Huntington River Study Summer 2006

02/07/07

Summary

The Huntington River Study measuring Escherichia coli (E. coli) took place once again this past summer. Evaluation of the Huntington River by the Huntington River Conservation Commission began in 2002, sampling the river within the Town of Huntington. This year (2006) the study was extended to cover the Richmond segment of the river. Additional samples were taken in the Richmond section of the Winooski River. Forty five volunteers, 20 from Huntington and 25 from Richmond, covered 16 regular sites along the Huntington River, plus additional sites for spot checks and for duplicate samples to check accuracy, totaling 216 samples. Very few samples were missed, testimony to the commitment of all the samplers and their backups. Clearly, many in our Towns are committed to the water quality of the river. E. coli bacteria serve as a marker of fecal contamination. This bacterium is considered the best sentinel for human pathogens, but does not necessarily itself cause human disease. Over time and also distance along the river, levels of E. coli varied widely along the river with occasional extremely high values recorded. Adjusting for an abnormal distribution of results, evidence was found for a significant increase in E. coli counts between the first sample site (Sheldrake) and the last (Cochran Bridge). These bacteria do not survive well outside the intestine, and so there is likely to be significant loss of viability as they travel down the river. More E. coli organisms, therefore, are likely to have been added as one moves down the river than was observed from the actual counts. The literature, however, does not point to additional risk as one moves downstream, as might come from pathogenic organisms that retain their viability. Values at the same site on different sampling days and between adjacent sites on the same day were highly variable arguing against a chronic, regular source of contamination. The level of contamination in 2006 was significantly correlated with water level on the sampling day, though no cause and effect relationship has been established. Certain sites (Brace Bridge, Dugway West) appear to be particular hot spots, warranting additional scrutiny in future studies. The data also suggest the importance of further monitoring of certain feeder streams such as Owls Head Brook. The level of contamination exceeded Federal Standards in 8.8% of the samples. State standards, the most stringent nationally, were exceeded in 26.4%, although the State standard also has been exceeded in mountain streams considered to be pristine. Volatility in the numbers from week to week at the same site and between adjacent sites indicates that the level of contamination may change rapidly, limiting the usefulness of weekly postings. However, seasonal postings would appear warranted at sites where contamination routinely is high during periods of high water.

A detailed summary has been posted on:

http://www.gmavt.net/~aaronw/ecoli.htm

Introduction

The Huntington River Study measuring Escherichia coli (*E. coli*) took place once again this past summer. Evaluation of the Huntington River by the Huntington River Conservation Commission began in 2002, sampling the river within the Town of Huntington. This year (2006) the study was extended to cover the Richmond segment of the river. Additional samples were taken periodically in the Winooski River.

This study was underwritten by a LaRosa Environmental Partnership Program grant from the Vermont Department of Environmental Conservation (VTDEC) to cover the actual costs of the laboratory testing itself.

Sixteen sites along the river were sampled on a regular weekly schedule (**Figure 1**). Criteria for site selection included accessibility and landowner permission, the location of swimming holes, the locations of feeder streams and even distribution along the river. These sites also cover a variety of terrains and land uses, from forest lands to active farms to medium-density housing. Several other sites also were spot-checked based on previous studies as well as ongoing results during the sample season. Samples were taken each week, from July 20 through September 19. Generally collected on Tuesday mornings between 6:45 and 7:15 AM, samples immediately were delivered to the Waterbury testing lab at the VTDEC for analysis.

Throughout the survey, certain rigorous steps were taken to assure the quality of samples taken. For example, sample collection location and time of day collected were consistent. Sample bottles were handled with stringent care to avoid (human) contamination. Samples were taken up-stream of the sampler, whenever possible at mid-depth. Ten percent of the samples were field duplicates to assess the accuracy of the sampling process (see below). All samples were transported on ice to the testing lab in Waterbury well within required time.

Table 1 and Figure 2 present the raw data. Also shown in the table are data regarding river level taken at 1500 East Street as well as summary data regarding general characteristics of the results (geomean and median: more about these below). A total of 216 samples were part of the regular sampling series, plus an additional 20 from the Winooski River. As part of a regular quality check, 27 additional duplicate samples were taken (same person, same time, same exact location) as a field check of laboratory accuracy. These data also are invaluable in trying to determine how samples from separate locations are different from one another. Finally, 37 additional samples were taken at sites scheduled periodically over the sampling period.

Very few scheduled samples were missed. This is testimony to the commitment of all the volunteers (20 from Huntington, 25 from Richmond) and their backups who took part in the study (see appendix for a list). Many citizens in our Towns clearly are committed to the water quality of the river.

It also is apparent that the results are not normally distributed (think statistics and a bell-shaped curve). In several cases, there were extremely high values (highest was for Dugway West the week of September 5). It is very unlikely, for a number of reasons, that

these high numbers represent measurement error. Much more likely is that these high results are telling us about potentially serious sources of bacterial contamination that need to be followed more closely as these studies continue. This could include such sources as overflowing beaver dams, sporadically ineffective septic systems or agricultural runoff. In any case, the skewed nature of the data requires special kinds of analysis from a data description point of view. The standard method in the water quality field is to calculate the Geometric Mean (geomean: see appendix for details). An alternative workhorse is to calculate median values (half of the measurements are above and half are below the median).

Measuring E. coli

The method used to measure *E. coli* is specific to it. *E. coli* is an indicator (sentinel) for dangerous contamination. Its presence indicates human and / or animal fecal contamination and the possible presence of unidentified human pathogens. However, the *E. coli* species measured is NOT specific for pathogenic *E. coli* but rather the species in general. Other species of *E. coli* do not make humans sick, just the pathogenic forms.

The method used by the VTDEC Laboratory is based on using a color reaction to measure the activity of a key enzyme found in all $\it E.~coli$ species, $\it \beta-D-galactosidase$. It assumes that all $\it E.~coli$ measured have the same amount of this enzyme. A multi-well procedure is used in which 100 ml of sample is distributed into individual wells. Color indicating enzyme activity is measured after the samples have been incubated at 35 degree centigrade (a bit below body temperature) using a color reference comparator. The data are then converted to MPN units (Most Probable Number). Data are reported as the number of organisms per 100 milliliters (ml) of water.

For quality assurance purposes, the State Laboratory requires that certain accuracy standards be met in the field check samples. When fewer than 25 colonies of *E. coli* are measured in a specific single sample, the relative percent difference (RPD) cannot exceed 125%. The threshold when more than 25 colonies are measured is 50%. RPD is the difference between the two samples divided by the average of the two, expressed as a percentage. This level of variability needs to be considered when evaluating results from individual sites.

Additional field checks involve taking duplicate samples (same person, time, location) which also have to meet stringent criteria. Results from analyses of duplicate field samples from the 2006 study are presented in <u>Table 2</u>.

With that in mind, there are both Federal (Environmental Protection Agency) and State (Division of Water Quality) Standards for water quality in terms of bacterial contamination. The unit of measure is the Most Probable Number (MPN) of organisms per 100 milliliters of water. The Federal Standard is 235 as an absolute value or a geometric mean (geomean) of 126. The State figure is 77 for a single sample. The more stringent State standard supersedes the Federal one. According to State documents, a level of 77 indicates that one can be 75% certain that 3.4 persons in 1000 will get sick. VTDEC scientists have required a geomean of over 77 over at least five samples in a season before considering streams impaired in terms of water quality.

Vermont's standard is the most stringent in the country and is based on a mix of scientific and political considerations. While the State would consider sites above 77 to be unsafe for swimming, it also is known that undisturbed and unaltered mountain streams can carry an *E. coli* burden that exceeds 77. Furthermore, the EPA considers illness rates of 8 or less per 1,000 to be indistinguishable from the normal, background rate of gastrointestinal illness. The State Water Quality Division currently is re-assessing the cut-off level of 77.

The literature strongly suggests that it is extremely difficult for *E. coli* to live outside the intestines for any length of time. Even factors like sunlight affect viability (which is a reason why all samples were taken in the morning). This is very important to bear in mind as one compares data from different points in the river. Bacteria from an upstream site may die before reaching the next downstream site. Therefore, *E. coli* levels are unlikely to be cumulative as one proceeds downstream. This is demonstrated when downstream sites have lower levels of *E. coli* than sites upstream.

Analysis

Table 3 shows the dates and sites that were measured to be above the Federal (Pink / dashed) or State (Pink plus yellow / speckled) Standard for contamination. These are raw data, so the federal standard of 235 and the State Standard 77 applies as a single sample, not the mean. The federal Standard was exceeded in 8.1% and the State Standard in 24.2% of the samples. These principally were clustered on three sample days (6/20, 6/27, 8/1). Inspection of the data suggests these high values are associated with high water levels.

Indeed, perhaps the most striking observation was the very strong correlation in 2006 (p < 0.002, 2-tailed test) between water level and contamination (**Figure 3**). A correlation, of course, does not establish a cause-and-effect relationship. Much in the sense that the *E. coli* measurement itself is a surrogate for potential presence of pathogens, water level (at least for 2006) would appear a good indicator of increased contamination. At least for 2006, there was more contamination when water levels were high. There could be many causes for this, including increased land runoff, overflowing beaver dams or overflowing septic systems. Thus, the safety conscious should be more wary when water levels are high.

The relationship between water level and contamination in 2006, held pretty well for the individual regular sample sites (<u>Figure 4</u>). The relationship in several cases was much less clear when *E. coli* values were very high (e.g. Sheldrake, East Street). The relationship especially was strange at Dugway West. More is said about this site below.

This relationship between water level and contamination was not consistent. For example, water level was quite high on July 5, yet contamination was uniformly low. River height remained high after some 1.7 inches of rain June 30 to July 2 (**Figure 5**). The lack of any rain July 2-4 may have allowed contamination to taper while the river was still subsiding.

Historically, the relationship between contamination and water level has been less clear. The data from the 2003 Huntington segment study suggested an inverse relationship. This

was less clear for 2004, while the generally higher water levels in 2005 supported the 2006 finding.

<u>Figure 6</u> shows an upward trend in the geomean data for the season as one progresses down the river. Such a trend is less apparent when median data are plotted (<u>Figure 7</u>).

A Sign Test was performed to determine if the most downstream value (Cochran Bridge) was higher than the most upstream (Sheldrake) over the sampling period $\underline{\textbf{Table 4}}$). The result (p = 0.01) supports the claim that the distribution of $E.\ coli$ counts was higher at Cochran Bridge. However, some caution is required, since on three dates, the difference in values was very small (less than 10 MPN).

This finding indicates that *E. coli* contamination was being added as one proceeded downstream. The actual measurements as one moved downstream almost certainly are an underestimate of added contamination, since as mentioned before, there is a very high likelihood that a significant number of *E. coli* added to the river did not survive for long during their down stream journey. We simply do not know about the viability of other organisms, some of which may be pathogenic. Indeed, the literature does <u>not</u> point to additional risk as one moves downstream, risk such as might come from pathogenic organisms that retain their viability.

All of the geomean values for the entire data sets for each site were considerably below the Federal Standard. However, five of the geomean values were above the State Standard of 77, the highest being 101.9 for Dugway West. The figure comes in under the Standard if the highest value (1730) is dropped. Whether several of the higher values are statistically higher than the State Standard is unclear: the aforementioned RPD for the group of samples had an average error of 22%. Similarly, values just below the State Standard may actually be above it.

According to Federal and State practice, geomeans are to be applied to sets of 5 samples taken within a period of 30 days. This constraint fits the 2006 sampling well geomeans over five consecutive sampling dates on a rolling basis through the sampling period. **Table 5** shows application of this 5-sample method over the first five weeks of the 2006 study, the 5-week period over which levels were highest. In this case, none of the geomean values exceeded Federal, while all of them exceeded State levels.

These same geomean data may contain important clues with regard to sources of contamination. For example, it looks as if there were two spikes in the measurements as one moved downstream. One was at Brace Bridge, the second at Dugway West.

The Dugway West data are interesting. For 11 of 14 weeks, the Dugway West number was higher than the preceding one. The aforementioned statistical Sign Test indicated that values at Dugway West were significantly higher than at the upstream site immediately above (Moultroup Bridge; p = 0.016). Again, caution is required in interpreting this finding since in this case 7 of the paired values were different by less than 10 organisms per 100 ml.

Noteworthy, for the two very high results at Dugway West, results were markedly reduced by the next site downstream. Importantly, a major feeder stream, Owls Head Brook, comes into the Huntington River immediately upstream from the Dugway West site.

One possible explanation of the rapid drop in values is that, at certain times, Owls Head delivers contaminated water to the Huntington as measured at the Dugway West site, and the contamination is diluted out shortly thereafter. Though *E. coli* viability also may be a contributor, it seems unlikely that viability could explain such a large drop.

One attempt was made on the last sampling date (Sept 19) to assess possible contamination from Owls Head Brook. Samples were taken in the Brook, just upstream from where it enters and as usual at Dugway West. These numbers were all very low and unremarkable, but that may well be because water level was low: the values for the whole river were well under State Standard. Owl's head Brook certainly will bear careful monitoring in the coming year.

Based on the extent of use, perhaps the Gorge becomes an important sampling site (<u>Figures 3 and 4</u>). Samples were taken some 100 yards down from the main pool at the base of the falls. The highest value was for the week of June 27 when water level was at its highest over the study period. That was the only time when contamination was above Federal Standard, while the State level was exceeded on a total of seven occasions (and tied once). There was a fairly clear relationship between water level and contamination.

Figure 8 shows that there also is a significant inverse correlation between geomean $E.\ colivative conductivity taken at the Horseshoe Bend swimming hole in Huntington (p < 0.001). That is, as geomean values increase, conductivity decreases. Conductivity is a measure of the ability of a fluid to conduct electricity (or heat): it is the reciprocal of resistivity or resistance. This means, in addition, that there is an inverse correlation between water conductivity and water level ($ **Figure 9**; p < 0.001). A major determinant of conductivity is the concentration of ions in the water. It is thought that immediately antecedent rains, having relatively low conductivity, dilute the normal ion concentration of river water more than either particulates, bacteria or other elements have added to it. Again, correlations do not prove a cause and effect relationship.

Surveying the data, it is clear that contamination levels can change markedly over a week's time. This could be due to a number of factors. For example, as described above, it is difficult for *E. coli* to live outside the intestines for any length of time. Just as for a swimming pool, the level of contamination (water) is determined by how much is coming in and how much is leaving. Two key variables regarding what is leaving are water flow and the rate of organism dying. In any case, a reasonable interpretation of the pattern of contamination suggests that ongoing contamination at an unsafe level is not occurring.

The variability between weeks makes the possibility of point contamination from such sources as failed (or no) septic systems less likely, as that contamination should be more steady. As well, one might predict such contamination would lead to higher values when water levels are low (less dilution), the opposite of what was seen in 2006.

At the same time, there are other explanations. For example, "point sources" may exist that are triggered by high water, even natural ones such as beaver dams.

Also quite variable in several cases was the difference in values at adjacent sites along the river. This is best exemplified by the striking fall at two sampling dates between a very high value at Dugway West and the next value at Yaggy a relatively short distance further on. Factors that might explain this are described above. They suggest that an upstream measurement is not always a good indicator of what will be found further down stream.

Overall, results from the 2006 season were some of the best we've seen in 4 years of rigorous sampling. Reasons for the improved water quality this year are still being evaluated and discussed, and answers are likely to only come with further sampling.

Floating Sites.

Table 6 shows results from sites that were sampled once a month or spot checked through the survey period (floating sites). The purposes here included sampling feeder streams and locations identified as possible hot spots. In past years, Floating Sites have been used to further investigate areas found to have high bacteria levels during a previous sample round. Typically, floating samples are used to "bracket" upstream and downstream of high locations in an effort to refine source locations. Floating sites were not heavily used in 2006, primarily due to the overall low bacteria levels. Monthly sampling was continued on major tributaries to the Huntington River. These tributaries have been regularly monitored once a month in past sample seasons. In addition, a few upstream sites (such as 7 Falls) that were dropped from weekly monitoring in 2006 were added to the monthly sample schedule.

The Winooski River

As the summer survey progressed, interest grew in sampling the Winooski River. Two sites were selected: The Jonesville Bridge (just upstream from where the Huntington River enters, tree rope side); and the Bridge Street Bridge (at Volunteers Green). Many predicted that Winooski values would be quite high, given the river's history as the valley's sewer. As shown in **Table 1**, Winooski River values generally were slightly higher than those for Cochran Bridge, just upstream from where the Huntington enters the Winooski) though this was not universally the case. The Federal Standard was exceeded twice and State Standard four times at these two Winooski River sites.

The values for August 22 were abnormally high. It is unlikely the numbers are in error, given what is known about the accuracy of the sampling and assay. Rather, it would appear likely that the contamination came from upstream. Noteworthy in this regard is that there was heavy rain (2.5 inches in Jonesville) two days before.

Unfortunately, it appears that there has been no ongoing sampling of the Winooski in our area during the Huntington River surveys or in the recent past.

Human Health

A key question for many is what are safe levels of bacterial contamination. *E. coli* has been used as a sentinel for potentially dangerous bacterial contamination. In this study, there are no records indicating that dangerous (pathogenic) *E. coli* is present due to the fact that the appropriate measurements have not been made to assess the presence of pathogenic strains. These are much more difficult, time-consuming and expensive tests than those done in the studies to date.

A key issue regards when it is appropriate to post warnings at sites that are contaminated above Standard. All sites on certain dates provided values below the State Standard (<u>Table 3</u>). However, all sites at one point or another also had higher values than the standard. The difficulty of posting results once known is that they are out of date, with a good likelihood that, by posting date, they are below the Standard (see <u>Table 3</u>). It would appear more appropriate to provide a general posting indicating contamination levels may be above standard when water levels are high (see Figure 2) especially for those sites where this especially has been found so far to be true. The issue here is whether a "threshold" water level can be established for warning purposes.

Finally, one always must remember that *E. coli* is serving as an indicator (sentinel). There is no assurance that when *E. coli* levels change dramatically that true pathogens change in parallel fashion.

Human health, of course, is a relative term. For example, the risk of death from bacterial contamination is less than getting a serious case of the flu. It also depends on the individual actions of swimmer. Ingesting river or pond water anywhere significantly increases the risk of illness.

The Future

Continued surveys of the Huntington River are essential to understanding safety issues related to bacterial contamination. These are necessary to establish the level of hazard as well as the causes of contamination. Results to date indicate that it will be difficult to support a conclusion regarding hot spots from a statistical point of view, absent a much larger data set. The relationships between rainfall, water level and contamination require confirmation. The identification of possible "spot" sources and their contributions during high and low water represent work in progress. Potential new trouble spots in the Richmond segment need to be confirmed and the survey of feeder streams added. Measurements to determine whether contamination is of animal or human origin or whether pathogenic *E. coli* are present, must be contemplated. A more complete survey of the Winooski River also is desirable. Mechanisms need to be put in place to warn the public about high water levels at least at certain sites, and a publicly accessible source of up-to-date water level data be made available.

Best practices for clean, safe river waters require everyone's continuing attention, behavior and support.

HUNTINGTON RIVER STUDY 2006

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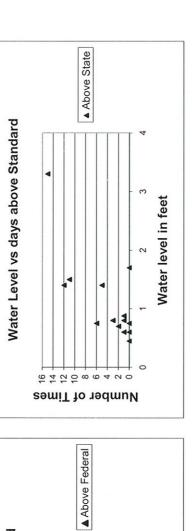
Huntington River Study 2006 Main Sites	Study 2	006 Main	Sites												
Location	20-Jun-06	27-Jun-06	5-Jul-06 11-Jul-06	11-Jul-06	18-Jul-06	25-Jul-06	1-Aug-06	8-Aug-06	14-Aug-06	22-Aug-06	29-Aug-06	90-daS-9	12-Sep-06	19-Sep-06	19-Sep-06 GEOMEAN
Sheidrake	114	116	56	178	48	20	130	32	10	39	22	14	24	19	42.9
Shaker Mountain	152	179	56	62	09	58	64	19	18	7.1	22			12	48.6
Brace Bridge	98	248	43	6/	40	102	156	687	99	156	36	09	21	20	8'2/2
Spence Bridge	125	186	28	88	125	99	248	61		137		98	32	9	0.99
East Street		172	38	61	179		110	22	22	79	31	28	22	43	55.3
Bridge Street	130	228	25	69	201	22	131	61	18	78	26	97	14	28	57.2
Cemetary	144	214	55	52	172	69	114	83	22	72	28	20	15	22	55.3
Audubon Horseshoe	179	387	49	36	118	82	214	45		81	58	22	18	18	65.2
Audubon Hemlock	112	387	20	99	145	111	140	69	23	96	20	37	17	13	58.7
Moultroup Bridge	186	308	48	28	91	55	172	51	22	167	25	20	13	12	51.7
Dugway West	192	461	55	161	93	63	1410	52	36	107	22	1730	9	44	101.9
Yaggy	173	461	09	140	105	98	172	49	21	102	51	133	12	49	79.9
Gorge	193	326	86	138	88	74	150	51	18	88	31	77	15	34	70.9
Triple Buckets	291	387	98	210	99	72	145	41	11	121	16	19	13	28	64.8
Chalet Trail	365	313	91	108	69	62	96	42	17	102	19	38	11	22	58.8
Cochran Bridge	411	461	72	130	55	-	219	36	20	96	20	99	24	43	74.0
Winooski Jonesville					105	172	124	63	30	1550	101	63	142	14	98.2
Winooski Bridge St					29	121	114	89	18	086	86	72	105	12	8'62
GEOMEAN wo Winoost	172.7	280.2	56.1	87.2	91.8	69.3	165.0	55.3	20.7	94.3	26.6	49.4	15.9	22.4	
GEOMEAN AII	172.7	280.2	56.1	87.2	6.06	75.9	159.1	56.4	21.0	125.4	31.1	51.3	20.3	21.1	
Conductivity	93	44.9	06	120.2	115	103.8	79.5	111.9	129.3	87.5	117.4	124.5	127	131.5	
Water Temp (deg C)	15.8	16.8	16.8	18.8	19.8	17.6	19.6	18.6	13.8	13.8	17	15.7	9.7	17.5	
Water Level ft (stake)	1.5	3.3	1.7	0.75	0.8	0.88	1.4	0.8	9.0	1.4	0.75	0.7	9.0	0.45	
Water Level (vertical)	1.1	2.45	1.26	0.56	0.59	0.65	1.04	0.59	0.45	1,04	0.56	0.52	0.45	0.33	

Table 2

Logation	B);}{a	r (equiles	77.77.03s	(# 14 (# (# (# (# (# (# (# (# (# (# (# (# (#
Moultrop Bridge Duplicate	20-Jun-06	114	48	72
Moultroup Bridge	20-Jun-06	186	-10	T dua
Cemetary	27-Jun-06	214	3.8	8
Cemetary Duplicate	27-Jun-06	206	0.0	<u> </u>
Lower Gorge	27-Jun-06	387	6	24
Lower Gorge Duplicate	27-Jun-06	411	0	<i>∠</i> ¬т
Spence Bridge	27-Jun-06	186	20.3	42
Spence Bridge Duplicate	27-Jun-06	228	20.5	74.
Gorge Grade Duplicate	5-Jul-06	98	36.1	30
Gorge Duplicate	5-Jul-06	68	30.1	30
Shaker Mtn.	5-Jul-06	56	28.6	14
Shaker Mtn. Duplicate	5-Jul-06	42	20.0	17
Chochran Br Duplicate	11-Jul-06	152	15.6	22
Cochran Bridge	11-Jul-06	130	10.0	<i>LL</i>
	18-Jul-06	91	5.3	5
Moultroup Bridge Moultroup Bridge Duplicate	18-Jul-06	96	3.3	3
Brace Bridge	25-Jul-06	102	37.2	32
Brace Bridge Duplicate	25-Jul-06	70	01.2	V4
Cemetary	25-Jul-06	59	25.2	17
Cemetary Duplicate	25-Jul-06	76	20.2	11
	25-Jul-06	86	29.3	22
Yaggy Duplicate	25-Jul-06	64	2.9.0	22
Dugway West	1-Aug-06	1410	20.4	320
Dugway West Duplicate	1-Aug-06	1730	20.4	320
Shaker Mtn.	1-Aug-06	64	65.3	62
Shaker Mtn. Duplicate	1-Aug-06	126	00.0	02
Cemetary	8-Aug-06	83	20.5	19
Cemetary Duplicate	8-Aug-06	102	2.0.0	10
Chalet Trail	8-Aug-06	42	15.4	7
Chalet Trail Duplicate	8-Aug-06	49	10.4	1
Triple Buckets	8-Aug-06	41	4.8	2
Triple Buckets Duplicate	8-Aug-06	43		
Audubon Horseshoe	14-Aug-06	19	31.1	7
Duplicate	14-Aug-06	26	V1.1	'
Chalet Trail	22-Aug-06	102	0	0
Chalet Trail Duplicate	22-Aug-06	102		
Spence Bridge	22-Aug-06	137	19.7	30
Spence Bridge Duplicate	22-Aug-06	167		
East St. Duplicate	29-Aug-06	24	25.5	7
East Street	29-Aug-06	31		
Cemetery	5-Sep-06	20	26.1	6
Cemetery Duplicate	5-Sep-06	26		
East St. Duplicate	5-Sep-06	43	15	6
East Street	5-Sep-06	37		
Brace Bridge	12-Sep-06	21	100	14
Brace Bridge Duplicate	12-Sep-06	7		
East Street	12-Sep-06	22	9.5	2
East Street Duplicate	12-Sep-06	20		
Moultroup Bridge	12-Sep-06	13	7.4	1
Moultroup Bridge Duplicate	12-Sep-06	14		
Spence Bridge	19-Sep-06	6	58.8	5
Spence Bridge Duplicate	19-Sep-06	11		
Triple Buckets	19-Sep-06	28	7.4	2
Triple Buckets Duplicate	19-Sep-06	26		
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Huntington River Study 2006 Measurem	liver Study	, 2006 Me		ents Above	ve Feder	Federal and Stae Standards	tae Stanc	lards							
	20-Jun-06	27-Jun-06	90-Inf-9	11-Jul-06	18-Jul-06	25-Jul-06	1-Aug-06	8-Aug-06	14-Aug-06	22-Aug-06	29-Aug-06	90-daS-9	12-Sep-06	19-Sep-06	
GEOMEAN	172.7	280.2	56.1	87.2	6.06	75.9	159.1	56.4	21.0	125.4	31.1	51.3	20.3	21.1	
Water Level ft (stake)	1.5	3.3	1.7	0.75	8.0	0.88	1.4	8.0	9.0	1.4	0.75	0.7	9.0	0.45	
Water Level (vertical)	1.11	2.45	1.26	0.56	0.59	0.65	1.04	0.59	0.45	1.04	0.56	0.52	0.45	0.33	
Huntington ONLY															
Above Federal	3	10	0	0	0	0	2	1	0	2	0	1	0	0	19
%	20.0	62.5	0.0	0.0	0.0	0.0	12.5	6.3	0.0	0.0	0.0	6.7	0.0	0.0	
Above State	11	15	0	9	3	1	12	1	0	5	0	2	1	0	22
%	73.3	93.8	0.0	37.5	18.8	0.0	75.0	6.3	0.0	18.8	0.0	13.3	0.0	0.0	

	20-Jun-06	27-Jun-06	90-InC-3	11-Jul-06	18-Jul-06	25-Jul-06	1-Aug-06	8-Aug-06	14-Aug-06	22-Aug-06	29-Aug-06	5-Sep-06	12-Sep-06	19-Sep-06	19-Sep-06 GEOMEAN	Median
Sheldrake	114	116	56	178	48	50	130	32	10	39	22	14	24	19	42.9	43.5
Shaker Mountain	152	179	56	79	09	58	64	19	18	71	22			12	48.6	29
Brace Bridge	98		43	79	40	102	156 N	687	99	156	36	09	21	20	77.8	72.5
Spence Bridge	125	186	28	88	125	99	(SAS	61		137		36	32	9	0.99	77
East Street		172	38	61	179		110	55	22	79	31	37	22	43	55.3	49
Bridge Street	130	228	22	69	201	57	131	61	18	78	26	26	14	28	57.2	29
Cemetary	144	214	22	52	172	69	114	83	22	72	28	20	15	22	55.3	22
Audubon Horsesho	479		49	36	118	82	214	45		81	58	22	18	18	65.2	28
Audubon Hemlock	112		20	26	145	111	140	59	23	96	20	37	17	13	58.7	57.5
Moultroup Bridge	186		48	28	91	55	172	51	22	167	25	20	13	12	51.7	49.5
Dugway West	192	A STATE OF THE STA	55	161	93	63		52	36	107	22	1/4884//	9	44	101.9	78
Yaggy	173	A CONTRACTOR OF THE PROPERTY O	09	140	105	86	172	49	21	102	51	133	12	49	79.9	94
Gorge	193		86	138	88	74	150	51	18	88	31	77	15	34	70.9	82.5
riple Buckets			98	210	56	72	145	41	11	121	16	61	13	28	64.8	66.5
Chalet Trail	365		91	108	69	62	96	42	17	102	19	38	11	22	58.8	65.5
Cochran Bridge			72	130	55		219	36	20	96	20	99	24	43	74.0	99
Winooski Jonesville					105	172	124	63	30	4550	101	63	142	14	98.2	103
Winooski Bridge St					29	121	114	89	18	ARC I	98	72	105	12	79.3	85
	15	16	16	16	16	14	16	16	14	16	15	15	15	16		
	Totals	% Above Federal	leral	8.8	% Above State	ite	26.4									



Water level in feet

Water Level vs Days above Standard

Number of Times

TABLE 4

Huntington River Study 2006: Sign Text

Date	Sheldrake	Cochran	Moultroup	Dugway W.	C - S	D - M
20-Jun	114	411	186	192	297	6
27-Jun	116	461	308	461	345	153
6-Jul	56	72	48	55	16	7
11-Jul	178	130	28	161	-48	133
18-Jul	48	55	91	93	7	2
25-Jul	50		55	63		8
1-Aug	130	219	172	1410	89	1238
8-Aug	32	36	51	52	4	1
14-Aug	10	20	22	36	10	14
22-Aug	39	96	167	107	57	-60
29-Aug	22	20	25	22	- 2	-3
5-Sep	14	66	20	1730	52	1710
12-Sep	24	24	13	6	No Diff	-7
19-Sep	19	43	12	44	24	32

For Sheldrake vs Cochran:

x = 10/12	0.833	number of pairs (n) =	12
Но	p = 0.5	(Distributions are the same)	
HI	p > 0.5	(Distribution at C is higher)	
P=	0.5		
Z = X-P/SC	QRT (P9/n) X-P =	0.333
Z = 2.31		Sq. root (P9/n) =	0.1443
Therefore	p = 0.01		

For Moultroup vs Dugway Wset:

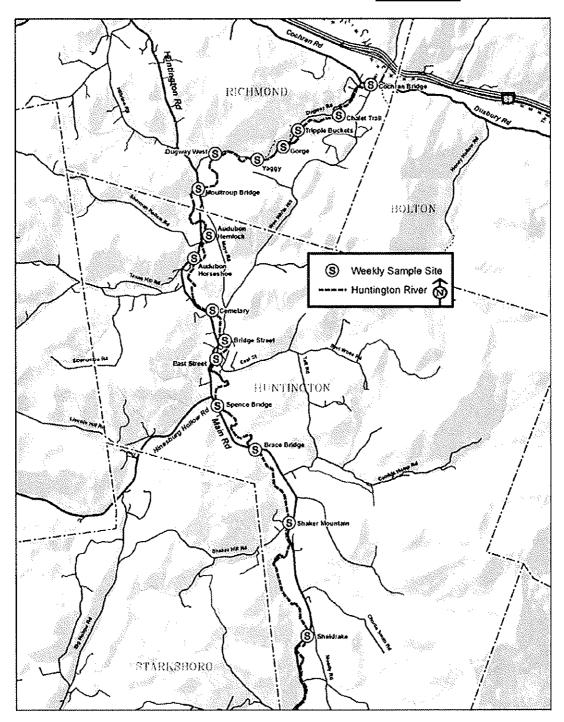
x = 11/14 Ho HI	-	number of pairs (n) = (Distributions are the same) (Distribution at C is higher)	14
Z = X-P/S0 Z = 2.14 Therefore	`) X-P = Sq. root (P9/n) =	0.286 0.1443

687 66 156 36 60 21 20 781 61 137 31 37 22 43 918 61 18 78 26 26 14 28 118 61 18 78 26 26 14 28 118 83 22 72 18 18 18 108 108 59 23 96 20 37 17 13 12 49 142 52 36 107 22 1730 6 44 148 102 51 22 167 25 20 13 12 49 147 12 49 21 102 51 133 12 49 147 148 143 142 143 143 143 143 143 143 143 143 143 143 143 143 143	156 36 60 21 20 137 36 32 6 73 6 73 73 6 6 73 6 73 6 6 43 73 6 43 74 28 6 43 74 78 6 6 72 73 6 74 73 73 73 73 74	156 36 60 21 20 137 36 32 6 73 6 73 73 6 73 6 73 6 73 6 74 28 6 74 28 6 74 28 20 15 22 18 18 18 18 18 18 18 18 18 18 18 18 18 12 12 13 12	156 36 60 21 20 137 36 32 6 73 6 78 26 26 14 28 6 7 7 43 7	156 36 60 21 20 137 36 32 6 73 6 73 73 6 73 6 73 6 73 6 74 28 6 74 28 22 14 28 22 18 18 18 18 18 18 18 18 18 18 18 18 18 18 12 18 18 12	156 36 60 21 20 137 36 32 6 73 6 79 31 37 22 43 6 6 72 43 6 43 72 43 72 43 72 43 72 43 72 43 72 44 73 44 73 49 73 49 73 43 43 43 43 43 43 43 43 43 43 43 43 43 43 43 44 43 43 43 43 43 43 43 43 44 43 43 44 43 43 44 43 44 43 44 43 44 43 44 43 44 43 44 43 44 43 44 43 44 43 44 43 44 44 44 44 44 44 44	156 36 60 21 20 137 36 32 6 179 31 37 22 43 172 28 20 15 22 181 58 22 18 18 96 20 37 17 13 107 22 1730 6 44 107 22 1730 6 44 107 22 1730 6 44 107 22 1730 6 44 108 31 77 15 34 108 31 77 15 34 109 96 20 105 12 109 98 72 105 12 109 98 72 105 12 100 101 63 142 15 110 105 0.52 0.45 0.33 110 104 0.56 0.52 0.45 104 0.56 0.52 0.45 105 0.50 0.50 106 0.50 0.50 107 0.50 0.50 108 0.50 0.50 109 0.50 109 0.50 0.50 109	156 36 60 21 20 79 137 36 60 21 20 43 78 26 26 14 28 20 15 22 43 18 18 18 18 18 10 20 37 17 13 12 10 20 20 10 20 20 20 20 20 20 20 20 20 20 20 20 20	156 36 60 21 20 6 779 31 37 22 43 72 28 26 14 28 28 20 15 28 18 18 18 18 18 18 18 19 102 102 19 102 102 102
157 37 37 22 43 45 45 45 45 45 45 45	157 31 37 22 43 45 45 45 45 45 45 45	79 31 37 22 43 78 26 26 14 28 72 28 20 15 22 81 58 22 18 18 96 20 37 17 13 167 25 20 13 12 102 51 133 12 49 88 31 77 15 34 102 51 133 12 49 88 31 77 15 34 102 51 133 12 49 980 20 66 24 43 150 101 66 24 43 150 107 105 12 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	110 55 22 79 31 37 22 43 14 14 14 18 22 72 28 26 14 28 14 14 14 18 22 72 28 20 15 22 18 18 18 14 14 15 13 12 14 13 12 14 13 12 14 14 14 14 14 14 14	157 31 37 22 43 45 45 45 45 45 45 45	57 131 65 22 79 31 35 22 43 65 65 131 651 18 78 26 26 14 28 85 114 83 22 72 88 20 15 22 18 18 18 114 45 28 20 37 17 13 15 12 140 59 23 96 20 37 17 13 12 140 59 21 140 59 21 140 59 21 140 50 1	79 31 37 22 43 78 26 26 14 28 81 58 22 18 18 18 96 20 37 17 13 107 22 1730 6 44 107 22 1730 6 44 108 31 77 15 34 109 20 66 24 49 96 20 66 24 49 97 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	157 157 157 157 157 157 157 158	157 157 158
78 26 26 14 28 72 28 20 15 22 81 58 22 18 18 81 58 22 18 18 96 20 37 17 13 167 25 20 13 12 107 22 1730 6 44 102 51 133 12 49 88 31 77 15 34 102 19 38 11 22 96 20 66 24 43 150 101 63 142 14 980 98 72 105 12 1554 31.1 51.3 20.3 21.1 87.5 117.4 15.7 9.7 17.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6	78 26 26 14 28 72 28 20 15 22 81 58 22 18 18 81 58 22 18 18 96 20 37 17 13 167 25 20 13 12 107 51 133 12 49 88 31 77 15 34 102 19 38 11 22 96 20 66 24 43 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 15.7 9.7 17.5 1.4 0.76 0.5 0.45 0.33	78 26 26 14 28 72 28 20 15 22 81 58 22 18 18 81 58 22 18 18 96 20 37 17 13 107 25 1730 6 44 102 51 133 12 49 88 31 77 15 34 102 19 38 11 22 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 13.8 17 15.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.65 0.45 0.33	78 26 26 14 28 72 28 20 15 22 81 58 22 18 18 81 58 22 18 18 96 20 37 17 13 167 25 20 13 12 107 22 1730 6 44 102 51 133 12 49 88 31 77 15 34 102 19 38 11 22 96 20 66 24 43 96 20 66 24 43 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 1.25.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 12.7 17.5 1.4 0.56 0.52 0.45	78 26 26 14 28 72 28 20 15 22 81 58 22 18 18 81 58 22 18 18 96 20 37 17 13 107 25 1730 6 44 102 51 1730 6 44 102 51 1730 6 44 102 51 173 12 49 88 31 77 15 34 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 13.8 17 15.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	67 131 61 18 78 26 26 14 28 59 114 83 22 72 28 20 15 22 82 214 45 22 72 28 20 15 22 111 140 59 23 96 20 37 17 13 55 172 51 22 167 25 20 13 12 63 1410 59 21 102 25 20 13 12 63 172 49 21 102 25 173 12 44 86 172 18 88 31 17 15 34 72 145 41 11 121 16 61 13 14 62 36 42 17 102 19 38 12 14 121 114	55 131 61 18 78 26 26 14 28 25 114 83 22 72 28 20 15 22 8 20 15 22 14 4 83 22 72 28 20 15 22 14 4 83 22 17 17 13 13 12 12 14 10 59 23 96 20 37 17 13 12 12 14 0 59 23 96 20 37 17 13 12 12 14 0 52 36 107 22 1730 6 44 14 17 172 124 63 30 1550 101 63 142 14 22 19 38 11 22 19 38 11 22 10 10 10 10 10 10 10 10 10 10 10 10 10	78	78 26 26 14 28 72 28 20 15 22 81 81 82 20 15 22 81 62 20 13 12 167 25 20 13 12 107 22 1730 6 44 107 22 1730 6 44 102 51 133 12 49 88 31 77 15 34 102 19 38 11 22 980 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 980 98 72 105 12 144 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33 Athia Order Administration of the order
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96 20 37 17 13 167 25 20 13 12 102 51 1730 6 44 102 51 133 12 49 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 150 101 63 142 43 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	96 20 37 17 13 167 25 20 13 12 107 22 1730 6 44 102 51 133 12 49 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.65 0.45 0.33	96 20 37 17 13 12 107 25 20 13 12 12 107 22 1730 6 44 102 51 133 12 49 88 31 77 15 34 12 49 88 31 77 15 34 12 28 102 19 38 11 22 8 11 22 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 17.5 117.4 124.5 127 131.5 13.8 17 15.7 17.5 1.04 0.56 0.52 0.45 0.33	96 20 37 17 13 12 10 10 10 10 10 10 10 10 10 10 10 10 10	96 20 37 17 13 12 107 25 20 13 12 107 22 1730 6 44 107 22 1730 6 44 100 25 170 15 34 12 10 38 31 77 15 34 10 20 10 98 20 66 24 43 150 10 98 10 98 10 10 10 10 10 10 10 10 10 10 10 10 10	111 140 59 23 96 20 37 17 13 55 172 51 22 167 25 20 13 12 63 1410 52 36 107 22 1730 6 44 86 172 49 21 102 51 133 12 49 74 150 51 18 88 31 77 15 34 72 145 41 11 121 16 61 13 28 72 145 41 11 121 16 61 13 28 62 96 42 17 102 19 38 11 22 62 96 44 17 102 19 38 11 22 62 96 42 17 102 19 88 72 105 172 124 68 18 980 98 72 105 183 159.1 56.4 21.0 125.4 117 114 159 159.1 129.3 87.5 117.4 124.5 127 131.	111 140 59 23 96 20 37 17 13 12 15 15 15 15 15 15 15 15 15 15 15 15 15	96 20 37 17 13 12 149 102 51 133 12 49 6 44 102 51 133 12 49 88 31 77 15 34 12 49 88 31 77 15 34 11 22 96 20 66 24 43 1650 101 63 142 14 980 98 72 105 12 14 980 98 72 105 12 14 980 98 72 105 12 14 980 98 72 105 12 14 126.4 31.1 51.3 20.3 21.1 126.4 31.1 51.3 20.3 21.1 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33	96 20 37 17 13 12 14 107 25 20 13 12 49 88 31 77 15 34 12 49 88 31 77 15 34 43 102 196 20 102 19 38 11 22 88 11 22 102 19 38 11 22 14 43 150 101 66 24 43 12 12 14 1250 101 63 142 142 142 142 142 142 142 142 142 142
167 25 20 13 12 107 22 1730 6 44 102 51 133 12 49 88 31 77 15 34 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 125.4 31.1 51.3 20.3 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	167 25 20 13 12 107 22 1730 6 44 102 51 133 12 49 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	167 25 20 13 12 107 22 1730 6 44 102 51 133 12 49 88 31 77 15 34 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 980 20 66 24 43 150 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	167 25 20 13 12 107 22 1730 6 44 102 51 133 12 49 88 31 77 15 34 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 1254 31.1 51.3 20.3 22.4 1254 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 13.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	167 25 20 13 12 107 22 1730 6 44 102 51 133 12 49 88 31 77 15 34 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 17.5 1.04 0.56 0.52 0.45 0.33	56 172 51 22 167 25 20 13 12 63 1410 52 36 107 22 1730 6 44 63 1410 52 36 107 22 1730 6 44 74 150 51 18 88 31 77 15 49 72 145 41 11 121 16 61 13 28 62 96 42 17 102 19 38 11 22 62 96 42 17 102 19 38 11 22 62 20 96 20 66 24 43 14 121 14 68 18 980 98 72 105 12 59.3 159.1 18.6 13.8 17 15.3 20.3 21 15.6 19.6 <t< td=""><td>55 172 51 22 167 25 20 13 12 6 44 86 172 36 170 52 1730 6 44 44 86 172 1730 6 5 44 44 150 51 18 88 31 77 15 34 77 17 17 17 17 17 17 17 17 17 17 17 17</td><td>102 25 20 13 12 49 102 51 133 12 49 103 31 77 15 34 110 10 6 1 13 28 110 20 66 24 43 110 63 142 14 125.0 101 63 142 14 125.0 101 63 142 14 125.4 31.1 51.3 20.3 21.1 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33 Ation of State of St</td><td>167 25 20 13 12 49 102 51 133 12 49 88 31 77 15 34 121 16 61 13 28 110 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33 Attaly Ordand Attaly Or</td></t<>	55 172 51 22 167 25 20 13 12 6 44 86 172 36 170 52 1730 6 44 44 86 172 1730 6 5 44 44 150 51 18 88 31 77 15 34 77 17 17 17 17 17 17 17 17 17 17 17 17	102 25 20 13 12 49 102 51 133 12 49 103 31 77 15 34 110 10 6 1 13 28 110 20 66 24 43 110 63 142 14 125.0 101 63 142 14 125.0 101 63 142 14 125.4 31.1 51.3 20.3 21.1 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33 Ation of State of St	167 25 20 13 12 49 102 51 133 12 49 88 31 77 15 34 121 16 61 13 28 110 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33 Attaly Ordand Attaly Or
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102 51 133 12 49 88 31 77 15 34 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 150 101 63 142 14 980 98 72 105 12 125.4 31.1 51.3 20.3 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	102 51 133 12 49 88 31 77 15 34 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	102 51 133 12 49 88 31 77 15 34 88 31 77 15 34 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	102 51 133 12 49 88 31 77 15 34 88 31 77 15 34 88 31 77 15 34 88 31 77 15 34 34 102 19 38 11 22 86 24 43 43 150 101 63 142 14 43 150 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 13.8 17 15.7 9.7 17.5 1.4 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.55 0.45 0.33 1.04 0.56 0.55 0.45 0.33 1.04 0.56 0.55 0.45 0.33 1.04 0.56 0.55 0.45 0.33 1.04 0.56 0.55 0.45 0.33 1.04 0.56 0.55 0.45 0.33 1.04 0.56 0.55 0.45 0.33 1.04 0.56 0.55 0.45 0.33 0.3	102 51 133 12 49 88 31 77 15 34 88 31 77 15 34 88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 1550 101 66 24 43 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33	866 172 49 21 102 51 133 12 49 74 150 51 88 31 77 15 34 75 145 41 11 121 16 61 13 28 62 96 20 66 24 43 172 124 63 30 1550 101 63 142 14 171 14 68 18 980 98 72 105 12 59.3 165.0 55.3 20.7 94.3 26.6 49.4 15.9 22.4 56.9 159.1 56.4 21.0 125.4 31.1 51.3 20.3 21.1 63.8 79.5 111.9 129.3 87.5 117.4 124.5 127 131.5 1004 0.59 0.45 1.04 0.56 0.52 0.45 0.33 EOMEAN: First Five Weeks	866 172 49 21 102 51 133 12 49 74 150 51 18 88 31 77 15 34 72 145 41 11 121 121 19 38 11 2 28 62 96 42 17 102 19 38 11 2 22 62 96 20 66 24 43 71 102 19 38 11 22 72 165 36 20 96 24 43 73 105 101 63 1142 14 74 114 68 18 980 98 72 105 12 75 119 129.3 87.5 117.4 124.5 127 131.5 76 196 186 13.8 13.8 17.8 17.8 17.5 76 196 0.59 0.45 1.04 0.56 0.52 0.45 0.33 20 0.45 1.04 0.59 0.45 1.04 0.56 0.52 0.45 0.33 20 0.45 1.04 0.59 0.45 1.04 0.56 0.52 0.45 0.33	102 51 133 12 49 88 31 77 15 34 88 112 19 34 102 19 38 11 22 34 43 105 105 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 10	102 51 133 12 49 88 31 77 15 34 88 112 19 38 11 22 86 24 43 150 101 66 24 43 150 102 102 103
88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 1550 101 66 24 43 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	88 31 77 15 34 121 16 61 13 28 102 19 38 11 22 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	88 31 77 15 34 14 121 16 61 13 28 16 102 19 38 11 22 8 11 22 102 102 103 11 22 14 43 150 101 63 142 142 14 125 101 63 142 142 142 142 142 142 143 143 143 144 174 174 175 174 175 174 175 174 175 174 175 174 175 174 175 174 175 174 175 174 175 174 175 174 175 174 175 174 175 174 175 174 175 175 176 175 176 176 176 176 176 176 176 176 176 176	88 31 77 15 34 34 121 15 16 61 13 28 1702 19 38 11 22 8 171 22 8 171 22 8 171 22 8 172 150 101 66 24 43 172 142 142 142 142 142 142 142 142 142 14	88 31 77 15 34 14 121 15 16 61 13 28 16 102 19 38 11 22 8 11 22 8 11 22 8 11 22 8 11 22 8 11 22 8 14 150 101 63 142 142 14 125 101 63 142 142 142 142 142 142 142 142 143 143 143 144 0.75 0.75 0.45 0.33 1.04 0.56 0.52 0.45 0.33	74 150 51 18 88 31 77 15 34 77 15 34 77 15 34 72 145 41 11 121 16 61 13 28 28 20 96 42 17 102 19 38 11 22 219 36 20 66 24 43 17 213 28 17 213 28 17 213 20 66 24 43 17 213 20 66 24 43 17 213 20 101 63 142 14 213 165.0 55.3 20.7 94.3 26.6 49.4 15.9 22.4 15.9 159.1 56.4 21.0 125.4 31.1 51.3 20.3 21.1 20.3 21.1 20.3 21.1 51.3 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 21.1 20.3 20.45 0.45 0.56 0.50 0.45 0.33	74 150 51 18 88 31 77 15 34 72 145 41 11 121 16 61 13 28 62 96 42 17 102 19 38 11 22 73 124 63 30 1550 101 63 142 14 72 124 68 18 980 98 72 105 12 73 165.0 55.3 20.7 94.3 26.6 49.4 15.9 22.4 75.9 159.1 56.4 21.0 125.4 31.1 51.3 20.3 21.1 78 19.6 11.6 129.3 87.5 117.4 124.5 127 131.5 79 104 0.59 0.45 1.04 0.56 0.52 0.45 0.33 EOMEAN: First Five Weeks	88 31 77 15 34 12 121 121 122 19 38 11 22 8 11 22 8 11 22 8 11 22 8 11 22 8 11 22 8 11 22 8 11 22 8 11 22 8 11 22 8 11 1250 101 63 142 142 14 43 1250 101 63 142 142 142 142 142 142 142 142 142 142	88 31 77 15 34 11 121 121 102 1102 119 38 111 22 28 111 22 38 111 22 38 111 22 38 111 22 38 111 22 38 112 38 111 22 38 380 98 72 105 12 12 393 380 98 72 105 12 12 12 12 12 12 12 12 12 12 12 12 12
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102 19 38 11 22 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	102 19 38 11 22 96 20 66 24 43 98 20 66 24 43 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	102 19 38 11 22 96 20 66 24 43 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 1.3 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	102 19 38 11 22 96 20 66 24 43 98 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 1.3 17 9.7 17.5 1.04 0.56 0.52 0.45 0.33	102 19 38 11 22 96 20 66 24 43 96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 1.3 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	62 96 42 17 102 19 38 11 22 1219 36 20 96 24 43 172 124 63 30 1550 101 63 142 14 173 124 68 18 980 98 72 105 12 180.3 165.0 55.3 20.7 94.3 26.6 49.4 15.9 22.4 180.3 165.0 56.4 21.0 125.4 31.1 51.3 20.3 21.1 17.6 19.6 18.6 13.8 13.8 17. 15.7 9.7 17.5 180.4 0.59 0.45 1.04 0.56 0.52 0.45 0.33 EOMEAN: First Five Weeks	62 96 42 17 102 19 38 11 22 81 11 22 81 11 22 81 11 22 81 11 11 11 11 11 11 11 11 11 11 11 11	102 19 38 11 22 43 43 1550 101 63 142 14 43 98 20 66 24 43 142 142 14 14 1550 101 63 142 14 14 1254 15.9 22.4 125.4 17.5 17.5 17.5 17.5 17.5 17.6 0.56 0.52 0.45 0.33 17.0 60 0.45 0.33 17.0 60 0.45 0.33 17.0 60 0.45 0.33 17.0 60 0.45 0.33 17.0 60 0.45 0.33 17.0 60 0.45 0.33 17.0 60 0.45 0.33 17.0 60 0.45 0.33 17.0 60 0.50 0.45 0.33 17.5 17.5 17.5 17.5 17.5 17.5 17.5 17.5	102 19 38 11 22 43 43 1550 101 63 142 14 43 980 98 72 105 12 142 14 125.4 125.4 125.4 125.4 125.4 127 131.5 13.8 17 15.7 131.5 13.8 17 15.7 131.5 13.8 17 15.7 131.5 13.8 17 15.7 13.8 17 15.7 13.8 17 15.7 13.8 17 15.7 13.8 17 15.7 13.8 17 15.7 13.8 17 15.7 13.8 17 15.7 13.8 17 15.7 13.8 17 15.7 13.8 17.5 13.8 17 15.7 13.8 17.5 13.8 17.
96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	96 20 66 24 43 43 45 150 101 63 142 14 14 14 1550 101 63 142 14 14 125.4 125.4 131.1 13.8 17 17.4 124.5 17.5 17.6 17.6 17.6 17.6 17.6 17.6 17.6 17.6	96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	219 36 20 96 24 43 172 124 63 30 1550 101 63 142 14 14 159 150 101 63 142 14 14 159 150 101 63 142 14 14 150 150 155.3 20.7 94.3 26.6 49.4 15.9 22.4 15.9 159.1 129.3 87.5 117.4 124.5 127 97.7 131.5 10.6 1.04 0.59 0.45 1.04 0.56 0.45 0.55 0.45 0.33	172 124 63 30 1550 101 63 142 14 15 151 114 68 18 980 98 72 105 12 14 14 15 15 15 15 105 101 63 142 14 14 15 15 15 15 105 105 12 14 15 15 15 15 15 15 15 15 15 15 15 15 15	96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 98.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33 Sample of the standard of the	96 20 66 24 43 1550 101 63 142 14 980 98 72 105 12 98.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33 Application of the standard o
1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	1550 101 63 142 14 980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	172 124 63 30 1550 101 63 142 14 121 114 68 18 980 98 72 105 12 12 15 15 15 15 15 15 15 15 15 15 15 15 15	172 124 63 30 1550 101 63 142 14 121 14 68 18 980 98 72 105 12 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 105 12 11 11 11 12 12 12 11 11 11 12 12 13 11 11 11 12 12 13 13 11 11 11 12 12 13 13 11 11 11 12 12 13 13 11 11 11 12 12 13 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 12 12 13 11 11 11 11 12 12 13 11 11 11 11 11 11 11 11 11 11 11 11	1550 101 63 142 14 14 14 15 14 15 12 14 15 14 15 14 15 14 15 14 15 14 15 14 15 14 15 14 15 14 15 14 15 14 15 14 15 14 15 14 15 14 15 15	1550 101 63 142 14 14 14 15 15 12 14 125.4 15.4 15.9 12.4 125.4 13.1 17.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.55 0.45 0.33 0.55 0.45 0.33 0.55 0.45 0.33 0.55 0.45
980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	121 114 68 18 980 98 72 105 12 195 99.3 165.0 55.3 20.7 94.3 26.6 49.4 15.9 22.4 55.9 159.1 56.4 21.0 125.4 31.1 51.3 20.3 21.1 17.6 19.6 18.6 13.8 13.8 17.7 15.7 9.7 17.5 10.6 0.45 10.4 0.59 0.45 1.04 0.56 0.52 0.45 0.33	121 114 68 18 980 98 72 105 12 15.9 165.0 55.3 20.7 94.3 26.6 49.4 15.9 22.4 15.9 159.1 56.4 21.0 125.4 31.1 51.3 20.3 21.1 03.8 79.5 111.9 129.3 87.5 117.4 124.5 127 131.5 17.6 19.6 18.6 13.8 13.8 17 15.7 9.7 17.5 0.65 1.04 0.59 0.45 1.04 0.56 0.52 0.45 0.33 EOMEAN: First Five Weeks The standard	980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33 Applying Applying Aright Applying Columbia (Columbia)	980 98 72 105 12 94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33 95 2.84 15.9 22.4 1.04 0.75 0.7 0.6 0.45 95 2.84 17.5 17.5 1.04 0.75 0.7 0.6 0.45 95 2.84 18.9 0.70 0.45 0.33 7.00 0.70 0.70 0.45 0.33 7.00 0.70 0.70 0.70 0.70 0.70 0.70 0.70
94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.04 0.56 0.52 0.45 0.33	94.3 26.6 49.4 15.9 22.4 125.4 31.1 51.3 20.3 21.1 87.5 117.4 124.5 127 131.5 13.8 17 15.7 9.7 17.5 1.4 0.75 0.7 0.6 0.45 1.04 0.56 0.52 0.45 0.33	99.3 165.0 55.3 20.7 94.3 26.6 49.4 15.9 22.4 75.9 159.1 56.4 21.0 125.4 31.1 51.3 20.3 21.1 93.8 79.5 111.9 129.3 87.5 117.4 124.5 127 131.5 17.6 19.6 18.6 13.8 13.8 17 15.7 9.7 17.5 9.8 1.4 0.8 0.6 1.4 0.75 0.7 0.6 0.45 9.6 1.04 0.59 0.45 1.04 0.56 0.52 0.45 0.33 EOMEAN: First Five Weeks	99.3 165.0 55.3 20.7 94.3 26.6 49.4 15.9 22.4 15.9 15.9 15.9 15.9 15.9 15.9 15.9 15.9	87.5 117.4 124.5 12.3 22.4 13.8 17.1 131.5 13.8 17 15.7 9.7 17.5 13.6 1.04 0.56 0.52 0.45 0.33 1.04 0.56 0.52 0.45 0.33 2.4 2.4 0.56 0.52 0.45 0.33 2.4 2.4 2.4 2.4 2.4 2.4 2.4 2.4 2.4 2.4	87.5 117.4 124.5 12.3 21.1 13.6 13.8 17.1 13.6 13.8 17.1 15.7 9.7 17.5 13.0 0.75 0.75 0.75 0.75 0.75 0.75 0.95 0.45 0.33 11.04 0.56 0.52 0.45 0.33 11.04 0.56 0.52 0.45 0.33 11.04 0.56 0.52 0.45 0.33 11.04 0.56 0.52 0.45 0.33 11.04 0.56 0.52 0.45 0.33 11.04 0.56 0.52 0.45 0.33 11.04 0.56 0.52 0.45 0.33 11.04 0.56 0.52 0.45 0.33 11.04 0.56 0.52 0.45 0.33 11.04 0.56 0.55 0.35 0.35 0.35 0.35 0.35 0.35 0.35
87.5 117.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	125.4 31.1 51.3 20.3 87.5 117.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	87.5 117.4 124.5 127 13.8 13.8 17.1 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	87.5 117.4 124.5 127 13.8 13.8 17.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	87.5 117.4 124.5 127 13.8 1.1 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	75.9 159.1 56.4 21.0 125.4 31.1 51.3 20.3 03.8 79.5 111.9 129.3 87.5 117.4 124.5 127 17.6 19.6 18.6 13.8 13.8 17 15.7 9.7 18.8 1.4 0.8 0.6 1.4 0.75 0.7 0.6 10.6 1.04 0.59 0.45 1.04 0.56 0.52 0.45 EOMEAN: First Five Weeks	159.1 56.4 21.0 125.4 31.1 51.3 20.3 03.8	87.5 117.4 124.5 127 13.8 20.3 13.8 17.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45 13.9 0.45 0.45 0.56 0.50 0.45 0.45 0.56 0.50 0.45 0.45 0.50 0.45 0.45 0.50 0.50	87.5 117.4 124.5 127 13.8 20.3 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45 0.52 0.45 0.59 0.59 0.59 0.59 0.59 0.59 0.59 0.5
87.5 117.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	87.5 117.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	87.5 117.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	87.5 117.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	87.5 117.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	03.8 79.5 111.9 129.3 87.5 117.4 124.5 127 17.6 19.6 13.8 13.8 17 15.7 9.7 18.8 1.4 0.8 0.6 1.4 0.75 0.7 0.6 1.65 1.04 0.59 0.45 1.04 0.56 0.52 0.45 EOMEAN: First Five Weeks	17.6 19.5 111.9 129.3 87.5 117.4 124.5 127 17.6 19.6 18.6 13.8 13.8 17 15.7 9.7 10.8 1.4 0.8 0.6 1.4 0.75 0.7 0.6 10.6 1.04 0.59 0.45 1.04 0.56 0.52 0.45 COMEAN: First Five Weeks The same and a same a sa	87.5 117.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45 8.2 1.09 0.99 4.19 4.109 0.11	87.5 117.4 124.5 127 13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45
13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	13.8 17 15.7 9.7 1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	17.6 19.6 18.8 13.8 17 15.7 9.7 13.8 17 15.7 9.7 15.7 9.7 15.5 1.04 0.59 0.45 1.04 0.56 0.52 0.45 1.04 0.56 0.55 0.45 0.45 1.04 0.56 0.55 0.45 0.45 0.45 0.56 0.55 0.45 0.45 0.45 0.56 0.55 0.45 0.45 0.45 0.56 0.55 0.45 0.45 0.45 0.56 0.55 0.45 0.45 0.45 0.45 0.45 0.45 0.45	COMEAN: First Five Weeks Solve 19.6 19.6 19.7 15.7 9.7 15.6 10.4 0.56 10.5 0.45 1.04 0.56 0.52 0.45 1.04 0.56 0.52 0.45 1.04 0.56 0.52 0.45 1.04 0.56 0.55 0.45 0.45 1.04 0.56 0.55 0.45 0.45 0.45 0.45 0.45 0.45 0.45	13.8 17 15.7 9.7 1.04 0.56 1.045 1.0	1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45 1.04 0.56 0.52 0.45 1.09 0.99 0.99 0.99 0.99 0.99 0.99 0.99
1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	1.04 0.75 0.7 0.6	1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	1.4 0.75 0.7 0.6 1.04 0.56 0.52 0.45	2.88 1.4 0.8 0.6 1.4 0.75 0.7 0.6 0.65 1.04 0.59 0.45 1.04 0.56 0.52 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.45	EOMEAN: First Five Weeks Solution and solut	1.4 0.75 0.7 0.6 1.04 1.04 1.04 1.04 1.04 1.04 1.04 1.04	1.4 0.75 0.7 0.6 1.04 0.75 0.7 0.6 1.04 0.75 0.75 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.4
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Huntington River Study 2006 Brooks and Floating Sites

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CATEGO	CATEGOR Location	20-Jun-06 27-Jun-06 5-Jul-06	3 27-Jur	06 5-J		1-Jul-06	18-Jul-0(6 25-Jul-	06 1-Aug	1-06 8-AL	1 90-6r	4-Aug-06	22-Aug	06 29-	Aug-06	5-Sep-06	11-Jul-06 18-Jul-06 25-Jul-06 1-Aug-06 8-Aug-06 14-Aug-06 22-Aug-06 29-Aug-06 5-Sep-06 12-Sep-06 19-Sep-06	6∤19-Sep-(90
BRK	Brushy Brook			96	ļ			1	185					_	37				ဖ
BRK	Carpenter Brook			102					17										16
BRK	Cobb Brook			78					34						9				
BRK	Fargo Brook			156					84						7				
BRK	Hollow Brook			461				-	34						30				36
BRK	Owls Head Brook								93										
BRK	Owls Head Dugway																	*****	4
FLOAT	7 Falls			49					11						6				
FLOAT	Above Owls Head																	,	43
FLOAT	Brushy Trib Culvert								51										
FLOAT	Rec Field			387					51						20		v		16
FLOAT	Brent Field			160					93						13				16
FLOAT	Carse Bridge			135					24						20				
FLOAT	Owls Head Huntington																		25

FIGURE 1



HUNTINGTON RIVER STUDY 2006 BOX PLOTS

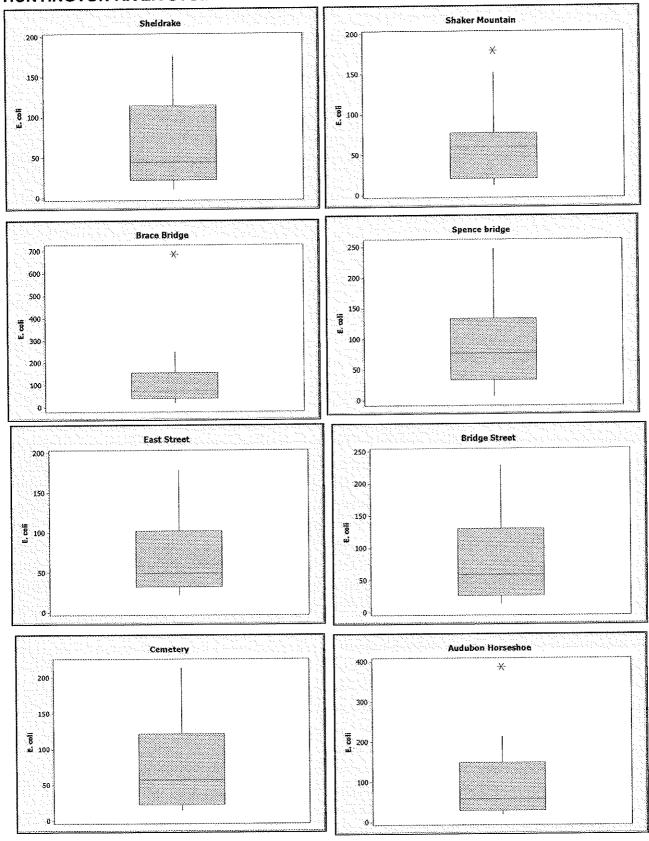


FIGURE 2 Part 2 of 3

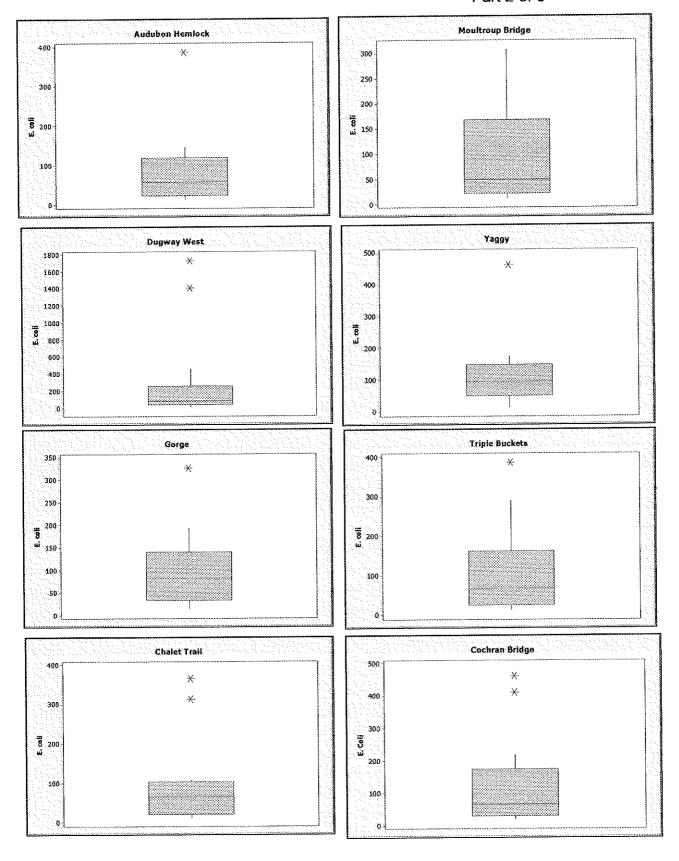


FIGURE 2 Part 3 of 3

Huntington River Study 2006 Explanation of Boxplots

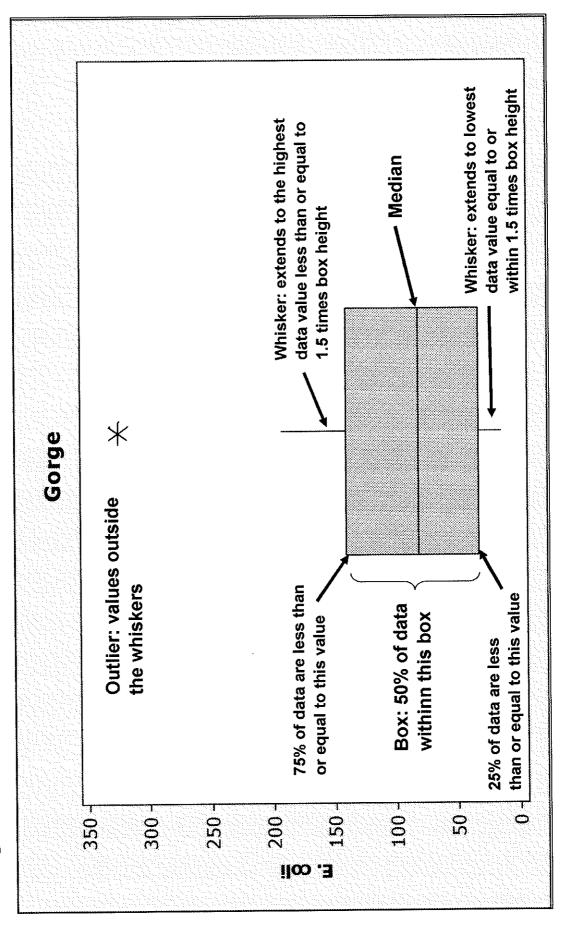
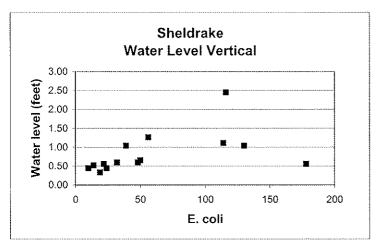
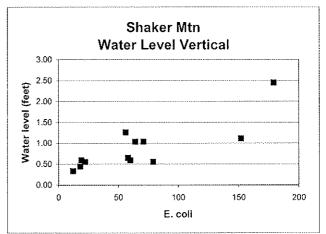
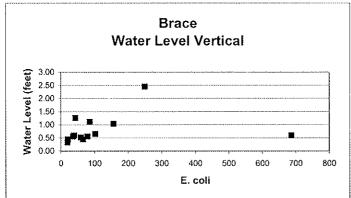


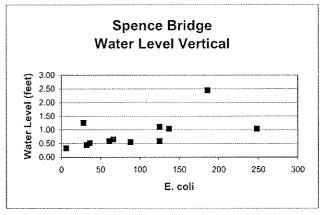
FIGURE 3

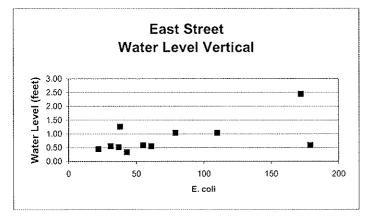
FIGURE 4 Part 1 of 3











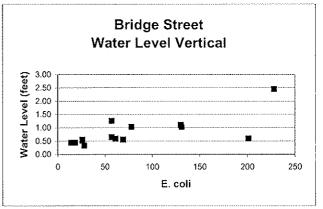
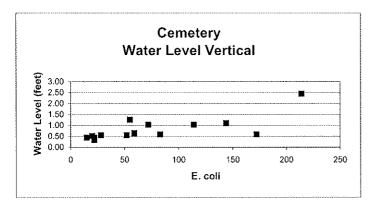
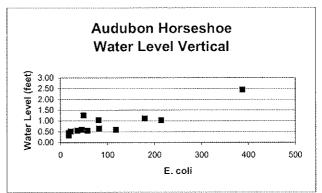
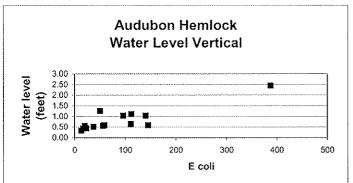
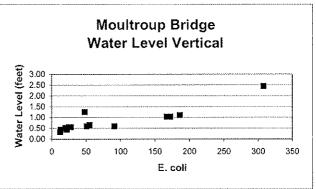


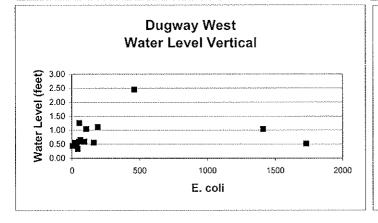
FIGURE 4 Part 2 of 3











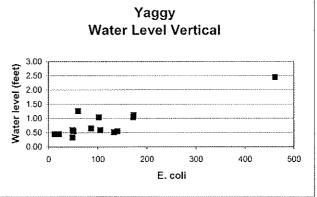


FIGURE 4 Part 3 of 3

