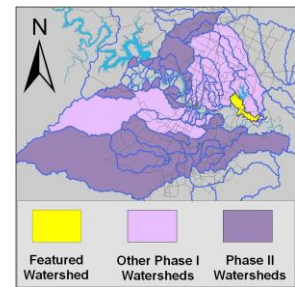


# Gilleland Creek Watershed

Catchment	Total area	39 sq. miles					
	Area in recharge	0					
	Creek length	62 miles					
	Receiving water	Colorado River					
Demographics	2000 population	26,586					
	2030 projected population	61,664					
	30 year projected % increase	232 %					
Land Use	Impervious cover (2003 estimate)	7.1 %					
	Impervious cover (2013 estimate)	13.8 %					
Overall EII Scores	1999	2002	2005	2008	2009	2011	2013
	68	70	62	64	67	62	65



## Flow Regime\* for Sample Sites on Gilleland Creek

Site	Site Name	2000			2002				2005				2008				2009				2010		2011				2013							
		Jun	Jun	Feb	Feb	May	Aug	Nov	Mar	Jun	Jun	Sep	Dec	Feb	May	Jun	Sep	Dec	Feb	May	May	Oct	Dec	Dec	Mar	Jun	Jun	Sep	Jan	Apr	May	Jun	Jun	Sep
1193	S Railroad	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
1195	Hill Cemetary	B																																
1914	Cameron			B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
1194	West Gill @ Cameron	B	B	B	B	n	B	B	B	B	n	n	S	B	B	n	B	n	B	B	B	B	B	n	B	n	n	n	B	B	n	n	n	n
1191	West Parsons	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
1192	FM973	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
886	FM969	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

\* B = baseflow    n = no flow    S = storm flow    blue = Samples were taken    light blue = Samples were not taken    blank = not visited

## Index scores\* for Gilleland Creek Sites by Year

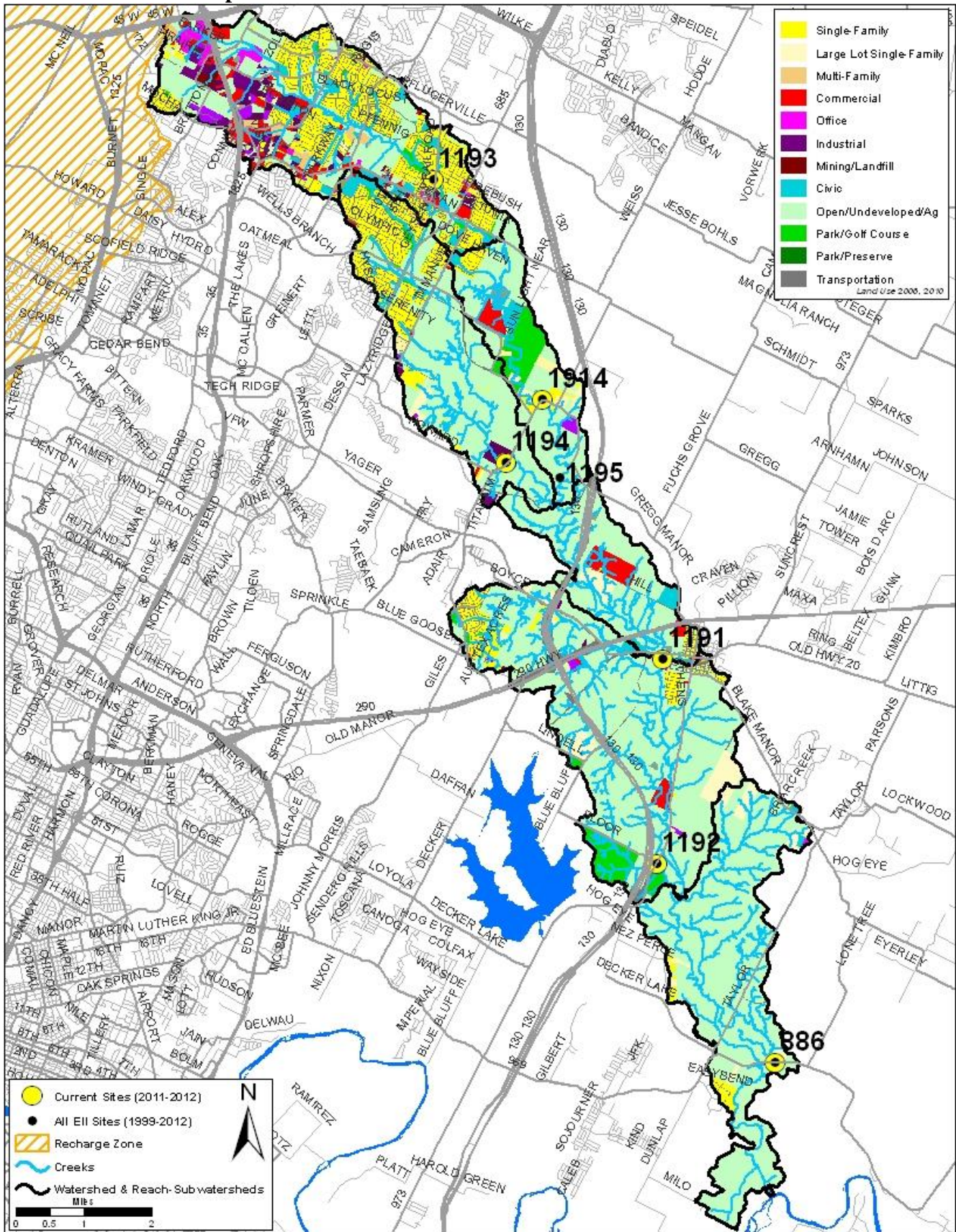
Reach	Site	Site Name	Year	Water Quality	Sediment**	Contact Rec.	Non-Contact Rec.	Physical Integrity	Aquatic Life	Benthic subindex	Diatom subindex	Total EII Score
GIL1	886	Gilleland Creek @ FM 969	2002	34	87	92	78	62	68	92	44	70
GIL2	1192	Gilleland Creek @ FM 973	2002	32	87	89	78	77	86	79	92	75
GIL3	1191	Gilleland Creek @ W Parsons St	2002	30	87	87	95	73	54	71	37	71
GIL4	1194	W Gilleland Creek @ Cameron Rd	2002	51	87	87	55	49	72	59	85	67
GIL5	1914	Gilleland Creek @ Cameron Rd.	2002	34	87	91	71	68	62	66	57	69
GIL6	1193	Gilleland Creek @ South RR Ave	2002	35	87	80	77	61	50	61	39	65
GIL1	886	Gilleland Creek @ FM 969	2005	32	88	41	78	77	72	95	48	65
GIL2	1192	Gilleland Creek @ FM 973	2005	33	88	53	68	59	69	99	39	62
GIL3	1191	Gilleland Creek @ W Parsons St	2005	29	88	40	63	61	78	98	57	60
GIL4	1194	W Gilleland Creek @ Cameron Rd	2005	52	88	48	48	45				47
GIL5	1914	Gilleland Creek @ Cameron Rd.	2005	27	88	44	68	49	76	95	56	59
GIL6	1193	Gilleland Creek @ South RR Ave	2005	40	88	50	83	69	68	66	70	66
GIL1	886	Gilleland Creek @ FM 969	2008	27	78	48	79	66	86	100	72	64
GIL2	1192	Gilleland Creek @ FM 973	2008	28	78	54	88	71	86	100	71	68
GIL3	1191	Gilleland Creek @ W Parsons St	2008	32	78	57	83	71	84	100	67	68
GIL4	1194	W Gilleland Creek @ Cameron Rd	2008	60	78	59	54	52	35	35		53
GIL5	1914	Gilleland Creek @ Cameron Rd.	2008	28	78	45	84	76	84	100	68	66
GIL6	1193	Gilleland Creek @ South RR Ave	2008	35	78	41	86	72	75	97	53	65
GIL1	886	Gilleland Creek @ FM 969	2009	40	82	53	68	80	92	100	84	69
GIL2	1192	Gilleland Creek @ FM 973	2009	33	82	39	64	74	100	100	100	65
GIL3	1191	Gilleland Creek @ W Parsons St	2009	39	82	52	78	77	100	100		71
GIL4	1194	W Gilleland Creek @ Cameron Rd	2009	52	82	45	68	47	60	45	74	59
GIL5	1914	Gilleland Creek @ Cameron Rd.	2009	35	82	41	77	71	90	100	80	66
GIL6	1193	Gilleland Creek @ South RR Ave	2009	40	82	39	78	68	98	96	100	68
GIL1	886	Gilleland Creek @ FM 969	2011	30	82	45	65	64	77	100	53	61
GIL2	1192	Gilleland Creek @ FM 973	2011	32	82	73	73	76	83	100	65	70
GIL3	1191	Gilleland Creek @ W Parsons St	2011	29	82	45	60	61	83	100	66	60
GIL4	1194	W Gilleland Creek @ Cameron Rd	2011	62	82	27	67	52				48
GIL5	1914	Gilleland Creek @ Cameron Rd.	2011	30	82	42	67	77	82	100	64	63
GIL6	1193	Gilleland Creek @ South RR Ave	2011	35	82	37	87	77	95	100	89	69
GIL1	886	Gilleland Creek @ FM 969	2013	32	86	44	78	77	80	100	60	66
GIL2	1192	Gilleland Creek @ FM 973	2013	29	86	58	79	83	90	100	80	71
GIL3	1191	Gilleland Creek @ W Parsons St	2013	29	86	43	77	76	85	100	69	66
GIL4	1194	W Gilleland Creek @ Cameron Rd	2013	70	86	61	45	38	48	48		58
GIL5	1914	Gilleland Creek @ Cameron Rd.	2013	25	86	43	68	61	79	87	71	60
GIL6	1193	Gilleland Creek @ South RR Ave	2013	37	86	32	84	67	91	100	82	66

\* blank cells indicate parameter was not collected, blank row indicate site was dropped \*\*sediment samples only collected at the downstream site

100-87.5 Excellent    87.5-75 V. Good    75-62.5 Good    62.5-50 Fair    50-37.5 Marginal    37.5-25 Poor    25-12.5 Bad    12.5-0 V. Bad

# Gilleland Creek Watershed

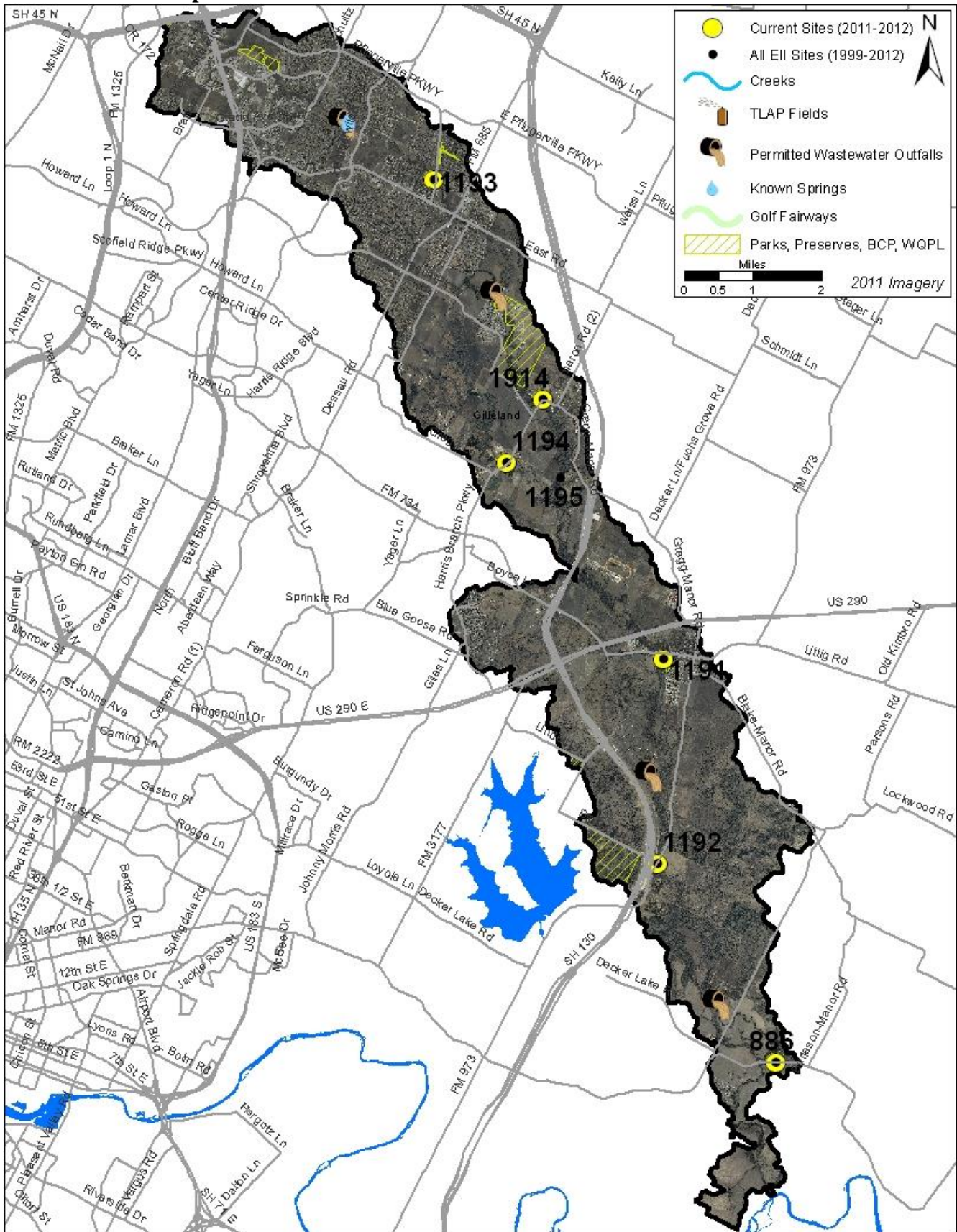
## Land Use Map





# Gilleland Creek Watershed

## Aerial Map



# Gilleland Creek Watershed

## Water Quality Data – Temperature, Conductivity, pH, Dissolved Oxygen & E. coli for 2013 Sample Sites (Downstream to Upstream)

Qualifiers to the left of value:	>	greater than	Qualifiers to the right of value:	(blank)	Useable
	<	less than		S	Exceeds standard range
	< J	less than detection limit		R	Rejected, failed QC
	J	Estimated			

Site Name	Site #	Reach	Date	Temp. Value	Temp. flag	Cond. Value	Cond. flag	pH Value	pH flag	D.O. Value	D.O. flag	E.coli Value	E.coli flag
Gilleland @ FM 969	886	GIL1	01/22/2013	11.9		1238		8.38		11.7		64.4	
Gilleland @ FM 969	886	GIL1	04/24/2013	16.1		1104		8.34		9.9		290.9	
Gilleland @ FM 969	886	GIL1	06/26/2013	28.1		1142		8.20		7.8	R	206.4	
Gilleland @ FM 969	886	GIL1	09/26/2013	24.2		941		8.05		7.4		298.7	
<b>Site 866 Mean</b>				20.1		1106		8.24		9.2		215.1	
Gilleland @ FM 973	1192	GIL2	01/22/2013	12.3		1261		8.30		9.8			
Gilleland @ FM 973	1192	GIL2	04/24/2013	17.1		1211		8.15		8.3		101.4	
Gilleland @ FM 973	1192	GIL2	06/26/2013	28.0		1264		8.14		7.4	R	29.8	
Gilleland @ FM 973	1192	GIL2	09/26/2013	24.0		1140		7.92		7.1		166.4	
<b>Site 1192 Mean</b>				20.3		1219		8.13		8.1		99.2	
Gilleland @ West Parsons	1191	GIL3	01/22/2013	12.4		1298		8.44		12.7			
Gilleland @ West Parsons	1191	GIL3	04/24/2013	15.7		1270		8.30		10.2		214.2	
Gilleland @ West Parsons	1191	GIL3	06/26/2013	26.9		1301		8.30		8.0	R	152.9	
Gilleland @ West Parsons	1191	GIL3	09/26/2013	23.6		1283		8.15		7.5		214.3	
<b>Site 1191 Mean</b>				19.7		1288		8.30		9.6		193.8	
West Gilleland @ Cameron	1194	GIL4	01/22/2013	10.7		390		7.90		10.1		42.5	
West Gilleland @ Cameron	1194	GIL4	04/24/2013	14.9		352		7.86		8.0		108.6	
<b>Site 1194 Mean</b>				12.8		371		7.88		9.0		75.6	
Gilleland @ Cameron Rd	1914	GIL5	01/22/2013	14.0		1378		8.08		9.9		228.2	
Gilleland @ Cameron Rd	1914	GIL5	04/24/2013	16.0		1403		8.07		8.9		125.9	
Gilleland @ Cameron Rd	1914	GIL5	06/26/2013	26.3		1414		8.03		6.8	R	167.0	
Gilleland @ Cameron Rd	1914	GIL5	09/26/2013	23.8		1439		7.99		7.1		248.9	
<b>Site 1914 Mean</b>				20.0		1409		8.04		8.2		192.5	
Gilleland @ SRR Ave	1193	GIL6	01/22/2013	14.8		1276		8.17		11.9		344.8	
Gilleland @ SRR Ave	1193	GIL6	04/24/2013	15.8		1352		8.10		9.9		613.1	
Gilleland @ SRR Ave	1193	GIL6	06/26/2013	27.0		1348		8.07		7.3	R	249.5	
Gilleland @ SRR Ave	1193	GIL6	09/26/2013	25.5		1482		8.13		7.9		435.2	
<b>Site 1193 Mean</b>				20.8		1365		8.12		9.2		410.7	
<b>Watershed Mean</b>				19.5		1195		8.14		8.9		215.2	

Orange highlighting indicates that the value exceeds one standard deviation from the mean of all E.I.I. sites combined.

Summary Statistics for all 2013 – 2014 E.I.I. Sites Combined.					
Parameter	2013-2014 Average	2013-2014 Minimum	2013-2014 Maximum	1 Standard Deviation Above	1 Standard Deviation Below
Temperature (C°)	19.6	8.6	34.0	25.8	
Conductivity (uS/cm)	711	107	1783	942	
pH (Standard units)	7.86	6.96	8.97	8.19	7.52
D.O. (mg/l)	8.1	1.2	30.5	11.4	4.8
E.coli. (col/100ml)	435	1	4840	1127	

# Gilleland Creek Watershed

## Water Quality Data – Ammonia, Nitrate / Nitrite, Ortho-Phosphorus, Total Suspended Solids & Turbidity for 2013 Sample Sites (Downstream to Upstream)

Qualifiers to the left of value:	>	greater than	Qualifiers to the right of value:	(blank)	Useable
	<	less than		S	Exceeds standard range
	< J	less than detection limit		R	Rejected, failed QC
	J	Estimated			

Site Name	Site #	Reach	Date	NH3-N		NO3/NO2		Ortho-P		T.S.S.		Turb.		
				<>	Value	flag	<>	Value	flag	<>	Value	flag	<>	Value
Gilleland @ FM 969	886	GIL1	01/22/2013	J	0.016		12.10		0.137		10.1		11.8	
Gilleland @ FM 969	886	GIL1	04/24/2013	J	0.020	R	11.20		0.377		32.7		20.0	R
Gilleland @ FM 969	886	GIL1	06/26/2013		0.026		8.98		0.229		27.7		27.5	
Gilleland @ FM 969	886	GIL1	09/26/2013	<J	0.008		9.33		0.174		25.1		20.9	
<b>Site 886 Mean</b>					0.018		10.40		0.229		23.9		20.0	
Gilleland @ FM 973	1192	GIL2	01/22/2013	J	0.015		13.40		0.171		9.8		12.5	
Gilleland @ FM 973	1192	GIL2	04/24/2013		0.041	R	13.00		0.369		26.8		24.3	R
Gilleland @ FM 973	1192	GIL2	06/26/2013		0.047		12.80		0.300		21.4		26.6	
Gilleland @ FM 973	1192	GIL2	09/26/2013		0.016		14.70		0.233		31.8		52.6	
<b>Site 1192 Mean</b>					0.030		13.48		0.268		22.5		29.0	
Gilleland @ West Parsons	1191	GIL3	01/22/2013	J	0.016		14.00		0.218		10.5		7.5	
Gilleland @ West Parsons	1191	GIL3	04/24/2013		0.023	R	14.20		0.468		13.4		13.6	R
Gilleland @ West Parsons	1191	GIL3	06/26/2013		0.034		12.80		0.366		13.0		11.1	
Gilleland @ West Parsons	1191	GIL3	09/26/2013	<J	0.008		12.80		0.275		13.9		10.2	
<b>Site 1191 Mean</b>					0.020		13.45		0.332		12.7		10.6	
West Gilleland @ Cameron	1194	GIL4	01/22/2013		0.094		0.05		<J	0.004	5.5		10.1	
West Gilleland @ Cameron	1194	GIL4	04/24/2013	J	0.008	R	<J	0.01	<J	0.004	42.0		48.8	R
<b>Site 1194 Mean</b>					0.051		0.03		0.004		23.8		29.4	
Gilleland @ Cameron Rd	1914	GIL5	01/22/2013		0.083		15.40		0.283		5.2		3.9	
Gilleland @ Cameron Rd	1914	GIL5	04/24/2013		0.042	R	14.10		0.293		13.1		9.6	R
Gilleland @ Cameron Rd	1914	GIL5	06/26/2013		0.029		15.30		0.342		10.6		7.3	
Gilleland @ Cameron Rd	1914	GIL5	09/26/2013		0.011		16.30		0.393		7.6		9.6	
<b>Site 1914 Mean</b>					0.041		15.28		0.328		9.1		7.6	
Gilleland @ SRR Ave	1193	GIL6	01/22/2013		0.273		3.30		J	0.004	2.1		1.9	
Gilleland @ SRR Ave	1193	GIL6	04/24/2013	J	0.020	R	2.97		0.011		3.7		3.3	R
Gilleland @ SRR Ave	1193	GIL6	06/26/2013		0.037		1.43		0.017		3.9		2.0	
Gilleland @ SRR Ave	1193	GIL6	09/26/2013		0.010		6.18		0.025		3.0		2.2	
<b>Site 1193 Mean</b>					0.085		3.47		0.014		3.2		2.3	
<b>Watershed Mean</b>					0.040		10.20		0.213		15.1		15.3	

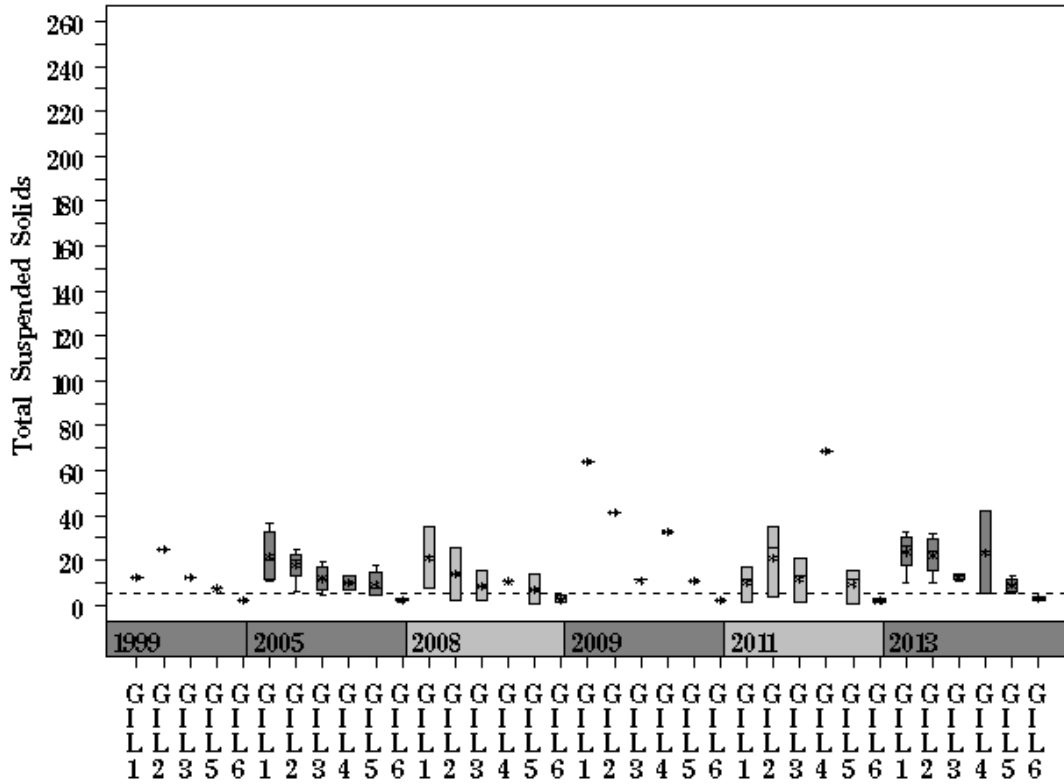
Orange highlighting indicates that the value exceeds one standard deviation from the mean of all E.I.I. sites combined.

Summary Statistics for all 2013 – 2014 E.I.I. Sites Combined.				
Parameter	2013-2014 Mean	2013-2014 Minimum	2013-2014 Maximum	1 Standard Deviation Above
NH3-M (mg/l)	0.031	0.008	2.250	0.150
NO3-N (mg/l)	1.16	0.01	16.30	4.02
Ortho-P (mg/l)	0.041	0.004	1.360	0.164
TSS (mg/l)	5.6	1.0	70.0	15.3
Turbidity (NTU)	4.5	0.0	97.1	13.2

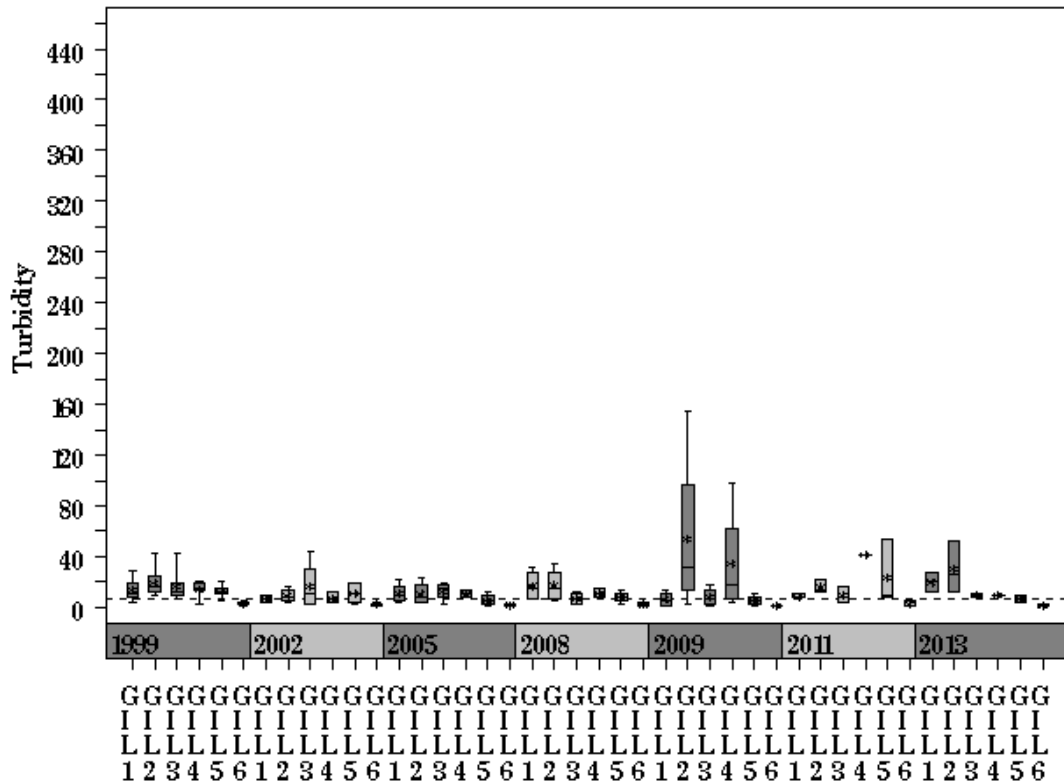
# Gilleland Creek Watershed

Data Summary Graphs – Total Suspended Solids and Turbidity (Downstream to Upstream by Year)

Parameter= TOTAL SUSPENDED SOLIDS Unit= mg/L Watershed= Gilleland



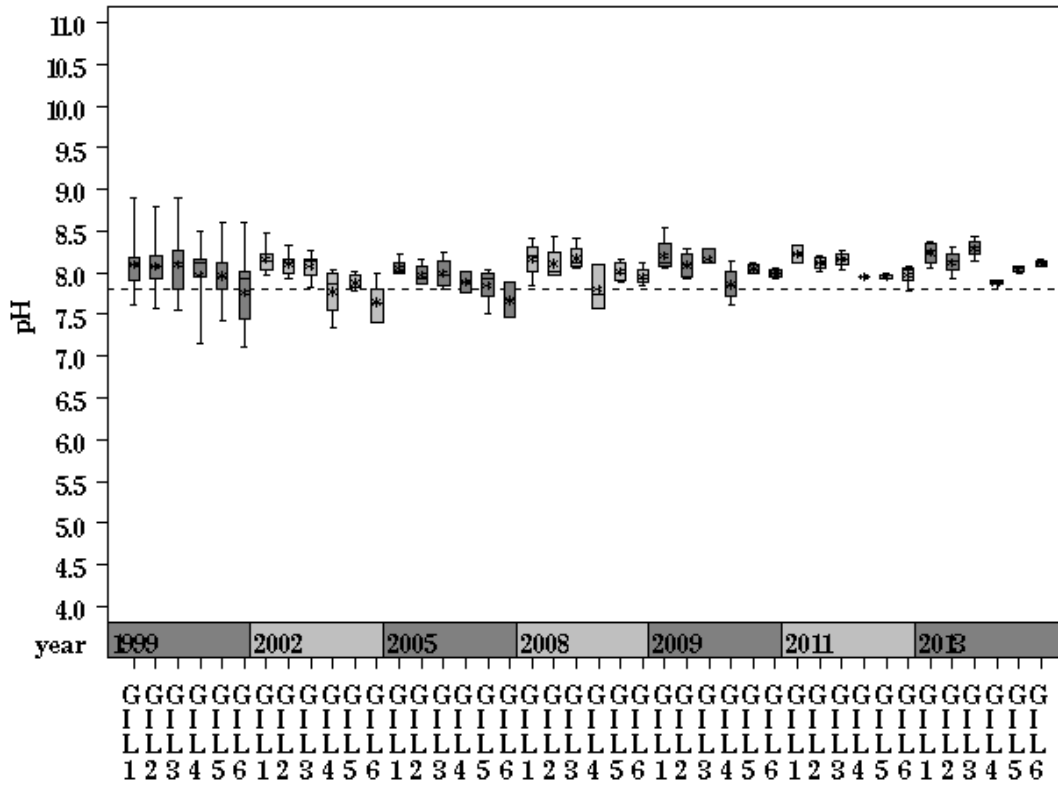
Parameter= TURBIDITY Unit= NTU Watershed= Gilleland



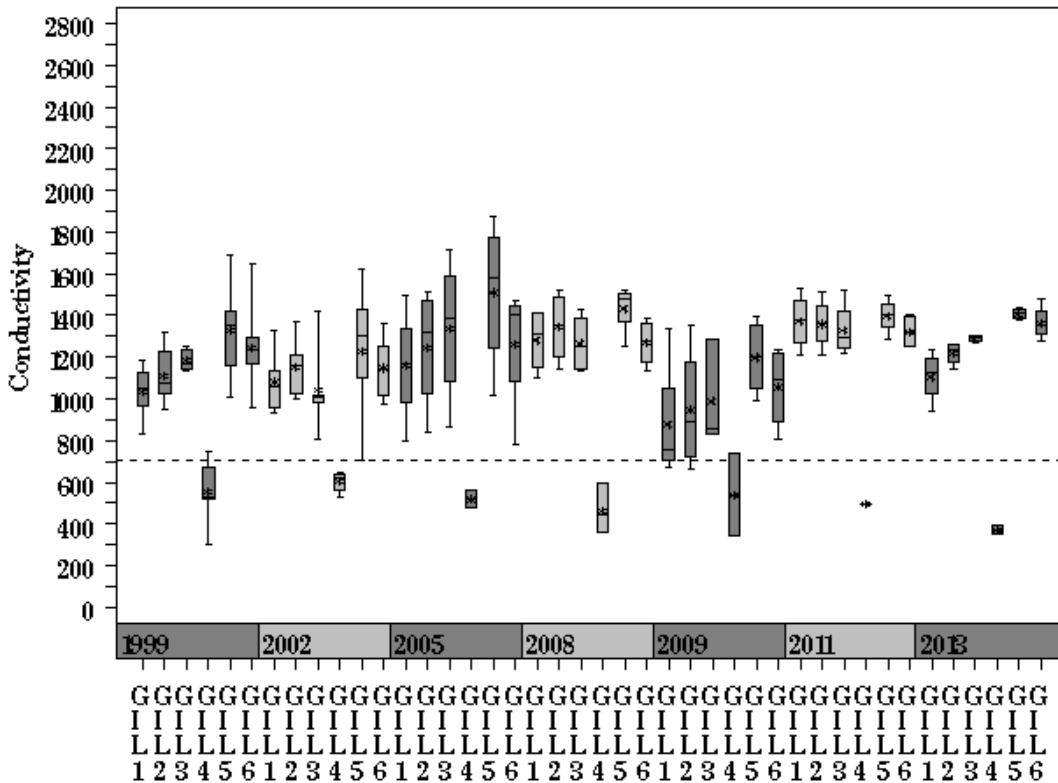
# Gilleland Creek Watershed

Data Summary Graphs – pH and Conductivity (Downstream to Upstream by Year)

Parameter= PH Unit= Standard units Watershed= Gilleland



Parameter= CONDUCTIVITY Unit= uS/cm Watershed= Gilleland

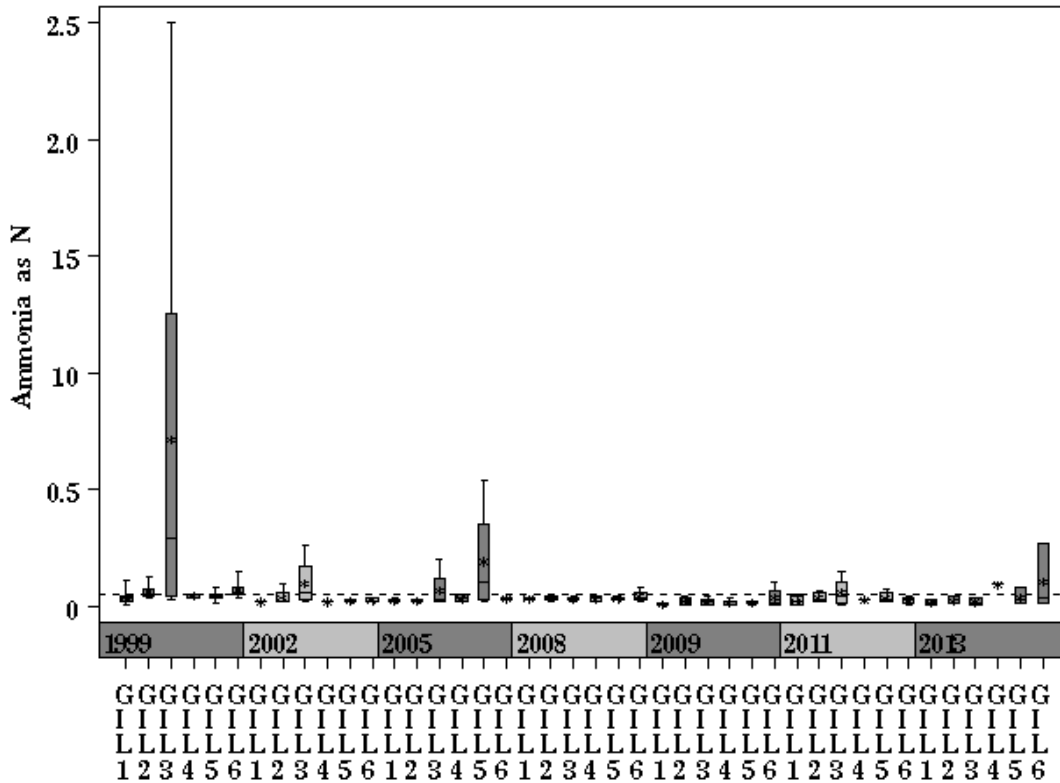




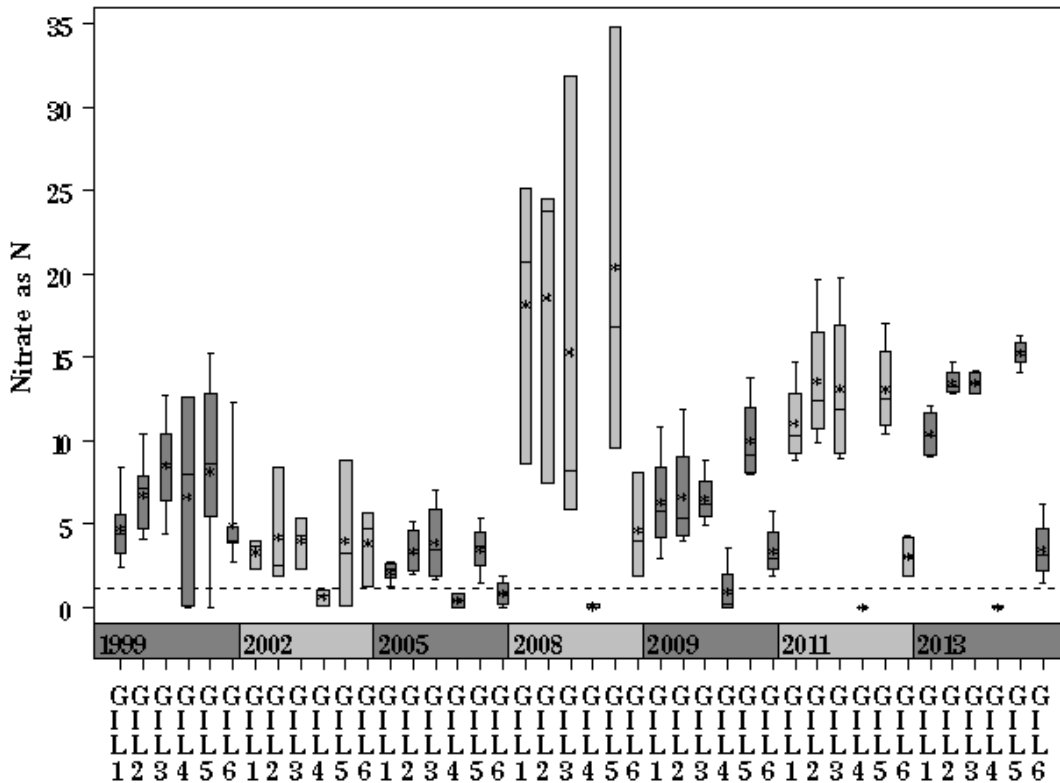
# Gilleland Creek Watershed

Data Summary Graphs – Ammonia and Nitrate/Nitrite (Downstream to Upstream by Year)

Parameter= AMMONIA AS N Unit= mg/L Watershed= Gilleland



Parameter= NITRATE AS N Unit= mg/L Watershed= Gilleland

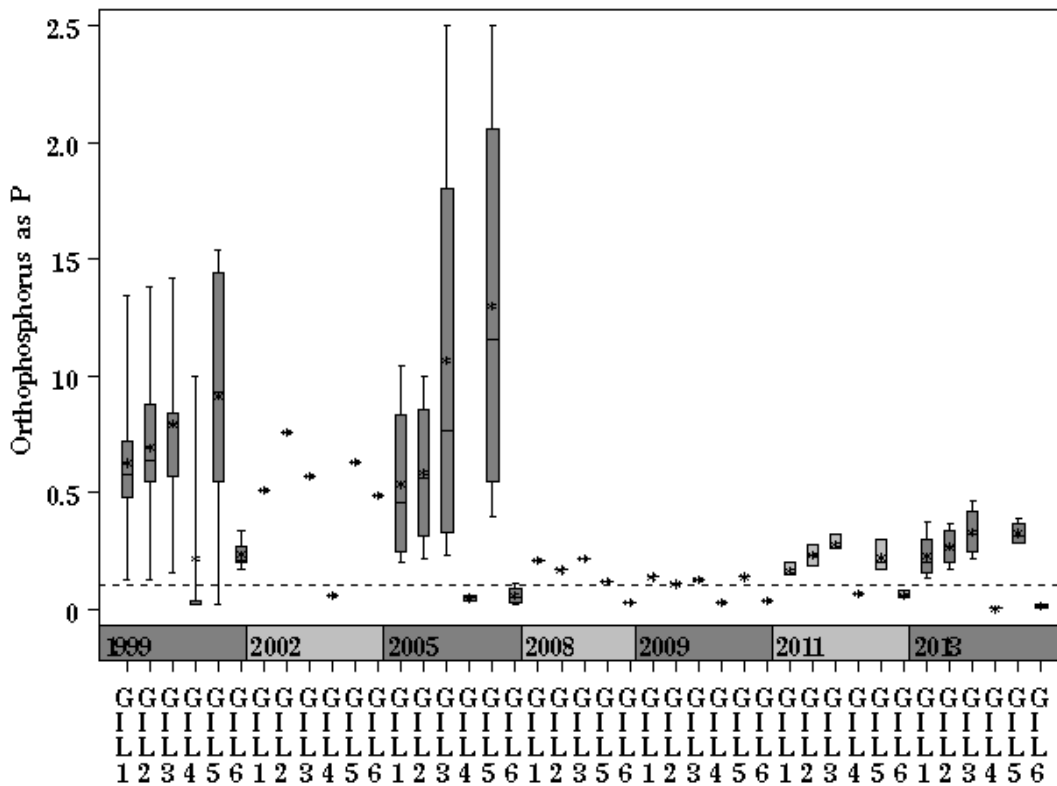




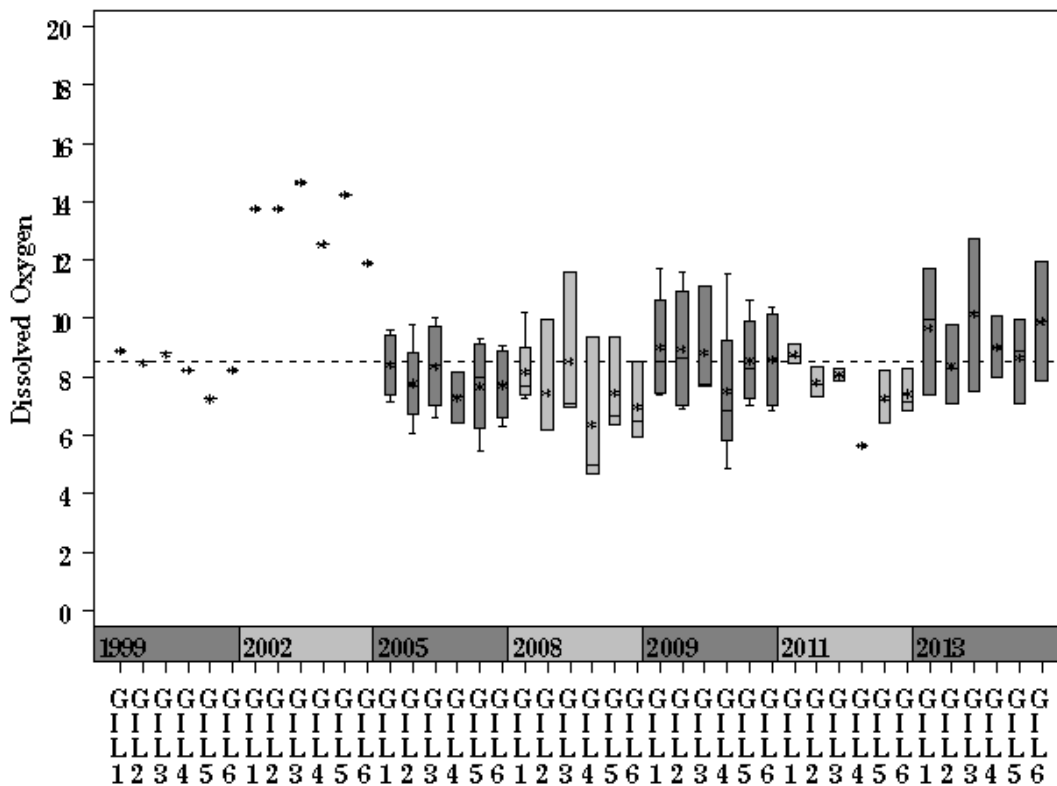
# Gilleland Creek Watershed

## Data Summary Graphs – Orthophosphate and Dissolved Oxygen (Downstream to Upstream by Year)

Parameter= ORTHOPHOSPHORUS AS P Unit= mg/L Watershed= Gilleland



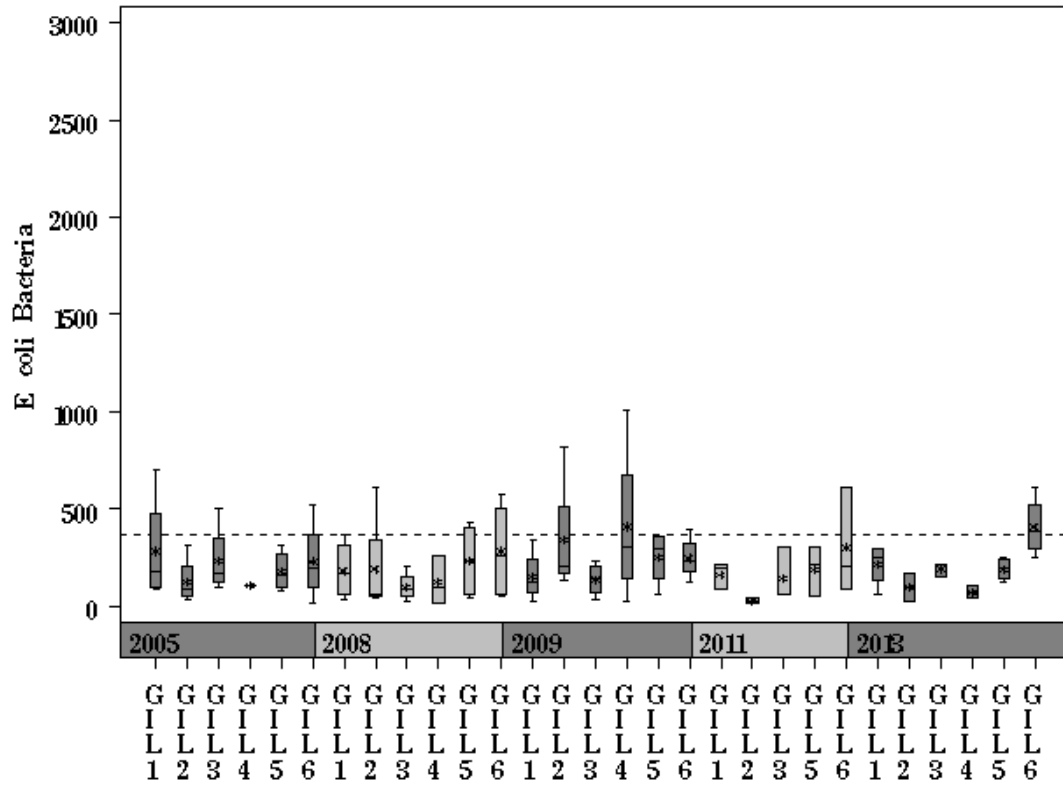
Parameter= DISSOLVED OXYGEN Unit= mg/L Watershed= Gilleland



# Gilleland Creek Watershed

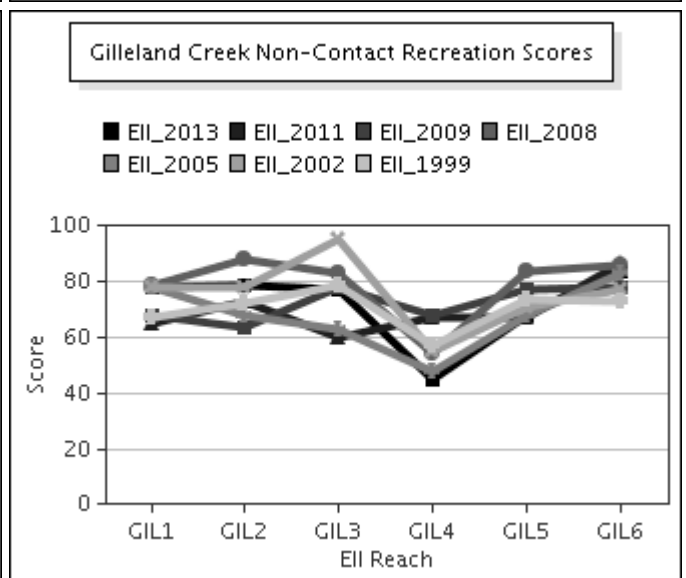
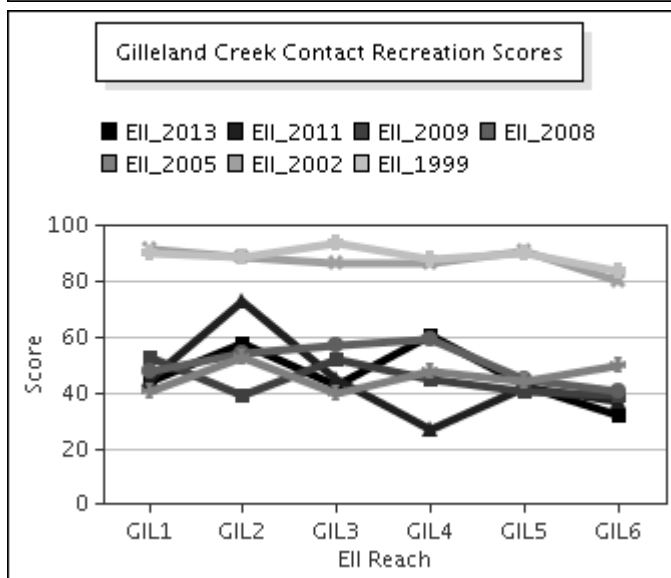
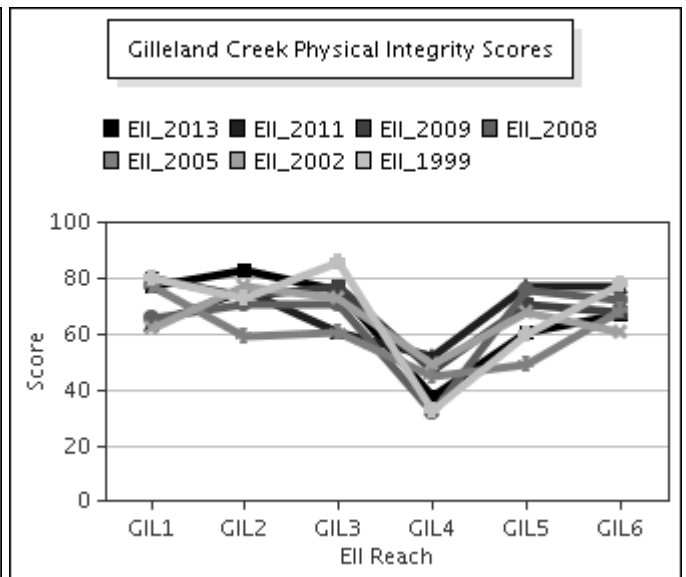
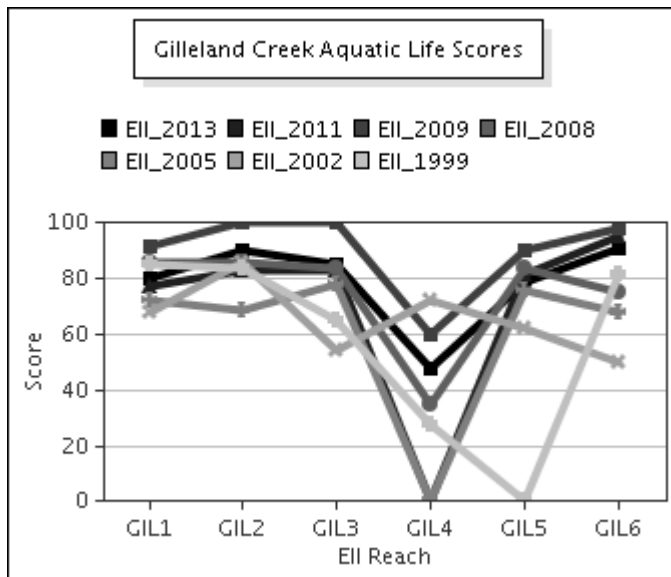
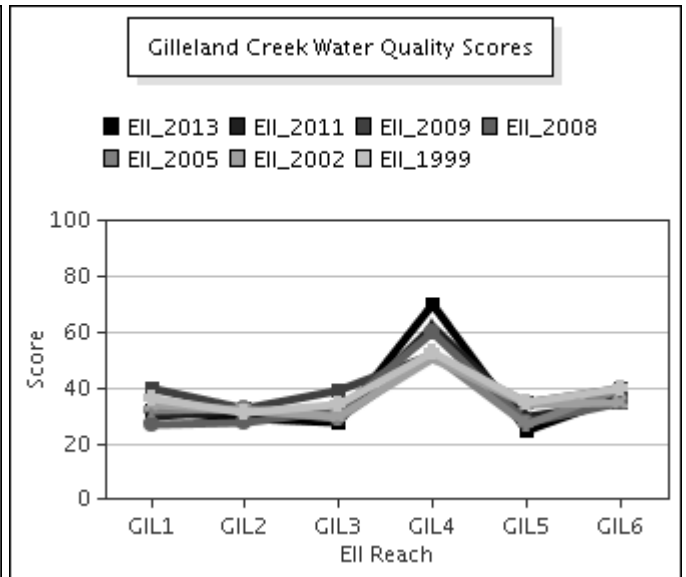
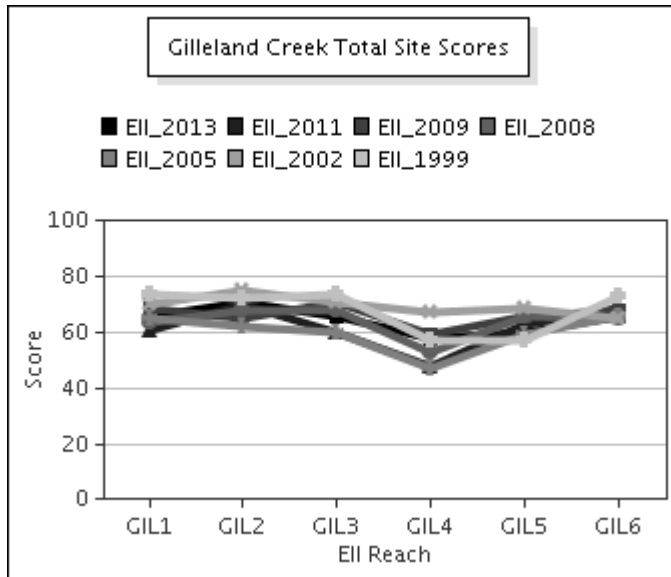
Data Summary Graphs – *E.coli* (Downstream to Upstream by Year)

Parameter= E COLI BACTERIA Unit= MPN/100mL Watershed= Gilleland



# Gilleland Creek Watershed

## Score Summary – Reach scores for each sample year



# Gilleland Creek Watershed

## Benthic Macroinvertebrates – Taxa List, Pollution Tolerance Index & Functional Feeding Group for 2013 Sample Sites (Downstream to Upstream)

Benthic Macroinvertebrate ID	PTI	FFG	Gilleland @ FM 969 (Site 886)	Gilleland @ FM 973 (Site 1192)	Gilleland @ West Parsons (Site 1191)	West Gilleland @ Cameron (Site 1194)	Gilleland @ Cameron Rd (Site 1914)	Gilleland @ SRR Ave (Site 1193)
<i>Perlesta</i> sp.	0	P			7			
<i>Erpetogomphus</i> sp.	1	P	10	2	3		6	
<i>Chimarra</i> sp.	2	FC		1	1			27
<i>Helicopsyche</i> sp.	2	SC	1	9	30		13	17
<i>Hexacylloepus ferrugineus</i>	2	SC,CG	22	18	26		24	
<i>Hydroptila</i> sp.	2	SC,PI			2			
<i>Microcyloepus pusillus</i>	2	SC,CG	6	7	9		6	5
<i>Neelmis caesa</i>	2	SC,CG	6	1	11		6	
<i>Thraulodes gonzalesi</i>	2	SC,CG	24	17	10		22	
<i>Isonychia</i> sp.	3	FC	29	3	14			
<i>Nectopsyche</i> sp.	3	SH,P,CG						1
<i>Callibaetis</i> sp.	4	CG				6		
<i>Camelobaetidium</i> sp.	4	CG						6
Copepoda	4	SC				5	400	
<i>Fallceon quilleri</i>	4	SC,CG	14	12	35		20	39
<i>Helichus</i> sp.	4	SC,CG		1				
<i>Heterelmis</i> sp.	4	SC,CG					1	
<i>Macrelmis</i> sp.	4	SC,CG						6
<i>Psephenus</i> sp.	4	SC	8	32	32		17	1
<i>Simulium</i> sp.	4	FC	37		3		2	
<i>Smicridea</i> sp.	4	FC	57	11	4		2	2
<i>Vacupernius packeri</i>	4	CG		3	2			
<i>Oecetis</i> sp.	5	SH,P		1				1
<i>Petrophila</i> sp.	5	SC		2				3
<i>Tricorythodes</i> sp.	5	CG		2	13		6	2
<i>Argia</i> sp.	6	P	1	7			6	3
<i>Brechmorhoga mendax</i>	6	P	1		4		3	
<i>Cheumatopsyche</i> sp.	6	FC	37	88	50		3	83
Chironomidae	6	P,FC		3	8	39	2	16
<i>Corbicula fluminea</i>	6	FC		3	2		3	16
<i>Fossaria</i> sp.	6	SC						1
<i>Hetaerina</i> sp.	6	P			1			
Hydracarina	6					27	400	1
<i>Microvelia</i> sp.	6	P				10		
<i>Rhagovelia</i> sp.	6	P	1		2		2	3
Tanypodinae	6	P			1			
<i>Bezzia</i> sp. / <i>Palpomyia</i> sp.	7	P,CG				3		
<i>Caenis</i> sp.	7	SC,CG				2		
<i>Stenelmis</i> sp.	7	SC,CG	4	11	10		3	
Cladocera	8	FC				1		
<i>Hyalella</i> sp.	8	SH,CG			1	26		9
Oligochaeta	8	CG				6		
Corixidae	9	P,CG				1		
<i>Physella</i> sp.	9	SC			1	7	75	20
Collembola	10	CG				1		
Cambaridae		CG				1		
<i>Dugesia</i> sp.		P,CG	2	22	40		7	19
<i>Melanoides tuberculatus</i>		SC						4



# Gilleland Creek Watershed

## Benthic Macroinvertebrates – Metric Summary for 2013 Sample Sites (Downstream to Upstream)

Scoring Metric	Gilleland @ FM 969 (Site 886)	Gilleland @ FM 973 (Site 1192)	Gilleland @ West Parsons (Site 1191)	West Gilleland @ Cameron (Site 1194)	Gilleland @ Cameron Rd (Site 1914)	Gilleland @ SRR Ave (Site 1193)
Number of Taxa *	17	21	25	13	22	22
Hilsenhoff Biotic Index *	3.7	4.5	3.8	6.5	5.0	5.0
Number of Ephemeroptera Taxa *	3	5	5	2	3	3
Percent of Total as Chironomidae *	0	1	3	29	0	6
Number of EPT Taxa *	6	10	11	2	6	9
Percent of Total as EPT *	62	58	53	6	6	66
Percent of Total as Predator *	6	14	21	40	3	16
Number of Intolerant Taxa *	11	13	15	2	12	9
Percent Dominance (Top 3 Taxa) *	50	56	39	69	85	55
EPT / EPT + Chironomidae	1	1	1	0	1	1
Number of Diptera Taxa	1	1	2	2	2	1
Number of Non-Insect Taxa	1	1	3	7	4	6
Number of Organisms	260	253	320	134	1026	269
Percent Dominance (Top 1 Taxa)	22	35	16	29	39	31
Percent of Total as Collector / Gatherer	30	37	49	34	9	32
Percent of Total as Dominant Guild (FFG)	62	43	52	40	57	48
Percent of Total as Elmidae	15	15	18	0	4	4
Percent of Total as Filterers	62	42	25	30	1	48
Percent of Total as Grazers (PI & SC)	33	43	52	10	57	36
Percent of Total as Tolerant Organisms	0	0	0	6	7	7
Percent of Trichoptera as Hydropsychidae	99	90	62	0	28	65
Ratio of Intolerant : Tolerant Organisms	4.86	1.11	2.58	0.09	1.06	0.80
TCEQ Qualitative Aquatic Life Use Score	31	31	34	21	28	33
TCEQ Quantitative Aquatic Life Use Score	37	39	41	19	23	35

\* **EII scoring parameter: Nine metric parameters are used in the calculation of the EII Benthic Subindex score. Other metrics are shown to supplement evaluation.**

1. # of Taxa: Higher diversity (number of taxa) correlates with greater biological integrity. The average number of taxa per site for 2013/2014 samples was 15; the lowest value was 5 and the highest value was 30.
2. Hilsenhoff Biotic Index (HBI): HBI values range from 0 to 10. Low HBI values reflect a higher abundance of taxa that are sensitive to organic (nutrient) pollution, thus a lower level of this type of pollution. The average HBI per site for 2013/2014 samples was 5.4; the lowest value was 3.7 and the highest value was 8.1.
3. # of Ephemeroptera taxa: A higher number of Ephemeroptera (mayfly) taxa correlates with greater biological integrity. The average number of taxa per site for 2013/2014 samples was 2; the lowest value was 0 and the highest value was 7.
4. % of total as Chironomidae: The percentage of the sample represented by the Dipteran family Chironomidae will increase with a decrease in biological integrity. The average percent Chironomidae per site for 2013/2014 samples was 16%; the lowest value was 0% and the highest value was 77%.
5. # of EPT Taxa: A higher number of Ephemeroptera (mayfly), Plecoptera (stonefly) and Trichoptera (caddisfly) taxa correlates with greater biological integrity. The average number of EPT taxa per site for 2013/2014 samples was 4; the lowest value was 0 and the highest value was 12.
6. % of total as EPT: The percentage of the sample represented by the insect orders Ephemeroptera (mayfly), Plecoptera (stonefly) and Trichoptera (caddisfly) will decrease with a decrease in biological integrity. The average percent EPT taxa per site for 2013/2014 samples was 46%; the lowest value was 0% and the highest value was 89%.
7. % of total as Predator: The percentage of the sample represented by predators is variable with regard to biological integrity. The average percent predator per site for 2013/2014 samples was 31%; the lowest value was 3% and the highest value was 82%.
8. # of Intolerant Taxa: A higher number of pollution intolerant taxa correlates with greater biological integrity. The average number of intolerant taxa per site for 2013/2014 samples was 5; the lowest value was 0 and the highest value was 15.
9. % Dominance (top 3 taxa): The percentage of the sample represented by the three most abundant taxa will increase with a decrease in biological integrity. The average percent of sample dominated by the top three taxa per site for 2013/2014 samples was 72%; the lowest value was 39% and the highest value was 96%.

# Gilleland Creek Watershed

## Diatoms – Taxa List & Pollution Tolerance Index for 2013 Sample Sites (Downstream to Upstream)

Diatom Species Name	PTI	Gilleland @ FM 969 (Site 886)	Gilleland @ FM 973 (Site 1192)	Gilleland @ West Parsons (Site 1191)	Gilleland @ Cameron Rd (Site 1914)	Gilleland @ SRR Ave (Site 1193)
<i>Amphora inariensis</i>	4			11		31
<i>Diploneis oblongella</i>	4				2	
<i>Achnanthydium minutissimum</i>	3	8	6	14	3	
<i>Achnanthydium pyrenaicum</i>	3	1				
<i>Amphora libyca</i>	3			1	1	4
<i>Amphora ovalis</i>	3					12
<i>Amphora pediculus</i>	3	13	8	27	10	35
<i>Caloneis bacillum</i>	3		2			1
<i>Cocconeis pediculus</i>	3		13	7	17	137
<i>Cymatopleura elliptica</i>	3					4
<i>Cymbella hustedtii</i>	3					4
<i>Denticula kuetzingii</i>	3		4		4	
<i>Diploneis puella</i>	3	1				
<i>Encyonema prostratum</i>	3	2	3			
<i>Encyonema silesiacum</i>	3		1			
<i>Fragilaria capucina</i>	3				2	
<i>Gomphonema affine</i>	3					3
<i>Gomphonema pumilum</i>	3	27		48	10	
<i>Gyrosigma nodiferum</i>	3	2				
<i>Halamphora montana</i>	3			2	1	
<i>Navicula cryptotenella</i>	3				1	
<i>Navicula radiosa</i>	3					1
<i>Nitzschia dissipata</i>	3		1	8	3	
<i>Nitzschia linearis</i>	3	1		1		
<i>Nitzschia recta</i>	3	1	2			
<i>Reimeria sinuata</i>	3	57	31	17	108	65
<i>Rhoicosphenia abbreviata</i>	3	14	81	124	4	
<i>Staurisira construens</i> var. <i>venter</i>	3		6			
<i>Tabularia fasciculata</i>	3		19	4	2	
<i>Tryblionella angustata</i>	3	1				
<i>Achnantheiopsis lanceolata</i>	2		4	6	10	1
<i>Bacillaria paradoxa</i>	2		1			
<i>Cyclotella meneghiniana</i>	2		2			1
<i>Diadesmis confervacea</i>	2					6
<i>Encyonema minutum</i>	2					13
<i>Halamphora veneta</i>	2			1		
<i>Navicula cincta</i>	2	1				
<i>Navicula menisculus</i>	2		2	1	2	
<i>Navicula recens</i>	2	42	1	10	2	
<i>Navicula sanctaerucis</i>	2	4				
<i>Navicula schroeterii</i>	2				1	
<i>Nitzschia amphibia</i>	2		4		8	4
<i>Nitzschia inconspicua</i>	2	133	7	29	4	
<i>Pleurosira laevis</i>	2	3	6	5		5
<i>Synedra ulna</i>	2		1		5	1
<i>Tryblionella apiculata</i>	2		2	2		
<i>Gomphonema parvulum</i>	1	4	10	10		
<i>Cocconeis plancentula</i> var. <i>lineata</i>		134	165	127	187	164
<i>Eolimna minima</i>		7				
<i>Gomphonema lateripunctatum</i>		2				
<i>Kolbesia ploenensis</i>		36	116	45	108	
<i>Staurisira venter</i>						5
<i>Terpsinoe musica</i>		4	2		4	3
<i>Tryblionella debilis</i>		2			1	

# Gilleland Creek Watershed

## Diatoms – Metric Summary for 2013 Sample Sites (Downstream to Upstream)

Scoring Metric	Gilleland @ FM 969 (Site 886)	Gilleland @ FM 973 (Site 1192)	Gilleland @ West Parsons (Site 1191)	Gilleland @ Cameron Rd (Site 1914)	Gilleland @ SRR Ave (Site 1193)
<i>Cymbella</i> Richness	2	3	1	1	3
Number of organisms	500	500	500	500	500
Number of taxa	24	27	22	25	21
Percent motile taxa	37	4	10	4	2
Percent similarity to reference condition	14	18	23	18	24
Pollution tolerance index	2.39	2.77	2.81	2.85	3.00

\* **EII scoring parameter:** Four metric parameters are used in the calculation of the EII Diatom Subindex score: *Cymbella* richness, percent motile taxa, percent similarity to reference condition and pollution tolerance index. Number of taxa is non-scoring, but is shown to supplement evaluation. The number of organisms is typically a sample of 500, but occasionally differs due to sample conditions.

1. *Cymbella* Richness: The Cymbelloid taxa include species in the genus *Cymbella*, in addition to some species belonging to the genera *Cymbellopsis*, *Cymbopleura*, *Encyonema*, *Encyonemopsis*, *Navicymbula* and *Reimeria*. Their presence highlights the presence of sensitive species, especially with regard to impervious cover, and this value increases with an increase in overall water quality. The average number of Cymbelloid taxa per site for 2013/2014 samples was 3; the lowest value was 0 and the highest value was 7.
2. % Motile Taxa: This is a siltation index showing the relative abundance of genera that are able to move towards the surface if covered by silt. A higher percentage is indicative of a degraded condition caused by increased silt pollution. The average percent motile taxa per site for 2013/2014 samples was 16%; the lowest value was 0% and the highest value was 77%.
3. % similarity to reference condition: This percentage compares a site to reference sites that are selected based on having low percent impervious cover. A higher percentage reflects greater biological integrity. The average percent similarity per site for 2013/2014 samples was 31%; the lowest value was 6% and the highest value was 57%.
4. Pollution Tolerance Index (PTI): This is a total value for a sample, which is a function of the abundance of each taxon (usually species) in a sample and the individual PTI's for each of those taxa. Individual PTI's for each taxon range from 1 (most pollution tolerant) to 4 (most pollution sensitive), thus higher total PTI's for a site reflect greater biological integrity. The average PTI per site for 2013/2014 samples was 2.76; the lowest value was 1.70 and the highest value was 3.45.



# Gilleland Creek Watershed

## Site Photographs



1193\_t00-us-03\_27\_2002



1193\_t00-ur-06\_16\_2008



1914\_t00-us-06\_16\_2008



1914\_t00-ds-05\_27\_2009



1194\_t00-us-03\_27\_2002



1194\_t00-us-06\_17\_2008



# Gilleland Creek Watershed

## Site Photographs



1191\_t00-ds-06\_16\_2008



1191\_t00-us-06\_17\_2005



1192\_t00-us-05\_28\_2009



1192\_t00-ds-05\_28\_2009



886\_t00-us-05\_28\_2009



886\_t00-ds-03\_27\_2002

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