Ompompanoosuc River Water Quality Study
Summer 2007

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A final report Submitted to the Department of Environmental Conservation, November 15, 2007
from the Ompompanoosuc Watershed Council

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EXECUTIVE SUMMARY

1. A comprehensive water quality survey of the Eastern Branch and main stem of the Ompompanoosuc River and its major tributaries was conducted from June through August 2007.
2. Samples were collected by volunteers every two weeks at 18 different sites in the towns of Vershire, West Fairlee, Thetford, and Norwich Vermont.
3. All sites were monitored for levels of Escherichia coli (*E. coli*), temperature, pH, and dissolved oxygen.
4. The *E. coli* analysis was conducted at the State of Vermont's LaRosa Laboratories in Waterbury, Vermont. Temperature, pH, and dissolved oxygen were measured *in situ*.
5. All samples were collected and measurements taken in accordance with a previously defined "Quality Assurance Project Plan" (QAPP) to ensure consistency and to limit errors (Ompompanoosuc River Watershed Council, 2007)
6. The level of dissolved oxygen (DO) ranged from 7.69 to 9.25 mg/l on the Eastern Branch and main stem of the Ompompanoosuc and from 8.45 to 9.39 mg/l on the tributaries. The average DO for all sites met the tolerance of 6.0 mg/l as determined by the Vermont Water Quality Standards.
7. The pH data from this round of sampling was very limited due to malfunctioning meters. However, the pH levels measured early on in the process fell within the range of 6.5 and 8.5 listed in The Vermont Water Quality Standards.
8. The temperature ranged from 13.1 to 17.3 ^{o}C on the Eastern Branch and main stem of the Ompompanoosuc, and from 12.1 to 13.1 ^{o}C on the tributaries.
9. All but one of the sites in this study exceeded the state of Vermont's acceptable limit of 77 colonies of *E. coli* per 100 ml sample, (based on the geometric mean of each site's *E. coli* level).
10. Individual samples with excessively high E. *coli* levels could be correlated with periods of heavy rainfall.

1.0 INTRODUCTION

The Ompompanoosuc River Water Quality Survey monitored the water quality of the 18-mile Eastern Branch and 5-mile main section of the Ompompanoosuc River over a three month period in the summer of 2007. This is the second consecutive year in which a survey of this type was conducted. The Ompompanoosuc River is the principle waterway for the towns of Vershire, West Fairlee, Thetford, and Norwich Vermont and is an important natural and scenic resource. The river provides numerous recreational activities for area residents and is designated by the state of Vermont as a Class B water and in some areas as a cold water fishery. Sections of the river have been classified by the state as an impaired surface water due to high levels of *E. coli* and heavy metals. At each location where a water sample was collected, levels of *E. coli*, temperature, pH, and dissolved oxygen were monitored. Data generated from this project will quantify the level of river contamination and help pinpoint specific sources of pollution.

Approximately 15 volunteers helped conduct this survey. Volunteers included members of the West Fairlee Conservation Commission, Thetford Conservation Commission, Norwich Conservation Commission and the Friends of the Ompompanoosuc. Technical expertise and data management were again provided by Ben Copans, the Watershed Coordinator with the Vermont Department of Environmental Conservation.

Add sections linking to previous year's results.

2.0 SAMPLE SITES

Figure 1 is a map of the sampling area. Sampling sites are identified alphabetically from the northernmost site in Vershire, VT to the Connecticut River in the south, including tributaries. The list of sites chosen for the 2007 sampling season closely mirrored those used in 2006, with refinements made based on the data collected previously. During the site selection process, eight sites were removed from the group used in 2006 and five sites were added (C1, C2, L1, P1, W1). Sites tended to be eliminated because they had relatively low levels of *E. coli* in 2006 or the sites closest to them exhibited similar environmental traits. Sites C1 and C2 were added in West Fairlee to try to pinpoint the source(s) of the anomalously high levels of *E. coli* measured in 2006. It should be noted that Site E, in the School House Brook in West Fairlee, is downstream from the former Ely Copper Mine, an EPA designated Super Fund site.

A prominent feature in this sampling area is 900 acres of conserved land maintained by the Army Corps of Engineers at the Union Village Dam in Thetford. This land is open to the public and is used for many recreational activities including swimming and fishing. The Eastern Branch and the Western Branch of the Ompompanoosuc merge above the Union Village Dam.

Appendix A summarizes each site's GPS coordinates, relative position to the landscape around it, and the surrounding habitat. The sampling sites were primarily in wooded and residential areas. Heavy agricultural use was not in evidence at any of the sites.

3.0 METHODOLOGY

Each site was sampled for levels of *E. coli*, temperature, dissolved oxygen, and pH. Water samples for *E. coli* testing were sent to the State of Vermont La Rosa Analytical Laboratory in Waterbury, Vermont where each sample was analyzed under EPA qualified analytical methods. Hand held meters were used to obtain all other measurements. Each meter was calibrated prior to each sampling session.

Samples were collected every two weeks from May 31, 2007 to August 23, 2007. The technique for acquiring samples followed a pre-defined Quality Assurance Process Procedure (QAPP). The sampling sites were divided among the volunteers with different groups taking responsibility for a specific cluster of sites. Field data was regularly sent to Ben Copans for compilation.

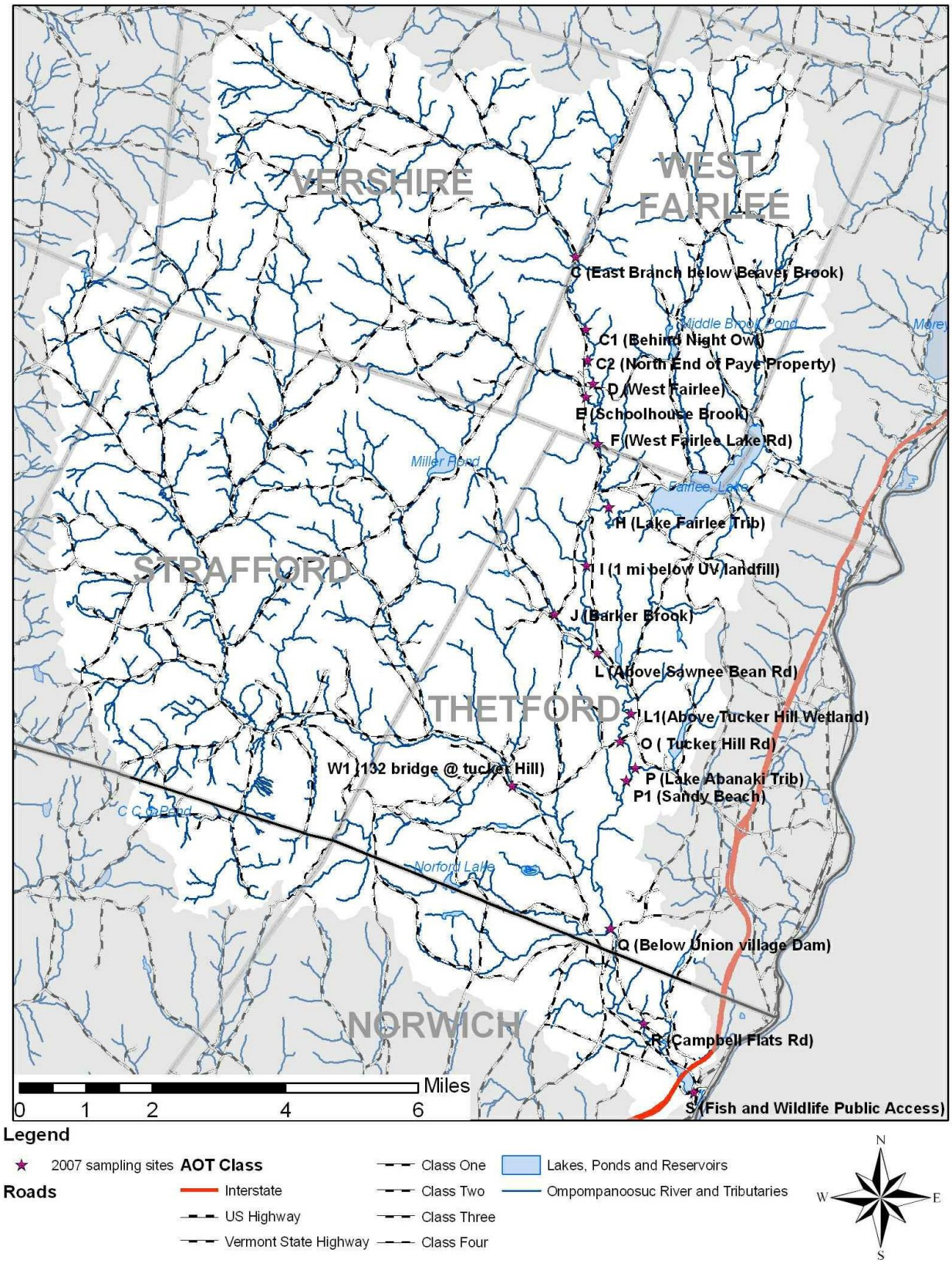


Figure 1: Locations of the water sampling sites

4.0 RESULTS

The following sections summarize the data collected during the project. To ensure the accuracy of the results, groups utilized field blanks and field and laboratory duplicates. All samples were collected in accordance to methodologies described in the volunteers' QAPP.

4.1 *E. coli*

Figure 1 shows the geometric mean of the *E. coli* levels at all of the sites monitored in 2007. The geometric mean "smoothes" the data by limiting the impact of outlying data values and the EPA recommends using the geometric mean when analyzing data. For comparison purposes, included in this figure is Vermont's standard for the maximum level of *E. coli* contamination. A bar graph showing the *E. coli* levels measured during each sampling session at each site is shown in Appendix A.

On average, the level of *E. coli* contamination in the Ompompanoosuc increases as the river passes through the town of West Fairlee (sites C through F in Figure 1). (This trend was also seen in 2006.) This section of the Ompompanoosuc flows through a relatively dense residential area. While the level of *E. coli* remained well above the Vermont standard on all sample sites along the river, it significantly decreased once it was well within the boundaries of Thetford. The *E. coli* levels in the tributaries tended to be well below the levels measured along the river. This trend is the same as last year.

Using the field reports submitted by the volunteers, it was possible to divide the data based on which days rain had fallen. Figure 2 compares the levels of *E. coli* on days on which rain had fallen within the past 24 hours and days on which no rain had fallen. As can be seen, the rain had a significant impact on the levels of *E. coli* measured. On the river itself, the rain caused the levels of *E. coli* to increase by 1.5 to almost 8 times in comparison to the levels measured on the days without rain. On the tributaries, the levels of *E. coli* increased from between 1.5 times to 10 times when rainfall occurred within 24 hours of a sampling session.

There is high confidence in the accuracy of the measured levels of *E. coli*. The average difference between field duplicates was well within the standards required for under the Quality Assurance Plan.

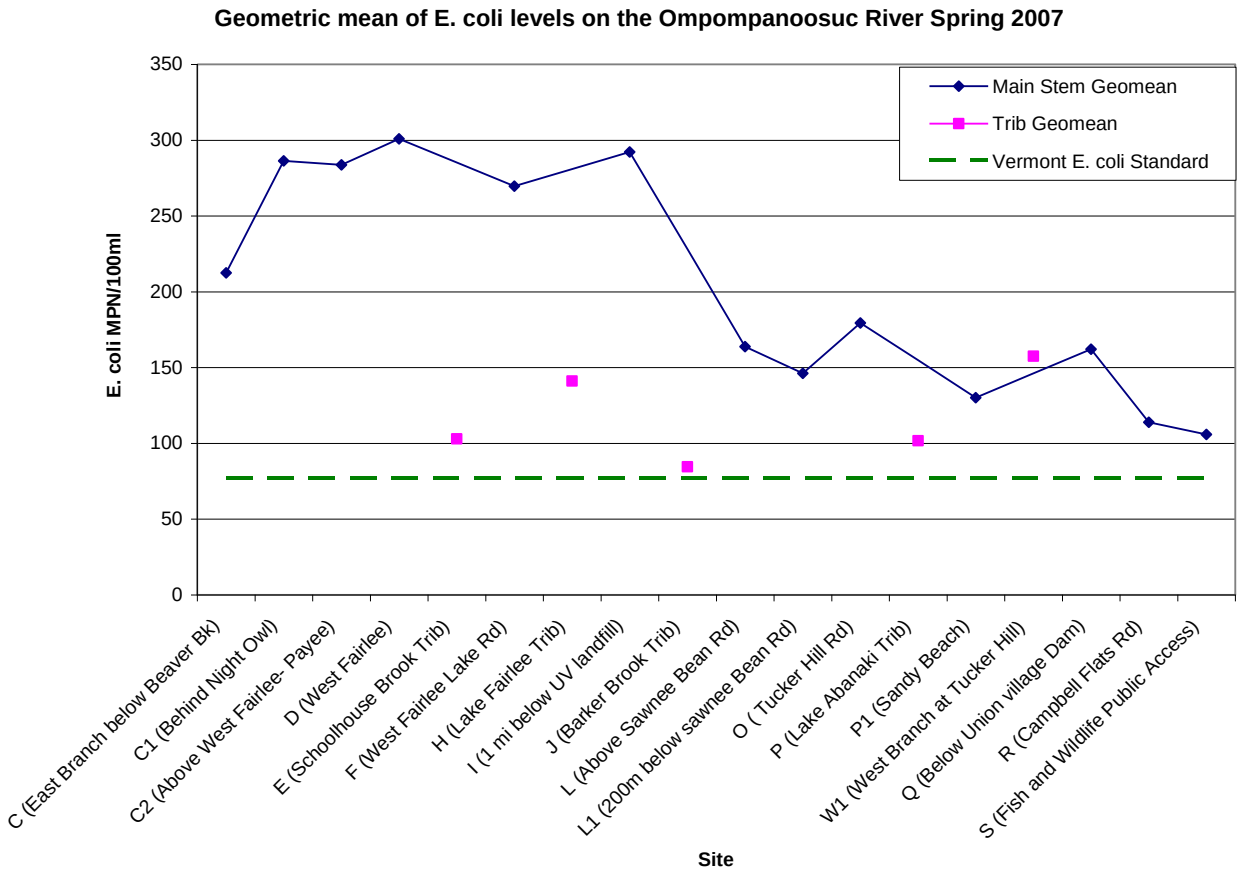


Figure 1: Geometric mean of the E. coli *levels measured on the Eastern branch of the Ompompanoosuc River and some of its tributaries.*

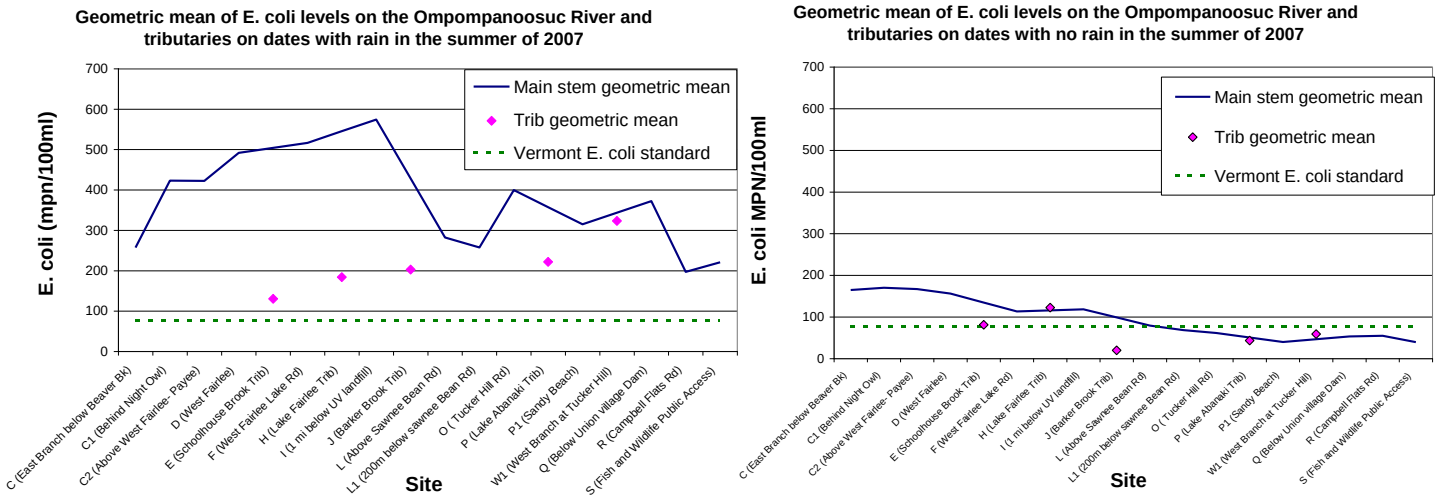


Figure 2: Comparison of E. coli *levels when there was rain within 24 hours of sampling (left graph) and when there was no rain within 24 hours of sampling (right graph).*

4.3 Temperature, pH and Dissolved Oxygen

The average temperature for all testing sites is shown in Figure 3. As expected the average water temperature at the upper test sites was low (ranging from approximately 10ºC to 15ºC throughout the spring and summer). The water temperature increases significantly once the river mixes with Lake Fairlee (around site I). Water temperatures declined somewhat below the Union Village Dam but increased again, to an approximate mean of 17ºC at site S, just above the confluence with the Connecticut River. All of the measured temperatures meet the Vermont Water Quality Standards.

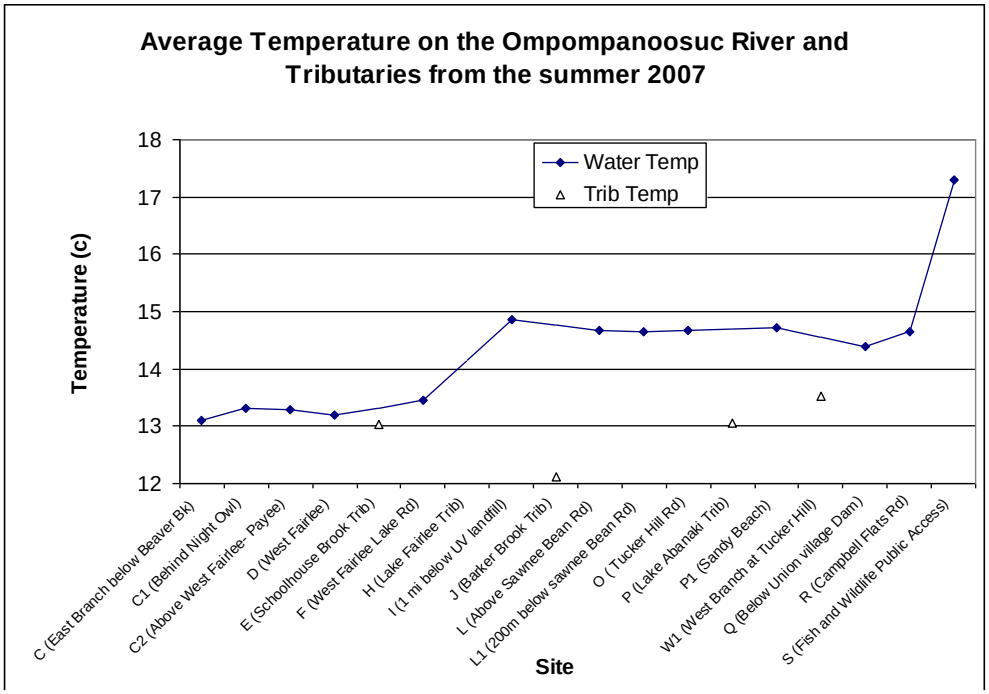


Figure 3: Average water temperature during the Summer of 2007 on the eastern branch of the Ompompanoosuc and some of its tributaries.

Unfortunately due to equipment malfunctions during the 2007 testing season, volunteers were unable to gather a significant amount of data on the pH and dissolved oxygen levels.

5.0 DISCUSSION

The following sections describe the potential impact of the contaminants and environmental parameters measured in this study.

5.1 *E. coli* – Summer 2007

Water-borne disease-causing microbes generally exist at very low levels and are difficult and expensive to detect. Therefore, indicator organisms have been used for more than a century to help identify where fecal contamination has occurred, and where there may be a risk of

contracting disease-causing microbes. *E. coli*, a universal inhabitant of the intestines of warm-blooded animals, is the accepted indicator organism for freshwater.

As in 2006, our results indicate that levels of *E. coli* are especially elevated in the East Branch of the Ompompanoosuc River in and around the town of West Fairlee. Since these sites are not near large agricultural operations, it was suspected that the relatively dense housing in the main part of the village was responsible for these elevated *E. coli* levels. As mentioned earlier in the report, new sites were added in this area to try to pinpoint the source of the *E. coli* contamination. However, the results from the 2007 study show that the levels of *E. coli* in the Ompompanoosuc are elevated well before the river enters the village proper (around site C2). Referring to Figure 1, the level of *E. coli* jumps 35% from between site C and C1, but from site C1 through site I, the level of *E. coli* remains relatively constant.

As described previously, rain had a significant impact on the level of *E. coli* in the river. Since nearly all streams in Vermont have elevated *E. coli* levels during storm events, it can be helpful to segregate the data and examine the *E. coli* levels on dates without rain. Additionally, analyzing the flow is important in determining the type of *E. coli* source. Sources that are consistent regardless of flow, such as straight pipes into the river show up during low flows because there is less dilution. Sources that wash off the landscape are much higher during and after rainfall events since the rain acts to wash these into the river. Based on the geometric mean of *E. coli* levels on dates with out rain there is a consistent source of *E. coli* in or above West Fairlee.

Another way to look at this is a correlation between *E. coli* and rainfall intensity at each site. At the Sandy Beach and sites in Thetford there is a clear relationship between increasing *E. coli* levels with increasing rainfall intensity (see Figure 4). This indicates that the main source of *E. coli* in these areas is running off the landscape during rainfall events. At the uppermost site at Beaver Brook Rd there is also an increase in E. coli with rainfall but it is not as clear as it is in Thetford (see Figure 5). Finally, the Lake Fairlee Tributary has consistent E. coli levels across all rainfall intensities suggesting a consistent source of *E. coli* without rainfall (see Figure 6).

Based on the data from 2007, we do not yet have a better idea of any specific location of *E. coli* sources. The sampling data suggests a consistent source of *E. coli* near or above Site C, and increasing non-point source *E. coli* runoff through the town of West Fairlee. There are a number of possible sources including septic systems, manure runoff from hayfields, pasture land and barnyard runoff above site C, backyard runoff including pet waste, and natural wildlife sources. A hayfield along the river appears to be well buffered and not heavily spread with manure. Wildlife, while a possible source, are not likely the main source of *E. coli* and typically it is not an issue that can be addressed unless there is a large geese population or other similar groups. This leaves septic systems, suburban stormwater runoff, and pasture land as the most likely possible sources.

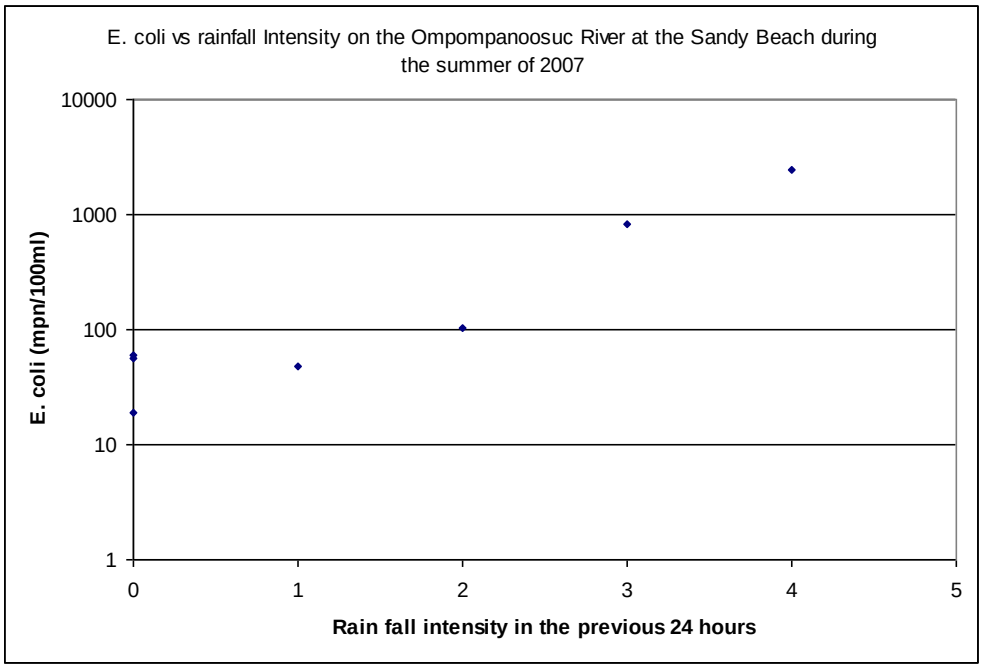


Figure 4: Relationship between E. coli *levels at the Sandy Beach at Union Village Dam and the amount of rainfall (0 = No Rain, 1 = Sprinkles, 2 = Light Rain, 3 = Moderate Rain, 4 = Heavy Rain).*

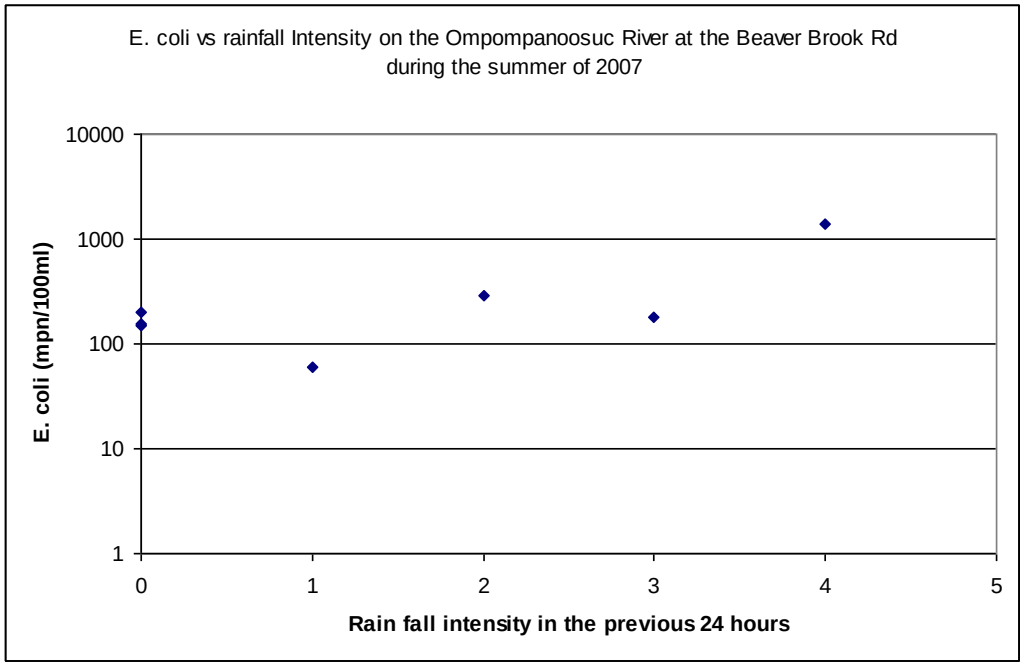


Figure 5: Relationship between E. coli *levels at Beaver Brook Rd. and the amount of rainfall (0 = No Rain, 1 = Sprinkles, 2 = Light Rain, 3 = Moderate Rain, 4 = Heavy Rain).*

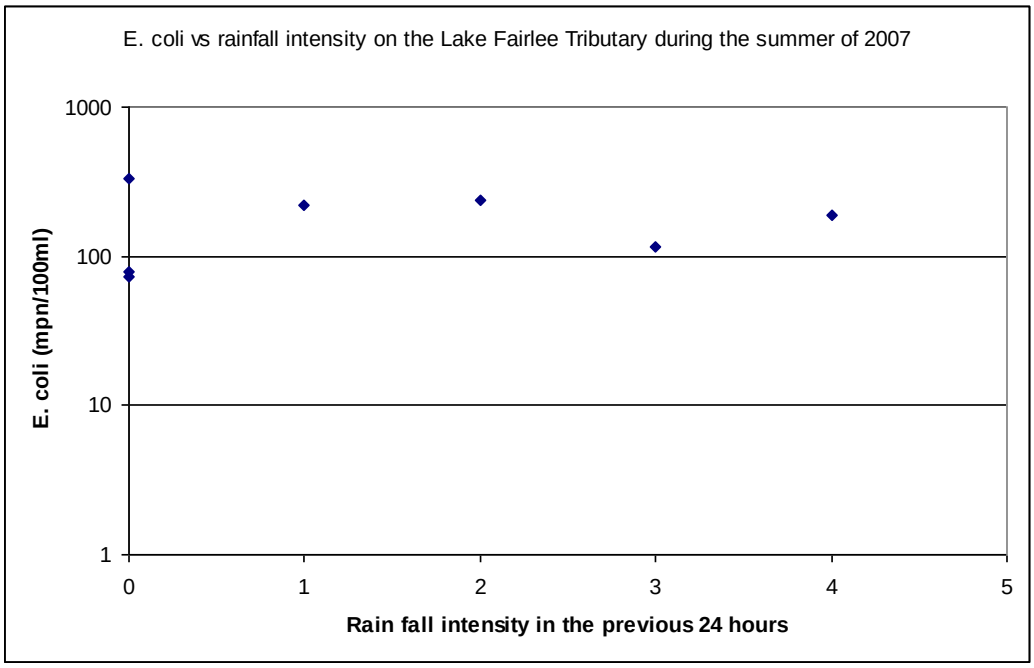


Figure 6: Relationship between E. coli *levels on the Lake Fairlee tributary and the amount of rainfall (0 = No Rain, 1 = Sprinkles, 2 = Light Rain, 3 = Moderate Rain, 4 = Heavy Rain).*

E. coli contamination could pose a significant health risk to swimmers. EPA studies indicate that a geometric mean value of 200 *E. coli* per 100 mL would cause 8 illnesses per 1000 swimmers. In addition, if high levels of fecal matter persist they would encourage growth of aquatic microorganisms and algae, resulting in increased water turbidity, reduced oxygen levels and an environment less suited to fish. Fish kills may even result from such increases in pollution, although dissolved oxygen levels measured during this study do not indicate levels low enough for this to occur.

5.2 *E. coli* – Summer 2006 vs. Summer 2007

Many of the trends observed in the Summer of 2006 were also seen in during the 2007 testing season. Figure 7 shows the geometric mean of the *E. coli* levels at all sampling sites for both years. Both years show elevated levels of *E. coli* in and around West Fairlee. While not all of the tributaries met the Vermont standard for *E. coli* contamination, the *E. coli* levels in these waters were significantly lower than those in the river during both years.

While the trend in the levels of *E. coli* are similar in 2006 and 2007, two sites sampled in 2007 had *E. coli* levels which appeared to be significantly higher than in 2006. This included the uppermost site, Site C, and the Lake Fairlee Tributary, Site H. The increase in *E. coli* at Site C is of particular importance because this is the uppermost site and complicates the picture of where the location of the source of *E. coli* is. In 2006 it appeared that the source of *E. coli* was in West Fairlee but the elevated levels this year suggests there is a source upstream of Beaver Brook as well. As for site H, a new beaver dam on the lake Fairlee Tributary may be a new E. coli source there.

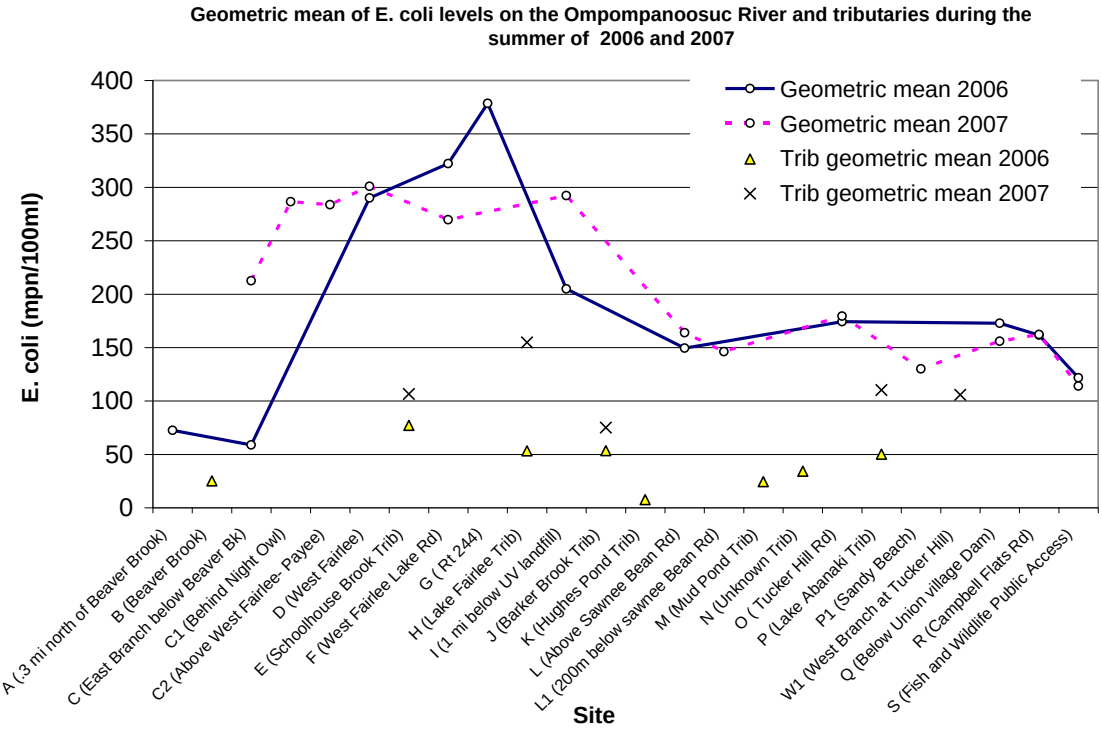


Figure 7: Comparison of E. coli *levels along the Ompompanoosuc River and some of its tributaries in 2006 and 2007.*

5.3 Temperature, Dissolved Oxygen and pH – Summer 2007

The water temperature measured in 2007 was within Vermont Water Quality Standards for Class B waters.

Extensive analysis of the levels of dissolved oxygen and pH were not possible due to the limited data. However the DO levels never dropped below the Vermont water quality standard and the pH was generally in the normal range.

5.4 Temperature, Dissolved Oxygen and pH – Summer 2006 vs. Summer 2007

A comparison between the two testing seasons is difficult because of the limited data. The water temperature in 2007 followed a similar trend as in 2006: increasing below the Lake Fairlee tributary and again in the backwater of the Connecticut River.

In 2006 in some areas of the river, the dissolved oxygen levels were below those ideal for trout, which require dissolved oxygen levels between 9 and 11 milligrams/liter for embryo and larval survival, (although adult trout can tolerate oxygen levels as low as 8 milligrams/liter without impairment). It is likely that this same trend continued in 2007. Decomposition of fecal waste may be one factor that reduces oxygen levels. Additionally, since oxygen becomes less soluble as the water temperature increases, warm temperatures may also contribute to lower dissolved oxygen values. The lack of a shading, forested buffer along much of the East Branch would allow the river to warm in the summer and therefore reduce the amount of dissolved oxygen.

6.0 RECOMMENDATIONS AND CONCLUSIONS

A review of the data by the project volunteers and officials from the Department of Environmental Conservation resulted in several recommendations for action items regarding the Ompompanoosuc River. Recommendations fall into two categories: recommendations based on specific data collected in the study, and general recommendations for future work.

In response to the measured *E. coli* levels found in the Ompompanoosuc River, the recommended actions are:

- Conduct a septic survey around West Fairlee, VT.
    - Survey should be conducted door-to-door to maximize the response rate
    - Solicit the assistance of respected, long-time village residents
- Conduct a windshield survey to located potential runoff sources of *E. coli* around West Fairlee, VT to explain high *E. coli* levels during rain events.

Recommendations for improving the temperature and DO of the river are:

- Provide more riverside shade (this would also help control erosion).
- Reducing nutrient levels and biological oxygen demand to increase the DO.

Additionally, there was a general consensus to apply for funding to begin an in-depth multi-year survey of the Eastern branch of the Ompompanoosuc. This survey would address issues such as erosion, riparian repair and invasive species removal.

In conclusion, with the help of volunteers from several citizens groups and officials from the state of Vermont, the health of the Ompompanoosuc River was monitored over a three month period. Through careful planning and quality assurance procedures, participants in this project feel that their data accurately reflects the river's current state. Though parts of the Eastern Branch of the Ompompanoosuc River were previously designated as impaired, data from this project indicates that the entire stretch of the river from West Fairlee to the Connecticut River may now fall under this category. High levels of *E. coli* were especially evident in the town of West Fairlee, VT and these levels dramatically increased after heavy rainfall. Measured temperature, pH, and dissolved oxygen levels in the river all fell within the range recommended by Vermont's Water Quality Standards although the records for these parameters are limited due a high number of equipment failures. However, some action is recommended to improve these parameters. Data from this study is being made available to the public and will be presented in an open meeting of the Ompompanoosuc River Watershed Council.

REFERENCES

Ompompanoosuc River Watershed Council, 2006. *Vermont General Quality Assurance Project Plan for Volunteer, Educational and Local Community Monitoring and Reporting Activities-Ompompanoosuc River Water Quality Sampling.* Submitted to the VT DEC June 2006.

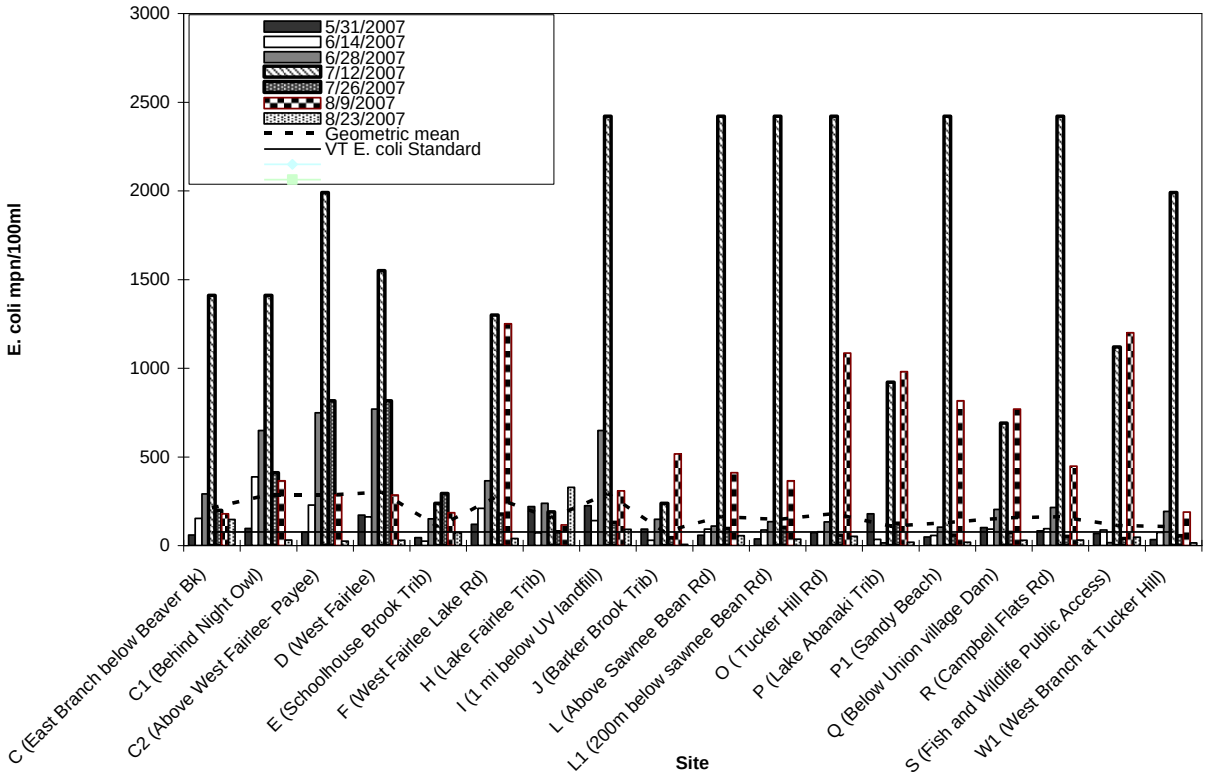
APPENDIX A – SITE DESCRIPTIONS

Site ID	GPS Location Latitude/Longitude		Site Description	Habitat
C	43.93772	72.26568	East Branch of the Ompompanoosuc River just below Beaver Meadow Rd. Downstream from Bridge (SE)	Cobble bottom. Farm upstream on left bank and forested buffer on right bank.
C1	43.92129	72.26260	East Branch of the Ompompanoosuc River behind the Night owl.	Sandy bottom, shallow (<2'), mostly open sandy banks, west side is Nite Owl (auto repair and towing, flat dirt parking lot), east side gentle slope mix of grass and trees
C2	43.91466	72.26214	East Branch of the Ompompanoosuc River on Corey Paye's property.	Sandy/cobble bottom, shallow (<1.5'), mostly shady by hardwood trees, west side gently sloping field, east side: short embankment to field used by cows in spring and summer
D	43.91002	72.26050	East Branch of the Ompompanoosuc River, 150 meters north of the Mill St Bridge. Site is accessed through private property down a trail to the river	Gravel/ sand bottom – Right bank open /residential, Left bank field. Small buffer both sides.
E	43.90702	72.26270	School House Brook in West Fairlee. Sample downstream of Rt 113 bridge from north side.	Cobble bottom, Steep gradient. Narrow shrub/forest buffer. Residential upstream
F	43.89687	72.25923	East Branch of the Ompompanoosuc River at Cross Road – north side of river (Upstream)	Mixed sand and cobble substrate. Open fields both sides with 25 foot forested buffer
H	43.88298	72.2559	Lake Fairlee Brook just above the confluence with the East Branch of the Ompompanoosuc River. Hike in through Post Mills Natural Area along the ridge to the confluence. Sample is taken about 40 feet from the confluence to prevent any water mixing.	Predominantly hemlock trees on each side of the river with steep banks. Open field on both sides of the river upstream, with the dump on the left bank and the airport on the right. Sandy and Cobble Bottom.
I	43.87032	72.26264	Ompompanoosuc River accessed from 921 Barker Road. Turn into the driveway of 921 Barker Rd and park at the second house. Hike down to the bottom of the field and there is a trail down to the river. Sample site is just below a bedrock outcrop.	Mixed Woodland with a predominance of evergreens. The river bottom has a lot of ledge here, with some smaller rocks, and there is a sand/silt 'beach' upstream of the site.
J	43.85963	72.27232	Barker Brook, on the upstream side of the Barker Brook Rd culvert-	High gradient stream with cobbles and large gravel. Steep wooded ravine with some housing on each side.
L	43.85120	72.25942	East Branch of the Ompompanoosuc River upstream from the Sawanee Bean Bridge. The site is accessed .4 miles from Rt 113 at the sharp corner with parking near the driveway with the mailbox "OAK". Follow a trail from the	Cobble Bottom with mixed forested buffer on both sides. Houses along Sawanee Bean road a few hundred feet from the stream and some farm land upstream.

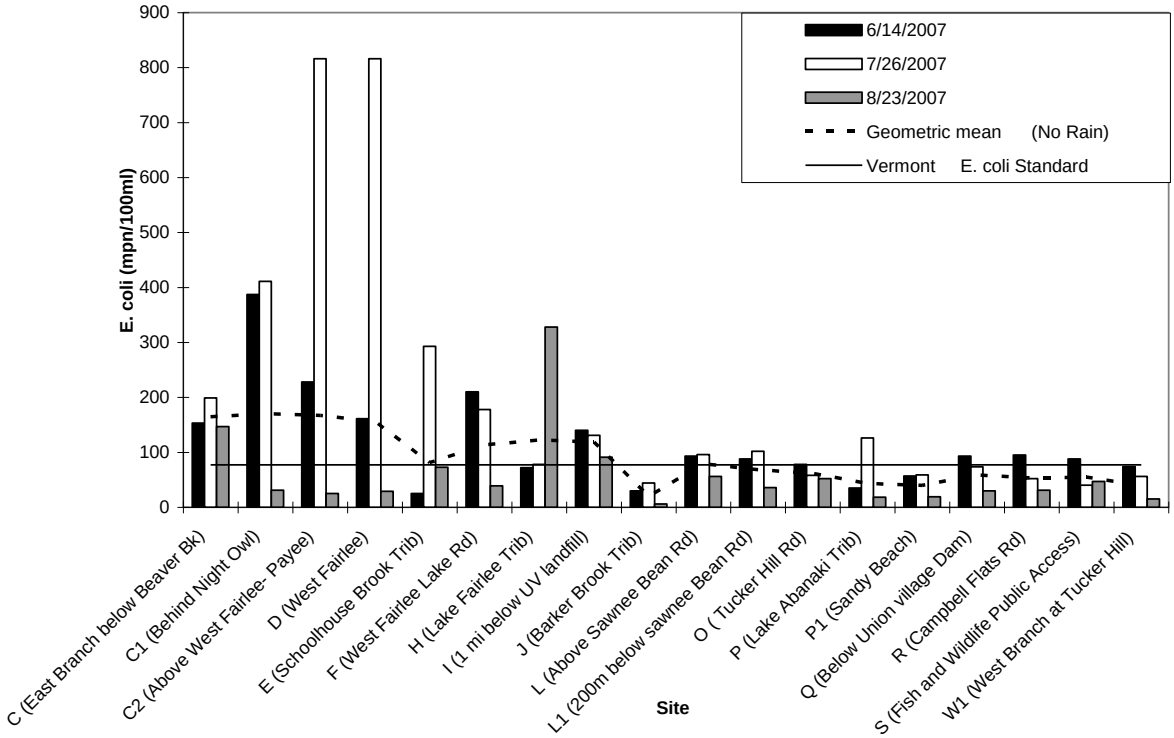
			corner down to the river. Two small boulders at side of road mark trail head.	
L1	43.83786	72.24940	East Branch Above Wetland between Sawanee Bean Bridge and Tucker Hill Rd	(TBD)
O	43.83182	72.25260	East Branch of the Ompompanoosuc River at Tucker Hill Road. West Side of the covered bridge just above the falls and about 100 feet down stream from the bridge.	Sandy Bottom- Residential and open farm land (currently no farm animals) with a shrub and forested buffer.
P	43.82603	72.24812	Lake Abenaki Tributary at the Buzzelle Bridge Road- upstream of the culvert.	Small cobble stream. Forested banks. Rte 113 upstream with some development
P1	43.82315	72.25054	Sandy Beach off of Buzzell Bridge Road. Sample site is a the upstream end of the site at rock outcropping.	Bedrock outcrop and sandy substrate. Heavily used recreation area and beach just downstream. Road and forest along the left bank upstream and meadow with shrub buffer on the right
Q	43.79093	72.25570	Ompompanoosuc River below Union Village Dam. Site is accessed from a trail which begins 100ft past the Army Corps gate and just below Avery Brook	A quarter mile below the outflow of the Union Village Dam. The site is forested on both sides but there is a field on the right bank and recreational use of the area.
R	43.77013	72.24580	Ompompanoosuc River from Campbell Flats Road 0.7 miles from Rt 132. This site is just before the road curves away from the river. Sample near white birch tree.	Sand and Cobble Bottom. Just above the confluence with the Connecticut River. Hay fields and residential on both side,s with horses and beef cow upstream
S	43.75517	72.23082	Ompompanoosuc River at the Department of Fish and Wildlife Access off of Rte 5 on Old Bridge Road. Sample from boat launch area.	Sandy Bottom. Residential, agricultural, and interstate upstream. Some forested buffer on both sides of river.
W1	43.82123	72.28642	West Branch at route 132 bridge crossing just below Tucker Hill Rd	River bottom, cobbles and some ledges. Banks, mixed woods, hemlocks, pines, Site is close to Rt 132, Tucker Hill Rd and Gove Hill Rd, which runs along W. bank at site.

APPENDIX B – E. *COLI* LEVELS AT ALL SITES

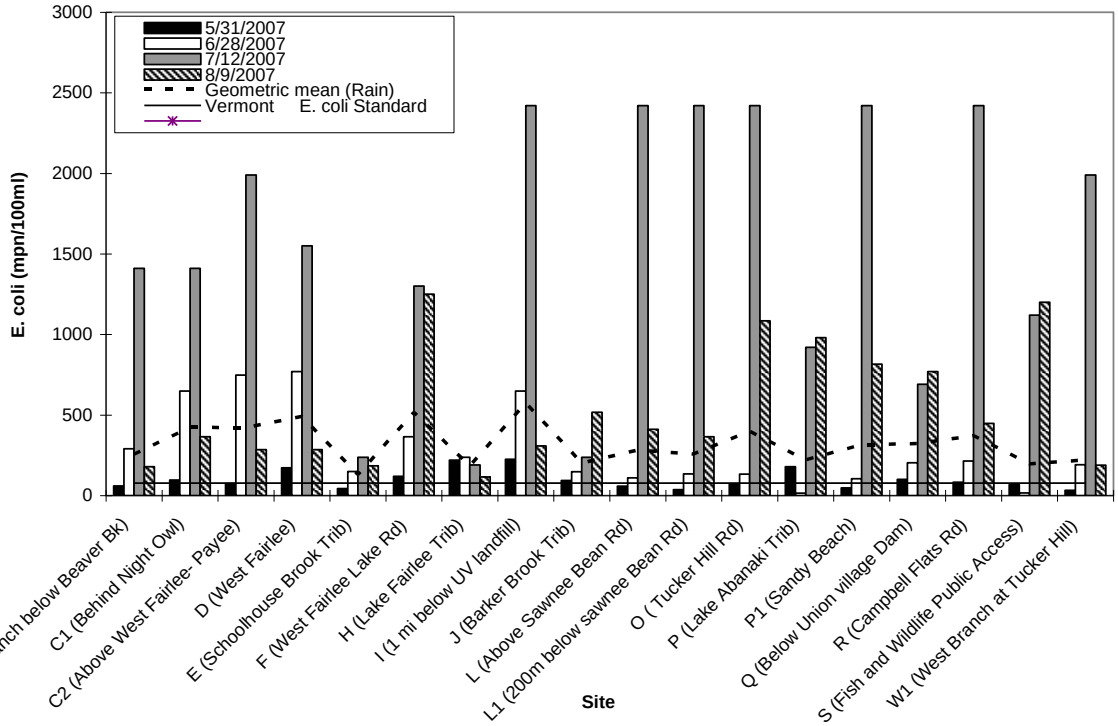
E. coli levels on the Ompompanoosuc River Spring 2007



E. coli levels on the Ompompanoosuc River during the summer of 2007 on dates with no rain in the previous 24 hours.



E. coli levels on the Ompompanoosuc River during the summer of 2007 on dates with rain in the previous 24 hours.



APPENDIX C – FIELD NOTES

5/31/07 West Fairlee -drizzling 60*F – Steady Flow (85 cfs) DO meter calibrated but not pH

Thetford – Overcast, light rain DO calibrated pH battery dead

Norwich – Drizzel, 63*F DO (9.3)and PH (9.68, 6.78, 3.77,end check by Pat)calibrated

6/14/07 West Fairlee NO Rain but Steady flow (98 cfs) DO cal & pH Cal. By Pat on Tues/Wend
Thetford – No rain in past 24 hours – sunny and clear, ph probe broken do cal @ 7:10 (10.2) and 8:46 (9.8)
Norwich – Drizzel in past 24 hours but sunny – Fast flow

6-28-07 West Fairlee –Rain in past 24 hours/Overcast, warm 68 Calibrated DO/pH meter broken Flow (53cfs)
Thetford –light rain in past 24 hours temp in mid 90s past 2 days. Lower slower flow. DO calibrated start 8.6 end 8.6
Norwich – Rain in past 24 hours/Overcast Calibrated DO & pH

7-12-07 West Fairlee – Rain in past 24 hours yes! Clear, Sunny Flow conditions fast, turbid. (311 cfs) DO Calibrated, pH meter would not work.

Thetford – Heavy rain daily for many days - Barre VT flooded yesterday (1 inch of rain). Sunny, very pleasant. Main stem: High, fast, muddy. Tribs: Somewhat higher and faster than past days, very clear. DO start 9.0 end 9.4.

Norwich – yes - torrential rain & T-storms last 2-3 days, Clear, sunny. Flow very fast very high DO pH Calibrated

7/26/07 West Fairlee – No rain in past 24 hours foggy. DO and pH meters not working (but pH used for temp) (61 cfs)
Thetford – No rain, sunny and pleasant Lower slower flow DO cal 9.0 8.9. pH Broken
Norwich – no Rain in past 24 hours, Clear weather

8/9/07 West Fairlee – Rain in past 24 hours, Clear and cool. No DO or pH flow (76 cfs)
Thetford – Rain in past 24 hours, Sunny, mild. Flow swifter than average. DO cal 9.2 pH calibrated. * COE employee also at site; said in addition to the extreme turbidity today, the river was an unusual green color, new today.
Norwich – Rain in past 24 hours, Mild and overcast. Flow Fast river low DO pH calibrated

8/23/07 Thetford – NO rain in past 24 hours. Overcast 59 degrees. Flow conditions (25 cfs)
Norwich –

APPENDIX D – *E. COLI* RESULTS

Table 2 E. coli levels at each site on each date of the sampling season as MPN/100ml. Numbers in bold are averages of duplicate samples

	5/31/2007	6/14/2007	6/28/2007	7/12/2007	7/26/2007	8/9/2007	8/23/2007	Geometric mean
C (East Branch below Beaver Bk)	59.5	153	291	1410	199	179	147	212
C1 (Behind Night Owl)	96	387	649	1410	411	365	31	286
C2 (Above West Fairlee- Payee)	75	228	**748.5**	1990	816	285	25	284
D (West Fairlee)	172	161	770	**1550**	816	285	29	301
E (Schoolhouse Brook Trib)	44	25	150	238	293	185	73	106
F (West Fairlee Lake Rd)	120	210	365	1300	178	**1250**	39	270
H (Lake Fairlee Trib)	**219.5**	72	238	190	78	116	328	155
I (1 mi below UV landfill)	225	**140**	649	2420	131	308	91	292
J (Barker Brook Trib)	93	30	**148**	238	44	517	6	75
L (Above Sawnee Bean Rd)	58	93	110	2420	96	411	56	164
L1 (200m below sawnee Bean Rd)	37	88	135	2420	**102**	365	36	146
O (Tucker Hill Rd)	73	78	133	2420	58	**1085**	52	179
P (Lake Abanaki Trib)	179	35	15	921	126	980	**18.5**	110
P1 (Sandy Beach)	48	57	104	2420	59	816	19	130
Q (Below Union village Dam)	**100.5**	93	204	691	**73.5**	770	30	156
R (Campbell Flats Rd)	83	**95**	214	2420	52	**448**	31	162
S (Fish and Wildlife Public Access)	68	88	**16.5**	1120	40	1200	**47**	114
W1 (West Branch at Tucker Hill)	33	74	192	**1990**	56	189	15	106