64	12.73

July

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion	4.39	7.73	8.22	0.02	0.05	0.09	4.38	7.30	8.12	4.41	7.13	8.28
9 Bean at Dillion	4.67	8.24	1.37	0.04	0.02	0.01	4.64	8.22	1.30	4.71	8.26	1.50
8 Bean at Medina	4.50	8.67	9.84	0.01	0.02	0.07	4.49	8.50	9.76	4.51	8.80	9.90
7 Bean at Bothwell	4.69	8.16	1.25	0.04	0.01	0.04	4.66	8.16	1.20	4.73	8.17	1.30
5 Bean at Bates	4.51	7.88	8.93	0.05	0.02	0.06	4.47	7.87	8.89	4.56	7.90	9.00
6 Covell Drain at Harris	5.14	7.84	1.87	0.09	0.02	0.04	5.50	7.82	1.50	5.23	7.86	1.13
4 Bean at Packard	4.36	7.73	9.64	0.02	0.00	0.02	4.34	7.73	9.62	4.38	7.73	9.66
3 Bean at Lime Creek Hwy	4.53	8.13	9.57	0.08	0.03	0.02	4.46	7.99	9.55	4.61	8.40	9.59
26 Bean at Ridgeville	4.47	8.17	9.39	0.01	0.02	0.01	4.46	8.90	9.38	4.48	8.13	9.40
2 Bean at Mulberry	4.35	8.18	7.92	0.03	0.01	0.02	4.33	8.17	7.90	4.39	8.19	7.94
22 Blanchard Drain at Coman	4.62	7.73		0.03	0.01		4.60	7.70		4.65	7.71	
21 Blanchard Drain at Meridian	5.68	8.70	6.94	0.02	0.02	0.04	5.66	8.68	6.90	5.70	8.71	6.98
20 Blanchard Drain at Munson	6.46	8.45	7.12	0.03	0.02	0.01	6.43	8.43	7.12	6.48	8.46	7.13
19 Blanchard Drain at Ingall	4.95	8.47	1.71	0.01	0.01	0.03	4.94	8.46	1.68	4.96	8.47	1.74
11 Lime at Coman	3.63	8.96	1.96	0.02	0.16	0.04	3.60	8.78	1.93	3.64	9.90	11.00
12 Lime at Tamarack	5.37	9.35	5.65	0.01	0.01	0.01	5.36	9.35	5.64	5.38	9.36	5.66
13 Lime at Lime Creek Drive	5.17	8.79	8.46	0.02	0.01	0.01	5.16	8.78	8.45	5.19	8.80	8.46
14 Lime at Prattville	3.96	11.66	5.54	0.02	0.02	0.18	3.94	11.64	5.34	3.97	11.68	5.69
15 Lime at Lime Creek Hwy	4.52	8.65		0.03	0.01		4.49	8.64		4.55	8.66	
16 Site A at Lime Creek Hwy		6.44			0.01			6.44			6.45	
17 Site B at Lime Creek Hwy	4.88	8.13	9.92	0.01	0.02	0.02	4.88	8.12	9.91	4.89	8.15	9.94
18 Lime at Ingall	4.30	7.42	9.58	0.02	0.02	0.06	4.28	7.41	9.51	4.32	7.44	9.62
23 Lime at White Pine	4.50	7.86	9.37	0.05	0.02	0.03	4.46	7.84	9.35	4.55	7.88	9.40
24 Lime at Ridgeville	4.44	7.61	9.61	0.05	0.07	0.02	4.39	7.55	9.60	4.49	7.68	9.63
25 Mansfield Drain at Ranger	4.73	8.36	9.54	0.03	0.01	0.04	4.70	8.36	9.50	4.76	8.37	9.57
1 Lime at Mulberry	4.49	7.81	9.78	0.02	0.08	0.06	4.47	7.73	9.75	4.51	7.89	9.85

August

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion	7.53	8.79	6.78	0.10	0.04	0.09	6.95	8.76	6.69	7.14	8.83	6.87
9 Bean at Dillion	7.75	9.49	6.86	0.03	0.03	0.09	7.73	9.46	6.78	7.78	9.52	6.95
8 Bean at Medina	7.64	9.27	6.83	0.05	0.06	0.03	7.59	9.21	6.81	7.68	9.32	6.86
7 Bean at Bothwell	8.33	9.49	6.98	0.05	0.05	0.04	7.99	9.45	6.95	8.80	9.54	7.20
5 Bean at Bates	7.43	9.17	7.60	0.03	0.04	0.04	7.40	9.13	7.30	7.45	9.21	7.10
6 Covell Drain at Harris	8.97	8.84	6.88	0.03	0.05	0.06	8.70	8.78	6.82	8.13	8.87	6.94
4 Bean at Packard	7.88	9.39	7.17	0.07	0.02	0.12	7.82	9.37	7.60	7.95	9.41	7.30
3 Bean at Lime Creek Hwy	7.87	9.67	7.16	0.02	0.02	0.07	7.79	9.65	7.90	7.83	9.68	7.23
26 Bean at Ridgeville	7.92	9.63	7.32	0.03	0.03	0.07	7.90	9.61	7.26	7.95	9.67	7.39
2 Bean at Mulberry	7.94	9.65	8.16	0.06	0.01	0.09	7.87	9.64	8.70	7.98	9.66	8.25
22 Blanchard Drain at Coman		7.42	4.20		0.01	0.25		7.41	4.30		7.42	4.49
21 Blanchard Drain at Meridian		7.82	5.14		0.02	0.13		7.81	5.20		7.84	5.28
20 Blanchard Drain at Munson	3.43	7.77	5.97	0.03	0.02	0.04	3.40	7.75	5.94	3.45	7.79	6.20
19 Blanchard Drain at Ingall	6.97	8.99	7.23	0.11	0.03	0.07	5.98	8.96	7.14	6.19	9.10	7.27
11 Lime at Coman	6.00	7.93	4.72	0.07	0.07	0.07	5.94	7.88	4.67	6.70	8.10	4.80
12 Lime at Tamarack	3.49	7.31	6.23	0.03	0.07	0.39	3.46	7.24	5.93	3.52	7.37	6.67
13 Lime at Lime Creek Drive	7.58	8.23	6.97	0.06	0.03	0.05	7.53	8.21	6.92	7.65	8.27	7.20
14 Lime at Prattville	2.93	6.72	8.93	0.06	0.01	0.04	2.87	6.71	8.50	2.99	6.73	8.13
15 Lime at Lime Creek Hwy		9.38	7.63		0.01	0.06		9.37	7.10		9.39	7.13
16 Site A at Lime Creek Hwy	5.62		7.19	0.08		0.13	5.54		7.10	5.69		7.34
17 Site B at Lime Creek Hwy	6.81	8.41	7.23	0.02	0.02	0.08	6.80	8.39	7.12	6.84	8.43	7.28
18 Lime at Ingall	7.53	8.23	7.17	0.18	0.03	0.13	7.32	8.18	7.40	7.66	8.24	7.29
23 Lime at White Pine	7.59	8.92	7.14	0.13	0.02	0.10	7.50	8.90	7.50	7.73	8.94	7.25
24 Lime at Ridgeville	6.65	8.44	6.90	0.03	0.03	0.05	6.62	8.42	6.85	6.67	8.48	6.95
25 Mansfield Drain at Ranger	7.86	8.50	7.80	0.01	0.01	0.03	7.85	8.49	7.60	7.87	8.51	7.11
1 Lime at Mulberry	7.19	9.43	7.39	0.05	0.03	0.10	7.15	9.20	7.29	7.24	9.80	7.49

September

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion	7.57	12.81	8.15	0.02	0.03	0.09	7.40	12.78	8.90	7.70	12.83	8.25
9 Bean at Dillion	7.90	13.77	9.36	0.02	0.02	0.39	7.89	13.75	8.93	7.92	13.79	9.69
8 Bean at Medina	7.80	13.72	8.73	0.03	0.01	0.00	7.77	13.71	8.73	7.83	13.72	8.73
7 Bean at Bothwell	8.27	14.12	8.83	0.03	0.00	0.03	8.00	14.12	8.81	8.60	14.12	8.87
5 Bean at Bates	7.67	13.81	8.39	0.03	0.02	0.07	7.64	13.80	8.33	7.70	13.83	8.47
6 Covell Drain at Harris	7.37	14.48	8.77	0.01	0.02	0.20	7.36	14.47	8.59	7.38	14.50	8.99
4 Bean at Packard	7.58	14.10	8.53	0.01	0.02	0.10	7.57	14.00	8.44	7.59	14.30	8.64
3 Bean at Lime Creek Hwy	7.97	13.87	9.76	0.01	0.01	0.14	7.96	13.86	9.63	7.98	13.88	9.90
26 Bean at Ridgeville	8.43	13.54	9.33	0.02	0.03	0.02	8.20	13.52	9.31	8.60	13.57	9.35
2 Bean at Mulberry	8.73	13.87	9.72	0.02	0.02	0.41	8.60	13.85	9.39	8.90	13.88	1.18
22 Blanchard Drain at Coman	6.88	12.57		0.01	0.01		6.87	12.57		6.89	12.58	
21 Blanchard Drain at Meridian	7.67	14.44	8.86	0.03	0.03	0.06	7.58	14.40	8.81	7.63	14.46	8.93
20 Blanchard Drain at Munson	8.33	14.82	9.23	0.02	0.02	0.03	7.99	14.81	9.20	8.20	14.84	9.26
19 Blanchard Drain at Ingall	7.37	14.43	9.10	0.03	0.03	0.03	7.35	14.10	9.70	7.40	14.60	9.13
11 Lime at Coman	8.53	14.48	7.74	0.04	0.07	0.09	8.49	14.44	7.66	8.56	14.56	7.84
12 Lime at Tamarack	8.18	12.83	8.83	0.03	0.12	0.05	8.16	12.67	8.79	8.21	12.88	8.88
13 Lime at Lime Creek Drive	8.43	13.10	9.64	0.03	0.00	0.23	8.38	13.10	9.39	8.44	13.10	9.84
14 Lime at Prattville		11.35	6.99		0.04	0.39		11.30	6.73		11.38	7.43
15 Lime at Lime Creek Hwy		15.12	9.57		0.02	0.28		15.10	9.35		15.14	9.89
16 Site A at Lime Creek Hwy			9.76			0.03			9.73			9.79
17 Site B at Lime Creek Hwy	7.53	13.72	9.17	0.01	0.04	0.09	7.52	13.69	8.93	7.54	13.76	9.11
18 Lime at Ingall	7.78	13.22	8.73	0.03	0.02	0.08	7.75	13.21	8.63	7.80	13.24	8.78
23 Lime at White Pine	7.41	13.69	8.99	0.02	0.01	0.02	7.39	13.68	8.97	7.43	13.70	9.10
24 Lime at Ridgeville	6.18	13.28	8.68	0.03	0.01	0.04	6.16	13.27	8.65	6.21	13.29	8.73
25 Mansfield Drain at Ranger	8.15	13.38	9.26	0.34	0.03	0.03	7.77	13.36	9.24	8.43	13.42	9.29
1 Lime at Mulberry	7.37	13.62	1.43	0.03	0.02	0.25	7.10	13.60	9.80	7.60	13.63	1.30

October

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion	6.56	8.59		0.03	0.04		6.54	8.56		6.59	8.63	
9 Bean at Dillion	7.74	9.58		0.19	0.03		7.59	9.55		7.96	9.60	
8 Bean at Medina	8.63	9.45		0.05	0.07		8.30	9.40		8.12	9.53	
7 Bean at Bothwell	8.88	1.56		0.03	0.03		8.86	1.53		8.91	1.59	
5 Bean at Bates	8.67	1.39		0.06	0.06		7.95	1.35		8.60	1.46	
6 Covell Drain at Harris	8.12	9.28		0.03	0.06		8.90	9.23		8.15	9.34	
4 Bean at Packard	8.20	1.36		0.04	0.02		8.17	1.34		8.24	1.38	
3 Bean at Lime Creek Hwy	8.14	1.63		0.05	0.09		8.10	1.50		8.19	1.67	
26 Bean at Ridgeville	8.14	11.25		0.03	0.14		8.11	11.12		8.17	11.40	
2 Bean at Mulberry	8.36	12.73		0.03	0.41		8.33	11.61		8.38	12.41	
22 Blanchard Drain at Coman		8.22			0.01			8.22			8.23	
21 Blanchard Drain at Meridian		9.55			0.02			9.53			9.57	
20 Blanchard Drain at Munson		9.72			0.01			9.72			9.73	
19 Blanchard Drain at Ingall	7.27	1.83		0.03	0.02		7.25	1.70		7.30	1.10	
11 Lime at Coman	7.78	7.50		0.06	0.02		7.71	7.40		7.82	7.70	
12 Lime at Tamarack	8.30	8.57		0.07	0.08		8.22	8.48		8.36	8.62	
13 Lime at Lime Creek Drive	8.52	1.15		0.04	0.02		8.49	1.13		8.57	1.17	
14 Lime at Prattville		5.61			0.13			5.48			5.74	
15 Lime at Lime Creek Hwy		1.62			0.02			1.60			1.63	
16 Site A at Lime Creek Hwy	2.21			0.02			2.19			2.22		
17 Site B at Lime Creek Hwy	5.69	7.52		0.02	0.05		5.68	7.47		5.72	7.57	
18 Lime at Ingall	7.30	8.59		0.04	0.02		7.27	8.58		7.34	8.61	
23 Lime at White Pine	6.98	9.45		0.06	0.03		6.91	9.43		7.10	9.49	
24 Lime at Ridgeville	5.30	8.87		0.03	0.09		5.28	8.79		5.33	8.97	
25 Mansfield Drain at Ranger	8.43	8.88		0.04	0.06		8.38	8.83		8.45	8.94	
1 Lime at Mulberry	6.66	9.35		0.05	0.05		6.60	9.30		6.70	9.39	

November

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion	6.63	12.33		0.07	0.06		5.98	12.25		6.11	12.36	
9 Bean at Dillion	6.54	11.80		0.03	0.01		6.51	11.79		6.56	11.81	
8 Bean at Medina	6.69	1.65		0.08	0.25		6.64	1.50		6.79	1.93	
7 Bean at Bothwell	6.68	1.75		0.05	0.03		6.64	1.73		6.73	1.78	
5 Bean at Bates	6.59	1.89		0.08	0.03		6.52	1.86		6.68	1.92	
6 Covell Drain at Harris	6.72	1.41		0.02	0.04		6.69	1.37		6.73	1.45	
4 Bean at Packard	6.57	1.44		0.07	0.02		6.51	1.43		6.64	1.46	
3 Bean at Lime Creek Hwy	6.66	11.21		0.09	0.09		6.61	11.15		6.76	11.31	
26 Bean at Ridgeville	6.62	11.43		0.02	0.02		6.60	11.39		6.63	11.42	
2 Bean at Mulberry	6.87	11.87		0.03	0.11		6.84	11.73		6.89	11.93	
22 Blanchard Drain at Coman		12.12			0.41			11.67			12.48	
21 Blanchard Drain at Meridian		12.67			0.04			12.62			12.70	
20 Blanchard Drain at Munson	6.78	12.37	9.15	0.06	0.02		6.71	12.35	9.15	6.83	12.39	9.15
19 Blanchard Drain at Ingall	6.12	11.19		0.08	0.00		6.50	11.19		6.20	11.19	
11 Lime at Coman	6.34	11.81		0.04	0.11		6.29	11.72		6.37	11.93	
12 Lime at Tamarack	6.18	13.65		0.08	0.01		6.10	13.64		6.25	13.66	
13 Lime at Lime Creek Drive	6.37	12.39		0.07	0.03		6.30	12.36		6.43	12.42	
14 Lime at Prattville		9.20			0.07			8.98			9.10	
15 Lime at Lime Creek Hwy		12.12			0.01			12.11			12.12	
16 Site A at Lime Creek Hwy												
17 Site B at Lime Creek Hwy	6.18	1.82		0.03	0.03		6.14	1.80		6.20	1.85	
18 Lime at Ingall	6.12	1.31		0.05	0.05		6.60	1.27		6.16	1.36	
23 Lime at White Pine	6.57	1.63		0.11	0.03		5.98	1.60		6.18	1.66	
24 Lime at Ridgeville	5.89	7.45		0.10	0.10		5.82	7.35		6.10	7.55	
25 Mansfield Drain at Ranger	6.30	8.74		0.05	0.02		5.99	8.72		6.80	8.76	
1 Lime at Mulberry	5.85	9.46		0.05	0.06		5.79	9.41		5.88	9.53	

December

	AVG			STDEV			MIN			MAX		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
10 Site C at Dillion		11.46		0.00	0.01			11.45			11.47	
9 Bean at Dillion	6.17	11.54		0.02	0.03		6.16	11.51		6.19	11.56	
8 Bean at Medina	6.22	11.14		0.05	0.01		6.17	11.13		6.26	11.14	
7 Bean at Bothwell	6.21	11.42		0.05	0.02		6.16	11.41		6.26	11.44	
5 Bean at Bates	6.12	11.49		0.09	0.02		6.20	11.47		6.19	11.50	
6 Covell Drain at Harris	4.64	1.67		0.06	0.03		4.59	1.64		4.70	1.70	
4 Bean at Packard	6.22	11.75		0.06	0.03		6.15	11.72		6.27	11.78	
3 Bean at Lime Creek Hwy	6.10	11.96		0.03	0.05		6.80	11.93		6.14	12.10	
26 Bean at Ridgeville	6.43	12.54		0.06	0.04		6.36	12.50		6.47	12.57	
2 Bean at Mulberry	5.69	13.33		0.05	0.03		5.66	12.98		5.74	13.30	
22 Blanchard Drain at Coman		11.49			0.01			11.48			11.49	
21 Blanchard Drain at Meridian		12.80			0.02			12.70			12.10	
20 Blanchard Drain at Munson		11.99			0.04			11.96			12.40	
19 Blanchard Drain at Ingall		11.97			0.04			11.94			12.10	
11 Lime at Coman	4.18	1.59		0.03	0.18		4.15	1.46		4.20	1.79	
12 Lime at Tamarack	4.81	14.13		0.04	0.05		4.78	13.96		4.85	14.60	
13 Lime at Lime Creek Drive	5.33	12.51		0.06	0.04		4.95	12.48		5.70	12.55	
14 Lime at Prattville	6.17	9.42		0.08	0.01		5.96	9.42		6.11	9.43	
15 Lime at Lime Creek Hwy		13.35			0.02			13.34			13.37	
16 Site A at Lime Creek Hwy												
17 Site B at Lime Creek Hwy		12.44			0.03			12.41			12.47	
18 Lime at Ingall	5.76	11.42		0.09	0.04		5.66	11.38		5.82	11.45	
23 Lime at White Pine		11.66			0.06			11.60			11.72	
24 Lime at Ridgeville		11.63			0.02			11.40			11.80	
25 Mansfield Drain at Ranger		1.27			0.07			1.20			1.34	
1 Lime at Mulberry	5.62	11.20		0.04	0.04		5.57	11.16		5.65	11.24	

32 Month Baseline Statistical Analysis

April 2005 - December 2007

All Sites by Month

Turbidity (NTU)

January

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		10.2	5.3		2.6	0.9		7.2	4.3		12.0	5.9
9 Bean at Dillion		4.9	0.1		0.4	0.1		4.5	0.0		5.3	0.1
8 Bean at Medina		4.9	4.5		0.1	1.5		4.8	3.4		4.9	6.2
7 Bean at Bothwell		5.1	4.2		0.3	1.3		4.9	2.8		5.4	5.4
5 Bean at Bates		5.5	10.1		0.6	4.4		5.0	6.0		6.1	14.7
6 Covell Drain at Harris		4.5	28.1		0.1	0.7		4.5	27.3		4.6	28.5
4 Bean at Packard		6.2	6.3		0.4	4.4		5.8	1.9		6.6	10.7
3 Bean at Lime Creek Hwy		7.5	4.6		0.3	1.6		7.3	3.5		7.8	6.4
26 Bean at Ridgeville		7.9	17.9		0.6	1.2		7.4	17.0		8.5	19.3
2 Bean at Mulberry		11.9	50.4		0.9	10.3		11.1	42.6		12.8	62.1
22 Blanchard Drain at Coman		12.5	13.5		0.1	0.4		12.4	13.1		12.6	13.8
21 Blanchard Drain at Meridian		12.5	19.8		0.3	1.2		12.3	18.8		12.9	21.1
20 Blanchard Drain at Munson		11.5	23.5		0.4	1.1		11.2	22.6		11.9	24.7
19 Blanchard Drain at Ingall		10.2	24.1		0.1	1.5		10.1	23.1		10.3	25.8
11 Lime at Coman		4.0	34.3		0.2	0.3		3.8	34.0		4.2	34.5
12 Lime at Tamarack		5.8	75.2		0.3	2.8		5.5	72.2		6.1	77.8
13 Lime at Lime Creek Drive		6.5	41.7		0.2	2.3		6.4	40.0		6.7	44.3
14 Lime at Prattville		7.6	16.8		0.2	0.7		7.5	16.2		7.8	17.6
15 Lime at Lime Creek Hwy		10.2	23.8		0.5	1.3		9.7	22.7		10.6	25.2
16 Site A at Lime Creek Hwy		8.5			0.9			7.5			9.2	
17 Site B at Lime Creek Hwy		5.7	3.8		0.1	0.6		5.6	3.3		5.8	4.4
18 Lime at Ingall		6.7	20.2		0.5	1.5		6.3	18.5		7.2	21.3
23 Lime at White Pine		7.9	19.0		0.4	0.7		7.6	18.4		8.3	19.7
24 Lime at Ridgeville		8.4	19.1		0.4	0.9		8.0	18.3		8.8	20.0
25 Mansfield Drain at Ranger		8.6	14.4		0.8	1.7		7.7	13.3		9.3	16.4
1 Lime at Mulberry		8.6	17.9		0.5	1.6		8.2	16.3		9.2	19.5

February

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		6.4	5.3		0.3	2.9		6.1	2.0		6.7	7.5
9 Bean at Dillion		6.4	24.1		0.6	4.7		5.7	20.6		6.8	29.5
8 Bean at Medina		7.2			0.6			6.7			7.8	
7 Bean at Bothwell		7.1	13.4		0.6	2.3		6.7	11.4		7.8	15.9
5 Bean at Bates		6.6	22.2		0.5	2.7		6.1	19.9		7.0	25.2
6 Covell Drain at Harris		4.3	2.5		0.2	0.2		4.2	2.3		4.5	2.6
4 Bean at Packard		7.5	13.0		0.7	1.1		6.6	11.9		8.3	14.0
3 Bean at Lime Creek Hwy		7.9	17.9		0.9	1.9		7.2	16.3		8.9	20.0
26 Bean at Ridgeville		8.4	46.7		0.5	1.6		7.9	45.5		8.9	48.5
2 Bean at Mulberry		7.0	74.9		0.4	3.6		6.8	70.9		7.5	78.0
22 Blanchard Drain at Coman		7.0			0.9			6.0			7.7	
21 Blanchard Drain at Meridian		10.5	40.9		0.1	2.7		10.5	37.9		10.6	42.8
20 Blanchard Drain at Munson		10.3	49.0		0.8	1.6		9.6	47.9		11.1	50.8
19 Blanchard Drain at Ingall		7.4			0.1			7.3			7.4	
11 Lime at Coman		3.5	99.0		0.2	2.8		3.3	97.0		3.6	101.0
12 Lime at Tamarack		4.9	39.0		0.2	0.7		4.7	38.3		5.0	39.6
13 Lime at Lime Creek Drive		7.9			0.5			7.5			8.4	
14 Lime at Prattville		11.6	16.0		0.1	0.2		11.5	15.9		11.7	16.2
15 Lime at Lime Creek Hwy		10.4			0.4			10.0			10.7	
16 Site A at Lime Creek Hwy		14.4			0.2			14.3			14.6	
17 Site B at Lime Creek Hwy		10.0	50.7		0.4	1.8		9.7	49.3		10.4	52.8
18 Lime at Ingall		11.0	13.8		0.2	1.9		10.8	12.6		11.2	16.0
23 Lime at White Pine		9.7			0.7			9.1			10.4	
24 Lime at Ridgeville		7.7	19.5		0.5	2.8		7.1	17.2		8.0	22.6
25 Mansfield Drain at Ranger		11.4	13.8		0.4	1.4		11.1	12.4		11.8	15.2
1 Lime at Mulberry		10.2	40.4		0.3	1.2		10.0	39.1		10.6	41.4

March

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		3.5	24.3		0.3	5.1		3.2	18.4		3.7	27.8
9 Bean at Dillion		5.3	33.9		0.8	2.7		4.6	30.8		6.2	35.7
8 Bean at Medina		5.3	51.5		1.0	6.8		4.3	47.0		6.2	59.3
7 Bean at Bothwell		5.2	51.8		0.8	4.6		4.4	46.9		6.0	56.0
5 Bean at Bates		4.4	53.1		0.8	2.2		3.7	51.5		5.3	55.6
6 Covell Drain at Harris		2.3	16.3		0.1	1.4		2.2	15.0		2.4	17.8
4 Bean at Packard		3.3	65.0		0.4	3.7		2.9	61.8		3.7	69.0
3 Bean at Lime Creek Hwy		3.2	61.9		0.3	4.1		3.0	58.1		3.5	66.3
26 Bean at Ridgeville		6.8	42.7		1.5	3.4		5.8	39.5		8.5	46.2
2 Bean at Mulberry		7.2	51.9		0.5	6.9		6.7	44.1		7.7	57.1
22 Blanchard Drain at Coman		2.4	15.4		0.1	1.8		2.3	13.8		2.5	17.3
21 Blanchard Drain at Meridian		7.9	40.4		0.3	2.6		7.6	38.4		8.1	43.3
20 Blanchard Drain at Munson		5.2	43.9		0.1	1.8		5.1	42.1		5.2	45.6
19 Blanchard Drain at Ingall		4.0	26.3		0.0	1.6		4.0	24.6		4.0	27.7
11 Lime at Coman		3.5	39.1		0.1	4.6		3.4	34.7		3.6	43.8
12 Lime at Tamarack		7.8	47.6		0.5	1.5		7.4	46.5		8.3	49.3
13 Lime at Lime Creek Drive		4.7	54.8		0.2	2.5		4.6	52.6		4.9	57.6
14 Lime at Prattville		7.4	23.1		0.3	0.8		7.2	22.4		7.8	24.0
15 Lime at Lime Creek Hwy		4.6	32.8		0.2	1.7		4.4	31.1		4.8	34.5
16 Site A at Lime Creek Hwy			10.1			2.3			7.5			11.8
17 Site B at Lime Creek Hwy		2.5	0.0		0.1	0.0		2.4	0.0		2.6	0.0
18 Lime at Ingall		3.8	31.0		0.4	2.6		3.5	28.0		4.3	33.0
23 Lime at White Pine		3.5	30.5		0.1	1.9		3.4	28.8		3.6	32.5
24 Lime at Ridgeville		3.3	25.0		0.1	1.2		3.2	23.6		3.4	26.0
25 Mansfield Drain at Ranger		3.4	7.3		0.1	12.7		3.3	0.0		3.5	22.0
1 Lime at Mulberry		3.4	28.7		0.0	3.0		3.4	26.2		3.4	32.0

April

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	46.0	31.9	0.8	69.3	11.8	1.4	5.1	19.2	0.0	126.0	42.5	2.4
9 Bean at Dillion	9.1	25.4	6.1	7.5	4.5	1.8	4.5	22.4	4.3	17.7	30.6	7.9
8 Bean at Medina	10.2	26.5	9.5	13.1	2.7	1.4	3.8	23.9	8.3	43.9	29.3	11.1
7 Bean at Bothwell	5.8	17.1	10.5	0.5	4.4	1.0	5.4	12.9	9.8	6.1	21.7	11.6
5 Bean at Bates	18.5	15.2	11.4	28.3	4.9	1.0	2.2	11.0	10.2	88.3	20.6	12.1
6 Covell Drain at Harris	8.5	5.5	17.6	2.2	1.1	7.2	7.1	4.8	10.5	11.1	6.8	24.9
4 Bean at Packard	5.4	15.7	14.6	8.6	3.5	1.0	0.0	12.1	13.7	28.0	19.0	15.6
3 Bean at Lime Creek Hwy	12.7	15.6	15.9	12.0	6.0	1.2	5.0	10.0	14.8	41.4	22.0	17.1
26 Bean at Ridgeville	8.0	27.6	21.5	7.6	3.7	3.6	0.0	23.8	18.8	17.3	31.2	25.6
2 Bean at Mulberry	8.7	25.6	30.3	9.0	6.1	8.1	1.6	19.2	25.5	19.9	31.3	39.7
22 Blanchard Drain at Coman	143.9	11.5	57.3	179.5	0.8	0.3	6.3	10.9	57.1	347.0	12.4	57.6
21 Blanchard Drain at Meridian	14.6	13.4	67.4	16.4	3.4	2.0	0.0	9.9	65.8	32.4	16.7	69.6
20 Blanchard Drain at Munson	7.9	15.3	55.3	5.2	16.2	9.5	2.4	0.0	48.0	12.7	32.2	66.0
19 Blanchard Drain at Ingall	19.8	5.7	38.3	15.4	5.5	5.3	10.6	0.0	32.3	37.6	11.0	42.1
11 Lime at Coman	8.0	18.9	40.0	0.4	1.2	3.4	7.7	18.1	36.3	8.2	20.3	43.0
12 Lime at Tamarack	52.8	20.2	78.6	8.8	3.0	15.5	46.6	17.0	62.9	59.0	22.9	93.8
13 Lime at Lime Creek Drive	10.3	18.2	58.5	8.0	3.7	4.0	1.1	14.2	55.2	15.3	21.5	63.0
14 Lime at Prattville	10.1	14.4	48.9	3.8	1.0	7.5	7.0	13.8	40.9	14.3	15.6	55.7
15 Lime at Lime Creek Hwy	74.4	19.8	22.6	107.2	1.0	2.1	6.1	18.8	20.5	198.0	20.8	24.6
16 Site A at Lime Creek Hwy	52.5		0.0	29.2		0.0	19.8		0.0	75.8		0.0
17 Site B at Lime Creek Hwy	9.6	10.1	0.0	2.1	0.9	0.0	8.0	9.1	0.0	12.0	10.8	0.0
18 Lime at Ingall	7.7	13.0	2.6	1.6	1.7	3.9	4.5	11.2	0.0	9.1	14.6	7.0
23 Lime at White Pine	11.9	53.7	14.7	9.2	2.1	7.5	6.6	51.4	6.3	35.9	55.4	20.7
24 Lime at Ridgeville	5.5	9.7	19.1	1.2	2.3	2.5	4.4	7.2	16.3	8.5	11.7	21.0
25 Mansfield Drain at Ranger	8.4	9.8	5.4	5.3	1.2	9.4	3.5	8.8	0.0	14.1	11.1	16.2
1 Lime at Mulberry	4.2	10.0	34.2	1.3	0.7	2.6	2.8	9.5	31.3	5.3	10.8	36.3

May

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.2	1.4	4.0	0.3	0.0	0.9	0.0	1.4	3.0	0.6	1.4	4.8
9 Bean at Dillion	1.4	6.0	0.0	1.1	2.7	0.0	0.0	2.9	0.0	2.6	7.9	0.0
8 Bean at Medina	1.6	3.5	0.0	0.2	2.3	0.0	1.2	2.1	0.0	1.7	6.1	0.0
7 Bean at Bothwell	27.4	4.1	0.0	51.1	1.4	0.0	1.2	2.7	0.0	104.0	5.5	0.0
5 Bean at Bates	1.9	10.3	0.4	0.6	0.5	0.8	1.4	9.7	0.0	2.8	10.7	1.3
6 Covell Drain at Harris	0.4	7.9	0.0	0.3	0.2	0.0	0.2	7.7	0.0	0.7	8.0	0.0
4 Bean at Packard	1.8	17.7	0.7	0.2	0.1	1.2	1.6	17.6	0.0	2.1	17.8	2.0
3 Bean at Lime Creek Hwy	1.7	7.5	0.3	0.2	1.4	0.6	1.5	6.0	0.0	2.0	8.8	1.0
26 Bean at Ridgeville	7.7	9.5	0.0	0.8	1.7	0.0	6.5	7.8	0.0	8.3	11.1	0.0
2 Bean at Mulberry	2.3	2.6	0.0	1.7	0.2	0.0	1.2	2.4	0.0	4.8	2.8	0.0
22 Blanchard Drain at Coman	1.9	2.8		0.4	0.6		1.5	2.3		2.2	3.5	
21 Blanchard Drain at Meridian	2.4	9.5	1.3	2.1	2.9	0.2	0.0	7.4	1.1	3.7	12.8	1.5
20 Blanchard Drain at Munson	3.5	34.5	5.3	0.4	1.7	0.6	3.1	32.9	4.8	3.9	36.3	5.9
19 Blanchard Drain at Ingall	1.2	111.0	0.0	0.1	2.6	0.0	1.1	108.0	0.0	1.3	113.0	0.0
11 Lime at Coman	2.7	13.4	1.2	1.2	1.4	0.2	1.8	11.8	1.0	4.7	14.3	1.3
12 Lime at Tamarack	5.4	29.9	10.9	0.6	4.2	7.5	5.0	25.0	4.9	6.1	32.4	19.3
13 Lime at Lime Creek Drive	6.4	67.7	4.9	0.1	1.2	2.1	6.3	67.0	3.3	6.5	69.1	7.3
14 Lime at Prattville	1.1	1.5	0.8	0.3	1.6	0.6	0.8	0.5	0.4	1.3	3.3	1.4
15 Lime at Lime Creek Hwy	2.8	16.5	3.4	0.1	1.8	0.9	2.7	14.8	2.8	2.9	18.3	4.4
16 Site A at Lime Creek Hwy	1.9	0.2		0.2	0.0		1.7	0.2		2.0	0.2	
17 Site B at Lime Creek Hwy	1.4	2.6	0.0	0.1	1.2	0.0	1.3	1.4	0.0	1.4	3.7	0.0
18 Lime at Ingall	1.1	31.8	0.0	0.1	2.9	0.0	1.0	29.6	0.0	1.1	35.0	0.0
23 Lime at White Pine	1.0	47.3	0.0	0.1	1.7	0.0	0.9	46.3	0.0	1.0	49.3	0.0
24 Lime at Ridgeville	2.3	20.2	0.0	0.6	1.6	0.0	1.7	18.4	0.0	2.8	21.4	0.0
25 Mansfield Drain at Ranger	1.7	47.1	0.0	0.1	11.9	0.0	1.6	33.4	0.0	1.8	54.1	0.0
1 Lime at Mulberry	1.6	8.8	0.0	0.4	1.4	0.0	1.2	7.4	0.0	2.0	10.1	0.0

June

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	129.8	15.4	54.7	88.0	0.5	2.6	67.6	14.8	53.1	192.0	15.8	57.7
9 Bean at Dillion	9.6	14.6	26.9	4.9	9.8	3.0	6.6	3.3	23.9	15.2	20.3	29.8
8 Bean at Medina	8.2	20.8	18.4	1.3	2.4	1.7	7.1	18.2	17.1	9.6	23.0	20.3
7 Bean at Bothwell	25.2	24.8	12.1	3.3	2.2	0.6	22.5	22.8	11.7	28.9	27.2	12.8
5 Bean at Bates	27.0	26.7	18.7	28.3	1.1	2.0	10.4	25.4	16.5	59.6	27.5	20.1
6 Covell Drain at Harris	4.2	33.2	12.9	1.7	1.8	4.8	2.9	31.9	9.0	6.1	35.2	18.3
4 Bean at Packard	9.7	32.2	14.1	1.4	2.6	1.0	8.1	28.7	13.3	10.9	34.5	15.2
3 Bean at Lime Creek Hwy	14.5	32.4	18.0	7.8	1.3	0.2	9.8	30.9	17.8	23.5	33.4	18.2
26 Bean at Ridgeville	9.8	117.0	13.6	1.1	11.8	1.1	8.6	104.0	12.3	10.8	127.0	14.3
2 Bean at Mulberry	16.5	33.5	27.9	8.0	0.5	5.9	10.8	33.0	23.7	25.6	33.8	34.7
22 Blanchard Drain at Coman		105.3			3.1			102.0			108.0	
21 Blanchard Drain at Meridian	52.6	60.4	124.0	14.7	1.8	20.7	36.2	59.3	101.0	64.5	62.4	141.0
20 Blanchard Drain at Munson	84.8	21.0	83.7	49.5	0.6	6.3	55.2	20.4	78.9	142.0	21.6	90.8
19 Blanchard Drain at Ingall	4.9	13.2	23.7	1.0	3.2	1.1	4.2	9.8	22.9	6.1	16.0	25.0
11 Lime at Coman	35.2	8.4	94.5	17.6	1.6	4.0	22.1	7.4	91.6	55.2	10.2	99.0
12 Lime at Tamarack	13.7	12.2	79.7	1.3	2.6	3.7	12.6	10.0	76.3	15.1	15.1	83.7
13 Lime at Lime Creek Drive	58.8	19.2	85.1	4.3	0.3	2.1	54.1	18.8	83.1	62.6	19.4	87.3
14 Lime at Prattville	18.1	4.8	52.0	1.6	2.7	2.7	16.9	3.1	49.6	19.2	7.9	55.0
15 Lime at Lime Creek Hwy		44.5			0.6			43.9			45.1	
16 Site A at Lime Creek Hwy		44.1			34.4			14.6			81.9	
17 Site B at Lime Creek Hwy	14.9	40.7	21.2	5.8	0.9	0.7	10.4	39.7	20.7	21.5	41.3	22.0
18 Lime at Ingall	5.0	23.8	44.2	0.3	0.9	3.7	4.8	22.8	39.9	5.2	24.6	46.5
23 Lime at White Pine	7.8	27.3	15.9	0.6	1.1	1.3	7.1	26.1	14.8	8.2	28.0	17.3
24 Lime at Ridgeville	13.3	34.8	28.9	1.3	3.2	2.6	12.3	31.1	26.2	14.2	36.7	31.3
25 Mansfield Drain at Ranger	25.9	1.6	23.2	15.9	0.8	0.4	14.6	0.8	22.9	44.0	2.4	23.7
1 Lime at Mulberry	7.2	36.6	21.7	0.6	1.6	0.4	6.6	34.8	21.4	7.7	37.7	22.2

July

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	52.2	1.7	13.4	32.5	0.9	1.4	29.3	1.1	11.9	89.4	2.7	14.6
9 Bean at Dillion	33.7	9.6	5.6	5.3	2.5	2.2	28.5	6.8	3.5	39.0	11.7	7.9
8 Bean at Medina	45.7	13.3	1.4	2.6	1.2	1.2	42.7	12.4	0.0	47.6	14.7	2.2
7 Bean at Bothwell	52.6	17.2	0.0	0.7	2.1	0.0	51.9	14.7	0.0	53.3	18.5	0.0
5 Bean at Bates	44.9	17.8	0.6	4.6	1.6	1.0	40.3	16.0	0.0	49.4	18.9	1.7
6 Covell Drain at Harris	12.6	1.1	1.9	0.8	2.0	2.3	11.7	0.0	0.0	13.1	3.4	4.4
4 Bean at Packard	47.1	24.2	0.0	1.3	1.7	0.0	46.4	22.3	0.0	48.6	25.7	0.0
3 Bean at Lime Creek Hwy	47.2	26.5	0.0	3.2	0.6	0.0	43.9	26.1	0.0	50.2	27.2	0.0
26 Bean at Ridgeville	58.7	27.4	0.0	19.5	1.9	0.0	47.2	26.0	0.0	81.3	29.6	0.0
2 Bean at Mulberry	54.8	27.4	0.0	1.0	0.6	0.1	53.7	26.7	0.0	55.7	27.9	0.1
22 Blanchard Drain at Coman	21.4	3.4		4.9	0.6		16.0	2.8		25.6	3.9	
21 Blanchard Drain at Meridian	27.7	6.9	164.0	1.8	1.0	19.0	26.5	6.0	143.0	29.8	8.0	180.0
20 Blanchard Drain at Munson	42.6	8.2	46.6	0.9	1.1	2.7	41.9	6.9	43.4	43.7	9.1	48.3
19 Blanchard Drain at Ingall	13.3	8.2	0.0	0.4	1.2	0.0	12.9	6.9	0.0	13.6	9.2	0.0
11 Lime at Coman	41.9	2.9	66.2	1.2	1.2	7.1	40.8	1.8	59.2	43.1	4.2	73.3
12 Lime at Tamarack	21.6	3.7	43.5	0.6	0.4	2.9	21.2	3.4	41.1	22.3	4.1	46.8
13 Lime at Lime Creek Drive	58.9	9.8	47.3	2.4	0.4	11.0	56.6	9.4	34.7	61.4	10.2	54.7
14 Lime at Prattville	45.3	5.8	24.7	11.8	0.4	1.6	37.0	5.4	23.8	58.8	6.1	26.5
15 Lime at Lime Creek Hwy	49.6	31.3		0.6	1.4		49.0	29.9		50.2	32.6	
16 Site A at Lime Creek Hwy		199.9			111.4			71.7			273.0	
17 Site B at Lime Creek Hwy	11.8	11.0	694.7	0.2	1.0	43.0	11.5	10.2	651.0	11.9	12.1	737.0
18 Lime at Ingall	12.5	18.8	1.7	2.1	0.7	2.1	10.9	18.2	0.3	14.9	19.6	4.1
23 Lime at White Pine	20.9	17.8	0.0	1.4	0.4	0.0	19.7	17.5	0.0	22.4	18.3	0.0
24 Lime at Ridgeville	10.7	23.7	3.4	1.8	1.7	2.7	9.1	22.0	1.2	12.7	25.3	6.4
25 Mansfield Drain at Ranger	28.4	2.6	0.0	1.4	0.4	0.0	27.6	2.2	0.0	30.1	3.0	0.0
1 Lime at Mulberry	14.6	27.5	0.0	3.2	1.4	0.0	11.7	25.6	0.0	18.0	29.2	0.0

August

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	4.1	0.7	20.7	0.2	1.0	2.6	3.9	0.0	17.8	4.2	1.8	22.8
9 Bean at Dillion	1.2	1.2	34.8	0.1	1.0	2.2	1.1	0.5	32.4	1.3	2.3	36.8
8 Bean at Medina	1.2	5.3	39.7	0.1	3.3	0.8	1.2	2.0	38.9	1.3	8.6	40.4
7 Bean at Bothwell	1.1	1.3	41.5	0.1	0.1	0.8	1.1	1.2	40.7	1.2	1.4	42.2
5 Bean at Bates	1.5	2.5	41.1	0.3	0.9	0.7	1.3	1.5	40.4	1.8	3.2	41.8
6 Covell Drain at Harris	11.8	3.5	17.3	0.4	0.4	0.9	11.4	3.0	16.6	12.2	3.8	18.4
4 Bean at Packard	1.1	7.8	47.8	0.1	4.3	1.4	1.1	3.5	46.2	1.2	12.1	48.7
3 Bean at Lime Creek Hwy	1.5	4.7	45.9	0.2	0.4	1.5	1.4	4.5	44.2	1.8	5.2	46.9
26 Bean at Ridgeville	1.5	5.9	45.2	0.3	1.4	1.7	1.3	5.1	43.3	1.8	7.5	46.4
2 Bean at Mulberry	1.5	6.5	50.0	0.2	1.9	4.2	1.4	5.0	47.0	1.7	8.7	54.8
22 Blanchard Drain at Coman		9.7	23.2		0.2	2.0		9.5	21.7		9.9	25.5
21 Blanchard Drain at Meridian		27.8	14.8		0.4	0.9		27.5	13.7		28.2	15.4
20 Blanchard Drain at Munson	9.1	39.9	11.5	0.2	2.1	5.5	9.0	37.8	5.5	9.3	41.9	16.3
19 Blanchard Drain at Ingall	6.6	50.0	22.3	2.5	0.8	0.6	4.1	49.2	21.8	9.1	50.7	23.0
11 Lime at Coman	15.2	57.1	29.3	0.5	0.8	2.5	14.8	56.3	27.2	15.7	57.9	32.0
12 Lime at Tamarack	3.0	55.2	10.5	0.1	0.7	0.8	2.9	54.4	9.6	3.1	55.6	10.9
13 Lime at Lime Creek Drive	17.4	87.4	31.1	2.9	1.0	5.0	15.5	86.4	26.6	20.7	88.3	36.4
14 Lime at Prattville	207.7	16.4	37.4	6.1	1.3	3.1	201.0	15.2	34.4	213.0	17.7	40.5
15 Lime at Lime Creek Hwy		126.7	20.7		1.2	1.1		126.0	19.7		128.0	21.9
16 Site A at Lime Creek Hwy	19.5		231.5	4.3		143.5	14.8		130.0	23.2		333.0
17 Site B at Lime Creek Hwy	1.2	19.9	17.2	0.2	1.4	0.2	1.1	18.9	17.0	1.4	21.5	17.4
18 Lime at Ingall	1.3	103.0	22.7	0.2	1.7	1.7	1.2	102.0	20.8	1.5	105.0	23.7
23 Lime at White Pine	0.9	49.9	25.0	0.1	3.1	0.9	0.9	46.8	24.0	1.0	52.9	25.7
24 Lime at Ridgeville	2.4	62.1	26.3	0.1	4.3	0.8	2.3	57.9	25.4	2.4	66.5	27.0
25 Mansfield Drain at Ranger	3.5	33.0	59.4	0.9	2.0	2.9	2.7	30.7	56.6	4.5	34.3	62.3
1 Lime at Mulberry	1.3	72.9	27.8	0.1	1.6	0.8	1.3	71.9	27.0	1.4	74.8	28.5

September

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	48.6	2.3	5.9	44.4	4.0	1.8	10.3	0.0	4.4	97.2	6.9	7.9
9 Bean at Dillion	2.9	0.0	1.3	0.2	0.0	1.2	2.8	0.0	0.3	3.2	0.0	2.6
8 Bean at Medina	1.7	0.0	1.6	0.5	0.0	0.4	1.4	0.0	1.3	2.3	0.0	2.0
7 Bean at Bothwell	3.8	0.0	1.3	0.4	0.0	0.3	3.5	0.0	1.1	4.2	0.0	1.7
5 Bean at Bates	2.6	0.0	2.2	1.1	0.0	0.4	1.4	0.0	1.7	3.5	0.0	2.5
6 Covell Drain at Harris	1.4	0.0	4.2	0.1	0.1	1.2	1.4	0.0	3.5	1.5	0.1	5.6
4 Bean at Packard	0.8	0.0	2.1	0.4	0.0	0.2	0.5	0.0	1.9	1.2	0.0	2.3
3 Bean at Lime Creek Hwy	1.3	0.0	2.2	0.1	0.0	0.1	1.3	0.0	2.2	1.4	0.0	2.3
26 Bean at Ridgeville	0.9	0.0	3.2	0.1	0.0	0.4	0.8	0.0	2.8	1.0	0.0	3.6
2 Bean at Mulberry	3.0	0.0	3.7	3.0	0.0	0.4	1.2	0.0	3.2	6.5	0.0	3.9
22 Blanchard Drain at Coman	0.0	0.6		0.0	1.0		0.0	0.0		0.0	1.7	
21 Blanchard Drain at Meridian	5.8	23.0	21.4	0.4	1.6	0.3	5.4	21.6	21.0	6.1	24.7	21.6
20 Blanchard Drain at Munson	8.7	18.9	14.1	0.8	6.0	4.3	7.9	15.3	10.1	9.5	25.8	18.6
19 Blanchard Drain at Ingall	0.2	74.9	0.0	0.3	60.1	0.0	0.0	8.7	0.0	0.5	126.0	0.0
11 Lime at Coman	25.0	875.3	9.9	0.5	37.2	1.7	24.5	836.0	8.7	25.5	910.0	11.8
12 Lime at Tamarack	2.0	49.0	15.8	0.2	3.3	1.3	1.8	46.6	14.5	2.1	52.8	17.0
13 Lime at Lime Creek Drive	9.4	72.4	3.8	0.6	1.8	0.2	8.8	70.6	3.7	9.9	74.2	4.1
14 Lime at Prattville		3.0	25.0		0.7	25.1		2.2	7.9		3.6	53.8
15 Lime at Lime Creek Hwy		33.2	5.1		1.6	1.1		31.4	4.0		34.3	6.1
16 Site A at Lime Creek Hwy			2.4			0.6			1.8			3.0
17 Site B at Lime Creek Hwy	20.3	9.6	5.7	0.4	0.8	0.7	19.8	8.8	5.1	20.5	10.4	6.5
18 Lime at Ingall	0.9	3.2	1.0	0.1	0.9	0.5	0.8	2.6	0.5	1.0	4.2	1.5
23 Lime at White Pine	1.0	0.0	0.9	0.4	0.0	0.9	0.7	0.0	0.0	1.4	0.0	2.2
24 Lime at Ridgeville	2.6	1.0	2.1	0.7	1.8	1.0	2.1	0.0	1.5	3.4	3.1	3.2
25 Mansfield Drain at Ranger	10.0	0.2	1.9	8.6	0.3	2.1	4.9	0.0	0.0	19.9	0.5	4.1
1 Lime at Mulberry	6.3	0.0	0.0	0.4	0.0	0.0	6.0	0.0	0.0	6.8	0.0	0.0

October

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	3.0	0.0	113.5	5.3	0.0	69.3	0.0	0.0	66.1	9.1	0.0	193.0
9 Bean at Dillion	0.4	0.0	33.5	0.1	0.0	1.7	0.4	0.0	32.3	0.5	0.0	35.5
8 Bean at Medina	0.4	0.0	43.3	0.0	0.0	2.2	0.4	0.0	40.9	0.4	0.0	45.2
7 Bean at Bothwell	0.4	0.0	30.1	0.0	0.0	1.1	0.4	0.0	29.1	0.4	0.0	31.2
5 Bean at Bates	0.5	0.0	33.1	0.1	0.0	3.2	0.4	0.0	30.4	0.5	0.0	36.7
6 Covell Drain at Harris	0.7	0.0	28.1	0.1	0.0	0.7	0.6	0.0	27.5	0.7	0.0	28.8
4 Bean at Packard	1.0	0.0	42.7	1.0	0.0	6.8	0.4	0.0	35.0	2.2	0.0	47.6
3 Bean at Lime Creek Hwy	0.5	0.0	33.6	0.0	0.0	3.7	0.5	0.0	31.0	0.5	0.0	37.8
26 Bean at Ridgeville	0.6	0.0	32.0	0.1	0.0	2.4	0.5	0.0	29.9	0.7	0.0	34.6
2 Bean at Mulberry	0.6	0.0	30.8	0.1	0.0	3.8	0.5	0.0	26.8	0.7	0.0	34.3
22 Blanchard Drain at Coman		0.0			0.0			0.0			0.0	
21 Blanchard Drain at Meridian		0.0	84.6	0.0	0.0	0.6		0.0	83.9		0.0	85.0
20 Blanchard Drain at Munson		0.0			0.0			0.0			0.0	
19 Blanchard Drain at Ingall	3.0	0.0	41.5	1.9	0.0	8.6	1.2	0.0	36.2	4.9	0.0	51.5
11 Lime at Coman	29.0	0.0	49.4	21.5	0.0	6.4	13.0	0.0	44.6	53.5	0.0	56.7
12 Lime at Tamarack	3.1	0.0	62.1	0.4	0.0	3.3	2.7	0.0	58.3	3.4	0.0	64.5
13 Lime at Lime Creek Drive	12.4	0.0	31.7	0.5	0.0	2.5	11.9	0.0	29.9	12.9	0.0	34.5
14 Lime at Prattville		0.0	29.3		0.0	0.3		0.0	29.0		0.0	29.5
15 Lime at Lime Creek Hwy		0.0	37.2		0.0	1.1		0.0	36.5		0.0	38.4
16 Site A at Lime Creek Hwy	15.1		47.3	1.9		1.8	13.9		45.4	17.3		48.9
17 Site B at Lime Creek Hwy	3.7	0.0	32.6	1.1	0.0	1.3	2.4	0.0	31.4	4.5	0.0	34.0
18 Lime at Ingall	0.4	0.0	33.7	0.1	0.0	2.7	0.4	0.0	31.3	0.5	0.0	36.7
23 Lime at White Pine	0.7	0.0	29.9	0.5	0.0	0.3	0.4	0.0	29.7	1.3	0.0	30.2
24 Lime at Ridgeville	1.0	0.0	31.6	0.1	0.0	1.2	0.9	0.0	30.5	1.1	0.0	32.8
25 Mansfield Drain at Ranger	2.3	0.0	38.4	0.2	0.0	1.3	2.2	0.0	37.3	2.5	0.0	39.8
1 Lime at Mulberry	0.7	0.0	32.9	0.1	0.0	2.3	0.6	0.0	30.9	0.8	0.0	35.4

November

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	2.8	0.4	28.8	0.2	0.7	1.1	2.7	0.0	28.0	3.0	1.2	30.1
9 Bean at Dillion	2.3	0.0	29.1	0.1	0.0	1.8	2.2	0.0	27.2	2.4	0.0	30.8
8 Bean at Medina	2.4	3.9	27.2	0.3	4.6	0.6	2.2	0.0	26.7	2.7	9.0	27.9
7 Bean at Bothwell	2.5	0.0	28.2	0.3	0.0	1.3	2.2	0.0	27.3	2.7	0.0	29.7
5 Bean at Bates	2.5	0.0	28.2	0.2	0.0	1.3	2.3	0.0	27.2	2.7	0.0	29.6
6 Covell Drain at Harris	3.5	0.0	28.0	0.4	0.0	0.4	3.1	0.0	27.7	3.8	0.0	28.4
4 Bean at Packard	2.7	8.9	28.1	0.6	1.6	0.8	2.2	7.4	27.5	3.3	10.5	29.0
3 Bean at Lime Creek Hwy	2.5	22.7	29.9	0.3	3.2	2.2	2.2	20.5	28.2	2.7	26.3	32.4
26 Bean at Ridgeville	3.1	4.7	28.4	0.5	1.3	0.6	2.6	3.4	27.9	3.5	6.0	29.1
2 Bean at Mulberry	3.9	1.1	42.2	0.3	1.8	0.1	3.6	0.0	42.1	4.2	3.2	42.3
22 Blanchard Drain at Coman		0.0	27.1		0.0	0.2		0.0	26.9		0.0	27.3
21 Blanchard Drain at Meridian		9.4	35.7		1.7	0.9		7.4	34.7	0.0	10.7	36.5
20 Blanchard Drain at Munson	24.8	0.1	54.1	23.0	0.2	1.5	9.8	0.0	52.7	51.3	0.4	55.6
19 Blanchard Drain at Ingall	4.3	0.0	45.6	0.1	0.0	1.1	4.2	0.0	44.4	4.4	0.0	46.5
11 Lime at Coman	350.0	2.3	69.7	2.0	2.2	2.8	348.0	0.0	67.7	352.0	4.3	71.6
12 Lime at Tamarack	6.0	7.5	62.2	0.2	1.2	7.7	5.9	6.1	53.4	6.2	8.5	67.6
13 Lime at Lime Creek Drive	4.4	17.8	39.6	0.2	2.4	1.5	4.2	15.1	38.0	4.5	19.4	40.9
14 Lime at Prattville		3.7	30.5		1.6	1.1		1.9	29.5		4.8	31.6
15 Lime at Lime Creek Hwy		5.7	32.3		1.4	0.7		4.8	31.7		7.3	33.0
16 Site A at Lime Creek Hwy			32.6			0.7			32.0			33.4
17 Site B at Lime Creek Hwy	2.8	41.5	31.8	0.3	1.0	0.3	2.5	40.7	31.5	3.0	42.6	32.0
18 Lime at Ingall	143.0	0.0	32.4	7.1	0.0	0.6	138.0	0.0	31.8	148.0	0.0	32.9
23 Lime at White Pine	8.4	7.0	36.6	6.8	1.5	0.6	4.4	5.5	36.0	16.2	8.5	37.1
24 Lime at Ridgeville	2.8	0.0	37.1	0.1	0.0	0.6	2.7	0.0	36.7	2.9	0.0	37.7
25 Mansfield Drain at Ranger	3.0	0.0	34.0	0.2	0.0	0.3	2.9	0.0	33.8	3.2	0.0	34.3
1 Lime at Mulberry	7.0	6.6	28.8	4.6	3.4	0.6	3.1	2.8	28.1	12.1	9.4	29.2

December

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		5.5	25.6		9.6	1.4		0.0	24.3		16.6	27.6
9 Bean at Dillion	4.7	0.0	22.8	0.3	0.0	2.0	4.4	0.0	21.2	4.9	0.0	25.1
8 Bean at Medina	5.4	0.0	22.4	0.4	0.0	1.8	4.9	0.0	20.3	5.7	0.0	24.7
7 Bean at Bothwell	3.3	0.0	24.8	0.1	0.0	1.9	3.2	0.0	23.3	3.3	0.0	26.9
5 Bean at Bates	3.3	0.0	25.3	0.2	0.0	2.8	3.2	0.0	23.4	3.5	0.0	28.5
6 Covell Drain at Harris	3.1	0.0	35.0	0.0	0.0	0.8	3.1	0.0	34.2	3.1	0.0	35.7
4 Bean at Packard	3.8	0.0	35.7	0.3	0.0	2.9	3.5	0.0	32.6	4.0	0.0	38.3
3 Bean at Lime Creek Hwy	6.5	0.7	32.3	0.5	1.2	2.0	6.0	0.0	30.0	6.9	2.1	33.6
26 Bean at Ridgeville	6.6	0.1	40.4	0.3	0.2	2.1	6.3	0.0	38.3	6.9	0.3	42.5
2 Bean at Mulberry	6.8	17.4	41.1	0.2	2.4	1.6	6.7	15.2	39.5	7.0	20.0	42.6
22 Blanchard Drain at Coman		0.0	50.3		0.0	1.2		0.0	48.9		0.0	51.1
21 Blanchard Drain at Meridian		0.0	51.8		0.0	1.0		0.0	50.6		0.0	52.5
20 Blanchard Drain at Munson		11.5	57.0		0.7	0.8		10.8	56.4		12.2	57.9
19 Blanchard Drain at Ingall		0.0	58.8	0.0	0.1	1.8		0.0	57.7		0.1	60.9
11 Lime at Coman	7.6	22.9	17.5	1.5	6.2	2.7	6.6	19.3	15.4	9.3	30.1	20.6
12 Lime at Tamarack	4.1	19.5	20.2	0.5	0.8	0.6	3.6	18.7	19.5	4.5	20.3	20.7
13 Lime at Lime Creek Drive	5.6	21.9	85.1	0.5	1.8	37.0	5.3	20.5	42.4	6.1	23.9	107.0
14 Lime at Prattville	3.7	9.6	36.3	0.2	0.6	1.5	3.6	9.1	34.8	3.9	10.2	37.7
15 Lime at Lime Creek Hwy		8.7	35.0		1.3	2.4		7.4	32.3		9.9	36.9
16 Site A at Lime Creek Hwy			26.8			4.8			23.8			32.3
17 Site B at Lime Creek Hwy		0.0	19.1		0.0	0.6		0.0	18.6		0.0	19.8
18 Lime at Ingall	6.1	1.0	28.7	0.3	0.4	0.8	5.8	0.7	28.0	6.4	1.4	29.5
23 Lime at White Pine		1.4	38.3		0.7	0.3		0.6	38.1		2.0	38.6
24 Lime at Ridgeville		0.0	42.6		0.0	2.6		0.0	41.1		0.0	45.6
25 Mansfield Drain at Ranger		0.0	41.7		0.0	2.2		0.0	39.4		0.0	43.8
1 Lime at Mulberry	3.8	0.0	59.1	0.3	0.0	1.1	3.6	0.0	58.3	4.1	0.0	60.3

32 Month Baseline Statistical Analysis
April 2005 - December 2007
All Sites by Month

Total Dissolved Solids (g/L)

January

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		0.36	0.30		6.1E-09	5.8E-03		0.36	0.29		0.36	0.30
9 Bean at Dillion		0.41	0.31		0.0E+00	4.3E-09		0.41	0.31		0.41	0.31
8 Bean at Medina		0.41	0.32		6.1E-09	4.3E-09		0.41	0.32		0.41	0.32
7 Bean at Bothwell		0.41	0.32		6.1E-09	4.3E-09		0.41	0.32		0.41	0.32
5 Bean at Bates		0.41	0.32		6.1E-09	4.3E-09		0.41	0.32		0.41	0.32
6 Covell Drain at Harris		0.52	0.35		0.0E+00	0.0E+00		0.52	0.35		0.52	0.35
4 Bean at Packard		0.41	0.32		6.1E-09	4.3E-09		0.41	0.32		0.41	0.32
3 Bean at Lime Creek Hwy		0.41	0.32		6.1E-09	4.3E-09		0.41	0.32		0.41	0.32
26 Bean at Ridgeville		0.41	0.32		6.1E-09	4.3E-09		0.41	0.32		0.41	0.32
2 Bean at Mulberry		0.41	0.32		6.1E-09	4.3E-09		0.41	0.32		0.41	0.32
22 Blanchard Drain at Coman		0.36	0.26		6.1E-09	0.0E+00		0.36	0.26		0.36	0.26
21 Blanchard Drain at Meridian		0.39	0.28		6.1E-09	4.3E-09		0.39	0.28		0.39	0.28
20 Blanchard Drain at Munson		0.41	0.30		6.1E-09	6.1E-09		0.41	0.30		0.41	0.30
19 Blanchard Drain at Ingall		0.42	0.31		8.6E-09	4.3E-09		0.42	0.31		0.42	0.31
11 Lime at Coman		0.52	0.39		5.8E-03	6.1E-09		0.52	0.39		0.53	0.39
12 Lime at Tamarack		0.53	0.41		0.0E+00	6.1E-09		0.53	0.41		0.53	0.41
13 Lime at Lime Creek Drive		0.53	0.40		0.0E+00	0.0E+00		0.53	0.40		0.53	0.40
14 Lime at Prattville		0.35	0.25		0.0E+00	0.0E+00		0.35	0.25		0.35	0.25
15 Lime at Lime Creek Hwy		0.36	0.24		6.1E-09	0.0E+00		0.36	0.24		0.36	0.24
16 Site A at Lime Creek Hwy		0.43			6.1E-09			0.43			0.43	
17 Site B at Lime Creek Hwy		0.51	0.39		0.0E+00	6.1E-09		0.51	0.39		0.51	0.39
18 Lime at Ingall		0.42	0.30		8.6E-09	6.1E-09		0.42	0.30		0.42	0.30
23 Lime at White Pine		0.42	0.30		8.6E-09	6.1E-09		0.42	0.30		0.42	0.30
24 Lime at Ridgeville		0.42	0.31		8.6E-09	4.3E-09		0.42	0.31		0.42	0.31
25 Mansfield Drain at Ranger		0.39	0.27		2.3E-02	4.3E-09		0.38	0.27		0.42	0.27
1 Lime at Mulberry		0.42	0.31		8.6E-09	4.3E-09		0.42	0.31		0.42	0.31

February

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		0.39	0.36		6.1E-09	6.1E-09		0.39	0.36		0.39	0.36
9 Bean at Dillion		0.39	0.33		5.8E-03	6.1E-09		0.38	0.33		0.39	0.33
8 Bean at Medina		0.39			6.1E-09			0.39			0.39	
7 Bean at Bothwell		0.39	0.33		6.1E-09	6.1E-09		0.39	0.33		0.39	0.33
5 Bean at Bates		0.39	0.33		6.1E-09	6.1E-09		0.39	0.33		0.39	0.33
6 Covell Drain at Harris		0.53	0.45		0.0E+00	0.0E+00		0.53	0.45		0.53	0.45
4 Bean at Packard		0.39	0.33		5.0E-03	6.1E-09		0.39	0.33		0.40	0.33
3 Bean at Lime Creek Hwy		0.40	0.34		0.0E+00	6.1E-09		0.40	0.34		0.40	0.34
26 Bean at Ridgeville		0.39	0.34		6.1E-09	6.1E-09		0.39	0.34		0.39	0.34
2 Bean at Mulberry		0.40	0.35		0.0E+00	0.0E+00		0.40	0.35		0.40	0.35
22 Blanchard Drain at Coman		0.46			6.1E-09			0.46			0.46	
21 Blanchard Drain at Meridian		0.46	0.39		6.1E-09	6.1E-09		0.46	0.39		0.46	0.39
20 Blanchard Drain at Munson		0.47	0.39		6.1E-09	6.1E-09		0.47	0.39		0.47	0.39
19 Blanchard Drain at Ingall		0.46			6.1E-09			0.46			0.46	
11 Lime at Coman		0.53	0.43		0.0E+00	6.1E-09		0.53	0.43		0.53	0.43
12 Lime at Tamarack		0.56	0.43		8.6E-09	5.8E-03		0.56	0.43		0.56	0.44
13 Lime at Lime Creek Drive		0.56			8.6E-09			0.56			0.56	
14 Lime at Prattville		0.35	0.25		0.0E+00	0.0E+00		0.35	0.25		0.35	0.25
15 Lime at Lime Creek Hwy		0.38			6.1E-09			0.38			0.38	
16 Site A at Lime Creek Hwy		0.42			8.6E-09			0.42			0.42	
17 Site B at Lime Creek Hwy		0.52	0.37		0.0E+00	6.1E-09		0.52	0.37		0.52	0.37
18 Lime at Ingall		0.44	0.32		6.1E-09	4.3E-09		0.44	0.32		0.44	0.32
23 Lime at White Pine		0.45			0.0E+00			0.45			0.45	
24 Lime at Ridgeville		0.45	0.35		0.0E+00	0.0E+00		0.45	0.35		0.45	0.35
25 Mansfield Drain at Ranger		0.38	0.35		6.1E-09	5.8E-03		0.38	0.34		0.38	0.35
1 Lime at Mulberry		0.44	0.35		6.1E-09	0.0E+00		0.44	0.35		0.44	0.35

March

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		0.41	0.32		6.1E-09	4.3E-09		0.41	0.32		0.41	0.32
9 Bean at Dillion		0.40	0.31		0.0E+00	5.8E-03		0.40	0.31		0.40	0.32
8 Bean at Medina		0.40	0.32		0.0E+00	5.8E-03		0.40	0.32		0.40	0.33
7 Bean at Bothwell		0.40	0.31		0.0E+00	4.3E-09		0.40	0.31		0.40	0.31
5 Bean at Bates		0.40	0.31		5.8E-03	4.3E-09		0.39	0.31		0.40	0.31
6 Covell Drain at Harris		0.56	0.49		5.8E-03	4.5E-02		0.55	0.44		0.56	0.53
4 Bean at Packard		0.41	0.31		6.1E-09	5.8E-03		0.41	0.31		0.41	0.32
3 Bean at Lime Creek Hwy		0.41	0.31		6.1E-09	4.3E-09		0.41	0.31		0.41	0.31
26 Bean at Ridgeville		0.41	0.31		6.1E-09	4.3E-09		0.41	0.31		0.41	0.31
2 Bean at Mulberry		0.41	0.31		6.1E-09	4.3E-09		0.41	0.31		0.41	0.31
22 Blanchard Drain at Coman		0.45	0.34		0.0E+00	6.1E-09		0.45	0.34		0.45	0.34
21 Blanchard Drain at Meridian		0.45	0.33		0.0E+00	6.1E-09		0.45	0.33		0.45	0.33
20 Blanchard Drain at Munson		0.47	0.34		6.1E-09	6.1E-09		0.47	0.34		0.47	0.34
19 Blanchard Drain at Ingall		0.46	0.33		6.1E-09	6.1E-09		0.46	0.33		0.46	0.33
11 Lime at Coman		0.52	0.40		0.0E+00	0.0E+00		0.52	0.40		0.52	0.40
12 Lime at Tamarack		0.54	0.39		8.6E-09	6.1E-09		0.54	0.39		0.54	0.39
13 Lime at Lime Creek Drive		0.55	0.40		0.0E+00	0.0E+00		0.55	0.40		0.55	0.40
14 Lime at Prattville		0.35	0.27		0.0E+00	4.3E-09		0.35	0.27		0.35	0.27
15 Lime at Lime Creek Hwy		0.38	0.28		6.1E-09	4.3E-09		0.38	0.28		0.38	0.28
16 Site A at Lime Creek Hwy			0.28			4.3E-09			0.28			0.28
17 Site B at Lime Creek Hwy		0.50	0.35		0.0E+00	0.0E+00		0.50	0.35		0.50	0.35
18 Lime at Ingall		0.43	0.30		5.8E-03	6.1E-09		0.43	0.30		0.44	0.30
23 Lime at White Pine		0.44	0.31		6.1E-09	4.3E-09		0.44	0.31		0.44	0.31
24 Lime at Ridgeville		0.45	0.32		6.7E-09	4.3E-09		0.45	0.32		0.45	0.32
25 Mansfield Drain at Ranger		0.40	0.28		0.0E+00	4.3E-09		0.40	0.28		0.40	0.28
1 Lime at Mulberry		0.45	0.32		0.0E+00	4.3E-09		0.45	0.32		0.45	0.32

April

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.46	0.46	0.27	6.1E-09	6.1E-09	4.3E-09	0.46	0.46	0.27	0.46	0.46	0.27
9 Bean at Dillion	0.43	0.43	0.29	5.8E-03	6.1E-09	4.3E-09	0.42	0.43	0.29	0.43	0.43	0.29
8 Bean at Medina	0.44	0.43	0.29	7.1E-03	6.1E-09	4.3E-09	0.42	0.43	0.29	0.44	0.43	0.29
7 Bean at Bothwell	0.44	0.42	0.29	0.0E+00	8.6E-09	4.3E-09	0.44	0.42	0.29	0.44	0.42	0.29
5 Bean at Bates	0.44	0.42	0.29	6.0E-03	8.6E-09	4.3E-09	0.43	0.42	0.29	0.45	0.42	0.29
6 Covell Drain at Harris	0.51	0.57	0.30	1.7E-02	5.8E-03	6.1E-09	0.50	0.57	0.30	0.53	0.58	0.30
4 Bean at Packard	0.44	0.42	0.30	0.0E+00	8.6E-09	6.1E-09	0.44	0.42	0.30	0.44	0.42	0.30
3 Bean at Lime Creek Hwy	0.44	0.43	0.30	0.0E+00	6.1E-09	6.1E-09	0.44	0.43	0.30	0.44	0.43	0.30
26 Bean at Ridgeville	0.44	0.43	0.30	1.1E-02	6.1E-09	6.1E-09	0.43	0.43	0.30	0.47	0.43	0.30
2 Bean at Mulberry	0.45	0.43	0.30	4.5E-03	6.1E-09	6.1E-09	0.44	0.43	0.30	0.45	0.43	0.30
22 Blanchard Drain at Coman	0.46	0.47	0.21	4.6E-02	6.1E-09	4.3E-09	0.41	0.47	0.21	0.50	0.47	0.21
21 Blanchard Drain at Meridian	0.51	0.46	0.35	7.1E-03	6.1E-09	5.8E-03	0.50	0.46	0.35	0.51	0.46	0.36
20 Blanchard Drain at Munson	0.54	0.48	0.33	8.6E-09	5.8E-03	6.1E-09	0.54	0.48	0.33	0.54	0.49	0.33
19 Blanchard Drain at Ingall	0.35	0.46	0.30	2.9E-01	6.1E-09	6.1E-09	0.01	0.46	0.30	0.52	0.46	0.30
11 Lime at Coman	0.55	0.54	0.35	5.8E-03	8.6E-09	0.0E+00	0.55	0.54	0.35	0.56	0.54	0.35
12 Lime at Tamarack	0.54	0.54	0.36	1.2E-02	8.6E-09	6.1E-09	0.53	0.54	0.36	0.55	0.54	0.36
13 Lime at Lime Creek Drive	0.47	0.52	0.36	1.0E-01	0.0E+00	6.1E-09	0.35	0.52	0.36	0.54	0.52	0.36
14 Lime at Prattville	0.36	0.34	0.25	1.7E-02	6.1E-09	0.0E+00	0.35	0.34	0.25	0.38	0.34	0.25
15 Lime at Lime Creek Hwy	0.38	0.37	0.32	1.5E-02	6.1E-09	4.3E-09	0.37	0.37	0.32	0.40	0.37	0.32
16 Site A at Lime Creek Hwy	0.47		0.34	7.8E-02		5.8E-03	0.41		0.33	0.52		0.34
17 Site B at Lime Creek Hwy	0.48	0.50	0.37	4.4E-02	0.0E+00	5.8E-03	0.43	0.50	0.37	0.51	0.50	0.38
18 Lime at Ingall	0.43	0.43	0.33	3.5E-03	6.1E-09	5.8E-03	0.43	0.43	0.33	0.44	0.43	0.34
23 Lime at White Pine	0.47	0.43	0.31	3.3E-03	6.1E-09	5.8E-03	0.46	0.43	0.31	0.47	0.43	0.32
24 Lime at Ridgeville	0.47	0.45	0.32	0.0E+00	0.0E+00	4.3E-09	0.47	0.45	0.32	0.47	0.45	0.32
25 Mansfield Drain at Ranger	0.47	0.48	0.37	6.1E-09	0.0E+00	2.6E-02	0.47	0.48	0.35	0.47	0.48	0.40
1 Lime at Mulberry	0.47	0.44	0.32	6.1E-09	6.1E-09	4.3E-09	0.47	0.44	0.32	0.47	0.44	0.32

May

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.44	0.47	0.44	6.1E-09	5.8E-04	6.1E-09	0.44	0.47	0.44	0.44	0.47	0.44
9 Bean at Dillion	0.41	0.44	0.39	6.1E-09	0.0E+00	5.8E-03	0.41	0.44	0.39	0.41	0.44	0.40
8 Bean at Medina	0.41	0.44	0.40	5.0E-03	8.6E-09	0.0E+00	0.40	0.44	0.40	0.41	0.44	0.40
7 Bean at Bothwell	0.41	0.44	0.38	5.8E-03	1.1E-02	6.1E-09	0.40	0.43	0.38	0.41	0.44	0.38
5 Bean at Bates	0.41	0.44	0.54	0.0E+00	8.6E-09	6.5E-02	0.41	0.44	0.47	0.41	0.44	0.60
6 Covell Drain at Harris	0.58	0.58	1.43	1.0E-02	5.8E-04	2.1E-01	0.57	0.58	1.20	0.59	0.58	1.60
4 Bean at Packard	0.41	0.44	0.46	0.0E+00	0.0E+00	3.5E-02	0.41	0.44	0.43	0.41	0.44	0.50
3 Bean at Lime Creek Hwy	0.41	0.44	0.43	0.0E+00	0.0E+00	3.8E-02	0.41	0.44	0.40	0.41	0.44	0.47
26 Bean at Ridgeville	0.41	0.45	0.42	0.0E+00	0.0E+00	5.8E-03	0.41	0.45	0.41	0.41	0.45	0.42
2 Bean at Mulberry	0.41	0.45	0.42	0.0E+00	6.1E-09	8.6E-09	0.41	0.45	0.42	0.41	0.45	0.42
22 Blanchard Drain at Coman	0.43	0.48		6.1E-09	5.8E-04		0.43	0.48		0.43	0.48	
21 Blanchard Drain at Meridian	0.47	0.49	0.39	6.1E-09	8.6E-09	6.1E-09	0.47	0.49	0.39	0.47	0.49	0.39
20 Blanchard Drain at Munson	0.45	0.47	0.43	5.8E-03	5.8E-04	1.0E-02	0.44	0.47	0.42	0.45	0.47	0.44
19 Blanchard Drain at Ingall	0.44	0.41	0.44	5.8E-03	6.1E-09	5.8E-03	0.43	0.41	0.43	0.44	0.41	0.44
11 Lime at Coman	0.51	0.52	0.43	5.5E-03	6.1E-03	5.8E-03	0.51	0.52	0.43	0.52	0.53	0.44
12 Lime at Tamarack	0.46	0.49	0.50	6.1E-09	5.8E-04	2.3E-02	0.46	0.49	0.47	0.46	0.49	0.51
13 Lime at Lime Creek Drive	0.48	0.52	0.43	0.0E+00	8.6E-09	5.8E-03	0.48	0.52	0.43	0.48	0.52	0.44
14 Lime at Prattville	0.31	0.35	0.83	4.3E-09	0.0E+00	2.1E-01	0.31	0.35	0.60	0.31	0.35	1.00
15 Lime at Lime Creek Hwy	0.35	0.37	0.31	0.0E+00	6.1E-09	4.3E-09	0.35	0.37	0.31	0.35	0.37	0.31
16 Site A at Lime Creek Hwy	0.32	0.42		4.3E-09	6.1E-09		0.32	0.42		0.32	0.42	
17 Site B at Lime Creek Hwy	0.46	0.57	0.70	6.1E-09	8.6E-09	0.0E+00	0.46	0.57	0.70	0.46	0.57	0.70
18 Lime at Ingall	0.40	0.41	0.46	0.0E+00	6.1E-09	2.6E-02	0.40	0.41	0.43	0.40	0.41	0.48
23 Lime at White Pine	0.42	0.40	0.39	5.0E-03	5.8E-04	5.8E-03	0.41	0.40	0.38	0.42	0.41	0.39
24 Lime at Ridgeville	0.43	0.45	0.47	0.0E+00	6.1E-09	1.5E-02	0.43	0.45	0.45	0.43	0.45	0.48
25 Mansfield Drain at Ranger	0.46	0.48	0.43	6.1E-09	8.6E-09	1.5E-02	0.46	0.48	0.42	0.46	0.48	0.45
1 Lime at Mulberry	0.43	0.46	0.40	6.1E-09	6.1E-09	5.8E-03	0.43	0.46	0.39	0.43	0.46	0.40

June

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.48	0.31	0.70	5.8E-03	4.3E-09	0.0E+00	0.48	0.31	0.70	0.49	0.31	0.70
9 Bean at Dillion	0.45	0.42	0.42	5.8E-03	6.1E-09	5.8E-03	0.44	0.42	0.42	0.45	0.42	0.43
8 Bean at Medina	0.44	0.41	0.43	5.8E-03	3.5E-03	5.8E-03	0.44	0.40	0.42	0.45	0.41	0.43
7 Bean at Bothwell	0.44	0.41	0.39	6.1E-09	6.1E-09	6.1E-09	0.44	0.41	0.39	0.44	0.41	0.39
5 Bean at Bates	0.44	0.40	0.47	6.1E-09	4.6E-03	7.0E-02	0.44	0.40	0.40	0.44	0.41	0.54
6 Covell Drain at Harris	0.60	0.32	0.80	5.8E-03	4.3E-09	0.0E+00	0.59	0.32	0.80	0.60	0.32	0.80
4 Bean at Packard	0.44	0.40	0.42	5.8E-03	5.0E-04	1.2E-02	0.44	0.40	0.41	0.45	0.41	0.43
3 Bean at Lime Creek Hwy	0.44	0.40	0.43	6.1E-09	5.8E-04	2.9E-02	0.44	0.40	0.41	0.44	0.41	0.46
26 Bean at Ridgeville	0.45	0.40	0.44	0.0E+00	0.0E+00	3.5E-02	0.45	0.40	0.42	0.45	0.40	0.48
2 Bean at Mulberry	0.45	0.40	0.42	5.8E-03	1.7E-03	1.7E-02	0.45	0.40	0.40	0.46	0.40	0.43
22 Blanchard Drain at Coman		0.36			5.8E-04			0.36			0.36	
21 Blanchard Drain at Meridian	0.46	0.39	0.47	6.1E-09	1.0E-03	2.1E-02	0.46	0.39	0.45	0.46	0.39	0.49
20 Blanchard Drain at Munson	0.42	0.44	0.56	8.6E-09	8.6E-09	4.0E-02	0.42	0.44	0.52	0.42	0.44	0.60
19 Blanchard Drain at Ingall	0.42	0.43	0.37	8.6E-09	6.1E-09	5.8E-03	0.42	0.43	0.36	0.42	0.43	0.37
11 Lime at Coman	0.51	0.56	0.69	4.2E-02	5.8E-04	1.2E-01	0.48	0.56	0.57	0.56	0.56	0.80
12 Lime at Tamarack	0.50	0.53	0.57	1.2E-02	1.2E-08	5.8E-03	0.49	0.53	0.56	0.51	0.53	0.57
13 Lime at Lime Creek Drive	0.48	0.52	0.38	5.8E-03	5.8E-04	6.1E-09	0.48	0.52	0.38	0.49	0.52	0.38
14 Lime at Prattville	0.32	0.32	0.70	4.3E-09	4.3E-09	1.7E-01	0.32	0.32	0.60	0.32	0.32	0.90
15 Lime at Lime Creek Hwy		0.35			5.8E-04			0.35			0.35	
16 Site A at Lime Creek Hwy		0.32			5.8E-04			0.32			0.32	
17 Site B at Lime Creek Hwy	0.39	0.44	0.41	5.8E-03	8.6E-09	5.8E-03	0.38	0.44	0.41	0.39	0.44	0.42
18 Lime at Ingall	0.45	0.35	0.51	3.5E-02	5.8E-04	5.8E-03	0.43	0.35	0.51	0.49	0.35	0.52
23 Lime at White Pine	0.43	0.36	0.40	6.1E-09	1.7E-03	0.0E+00	0.43	0.36	0.40	0.43	0.36	0.40
24 Lime at Ridgeville	0.45	0.37	0.47	5.8E-03	5.8E-04	1.0E-02	0.44	0.37	0.46	0.45	0.37	0.48
25 Mansfield Drain at Ranger	0.47	0.55	0.49	6.1E-09	5.8E-04	2.0E-02	0.47	0.55	0.47	0.47	0.55	0.51
1 Lime at Mulberry	0.44	0.37	0.46	6.1E-09	6.1E-09	1.2E-02	0.44	0.37	0.45	0.44	0.37	0.47

July

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.49	0.30	0.56	0.0E+00	6.1E-09	3.5E-02	0.49	0.30	0.52	0.49	0.30	0.58
9 Bean at Dillion	0.44	0.36	0.44	6.1E-09	6.1E-09	1.0E-02	0.44	0.36	0.43	0.44	0.36	0.45
8 Bean at Medina	0.44	0.35	0.42	6.1E-09	0.0E+00	2.5E-02	0.44	0.35	0.40	0.44	0.35	0.45
7 Bean at Bothwell	0.43	0.36	0.39	6.1E-09	6.1E-09	0.0E+00	0.43	0.36	0.39	0.43	0.36	0.39
5 Bean at Bates	0.43	0.35	0.43	6.1E-09	0.0E+00	2.6E-02	0.43	0.35	0.41	0.43	0.35	0.46
6 Covell Drain at Harris	0.70	0.38	0.70	0.0E+00	6.1E-09	0.0E+00	0.70	0.38	0.70	0.70	0.38	0.70
4 Bean at Packard	0.43	0.36	0.40	6.1E-09	6.1E-09	5.8E-03	0.43	0.36	0.40	0.43	0.36	0.41
3 Bean at Lime Creek Hwy	0.42	0.36	0.41	8.6E-09	6.1E-09	6.1E-09	0.42	0.36	0.41	0.42	0.36	0.41
26 Bean at Ridgeville	0.42	0.35	0.40	0.0E+00	0.0E+00	0.0E+00	0.42	0.35	0.40	0.42	0.35	0.40
2 Bean at Mulberry	0.41	0.35	0.83	6.1E-09	0.0E+00	5.8E-02	0.41	0.35	0.80	0.41	0.35	0.90
22 Blanchard Drain at Coman	0.63	0.43		0.0E+00	6.1E-09		0.63	0.43		0.63	0.43	
21 Blanchard Drain at Meridian	0.50	0.41	0.70	0.0E+00	6.1E-09	0.0E+00	0.50	0.41	0.70	0.50	0.41	0.70
20 Blanchard Drain at Munson	0.45	0.40	0.73	0.0E+00	0.0E+00	5.8E-02	0.45	0.40	0.70	0.45	0.40	0.80
19 Blanchard Drain at Ingall	0.45	0.40	0.44	5.8E-03	0.0E+00	6.1E-09	0.44	0.40	0.44	0.45	0.40	0.44
11 Lime at Coman	0.60	0.50	2.23	5.8E-03	5.8E-03	8.7E-01	0.59	0.49	1.50	0.60	0.50	3.20
12 Lime at Tamarack	0.64	0.50	1.20	8.6E-09	0.0E+00	2.4E-08	0.64	0.50	1.20	0.64	0.50	1.20
13 Lime at Lime Creek Drive	0.58	0.50	0.63	8.6E-09	0.0E+00	5.8E-02	0.58	0.50	0.60	0.58	0.50	0.70
14 Lime at Prattville	0.28	0.25	1.07	4.3E-09	0.0E+00	1.2E-01	0.28	0.25	1.00	0.28	0.25	1.20
15 Lime at Lime Creek Hwy	0.29	0.31		4.3E-09	4.3E-09		0.29	0.31		0.29	0.31	
16 Site A at Lime Creek Hwy		0.31			4.3E-09			0.31			0.31	
17 Site B at Lime Creek Hwy	0.49	0.41	0.83	0.0E+00	6.1E-09	5.8E-02	0.49	0.41	0.80	0.49	0.41	0.90
18 Lime at Ingall	0.39	0.34	0.43	6.1E-09	6.1E-09	6.1E-09	0.39	0.34	0.43	0.39	0.34	0.43
23 Lime at White Pine	0.40	0.36	0.47	5.8E-03	6.1E-09	6.1E-09	0.40	0.36	0.47	0.41	0.36	0.47
24 Lime at Ridgeville	0.42	0.36	0.47	8.6E-09	6.1E-09	6.1E-09	0.42	0.36	0.47	0.42	0.36	0.47
25 Mansfield Drain at Ranger	0.54	0.47	0.49	8.6E-09	6.1E-09	5.8E-03	0.54	0.47	0.48	0.54	0.47	0.49
1 Lime at Mulberry	0.42	0.36	0.46	8.6E-09	5.5E-03	5.8E-03	0.42	0.35	0.46	0.42	0.36	0.47

August

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.61	0.40	0.30	5.8E-03	0.0E+00	5.8E-03	0.60	0.40	0.30	0.61	0.40	0.31
9 Bean at Dillion	0.55	0.34	0.32	1.5E-02	6.1E-09	5.8E-03	0.54	0.34	0.32	0.57	0.34	0.33
8 Bean at Medina	0.53	0.34	0.32	1.0E-02	6.1E-09	4.3E-09	0.52	0.34	0.32	0.54	0.34	0.32
7 Bean at Bothwell	0.51	0.34	0.32	0.0E+00	6.1E-09	4.3E-09	0.51	0.34	0.32	0.51	0.34	0.32
5 Bean at Bates	0.52	0.34	0.32	5.8E-03	6.1E-09	4.3E-09	0.52	0.34	0.32	0.53	0.34	0.32
6 Covell Drain at Harris	0.70	0.41	0.34	0.0E+00	6.1E-09	6.1E-09	0.70	0.41	0.34	0.70	0.41	0.34
4 Bean at Packard	0.51	0.33	0.32	5.8E-03	6.1E-09	4.3E-09	0.51	0.33	0.32	0.52	0.33	0.32
3 Bean at Lime Creek Hwy	0.53	0.35	0.32	5.8E-03	0.0E+00	5.8E-03	0.52	0.35	0.31	0.53	0.35	0.32
26 Bean at Ridgeville	0.52	0.35	0.31	5.8E-03	0.0E+00	4.3E-09	0.51	0.35	0.31	0.52	0.35	0.31
2 Bean at Mulberry	0.51	0.35	0.30	0.0E+00	0.0E+00	6.1E-09	0.51	0.35	0.30	0.51	0.35	0.30
22 Blanchard Drain at Coman		0.33	0.77		6.1E-09	5.8E-02		0.33	0.70		0.33	0.80
21 Blanchard Drain at Meridian		0.29	0.22		4.3E-09	5.8E-03		0.29	0.21		0.29	0.22
20 Blanchard Drain at Munson	0.62	0.28	0.23	5.8E-03	4.3E-09	3.0E-09	0.62	0.28	0.23	0.63	0.28	0.23
19 Blanchard Drain at Ingall	0.54	0.28	0.23	5.8E-03	4.3E-09	3.0E-09	0.53	0.28	0.23	0.54	0.28	0.23
11 Lime at Coman	0.50	0.33	0.45	0.0E+00	6.1E-09	1.0E-02	0.50	0.33	0.44	0.50	0.33	0.46
12 Lime at Tamarack	0.60	0.33	0.38	1.2E-08	6.1E-09	6.1E-09	0.60	0.33	0.38	0.60	0.33	0.38
13 Lime at Lime Creek Drive	0.61	0.33	0.37	1.2E-08	6.1E-09	6.1E-09	0.61	0.33	0.37	0.61	0.33	0.37
14 Lime at Prattville	0.57	0.20	0.19	5.8E-02	0.0E+00	3.0E-09	0.50	0.20	0.19	0.60	0.20	0.19
15 Lime at Lime Creek Hwy		0.25	0.22		0.0E+00	3.0E-09		0.25	0.22		0.25	0.22
16 Site A at Lime Creek Hwy	0.45		0.23	5.8E-03		3.0E-09	0.44		0.23	0.45		0.23
17 Site B at Lime Creek Hwy	0.48	0.36	0.36	0.0E+00	6.1E-09	6.1E-09	0.48	0.36	0.36	0.48	0.36	0.36
18 Lime at Ingall	0.47	0.30	0.26	6.1E-09	6.1E-09	0.0E+00	0.47	0.30	0.26	0.47	0.30	0.26
23 Lime at White Pine	0.46	0.29	0.25	6.1E-09	4.3E-09	0.0E+00	0.46	0.29	0.25	0.46	0.29	0.25
24 Lime at Ridgeville	0.49	0.28	0.25	5.8E-03	4.3E-09	0.0E+00	0.48	0.28	0.25	0.49	0.28	0.25
25 Mansfield Drain at Ranger	0.56	0.30	0.36	8.6E-09	6.1E-09	5.8E-03	0.56	0.30	0.36	0.56	0.30	0.37
1 Lime at Mulberry	0.48	0.26	0.25	0.0E+00	0.0E+00	0.0E+00	0.48	0.26	0.25	0.48	0.26	0.25

September

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.52	0.41	0.40	5.8E-03	6.1E-09	0.0E+00	0.51	0.41	0.40	0.52	0.41	0.40
9 Bean at Dillion	0.59	0.36	0.38	5.8E-03	6.1E-09	6.1E-09	0.59	0.36	0.38	0.60	0.36	0.38
8 Bean at Medina	0.54	0.36	0.38	5.8E-03	6.1E-09	6.1E-09	0.53	0.36	0.38	0.54	0.36	0.38
7 Bean at Bothwell	0.52	0.35	0.39	5.8E-03	0.0E+00	6.1E-09	0.52	0.35	0.39	0.53	0.35	0.39
5 Bean at Bates	0.53	0.37	0.39	0.0E+00	6.1E-09	6.1E-09	0.53	0.37	0.39	0.53	0.37	0.39
6 Covell Drain at Harris	0.60	0.48	0.50	1.2E-08	0.0E+00	5.8E-03	0.60	0.48	0.49	0.60	0.48	0.50
4 Bean at Packard	0.56	0.37	0.39	2.5E-02	6.1E-09	6.1E-09	0.53	0.37	0.39	0.58	0.37	0.39
3 Bean at Lime Creek Hwy	0.55	0.37	0.39	5.8E-03	6.1E-09	6.1E-09	0.54	0.37	0.39	0.55	0.37	0.39
26 Bean at Ridgeville	0.54	0.37	0.39	8.6E-09	6.1E-09	6.1E-09	0.54	0.37	0.39	0.54	0.37	0.39
2 Bean at Mulberry	0.55	0.37	0.39	0.0E+00	6.1E-09	6.1E-09	0.55	0.37	0.39	0.55	0.37	0.39
22 Blanchard Drain at Coman	0.70	0.38		0.0E+00	6.1E-09		0.70	0.38		0.70	0.38	
21 Blanchard Drain at Meridian	0.70	0.35	0.40	0.0E+00	0.0E+00	0.0E+00	0.70	0.35	0.40	0.70	0.35	0.40
20 Blanchard Drain at Munson	0.63	0.33	0.42	0.0E+00	6.1E-09	8.6E-09	0.63	0.33	0.42	0.63	0.33	0.42
19 Blanchard Drain at Ingall	0.50	0.37	0.40	1.5E-02	6.1E-09	0.0E+00	0.49	0.37	0.40	0.52	0.37	0.40
11 Lime at Coman	0.70	0.41	0.43	0.0E+00	6.1E-09	6.1E-09	0.70	0.41	0.43	0.70	0.41	0.43
12 Lime at Tamarack	0.70	0.41	0.43	0.0E+00	6.1E-09	6.1E-09	0.70	0.41	0.43	0.70	0.41	0.43
13 Lime at Lime Creek Drive	0.60	0.37	0.21	1.2E-08	6.1E-09	4.3E-09	0.60	0.37	0.21	0.60	0.37	0.21
14 Lime at Prattville		0.21	0.22		4.3E-09	3.0E-09		0.21	0.22		0.21	0.22
15 Lime at Lime Creek Hwy		0.28	0.30		4.3E-09	6.1E-09		0.28	0.30		0.28	0.30
16 Site A at Lime Creek Hwy			0.31			4.3E-09			0.31			0.31
17 Site B at Lime Creek Hwy	0.48	0.43	0.44	0.0E+00	5.8E-03	6.1E-09	0.48	0.42	0.44	0.48	0.43	0.44
18 Lime at Ingall	0.50	0.34	0.37	0.0E+00	6.1E-09	6.1E-09	0.50	0.34	0.37	0.50	0.34	0.37
23 Lime at White Pine	0.50	0.37	0.38	5.8E-03	6.1E-09	0.0E+00	0.49	0.37	0.38	0.50	0.37	0.38
24 Lime at Ridgeville	0.56	0.38	0.38	1.5E-02	6.1E-09	6.1E-09	0.54	0.38	0.38	0.57	0.38	0.38
25 Mansfield Drain at Ranger	0.61	0.39	0.41	7.1E-03	6.1E-09	6.1E-09	0.60	0.39	0.41	0.61	0.39	0.41
1 Lime at Mulberry	0.49	0.37	0.41	5.8E-03	6.1E-09	5.8E-03	0.48	0.37	0.40	0.49	0.37	0.41

October

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.60	0.39	0.50	1.2E-08	6.1E-09	0.0E+00	0.60	0.39	0.50	0.60	0.39	0.50
9 Bean at Dillion	0.52	0.36	0.43	5.8E-03	6.1E-09	6.1E-09	0.52	0.36	0.43	0.53	0.36	0.43
8 Bean at Medina	0.52	0.36	0.42	0.0E+00	6.1E-09	5.8E-03	0.52	0.36	0.42	0.52	0.36	0.43
7 Bean at Bothwell	0.51	0.36	0.42	0.0E+00	6.1E-09	8.6E-09	0.51	0.36	0.42	0.51	0.36	0.42
5 Bean at Bates	0.52	0.36	0.43	0.0E+00	6.1E-09	6.1E-09	0.52	0.36	0.43	0.52	0.36	0.43
6 Covell Drain at Harris	0.80	0.46	0.59	0.0E+00	6.1E-09	1.2E-08	0.80	0.46	0.59	0.80	0.46	0.59
4 Bean at Packard	0.51	0.36	0.43	0.0E+00	6.1E-09	6.1E-09	0.51	0.36	0.43	0.51	0.36	0.43
3 Bean at Lime Creek Hwy	0.51	0.36	0.43	0.0E+00	6.1E-09	6.1E-09	0.51	0.36	0.43	0.51	0.36	0.43
26 Bean at Ridgeville	0.51	0.36	0.43	0.0E+00	6.1E-09	6.1E-09	0.51	0.36	0.43	0.51	0.36	0.43
2 Bean at Mulberry	0.50	0.36	0.42	0.0E+00	6.1E-09	5.8E-03	0.50	0.36	0.42	0.50	0.36	0.43
22 Blanchard Drain at Coman		0.37			6.1E-09			0.37			0.37	
21 Blanchard Drain at Meridian		0.41	0.54		6.1E-09	5.8E-03		0.41	0.54		0.41	0.55
20 Blanchard Drain at Munson		0.40			0.0E+00			0.40			0.40	
19 Blanchard Drain at Ingall	0.60	0.41	0.48	1.2E-08	6.1E-09	5.8E-03	0.60	0.41	0.47	0.60	0.41	0.48
11 Lime at Coman	0.61	0.45	0.56	1.2E-08	0.0E+00	5.8E-03	0.61	0.45	0.55	0.61	0.45	0.56
12 Lime at Tamarack	0.70	0.49	0.58	0.0E+00	0.0E+00	8.6E-09	0.70	0.49	0.58	0.70	0.49	0.58
13 Lime at Lime Creek Drive	0.70	0.47	0.26	0.0E+00	6.1E-09	0.0E+00	0.70	0.47	0.26	0.70	0.47	0.26
14 Lime at Prattville		0.25	0.27		0.0E+00	5.8E-03		0.25	0.26		0.25	0.27
15 Lime at Lime Creek Hwy		0.32	0.36		4.3E-09	6.1E-09		0.32	0.36		0.32	0.36
16 Site A at Lime Creek Hwy	0.70		0.46	0.0E+00		6.1E-09	0.70		0.46	0.70		0.46
17 Site B at Lime Creek Hwy	0.56	0.44	0.70	8.6E-09	6.1E-09	0.0E+00	0.56	0.44	0.70	0.56	0.44	0.70
18 Lime at Ingall	0.52	0.37	0.45	0.0E+00	6.1E-09	0.0E+00	0.52	0.37	0.45	0.52	0.37	0.45
23 Lime at White Pine	0.53	0.39	0.46	5.8E-03	6.1E-09	6.1E-09	0.53	0.39	0.46	0.54	0.39	0.46
24 Lime at Ridgeville	0.56	0.40	0.47	5.8E-03	0.0E+00	5.8E-03	0.55	0.40	0.46	0.56	0.40	0.47
25 Mansfield Drain at Ranger	0.59	0.40	0.49	1.2E-08	0.0E+00	0.0E+00	0.59	0.40	0.49	0.59	0.40	0.49
1 Lime at Mulberry	0.55	0.39	0.46	5.8E-03	6.1E-09	6.1E-09	0.55	0.39	0.46	0.56	0.39	0.46

November

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.70	0.35	0.52	0.0E+00	0.0E+00	0.0E+00	0.70	0.35	0.52	0.70	0.35	0.52
9 Bean at Dillion	0.55	0.34	0.50	0.0E+00	6.1E-09	5.8E-03	0.55	0.34	0.49	0.55	0.34	0.50
8 Bean at Medina	0.55	0.35	0.50	5.8E-03	0.0E+00	5.8E-03	0.54	0.35	0.50	0.55	0.35	0.51
7 Bean at Bothwell	0.55	0.35	0.80	0.0E+00	0.0E+00	0.0E+00	0.55	0.35	0.80	0.55	0.35	0.80
5 Bean at Bates	0.55	0.35	0.90	0.0E+00	0.0E+00	0.0E+00	0.55	0.35	0.90	0.55	0.35	0.90
6 Covell Drain at Harris	0.80	0.45	1.03	0.0E+00	0.0E+00	5.8E-02	0.80	0.45	1.00	0.80	0.45	1.10
4 Bean at Packard	0.55	0.35	0.90	0.0E+00	0.0E+00	0.0E+00	0.55	0.35	0.90	0.55	0.35	0.90
3 Bean at Lime Creek Hwy	0.55	0.35	0.90	0.0E+00	0.0E+00	0.0E+00	0.55	0.35	0.90	0.55	0.35	0.90
26 Bean at Ridgeville	0.55	0.35	0.90	0.0E+00	0.0E+00	0.0E+00	0.55	0.35	0.90	0.55	0.35	0.90
2 Bean at Mulberry	0.56	0.36	0.56	5.8E-03	6.1E-09	1.0E-02	0.55	0.36	0.55	0.56	0.36	0.57
22 Blanchard Drain at Coman		0.38	1.00		6.1E-09	0.0E+00		0.38	1.00		0.38	1.00
21 Blanchard Drain at Meridian		0.38	0.90		6.1E-09	0.0E+00		0.38	0.90		0.38	0.90
20 Blanchard Drain at Munson	0.70	0.39	0.58	0.0E+00	6.1E-09	1.0E-02	0.70	0.39	0.57	0.70	0.39	0.59
19 Blanchard Drain at Ingall	0.70	0.39	0.90	0.0E+00	6.1E-09	0.0E+00	0.70	0.39	0.90	0.70	0.39	0.90
11 Lime at Coman	0.70	0.40	1.10	0.0E+00	0.0E+00	0.0E+00	0.70	0.40	1.10	0.70	0.40	1.10
12 Lime at Tamarack	0.70	0.41	1.10	0.0E+00	6.1E-09	0.0E+00	0.70	0.41	1.10	0.70	0.41	1.10
13 Lime at Lime Creek Drive	0.70	0.42	1.00	0.0E+00	8.6E-09	0.0E+00	0.70	0.42	1.00	0.70	0.42	1.00
14 Lime at Prattville		0.26	0.43		0.0E+00	5.8E-03		0.26	0.43		0.26	0.44
15 Lime at Lime Creek Hwy		0.29	0.43		4.3E-09	6.1E-09		0.29	0.43		0.29	0.43
16 Site A at Lime Creek Hwy			0.45			0.0E+00			0.45			0.45
17 Site B at Lime Creek Hwy	0.70	0.40	0.90	0.0E+00	0.0E+00	0.0E+00	0.70	0.40	0.90	0.70	0.40	0.90
18 Lime at Ingall	0.53	0.34	0.48	2.6E-02	6.1E-09	0.0E+00	0.50	0.34	0.48	0.55	0.34	0.48
23 Lime at White Pine	0.55	0.36	0.50	4.7E-02	6.1E-09	5.8E-03	0.51	0.36	0.50	0.60	0.36	0.51
24 Lime at Ridgeville	0.59	0.36	0.51	1.2E-02	6.1E-09	0.0E+00	0.58	0.36	0.51	0.60	0.36	0.51
25 Mansfield Drain at Ranger	0.63	0.34	1.00	5.8E-02	6.1E-09	0.0E+00	0.60	0.34	1.00	0.70	0.34	1.00
1 Lime at Mulberry	0.52	0.36	0.80	6.8E-02	6.1E-09	0.0E+00	0.47	0.36	0.80	0.60	0.36	0.80

December

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		0.33	0.32	0.0E+00	6.1E-09	0.0E+00		0.33	0.32		0.33	0.32
9 Bean at Dillion	0.56	0.33	0.36	8.6E-09	6.1E-09	5.8E-03	0.56	0.33	0.35	0.56	0.33	0.36
8 Bean at Medina	0.54	0.33	0.35	8.6E-09	6.1E-09	0.0E+00	0.54	0.33	0.35	0.54	0.33	0.35
7 Bean at Bothwell	0.55	0.33	0.37	0.0E+00	6.1E-09	6.1E-09	0.55	0.33	0.37	0.55	0.33	0.37
5 Bean at Bates	0.56	0.33	0.37	5.8E-03	6.1E-09	5.8E-03	0.56	0.33	0.36	0.57	0.33	0.37
6 Covell Drain at Harris	0.80	0.42	0.63	0.0E+00	8.6E-09	5.8E-02	0.80	0.42	0.60	0.80	0.42	0.70
4 Bean at Packard	0.57	0.33	0.45	0.0E+00	6.1E-09	1.3E-01	0.57	0.33	0.38	0.57	0.33	0.60
3 Bean at Lime Creek Hwy	0.57	0.33	0.60	0.0E+00	6.1E-09	1.2E-08	0.57	0.33	0.60	0.57	0.33	0.60
26 Bean at Ridgeville	0.57	0.33	0.60	5.8E-03	6.1E-09	1.2E-08	0.56	0.33	0.60	0.57	0.33	0.60
2 Bean at Mulberry	0.56	0.33	0.60	5.8E-03	6.1E-09	1.2E-08	0.56	0.33	0.60	0.57	0.33	0.60
22 Blanchard Drain at Coman		0.37	0.28		6.1E-09	4.3E-09		0.37	0.28		0.37	0.28
21 Blanchard Drain at Meridian		0.37	0.31		5.8E-03	5.8E-03		0.37	0.31		0.38	0.32
20 Blanchard Drain at Munson		0.38	0.32		6.1E-09	4.3E-09		0.38	0.32		0.38	0.32
19 Blanchard Drain at Ingall		0.38	0.32		6.1E-09	4.3E-09		0.38	0.32		0.38	0.32
11 Lime at Coman	0.70	0.39	2.21	0.0E+00	5.8E-03	3.1E+00	0.70	0.38	0.41	0.70	0.39	5.80
12 Lime at Tamarack	0.60	0.43	0.48	1.2E-08	6.1E-09	0.0E+00	0.60	0.43	0.48	0.60	0.43	0.48
13 Lime at Lime Creek Drive	0.70	0.43	0.18	0.0E+00	6.1E-09	1.9E-01	0.70	0.43	0.03	0.70	0.43	0.39
14 Lime at Prattville	0.35	0.26	0.30	0.0E+00	0.0E+00	6.1E-09	0.35	0.26	0.30	0.35	0.26	0.30
15 Lime at Lime Creek Hwy		0.30	0.30		5.8E-03	6.1E-09		0.29	0.30		0.30	0.30
16 Site A at Lime Creek Hwy			0.30			6.1E-09			0.30			0.30
17 Site B at Lime Creek Hwy		0.40	0.39		0.0E+00	6.1E-09		0.40	0.39		0.40	0.39
18 Lime at Ingall	0.56	0.33	0.32	8.6E-09	6.1E-09	5.8E-03	0.56	0.33	0.32	0.56	0.33	0.33
23 Lime at White Pine		0.35	0.32		0.0E+00	4.3E-09		0.35	0.32		0.35	0.32
24 Lime at Ridgeville		0.35	0.35		0.0E+00	0.0E+00		0.35	0.35		0.35	0.35
25 Mansfield Drain at Ranger		0.30	0.33		6.1E-09	6.1E-09		0.30	0.33		0.30	0.33
1 Lime at Mulberry	0.61	0.35	0.70	1.2E-08	0.0E+00	0.0E+00	0.61	0.35	0.70	0.61	0.35	0.70

32 Month Baseline Statistical Analysis
April 2005 - December 2007
All Sites by Month

Oxidation Reduction Potential (mV)

January

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		367	333		3.51	2.00		364	331		371	335
9 Bean at Dillion		393	360		2.22	7.09		390	352		395	366
8 Bean at Medina		373	355		1.00	1.53		372	353		374	356
7 Bean at Bothwell		373	347		2.52	2.52		371	345		376	350
5 Bean at Bates		368	337		3.06	2.52		365	335		371	340
6 Covell Drain at Harris		366	338		2.00	1.53		364	337		368	340
4 Bean at Packard		381	351		2.08	5.69		379	346		383	357
3 Bean at Lime Creek Hwy		379	355		2.00	3.51		377	352		381	359
26 Bean at Ridgeville		378	384		3.51	5.51		375	378		382	389
2 Bean at Mulberry		356	413		1.53	9.07		354	406		357	423
22 Blanchard Drain at Coman		353	218		4.00	8.50		349	209		357	226
21 Blanchard Drain at Meridian		382	239		3.06	0.58		379	239		385	240
20 Blanchard Drain at Munson		361	309		3.06	2.00		358	307		364	311
19 Blanchard Drain at Ingall		318	298		1.73	1.53		317	297		320	300
11 Lime at Coman		379	99		2.00	1.53		377	98		381	101
12 Lime at Tamarack		363	183		1.15	0.58		362	183		364	184
13 Lime at Lime Creek Drive		351	250		1.00	0.58		350	250		352	251
14 Lime at Prattville		365	252		0.58	0.58		365	251		366	252
15 Lime at Lime Creek Hwy		360	330		1.00	2.52		359	327		361	332
16 Site A at Lime Creek Hwy		341			1.00			340			342	
17 Site B at Lime Creek Hwy		330	310		1.15	1.53		329	309		331	312
18 Lime at Ingall		329	299		2.08	0.58		327	299		331	300
23 Lime at White Pine		315	336		1.53	4.00		313	332		316	340
24 Lime at Ridgeville		329	356		1.53	3.51		327	352		330	359
25 Mansfield Drain at Ranger		315	310		9.29	6.00		309	304		326	316
1 Lime at Mulberry		309	333		1.00	3.06		308	330		310	336

February

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		323	270		1.00	0.58		322	269		324	270
9 Bean at Dillion		338	276		2.52	0.58		335	276		340	277
8 Bean at Medina		331			1.00			330			332	
7 Bean at Bothwell		329	270		1.00	0.58		328	270		330	271
5 Bean at Bates		321	272		1.00	0.00		320	272		322	272
6 Covell Drain at Harris		329	280		1.00	0.00		328	280		330	280
4 Bean at Packard		338	290		2.08	0.58		335	290		340	291
3 Bean at Lime Creek Hwy		336	324		2.08	1.15		334	323		338	325
26 Bean at Ridgeville		336	339		2.00	1.15		334	338		338	340
2 Bean at Mulberry		331	287		2.89	0.58		329	286		334	287
22 Blanchard Drain at Coman		319			1.00			318			320	
21 Blanchard Drain at Meridian		317	234		0.58	1.00		316	233		317	235
20 Blanchard Drain at Munson		319	234		1.00	0.00		318	234		320	234
19 Blanchard Drain at Ingall		305			1.15			304			306	
11 Lime at Coman		312	88		1.53	2.08		311	86		314	90
12 Lime at Tamarack		310	165		1.00	3.00		309	162		311	168
13 Lime at Lime Creek Drive		311			1.00			310			312	
14 Lime at Prattville		321	212		0.00	0.58		321	211		321	212
15 Lime at Lime Creek Hwy		318			1.00			317			319	
16 Site A at Lime Creek Hwy		321			1.00			320			322	
17 Site B at Lime Creek Hwy		317	223		0.58	2.00		317	221		318	225
18 Lime at Ingall		316	227		0.58	0.58		316	226		317	227
23 Lime at White Pine		312			2.52			310			315	
24 Lime at Ridgeville		341	246		2.00	0.00		339	246		343	246
25 Mansfield Drain at Ranger		322	247		1.53	1.15		321	246		324	248
1 Lime at Mulberry		308	243		1.00	0.58		307	243		309	244

March

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		281	340		0.58	2.00		280	338		281	342
9 Bean at Dillion		301	346		5.86	2.00		297	344		308	348
8 Bean at Medina		306	352		2.52	1.73		304	351		309	354
7 Bean at Bothwell		272	342		0.58	2.00		271	340		272	344
5 Bean at Bates		233	334		0.58	1.00		232	333		233	335
6 Covell Drain at Harris		235	332		0.58	1.53		235	331		236	334
4 Bean at Packard		252	345		0.00	2.00		252	343		252	347
3 Bean at Lime Creek Hwy		286	338		1.53	2.08		284	336		287	340
26 Bean at Ridgeville		340	327		1.00	2.52		339	324		341	329
2 Bean at Mulberry		290	256		1.53	0.58		288	255		291	256
22 Blanchard Drain at Coman		229	310		0.00	2.52		229	307		229	312
21 Blanchard Drain at Meridian		244	277		0.58	0.58		244	277		245	278
20 Blanchard Drain at Munson		249	259		0.58	0.58		248	258		249	259
19 Blanchard Drain at Ingall		222	234		0.00	0.58		222	233		222	234
11 Lime at Coman		291	134		1.00	3.61		290	130		292	137
12 Lime at Tamarack		224	252		0.00	1.00		224	251		224	253
13 Lime at Lime Creek Drive		224	295		0.58	1.00		224	294		225	296
14 Lime at Prattville		218	332		1.15	1.00		217	331		219	333
15 Lime at Lime Creek Hwy		255	250		0.58	0.00		255	250		256	250
16 Site A at Lime Creek Hwy			246		0.00				246			247
17 Site B at Lime Creek Hwy		233	237		0.00	0.58		233	236		233	237
18 Lime at Ingall		231	233		0.00	1.00		231	232		231	234
23 Lime at White Pine		221	235		0.00	0.58		221	235		221	236
24 Lime at Ridgeville		226	236		0.45	0.00		225	236		226	236
25 Mansfield Drain at Ranger		220	230		0.00	0.00		220	230		220	230
1 Lime at Mulberry		227	231		0.00	0.00		227	231		227	231

April

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	227	304	255	2.89	1.00	2.00	225	303	253	230	305	257
9 Bean at Dillion	214	295	262	5.29	2.52	0.58	210	293	261	220	298	262
8 Bean at Medina	216	309	267	6.46	5.13	1.00	203	305	266	228	315	268
7 Bean at Bothwell	211	290	265	11.50	4.00	0.58	199	286	265	222	294	266
5 Bean at Bates	208	288	264	3.90	3.00	0.58	202	285	263	214	291	264
6 Covell Drain at Harris	211	275	275	7.21	0.58	1.53	205	275	273	219	276	276
4 Bean at Packard	211	314	272	2.24	3.51	2.00	208	311	270	216	318	274
3 Bean at Lime Creek Hwy	208	318	271	9.71	8.50	1.00	185	309	270	218	326	272
26 Bean at Ridgeville	207	329	280	6.80	3.51	2.08	200	326	278	218	333	282
2 Bean at Mulberry	104	323	280	49.31	5.13	1.00	9	317	279	137	327	281
22 Blanchard Drain at Coman	169	240	214	5.03	5.13	1.00	164	236	213	174	246	215
21 Blanchard Drain at Meridian	172	252	257	17.67	0.58	0.58	160	252	257	192	253	258
20 Blanchard Drain at Munson	162	271	249	1.53	1.00	0.58	161	270	248	164	272	249
19 Blanchard Drain at Ingall	202	252	237	5.03	1.00	0.58	197	251	237	207	253	238
11 Lime at Coman	181	283	139	10.15	0.58	2.00	170	283	137	190	284	141
12 Lime at Tamarack	179	258	236	2.00	1.00	0.00	177	257	236	181	259	236
13 Lime at Lime Creek Drive	181	252	239	4.58	1.53	0.58	176	250	239	185	253	240
14 Lime at Prattville	184	258	226	8.33	1.53	0.00	177	257	226	193	260	226
15 Lime at Lime Creek Hwy	193	249	235	1.73	1.53	0.00	191	248	235	194	251	235
16 Site A at Lime Creek Hwy	184		232	24.98		0.58	156		231	204		232
17 Site B at Lime Creek Hwy	200	271	230	2.08	2.08	0.00	198	269	230	202	273	230
18 Lime at Ingall	204	267	238	5.18	1.53	0.58	197	266	238	212	269	239
23 Lime at White Pine	200	246	241	4.33	0.58	0.58	194	246	241	206	247	242
24 Lime at Ridgeville	212	271	246	2.79	1.00	0.00	208	270	246	216	272	246
25 Mansfield Drain at Ranger	156	255	245	8.62	0.58	0.58	148	254	245	165	255	246
1 Lime at Mulberry	142	258	245	11.02	0.00	0.00	131	258	245	153	258	245

May

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	156	223	279	1.53	0.58	0.58	154	222	279	157	223	280
9 Bean at Dillion	141	226	286	0.96	0.58	1.53	140	225	285	142	226	288
8 Bean at Medina	156	228	293	1.71	0.58	1.00	154	228	292	158	229	294
7 Bean at Bothwell	145	229	308	2.58	0.00	1.53	142	229	306	148	229	309
5 Bean at Bates	139	227	305	2.22	0.00	4.51	137	227	301	142	227	310
6 Covell Drain at Harris	133	233	308	2.52	1.15	2.52	130	232	306	135	234	311
4 Bean at Packard	134	261	320	2.22	1.00	3.51	132	260	316	137	262	323
3 Bean at Lime Creek Hwy	130	293	323	2.50	5.57	2.52	127	287	321	133	298	326
26 Bean at Ridgeville	122	281	318	0.82	5.29	4.73	121	277	314	123	287	323
2 Bean at Mulberry	106	230	268	3.70	1.00	0.58	102	229	268	110	231	269
22 Blanchard Drain at Coman	171	191		3.51	0.00		167	191		174	191	
21 Blanchard Drain at Meridian	153	200	265	2.08	0.58	1.00	151	199	264	155	200	266
20 Blanchard Drain at Munson	169	199	255	2.00	0.00	1.00	167	199	254	171	199	256
19 Blanchard Drain at Ingall	164	188	279	2.08	0.58	1.53	162	188	278	166	189	281
11 Lime at Coman	166	87	-21	4.22	16.64	3.21	163	68	-25	171	99	-19
12 Lime at Tamarack	70	160	159	0.58	1.00	1.53	70	159	157	71	161	160
13 Lime at Lime Creek Drive	123	165	225	2.00	1.00	0.00	121	164	225	125	166	225
14 Lime at Prattville	129	163	263	2.00	0.00	6.11	127	163	258	131	163	270
15 Lime at Lime Creek Hwy	166	189	262	1.53	0.58	2.00	165	188	260	168	189	264
16 Site A at Lime Creek Hwy	164	193		2.00	0.58		162	192		166	193	
17 Site B at Lime Creek Hwy	176	195	313	0.58	0.00	3.06	176	195	310	177	195	316
18 Lime at Ingall	185	194	314	2.06	0.58	2.52	183	194	312	187	195	317
23 Lime at White Pine	192	189	309	0.82	0.00	1.53	191	189	308	193	189	311
24 Lime at Ridgeville	217	191	318	0.96	0.00	2.00	216	191	316	218	191	320
25 Mansfield Drain at Ranger	228	187	314	1.53	0.58	2.00	227	187	312	230	188	316
1 Lime at Mulberry	217	181	311	2.65	0.58	3.00	214	181	308	219	182	314

June

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	234	258	313	2.00	0.00	1.00	232	258	312	236	258	314
9 Bean at Dillion	229	272	323	3.51	2.00	1.00	225	270	322	232	274	324
8 Bean at Medina	242	276	316	5.51	2.52	1.53	237	274	315	248	279	318
7 Bean at Bothwell	228	253	310	4.51	1.53	3.06	224	252	307	233	255	313
5 Bean at Bates	212	251	327	2.08	2.52	3.51	210	248	323	214	253	330
6 Covell Drain at Harris	199	250	333	6.51	4.00	8.96	192	246	327	205	254	343
4 Bean at Packard	230	270	336	3.00	5.74	2.00	227	265	334	233	278	338
3 Bean at Lime Creek Hwy	192	256	339	0.58	3.61	1.53	192	253	338	193	260	341
26 Bean at Ridgeville	182	262	350	2.89	2.00	3.06	179	260	347	184	264	353
2 Bean at Mulberry	179	162	304	1.00	10.15	0.00	178	151	304	180	171	304
22 Blanchard Drain at Coman		236			2.52			234			239	
21 Blanchard Drain at Meridian	248	259	299	4.00	0.58	1.00	244	258	298	252	259	300
20 Blanchard Drain at Munson	218	253	273	4.16	2.08	1.00	215	251	272	223	255	274
19 Blanchard Drain at Ingall	244	243	252	8.54	1.00	2.00	236	242	250	253	244	254
11 Lime at Coman	244	43	293	4.73	5.51	3.21	240	37	289	249	47	295
12 Lime at Tamarack	226	149	300	1.53	1.15	0.58	225	148	299	228	150	300
13 Lime at Lime Creek Drive	233	224	259	8.19	2.00	1.00	224	222	258	240	226	260
14 Lime at Prattville	214	214	277	15.01	1.15	1.53	197	213	276	223	215	279
15 Lime at Lime Creek Hwy		255			1.53			254			257	
16 Site A at Lime Creek Hwy		257			3.00			254			260	
17 Site B at Lime Creek Hwy	188	261	279	11.68	3.06	0.58	178	258	279	201	264	280
18 Lime at Ingall	248	258	293	3.21	1.53	1.53	246	256	292	252	259	295
23 Lime at White Pine	247	262	247	1.73	2.52	0.00	246	260	247	249	265	247
24 Lime at Ridgeville	262	270	272	2.65	2.52	0.58	260	268	272	265	273	273
25 Mansfield Drain at Ranger	270	269	265	2.08	2.00	2.00	268	267	263	272	271	267
1 Lime at Mulberry	258	258	259	9.45	2.08	0.00	251	256	259	269	260	259

July

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	238	190	321	3.79	4.16	2.08	235	187	319	242	195	323
9 Bean at Dillion	217	204	344	4.36	4.16	3.51	214	201	341	222	209	348
8 Bean at Medina	206	211	334	1.15	3.51	9.61	205	208	325	207	215	344
7 Bean at Bothwell	234	213	332	3.51	4.00	3.86	231	209	328	238	217	337
5 Bean at Bates	227	152	322	3.06	8.62	3.00	224	143	319	230	160	325
6 Covell Drain at Harris	219	164	312	21.13	2.52	2.52	197	161	310	239	166	315
4 Bean at Packard	253	163	247	3.51	3.00	0.00	250	160	247	257	166	247
3 Bean at Lime Creek Hwy	257	119	254	3.06	1.53	0.58	254	117	254	260	120	255
26 Bean at Ridgeville	174	116	253	2.52	0.58	0.58	172	115	252	177	116	253
2 Bean at Mulberry	148	122	258	1.00	0.00	1.00	147	122	257	149	122	259
22 Blanchard Drain at Coman	227	127		4.16	2.00		222	125		230	129	
21 Blanchard Drain at Meridian	234	141	280	1.53	9.07	1.00	233	134	279	236	151	281
20 Blanchard Drain at Munson	188	171	289	4.36	5.57	1.00	185	165	288	193	176	290
19 Blanchard Drain at Ingall	75	154	213	10.50	2.00	2.00	64	152	211	85	156	215
11 Lime at Coman	247	6	283	0.58	1.53	1.53	246	4	282	247	7	285
12 Lime at Tamarack	289	109	320	2.52	2.52	0.58	287	107	319	292	112	320
13 Lime at Lime Creek Drive	241	126	299	2.00	1.00	1.00	239	125	298	243	127	300
14 Lime at Prattville	231	122	321	1.00	0.58	1.15	230	122	320	232	123	322
15 Lime at Lime Creek Hwy	242	171		3.00	3.51		239	168		245	175	
16 Site A at Lime Creek Hwy		159			3.06			156			162	
17 Site B at Lime Creek Hwy	190	160	263	0.58	2.52	0.58	190	157	262	191	162	263
18 Lime at Ingall	263	160	300	1.00	3.61	0.58	262	157	299	264	164	300
23 Lime at White Pine	207	164	276	1.53	3.61	2.08	205	161	274	208	168	278
24 Lime at Ridgeville	249	161	291	2.00	5.86	0.58	247	157	291	251	168	292
25 Mansfield Drain at Ranger	208	170	300	0.00	2.00	1.53	208	168	299	208	172	302
1 Lime at Mulberry	246	145	290	2.08	24.30	1.53	244	123	289	248	169	292

August

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	205	205	11	1.00	0.00	0.00	204	205	11	206	205	11
9 Bean at Dillion	178	211	11	4.51	0.00	0.00	174	211	11	183	211	11
8 Bean at Medina	221	235	11	5.03	0.00	0.58	216	235	11	226	235	12
7 Bean at Bothwell	201	230	14	1.00	1.00	0.58	200	229	14	202	231	15
5 Bean at Bates	250	238	15	2.65	0.58	0.58	248	238	14	253	239	15
6 Covell Drain at Harris	257	238	19	2.00	1.00	0.58	255	237	18	259	239	19
4 Bean at Packard	257	237	18	4.58	1.00	0.58	253	236	17	262	238	18
3 Bean at Lime Creek Hwy	235	245	21	0.58	0.58	1.00	234	245	20	235	246	22
26 Bean at Ridgeville	252	245	23	4.00	0.58	1.00	248	244	22	256	245	24
2 Bean at Mulberry	257	248	32	3.00	0.58	1.00	254	248	31	260	249	33
22 Blanchard Drain at Coman		239	-52		4.00	4.73		235	-56		243	-47
21 Blanchard Drain at Meridian		226	-2		1.53	0.58		224	-2		227	-1
20 Blanchard Drain at Munson	56	103	3	1.00	4.51	0.00	55	99	3	57	108	3
19 Blanchard Drain at Ingall	-128	221	1	3.79	1.00	0.00	-131	220	1	-124	222	1
11 Lime at Coman	35	188	21	2.08	0.58	1.00	33	187	20	37	188	22
12 Lime at Tamarack	21	226	26	0.00	0.58	4.16	21	226	23	21	227	31
13 Lime at Lime Creek Drive	12	224	12	0.58	1.73	0.00	11	222	12	12	225	12
14 Lime at Prattville	-110	264	2	12.12	1.00	0.58	-123	263	2	-99	265	3
15 Lime at Lime Creek Hwy		179	1		1.53	0.00		177	1		180	1
16 Site A at Lime Creek Hwy	24		0	0.00		0.58	24			24		1
17 Site B at Lime Creek Hwy	21	226	1	0.00	1.00	0.00	21	225	1	21	227	1
18 Lime at Ingall	261	229	0	3.61	1.00	0.58	257	228	-1	264	230	
23 Lime at White Pine	254	229	0	8.08	0.58	0.00	249	229	0	263	230	0
24 Lime at Ridgeville	269	242	0	3.06	0.58	0.00	266	242	0	272	243	0
25 Mansfield Drain at Ranger	265	243	7	1.00	1.00	1.53	264	242	5	266	244	8
1 Lime at Mulberry	254	244	27	1.00	0.58	1.00	253	244	26	255	245	28

September

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	237	130	23	3.06	1.53	0.00	234	128	23	240	131	23
9 Bean at Dillion	247	220	24	3.51	0.58	0.58	244	219	24	251	220	25
8 Bean at Medina	209	225	25	0.00	0.00	1.00	209	225	24	209	225	26
7 Bean at Bothwell	235	228	26	2.00	0.00	0.00	233	228	26	237	228	26
5 Bean at Bates	237	225	27	1.15	0.58	0.00	236	225	27	238	226	27
6 Covell Drain at Harris	226	227	28	1.53	1.15	0.58	224	226	28	227	228	29
4 Bean at Packard	238	238	29	1.73	1.00	0.00	236	237	29	239	239	29
3 Bean at Lime Creek Hwy	244	235	31	1.53	0.58	0.58	243	234	30	246	235	31
26 Bean at Ridgeville	231	215	33	1.53	0.00	0.00	230	215	33	233	215	33
2 Bean at Mulberry	245	186	39	2.52	0.58	1.00	242	185	38	247	186	40
22 Blanchard Drain at Coman	-174	127		1.53	1.53		-175	125		-172	128	
21 Blanchard Drain at Meridian	254	154	25	2.00	0.58	1.53	252	154	23	256	155	26
20 Blanchard Drain at Munson	248	164	21	1.53	0.00	0.58	246	164	21	249	164	22
19 Blanchard Drain at Ingall	244	166	1	2.52	0.58	2.08	242	165	-1	247	166	3
11 Lime at Coman	74	103	26	0.00	1.15	0.58	74	102	25	74	104	26
12 Lime at Tamarack	78	124	24	1.00	1.00	0.00	77	123	24	79	125	24
13 Lime at Lime Creek Drive	62	132	18	0.00	0.00	0.58	62	132	18	62	132	19
14 Lime at Prattville		137	17		0.58	1.15		136	16		137	18
15 Lime at Lime Creek Hwy		156	19		0.00	0.58		156	18		156	19
16 Site A at Lime Creek Hwy			20			0.58			20			21
17 Site B at Lime Creek Hwy	217	178	17	1.00	0.58	0.00	216	177	17	218	178	17
18 Lime at Ingall	206	178	15	5.03	0.00	0.00	201	178	15	211	178	15
23 Lime at White Pine	234	168	14	3.00	0.00	0.00	231	168	14	237	168	14
24 Lime at Ridgeville	228	170	15	1.00	0.58	0.58	227	170	14	229	171	15
25 Mansfield Drain at Ranger	241	172	15	1.00	0.00	1.15	240	172	14	242	172	16
1 Lime at Mulberry	240	170	36	1.00	0.00	0.58	239	170	36	241	170	37

October

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	337	310	2	2.52	4.51	2.08	335	306	0	340	315	4
9 Bean at Dillion	384	335	29	13.75	3.06	0.00	372	332	29	399	338	29
8 Bean at Medina	347	330	29	5.51	3.21	0.58	342	328	29	353	334	30
7 Bean at Bothwell	355	335	30	6.03	3.21	0.58	349	333	29	361	339	30
5 Bean at Bates	366	331	29	6.24	3.61	0.00	361	328	29	373	335	29
6 Covell Drain at Harris	367	331	31	2.00	2.00	0.00	365	329	31	369	333	31
4 Bean at Packard	357	334	28	5.57	1.53	0.00	352	333	28	363	336	28
3 Bean at Lime Creek Hwy	361	320	29	4.58	3.79	0.58	357	317	29	366	324	30
26 Bean at Ridgeville	360	318	29	5.00	1.53	0.00	355	317	29	365	320	29
2 Bean at Mulberry	343	274	29	4.04	2.52	0.58	339	272	29	347	277	30
22 Blanchard Drain at Coman		250			4.51			245			254	
21 Blanchard Drain at Meridian		226	35		0.58	0.58		225	34		226	35
20 Blanchard Drain at Munson		291			2.00			289			293	
19 Blanchard Drain at Ingall	180	303	-15	1.00	2.08	3.21	179	301	-17	181	305	-11
11 Lime at Coman	202	89	45	0.00	4.16	0.58	202	84	44	202	92	45
12 Lime at Tamarack	207	180	43	1.53	2.00	1.15	206	178	42	209	182	44
13 Lime at Lime Creek Drive	240	237	38	0.58	2.31	0.58	239	236	38	240	240	39
14 Lime at Prattville		252	35		4.04	1.00		248	34		256	36
15 Lime at Lime Creek Hwy		313	34		2.00	0.58		311	33		315	34
16 Site A at Lime Creek Hwy	64		34	5.69		0.00	58		34	69		34
17 Site B at Lime Creek Hwy	220	321	34	1.00	2.52	0.00	219	319	34	221	324	34
18 Lime at Ingall	284	322	34	2.00	2.52	0.58	282	319	34	286	324	35
23 Lime at White Pine	307	328	30	4.51	3.51	0.00	303	325	30	312	332	30
24 Lime at Ridgeville	347	337	31	3.00	4.04	0.00	344	333	31	350	341	31
25 Mansfield Drain at Ranger	360	307	30	2.52	2.00	0.58	358	305	30	363	309	31
1 Lime at Mulberry	330	320	30	8.74	1.53	0.00	320	319	30	337	322	30

November

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	324	304	100	3.00	5.13	0.58	321	300	100	327	310	101
9 Bean at Dillion	358	316	96	5.03	2.52	2.08	353	314	94	363	319	98
8 Bean at Medina	352	339	97	5.29	6.11	1.15	346	332	96	356	344	98
7 Bean at Bothwell	354	316	120	3.06	2.52	2.52	351	314	117	357	319	122
5 Bean at Bates	354	306	99	2.52	2.00	2.08	351	304	97	356	308	101
6 Covell Drain at Harris	360	317	96	1.00	3.51	0.58	359	314	96	361	321	97
4 Bean at Packard	353	318	105	2.52	2.52	2.65	351	316	102	356	321	107
3 Bean at Lime Creek Hwy	353	291	115	2.08	2.08	7.21	351	289	107	355	293	121
26 Bean at Ridgeville	355	280	114	2.00	1.53	1.53	353	279	112	357	282	115
2 Bean at Mulberry	266	176	105	0.58	0.58	1.00	265	175	104	266	176	106
22 Blanchard Drain at Coman		191	119		7.00	0.58		184	118		198	119
21 Blanchard Drain at Meridian		271	135		4.00	2.65		267	132		275	137
20 Blanchard Drain at Munson	311	274	139	0.58	5.00	3.51	311	269	135	312	279	142
19 Blanchard Drain at Ingall	236	281	113	7.51	2.00	1.00	229	279	112	244	283	114
11 Lime at Coman	335	-2	85	0.58	1.53	3.61	334	-4	82	335	-1	89
12 Lime at Tamarack	275	103	149	1.00	0.58	1.00	274	102	148	276	103	150
13 Lime at Lime Creek Drive	270	179	137	0.58	3.00	0.58	270	176	137	271	182	138
14 Lime at Prattville		181	105		3.06	4.16		178	102		184	110
15 Lime at Lime Creek Hwy		286	111		4.04	1.53		282	109		290	112
16 Site A at Lime Creek Hwy			111			3.00			108			114
17 Site B at Lime Creek Hwy	354	313	112	2.52	4.04	2.00	351	309	110	356	317	114
18 Lime at Ingall	344	300	107	0.58	4.73	1.53	343	296	106	344	305	109
23 Lime at White Pine	304	306	115	3.21	3.06	2.00	302	303	113	308	309	117
24 Lime at Ridgeville	320	314	110	3.21	2.52	0.58	318	311	110	324	316	111
25 Mansfield Drain at Ranger	247	303	94	0.58	7.00	1.00	246	296	93	247	310	95
1 Lime at Mulberry	290	312	133	2.31	7.51	2.00	289	305	131	293	320	135

December

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		332	138	0.00	1.53	3.87		331	133		334	142
9 Bean at Dillion	290	333	149	1.15	1.00	3.51	289	332	146	291	334	153
8 Bean at Medina	304	330	138	2.00	0.58	2.99	302	330	134	306	331	141
7 Bean at Bothwell	310	327	136	1.15	1.00	1.53	309	326	135	311	328	138
5 Bean at Bates	270	318	136	2.00	1.00	0.58	268	317	136	272	319	137
6 Covell Drain at Harris	261	338	146	2.65	0.58	4.16	258	337	143	263	338	151
4 Bean at Packard	285	346	160	0.00	1.15	3.21	285	345	158	285	347	164
3 Bean at Lime Creek Hwy	321	350	153	0.58	1.53	2.52	320	349	151	321	352	156
26 Bean at Ridgeville	297	359	165	0.58	1.00	2.08	296	358	163	297	360	167
2 Bean at Mulberry	260	372	174	0.00	3.06	3.00	260	369	171	260	375	177
22 Blanchard Drain at Coman		280	130		3.06	4.73		277	126		283	135
21 Blanchard Drain at Meridian		313	146		2.00	4.51		311	142		315	151
20 Blanchard Drain at Munson		315	145		2.00	4.00		313	141		317	149
19 Blanchard Drain at Ingall		312	124		1.53	2.52		311	121		314	126
11 Lime at Coman	325	87	82	1.00	5.00	2.31	324	82	81	326	92	85
12 Lime at Tamarack	285	198	131	1.15	0.58	4.51	284	198	127	286	199	136
13 Lime at Lime Creek Drive	290	231	121	1.00	0.58	24.99	289	231	94	291	232	143
14 Lime at Prattville	289	261	152	0.58	1.53	4.51	288	259	148	289	262	157
15 Lime at Lime Creek Hwy		318	131		2.52	2.00		316	129		321	133
16 Site A at Lime Creek Hwy			144		0.00	3.51			141			148
17 Site B at Lime Creek Hwy		316	132		3.06	4.00		313	128		319	136
18 Lime at Ingall	227	318	144	10.07	1.53	3.00	218	316	141	238	319	147
23 Lime at White Pine		327	140		1.53	2.52		326	138		329	143
24 Lime at Ridgeville		326	126		1.53	2.00		325	124		328	128
25 Mansfield Drain at Ranger		279	136		13.80	2.52		269	133		295	138
1 Lime at Mulberry	317	258	168	2.00	0.58	0.58	315	258	167	319	259	168

32 Month Baseline Statistical Analysis

April 2005 - December 2007

All Sites by Month

Temperature (ºC)

January

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		1.3	0.6		0.0	0.0		1.3	0.6		1.3	0.6
9 Bean at Dillion		1.6	0.8		0.0	0.0		1.6	0.8		1.6	0.8
8 Bean at Medina		1.6	0.8		0.0	0.1		1.6	0.7		1.6	0.8
7 Bean at Bothwell		1.7	0.7		0.0	0.0		1.7	0.7		1.7	0.7
5 Bean at Bates		1.7	0.7		0.0	0.0		1.7	0.7		1.7	0.7
6 Covell Drain at Harris		2.5	1.7		0.0	0.0		2.5	1.7		2.5	1.7
4 Bean at Packard		1.6	0.6		0.1	0.0		1.6	0.6		1.7	0.6
3 Bean at Lime Creek Hwy		1.6	0.6		0.0	0.0		1.6	0.6		1.6	0.6
26 Bean at Ridgeville		1.6	0.6		0.0	0.0		1.6	0.6		1.6	0.6
2 Bean at Mulberry		1.6	0.6		0.0	0.0		1.6	0.6		1.6	0.6
22 Blanchard Drain at Coman		3.1	2.2		0.0	0.1		3.1	2.1		3.1	2.2
21 Blanchard Drain at Meridian		2.8	1.6		0.0	0.0		2.8	1.6		2.8	1.6
20 Blanchard Drain at Munson		2.6	1.5		0.0	0.0		2.6	1.5		2.6	1.5
19 Blanchard Drain at Ingall		2.5	1.3		0.0	0.0		2.5	1.3		2.5	1.3
11 Lime at Coman		4.0	2.3		0.0	0.0		4.0	2.3		4.0	2.3
12 Lime at Tamarack		3.3	1.3		0.0	0.0		3.3	1.3		3.3	1.3
13 Lime at Lime Creek Drive		2.6	0.7		0.1	0.1		2.6	0.7		2.7	0.8
14 Lime at Prattville		3.0	2.3		0.0	0.0		3.0	2.3		3.0	2.3
15 Lime at Lime Creek Hwy		2.6	1.3		0.1	0.0		2.6	1.3		2.7	1.3
16 Site A at Lime Creek Hwy		2.4			0.0			2.4			2.4	
17 Site B at Lime Creek Hwy		2.7	1.6		0.0	0.0		2.7	1.6		2.7	1.6
18 Lime at Ingall		2.3	1.3		0.0	0.0		2.3	1.3		2.3	1.3
23 Lime at White Pine		2.2	1.2		0.0	0.0		2.2	1.2		2.2	1.2
24 Lime at Ridgeville		2.2	1.2		0.0	0.0		2.2	1.2		2.2	1.2
25 Mansfield Drain at Ranger		2.6	2.1		0.3	0.0		2.2	2.1		2.8	2.1
1 Lime at Mulberry		2.3	1.2		0.1	0.0		2.2	1.2		2.3	1.2

February

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		1.7	1.0		0.0	0.1		1.7	0.9		1.7	1.0
9 Bean at Dillion		2.1	0.0		0.1	0.0		2.0	0.0		2.1	0.0
8 Bean at Medina		2.1			0.0			2.1			2.1	
7 Bean at Bothwell		2.0	0.0		0.0	0.0		2.0	0.0		2.0	0.0
5 Bean at Bates		2.0	0.0		0.0	0.0		2.0	0.0		2.0	0.0
6 Covell Drain at Harris		3.3	2.3		0.0	0.0		3.3	2.3		3.3	2.3
4 Bean at Packard		1.9	0.0		0.0	0.0		1.9	0.0		1.9	0.0
3 Bean at Lime Creek Hwy		1.9	0.0		0.0	0.1		1.9			1.9	0.1
26 Bean at Ridgeville		2.0	0.1		0.0	0.0		2.0	0.1		2.0	0.1
2 Bean at Mulberry		2.0	0.0		0.0	0.1		2.0	0.0		2.0	0.1
22 Blanchard Drain at Coman		4.9			0.0			4.9			4.9	
21 Blanchard Drain at Meridian		4.2	1.0		0.1	0.0		4.1	1.0		4.2	1.0
20 Blanchard Drain at Munson		3.5	1.3		0.0	0.0		3.5	1.3		3.5	1.3
19 Blanchard Drain at Ingall		3.8			0.0			3.8			3.8	
11 Lime at Coman		4.3	2.4		0.0	0.1		4.3	2.3		4.3	2.4
12 Lime at Tamarack		3.4	2.0		0.0	0.0		3.4	2.0		3.4	2.0
13 Lime at Lime Creek Drive		2.5			0.0			2.5			2.5	
14 Lime at Prattville		2.2	1.8		0.0	0.0		2.2	1.8		2.2	1.8
15 Lime at Lime Creek Hwy		3.6			0.0			3.6			3.6	
16 Site A at Lime Creek Hwy		3.3			0.0			3.3			3.3	
17 Site B at Lime Creek Hwy		3.7	1.4		0.1	0.0		3.6	1.4		3.7	1.4
18 Lime at Ingall		3.2	1.8		0.0	0.0		3.2	1.8		3.2	1.8
23 Lime at White Pine		3.1			0.0			3.1			3.1	
24 Lime at Ridgeville		3.1	1.1		0.0	0.0		3.1	1.1		3.1	1.1
25 Mansfield Drain at Ranger		4.1	2.7		0.0	0.0		4.1	2.7		4.1	2.7
1 Lime at Mulberry		3.1	0.1		0.0	0.0		3.1	0.1		3.1	0.1

March

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		6.7	11.0		0.0	0.0		6.7	11.0		6.7	11.0
9 Bean at Dillion		6.9	10.9		0.0	0.0		6.9	10.9		6.9	10.9
8 Bean at Medina		6.7	10.9		0.0	0.0		6.7	10.9		6.7	10.9
7 Bean at Bothwell		6.8	11.0		0.0	0.0		6.8	11.0		6.8	11.0
5 Bean at Bates		6.7	10.9		0.0	0.0		6.7	10.9		6.7	10.9
6 Covell Drain at Harris		8.0	10.4		0.1	0.0		7.9	10.4		8.0	10.4
4 Bean at Packard		6.5	10.6		0.0	0.0		6.5	10.6		6.5	10.6
3 Bean at Lime Creek Hwy		6.6	10.5		0.0	0.0		6.6	10.5		6.6	10.5
26 Bean at Ridgeville		6.6	10.4		0.0	0.0		6.6	10.4		6.6	10.4
2 Bean at Mulberry		6.6	10.3		0.0	0.0		6.6	10.3		6.6	10.3
22 Blanchard Drain at Coman		10.8	11.2		0.0	0.0		10.8	11.2		10.8	11.2
21 Blanchard Drain at Meridian		9.2	11.3		0.1	0.0		9.2	11.3		9.3	11.3
20 Blanchard Drain at Munson		9.3	11.6		0.0	0.0		9.3	11.6		9.3	11.6
19 Blanchard Drain at Ingall		9.3	12.8		0.0	0.0		9.3	12.8		9.3	12.8
11 Lime at Coman		10.4	12.2		0.0	0.7		10.4	11.6		10.4	13.0
12 Lime at Tamarack		9.6	13.0		0.0	0.0		9.6	13.0		9.6	13.0
13 Lime at Lime Creek Drive		8.3	11.9		0.0	0.0		8.3	11.9		8.3	11.9
14 Lime at Prattville		6.3	7.7		0.0	0.0		6.3	7.7		6.3	7.7
15 Lime at Lime Creek Hwy		9.6	11.6		0.0	0.0		9.6	11.6		9.6	11.6
16 Site A at Lime Creek Hwy			12.5			0.0			12.5			12.5
17 Site B at Lime Creek Hwy		9.1	13.1		0.1	0.0		9.0	13.1		9.1	13.1
18 Lime at Ingall		8.2	10.9		0.0	0.0		8.2	10.9		8.2	10.9
23 Lime at White Pine		8.5	11.6		0.0	0.1		8.5	11.5		8.5	11.6
24 Lime at Ridgeville		8.0	11.5		0.0	0.1		8.0	11.5		8.0	11.6
25 Mansfield Drain at Ranger		9.1	14.3		0.0	0.0		9.1	14.3		9.1	14.3
1 Lime at Mulberry		8.1	12.3		0.0	0.0		8.1	12.3		8.1	12.3

April

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	11.6	10.6	14.0	0.0	0.0	0.0	11.6	10.6	14.0	11.6	10.6	14.0
9 Bean at Dillion	9.0	12.1	14.9	0.4	0.0	0.0	8.8	12.1	14.9	9.5	12.1	14.9
8 Bean at Medina	8.4	11.5	15.0	0.1	0.0	0.0	8.3	11.5	15.0	8.6	11.5	15.0
7 Bean at Bothwell	8.4	12.0	15.1	0.2	0.0	0.0	8.3	12.0	15.1	8.7	12.0	15.1
5 Bean at Bates	8.6	11.8	15.1	0.3	0.0	0.0	8.4	11.8	15.1	9.5	11.8	15.1
6 Covell Drain at Harris	12.9	12.7	13.3	0.9	0.1	0.0	11.9	12.6	13.3	13.5	12.8	13.3
4 Bean at Packard	8.2	11.4	15.0	0.0	0.0	0.0	8.2	11.4	15.0	8.3	11.4	15.0
3 Bean at Lime Creek Hwy	8.2	11.4	14.9	0.0	0.0	0.0	8.2	11.4	14.9	8.3	11.4	14.9
26 Bean at Ridgeville	8.3	11.4	14.8	0.1	0.0	0.0	8.1	11.4	14.8	8.3	11.4	14.8
2 Bean at Mulberry	6.9	11.3	14.7	0.2	0.0	0.0	6.8	11.3	14.7	7.2	11.3	14.7
22 Blanchard Drain at Coman	12.8	18.9	14.8	0.1	0.0	0.0	12.7	18.9	14.8	12.9	18.9	14.8
21 Blanchard Drain at Meridian	10.5	17.3	15.2	0.1	0.0	0.0	10.5	17.3	15.2	10.6	17.3	15.2
20 Blanchard Drain at Munson	9.8	16.7	15.1	0.5	0.0	0.0	9.5	16.7	15.1	10.4	16.7	15.1
19 Blanchard Drain at Ingall	10.5	16.9	15.7	0.2	0.0	0.0	10.3	16.9	15.7	10.6	16.9	15.7
11 Lime at Coman	14.3	17.1	15.4	0.2	0.1	0.4	14.1	17.0	15.1	14.5	17.1	15.9
12 Lime at Tamarack	13.5	16.7	15.2	2.1	0.1	0.0	11.0	16.6	15.2	14.7	16.7	15.2
13 Lime at Lime Creek Drive	10.8	15.9	14.0	0.2	0.1	0.0	10.5	15.9	14.0	10.9	16.0	14.0
14 Lime at Prattville	10.7	16.1	15.7	0.5	0.0	0.0	10.4	16.1	15.7	11.3	16.1	15.7
15 Lime at Lime Creek Hwy	11.2	19.2	16.2	0.1	0.0	0.0	11.1	19.2	16.2	11.3	19.2	16.2
16 Site A at Lime Creek Hwy	11.4		17.2	0.5		0.0	11.1		17.2	11.9		17.2
17 Site B at Lime Creek Hwy	10.8	15.3	15.8	1.6	0.0	0.0	8.9	15.3	15.8	11.8	15.3	15.8
18 Lime at Ingall	9.0	14.2	15.3	0.1	0.0	0.0	8.8	14.2	15.3	9.1	14.2	15.3
23 Lime at White Pine	8.7	14.5	15.3	0.1	0.0	0.0	8.7	14.5	15.3	8.8	14.5	15.3
24 Lime at Ridgeville	8.1	14.0	14.8	0.0	0.0	0.0	8.1	14.0	14.8	8.2	14.0	14.8
25 Mansfield Drain at Ranger	8.2	14.1	16.1	0.1	0.0	0.0	8.2	14.1	16.1	8.3	14.1	16.1
1 Lime at Mulberry	6.8	14.0	15.4	0.1	0.1	0.0	6.8	13.9	15.4	6.9	14.0	15.4

May

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	15.1	19.3	16.2	0.0	0.0	0.0	15.1	19.3	16.2	15.1	19.3	16.2
9 Bean at Dillion	17.0	21.1	18.4	0.0	0.0	0.0	17.0	21.1	18.4	17.0	21.1	18.4
8 Bean at Medina	16.8	20.8	18.5	0.0	0.0	0.0	16.8	20.8	18.5	16.9	20.8	18.5
7 Bean at Bothwell	17.4	21.0	18.8	0.1	0.0	0.0	17.3	21.0	18.8	17.4	21.0	18.8
5 Bean at Bates	17.0	20.9	18.8	0.1	0.0	0.0	17.0	20.9	18.8	17.1	20.9	18.8
6 Covell Drain at Harris	16.0	17.9	17.2	0.4	0.0	0.0	15.7	17.8	17.2	16.4	17.9	17.2
4 Bean at Packard	16.8	20.8	18.7	0.0	0.0	0.0	16.8	20.8	18.7	16.9	20.8	18.7
3 Bean at Lime Creek Hwy	16.9	20.8	18.7	0.0	0.0	0.0	16.9	20.8	18.7	16.9	20.8	18.7
26 Bean at Ridgeville	17.1	20.6	18.7	0.0	0.0	0.0	17.1	20.6	18.7	17.1	20.6	18.7
2 Bean at Mulberry	17.1	20.5	18.9	0.0	0.0	0.0	17.1	20.5	18.9	17.1	20.5	18.9
22 Blanchard Drain at Coman	24.1	20.1		0.0	0.0		24.1	20.1		24.1	20.1	
21 Blanchard Drain at Meridian	22.7	20.2	20.1	0.0	0.0	0.0	22.7	20.2	20.1	22.7	20.2	20.1
20 Blanchard Drain at Munson	22.6	20.5	20.4	0.1	0.0	0.0	22.5	20.5	20.4	22.6	20.5	20.4
19 Blanchard Drain at Ingall	20.8	21.1	20.6	0.1	0.0	0.0	20.7	21.1	20.6	20.8	21.1	20.6
11 Lime at Coman	15.6	27.6	17.7	1.4	0.7	0.2	14.2	26.8	17.5	17.4	28.0	17.9
12 Lime at Tamarack	23.4	22.6	19.1	0.0	0.0	0.0	23.4	22.6	19.1	23.4	22.6	19.1
13 Lime at Lime Creek Drive	21.4	20.4	18.8	0.0	0.0	0.0	21.4	20.4	18.8	21.4	20.4	18.8
14 Lime at Prattville	22.0	25.4	21.6	0.1	0.0	0.0	22.0	25.4	21.6	22.1	25.4	21.6
15 Lime at Lime Creek Hwy	21.6	24.0	20.9	0.0	0.0	0.0	21.6	24.0	20.9	21.6	24.0	20.9
16 Site A at Lime Creek Hwy	20.7	23.1		0.0	0.0		20.7	23.1		20.7	23.1	
17 Site B at Lime Creek Hwy	20.1	20.9	18.9	0.0	0.0	0.0	20.1	20.9	18.9	20.1	20.9	18.9
18 Lime at Ingall	17.6	20.8	18.1	0.1	0.0	0.0	17.6	20.8	18.1	17.7	20.8	18.1
23 Lime at White Pine	18.9	21.0	19.1	0.1	0.0	0.0	18.8	21.0	19.1	18.9	21.0	19.1
24 Lime at Ridgeville	18.6	21.6	18.8	0.1	0.0	0.0	18.5	21.6	18.8	18.7	21.6	18.8
25 Mansfield Drain at Ranger	17.9	19.2	17.2	0.0	0.0	0.1	17.9	19.2	17.1	17.9	19.3	17.2
1 Lime at Mulberry	19.1	21.8	19.2	0.0	0.0	0.0	19.1	21.8	19.2	19.1	21.8	19.2

June

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	23.3	19.5	15.3	0.1	0.0	0.0	23.2	19.5	15.3	23.3	19.5	15.3
9 Bean at Dillion	24.0	19.3	17.1	0.1	0.0	0.0	24.0	19.3	17.1	24.1	19.3	17.1
8 Bean at Medina	23.6	19.1	17.3	0.1	0.0	0.0	23.5	19.1	17.3	23.6	19.1	17.3
7 Bean at Bothwell	24.9	19.4	17.8	0.1	0.0	0.1	24.9	19.4	17.7	25.0	19.4	17.8
5 Bean at Bates	23.6	19.2	17.2	0.0	0.0	0.0	23.6	19.2	17.2	23.6	19.2	17.2
6 Covell Drain at Harris	24.2	18.4	15.2	0.1	0.0	0.0	24.1	18.4	15.2	24.2	18.4	15.2
4 Bean at Packard	23.7	19.0	17.6	0.1	0.0	0.0	23.7	19.0	17.6	23.8	19.0	17.6
3 Bean at Lime Creek Hwy	23.6	19.0	17.4	0.1	0.0	0.0	23.6	19.0	17.4	23.7	19.0	17.4
26 Bean at Ridgeville	24.1	19.1	17.5	0.1	0.0	0.0	24.1	19.1	17.5	24.2	19.1	17.5
2 Bean at Mulberry	23.5	19.0	17.6	0.1	0.0	0.0	23.4	19.0	17.6	23.6	19.1	17.6
22 Blanchard Drain at Coman		23.3			0.0			23.3			23.3	
21 Blanchard Drain at Meridian	30.2	22.1	23.0	0.2	0.0	0.0	30.1	22.1	23.0	30.4	22.1	23.0
20 Blanchard Drain at Munson	30.6	23.9	23.4	0.1	0.0	0.0	30.5	23.9	23.4	30.6	23.9	23.4
19 Blanchard Drain at Ingall	26.4	23.1	18.8	0.1	0.0	0.0	26.3	23.1	18.8	26.5	23.1	18.8
11 Lime at Coman	27.8	25.1	17.7	2.2	0.5	0.1	25.5	24.6	17.6	29.8	25.5	17.8
12 Lime at Tamarack	29.0	23.8	14.6	1.3	0.0	0.0	28.0	23.8	14.6	30.5	23.8	14.6
13 Lime at Lime Creek Drive	28.6	21.7	18.7	0.1	0.0	0.0	28.5	21.7	18.7	28.7	21.7	18.7
14 Lime at Prattville	24.4	25.6	19.3	0.1	0.0	0.1	24.3	25.6	19.2	24.4	25.6	19.3
15 Lime at Lime Creek Hwy		24.4			0.0			24.4			24.4	
16 Site A at Lime Creek Hwy		23.3			0.0			23.3			23.3	
17 Site B at Lime Creek Hwy	26.5	21.6	20.4	0.1	0.0	0.0	26.4	21.6	20.4	26.6	21.6	20.4
18 Lime at Ingall	23.4	21.4	16.9	0.1	0.0	0.0	23.3	21.4	16.9	23.5	21.4	16.9
23 Lime at White Pine	25.1	21.5	18.5	0.1	0.0	0.1	25.1	21.5	18.4	25.2	21.5	18.5
24 Lime at Ridgeville	24.3	20.8	18.5	0.2	0.0	0.1	24.2	20.8	18.4	24.5	20.8	18.5
25 Mansfield Drain at Ranger	22.9	18.5	18.5	0.1	0.0	0.0	22.8	18.4	18.5	22.9	18.5	18.5
1 Lime at Mulberry	25.7	21.2	20.5	0.0	0.0	0.1	25.7	21.2	20.4	25.7	21.2	20.5

July

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	22.5	21.3	18.5	0.0	0.0	0.0	22.5	21.3	18.5	22.5	21.3	18.5
9 Bean at Dillion	24.1	21.4	18.8	0.0	0.0	0.1	24.1	21.4	18.8	24.1	21.4	18.9
8 Bean at Medina	24.1	21.2	19.0	0.1	0.0	0.0	24.0	21.2	19.0	24.1	21.2	19.0
7 Bean at Bothwell	24.2	21.3	19.5	0.0	0.0	0.1	24.2	21.3	19.4	24.2	21.3	19.5
5 Bean at Bates	24.2	21.1	19.0	0.0	0.0	0.0	24.2	21.1	19.0	24.2	21.1	19.0
6 Covell Drain at Harris	22.1	20.0	17.8	0.4	0.0	0.1	21.8	20.0	17.7	22.6	20.0	17.8
4 Bean at Packard	24.1	21.1	19.0	0.1	0.0	0.1	24.1	21.1	18.9	24.2	21.1	19.0
3 Bean at Lime Creek Hwy	24.2	21.0	18.8	0.0	0.0	0.0	24.2	21.0	18.8	24.2	21.0	18.8
26 Bean at Ridgeville	24.2	21.1	19.0	0.0	0.0	0.0	24.2	21.1	19.0	24.2	21.1	19.0
2 Bean at Mulberry	24.2	21.1	19.0	0.0	0.0	0.0	24.2	21.1	19.0	24.2	21.1	19.0
22 Blanchard Drain at Coman	29.6	21.5		0.1	0.0		29.5	21.5		29.6	21.5	
21 Blanchard Drain at Meridian	29.2	21.9	23.8	0.0	0.0	0.1	29.2	21.9	23.7	29.2	21.9	23.8
20 Blanchard Drain at Munson	29.6	22.6	24.6	0.0	0.0	0.0	29.6	22.6	24.6	29.6	22.6	24.6
19 Blanchard Drain at Ingall	24.1	22.9	20.2	0.0	0.0	0.0	24.1	22.9	20.2	24.1	22.9	20.2
11 Lime at Coman	23.1	22.6	23.5	0.1	0.3	0.0	23.1	22.4	23.5	23.2	22.9	23.5
12 Lime at Tamarack	25.5	22.9	18.2	0.1	0.0	0.0	25.5	22.9	18.2	25.6	22.9	18.2
13 Lime at Lime Creek Drive	27.0	21.7	21.7	0.0	0.0	0.1	27.0	21.7	21.6	27.0	21.7	21.7
14 Lime at Prattville	28.6	26.8	19.7	0.0	0.0	0.1	28.6	26.8	19.6	28.6	26.8	19.8
15 Lime at Lime Creek Hwy	27.8	25.4			0.0		27.8	25.4		27.8	25.4	
16 Site A at Lime Creek Hwy		24.7			0.0			24.7			24.7	
17 Site B at Lime Creek Hwy	26.3	22.2	22.2	0.0	0.0	0.0	26.3	22.2	22.2	26.3	22.2	22.2
18 Lime at Ingall	24.4	22.8	18.6	0.0	0.0	0.1	24.4	22.8	18.5	24.4	22.8	18.7
23 Lime at White Pine	25.2	22.5	19.5	0.0	0.0	0.0	25.2	22.5	19.5	25.2	22.5	19.5
24 Lime at Ridgeville	24.6	22.3	19.3	0.1	0.1	0.1	24.6	22.2	19.2	24.7	22.3	19.4
25 Mansfield Drain at Ranger	23.4	20.0	19.7	0.0	0.0	0.0	23.4	20.0	19.7	23.4	20.0	19.7
1 Lime at Mulberry	25.9	22.4	20.8	0.0	0.2	0.0	25.9	22.2	20.8	25.9	22.6	20.8

August

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	20.0	18.8	19.9	0.0	0.0	0.0	20.0	18.8	19.9	20.0	18.8	19.9
9 Bean at Dillion	20.8	19.2	20.8	0.0	0.0	0.1	20.8	19.2	20.7	20.8	19.2	20.8
8 Bean at Medina	21.1	19.2	20.6	0.0	0.0	0.0	21.1	19.2	20.6	21.1	19.2	20.6
7 Bean at Bothwell	21.2	19.5	20.6	0.0	0.0	0.0	21.2	19.5	20.6	21.2	19.5	20.6
5 Bean at Bates	21.4	19.7	20.5	0.0	0.0	0.0	21.4	19.7	20.5	21.4	19.7	20.5
6 Covell Drain at Harris	19.8	19.1	19.3	0.0	0.0	0.0	19.8	19.1	19.3	19.8	19.1	19.3
4 Bean at Packard	21.6	19.4	20.5	0.0	0.0	0.0	21.6	19.4	20.5	21.6	19.4	20.5
3 Bean at Lime Creek Hwy	21.3	19.6	20.5	0.0	0.0	0.0	21.3	19.6	20.5	21.3	19.6	20.5
26 Bean at Ridgeville	21.5	19.6	20.5	0.0	0.0	0.0	21.5	19.6	20.5	21.5	19.6	20.5
2 Bean at Mulberry	21.6	19.7	20.6	0.0	0.0	0.0	21.6	19.7	20.6	21.6	19.7	20.6
22 Blanchard Drain at Coman		19.7	22.1		0.0	0.1		19.7	22.1		19.7	22.2
21 Blanchard Drain at Meridian		20.0	23.0		0.0	0.0		20.0	23.0		20.0	23.0
20 Blanchard Drain at Munson	24.3	20.4	22.8	0.0	0.0	0.0	24.3	20.4	22.8	24.3	20.4	22.8
19 Blanchard Drain at Ingall	16.5	20.2	22.7	0.1	0.0	0.0	16.4	20.2	22.7	16.6	20.2	22.7
11 Lime at Coman	22.4	19.6	20.1	0.0	0.0	0.1	22.4	19.6	20.1	22.4	19.6	20.2
12 Lime at Tamarack	21.7	19.4	21.4	0.0	0.1	0.0	21.7	19.3	21.4	21.7	19.4	21.4
13 Lime at Lime Creek Drive	23.0	19.3	21.6	0.0	0.0	0.0	23.0	19.3	21.6	23.0	19.3	21.6
14 Lime at Prattville	23.7	22.8	25.1	0.0	0.0	0.0	23.7	22.8	25.1	23.7	22.8	25.1
15 Lime at Lime Creek Hwy		21.8	24.6		0.0	0.0		21.8	24.6		21.8	24.6
16 Site A at Lime Creek Hwy	23.7		22.8	0.1		0.0	23.6		22.8	23.7		22.8
17 Site B at Lime Creek Hwy	21.6	19.5	21.3	0.0	0.0	0.0	21.6	19.5	21.3	21.6	19.5	21.3
18 Lime at Ingall	20.7	18.6	21.7	0.0	0.0	0.0	20.7	18.6	21.7	20.7	18.6	21.7
23 Lime at White Pine	21.7	19.2	21.8	0.0	0.0	0.0	21.7	19.2	21.8	21.7	19.2	21.8
24 Lime at Ridgeville	20.5	19.1	21.9	0.0	0.1	0.0	20.5	19.1	21.9	20.5	19.2	21.9
25 Mansfield Drain at Ranger	19.4	18.9	20.5	0.0	0.1	0.0	19.4	18.8	20.5	19.4	18.9	20.5
1 Lime at Mulberry	21.6	19.4	21.6	0.0	0.0	0.0	21.6	19.4	21.6	21.6	19.4	21.6

September

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	17.5	12.6	15.7	0.0	0.0	0.0	17.5	12.6	15.7	17.5	12.6	15.7
9 Bean at Dillion	17.6	13.3	16.7	0.0	0.0	0.0	17.6	13.3	16.7	17.6	13.3	16.7
8 Bean at Medina	17.9	13.2	16.9	0.0	0.0	0.0	17.9	13.2	16.9	17.9	13.2	16.9
7 Bean at Bothwell	18.0	13.6	17.0	0.0	0.0	0.0	18.0	13.6	17.0	18.0	13.6	17.0
5 Bean at Bates	18.0	13.1	17.0	0.1	0.0	0.0	18.0	13.1	17.0	18.1	13.1	17.0
6 Covell Drain at Harris	17.7	12.8	15.8	0.0	0.0	0.0	17.7	12.8	15.8	17.7	12.8	15.8
4 Bean at Packard	18.2	13.2	17.1	0.1	0.0	0.0	18.2	13.2	17.1	18.3	13.2	17.1
3 Bean at Lime Creek Hwy	18.1	13.3	17.2	0.1	0.0	0.0	18.1	13.3	17.2	18.2	13.3	17.2
26 Bean at Ridgeville	18.2	13.3	17.1	0.0	0.0	0.0	18.2	13.3	17.1	18.2	13.3	17.1
2 Bean at Mulberry	18.2	13.3	17.2	0.1	0.0	0.0	18.2	13.3	17.2	18.3	13.3	17.2
22 Blanchard Drain at Coman	19.2	15.8		0.0	0.0		19.2	15.8		19.2	15.8	
21 Blanchard Drain at Meridian	18.7	16.2	18.8	0.0	0.0	0.1	18.7	16.2	18.7	18.7	16.2	18.8
20 Blanchard Drain at Munson	20.0	16.8	18.4	0.0	0.0	0.1	20.0	16.8	18.3	20.0	16.8	18.4
19 Blanchard Drain at Ingall	18.2	14.9	17.5	0.0	0.0	0.0	18.2	14.9	17.5	18.2	14.9	17.5
11 Lime at Coman	18.6	16.1	16.6	0.1	0.1	0.0	18.6	16.0	16.6	18.7	16.1	16.6
12 Lime at Tamarack	20.4	13.5	16.2	0.0	0.1	0.0	20.4	13.4	16.2	20.4	13.6	16.2
13 Lime at Lime Creek Drive	20.0	13.5	22.0	0.0	0.0	0.1	20.0	13.5	21.9	20.0	13.5	22.0
14 Lime at Prattville		16.0	19.6		0.1	0.1		16.0	19.6		16.1	19.7
15 Lime at Lime Creek Hwy		18.2	20.1		0.0	0.0		18.2	20.1		18.2	20.1
16 Site A at Lime Creek Hwy			18.3			0.1			18.3			18.4
17 Site B at Lime Creek Hwy	18.8	14.4	17.2	0.0	0.0	0.0	18.8	14.4	17.2	18.8	14.4	17.2
18 Lime at Ingall	19.1	13.6	16.9	0.0	0.1	0.0	19.1	13.5	16.9	19.1	13.6	16.9
23 Lime at White Pine	18.4	13.7	17.3	0.0	0.0	0.0	18.4	13.7	17.3	18.4	13.7	17.3
24 Lime at Ridgeville	18.0	14.1	17.4	0.1	0.0	0.0	18.0	14.1	17.4	18.1	14.1	17.4
25 Mansfield Drain at Ranger	18.1	14.0	16.9	0.4	0.0	0.0	17.8	14.0	16.9	18.5	14.0	16.9
1 Lime at Mulberry	18.5	14.3	17.1	0.0	0.0	0.0	18.5	14.3	17.1	18.5	14.3	17.1

October

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	5.6	6.8	9.1	0.1	0.0	0.0	5.6	6.8	9.0	5.7	6.8	9.1
9 Bean at Dillion	6.8	6.7	9.3	0.1	0.0	0.0	6.8	6.7	9.3	6.9	6.7	9.3
8 Bean at Medina	6.9	6.7	9.1	0.0	0.0	0.0	6.9	6.7	9.1	6.9	6.7	9.2
7 Bean at Bothwell	7.1	6.7	9.6	0.1	0.0	0.0	7.0	6.7	9.6	7.1	6.7	9.6
5 Bean at Bates	6.9	6.7	9.1	0.0	0.1	0.0	6.9	6.6	9.1	6.9	6.7	9.1
6 Covell Drain at Harris	5.4	7.6	11.3	0.0	0.0	0.0	5.4	7.6	11.3	5.4	7.6	11.4
4 Bean at Packard	7.3	6.6	8.9	0.0	0.0	0.0	7.3	6.6	8.9	7.3	6.6	8.9
3 Bean at Lime Creek Hwy	7.1	6.6	9.1	0.0	0.0	0.0	7.1	6.6	9.1	7.1	6.6	9.1
26 Bean at Ridgeville	7.4	6.6	9.2	0.0	0.0	0.0	7.4	6.6	9.2	7.4	6.6	9.2
2 Bean at Mulberry	7.4	6.7	9.0	0.1	0.0	0.0	7.4	6.7	9.0	7.5	6.7	9.0
22 Blanchard Drain at Coman		10.0			0.0			10.0			10.0	
21 Blanchard Drain at Meridian		8.8	6.6		0.0	0.0		8.8	6.6		8.8	6.6
20 Blanchard Drain at Munson		8.4			0.0			8.4			8.4	
19 Blanchard Drain at Ingall	7.6	7.5	8.2	0.0	0.0	0.2	7.6	7.5	8.1	7.6	7.5	8.5
11 Lime at Coman	8.8	8.5	5.4	0.1	0.0	0.0	8.7	8.5	5.4	8.9	8.5	5.5
12 Lime at Tamarack	6.9	7.8	5.3	0.0	0.0	0.0	6.9	7.8	5.3	6.9	7.8	5.3
13 Lime at Lime Creek Drive	8.0	7.1	13.6	0.0	0.1	0.0	8.0	7.1	13.6	8.0	7.2	13.6
14 Lime at Prattville		9.2	9.6		0.0	0.0		9.2	9.6		9.2	9.6
15 Lime at Lime Creek Hwy		7.3	7.6		0.0	0.0		7.3	7.6		7.3	7.6
16 Site A at Lime Creek Hwy	6.9		7.1	0.0		0.0	6.9		7.1	6.9		7.1
17 Site B at Lime Creek Hwy	7.1	7.6	8.0	0.0	0.0	0.0	7.1	7.6	8.0	7.1	7.6	8.0
18 Lime at Ingall	7.9	7.2	8.2	0.0	0.0	0.0	7.9	7.2	8.1	7.9	7.2	8.2
23 Lime at White Pine	7.1	7.1	7.8	0.0	0.0	0.0	7.1	7.1	7.8	7.1	7.1	7.9
24 Lime at Ridgeville	8.0	6.9	8.3	0.0	0.0	0.0	8.0	6.9	8.3	8.0	6.9	8.3
25 Mansfield Drain at Ranger	7.9	7.8	8.9	0.0	0.0	0.0	7.9	7.8	8.9	7.9	7.8	8.9
1 Lime at Mulberry	7.2	6.8	8.6	0.2	0.0	0.0	6.9	6.8	8.6	7.3	6.8	8.6

November

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	0.7	6.5	1.8	0.0	0.0	0.0	0.7	6.5	1.8	0.7	6.5	1.8
9 Bean at Dillion	1.6	6.9	2.1	0.0	0.0	0.0	1.6	6.9	2.1	1.6	6.9	2.1
8 Bean at Medina	1.6	6.7	2.0	0.1	0.0	0.0	1.6	6.7	2.0	1.7	6.7	2.0
7 Bean at Bothwell	1.7	6.7	2.1	0.1	0.0	0.0	1.6	6.7	2.0	1.7	6.7	2.1
5 Bean at Bates	1.7	6.7	2.1	0.0	0.0	0.0	1.7	6.7	2.1	1.7	6.7	2.1
6 Covell Drain at Harris	0.5	8.8	3.4	0.1	0.0	0.0	0.5	8.8	3.4	0.6	8.8	3.5
4 Bean at Packard	1.8	6.5	2.1	0.0	0.0	0.0	1.8	6.5	2.1	1.8	6.5	2.1
3 Bean at Lime Creek Hwy	1.9	6.5	2.2	0.0	0.0	0.0	1.9	6.5	2.2	1.9	6.5	2.2
26 Bean at Ridgeville	1.9	6.4	2.2	0.0	0.0	0.0	1.9	6.4	2.2	1.9	6.4	2.2
2 Bean at Mulberry	2.0	6.4	2.7	0.0	0.1	0.0	2.0	6.3	2.7	2.0	6.4	2.7
22 Blanchard Drain at Coman		9.5	6.2		0.0	0.0		9.5	6.1		9.5	6.2
21 Blanchard Drain at Meridian		8.8	4.6		0.0	0.0		8.8	4.6		8.8	4.7
20 Blanchard Drain at Munson	1.8	9.1	4.1	0.1	0.0	0.0	1.8	9.1	4.1	1.9	9.1	4.1
19 Blanchard Drain at Ingall	0.7	8.9	3.0	0.0	0.0	0.0	0.7	8.9	3.0	0.7	8.9	3.0
11 Lime at Coman	0.0	9.9	3.3	0.0	0.3	0.0	0.0	9.6	3.2	0.0	10.1	3.3
12 Lime at Tamarack	0.8	9.8	2.6	0.1	0.0	0.0	0.8	9.8	2.6	0.9	9.8	2.7
13 Lime at Lime Creek Drive	0.5	8.4	2.2	0.0	0.0	0.0	0.5	8.4	2.2	0.5	8.4	2.2
14 Lime at Prattville		7.4	5.1		0.1	0.0		7.3	5.1		7.4	5.1
15 Lime at Lime Creek Hwy		8.8	2.9		0.0	0.0		8.8	2.9		8.8	2.9
16 Site A at Lime Creek Hwy			1.6			0.0			1.6			1.6
17 Site B at Lime Creek Hwy		8.8	2.9		0.0	0.0		8.8	2.9		8.8	2.9
18 Lime at Ingall	0.9	8.2	2.5	0.1	0.0	0.0	0.8	8.2	2.5	0.9	8.2	2.5
23 Lime at White Pine	0.4	8.3	2.5	0.3	0.0	0.0	0.1	8.3	2.4	0.6	8.3	2.5
24 Lime at Ridgeville	1.6	8.0	2.5	0.0	0.0	0.0	1.6	8.0	2.5	1.6	8.0	2.5
25 Mansfield Drain at Ranger	1.7	8.8	3.2	0.0	0.1	0.0	1.7	8.7	3.2	1.7	8.8	3.3
1 Lime at Mulberry	1.0	8.0	2.2	0.1	0.0	0.0	0.9	8.0	2.2	1.1	8.0	2.3

December

Site	AVG 2005	AVG 2006	AVG 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		1.4	1.1	0.0	0.0	0.0		1.4	1.1		1.4	1.1
9 Bean at Dillion	0.0	2.6	1.2	0.1	0.0	0.0	0.0	2.6	1.2	0.1	2.6	1.2
8 Bean at Medina	0.1	2.6	1.1	0.0	0.0	0.0	0.1	2.6	1.1	0.1	2.6	1.1
7 Bean at Bothwell	0.0	2.7	1.0	0.0	0.0	0.0	0.0	2.7	1.0	0.0	2.7	1.1
5 Bean at Bates	0.0	2.7	1.0	0.0	0.0	0.0	0.0	2.7	1.0	0.0	2.7	1.0
6 Covell Drain at Harris	0.2	3.0	2.8	0.0	0.0	0.0	0.2	3.0	2.8	0.2	3.0	2.8
4 Bean at Packard	0.0	2.7	1.0	0.1	0.0	0.0	0.0	2.7	1.0	0.1	2.7	1.0
3 Bean at Lime Creek Hwy	0.0	2.9	0.9	0.0	0.0	0.0	0.0	2.9	0.9	0.0	2.9	0.9
26 Bean at Ridgeville	0.0	3.0	0.8	0.0	0.0	0.0	0.0	3.0	0.8	0.0	3.0	0.9
2 Bean at Mulberry	0.0	3.1	0.8	0.0	0.0	0.0	0.0	3.1	0.8	0.0	3.1	0.8
22 Blanchard Drain at Coman		5.9	2.6		0.0	0.0		5.9	2.6		5.9	2.6
21 Blanchard Drain at Meridian		3.9	2.9		0.0	0.0		3.9	2.9		3.9	2.9
20 Blanchard Drain at Munson		3.9	3.3		0.0	0.0		3.9	3.3		3.9	3.3
19 Blanchard Drain at Ingall		3.0	3.1		0.0	0.0		3.0	3.1		3.0	3.1
11 Lime at Coman	4.2	5.1	4.6	0.2	0.2	0.0	4.0	4.9	4.5	4.3	5.3	4.6
12 Lime at Tamarack	1.8	3.7	4.1	0.2	0.0	0.0	1.6	3.7	4.1	1.9	3.7	4.1
13 Lime at Lime Creek Drive	0.1	2.3	3.1	0.1	0.0	0.0	0.0	2.3	3.1	0.1	2.3	3.2
14 Lime at Prattville	1.8	3.8	1.5	0.0	0.0	0.0	1.8	3.8	1.5	1.8	3.8	1.5
15 Lime at Lime Creek Hwy		3.0	2.1		0.0	0.0		3.0	2.1		3.0	2.2
16 Site A at Lime Creek Hwy			2.5			0.0			2.5			2.5
17 Site B at Lime Creek Hwy	1.6	3.2	3.0	0.1	0.1	0.0	1.5	3.2	3.0	1.6	3.3	3.0
18 Lime at Ingall	0.1	2.6	2.4	0.0	0.0	0.0	0.1	2.6	2.4	0.1	2.6	2.4
23 Lime at White Pine		2.6	2.5		0.0	0.0		2.6	2.5		2.6	2.5
24 Lime at Ridgeville		2.6	2.9		0.0	0.0		2.6	2.9		2.6	2.9
25 Mansfield Drain at Ranger		3.8	2.3		0.0	0.0		3.8	2.3		3.8	2.3
1 Lime at Mulberry	0.1	2.9	1.9	0.1	0.1	0.0	0.0	2.8	1.9	0.1	2.9	1.9

32 Month Baseline Statistical Analysis
April 2005 - December 2007
All Sites by Month

pH

January

Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		8.04	8.00		1.00	1.00		8.03	8.00		8.05	8.01
9 Bean at Dillion		8.02	8.24		1.00	1.00		8.01	8.24		8.04	8.24
8 Bean at Medina		7.99	8.24		1.00	1.00		7.98	8.24		8.00	8.25
7 Bean at Bothwell		8.02	8.23		1.00	1.00		8.01	8.23		8.03	8.23
5 Bean at Bates		7.96	8.23		1.00	1.00		7.95	8.22		7.97	8.25
6 Covell Drain at Harris		7.81	8.09		1.00	1.00		7.80	8.08		7.82	8.10
4 Bean at Packard		7.95	8.23		1.00	1.00		7.95	8.21		7.96	8.24
3 Bean at Lime Creek Hwy		7.87	8.15		1.00	1.00		7.87	8.13		7.88	8.17
26 Bean at Ridgeville		7.70	7.89		1.00	1.00		7.69	7.86		7.71	7.91
2 Bean at Mulberry		7.59	7.39		1.00	1.03		7.58	7.18		7.59	7.55
22 Blanchard Drain at Coman		7.66	7.63		1.00	1.00		7.65	7.61		7.67	7.65
21 Blanchard Drain at Meridian		7.66	7.83		1.00	1.00		7.65	7.82		7.67	7.84
20 Blanchard Drain at Munson		7.70	7.94		1.00	1.00		7.69	7.93		7.71	7.94
19 Blanchard Drain at Ingall		7.74	8.06		1.00	1.00		7.73	8.06		7.74	8.07
11 Lime at Coman		7.85	7.75		1.00	1.00		7.84	7.75		7.86	7.76
12 Lime at Tamarack		7.76	7.80		1.00	1.00		7.74	7.79		7.77	7.80
13 Lime at Lime Creek Drive		7.79	8.10		1.00	1.00		7.79	8.10		7.80	8.11
14 Lime at Prattville		7.73	8.00		1.00	1.00		7.72	7.99		7.74	8.02
15 Lime at Lime Creek Hwy		7.74	8.08		1.00	1.00		7.74	8.07		7.75	8.09
16 Site A at Lime Creek Hwy		7.62			1.00			7.62			7.62	
17 Site B at Lime Creek Hwy		7.66	7.95		1.00	1.00		7.66	7.95		7.67	7.96
18 Lime at Ingall		7.65	8.02		1.00	1.00		7.63	8.02		7.67	8.03
23 Lime at White Pine		7.73	8.09		1.00	1.00		7.72	8.09		7.73	8.09
24 Lime at Ridgeville		7.76	8.10		1.00	1.00		7.75	8.10		7.76	8.10
25 Mansfield Drain at Ranger		7.76	7.89		1.00	1.00		7.76	7.88		7.76	7.90
1 Lime at Mulberry		7.71	8.04		1.00	1.00		7.70	8.03		7.72	8.05

February

Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		8.11	8.15		1.00	1.00		8.10	8.15		8.12	8.16
9 Bean at Dillion		8.13	8.23		1.00	1.00		8.13	8.23		8.13	8.24
8 Bean at Medina		8.12			1.00			8.10			8.13	
7 Bean at Bothwell		8.08	8.19		1.00	1.00		8.06	8.19		8.11	8.19
5 Bean at Bates		8.04	8.19		1.00	1.00		8.03	8.19		8.05	8.20
6 Covell Drain at Harris		7.91	8.13		1.00	1.00		7.90	8.12		7.92	8.13
4 Bean at Packard		8.01	8.12		1.00	1.00		8.00	8.11		8.03	8.13
3 Bean at Lime Creek Hwy		7.96	7.83		1.00	1.00		7.95	7.81		7.97	7.85
26 Bean at Ridgeville		7.81	7.72		1.00	1.00		7.80	7.70		7.82	7.73
2 Bean at Mulberry		7.63	7.21		1.00	1.01		7.62	7.13		7.64	7.28
22 Blanchard Drain at Coman		7.99			1.00			7.98			8.00	
21 Blanchard Drain at Meridian		8.00	7.95		1.00	1.00		7.99	7.94		8.02	7.95
20 Blanchard Drain at Munson		8.01	8.01		1.00	1.00		8.00	8.00		8.02	8.01
19 Blanchard Drain at Ingall		8.10			1.00			8.09			8.11	
11 Lime at Coman		7.88	7.75		1.00	1.00		7.87	7.73		7.89	7.78
12 Lime at Tamarack		7.89	7.79		1.00	1.00		7.88	7.79		7.90	7.79
13 Lime at Lime Creek Drive		8.06			1.00			8.05			8.06	
14 Lime at Prattville		8.03	8.04		1.00	1.00		8.02	8.04		8.05	8.04
15 Lime at Lime Creek Hwy		8.12			1.00			8.12			8.13	
16 Site A at Lime Creek Hwy		8.05			1.00			8.04			8.06	
17 Site B at Lime Creek Hwy		8.07	8.01		1.00	1.00		8.06	8.00		8.08	8.01
18 Lime at Ingall		8.06	8.22		1.00	1.00		8.05	8.21		8.08	8.22
23 Lime at White Pine		8.10			1.01			8.06			8.15	
24 Lime at Ridgeville		8.00	8.16		1.00	1.00		7.99	8.15		8.01	8.18
25 Mansfield Drain at Ranger		7.94	8.04		1.00	1.00		7.93	8.03		7.96	8.04
1 Lime at Mulberry		7.98	8.15		1.00	1.00		7.97	8.14		7.99	8.15

March

Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		7.98	8.31		1.00	1.00		7.97	8.28		7.99	8.35
9 Bean at Dillion		8.13	8.32		1.01	1.00		8.10	8.32		8.18	8.33
8 Bean at Medina		8.09	8.39		1.01	1.00		8.05	8.37		8.13	8.42
7 Bean at Bothwell		8.06	8.33		1.00	1.00		8.03	8.31		8.09	8.35
5 Bean at Bates		7.97	8.35		1.00	1.00		7.97	8.34		7.97	8.36
6 Covell Drain at Harris		7.84	8.16		1.00	1.00		7.84	8.15		7.85	8.16
4 Bean at Packard		7.86	8.30		1.00	1.00		7.85	8.27		7.87	8.34
3 Bean at Lime Creek Hwy		7.80	8.23		1.00	1.00		7.79	8.20		7.81	8.26
26 Bean at Ridgeville		7.79	8.11		1.00	1.00		7.78	8.10		7.80	8.11
2 Bean at Mulberry		6.77	7.79		1.02	1.01		6.64	7.74		6.91	7.82
22 Blanchard Drain at Coman		8.14	7.93		1.00	1.00		8.13	7.90		8.14	7.95
21 Blanchard Drain at Meridian		8.39	8.07		1.00	1.00		8.39	8.07		8.39	8.07
20 Blanchard Drain at Munson		8.33	8.06		1.00	1.00		8.33	8.06		8.33	8.07
19 Blanchard Drain at Ingall		8.27	8.19		1.00	1.00		8.27	8.18		8.27	8.19
11 Lime at Coman		7.81	8.03		1.00	1.00		7.81	8.02		7.82	8.04
12 Lime at Tamarack		8.14	6.83		1.00	1.02		8.14	6.69		8.15	6.98
13 Lime at Lime Creek Drive		8.21	8.11		1.00	1.00		8.21	8.10		8.22	8.11
14 Lime at Prattville		8.12	7.97		1.00	1.00		8.11	7.94		8.14	8.01
15 Lime at Lime Creek Hwy		8.40	8.27		1.00	1.00		8.40	8.27		8.41	8.27
16 Site A at Lime Creek Hwy			8.18			1.00			8.17			8.18
17 Site B at Lime Creek Hwy		8.27	8.23		1.00	1.00		8.27	8.23		8.27	8.23
18 Lime at Ingall		8.13	8.20		1.00	1.00		8.13	8.18		8.14	8.22
23 Lime at White Pine		8.28	8.23		1.00	1.00		8.28	8.22		8.29	8.23
24 Lime at Ridgeville		8.14	8.19		1.00	1.00		8.13	8.18		8.16	8.19
25 Mansfield Drain at Ranger		8.19	8.15		1.00	1.00		8.18	8.15		8.19	8.16
1 Lime at Mulberry		8.12	8.15		1.00	1.00		8.12	8.15		8.13	8.16

April

Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	8.20	8.18	7.97	1.00	1.00	1.00	8.20	8.16	7.96	8.20	8.20	7.98
9 Bean at Dillion	8.50	8.33	8.15	1.01	1.00	1.00	8.40	8.32	8.14	8.60	8.34	8.15
8 Bean at Medina	8.47	8.28	8.13	1.01	1.00	1.00	8.30	8.25	8.12	8.60	8.30	8.13
7 Bean at Bothwell	8.37	8.35	8.13	1.02	1.00	1.00	8.20	8.34	8.13	8.50	8.35	8.13
5 Bean at Bates	8.50	8.28	8.14	1.00	1.00	1.00	8.50	8.26	8.14	8.50	8.30	8.14
6 Covell Drain at Harris	8.33	8.16	7.98	1.01	1.00	1.01	8.30	8.16	7.92	8.40	8.16	8.05
4 Bean at Packard	8.49	8.15	8.10	1.01	1.00	1.00	8.40	8.15	8.10	8.60	8.16	8.10
3 Bean at Lime Creek Hwy	8.38	8.11	8.07	1.02	1.00	1.00	8.00	8.10	8.06	8.50	8.12	8.07
26 Bean at Ridgeville	8.47	8.09	7.94	1.01	1.00	1.00	8.30	8.08	7.91	8.50	8.11	7.96
2 Bean at Mulberry	7.68	7.74	7.62	1.04	1.01	1.01	7.10	7.70	7.56	8.00	7.78	7.66
22 Blanchard Drain at Coman	8.23	8.46	7.69	1.03	1.00	1.00	8.00	8.46	7.67	8.40	8.46	7.72
21 Blanchard Drain at Meridian	7.73	8.35	6.12	1.04	1.00	1.02	7.50	8.34	5.99	8.10	8.35	6.23
20 Blanchard Drain at Munson	7.79	8.23	7.33	1.06	1.00	1.01	7.30	8.22	7.28	8.10	8.24	7.40
19 Blanchard Drain at Ingall	8.33	8.32	8.11	1.01	1.00	1.00	8.20	8.32	8.10	8.40	8.33	8.13
11 Lime at Coman	8.07	7.89	8.07	1.02	1.00	1.00	7.90	7.89	8.06	8.20	7.90	8.09
12 Lime at Tamarack	8.33	8.10	8.27	1.01	1.00	1.00	8.20	8.10	8.25	8.40	8.10	8.29
13 Lime at Lime Creek Drive	8.37	8.24	8.22	1.01	1.00	1.00	8.30	8.24	8.21	8.50	8.24	8.23
14 Lime at Prattville	8.53	8.39	8.65	1.02	1.00	1.00	8.30	8.39	8.64	8.70	8.39	8.65
15 Lime at Lime Creek Hwy	8.40	8.40	8.19	1.01	1.00	1.00	8.30	8.40	8.17	8.50	8.40	8.21
16 Site A at Lime Creek Hwy	8.13		8.42	1.03		1.00	8.00		8.42	8.40		8.43
17 Site B at Lime Creek Hwy	8.17	8.25	8.38	1.01	1.00	1.00	8.10	8.24	8.38	8.30	8.26	8.39
18 Lime at Ingall	8.31	8.33	8.23	1.01	1.00	1.00	8.20	8.33	8.21	8.40	8.34	8.24
23 Lime at White Pine	8.50	8.44	8.15	1.00	1.00	1.00	8.50	8.44	8.15	8.50	8.44	8.16
24 Lime at Ridgeville	8.28	8.34	8.09	1.01	1.00	1.00	8.20	8.33	8.09	8.30	8.35	8.09
25 Mansfield Drain at Ranger	7.93	8.28	8.08	1.01	1.00	1.00	7.80	8.28	8.06	8.00	8.29	8.09
1 Lime at Mulberry	7.76	8.33	8.09	1.03	1.00	1.00	7.50	8.33	8.08	7.90	8.33	8.11

May

Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	8.11	7.86	7.75	1.00	1.00	1.00	8.11	7.85	7.75	8.12	7.87	7.75
9 Bean at Dillion	8.33	8.02	7.93	1.00	1.00	1.00	8.32	8.01	7.92	8.34	8.02	7.93
8 Bean at Medina	8.31	8.00	7.95	1.00	1.00	1.00	8.27	8.00	7.95	8.33	8.01	7.96
7 Bean at Bothwell	8.42	8.03	8.00	1.00	1.00	1.00	8.42	8.03	8.00	8.42	8.03	8.01
5 Bean at Bates	8.32	7.99	7.98	1.00	1.00	1.00	8.31	7.99	7.98	8.32	8.00	7.99
6 Covell Drain at Harris	8.30	7.87	7.87	1.00	1.00	1.00	8.29	7.87	7.86	8.31	7.88	7.87
4 Bean at Packard	8.28	7.95	7.93	1.00	1.00	1.00	8.27	7.95	7.93	8.29	7.95	7.94
3 Bean at Lime Creek Hwy	8.32	8.07	7.90	1.00	1.01	1.00	8.31	8.02	7.90	8.33	8.13	7.91
26 Bean at Ridgeville	8.18	7.90	7.57	1.01	1.00	1.00	8.12	7.88	7.57	8.24	7.92	7.58
2 Bean at Mulberry	8.32	7.45	7.45	1.00	1.01	1.00	8.31	7.41	7.44	8.32	7.49	7.45
22 Blanchard Drain at Coman	8.55	7.92		1.00	1.00		8.54	7.90		8.55	7.94	
21 Blanchard Drain at Meridian	8.07	7.85	7.75	1.00	1.01	1.00	8.07	7.81	7.75	8.07	7.89	7.75
20 Blanchard Drain at Munson	8.24	7.81	7.77	1.00	1.00	1.00	8.24	7.79	7.77	8.25	7.82	7.77
19 Blanchard Drain at Ingall	8.36	7.87	7.77	1.00	1.00	1.00	8.32	7.85	7.77	8.39	7.89	7.77
11 Lime at Coman	7.75	7.70	7.51	1.01	1.00	1.00	7.71	7.69	7.51	7.79	7.71	7.52
12 Lime at Tamarack	8.54	7.79	7.74	1.00	1.00	1.00	8.53	7.78	7.74	8.54	7.81	7.74
13 Lime at Lime Creek Drive	8.33	7.76	8.00	1.00	1.00	1.00	8.33	7.76	7.99	8.34	7.76	8.01
14 Lime at Prattville	8.40	8.35	8.14	1.00	1.00	1.00	8.40	8.34	8.14	8.40	8.36	8.14
15 Lime at Lime Creek Hwy	8.42	8.09	7.95	1.00	1.00	1.00	8.42	8.09	7.94	8.42	8.10	7.95
16 Site A at Lime Creek Hwy	8.91	7.95		1.00	1.00		8.90	7.95		8.91	7.96	
17 Site B at Lime Creek Hwy	8.26	7.96	7.73	1.00	1.00	1.00	8.26	7.95	7.71	8.27	7.96	7.75
18 Lime at Ingall	7.98	7.90	7.58	1.01	1.00	1.00	7.91	7.90	7.58	8.06	7.91	7.59
23 Lime at White Pine	8.32	7.92	7.70	1.00	1.00	1.00	8.30	7.91	7.70	8.34	7.93	7.70
24 Lime at Ridgeville	7.95	7.99	7.60	1.00	1.00	1.00	7.93	7.98	7.60	7.97	8.01	7.60
25 Mansfield Drain at Ranger	8.13	7.91	7.53	1.00	1.00	1.00	8.12	7.88	7.53	8.13	7.94	7.53
1 Lime at Mulberry	8.20	7.98	7.67	1.00	1.00	1.00	8.18	7.97	7.67	8.23	7.99	7.67

June

Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	8.31	8.39	7.18	1.00	1.00	1.00	8.31	8.36	7.17	8.32	8.42	7.19
9 Bean at Dillion	8.43	8.58	7.25	1.00	1.01	1.00	8.43	8.53	7.25	8.44	8.63	7.26
8 Bean at Medina	8.47	8.54	7.46	1.00	1.01	1.01	8.46	8.48	7.42	8.48	8.60	7.51
7 Bean at Bothwell	8.59	8.37	7.45	1.00	1.00	1.00	8.57	8.35	7.43	8.61	8.40	7.48
5 Bean at Bates	8.41	8.32	7.21	1.00	1.00	1.00	8.40	8.29	7.20	8.41	8.35	7.22
6 Covell Drain at Harris	8.35	8.35	6.90	1.00	1.01	1.01	8.34	8.28	6.83	8.35	8.44	6.95
4 Bean at Packard	8.35	8.40	7.26	1.00	1.01	1.00	8.34	8.33	7.25	8.35	8.53	7.27
3 Bean at Lime Creek Hwy	8.33	8.30	7.11	1.00	1.01	1.00	8.31	8.24	7.10	8.35	8.37	7.12
26 Bean at Ridgeville	8.32	8.33	7.07	1.00	1.01	1.01	8.30	8.27	7.04	8.33	8.39	7.12
2 Bean at Mulberry	8.33	7.75	7.14	1.00	1.00	1.01	8.32	7.73	7.08	8.34	7.78	7.17
22 Blanchard Drain at Coman		8.32			1.00			8.28			8.35	
21 Blanchard Drain at Meridian	8.30	8.26	7.95	1.00	1.00	1.00	8.30	8.25	7.94	8.30	8.28	7.96
20 Blanchard Drain at Munson	8.33	8.42	8.21	1.00	1.00	1.00	8.32	8.40	8.20	8.33	8.44	8.22
19 Blanchard Drain at Ingall	8.51	8.30	8.11	1.01	1.00	1.00	8.45	8.29	8.10	8.55	8.31	8.12
11 Lime at Coman	7.81	7.94	7.34	1.00	1.00	1.00	7.78	7.91	7.32	7.83	7.98	7.37
12 Lime at Tamarack	8.39	8.13	6.79	1.00	1.00	1.00	8.37	8.10	6.78	8.41	8.17	6.80
13 Lime at Lime Creek Drive	8.46	8.29	7.86	1.00	1.00	1.00	8.44	8.27	7.85	8.48	8.31	7.86
14 Lime at Prattville	7.76	8.75	7.65	1.00	1.00	1.00	7.74	8.74	7.62	7.79	8.76	7.67
15 Lime at Lime Creek Hwy		8.57			1.00			8.54			8.59	
16 Site A at Lime Creek Hwy		8.28			1.00			8.24			8.32	
17 Site B at Lime Creek Hwy	8.44	8.25	7.98	1.00	1.00	1.00	8.42	8.21	7.97	8.46	8.29	7.99
18 Lime at Ingall	8.34	8.21	7.52	1.03	1.00	1.00	8.19	8.19	7.49	8.59	8.23	7.55
23 Lime at White Pine	8.39	8.35	8.04	1.00	1.00	1.00	8.37	8.32	8.04	8.40	8.39	8.04
24 Lime at Ridgeville	8.27	8.31	7.75	1.02	1.00	1.00	8.15	8.28	7.74	8.48	8.35	7.75
25 Mansfield Drain at Ranger	8.21	8.31	7.88	1.00	1.01	1.00	8.21	8.26	7.86	8.21	8.36	7.90
1 Lime at Mulberry	8.31	8.32	8.16	1.00	1.00	1.00	8.31	8.30	8.16	8.31	8.35	8.17

July

Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	7.87	6.22	5.99	1.01	1.00	1.00	7.75	6.22	5.99	7.93	6.22	5.99
9 Bean at Dillion	8.13	6.21	6.07	1.00	1.00	1.00	8.12	6.20	6.07	8.15	6.21	6.07
8 Bean at Medina	8.18	6.03	6.03	1.01	1.00	1.00	8.15	6.03	6.03	8.23	6.04	6.04
7 Bean at Bothwell	8.46	6.06	6.08	1.00	1.00	1.00	8.46	6.05	6.08	8.47	6.06	6.08
5 Bean at Bates	8.38	6.14	6.03	1.00	1.00	1.00	8.35	6.12	6.03	8.42	6.16	6.04
6 Covell Drain at Harris	8.36	6.12	5.96	1.01	1.00	1.00	8.31	6.11	5.96	8.40	6.13	5.97
4 Bean at Packard	8.08	6.10	6.10	1.00	1.00	1.00	8.07	6.09	6.09	8.10	6.10	6.10
3 Bean at Lime Creek Hwy	8.13	6.19	6.04	1.00	1.00	1.00	8.11	6.18	6.03	8.17	6.20	6.04
26 Bean at Ridgeville	8.18	6.21	5.99	1.01	1.00	1.00	8.05	6.21	5.98	8.27	6.21	5.99
2 Bean at Mulberry	8.31	6.17	5.82	1.00	1.00	1.00	8.29	6.17	5.82	8.32	6.18	5.82
22 Blanchard Drain at Coman	8.17	6.31		1.00	1.00		8.16	6.31		8.17	6.32	
21 Blanchard Drain at Meridian	8.25	6.33	6.24	1.00	1.00	1.00	8.24	6.31	6.24	8.25	6.34	6.24
20 Blanchard Drain at Munson	8.32	6.26	6.28	1.00	1.00	1.00	8.32	6.25	6.28	8.32	6.27	6.29
19 Blanchard Drain at Ingall	7.82	6.32	6.29	1.00	1.00	1.00	7.79	6.32	6.29	7.86	6.33	6.30
11 Lime at Coman	7.67	6.76	6.24	1.00	1.00	1.00	7.66	6.75	6.23	7.68	6.77	6.25
12 Lime at Tamarack	8.09	6.38	5.73	1.00	1.00	1.00	8.07	6.38	5.72	8.11	6.38	5.75
13 Lime at Lime Creek Drive	8.43	6.33	6.24	1.00	1.00	1.00	8.43	6.32	6.23	8.43	6.33	6.24
14 Lime at Prattville	8.43	6.59	5.83	1.00	1.00	1.00	8.41	6.59	5.83	8.44	6.60	5.84
15 Lime at Lime Creek Hwy	8.54	6.37		1.00	1.00		8.52	6.36		8.55	6.38	
16 Site A at Lime Creek Hwy		6.34			1.00			6.34			6.35	
17 Site B at Lime Creek Hwy	8.42	6.28	6.32	1.00	1.00	1.00	8.42	6.28	6.31	8.43	6.29	6.33
18 Lime at Ingall	8.13	6.30	5.91	1.00	1.00	1.00	8.11	6.30	5.90	8.15	6.31	5.93
23 Lime at White Pine	8.36	6.31	6.12	1.00	1.00	1.00	8.35	6.30	6.11	8.37	6.31	6.13
24 Lime at Ridgeville	8.22	6.31	6.07	1.00	1.00	1.00	8.20	6.30	6.05	8.24	6.31	6.09
25 Mansfield Drain at Ranger	8.26	6.24	6.06	1.00	1.00	1.00	8.25	6.24	6.06	8.27	6.25	6.06
1 Lime at Mulberry	8.36	6.20	6.18	1.00	1.02	1.00	8.35	6.07	6.18	8.37	6.33	6.18

August

Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	7.98	8.04	6.53	1.00	1.00	1.00	7.98	8.04	6.52	7.98	8.05	6.53
9 Bean at Dillion	7.96	8.38	6.55	1.01	1.00	1.00	7.87	8.37	6.55	8.03	8.38	6.55
8 Bean at Medina	8.10	8.37	6.53	1.00	1.00	1.00	8.08	8.36	6.53	8.12	8.38	6.53
7 Bean at Bothwell	8.10	8.41	6.48	1.00	1.00	1.00	8.10	8.41	6.47	8.11	8.41	6.49
5 Bean at Bates	8.08	8.32	6.47	1.00	1.00	1.00	8.08	8.32	6.47	8.09	8.32	6.48
6 Covell Drain at Harris	8.04	8.33	6.40	1.00	1.00	1.00	8.04	8.33	6.39	8.04	8.34	6.41
4 Bean at Packard	8.11	8.34	6.41	1.00	1.00	1.00	8.11	8.33	6.40	8.12	8.35	6.42
3 Bean at Lime Creek Hwy	8.07	8.38	6.36	1.00	1.00	1.00	8.07	8.37	6.35	8.08	8.38	6.38
26 Bean at Ridgeville	8.11	8.36	6.31	1.00	1.00	1.00	8.11	8.35	6.30	8.12	8.36	6.32
2 Bean at Mulberry	8.13	8.37	6.14	1.00	1.00	1.00	8.12	8.37	6.12	8.14	8.38	6.15
22 Blanchard Drain at Coman		7.54	7.75		1.00	1.01		7.54	7.65		7.55	7.81
21 Blanchard Drain at Meridian		7.73	6.76		1.00	1.00		7.72	6.75		7.74	6.77
20 Blanchard Drain at Munson	7.55	7.86	6.68	1.00	1.00	1.00	7.54	7.86	6.68	7.55	7.86	6.68
19 Blanchard Drain at Ingall	7.55	8.10	6.72	1.00	1.00	1.00	7.54	8.10	6.71	7.56	8.10	6.72
11 Lime at Coman	7.47	7.66	6.33	1.00	1.00	1.00	7.46	7.66	6.32	7.48	7.66	6.34
12 Lime at Tamarack	7.61	7.78	6.23	1.00	1.00	1.01	7.61	7.77	6.15	7.61	7.78	6.29
13 Lime at Lime Creek Drive	7.79	8.15	6.51	1.00	1.00	1.00	7.78	8.15	6.50	7.81	8.16	6.52
14 Lime at Prattville	7.48	8.36	6.71	1.00	1.00	1.00	7.47	8.35	6.70	7.49	8.36	6.72
15 Lime at Lime Creek Hwy		8.41	6.73		1.00	1.00		8.40	6.73		8.41	6.73
16 Site A at Lime Creek Hwy	7.63		6.71	1.00		1.00	7.61		6.69	7.64		6.72
17 Site B at Lime Creek Hwy	7.77	7.94	6.71	1.00	1.00	1.00	7.77	7.94	6.71	7.77	7.94	6.72
18 Lime at Ingall	8.02	8.02	6.74	1.00	1.00	1.00	8.00	8.02	6.74	8.04	8.03	6.75
23 Lime at White Pine	8.09	8.15	6.74	1.00	1.00	1.00	8.08	8.15	6.73	8.10	8.16	6.74
24 Lime at Ridgeville	7.90	8.07	6.75	1.00	1.00	1.00	7.88	8.06	6.74	7.91	8.08	6.75
25 Mansfield Drain at Ranger	7.89	7.99	6.65	1.00	1.00	1.00	7.89	7.98	6.63	7.89	7.99	6.66
1 Lime at Mulberry	8.03	8.10	6.24	1.00	1.00	1.00	8.02	8.10	6.22	8.03	8.10	6.25

September

Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	7.61	8.20	5.70	1.00	1.00	1.00	7.61	8.20	5.70	7.62	8.20	5.70
9 Bean at Dillion	7.54	8.47	5.86	1.01	1.00	1.00	7.45	8.47	5.86	7.61	8.47	5.87
8 Bean at Medina	7.94	8.44	5.87	1.00	1.00	1.00	7.94	8.43	5.87	7.95	8.44	5.88
7 Bean at Bothwell	8.03	8.49	5.90	1.00	1.00	1.00	8.02	8.49	5.90	8.03	8.50	5.90
5 Bean at Bates	8.01	8.46	5.92	1.00	1.00	1.00	8.00	8.46	5.92	8.02	8.46	5.92
6 Covell Drain at Harris	8.06	8.43	5.91	1.00	1.00	1.00	8.06	8.42	5.90	8.06	8.43	5.91
4 Bean at Packard	8.02	8.38	5.94	1.00	1.00	1.00	8.01	8.38	5.94	8.03	8.38	5.94
3 Bean at Lime Creek Hwy	8.10	8.37	5.93	1.00	1.00	1.00	8.10	8.36	5.92	8.10	8.37	5.93
26 Bean at Ridgeville	8.13	8.35	5.73	1.00	1.00	1.00	8.13	8.33	5.73	8.14	8.37	5.74
2 Bean at Mulberry	8.07	8.27	5.60	1.00	1.00	1.00	8.07	8.26	5.58	8.08	8.28	5.61
22 Blanchard Drain at Coman	7.22	8.00		1.00	1.00		7.21	7.99		7.24	8.00	
21 Blanchard Drain at Meridian	7.80	8.34	5.64	1.00	1.00	1.00	7.78	8.34	5.62	7.81	8.35	5.66
20 Blanchard Drain at Munson	7.76	8.30	5.71	1.00	1.00	1.00	7.75	8.29	5.70	7.77	8.30	5.72
19 Blanchard Drain at Ingall	8.03	8.39	5.99	1.00	1.00	1.01	8.02	8.39	5.96	8.05	8.40	6.02
11 Lime at Coman	7.60	8.16	5.62	1.00	1.00	1.00	7.60	8.14	5.62	7.60	8.19	5.63
12 Lime at Tamarack	7.70	8.01	5.65	1.00	1.00	1.00	7.69	8.00	5.64	7.71	8.01	5.66
13 Lime at Lime Creek Drive	7.81	8.18	5.79	1.00	1.00	1.00	7.79	8.18	5.78	7.82	8.18	5.80
14 Lime at Prattville		8.19	5.77		1.00	1.00		8.19	5.76		8.20	5.78
15 Lime at Lime Creek Hwy		8.80	5.75		1.00	1.00		8.79	5.74		8.80	5.75
16 Site A at Lime Creek Hwy			5.71			1.00			5.70			5.71
17 Site B at Lime Creek Hwy	7.82	8.24	5.75	1.00	1.00	1.00	7.81	8.23	5.74	7.83	8.25	5.75
18 Lime at Ingall	7.96	8.18	5.76	1.00	1.00	1.00	7.95	8.18	5.75	7.96	8.19	5.76
23 Lime at White Pine	8.03	8.41	5.76	1.00	1.00	1.00	8.03	8.41	5.76	8.04	8.42	5.77
24 Lime at Ridgeville	7.93	8.35	5.75	1.00	1.00	1.00	7.92	8.35	5.74	7.94	8.35	5.75
25 Mansfield Drain at Ranger	7.88	8.27	5.83	1.01	1.00	1.00	7.76	8.27	5.82	7.94	8.28	5.86
1 Lime at Mulberry	8.06	8.42	7.00	1.00	1.00	1.00	8.05	8.42	6.99	8.07	8.42	7.00

October

Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	7.66	8.03	7.60	1.00	1.00	1.00	7.66	8.03	7.57	7.67	8.03	7.63
9 Bean at Dillion	7.19	8.37	7.24	1.02	1.00	1.00	7.05	8.36	7.23	7.31	8.37	7.24
8 Bean at Medina	7.98	8.36	7.24	1.00	1.00	1.00	7.96	8.35	7.24	8.00	8.36	7.24
7 Bean at Bothwell	8.13	8.38	7.22	1.00	1.00	1.00	8.11	8.38	7.22	8.15	8.38	7.22
5 Bean at Bates	8.12	8.36	7.24	1.00	1.00	1.00	8.12	8.35	7.23	8.12	8.37	7.24
6 Covell Drain at Harris	8.12	8.21	7.23	1.00	1.00	1.00	8.11	8.20	7.22	8.12	8.21	7.23
4 Bean at Packard	8.18	8.35	7.22	1.00	1.00	1.00	8.18	8.34	7.22	8.18	8.35	7.23
3 Bean at Lime Creek Hwy	8.18	8.33	7.19	1.00	1.00	1.00	8.18	8.32	7.19	8.19	8.34	7.19
26 Bean at Ridgeville	8.17	8.06	7.19	1.00	1.00	1.00	8.17	8.05	7.19	8.17	8.07	7.19
2 Bean at Mulberry	8.18	8.02	7.19	1.00	1.00	1.00	8.16	8.00	7.19	8.20	8.05	7.19
22 Blanchard Drain at Coman		7.70			1.00			7.70			7.71	
21 Blanchard Drain at Meridian		7.91	7.11		1.00	1.00		7.91	7.10		7.92	7.11
20 Blanchard Drain at Munson		8.01			1.00			8.00			8.01	
19 Blanchard Drain at Ingall	7.96	8.26	7.85	1.00	1.00	1.01	7.95	8.25	7.80	7.96	8.26	7.88
11 Lime at Coman	7.89	7.67	6.93	1.00	1.00	1.00	7.88	7.66	6.92	7.90	7.67	6.94
12 Lime at Tamarack	7.95	7.90	7.00	1.00	1.00	1.00	7.95	7.90	6.98	7.96	7.90	7.01
13 Lime at Lime Creek Drive	8.10	8.27	7.05	1.00	1.00	1.00	8.09	8.26	7.04	8.10	8.27	7.05
14 Lime at Prattville		7.98	7.11		1.00	1.00		7.96	7.10		8.00	7.12
15 Lime at Lime Creek Hwy		8.19	7.11		1.00	1.00		8.19	7.11		8.19	7.12
16 Site A at Lime Creek Hwy	7.67		7.12	1.00		1.00	7.66		7.11	7.68		7.12
17 Site B at Lime Creek Hwy	7.85	7.93	7.15	1.00	1.00	1.00	7.84	7.93	7.15	7.85	7.93	7.16
18 Lime at Ingall	7.97	8.06	7.17	1.00	1.00	1.00	7.97	8.06	7.17	7.97	8.06	7.17
23 Lime at White Pine	7.96	8.21	7.19	1.00	1.00	1.00	7.96	8.21	7.19	7.97	8.21	7.20
24 Lime at Ridgeville	7.80	8.15	7.18	1.00	1.00	1.00	7.79	8.15	7.18	7.81	8.16	7.18
25 Mansfield Drain at Ranger	8.06	8.04	7.17	1.00	1.00	1.00	8.05	8.04	7.16	8.06	8.05	7.18
1 Lime at Mulberry	8.01	8.25	7.18	1.00	1.00	1.00	8.00	8.24	7.18	8.02	8.25	7.18

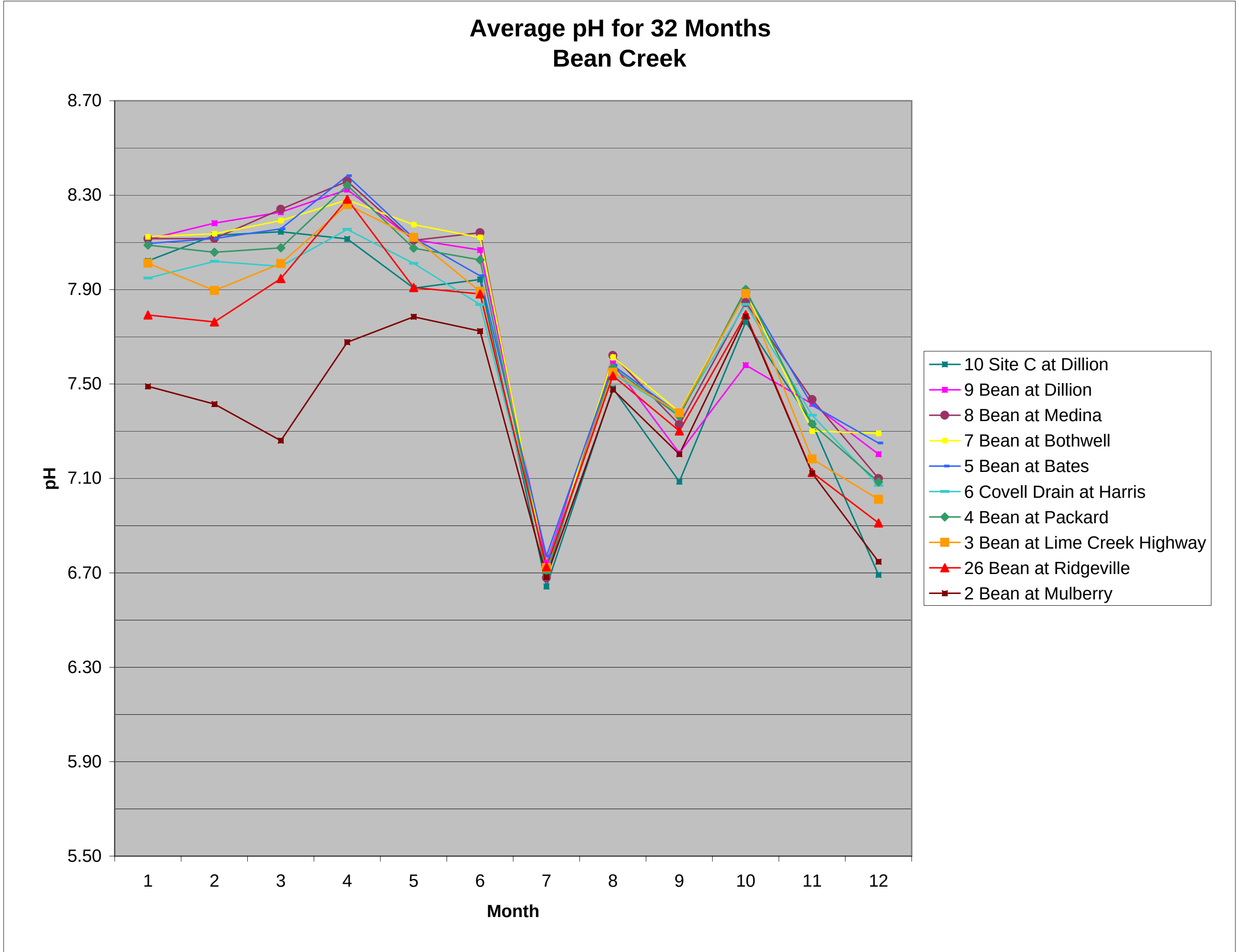
November

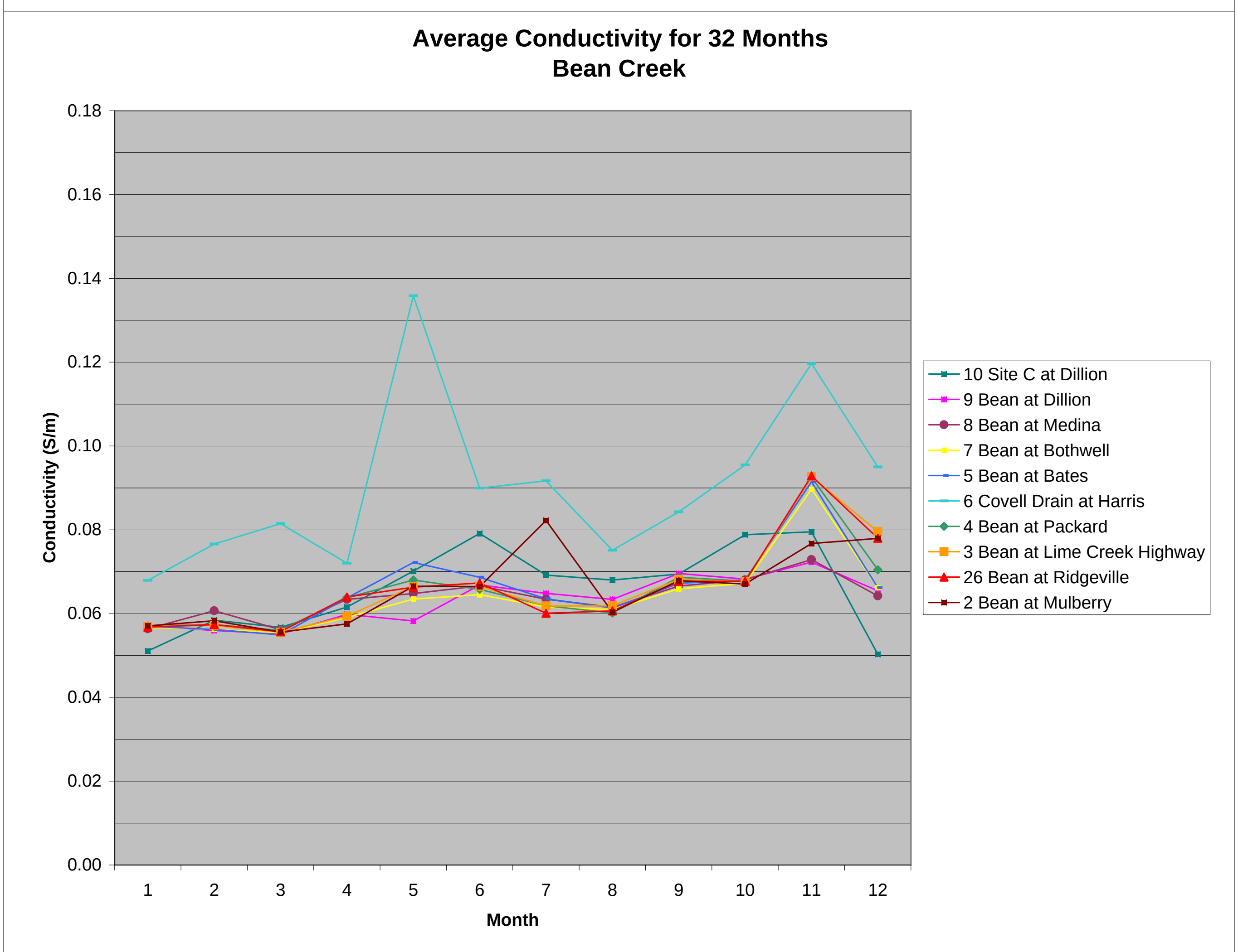
Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion	8.01	8.10	6.08	1.00	1.00	1.00	8.00	8.10	6.06	8.02	8.11	6.09
9 Bean at Dillion	8.03	8.33	6.10	1.00	1.00	1.00	8.01	8.32	6.07	8.06	8.33	6.13
8 Bean at Medina	8.15	8.29	6.08	1.00	1.00	1.00	8.13	8.29	6.06	8.17	8.30	6.10
7 Bean at Bothwell	8.14	8.33	5.74	1.00	1.00	1.01	8.14	8.33	5.70	8.14	8.33	5.79
5 Bean at Bates	8.05	8.30	6.08	1.00	1.00	1.01	8.04	8.30	6.05	8.06	8.31	6.12
6 Covell Drain at Harris	8.14	7.93	6.19	1.00	1.00	1.00	8.13	7.93	6.19	8.15	7.94	6.20
4 Bean at Packard	8.05	8.07	6.06	1.01	1.00	1.01	8.00	8.07	6.04	8.11	8.07	6.10
3 Bean at Lime Creek Hwy	7.82	8.11	5.84	1.00	1.00	1.02	7.82	8.09	5.75	7.82	8.14	5.97
26 Bean at Ridgeville	7.65	7.98	5.92	1.00	1.00	1.00	7.65	7.98	5.90	7.66	7.98	5.94
2 Bean at Mulberry	7.50	7.97	6.05	1.00	1.00	1.00	7.49	7.96	6.03	7.51	7.97	6.06
22 Blanchard Drain at Coman		7.72	5.67		1.00	1.00		7.72	5.66		7.72	5.68
21 Blanchard Drain at Meridian		7.99	5.37		1.00	1.01		7.99	5.33		7.99	5.42
20 Blanchard Drain at Munson	7.96	7.97	5.33	1.00	1.00	1.01	7.94	7.97	5.27	7.97	7.97	5.39
19 Blanchard Drain at Ingall	7.86	8.27	5.68	1.00	1.00	1.00	7.85	8.27	5.67	7.87	8.27	5.69
11 Lime at Coman	8.03	7.60	6.23	1.00	1.00	1.01	8.02	7.60	6.18	8.04	7.60	6.28
12 Lime at Tamarack	8.02	8.01	5.20	1.00	1.00	1.00	8.00	8.00	5.19	8.05	8.01	5.22
13 Lime at Lime Creek Drive	8.05	8.25	5.34	1.00	1.00	1.00	8.05	8.25	5.32	8.06	8.25	5.35
14 Lime at Prattville		7.85	5.85		1.00	1.01		7.85	5.77		7.85	5.90
15 Lime at Lime Creek Hwy		8.44	5.76		1.00	1.00		8.44	5.74		8.44	5.79
16 Site A at Lime Creek Hwy			5.75			1.01			5.71			5.79
17 Site B at Lime Creek Hwy	7.95	8.18	5.75	1.00	1.00	1.01	7.94	8.16	5.72	7.96	8.20	5.79
18 Lime at Ingall	7.91	8.10	5.77	1.00	1.00	1.00	7.89	8.10	5.76	7.94	8.11	5.80
23 Lime at White Pine	7.89	8.23	5.67	1.00	1.00	1.01	7.88	8.23	5.64	7.90	8.24	5.70
24 Lime at Ridgeville	7.90	8.11	5.75	1.01	1.00	1.00	7.85	8.11	5.74	7.99	8.11	5.75
25 Mansfield Drain at Ranger	7.89	7.97	6.18	1.00	1.00	1.00	7.88	7.96	6.17	7.90	7.98	6.19
1 Lime at Mulberry	7.88	8.22	5.62	1.00	1.00	1.01	7.88	8.21	5.58	7.89	8.23	5.67

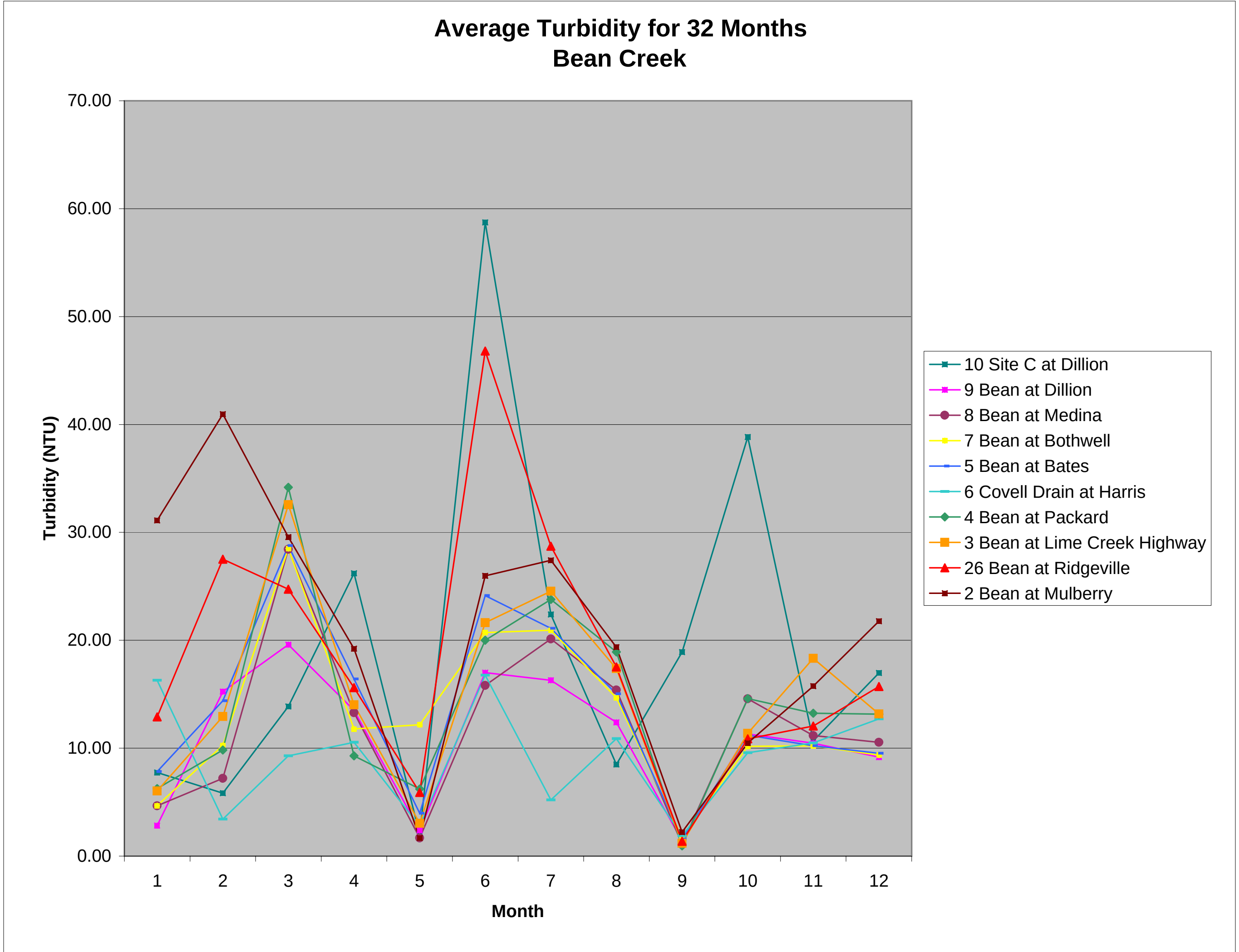
December

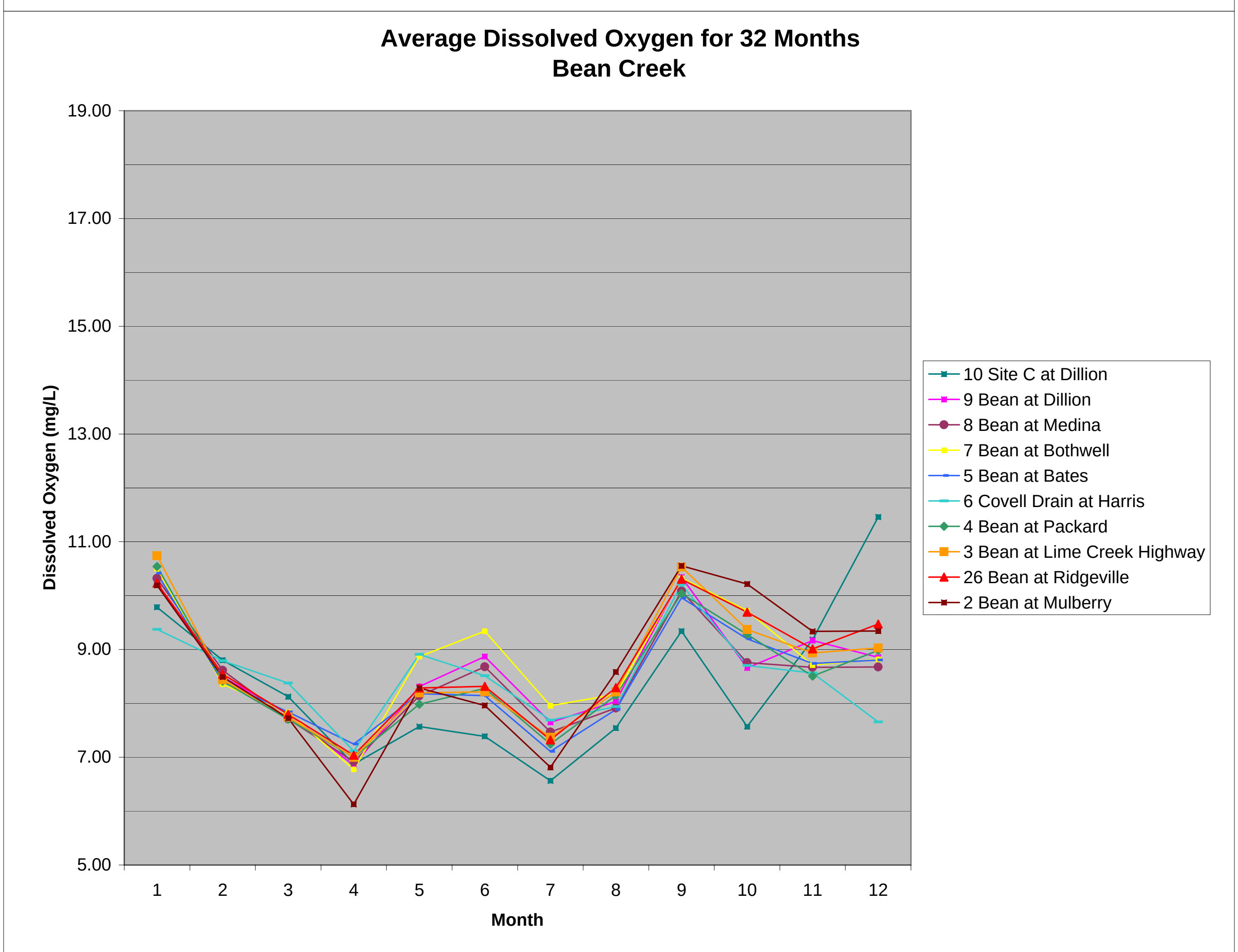
Site	GEOMETRIC MEAN 2005	GEOMETRIC MEAN 2006	GEOMETRIC MEAN 2007	STDEV 2005	STDEV 2006	STDEV 2007	MIN 2005	MIN 2006	MIN 2007	MAX 2005	MAX 2006	MAX 2007
10 Site C at Dillion		8.00	5.85		1.00	1.01		7.99	5.78		8.02	5.91
9 Bean at Dillion	7.96	8.23	5.71	1.00	1.00	1.01	7.95	8.23	5.66	7.96	8.23	5.75
8 Bean at Medina	7.98	8.20	5.84	1.00	1.00	1.01	7.95	8.20	5.79	7.99	8.20	5.89
7 Bean at Bothwell	8.04	8.23	5.86	1.00	1.00	1.00	8.04	8.22	5.83	8.05	8.23	5.88
5 Bean at Bates	7.95	8.21	5.84	1.00	1.00	1.00	7.95	8.21	5.83	7.95	8.22	5.84
6 Covell Drain at Harris	7.75	7.95	5.73	1.00	1.00	1.01	7.74	7.95	5.68	7.76	7.96	5.78
4 Bean at Packard	7.95	8.10	5.52	1.00	1.00	1.01	7.93	8.10	5.49	7.97	8.10	5.56
3 Bean at Lime Creek Hwy	7.71	7.99	5.59	1.00	1.00	1.01	7.70	7.99	5.56	7.72	8.00	5.62
26 Bean at Ridgeville	7.58	7.93	5.49	1.00	1.00	1.00	7.58	7.92	5.46	7.59	7.94	5.51
2 Bean at Mulberry	7.43	7.78	5.31	1.00	1.00	1.01	7.43	7.76	5.28	7.44	7.79	5.34
22 Blanchard Drain at Coman		7.70	5.98		1.00	1.01		7.69	5.91		7.71	6.03
21 Blanchard Drain at Meridian		7.85	5.75		1.00	1.01		7.84	5.69		7.86	5.79
20 Blanchard Drain at Munson		7.87	5.75		1.00	1.01		7.87	5.67		7.87	5.81
19 Blanchard Drain at Ingall		8.08	6.04		1.00	1.01		8.07	6.01		8.08	6.07
11 Lime at Coman	7.67	7.59	6.58	1.00	1.00	1.00	7.66	7.59	6.56	7.67	7.60	6.60
12 Lime at Tamarack	7.68	7.80	5.96	1.00	1.00	1.01	7.68	7.80	5.90	7.69	7.81	6.01
13 Lime at Lime Creek Drive	7.63	8.09	6.05	1.00	1.00	1.04	7.63	8.08	5.81	7.63	8.09	6.31
14 Lime at Prattville	7.83	7.93	5.66	1.00	1.00	1.01	7.82	7.92	5.61	7.84	7.94	5.72
15 Lime at Lime Creek Hwy		8.18	5.94		1.00	1.00		8.17	5.91		8.18	5.96
16 Site A at Lime Creek Hwy			5.77			1.01			5.71			5.82
17 Site B at Lime Creek Hwy		7.98	5.93		1.00	1.01		7.98	5.88		7.98	5.99
18 Lime at Ingall	7.72	8.03	5.77	1.00	1.00	1.01	7.71	8.03	5.73	7.72	8.03	5.81
23 Lime at White Pine		8.12	5.81		1.00	1.01		8.11	5.77		8.12	5.85
24 Lime at Ridgeville		8.08	6.00		1.00	1.00		8.08	5.97		8.08	6.02
25 Mansfield Drain at Ranger		7.81	5.87		1.00	1.01		7.79	5.84		7.83	5.91
1 Lime at Mulberry	7.60	8.06	5.33	1.00	1.00	1.00	7.60	8.06	5.31	7.61	8.06	5.35

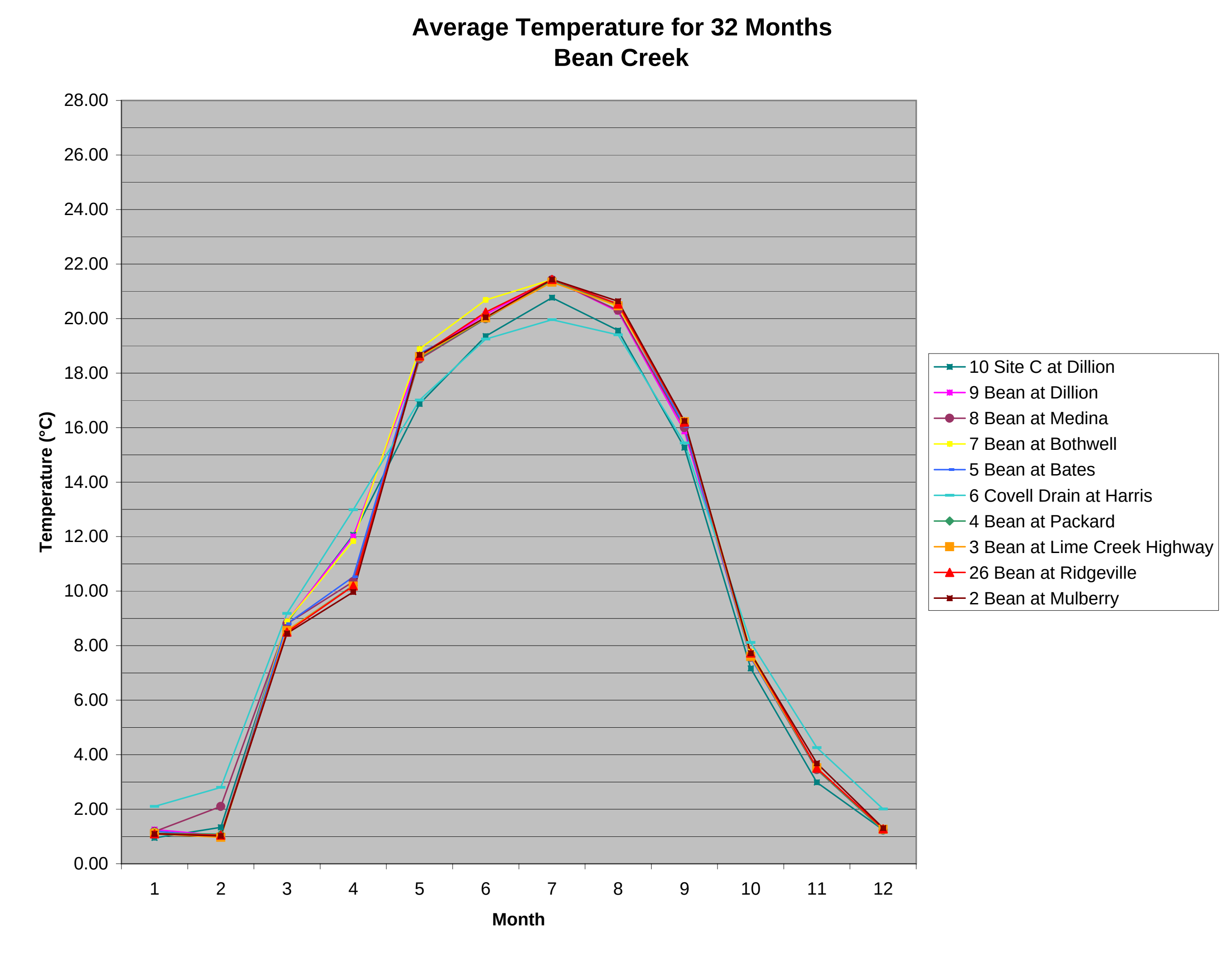
Appendix B: Average Monthly Parameter Trends

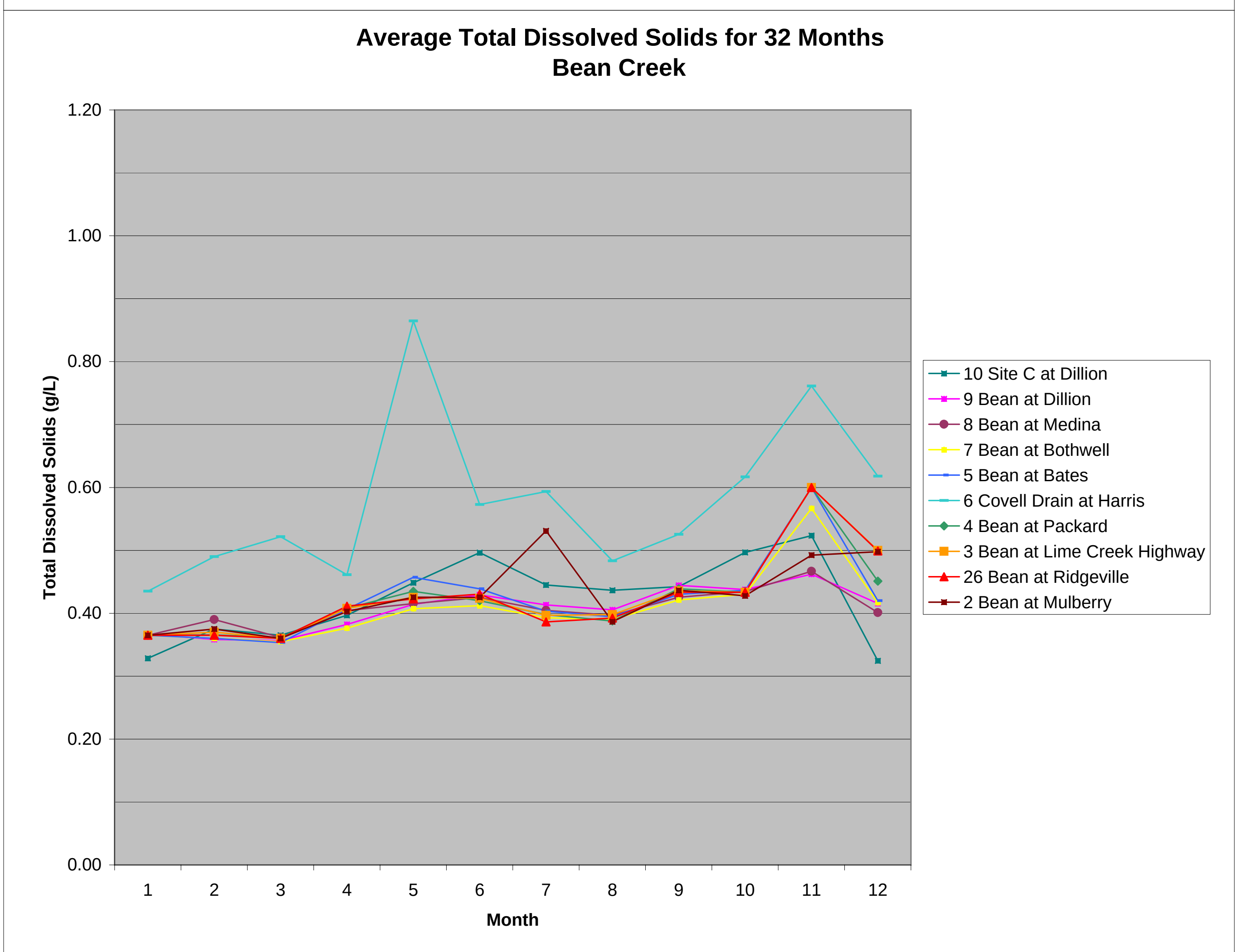

Average pH for 32 Months
Bean Creek
8.70
8.30
7.90
7.50
7.10
6.70
6.30
5.90
5.50
pH
1
2
3
4
5
6
7
8
9
10
11
12
Month
10 Site C at Dillion
9 Bean at Dillion
8 Bean at Medina
7 Bean at Bothwell
5 Bean at Bates
6 Covell Drain at Harris
4 Bean at Packard
3 Bean at Lime Creek Highway
26 Bean at Ridgeville
2 Bean at Mulberry

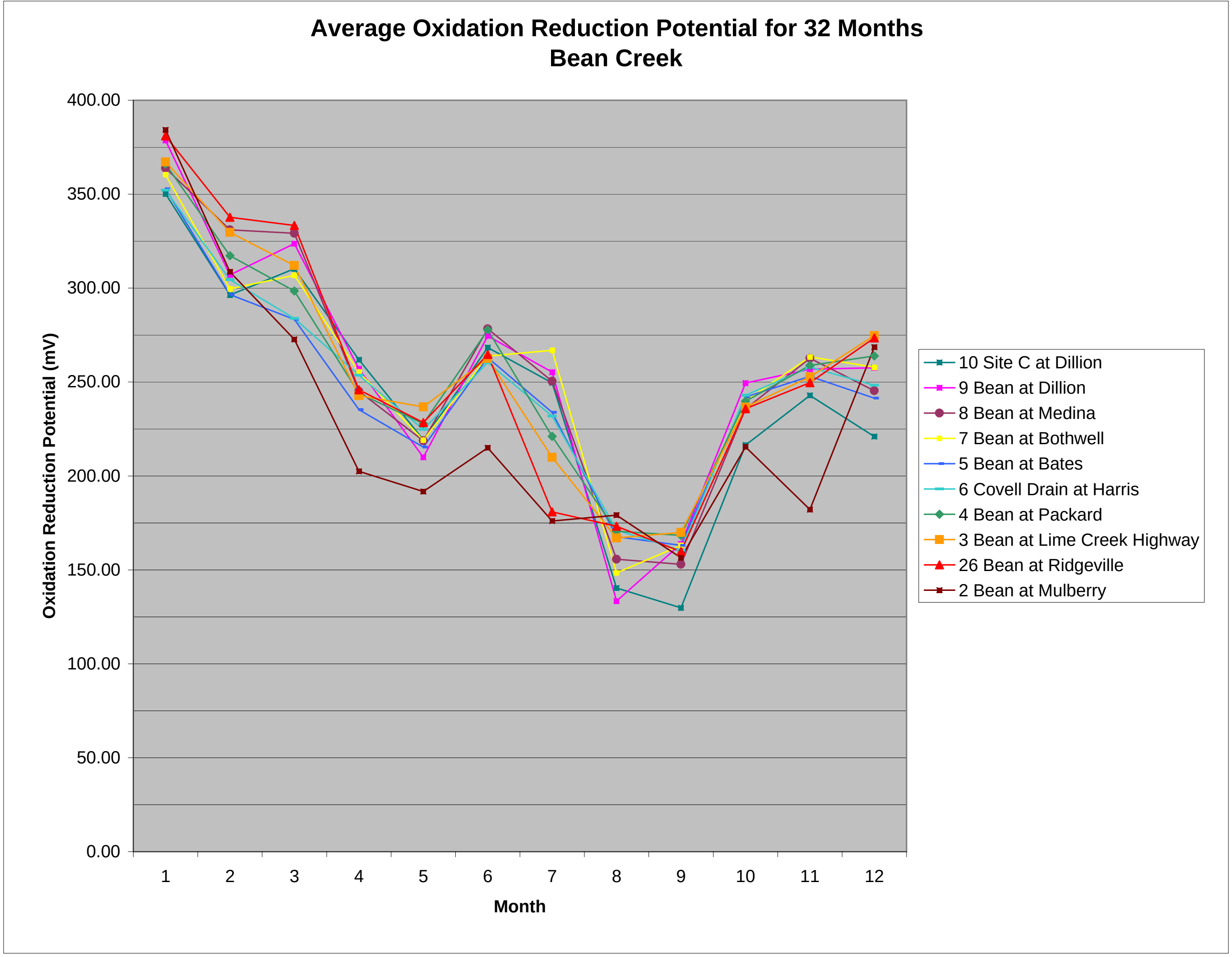

Average Conductivity for 32 Months
Bean Creek
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Conductivity (S/m)
1
2
3
4
5
6
7
8
9
10
11
12
Month
10 Site C at Dillion
9 Bean at Dillion
8 Bean at Medina
7 Bean at Bothwell
5 Bean at Bates
6 Covell Drain at Harris
4 Bean at Packard
3 Bean at Lime Creek Highway
26 Bean at Ridgeville
2 Bean at Mulberry

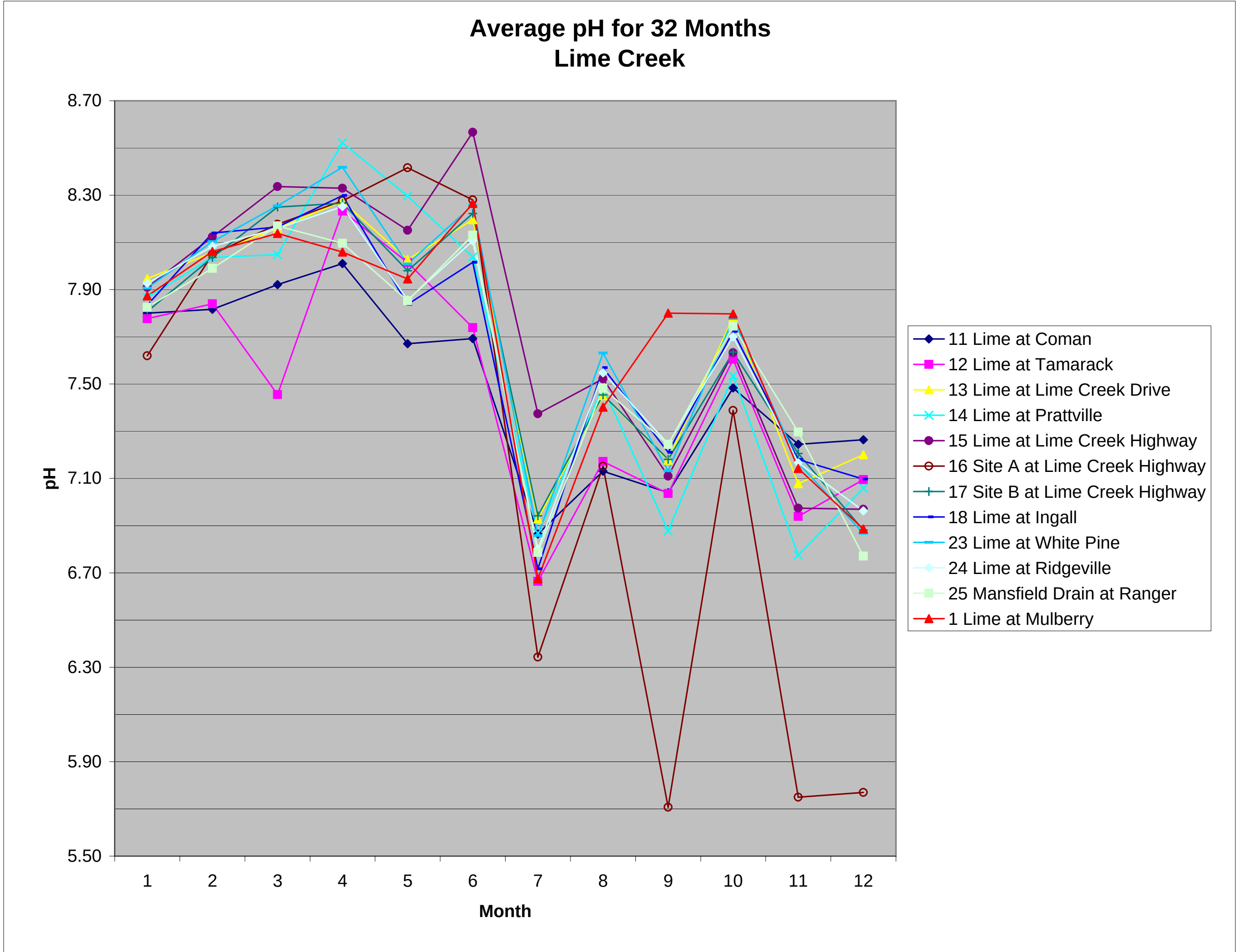

Average Turbidity for 32 Months
Bean Creek
Turbidity (NTU)
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1
2
3
4
5
6
7
8
9
10
11
12
Month
10 Site C at Dillion
9 Bean at Dillion
8 Bean at Medina
7 Bean at Bothwell
5 Bean at Bates
6 Covell Drain at Harris
4 Bean at Packard
3 Bean at Lime Creek Highway
26 Bean at Ridgeville
2 Bean at Mulberry

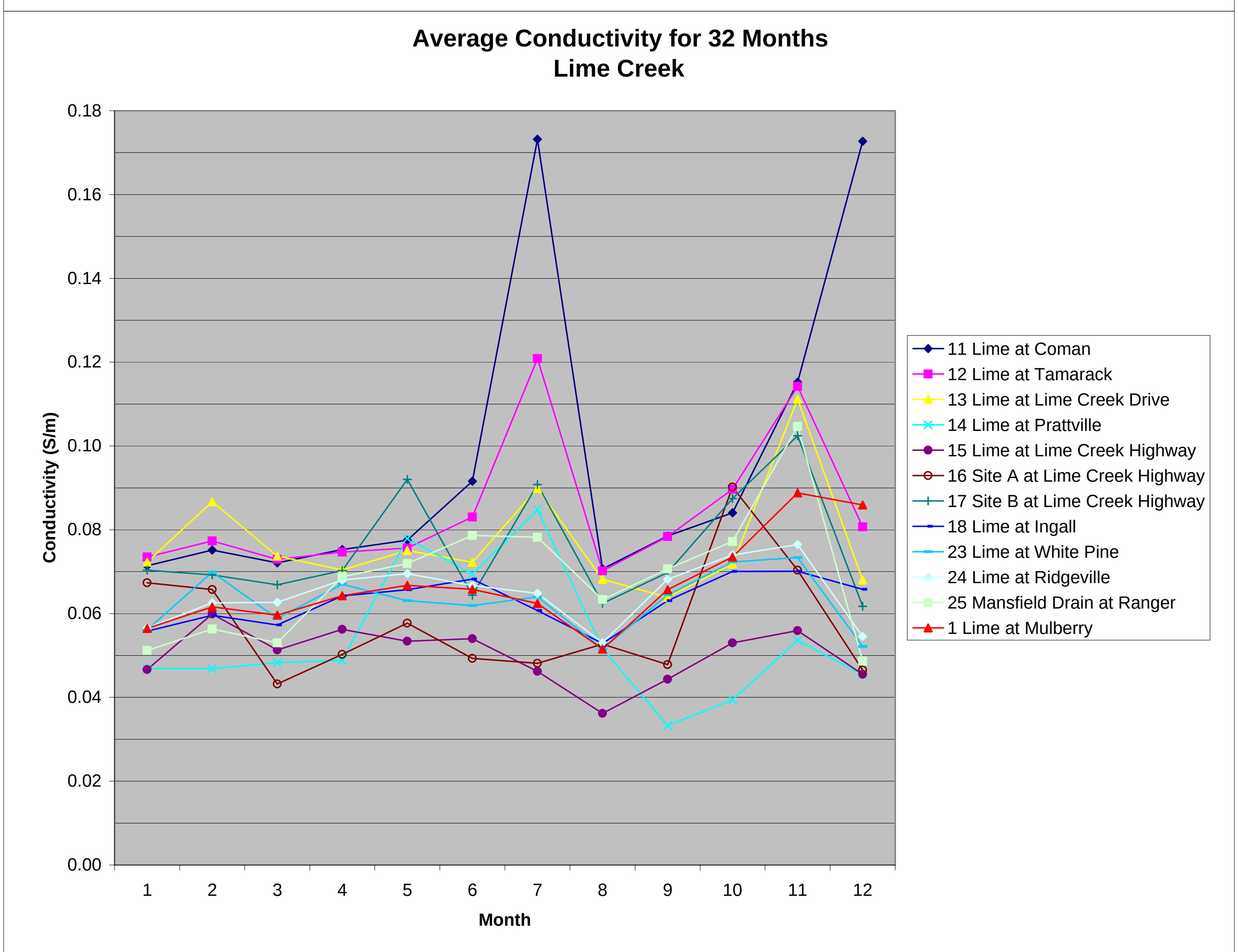

Average Dissolved Oxygen for 32 Months
Bean Creek
Dissolved Oxygen (mg/L)
19.00
17.00
15.00
13.00
11.00
9.00
7.00
5.00
1
2
3
4
5
6
7
8
9
10
11
12
Month
10 Site C at Dillion
9 Bean at Dillion
8 Bean at Medina
7 Bean at Bothwell
5 Bean at Bates
6 Covell Drain at Harris
4 Bean at Packard
3 Bean at Lime Creek Highway
26 Bean at Ridgeville
2 Bean at Mulberry

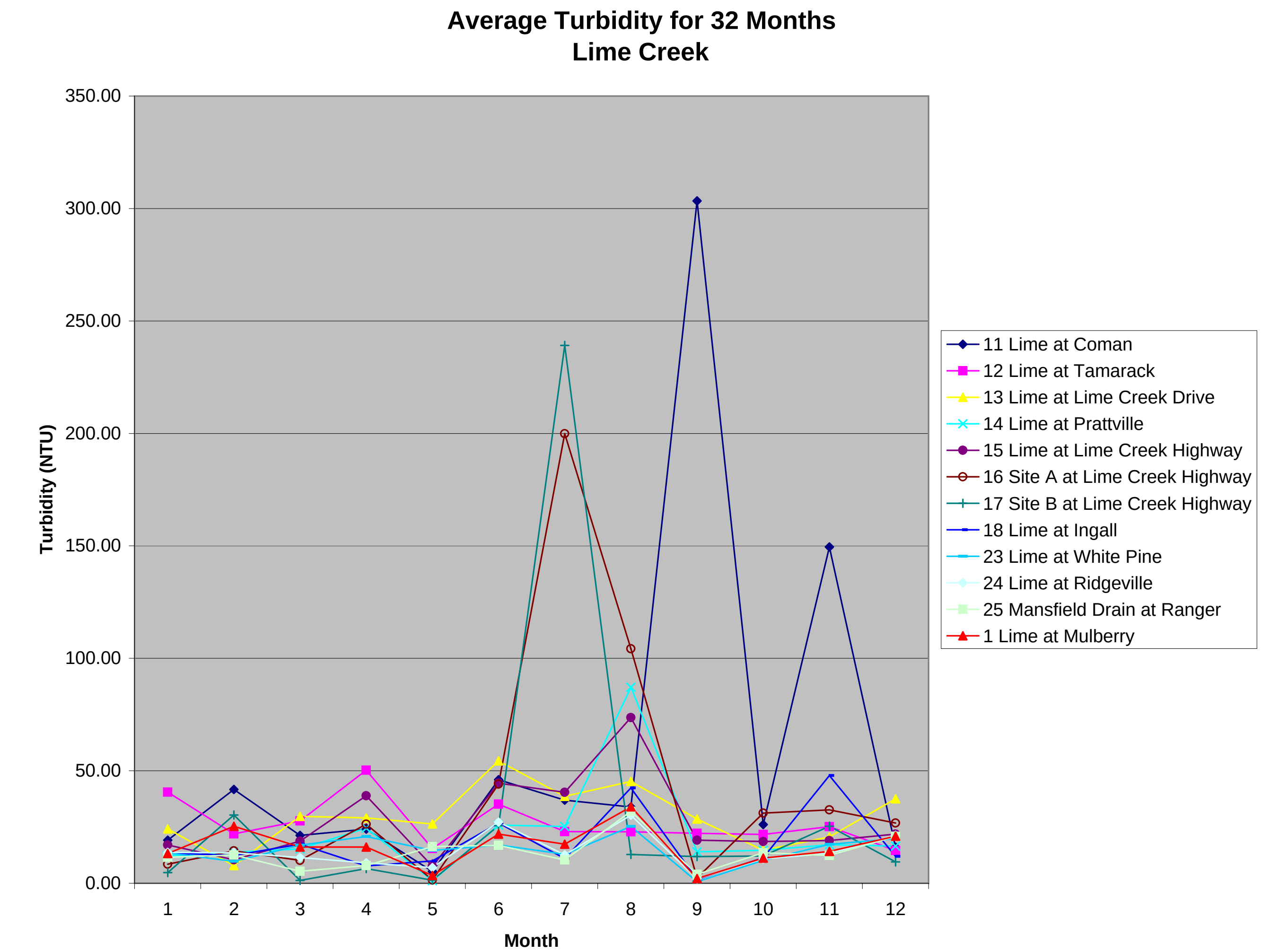

Average Temperature for 32 Months
Bean Creek
Temperature (°C)
Month
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
1
2
3
4
5
6
7
8
9
10
11
12
10 Site C at Dillion
9 Bean at Dillion
8 Bean at Medina
7 Bean at Bothwell
5 Bean at Bates
6 Covell Drain at Harris
4 Bean at Packard
3 Bean at Lime Creek Highway
26 Bean at Ridgeville
2 Bean at Mulberry

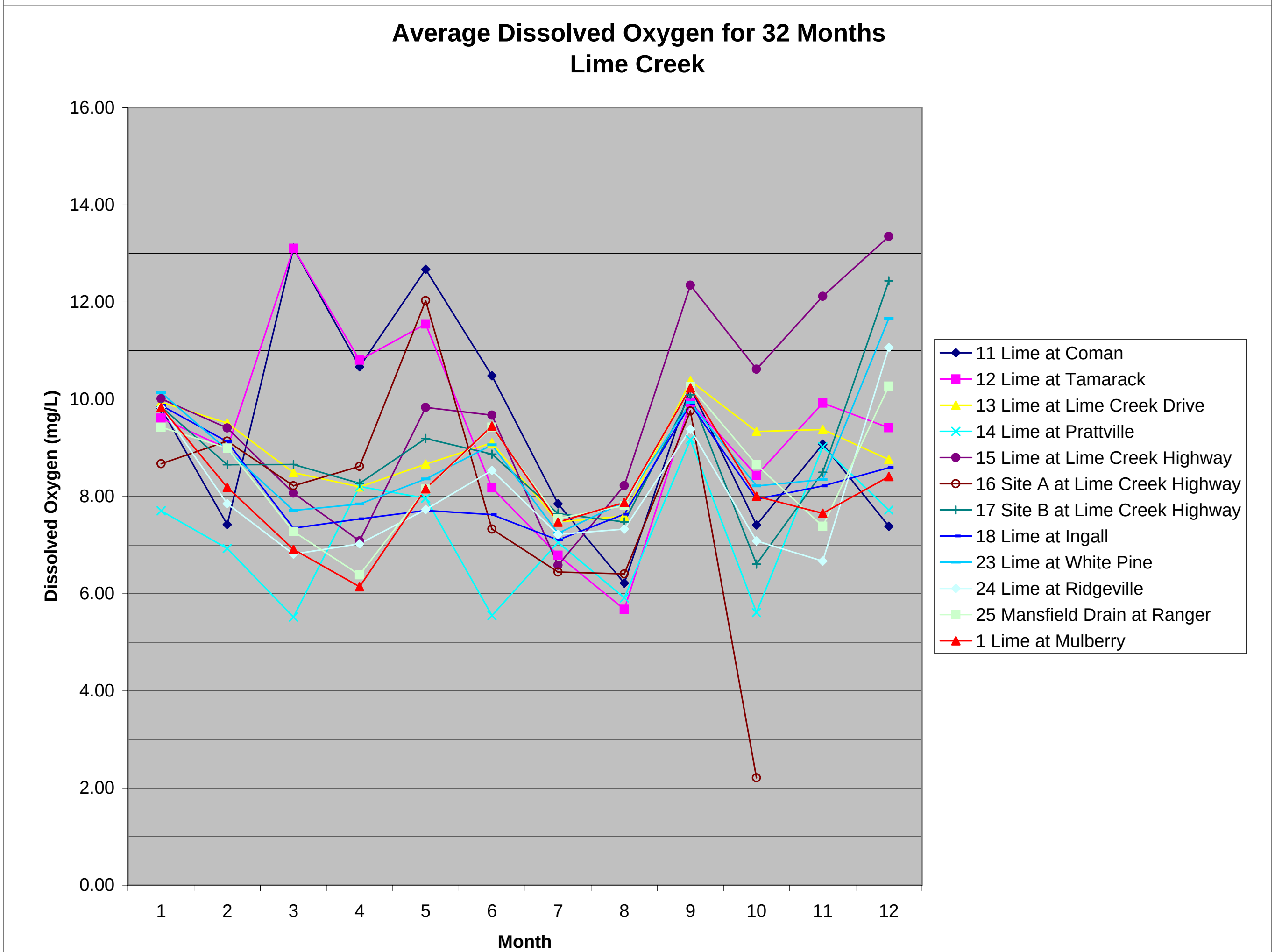

Average Total Dissolved Solids for 32 Months
Bean Creek
Total Dissolved Solids (g/L)
Month
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1
2
3
4
5
6
7
8
9
10
11
12
10 Site C at Dillion
9 Bean at Dillion
8 Bean at Medina
7 Bean at Bothwell
5 Bean at Bates
6 Covell Drain at Harris
4 Bean at Packard
3 Bean at Lime Creek Highway
26 Bean at Ridgeville
2 Bean at Mulberry

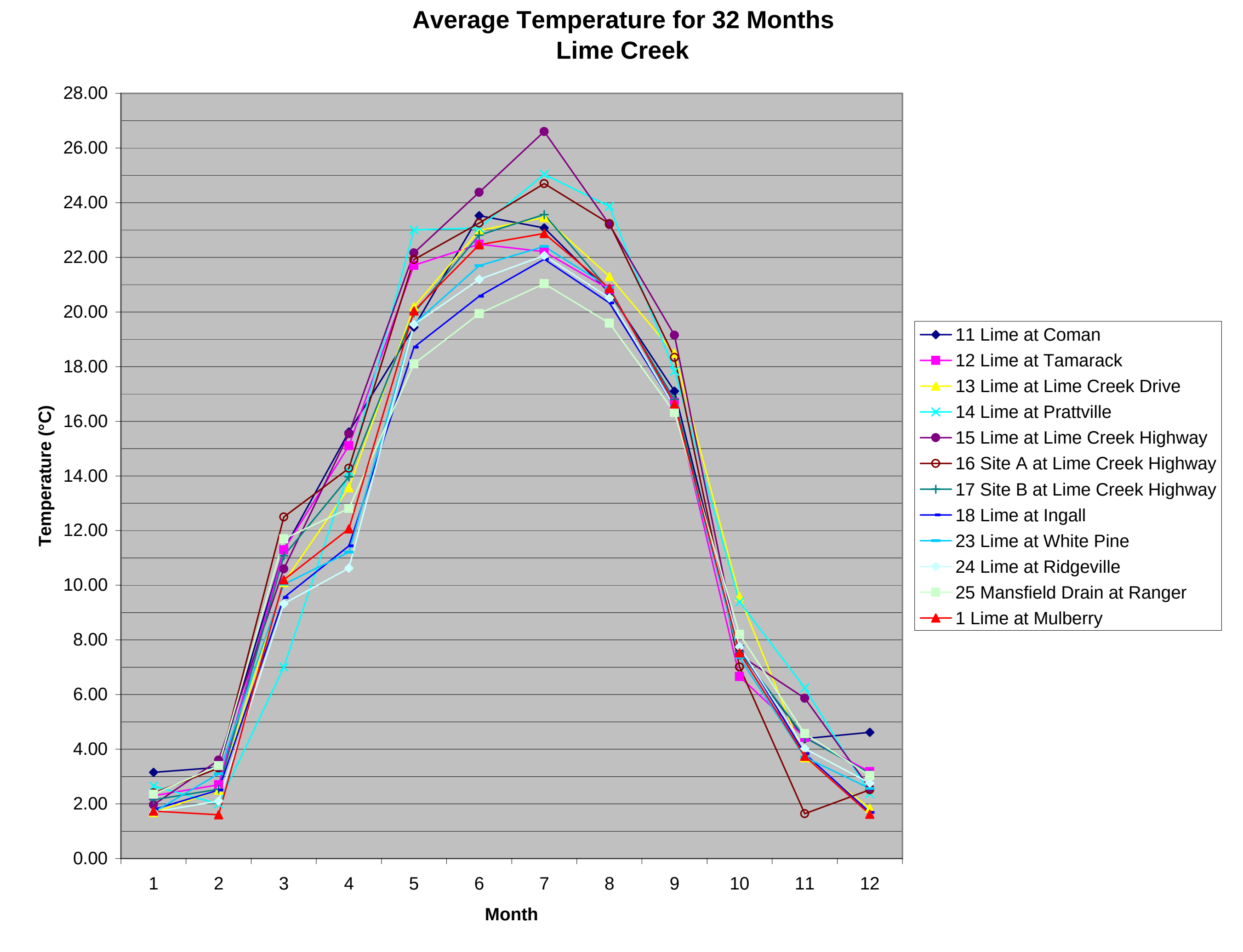

Average Oxidation Reduction Potential for 32 Months
Bean Creek
Oxidation Reduction Potential (mV)
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
1
2
3
4
5
6
7
8
9
10
11
12
Month
10 Site C at Dillion
9 Bean at Dillion
8 Bean at Medina
7 Bean at Bothwell
5 Bean at Bates
6 Covell Drain at Harris
4 Bean at Packard
3 Bean at Lime Creek Highway
26 Bean at Ridgeville
2 Bean at Mulberry

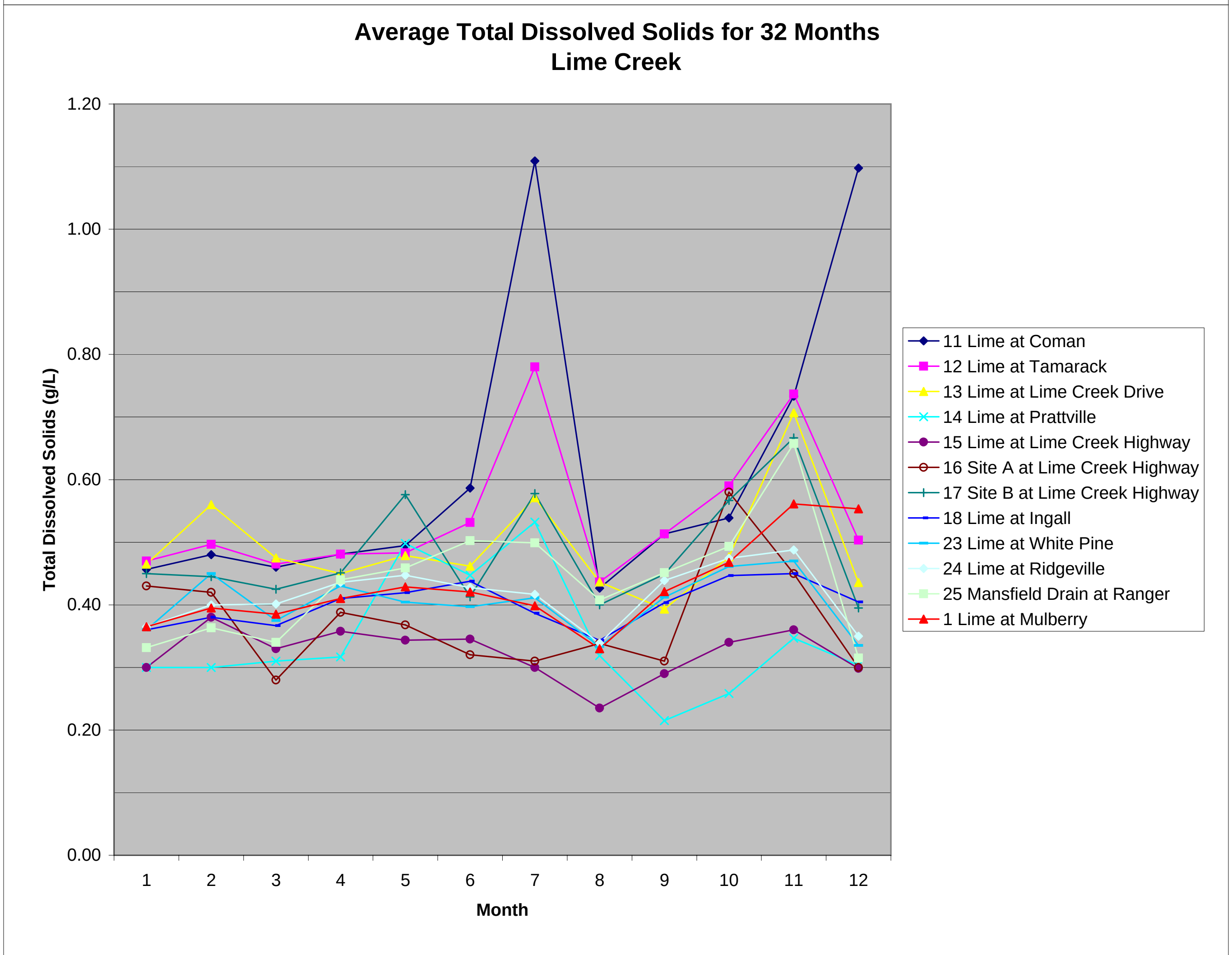

Average pH for 32 Months
Lime Creek
pH
Month
8.70
8.30
7.90
7.50
7.10
6.70
6.30
5.90
5.50
1 2 3 4 5 6 7 8 9 10 11 12
11 Lime at Coman
12 Lime at Tamarack
13 Lime at Lime Creek Drive
14 Lime at Prattville
15 Lime at Lime Creek Highway
16 Site A at Lime Creek Highway
17 Site B at Lime Creek Highway
18 Lime at Ingall
23 Lime at White Pine
24 Lime at Ridgeville
25 Mansfield Drain at Ranger
1 Lime at Mulberry

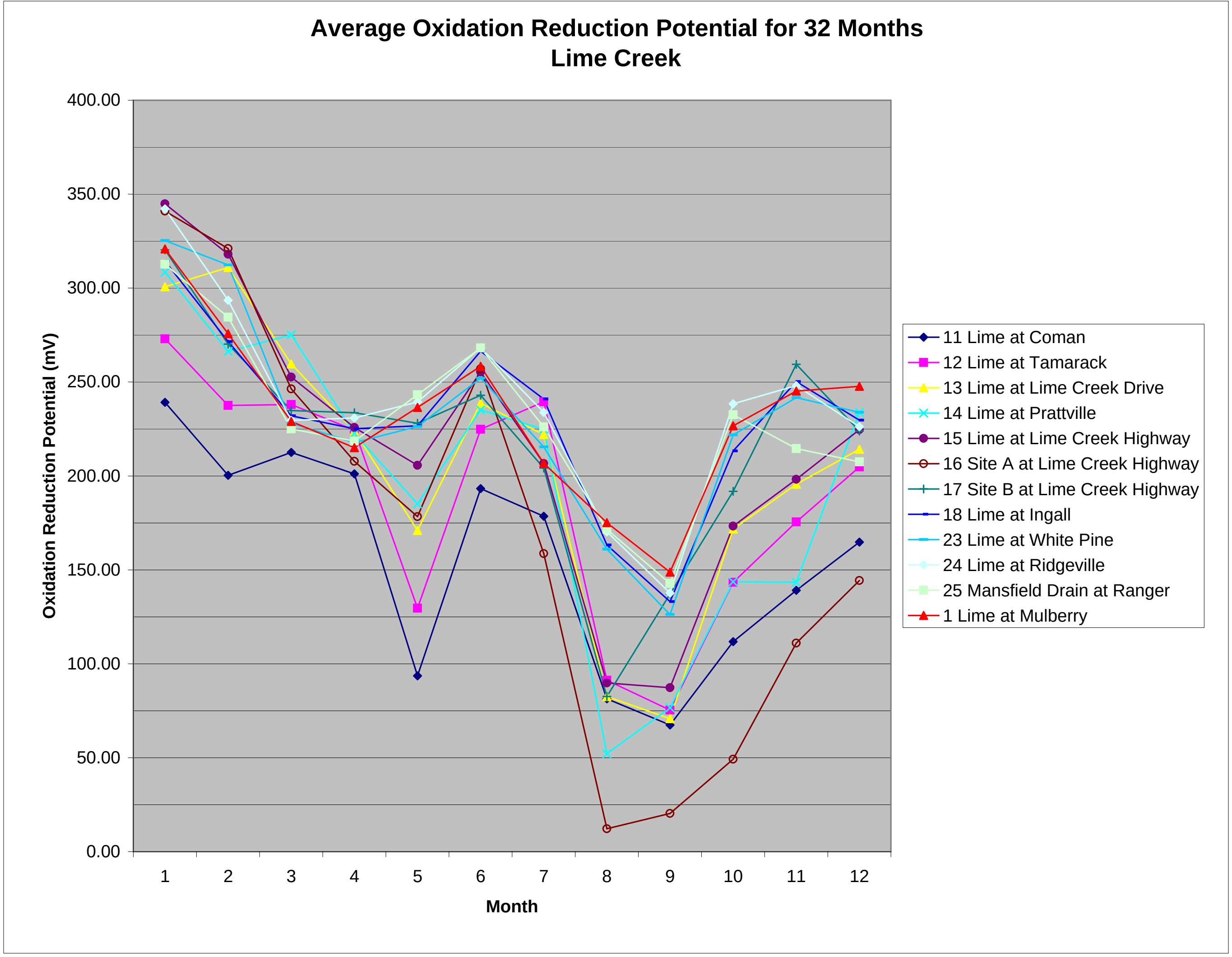

Average Conductivity for 32 Months
Lime Creek
Conductivity (S/m)
Month
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1 2 3 4 5 6 7 8 9 10 11 12
11 Lime at Coman
12 Lime at Tamarack
13 Lime at Lime Creek Drive
14 Lime at Prattville
15 Lime at Lime Creek Highway
16 Site A at Lime Creek Highway
17 Site B at Lime Creek Highway
18 Lime at Ingall
23 Lime at White Pine
24 Lime at Ridgeville
25 Mansfield Drain at Ranger
1 Lime at Mulberry

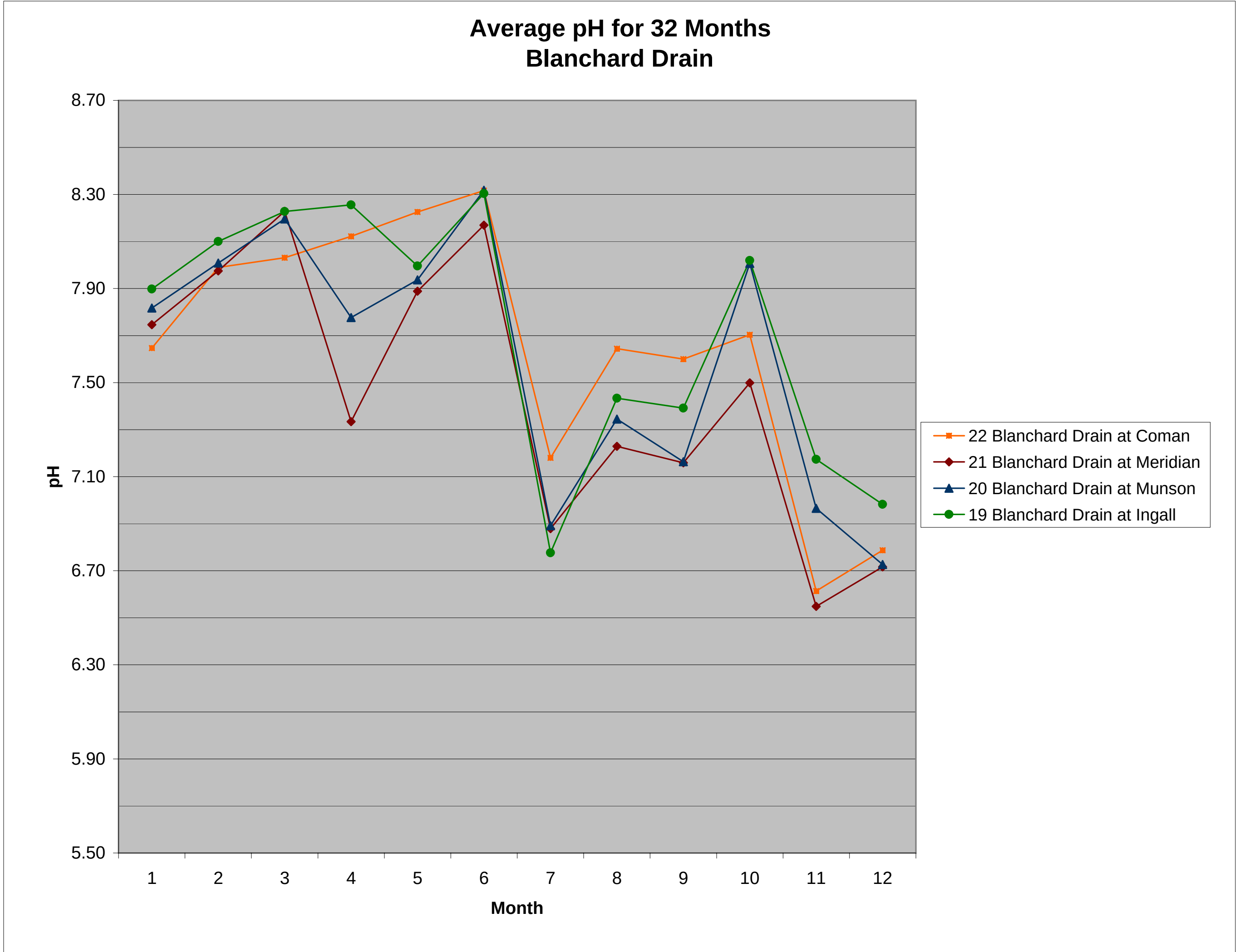

Average Turbidity for 32 Months
Lime Creek
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Turbidity (NTU)
1
2
3
4
5
6
7
8
9
10
11
12
Month
11 Lime at Coman
12 Lime at Tamarack
13 Lime at Lime Creek Drive
14 Lime at Prattville
15 Lime at Lime Creek Highway
16 Site A at Lime Creek Highway
17 Site B at Lime Creek Highway
18 Lime at Ingall
23 Lime at White Pine
24 Lime at Ridgeville
25 Mansfield Drain at Ranger
1 Lime at Mulberry

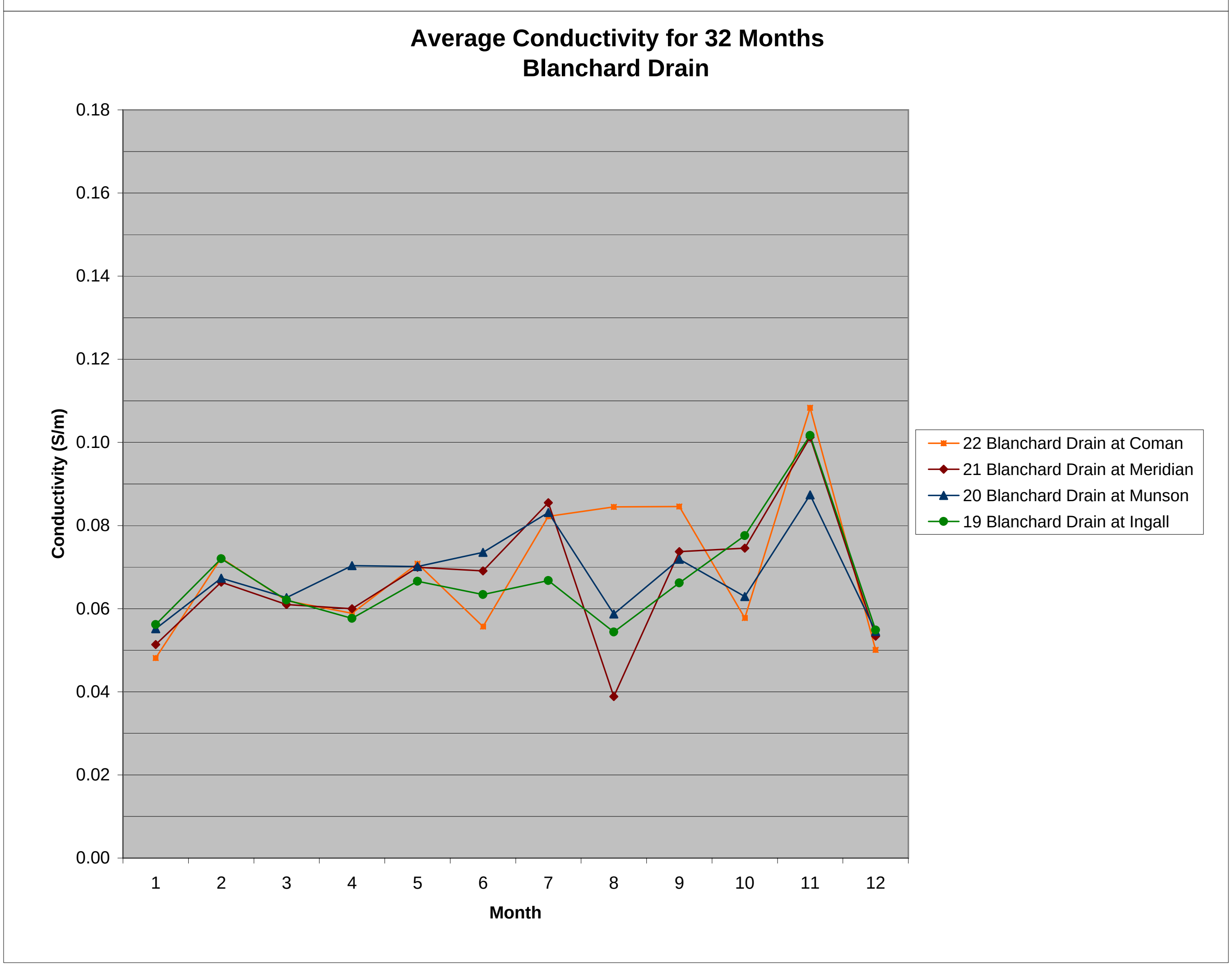

Average Dissolved Oxygen for 32 Months
Lime Creek
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Dissolved Oxygen (mg/L)
1
2
3
4
5
6
7
8
9
10
11
12
Month
11 Lime at Coman
12 Lime at Tamarack
13 Lime at Lime Creek Drive
14 Lime at Prattville
15 Lime at Lime Creek Highway
16 Site A at Lime Creek Highway
17 Site B at Lime Creek Highway
18 Lime at Ingall
23 Lime at White Pine
24 Lime at Ridgeville
25 Mansfield Drain at Ranger
1 Lime at Mulberry

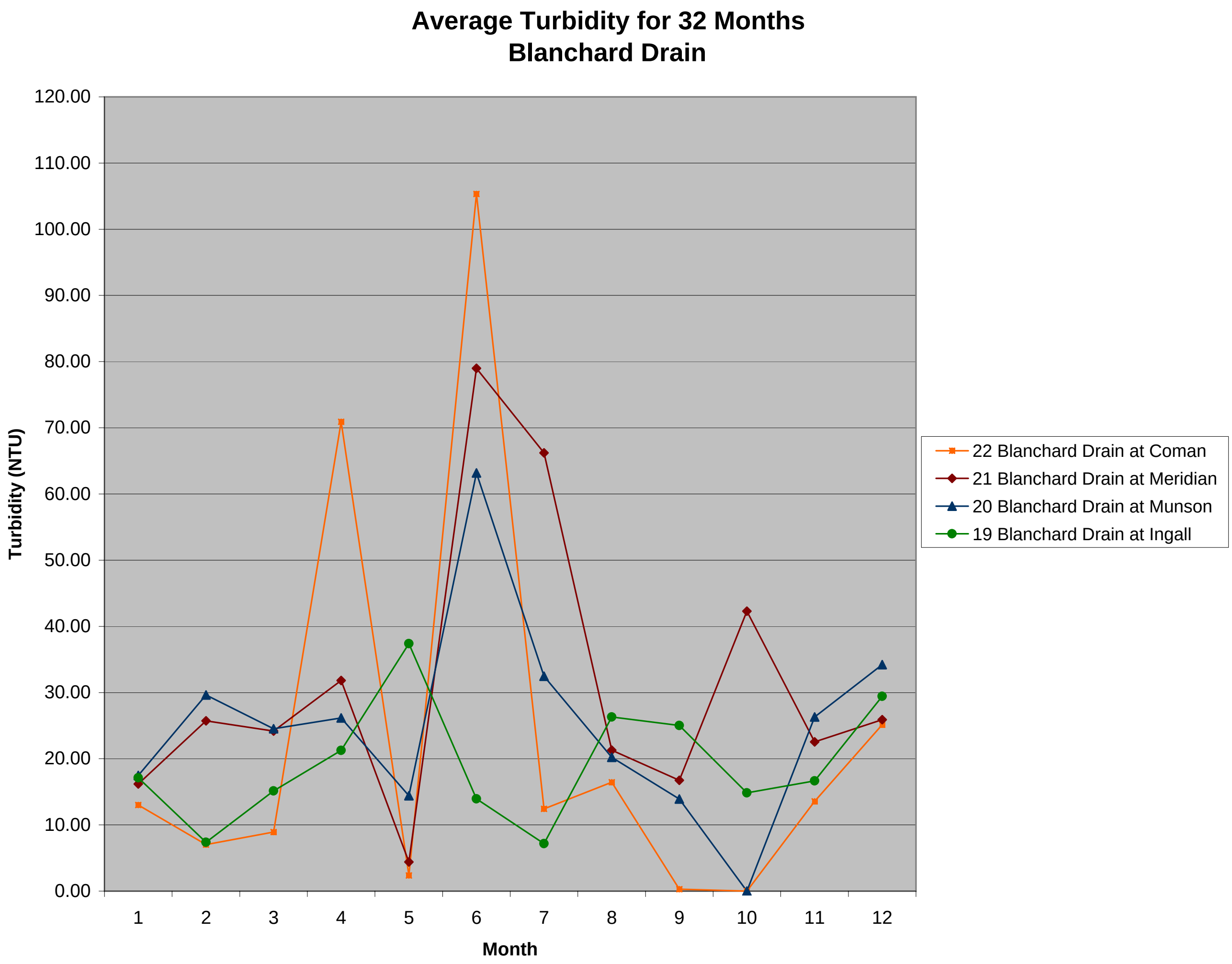

Average Temperature for 32 Months
Lime Creek
Temperature (°C)
Month
11 Lime at Coman
12 Lime at Tamarack
13 Lime at Lime Creek Drive
14 Lime at Prattville
15 Lime at Lime Creek Highway
16 Site A at Lime Creek Highway
17 Site B at Lime Creek Highway
18 Lime at Ingall
23 Lime at White Pine
24 Lime at Ridgeville
25 Mansfield Drain at Ranger
1 Lime at Mulberry

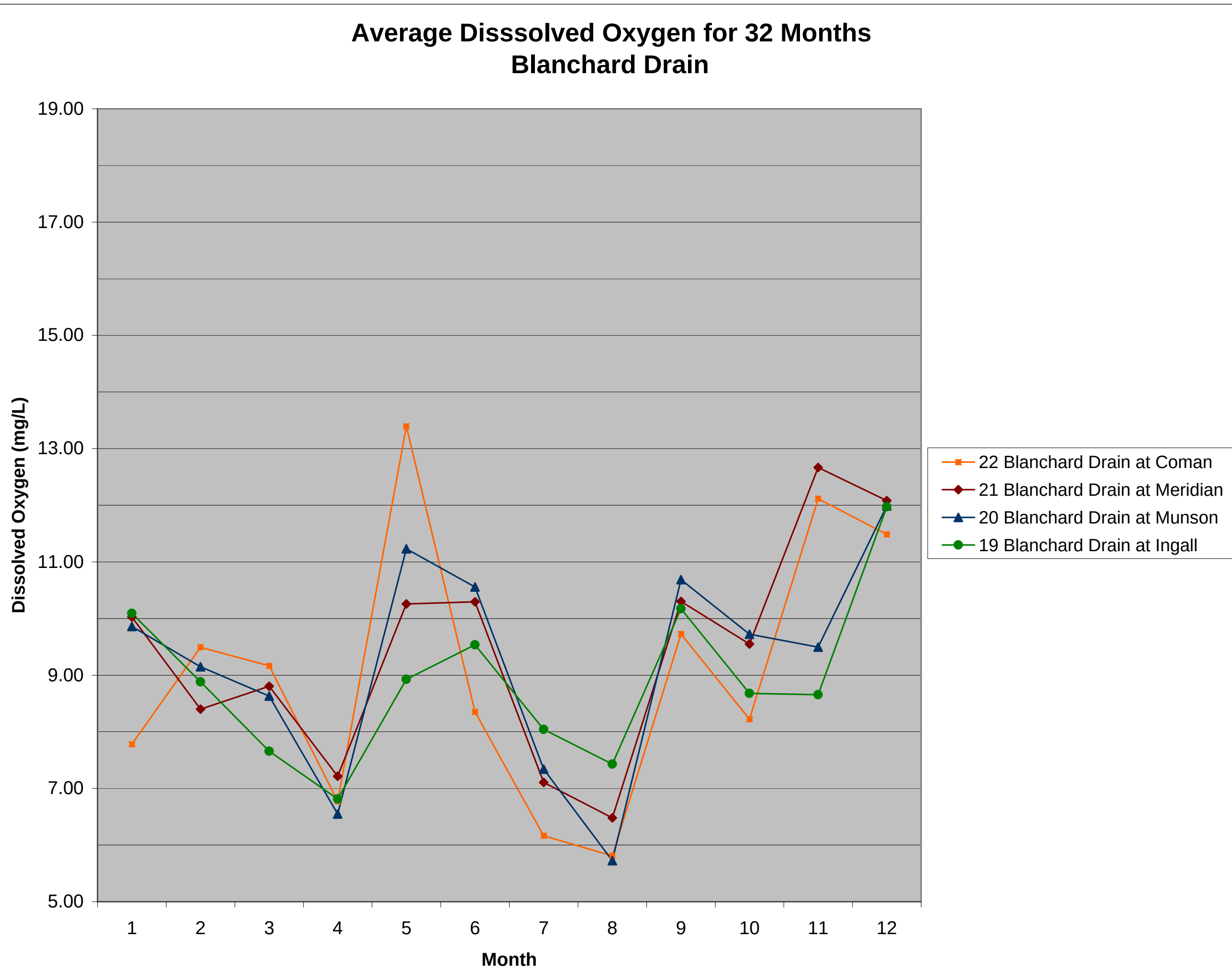

Average Total Dissolved Solids for 32 Months
Lime Creek
Total Dissolved Solids (g/L)
Month
11 Lime at Coman
12 Lime at Tamarack
13 Lime at Lime Creek Drive
14 Lime at Prattville
15 Lime at Lime Creek Highway
16 Site A at Lime Creek Highway
17 Site B at Lime Creek Highway
18 Lime at Ingall
23 Lime at White Pine
24 Lime at Ridgeville
25 Mansfield Drain at Ranger
1 Lime at Mulberry

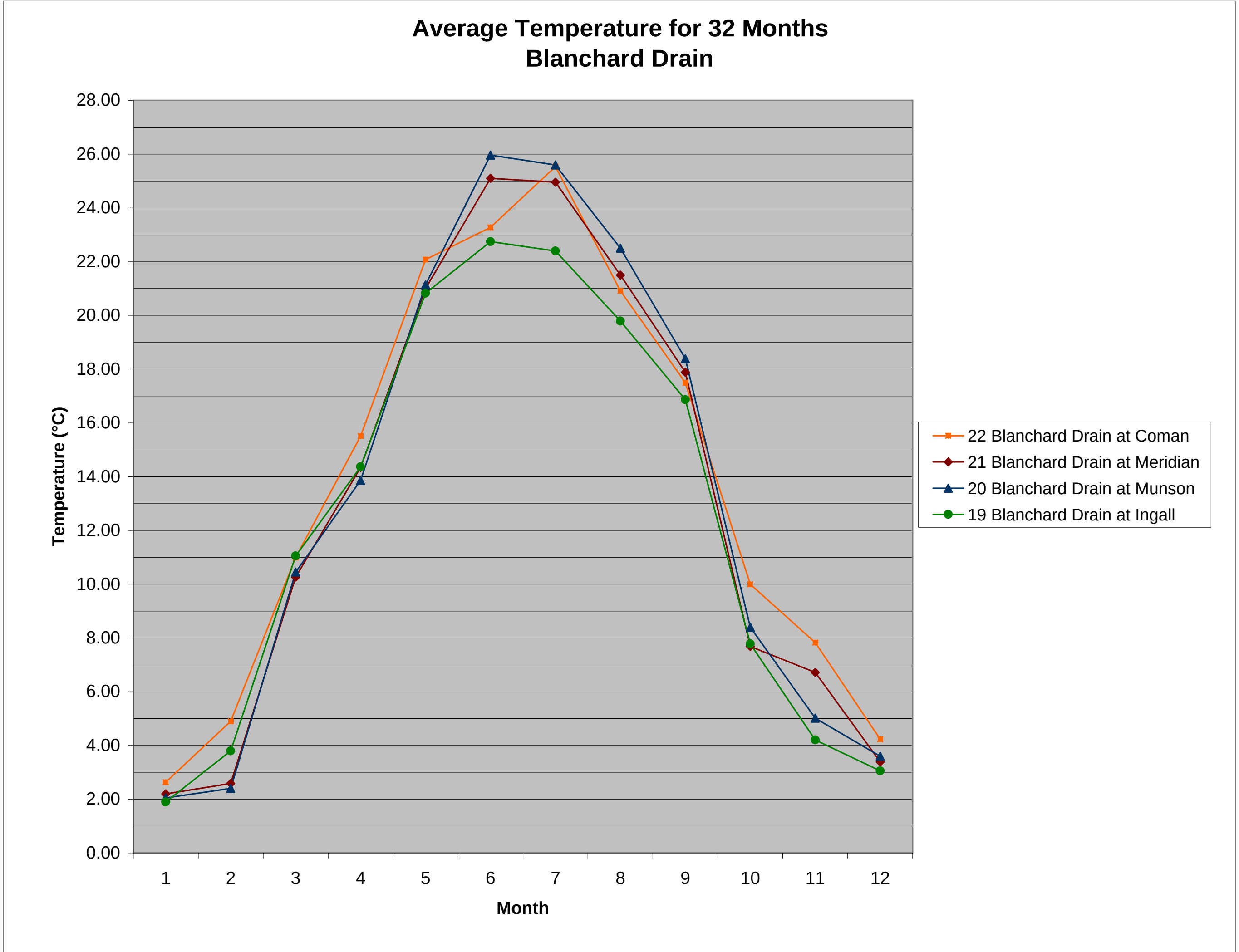

Average Oxidation Reduction Potential for 32 Months
Lime Creek
Oxidation Reduction Potential (mV)
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
1
2
3
4
5
6
7
8
9
10
11
12
Month
11 Lime at Coman
12 Lime at Tamarack
13 Lime at Lime Creek Drive
14 Lime at Prattville
15 Lime at Lime Creek Highway
16 Site A at Lime Creek Highway
17 Site B at Lime Creek Highway
18 Lime at Ingall
23 Lime at White Pine
24 Lime at Ridgeville
25 Mansfield Drain at Ranger
1 Lime at Mulberry

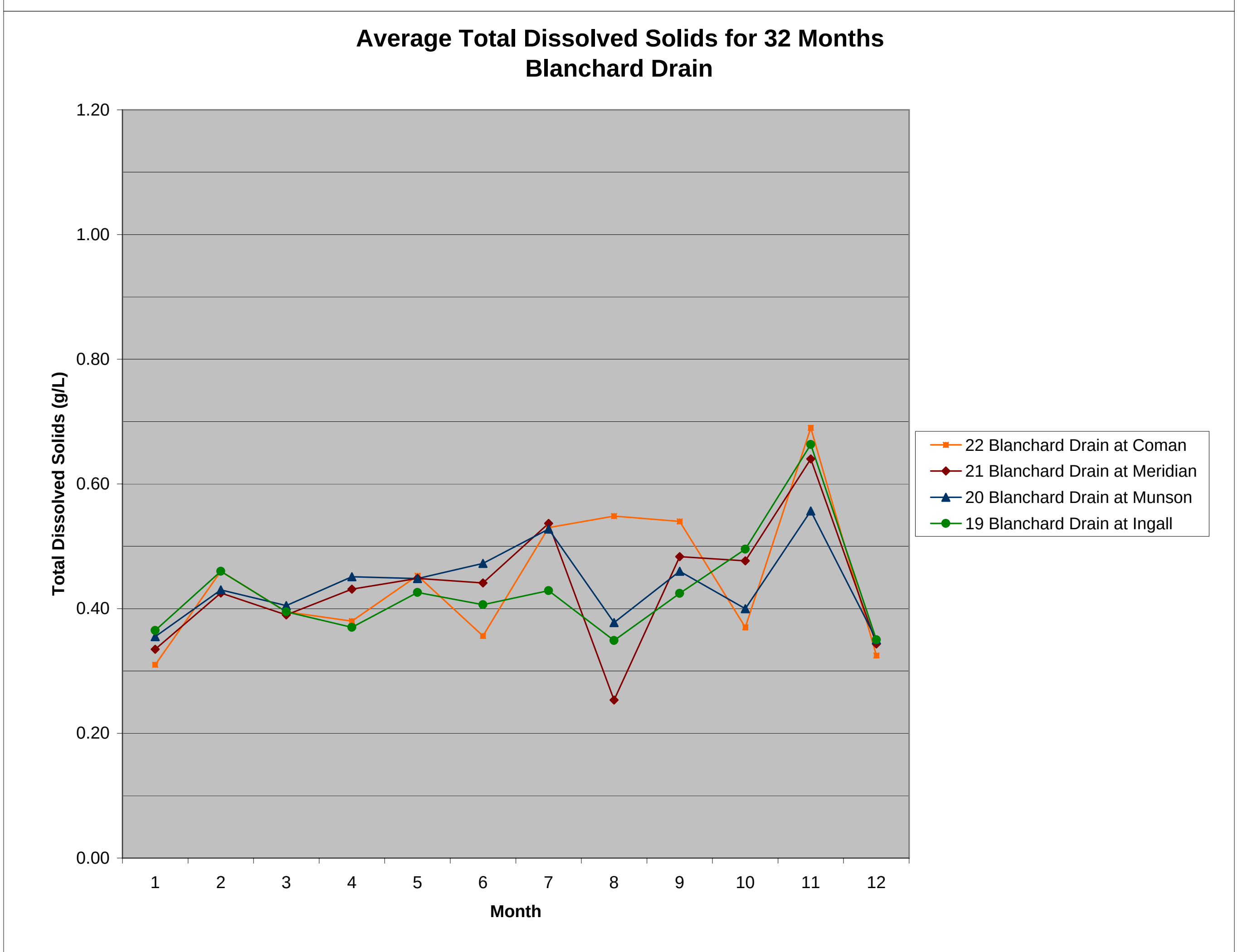

Average pH for 32 Months
Blanchard Drain
8.70
8.30
7.90
7.50
7.10
6.70
6.30
5.90
5.50
pH
1
2
3
4
5
6
7
8
9
10
11
12
Month
22 Blanchard Drain at Coman
21 Blanchard Drain at Meridian
20 Blanchard Drain at Munson
19 Blanchard Drain at Ingall

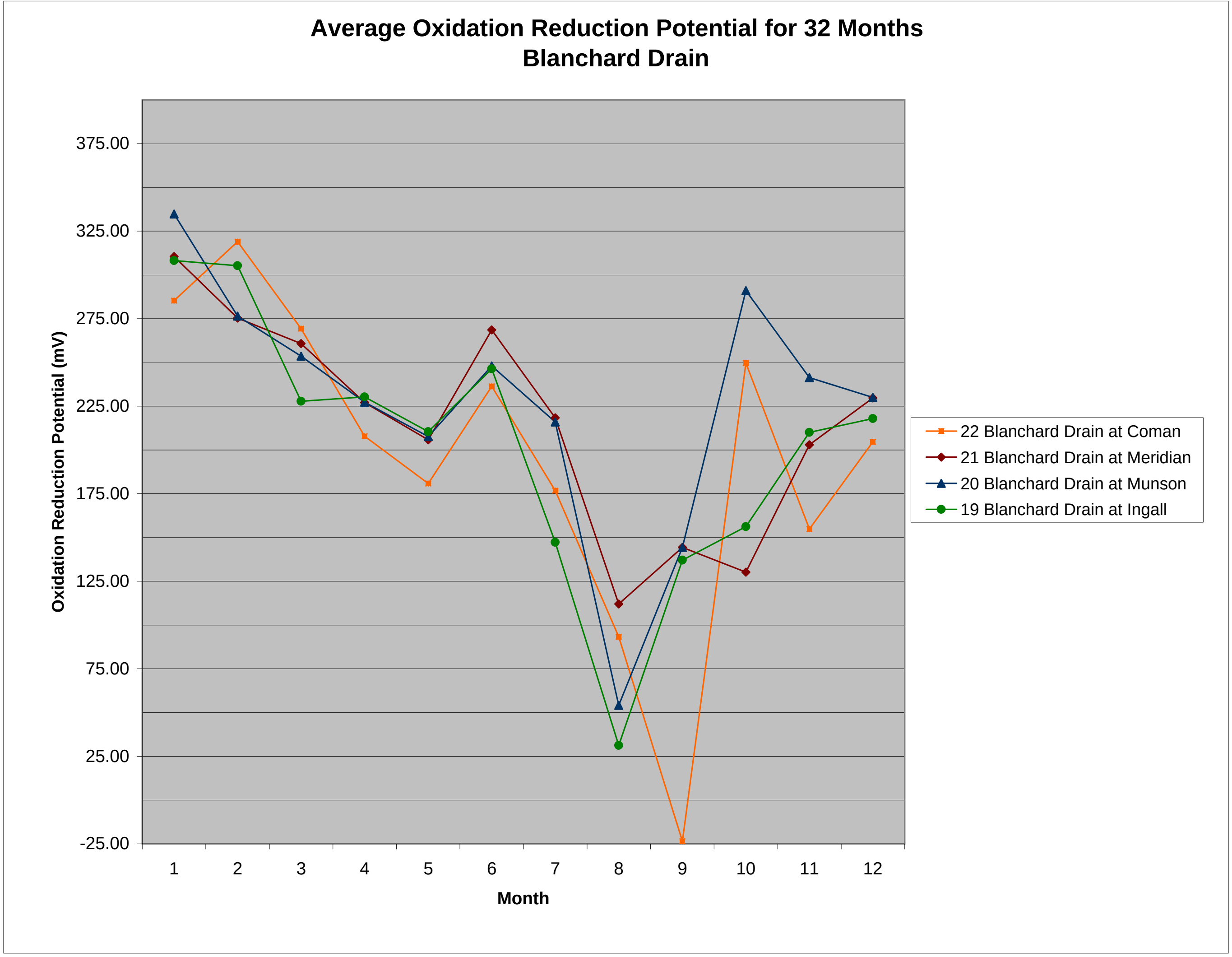

Average Conductivity for 32 Months
Blanchard Drain
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Conductivity (S/m)
1
2
3
4
5
6
7
8
9
10
11
12
Month
22 Blanchard Drain at Coman
21 Blanchard Drain at Meridian
20 Blanchard Drain at Munson
19 Blanchard Drain at Ingall


Average Turbidity for 32 Months
Blanchard Drain
Turbidity (NTU)
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00
110.00
120.00
1
2
3
4
5
6
7
8
9
10
11
12
Month
22 Blanchard Drain at Coman
21 Blanchard Drain at Meridian
20 Blanchard Drain at Munson
19 Blanchard Drain at Ingall


Average Disssolved Oxygen for 32 Months
Blanchard Drain
Dissolved Oxygen (mg/L)
5.00
7.00
9.00
11.00
13.00
15.00
17.00
19.00
1
2
3
4
5
6
7
8
9
10
11
12
Month
22 Blanchard Drain at Coman
21 Blanchard Drain at Meridian
20 Blanchard Drain at Munson
19 Blanchard Drain at Ingall


Average Temperature for 32 Months
Blanchard Drain
Temperature (°C)
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
1
2
3
4
5
6
7
8
9
10
11
12
Month
22 Blanchard Drain at Coman
21 Blanchard Drain at Meridian
20 Blanchard Drain at Munson
19 Blanchard Drain at Ingall


Average Total Dissolved Solids for 32 Months
Blanchard Drain
Total Dissolved Solids (g/L)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1
2
3
4
5
6
7
8
9
10
11
12
Month
22 Blanchard Drain at Coman
21 Blanchard Drain at Meridian
20 Blanchard Drain at Munson
19 Blanchard Drain at Ingall



Average Oxidation Reduction Potential for 32 Months
Blanchard Drain
Oxidation Reduction Potential (mV)
375.00
325.00
275.00
225.00
175.00
125.00
75.00
25.00
-25.00
1
2
3
4
5
6
7
8
9
10
11
12
Month
22 Blanchard Drain at Coman
21 Blanchard Drain at Meridian
20 Blanchard Drain at Munson
19 Blanchard Drain at Ingall

Appendix C: Storm Events Summary Parameters

July 2005 Storm									
	Bean Creek			Lime Creek			Blanchard Drain		
Parameters	***Before Avg***	***After Max/Min***	**After Avg**	***Before Avg***	***After Max/Min***	**After Avg**	***Before Avg***	***After Max/min***	**After Avg**
pH	8.40	8.21	8.28	8.21	7.56	8.01	8.38	8.26	8.38
Conductivity	0.0696	0.0242	0.0656	0.0700	0.0458	0.0576	0.0677	0.0744	0.0705
Turbidity	15.06	462.00	184.03	20.99	378.00	168.93	47.43	0.00	31.64
DO	7.93	5.80	5.98	6.93	5.28	6.05	9.42	5.91	8.27
Temperature	23.89	21.60	21.82	26.05	20.70	22.83	29.04	23.80	26.61
TDS	0.44	0.16	0.42	0.45	0.30	0.37	0.43	0.48	0.45
ORP	211.83	132.00	210.96	241.63	291.00	255.67	236.78	249.00	241.92

May 2006 Storm									
	Bean Creek			Lime Creek			Blanchard Drain		
Parameters	***Before Avg***	***After Max/Min***	***After Avg***	***Before Avg***	***After Max/Min***	***After Avg***	***Before Avg***	***After Max/min***	***After Avg***
pH	8.16	7.62	7.68	8.27	7.15	7.39	8.34	7.17	7.27
Conductivity	0.0666	0.0579	0.0583	0.0705	0.0517	0.0543	0.0732	0.0459	0.0492
Turbidity	21.08	62.80	51.86	19.77	153.00	75.08	11.48	103.00	89.59
DO	3.45	12.79	10.55	4.08	10.49	8.56	3.70	9.72	9.48
Temperature	11.61	11.80	11.72	15.74	11.80	12.44	17.45	12.00	12.06
TDS	0.43	0.37	0.37	0.45	0.33	0.35	0.47	0.30	0.32
ORP	308.33	178.00	201.30	260.37	140.00	244.87	253.92	317.00	283.83

March 2007 Storm									
	Bean Creek			Lime Creek			Blanchard Drain		
Parameters	***Before Avg***	***After Max/Min***	***After Avg***	***Before Avg***	***After Max/Min***	***After Avg***	***Before Avg***	***After Max/min***	***After Avg***
pH	7.92	6.75	7.35	8.02	7.65	7.71	7.98	7.62	7.69
Conductivity	0.0523	0.0318	0.0329	0.0558	0.0172	0.0229	0.0616	0.0153	0.0161
Turbidity	30.31	178.00	129.91	34.36	277.00	137.98	44.95	340.00	166.38
DO	8.20	5.55	5.81	7.08	2.54	4.76	8.30	4.36	4.92
Temperature	0.02	0.00	0.02	1.53	0.00	0.27	1.15	0.00	0.38
TDS	0.34	0.21	0.22	0.36	0.11	0.15	0.39	0.10	0.10
ORP	294.10	206.00	252.00	196.83	238.00	209.25	234.00	218.00	228.92

April 2007 Storm									
	Bean Creek			Lime Creek			Blanchard Drain		
Parameters	***Before Avg***	***After Max/Min***	***After Avg***	***Before Avg***	***After Max/Min***	***After Avg***	***Before Avg***	***After Max/min***	***After Avg***
pH	8.22	6.86	7.75	7.98	7.52	7.79	8.06	7.56	7.76
Conductivity	0.0481	0.0365	0.0377	0.0514	0.0315	0.0368	0.0523	0.0292	0.0305
Turbidity	51.48	195.00	117.56	34.73	229.00	132.76	31.50	214.00	149.50
DO	9.78	8.87	9.15	9.94	7.44	9.66	9.15	5.90	7.53
Temperature	10.69	10.80	10.76	11.41	9.90	10.76	11.73	10.10	10.33
TDS	0.31	0.24	0.25	0.33	0.20	0.24	0.34	0.19	0.20
ORP	329.96	380.00	354.16	244.26	337.00	286.89	269.83	347.00	314.67

July 2007 Storm									
	Bean Creek			Lime Creek			Blanchard Drain		
Parameters	***Before Avg***	***After Max/Min***	***After Avg***	***Before Avg***	***After Max/Min***	***After Avg***	***Before Avg***	***After Max/min***	***After Avg***
pH	6.02	7.02	7.12	6.04	7.64	7.34	6.27	7.54	7.43
Conductivity	0.0722	0.0478	0.0515	0.1365	0.0482	0.0820	0.0997	0.0434	0.0558
Turbidity	0.91	556.00	160.49	23.35	311.00	155.56	70.19	169.00	77.70
DO	9.48	7.07	7.24	8.62	4.27	6.91	8.26	6.10	7.79
Temperature	19.02	19.40	19.16	20.16	25.10	21.18	22.86	21.70	22.05
TDS	0.46	0.31	0.33	0.87	0.31	0.53	0.62	0.28	0.36
ORP	294.52	343.00	315.27	297.54	327.00	305.00	260.67	324.00	297.00

August 2007 Storm									
	Bean Creek			Lime Creek			Blanchard Drain		
Parameters	***Before Avg***	***After Max/Min***	***After Avg***	***Before Avg***	***After Max/Min***	***After Avg***	***Before Avg***	***After Max/min***	***After Avg***
pH	6.02	7.35	7.39	6.04	7.44	7.21	6.27	7.27	7.09
Conductivity	0.0722	0.0314	0.0335	0.1365	0.0293	0.0321	0.0997	0.0346	0.0358
Turbidity	0.91	195.00	137.12	23.35	167.00	110.91	70.19	123.00	87.67
DO	9.48	10.92	10.67	8.62	10.82	10.08	8.26	10.49	9.83
Temperature	19.02	17.70	17.85	20.16	17.80	19.04	22.86	17.90	18.05
TDS	0.46	0.20	0.22	0.87	0.19	0.21	0.62	0.23	0.24
ORP	294.52	60.00	62.28	297.54	64.00	74.04	260.67	72.00	79.67

Appendix D: Data Model of the Water Quality Monitoring SQL Database

Overview

This appendix contains the data dictionary information for the PostgreSQL/PostGIS database used to store water quality measurement data.

Tables list report

Generated: Tue 27 May 2008 11:30:40 AM EDT
Server: sql1 - postgres (sql1:5432)
Database: monitoring_sql
Schema: public

Tables

Table	Comment
geometry_columns	PostGIS System Table. Contains information on the geometry data type columns found in the user tables
spatial_ref_sys	PostGIS System Table. Information on spatial reference systems
t_location	Information on sampling locations
t_measurement	Information on sample measurements
t_parameter	Information on parameters that are sampled
t_valueflag	A list of qualifier flags for measurements

Table Data dictionary report - geometry_columns

Generated: Tue 27 May 2008 11:24:04 AM EDT
Server: sql1 - postgres (sql1:5432)
Database: monitoring_sql
Schema: public

Columns

Name	Data type	Not Null?	Primary key?	Default	Comment
f_table_catalog	character varying(256)	Yes	Yes		
f_table_schema	character varying(256)	Yes	Yes		
f_table_name	character varying(256)	Yes	Yes		
f_geometry_column	character varying(256)	Yes	Yes		
coord_dimension	integer	Yes	No		
srid	integer	Yes	No		
type	character varying(30)	Yes	No		

Constraints

Name	Type	Definition	Comment
geometry_columns_pk	Primary key	(f_table_catalog, f_table_schema, f_table_name, f_geometry_column)	

Table Data dictionary report - spatial_ref_sys

Generated: Tue 27 May 2008 11:32:28 AM EDT
Server: sql1 - postgres (sql1:5432)
Database: monitoring_sql
Schema: public

Columns

Name	Data type	Not Null?	Primary key?	Default	Comment
srid	integer	Yes	Yes		
auth_name	character varying(256)	No	No		
auth_srid	integer	No	No		
srtext	character varying(2048)	No	No		
proj4text	character varying(2048)	No	No		

Constraints

Name	Type	Definition	Comment
spatial_ref_sys_pkey	Primary key	(srid)	

Table Data dictionary report - t_location

Generated: Wed 28 May 2008 10:50:16 AM EDT
Server: sql1 - postgres (sql1:5432)
Database: monitoring_sql
Schema: public

Columns

Name	Data type	Not Null?	Primary key?	Default	Comment
location_id	integer	Yes	Yes		Unique ID for the location record
sitename	character varying(50)	No	No		Name of the sampling site
source_desc	character varying(254)	No	No		Source of the data for this site
geom	geometry	No	No		Geometry data type (2-D point) that describes the location of the site

Constraints

Name	Type	Definition	Comment
t_location_pk	Primary key	(location_id)	
enforce_dims_geom	Check	(ndims(geom) = 2)	
enforce_geotype_geom	Check	(geometrytype(geom) = 'POINT'::text OR geom IS NULL)	
enforce_srid_geom	Check	(srid(geom) = 4326)	

Table Data dictionary report - t_measurement

Generated: Wed 28 May 2008 10:50:33 AM EDT
Server: sql1 - postgres (sql1:5432)
Database: monitoring_sql
Schema: public

Columns

Name	Data type	Not Null?	Primary key?	Default	Comment
meas_id	integer	Yes	Yes	nextval('t_measurement_id_seq'::regclass)	Unique identifier for the measurement
meas_datetime	timestamp with time zone	Yes	No		Date & time when the measurement was taken
location_id	integer	Yes	No		Foreign key reference to the location where the measurement was obtained
parameter_id	smallint	Yes	No		Foreign key reference to the parameter that was sampled
value	double precision	Yes	No		The measured value, in the standard units for the parameter
flag_code	character(1)	No	No		Foreign key reference to a flag that qualifies the measurement record
import_datetime	timestamp with time zone	No	No	now()	The date/time at which the measurement record was imported into the database

Constraints

Name	Type	Definition	Comment
t_measurement_pk	Primary key	(meas_id)	

Table Data dictionary report - t_parameter

Generated: Wed 28 May 2008 10:50:55 AM EDT
Server: sql1 - postgres (sql1:5432)
Database: monitoring_sql
Schema: public

Columns

Name	Data type	Not Null?	Primary key?	Default	Comment
parameter_id	smallint	Yes	Yes		Unique identifier for the parameter
shortname	character varying(10)	Yes	No		a short name for the parameter
longname	character varying(50)	Yes	No		a long name for the parameter
description	text	Yes	No		a description of the parameter
unit	character varying(50)	Yes	No		the units that the parameter values are recorded in

Constraints

Name	Type	Definition	Comment
t_parameter_pk	Primary key	(parameter_id)	

Table Data dictionary report - t_valueflag

Generated: Wed 28 May 2008 10:51:12 AM EDT
Server: sql1 - postgres (sql1:5432)
Database: monitoring_sql
Schema: public

Columns

Name	Data type	Not Null?	Primary key?	Default	Comment
flag_code	character(1)	Yes	Yes		the unique code for the measurement qualifier
description	text	Yes	No		a description of the qualifier

Constraints

Name	Type	Definition	Comment
t_valueflag_pk	Primary key	(flag_code)	

Appendix E: Photo Examples of the 26 Sampling Locations

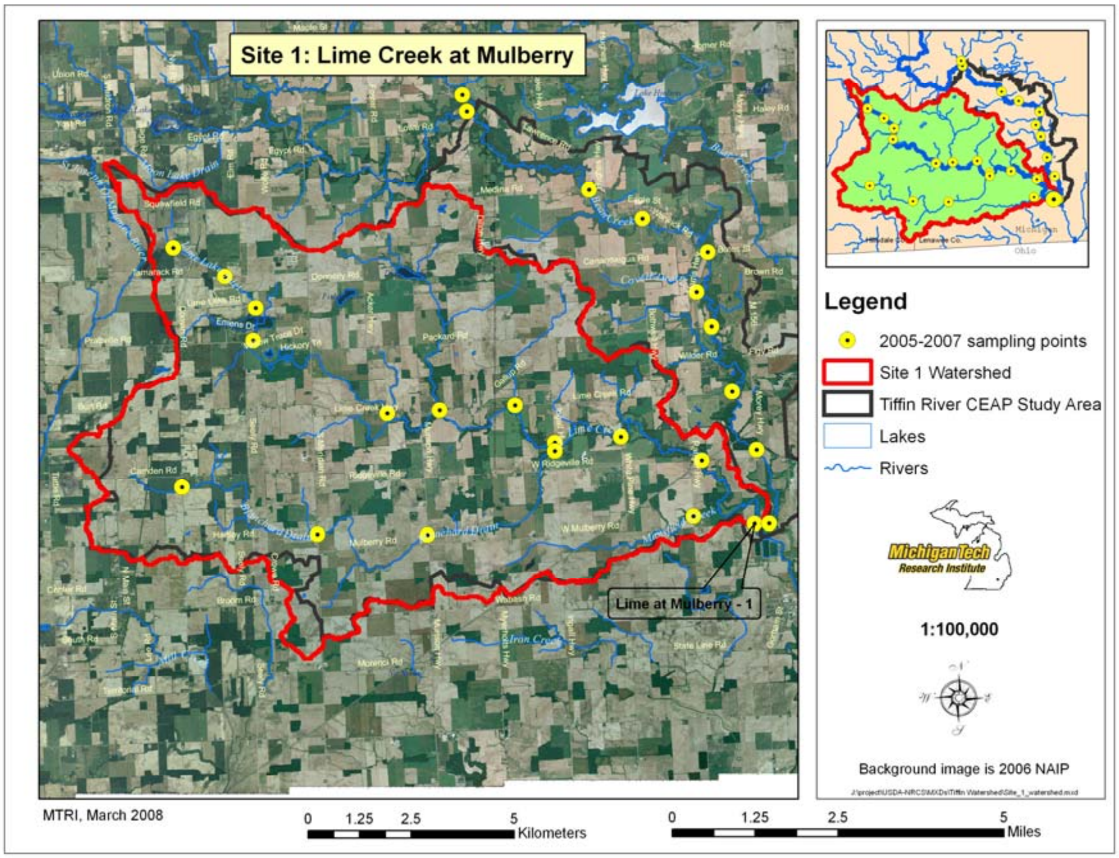
Site 1 Lime Creek at Mulberry

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 1

	Acres	Hectares
TOTAL AREA =	28,081	11,364
	% of total	
SMALL GRAINS	8.1%	
SOYBEANS	35.4%	
CORN	25.1%	
ALFALFA	4.3%	
TOTAL % AG	**72.9%**	
CRP/GRASS	13.3%	
FOREST	11.0%	
WATER	0.3%	
WETLANDS	0.1%	
SHRUBLAND	1.9%	
UNCLASSIFIED	0.3%	
DEVELOPED	0.2%	

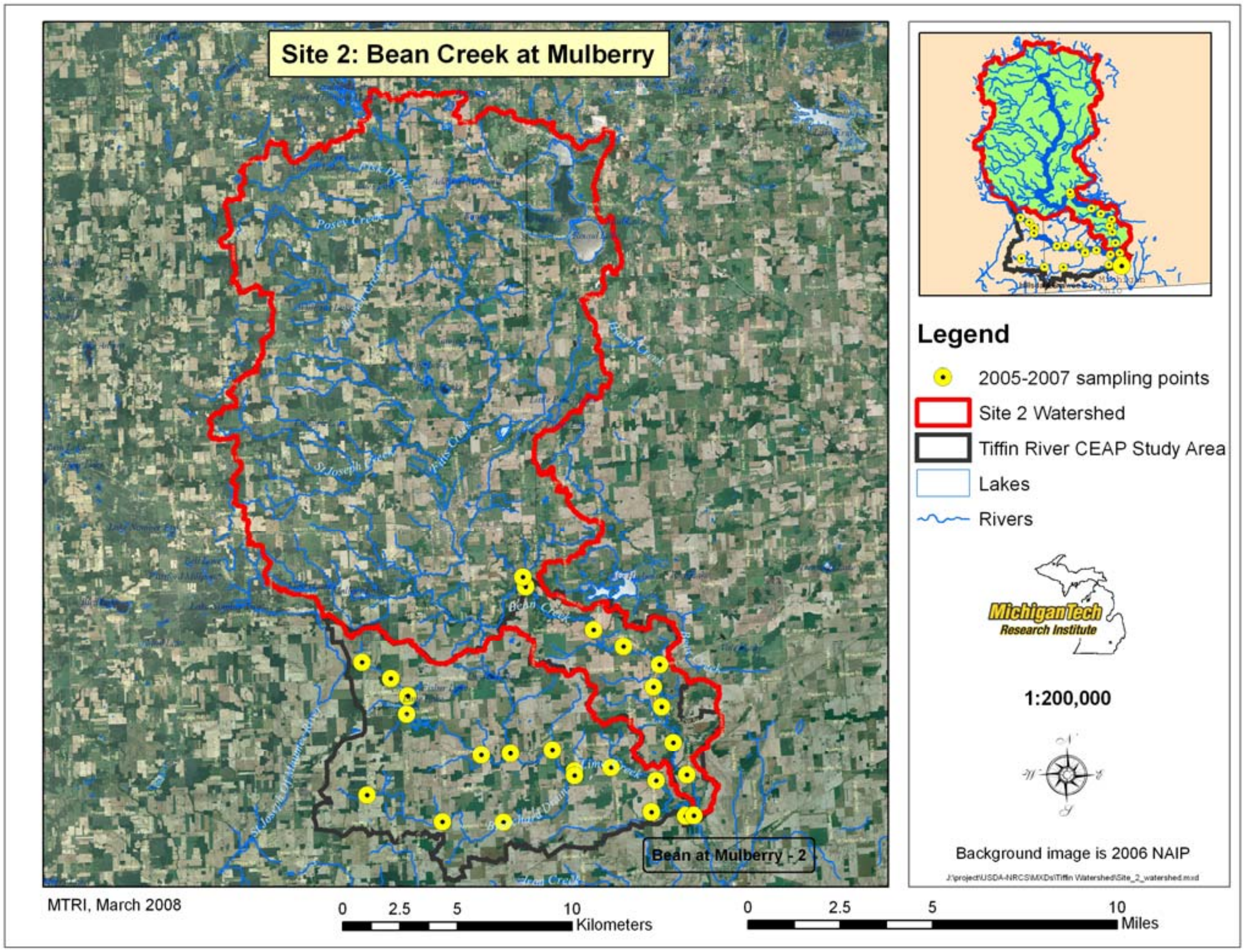
Site 2 Bean Creek at Mulberry

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 2		
	Acres	Hectares
TOTAL AREA =	89,051	36,037
	% of total	
SMALL GRAINS	5.3%	
SOYBEANS	20.3%	
CORN	12.9%	
ALFALFA	3.1%	
TOTAL % AG	**41.7%**	
CRP/GRASS	27.0%	
FOREST	17.6%	
WATER	2.5%	
WETLANDS	1.1%	
SHRUBLAND	7.8%	
UNCLASSIFIED	0.1%	
DEVELOPED	2.3%	

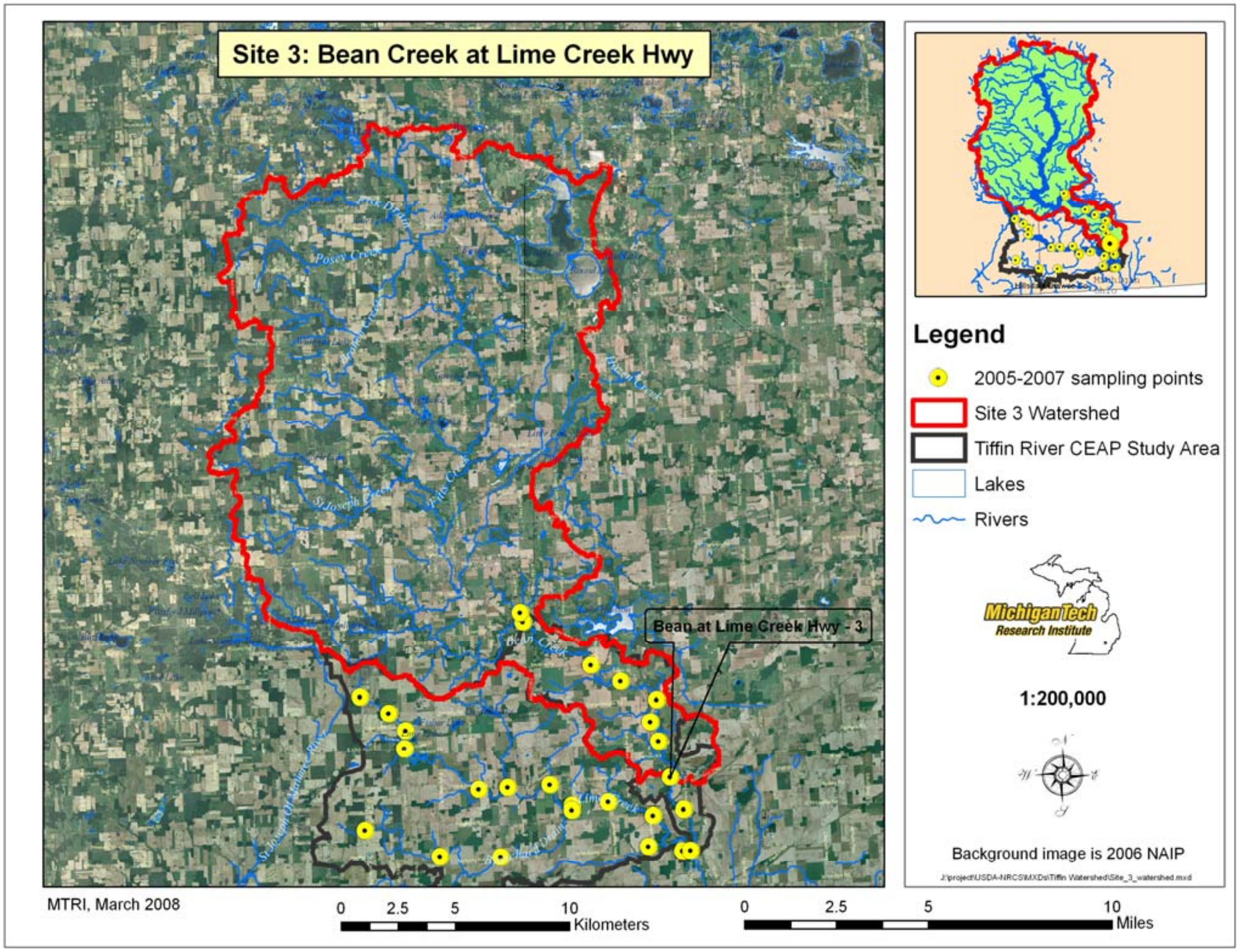
Site 3 Bean Creek at Lime Creek Hwy

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 3		
	Acres	Hectares
TOTAL AREA =	87,729	35,503
	% of total	
SMALL GRAINS	5.4%	
SOYBEANS	20.1%	
CORN	12.7%	
ALFALFA	3.2%	
TOTAL % AG	**41.3%**	
CRP/GRASS	27.3%	
FOREST	17.6%	
WATER	2.5%	
WETLANDS	1.1%	
SHRUBLAND	7.8%	
UNCLASSIFIED	0.1%	
DEVELOPED	2.3%	

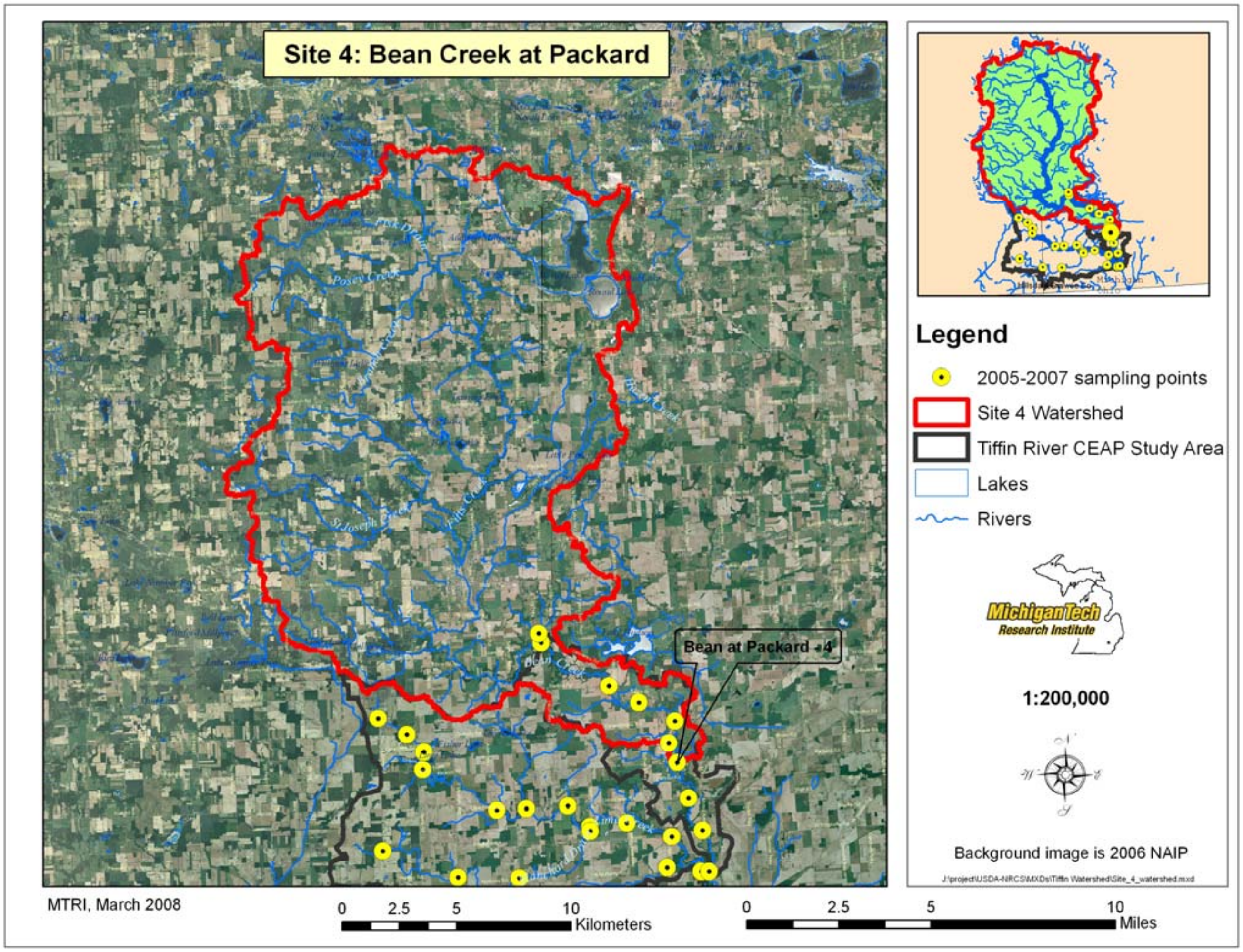
Site 4 Bean Creek at Packard


Upstream 4/11/2005


Downstream 4/11/2005


Upstream 12/27/2007


Downstream 12/27/2007



2006 watershed land cover profile for site 4

	Acres	Hectares
TOTAL AREA =	85,045	34,417

	% of total
SMALL GRAINS	5.5%
SOYBEANS	20.1%
CORN	12.5%
ALFALFA	3.0%
TOTAL % AG	**41.1%**
CRP/GRASS	27.5%
FOREST	17.7%
WATER	2.6%
WETLANDS	1.0%
SHRUBLAND	7.6%
UNCLASSIFIED	0.1%
DEVELOPED	2.4%

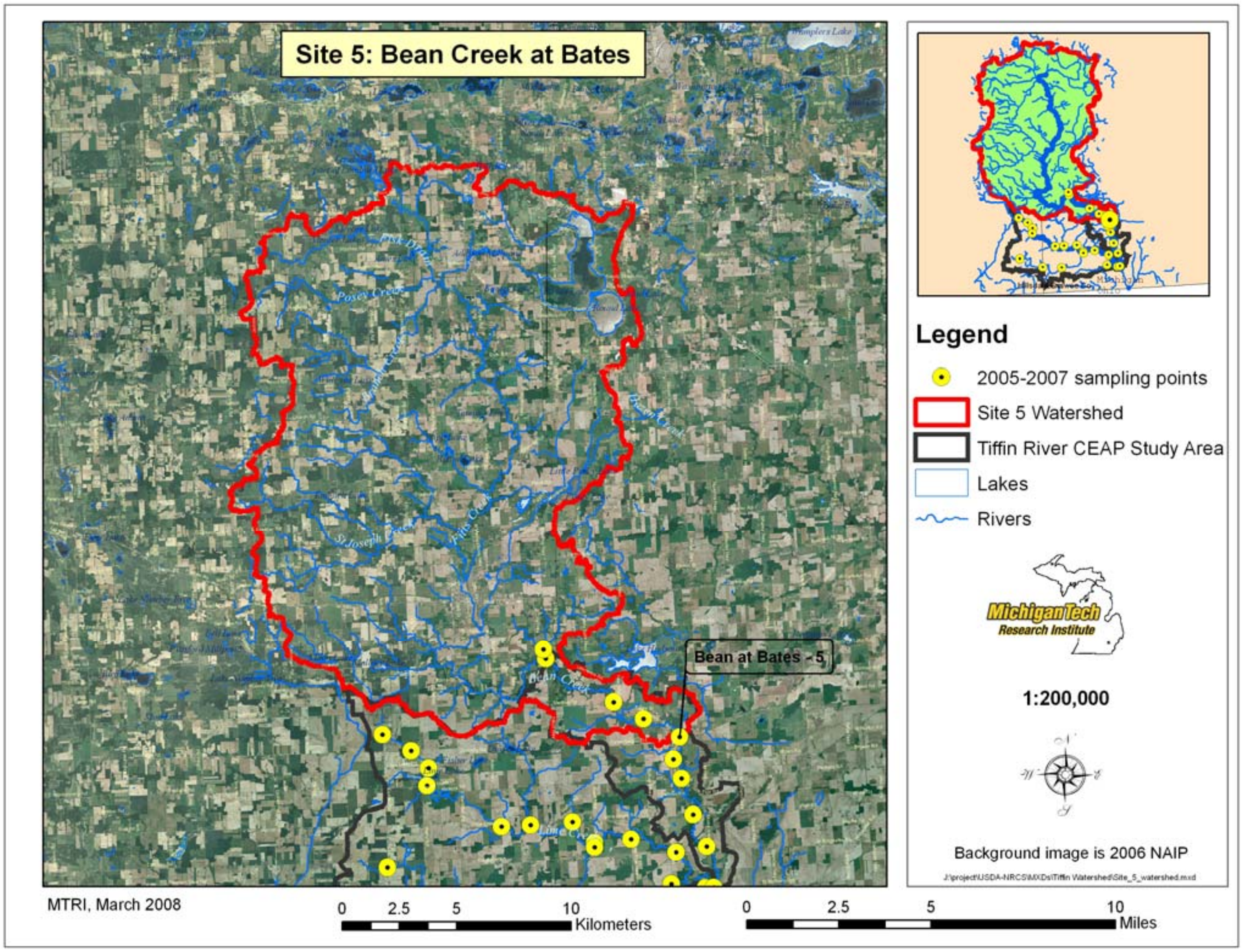
Site 5 Bean Creek at Bates


Upstream 4/11/2005


Downstream 4/11/2005


Upstream 12/27/2007


Downstream 12/27/2007



2006 watershed land cover profile for site 5		
	Acres	Hectares
TOTAL AREA =	83,599	33,831
	% of total	
SMALL GRAINS	5.6%	
SOYBEANS	20.1%	
CORN	12.3%	
ALFALFA	2.9%	
TOTAL % AG	**40.9%**	
CRP/GRASS	27.4%	
FOREST	17.8%	
WATER	2.7%	
WETLANDS	1.0%	
SHRUBLAND	7.6%	
UNCLASSIFIED	0.1%	
DEVELOPED	2.4%	

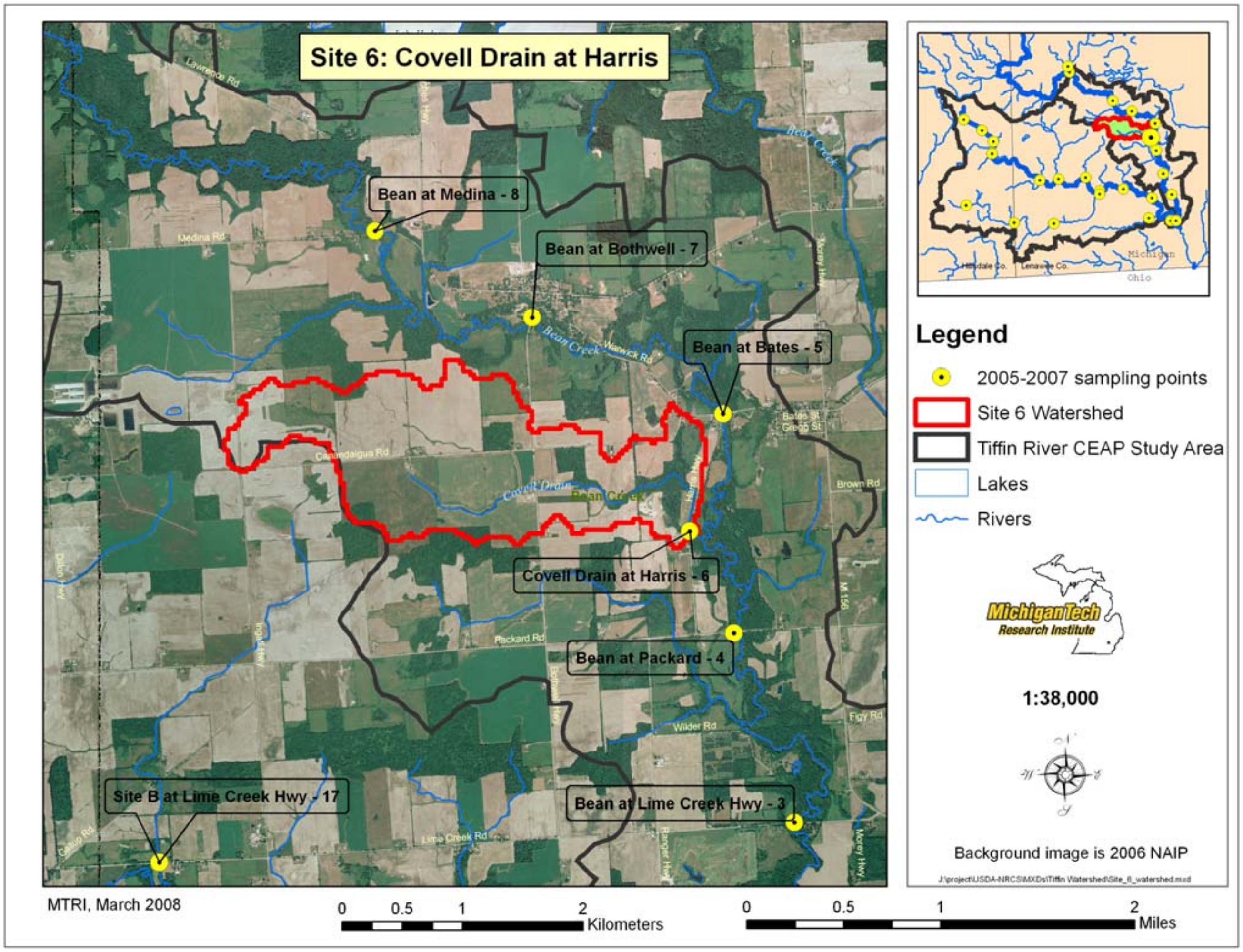
Site 6 Covell Drain at Harris

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 6

	Acres	Hectares
TOTAL AREA =	898	364
	% of total	
SMALL GRAINS	1.9%	
SOYBEANS	27.3%	
CORN	37.8%	
ALFALFA	14.0%	
TOTAL % AG	**81.0%**	
CRP/GRASS	14.4%	
FOREST	4.6%	
WATER	0.0%	
WETLANDS	0.0%	
SHRUBLAND	0.0%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.0%	

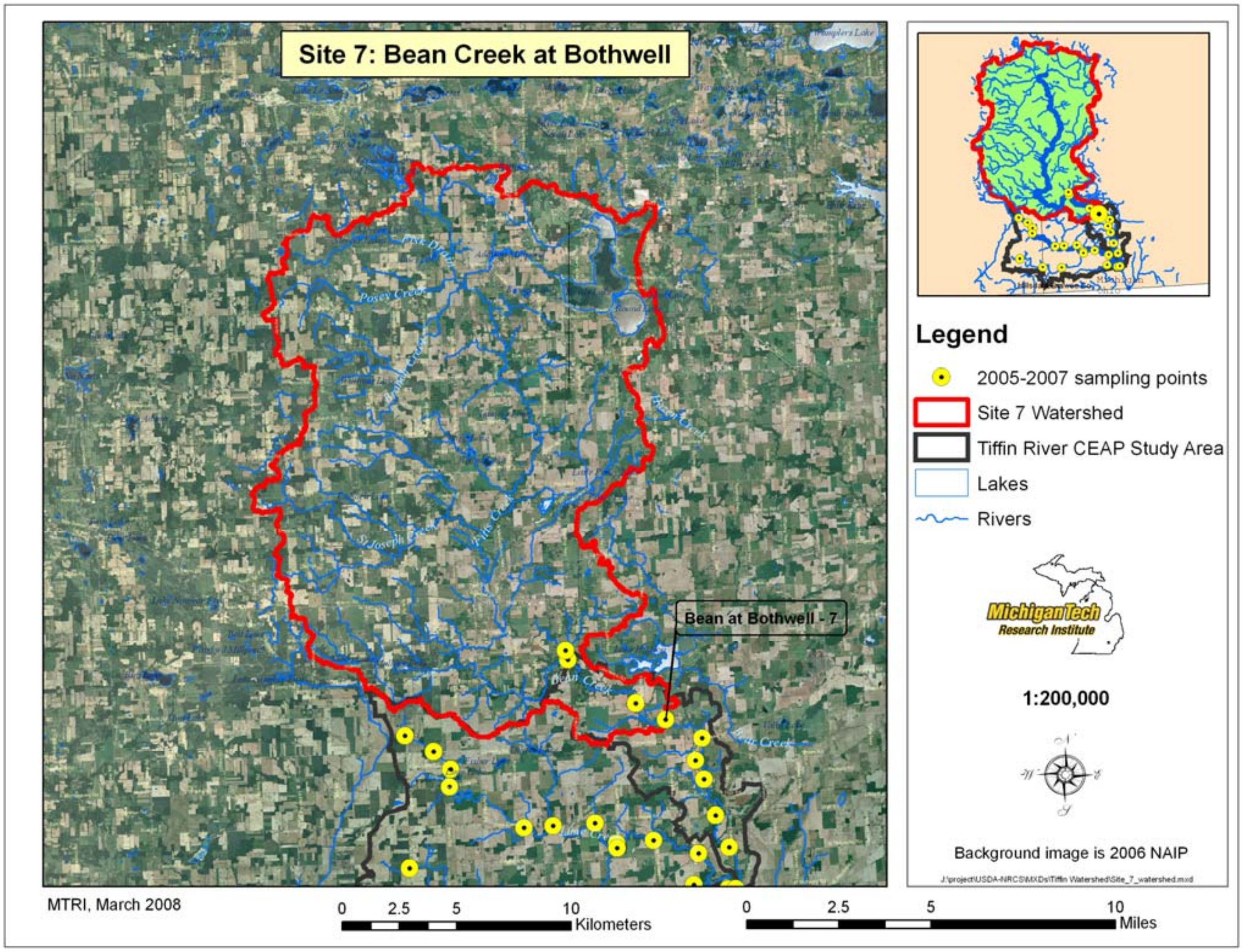
Site 7 Bean Creek at Bothwell

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 7

	Acres	Hectares
TOTAL AREA =	82,610	33,431

	% of total
SMALL GRAINS	5.6%
SOYBEANS	20.2%
CORN	12.3%
ALFALFA	2.9%
TOTAL % AG	**41.1%**
CRP/GRASS	27.5%
FOREST	17.7%
WATER	2.7%
WETLANDS	1.1%
SHRUBLAND	7.5%
UNCLASSIFIED	0.1%
DEVELOPED	2.5%

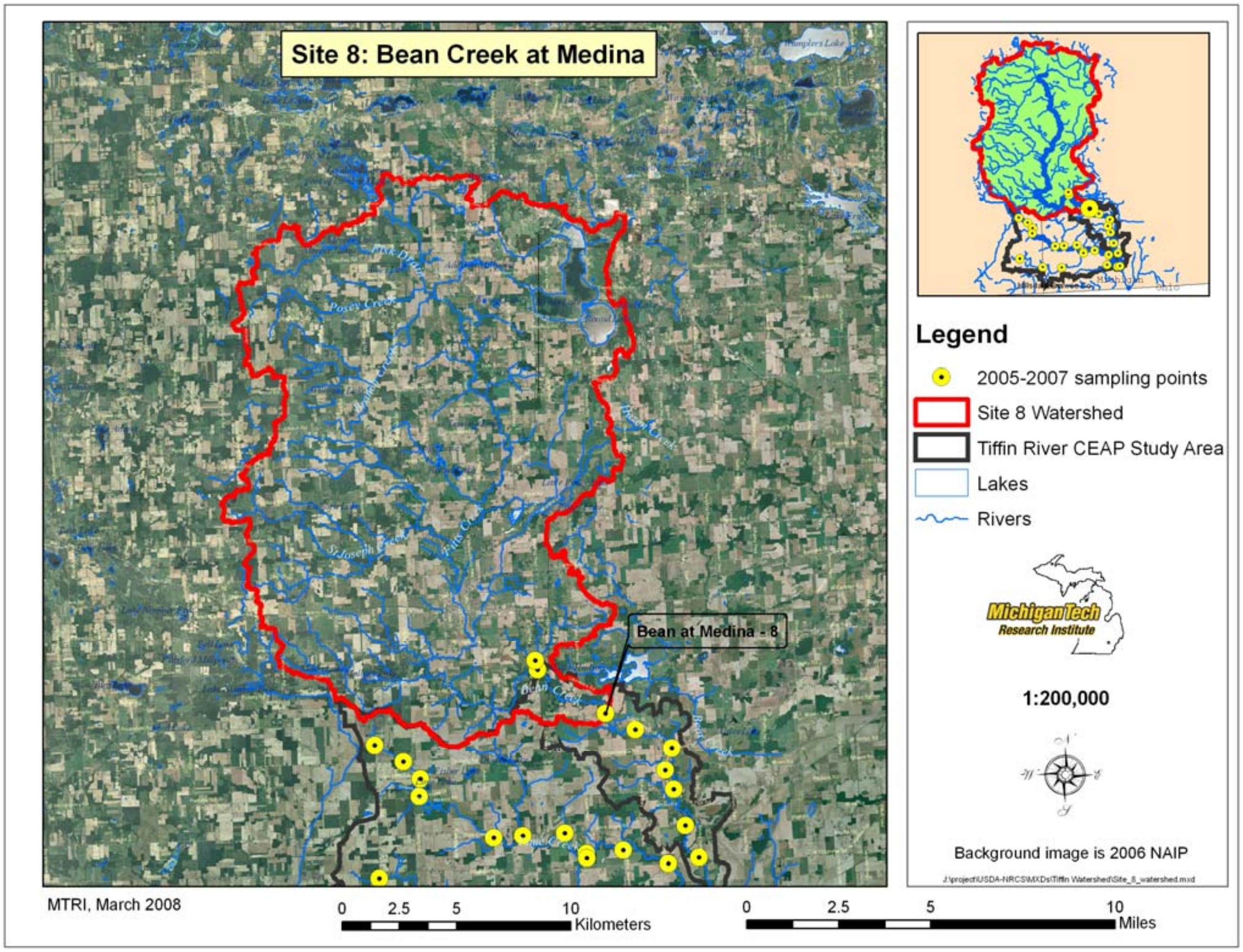
Site 8 Bean Creek at Madina

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 8

	Acres	Hectares
TOTAL AREA =	81,150	32,840

	% of total
SMALL GRAINS	5.7%
SOYBEANS	20.2%
CORN	12.3%
ALFALFA	2.5%
TOTAL % AG	**40.7%**
CRP/GRASS	27.8%
FOREST	17.6%
WATER	2.7%
WETLANDS	1.1%
SHRUBLAND	7.5%
UNCLASSIFIED	0.1%
DEVELOPED	2.4%

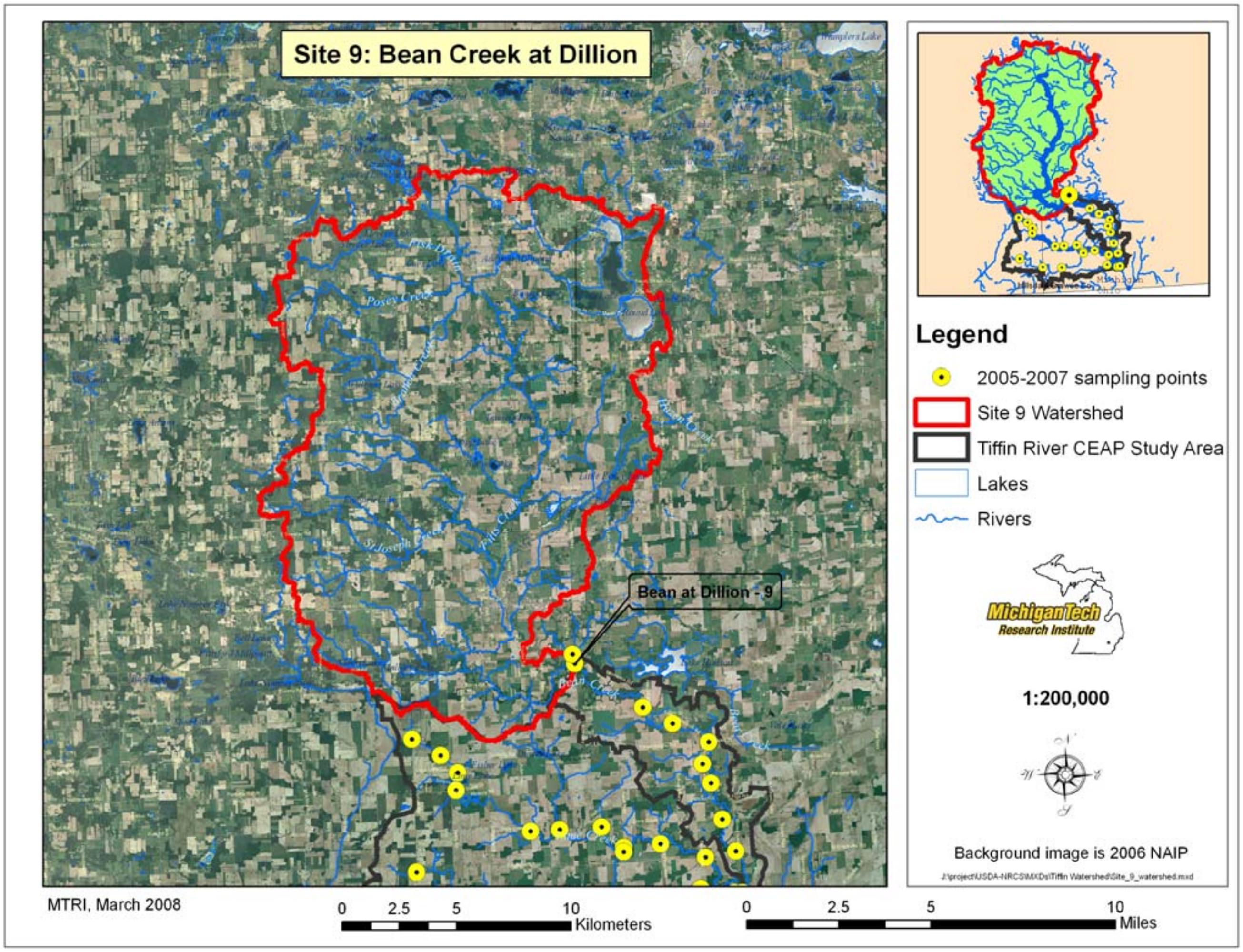
Site 9 Bean Creek at Dillion

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 9		
	Acres	Hectares
TOTAL AREA =	76,374	30,907
	% of total	
SMALL GRAINS	5.9%	
SOYBEANS	20.4%	
CORN	12.1%	
ALFALFA	2.4%	
TOTAL % AG	**40.8%**	
CRP/GRASS	27.7%	
FOREST	17.3%	
WATER	2.9%	
WETLANDS	1.1%	
SHRUBLAND	7.5%	
UNCLASSIFIED	0.1%	
DEVELOPED	2.6%	

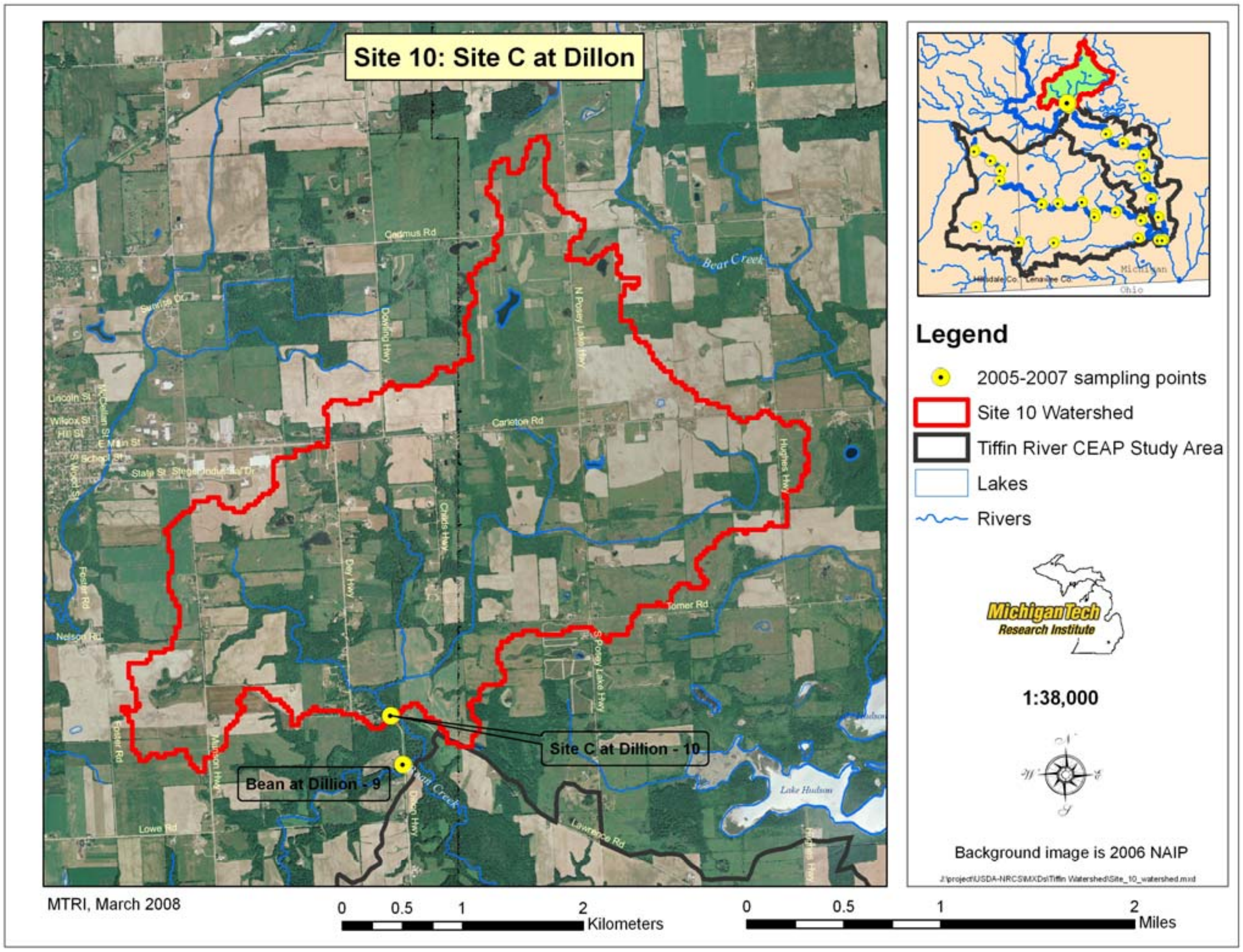
Site 10 Site C at Lawrence

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 10		
	Acres	Hectares
TOTAL AREA =	3,152	1,275
	% of total	
SMALL GRAINS	3.3%	
SOYBEANS	16.5%	
CORN	8.0%	
ALFALFA	4.3%	
TOTAL % AG	**32.2%**	
CRP/GRASS	40.1%	
FOREST	17.4%	
WATER	0.5%	
WETLANDS	0.7%	
SHRUBLAND	9.0%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.1%	

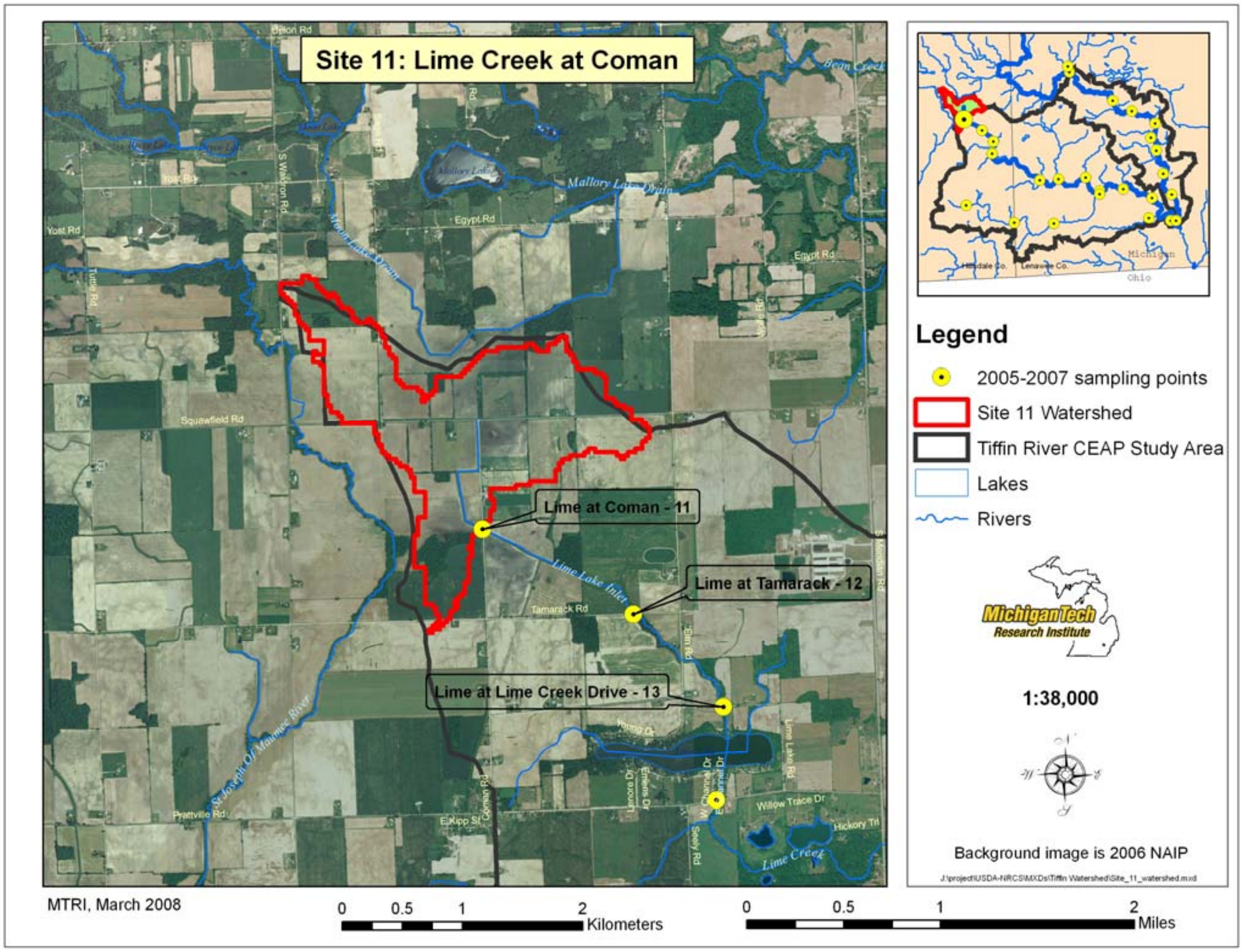
Site 11 Lime Creek at Coman


Upstream 4/11/2005


Downstream 4/11/2005


Upstream 12/27/2007


Downstream 12/27/2007



2006 watershed land cover profile for site 11		
	Acres	Hectares
TOTAL AREA =	714	289
	% of total	
SMALL GRAINS	23.1%	
SOYBEANS	51.8%	
CORN	11.3%	
ALFALFA	0.0%	
TOTAL % AG	**86.2%**	
CRP/GRASS	6.6%	
FOREST	7.2%	
WATER	0.0%	
WETLANDS	0.0%	
SHRUBLAND	0.0%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.0%	

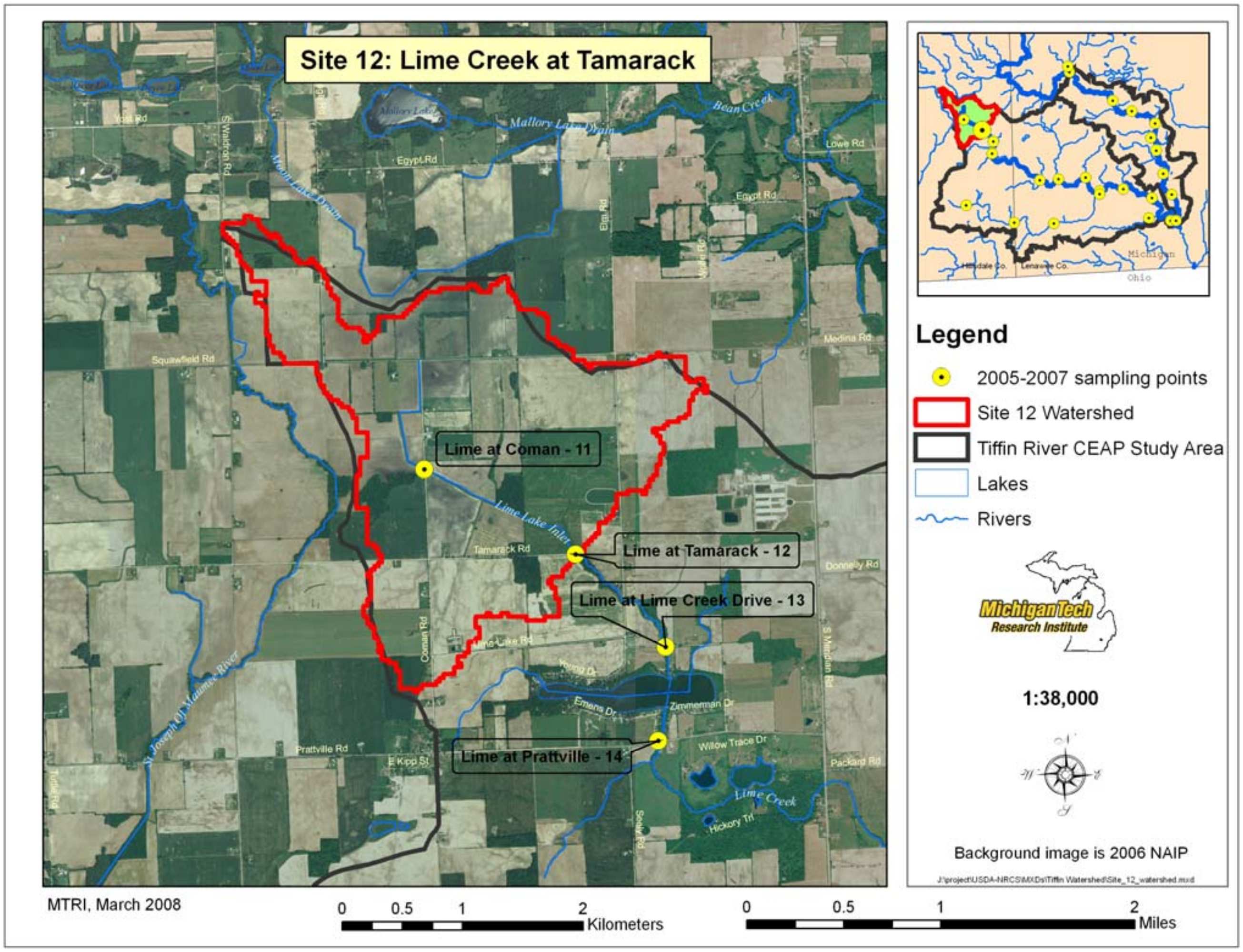
Site 12 Lime Creek at Tamarack


Upstream 4/11/2005


Downstream 4/11/2005


Upstream 12/27/2007


Downstream 12/27/2007



2006 watershed land cover profile for site 12		
	Acres	Hectares
TOTAL AREA =	1,637	662
	% of total	
SMALL GRAINS	11.3%	
SOYBEANS	47.6%	
CORN	15.9%	
ALFALFA	7.2%	
TOTAL % AG	**82.0%**	
CRP/GRASS	12.8%	
FOREST	5.2%	
WATER	0.0%	
WETLANDS	0.0%	
SHRUBLAND	0.0%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.0%	

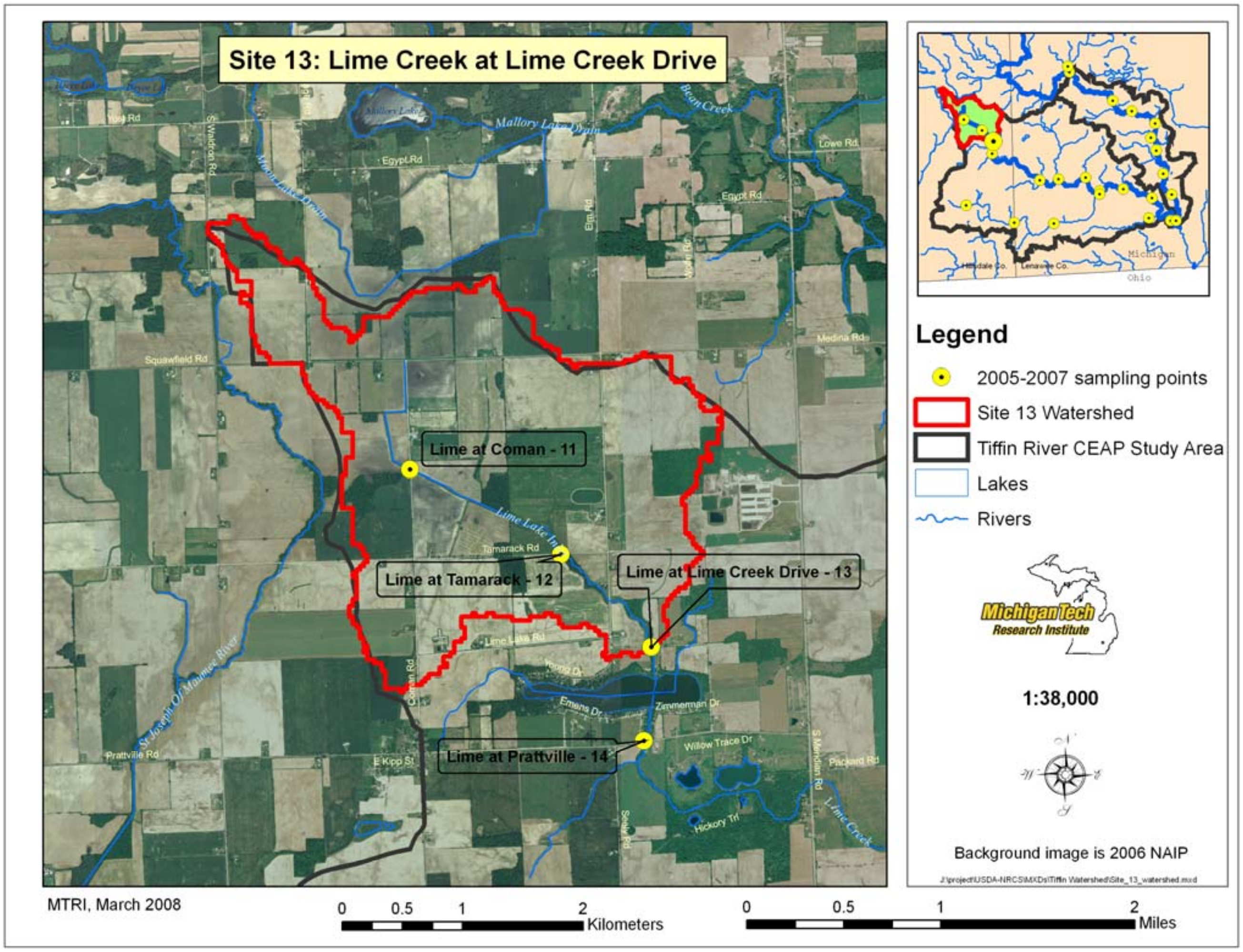
Site 13 Lime Creek at Lime Creek Road


Upstream 4/11/2005


Downstream 4/11/2005


Upstream 12/27/2007


Downstream 12/27/2007



2006 watershed land cover profile for site 13		
	Acres	Hectares
TOTAL AREA =	2,024	819
	% of total	
SMALL GRAINS	9.2%	
SOYBEANS	49.8%	
CORN	14.8%	
ALFALFA	7.1%	
TOTAL % AG	**80.8%**	
CRP/GRASS	13.0%	
FOREST	6.2%	
WATER	0.0%	
WETLANDS	0.0%	
SHRUBLAND	0.0%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.0%	

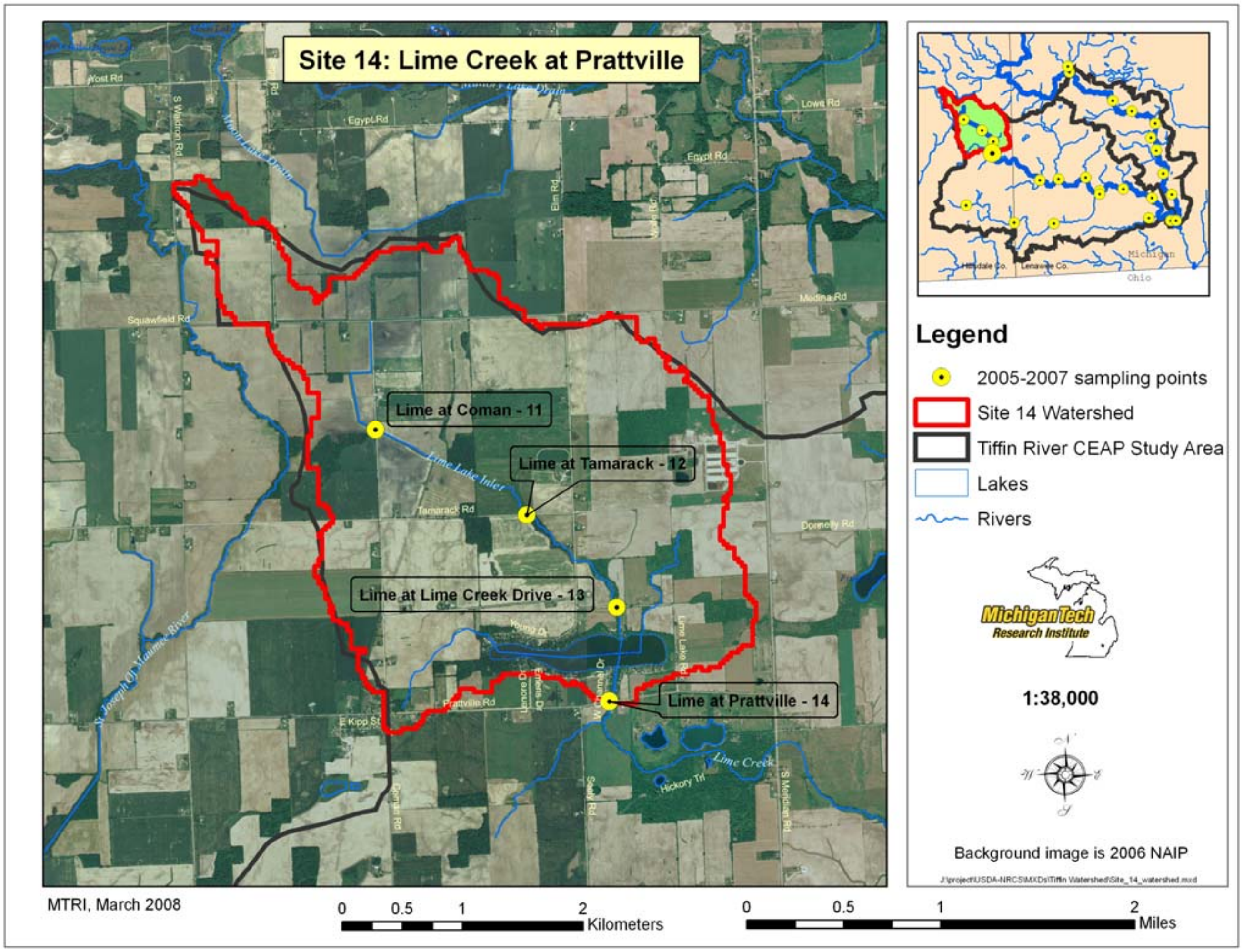
Site 14 Lime Creek at Prattville

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 14		
	Acres	Hectares
TOTAL AREA =	2,869	1,161
	% of total	
SMALL GRAINS	7.1%	
SOYBEANS	41.6%	
CORN	17.8%	
ALFALFA	8.5%	
TOTAL % AG	**75.1%**	
CRP/GRASS	17.3%	
FOREST	7.3%	
WATER	0.0%	
WETLANDS	0.0%	
SHRUBLAND	0.0%	
UNCLASSIFIED	0.4%	
DEVELOPED	0.0%	

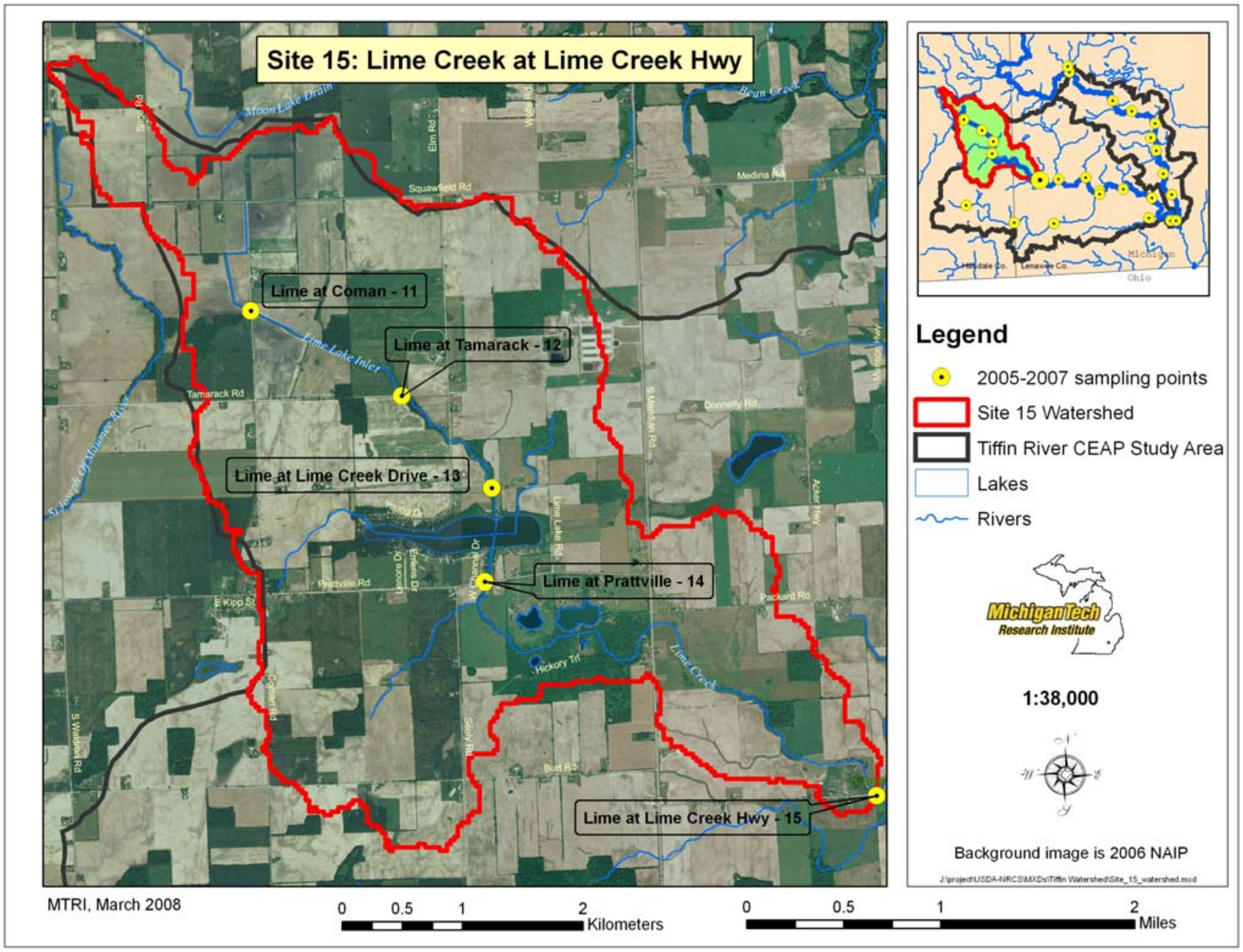
Site 15 Lime Creek at Lime Creek Hwy


Upstream 4/11/2005


Downstream 4/11/2005


Upstream 12/27/2007


Downstream 12/27/2007



2006 watershed land cover profile for site 15		
	Acres	Hectares
TOTAL AREA =	4,893	1,980
	% of total	
SMALL GRAINS	7.1%	
SOYBEANS	36.9%	
CORN	17.7%	
ALFALFA	7.0%	
TOTAL % AG	**68.7%**	
CRP/GRASS	21.1%	
FOREST	7.5%	
WATER	0.1%	
WETLANDS	0.0%	
SHRUBLAND	0.7%	
UNCLASSIFIED	1.8%	
DEVELOPED	0.0%	

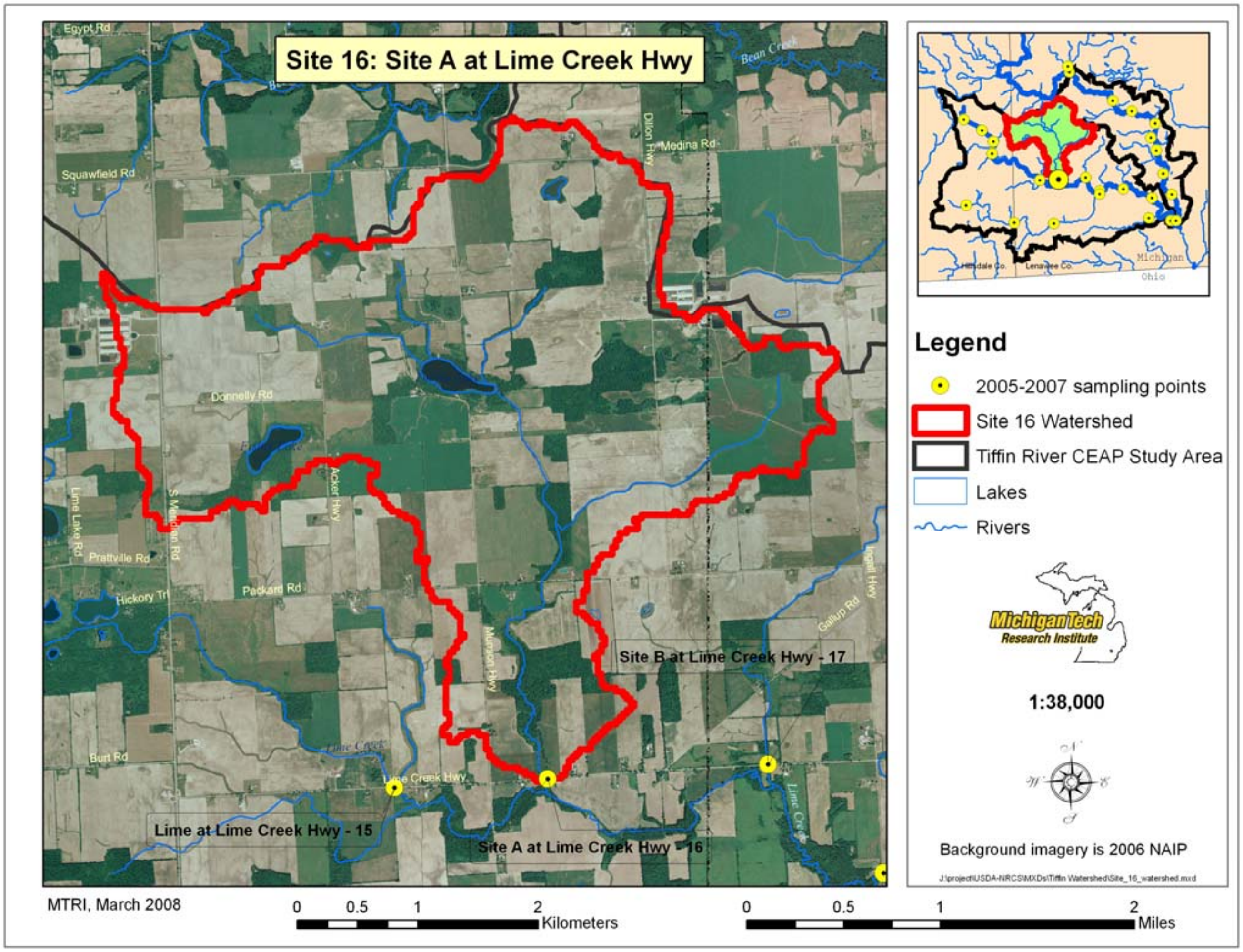
Site 16 Site A at Lime Creek Hwy

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 16		
	Acres	Hectares
TOTAL AREA =	3,723	1,507
	% of total	
SMALL GRAINS	9.7%	
SOYBEANS	20.5%	
CORN	31.1%	
ALFALFA	7.9%	
TOTAL % AG	**69.2%**	
CRP/GRASS	16.3%	
FOREST	10.8%	
WATER	1.2%	
WETLANDS	0.3%	
SHRUBLAND	0.9%	
UNCLASSIFIED	0.1%	
DEVELOPED	1.2%	

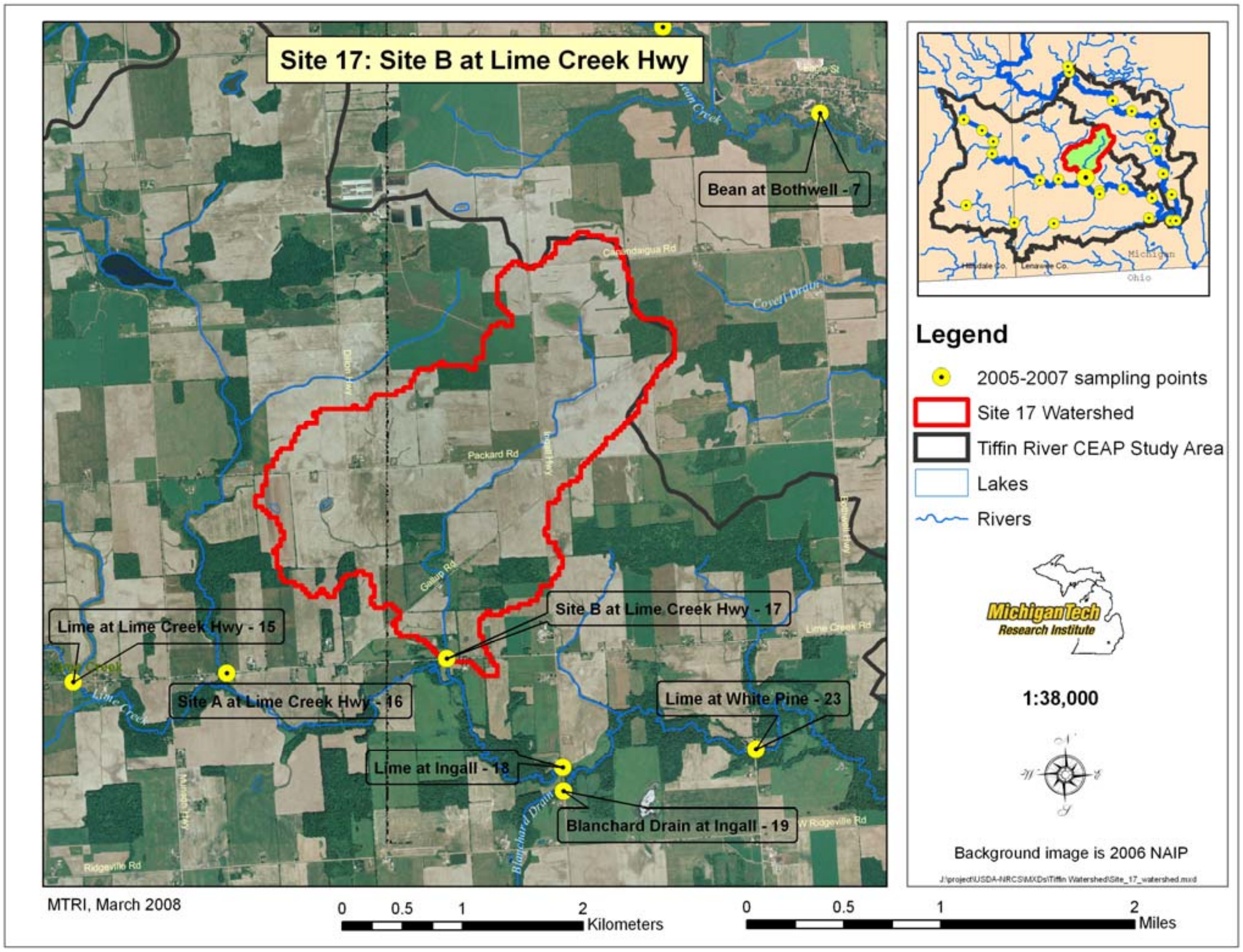
Site 17 Site B at Lime Creek Hwy

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 17		
	Acres	Hectares
TOTAL AREA =	1,503	608
	% of total	
SMALL GRAINS	2.8%	
SOYBEANS	34.8%	
CORN	46.6%	
ALFALFA	2.8%	
TOTAL % AG	**86.9%**	
CRP/GRASS	4.8%	
FOREST	0.7%	
WATER	0.0%	
WETLANDS	0.0%	
SHRUBLAND	7.6%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.0%	

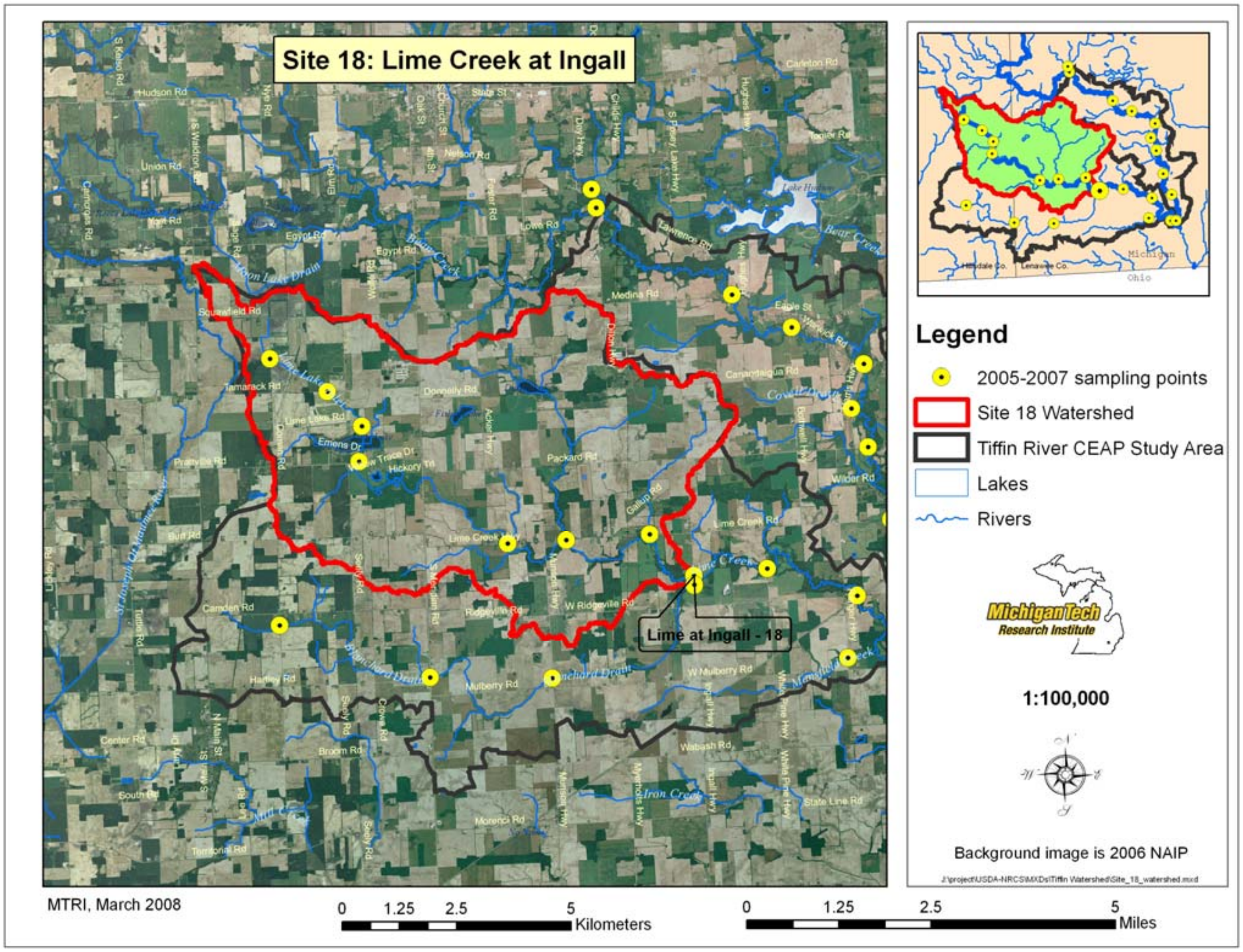
Site 18 Lime Creek at Ingall


Upstream 4/11/2005


Downstream 4/11/2005


Upstream 12/27/2007


Downstream 12/27/2007



2006 watershed land cover profile for site 18		
	Acres	Hectares
TOTAL AREA =	13,600	5,504
	% of total	
SMALL GRAINS	6.9%	
SOYBEANS	32.9%	
CORN	25.8%	
ALFALFA	5.3%	
TOTAL % AG	**70.8%**	
CRP/GRASS	17.5%	
FOREST	8.5%	
WATER	0.4%	
WETLANDS	0.1%	
SHRUBLAND	1.6%	
UNCLASSIFIED	0.7%	
DEVELOPED	0.3%	

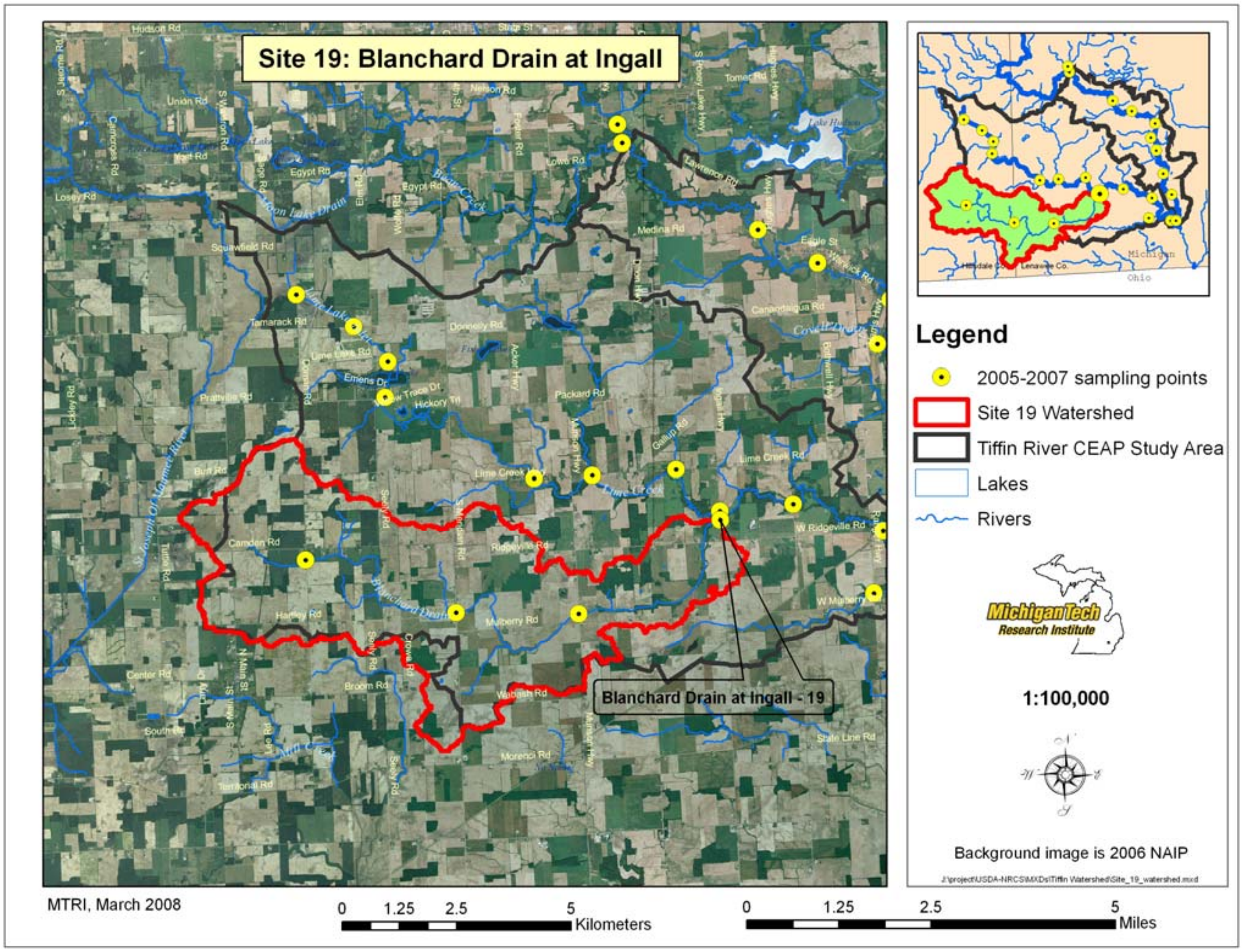
Site 19 Blanchard Drain at Ingall

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 19		
	Acres	Hectares
TOTAL AREA =	8,964	3,627
	% of total	
SMALL GRAINS	10.7%	
SOYBEANS	46.7%	
CORN	21.5%	
ALFALFA	2.6%	
TOTAL % AG	**81.5%**	
CRP/GRASS	7.1%	
FOREST	9.7%	
WATER	0.1%	
WETLANDS	0.1%	
SHRUBLAND	1.5%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.0%	

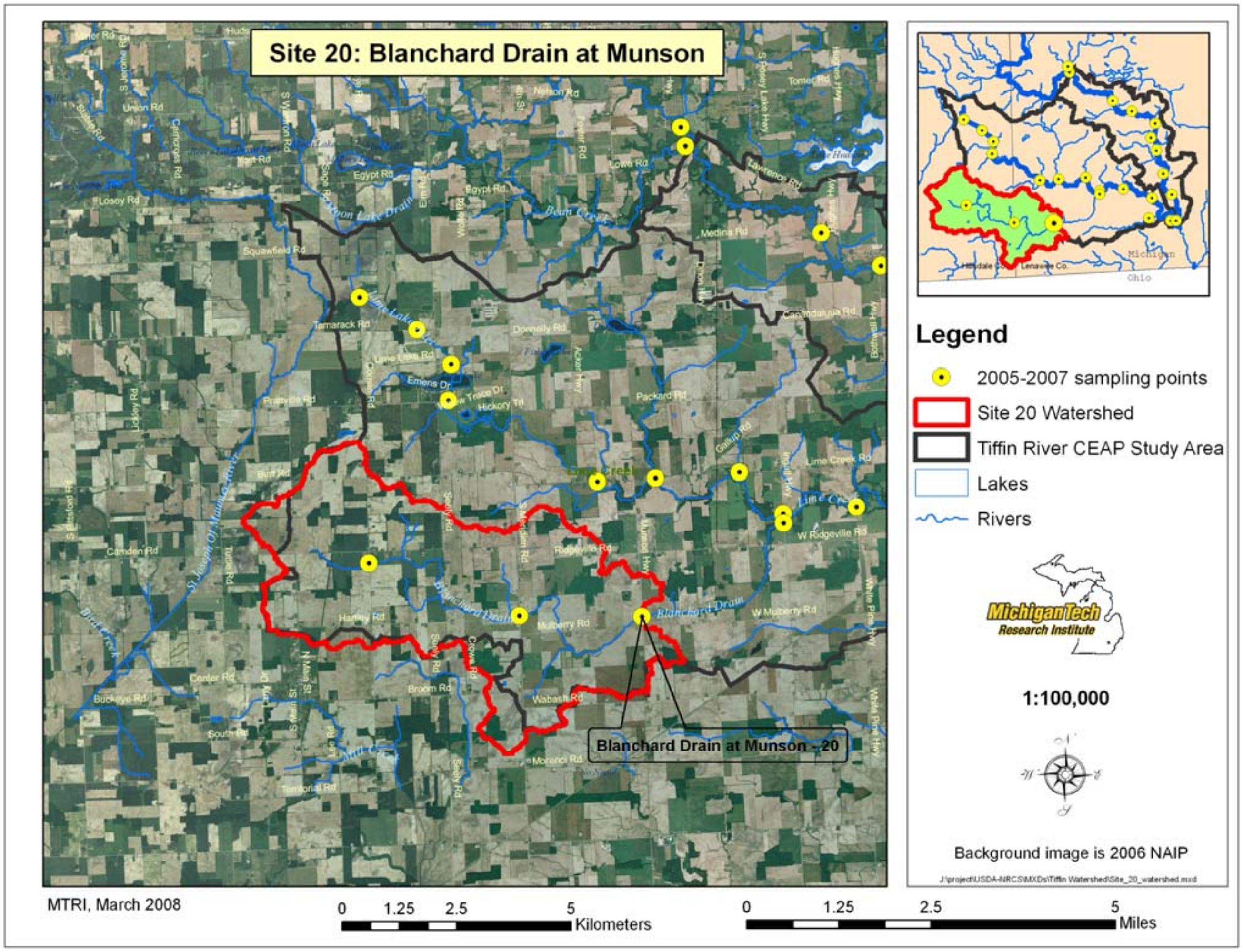
Site 20 Blanchard Drain at Munson

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 20		
	Acres	Hectares
TOTAL AREA =	7,633	3,089
	% of total	
SMALL GRAINS	10.7%	
SOYBEANS	48.0%	
CORN	22.6%	
ALFALFA	2.8%	
TOTAL % AG	**84.1%**	
CRP/GRASS	6.5%	
FOREST	8.2%	
WATER	0.1%	
WETLANDS	0.1%	
SHRUBLAND	1.0%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.0%	

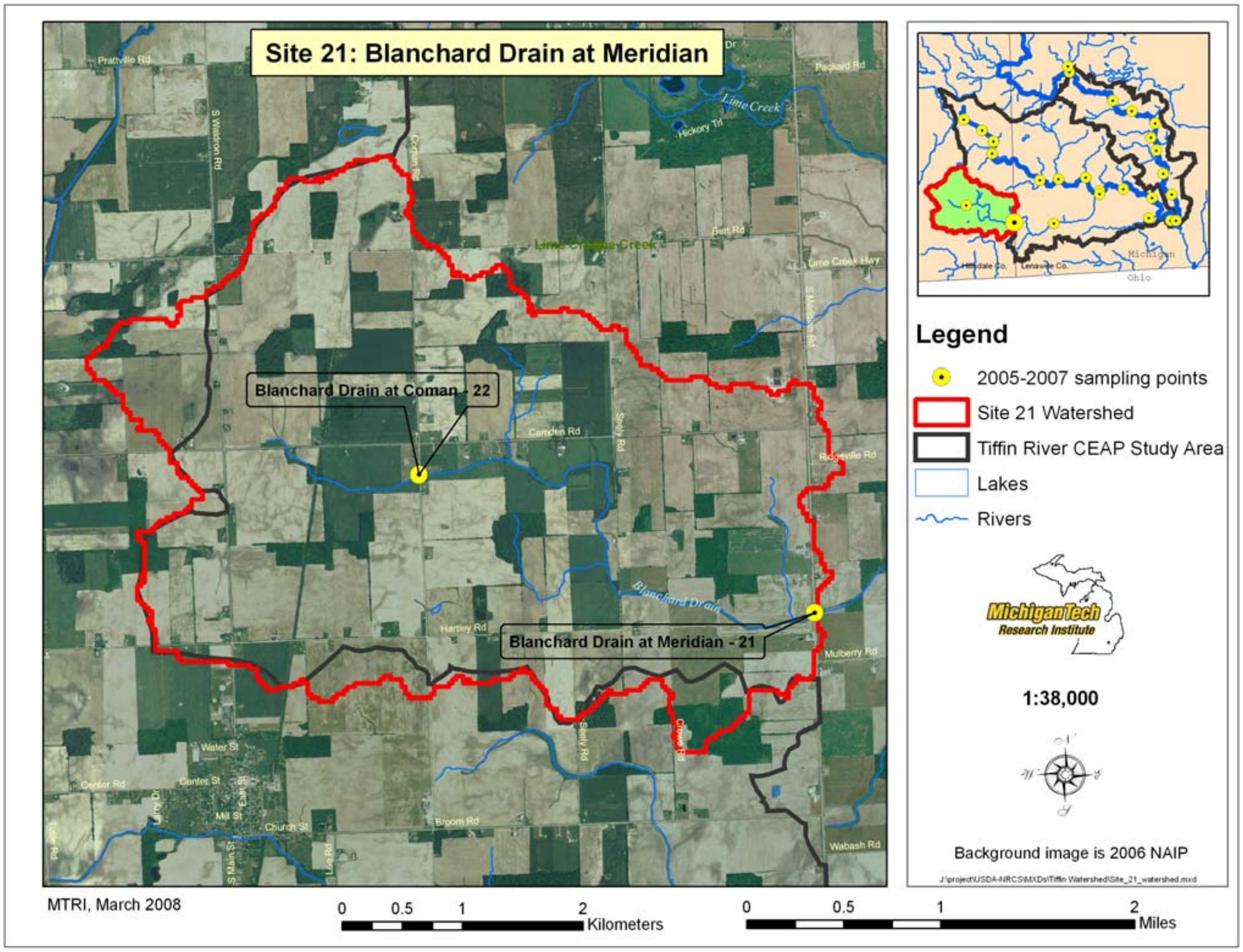
Site 21 Blanchard Drain at Meridian

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 21		
	Acres	Hectares
TOTAL AREA =	4,600	1,862
	% of total	
SMALL GRAINS	13.2%	
SOYBEANS	43.8%	
CORN	27.9%	
ALFALFA	2.5%	
TOTAL % AG	**87.4%**	
CRP/GRASS	5.4%	
FOREST	6.6%	
WATER	0.0%	
WETLANDS	0.2%	
SHRUBLAND	0.4%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.1%	

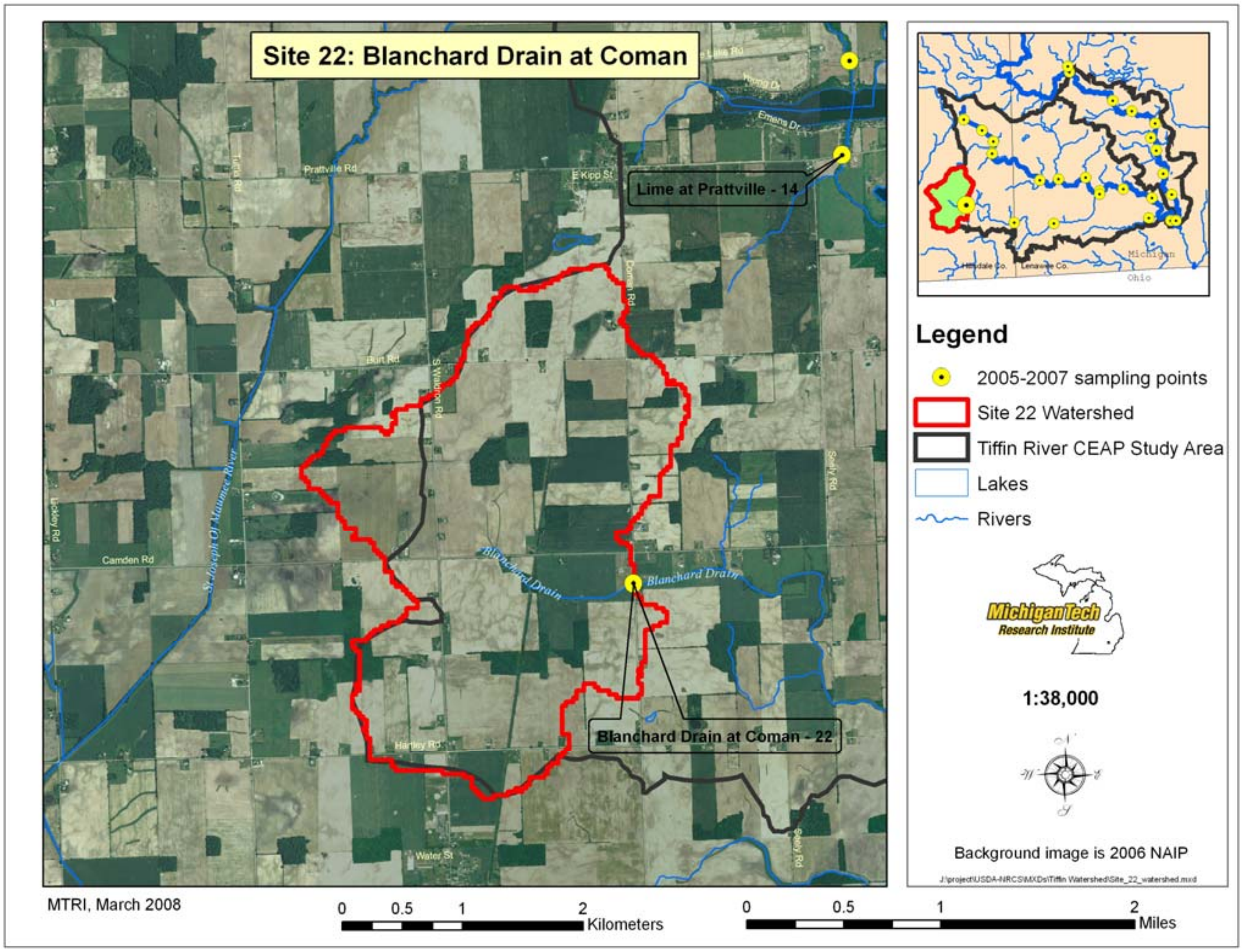
Site 22 Blanchard Drain at Coman

Upstream 4/11/2005

Downstream 4/11/2005

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 22		
	Acres	Hectares
TOTAL AREA =	2,087	845
	% of total	
SMALL GRAINS	12.0%	
SOYBEANS	51.3%	
CORN	23.0%	
ALFALFA	4.0%	
TOTAL % AG	**90.3%**	
CRP/GRASS	1.6%	
FOREST	7.4%	
WATER	0.0%	
WETLANDS	0.0%	
SHRUBLAND	0.7%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.0%	

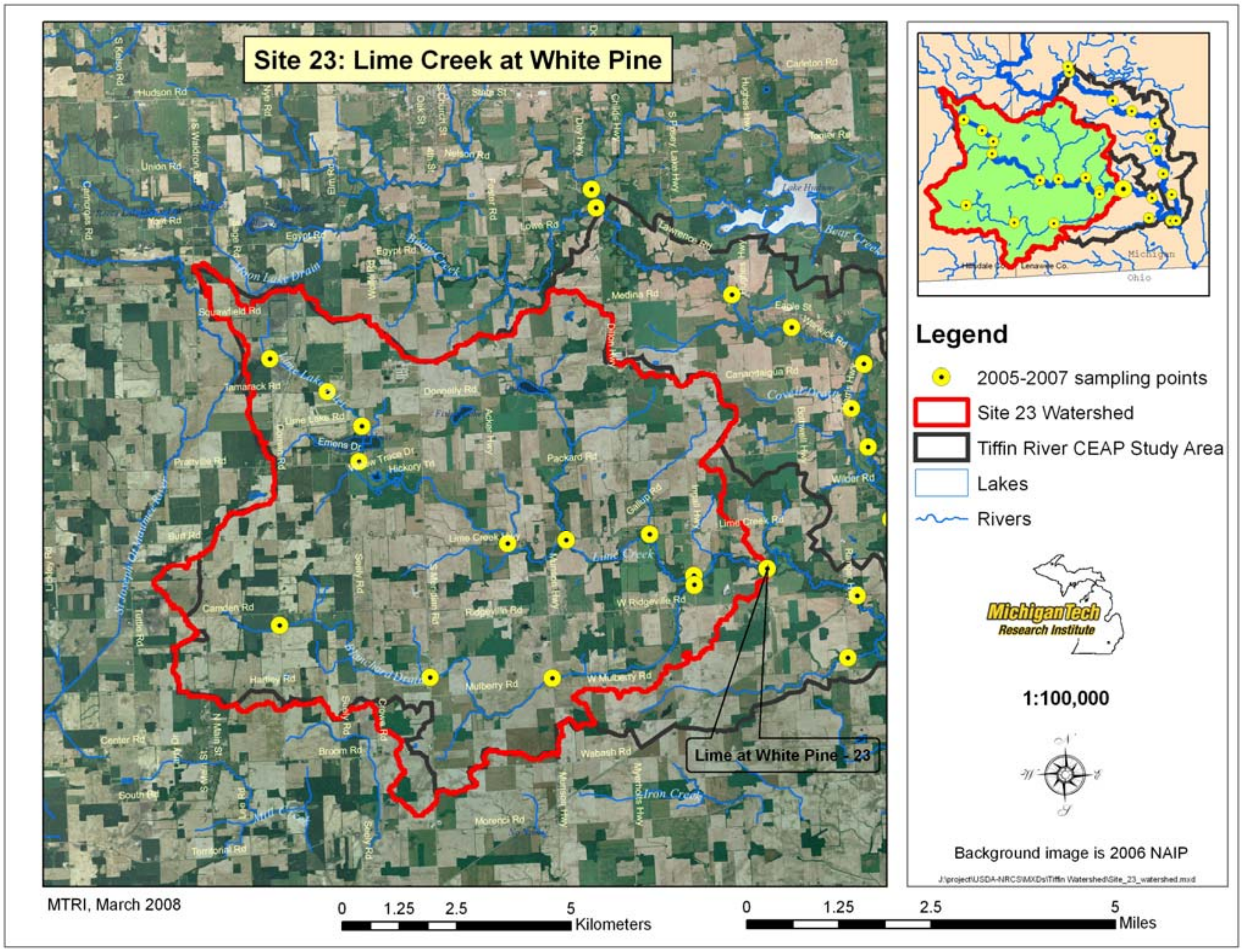
Site 23 Lime Creek at White Pine


Upstream 4/11/2005


Downstream 4/11/2005


Upstream 12/27/2007


Downstream 12/27/2007



2006 watershed land cover profile for site 23

	Acres	Hectares
TOTAL AREA =	23,515	9,516

	% of total
SMALL GRAINS	8.2%
SOYBEANS	37.4%
CORN	24.4%
ALFALFA	4.2%
TOTAL % AG	**74.2%**
CRP/GRASS	13.5%
FOREST	9.4%
WATER	0.4%
WETLANDS	0.1%
SHRUBLAND	1.9%
UNCLASSIFIED	0.4%
DEVELOPED	0.0%

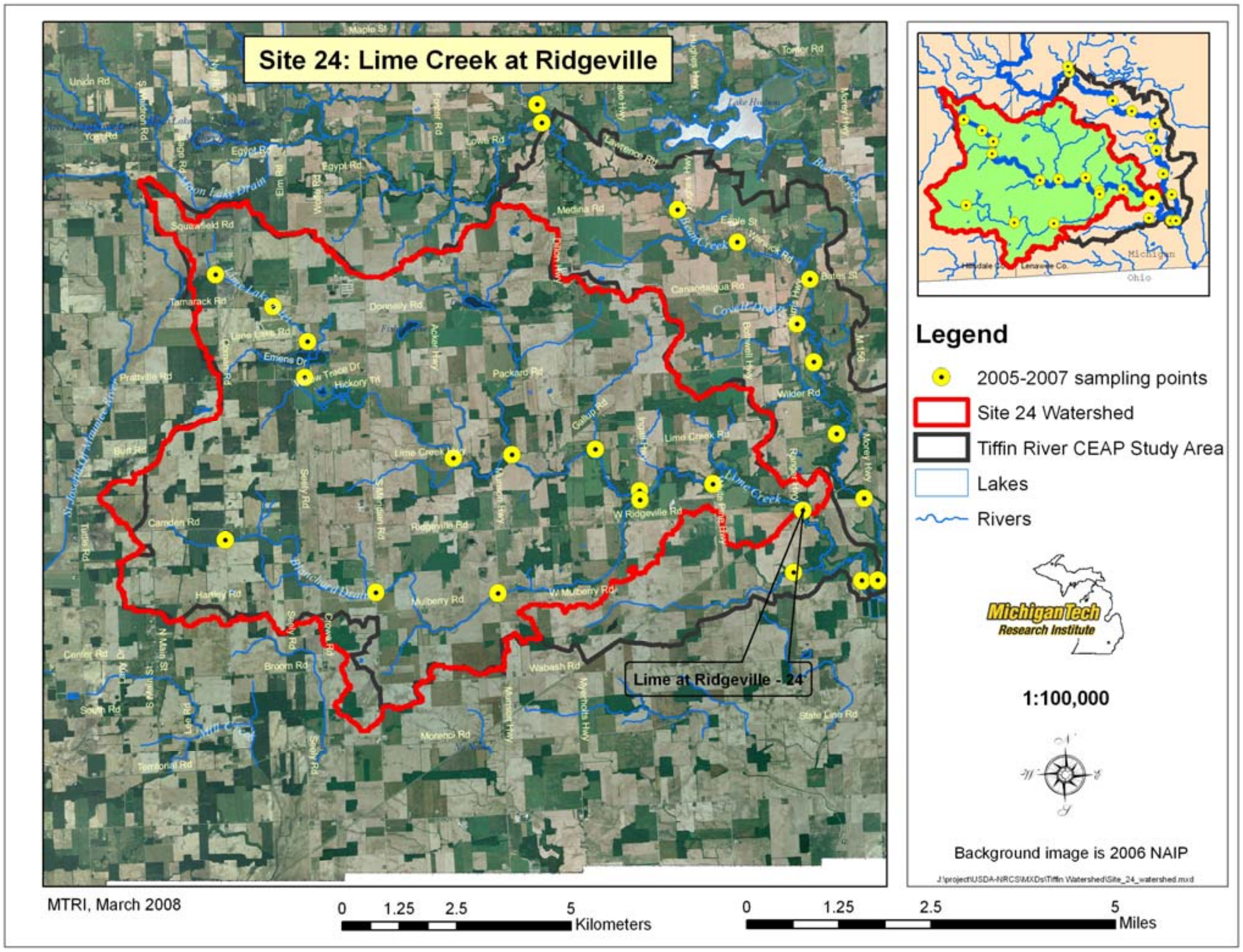
Site 24 Lime Creek at Ridgeville


Upstream 4/11/2005


Downstream 4/11/2005


Upstream 12/27/2007


Downstream 12/27/2007



2006 watershed land cover profile for site 24		
	Acres	Hectares
TOTAL AREA =	25,123	10,167
	% of total	
SMALL GRAINS	7.8%	
SOYBEANS	36.3%	
CORN	24.4%	
ALFALFA	4.5%	
TOTAL % AG	**72.9%**	
CRP/GRASS	13.6%	
FOREST	10.4%	
WATER	0.3%	
WETLANDS	0.1%	
SHRUBLAND	2.0%	
UNCLASSIFIED	0.4%	
DEVELOPED	0.2%	

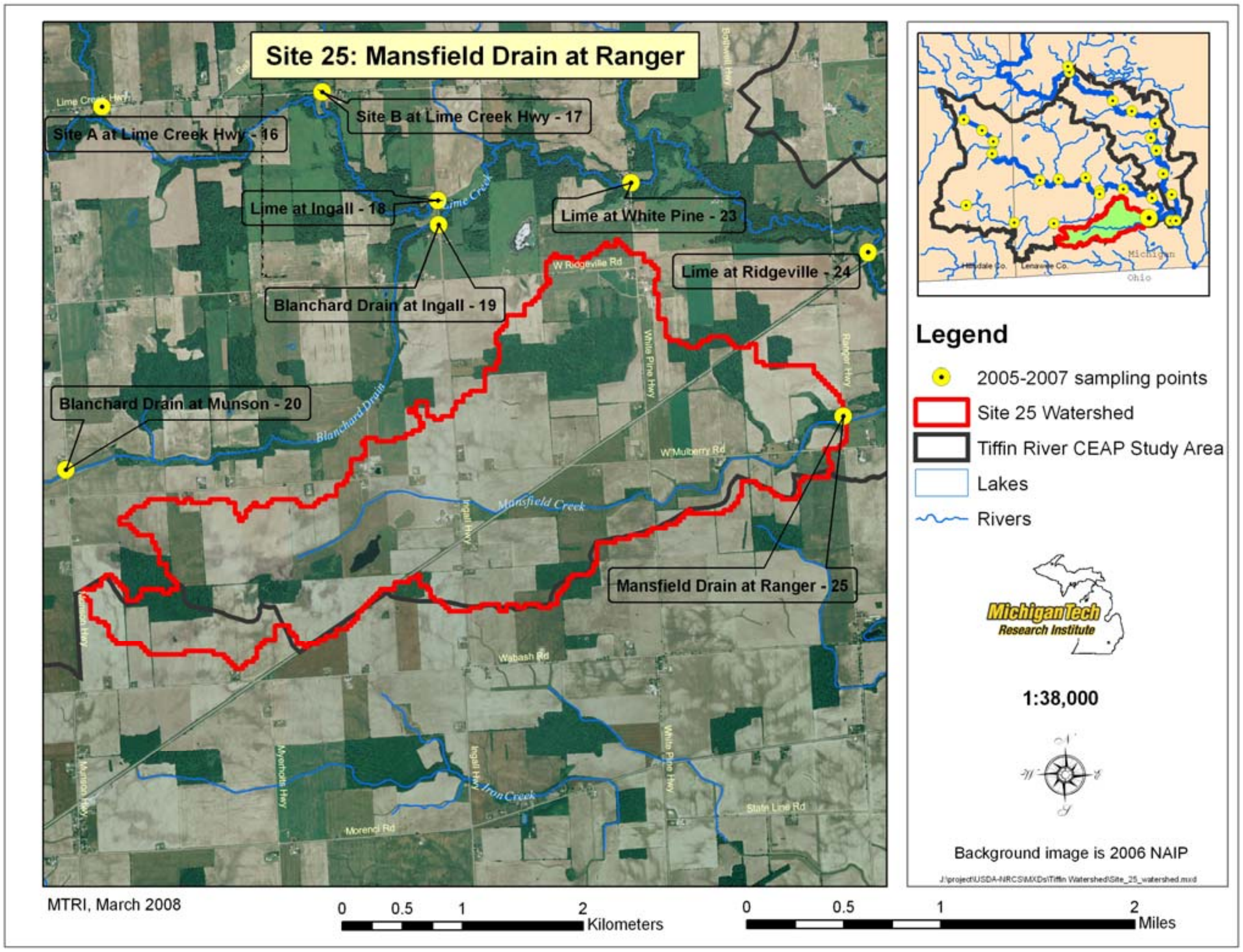
Site 25 Mansfield Drain at Ranger


Upstream 4/11/2005


Downstream 4/11/2005


Upstream 12/27/2007


Downstream 12/27/2007

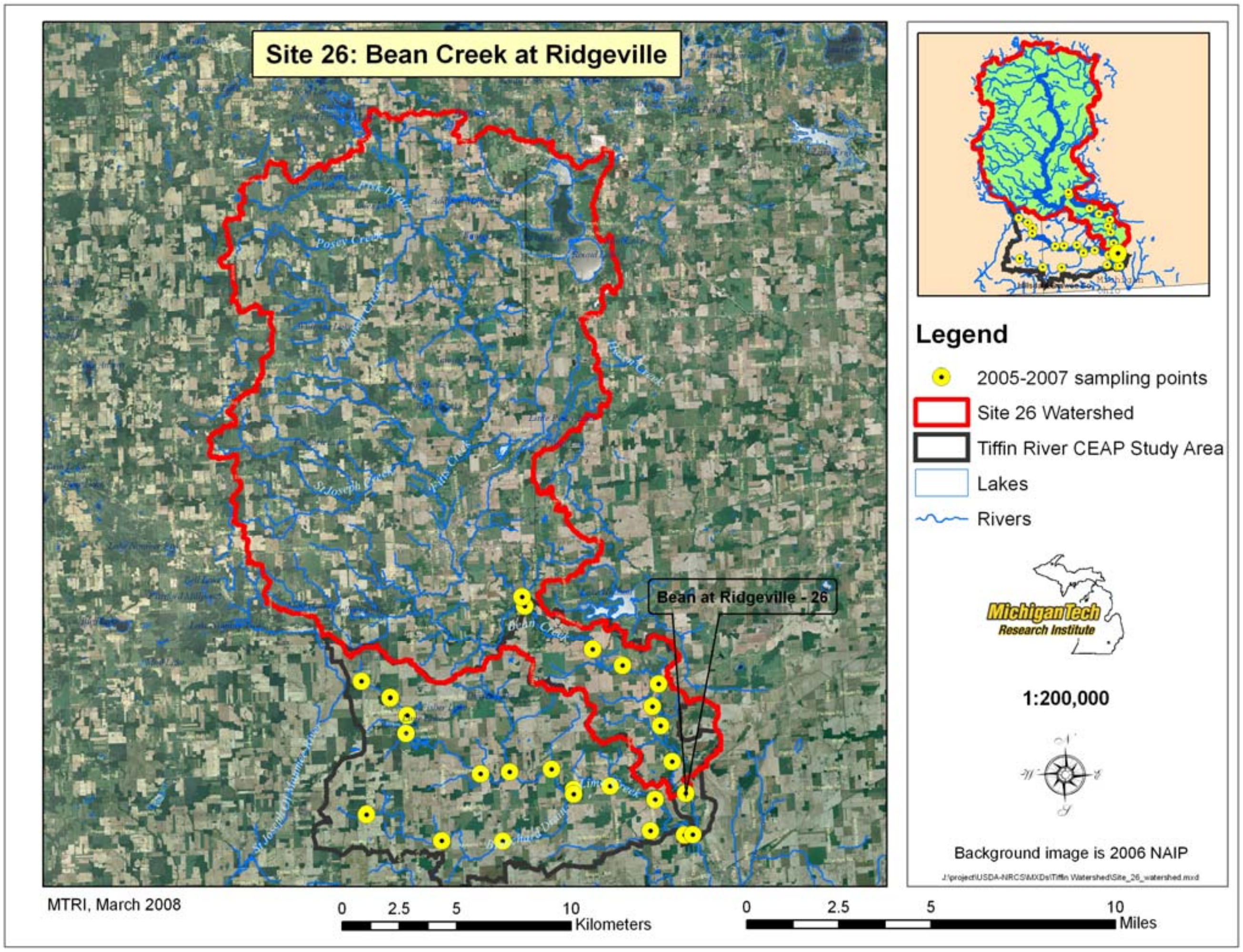


2006 watershed land cover profile for site 25		
	Acres	Hectares
TOTAL AREA =	2,268	918
	% of total	
SMALL GRAINS	14.3%	
SOYBEANS	29.6%	
CORN	31.6%	
ALFALFA	2.2%	
TOTAL % AG	**77.8%**	
CRP/GRASS	9.0%	
FOREST	12.9%	
WATER	0.3%	
WETLANDS	0.0%	
SHRUBLAND	0.0%	
UNCLASSIFIED	0.0%	
DEVELOPED	0.0%	

Site 26 Bean Creek at Ridgeville

Upstream 12/27/2007

Downstream 12/27/2007



2006 watershed land cover profile for site 26		
	Acres	Hectares
TOTAL AREA =	88,427	35,785
	% of total	
SMALL GRAINS	5.3%	
SOYBEANS	20.3%	
CORN	12.7%	
ALFALFA	3.1%	
TOTAL % AG	**41.4%**	
CRP/GRASS	27.1%	
FOREST	17.7%	
WATER	2.5%	
WETLANDS	1.1%	
SHRUBLAND	7.8%	
UNCLASSIFIED	0.1%	
DEVELOPED	2.3%	