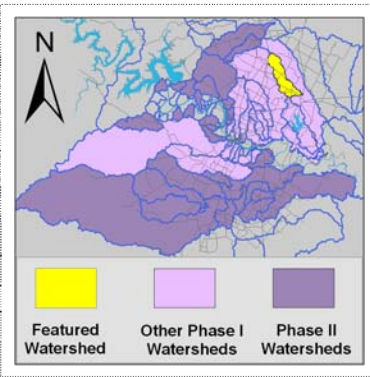


Harris Branch Watershed

Watershed Overview

Catchment	Total area	11 sq. miles						
	Area in recharge	0						
	Creek length	11 miles						
	Receiving water	Gilleland Creek						
Demographics	2000 population	10,173						
	2030 projected population	23,867						
	30 year projected % increase	235 %						
Land Use	Impervious cover (2003 estimate)	8.0 %						
	Impervious cover (2013 estimate)	18.6 %						
Overall EII Scores	1999	2002	2005	2008	2009	2011	2013	2015
	59	61	58	62	62	51	59	66



Flow Regime* for Sample Sites on Harris Branch

Site	2000		2002				2005				2006		2008				2009				2010				2011				2013				2015				
	Jun	Feb	Feb	May	Aug	Nov	Mar	Jun	Jun	Sep	Dec	Feb	Feb	May	Jun	Sep	Dec	Feb	May	May	Oct	Dec	Dec	Mar	Jun	Jun	Sep	Jan	Apr	May	Jun	Jun	Sep	Jan	Apr	Jul	Sep
	Bio	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	Bio	WQ	WQ	WQ	WQ	WQ	WQ	WQ
1199	B	B	B	B	B	B	B	B	B	B	S	B	B	B	B	B	B	B	B	B	B	B	B	B	n	n	n	B	B	B	B	B	B	B	B	B	n
888	B	B	B	B	B	B	B	B	B	n	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
1201	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	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 Harris Branch Sites by Year

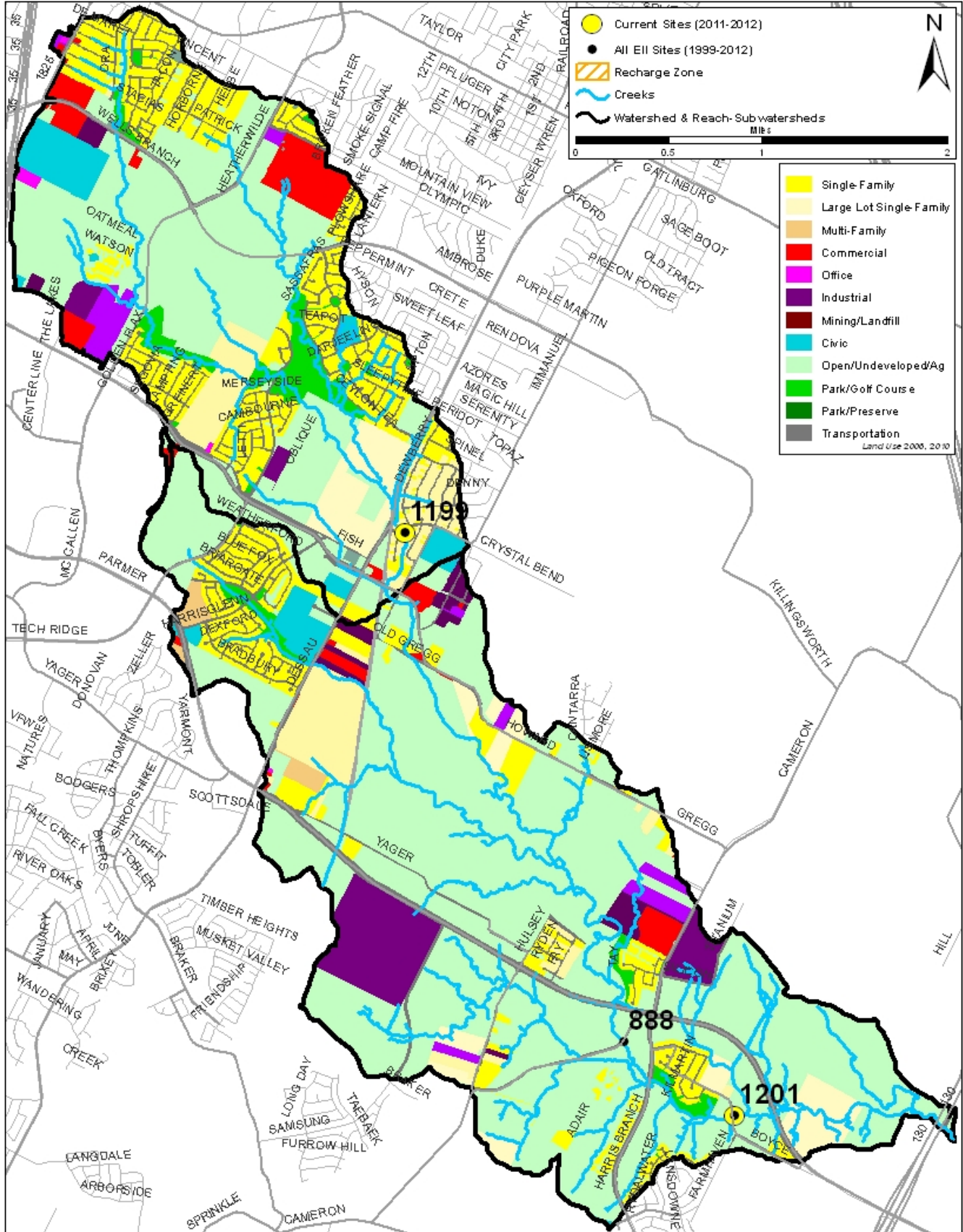
Reach	Site	Site Name	Year	Water Quality	Sediment**	Contact Recreation	Non-Contact Rec.	Physical Integrity	Aquatic Life	Benthic subindex	Diatom subindex	Total EII Score
HRS1	888	Harris Branch Creek @ Cameron Road	2002	36	84	89	58	65	59	75	42	65
HRS1	1201	Harris Branch Creek @ Boyce Lane	2002	34	84	78	68	67	48	65	30	63
HRS2	1199	Harris Branch Creek @ Crystal Bend Drive	2002	31	84	79	40	50	47	70	23	55
HRS1	888	Harris Branch Creek @ Cameron Road	2005	38	87	34	53	54	82	82		58
HRS1	1201	Harris Branch Creek @ Boyce Lane	2005	32	87	53	58	58	66	94	37	59
HRS2	1199	Harris Branch Creek @ Crystal Bend Drive	2005	34	87	33	67	53	69	74	64	57
HRS1	1201	Harris Branch Creek @ Boyce Lane	2008	31	82	63	71	63	80	97	63	65
HRS2	1199	Harris Branch Creek @ Crystal Bend Drive	2008	36	82	25	68	58	80	82	77	58
HRS1	1201	Harris Branch Creek @ Boyce Lane	2009	34	80	35	63	70	90	93	87	62
HRS2	1199	Harris Branch Creek @ Crystal Bend Drive	2009	47	80	32	72	57	84	90	77	62
HRS1	1201	Harris Branch Creek @ Boyce Lane	2011	25	82	38	66	45	73	89	56	55
HRS2	1199	Harris Branch Creek @ Crystal Bend Drive	2011	44	82	46	50	57				47
HRS1	1201	Harris Branch Creek @ Boyce Lane	2013	27	87	37	72	57	72	88	55	59
HRS2	1199	Harris Branch Creek @ Crystal Bend Drive	2013	34	87	25	70	57	80	87	73	59
HRS1	1201	Harris Branch Creek @ Boyce Lane	2015	35	81	48	71	70	82	99	64	65
HRS2	1199	Harris Branch Creek @ Crystal Bend Drive	2015	51	81	37	82	65	84	94	73	67

* 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

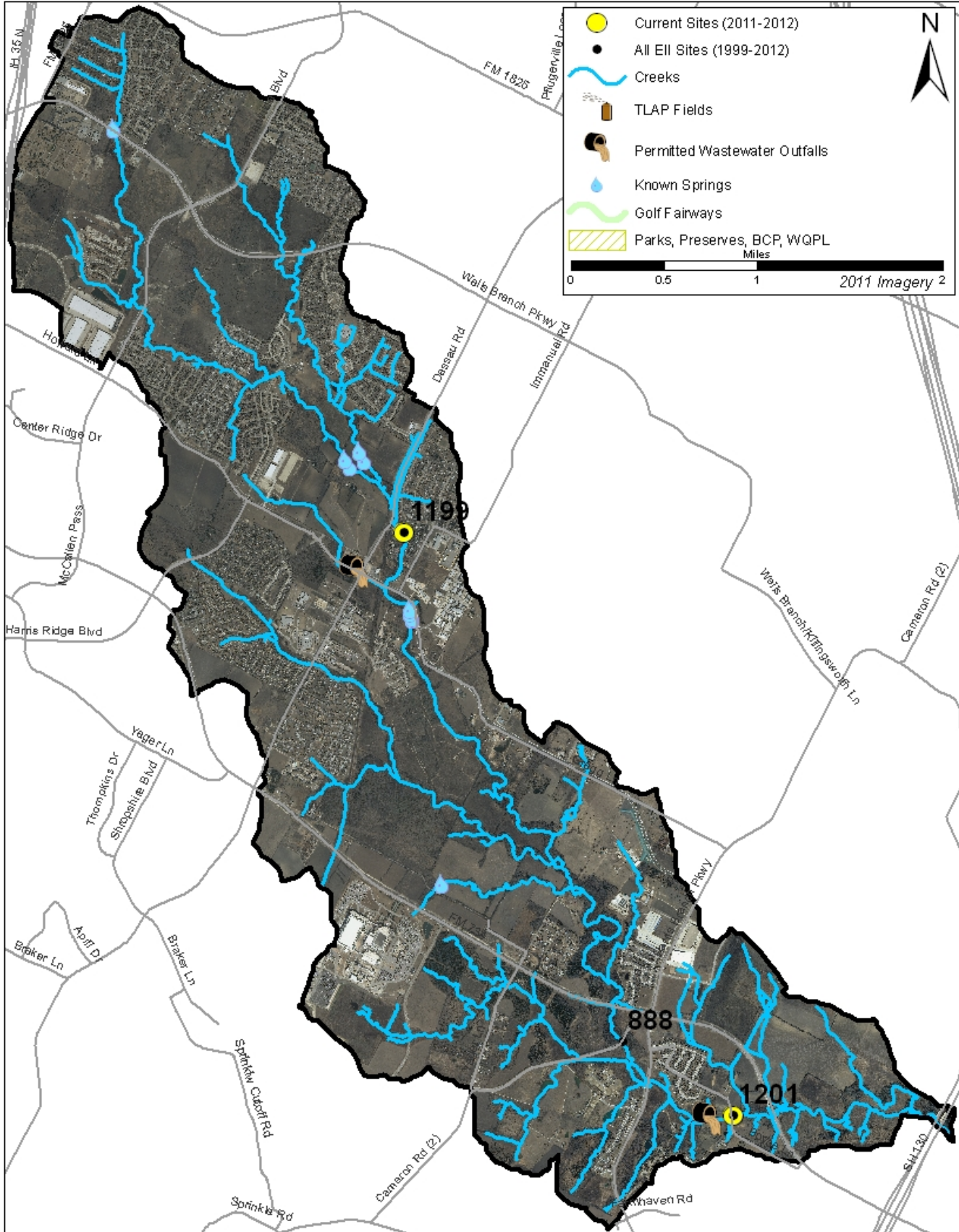
Harris Branch Watershed

Land Use Map



Harris Branch Watershed

Aerial Map



Harris Branch Watershed

Water Quality Data – Temperature, Conductivity, pH, Dissolved Oxygen & *E. coli* for 2015 Sample Sites (Downstream to Upstream)

Qualifiers to the left of the value	>	Greater than	Qualifiers to the right of the value	(blank)	Useable
	<	Less than		S	Exceeds standard range
	<J	Less than detected limit		R	Rejected, failed QC
	J	Estimated			

Watershed	Site	EII Reach	Date	Temp. flag	Cond. flag	pH flag	D.O. flag	E. Coli flag
Harris Branch	1201	HRS1	01/14/2015	8.8	691	8.10	11.3	231.0
Harris Branch	1201	HRS1	04/15/2015	18.6	781	7.97	8.4	387.3
Harris Branch	1201	HRS1	07/06/2015	26.9	776	8.05	8.3	
Harris Branch	1201	HRS1	07/14/2015	26.2	785	9.44	6.3	13.2
Harris Branch	1201	HRS1	09/09/2015	27.3	928	7.40	3.0	410.6
HRS1 Mean				21.6	792	8.19	7.4	260.5
Harris Branch	1199	HRS2	01/14/2015	10.1	709	7.92	10.5	214.2
Harris Branch	1199	HRS2	04/15/2015	18.3	803	7.75	8.0	166.4
Harris Branch	1199	HRS2	07/06/2015	25.0	715	7.80	7.5 R	
Harris Branch	1199	HRS2	07/14/2015	24.9	762	8.50	7.6	517.2
HRS2 Mean				19.6	747	7.99	8.4	299.3
Harris Branch Mean				20.7	772	8.10	7.9	277.1

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

Summary Statistics for all 2015-2016 E.I.I. Sites Combined					
Parameter	2015-2016 Average	2015-2016 Minimum	2015-2016 Maximum	1 Standard Deviation Above	1 Standard Deviation Below
Temperature (C°)	20.7	5.8	34.2	27.5	
Conductivity (uS/cm)	722	160	3549	955	
pH (Standard units)	7.86	5.85	10.25	8.24	7.47
D.O. (mg/l)	7.9	0.1	18.7	10.4	5.5
<i>E. Coli</i> (col/100ml)	316.1	1.0	2420.0	883.7	

Harris Branch Watershed

Water Quality Data – Ammonia, Nitrate / Nitrite, Ortho-Phosphorus, Total Suspended Solids & Turbidity for 2015 Sample Sites (Downstream to Upstream)

Qualifiers to the left of the value	>	Greater than	Qualifiers to the right of the value	(blank)	Useable
	<	Less than		S	Exceeds standard range
	<J	Less than detected limit		R	Rejected, failed QC
	J	Estimated			

Watershed	Site	EII Reach	Date	NH3-N		NO3/NO2		Ortho-P		T.S.S		Turb.		
				<	flag	<>	flag	<>	flag	<>	flag	<>	flag	
Harris Branch	1201	HRS1	01/14/2015	<J	0.008		3.5		0.261		3.1		4.3	R
Harris Branch	1201	HRS1	04/15/2015	<J	0.008		3.3		0.442		15.2		18.5	
Harris Branch	1201	HRS1	07/06/2015											
Harris Branch	1201	HRS1	07/14/2015		0.291		2.1		0.314		2.9		4.8	R
Harris Branch	1201	HRS1	09/09/2015		0.268	R	9.6		0.126		4.6		4.3	R
HRS1 Mean					0.144		4.6		0.286		6.4		8.0	
Harris Branch	1199	HRS2	01/14/2015	<J	0.008		1.6	<J	0.004	<J	1.0		2.6	R
Harris Branch	1199	HRS2	04/15/2015	<J	0.008		2.3		0.010		2.2		2.0	
Harris Branch	1199	HRS2	07/06/2015											
Harris Branch	1199	HRS2	07/14/2015		0.022		1.5		0.012	R	1.5		3.2	R
HRS2 Mean					0.013		1.8		0.008		1.5		2.6	
Harris Branch Mean					0.088		3.4		0.167		4.3		5.7	

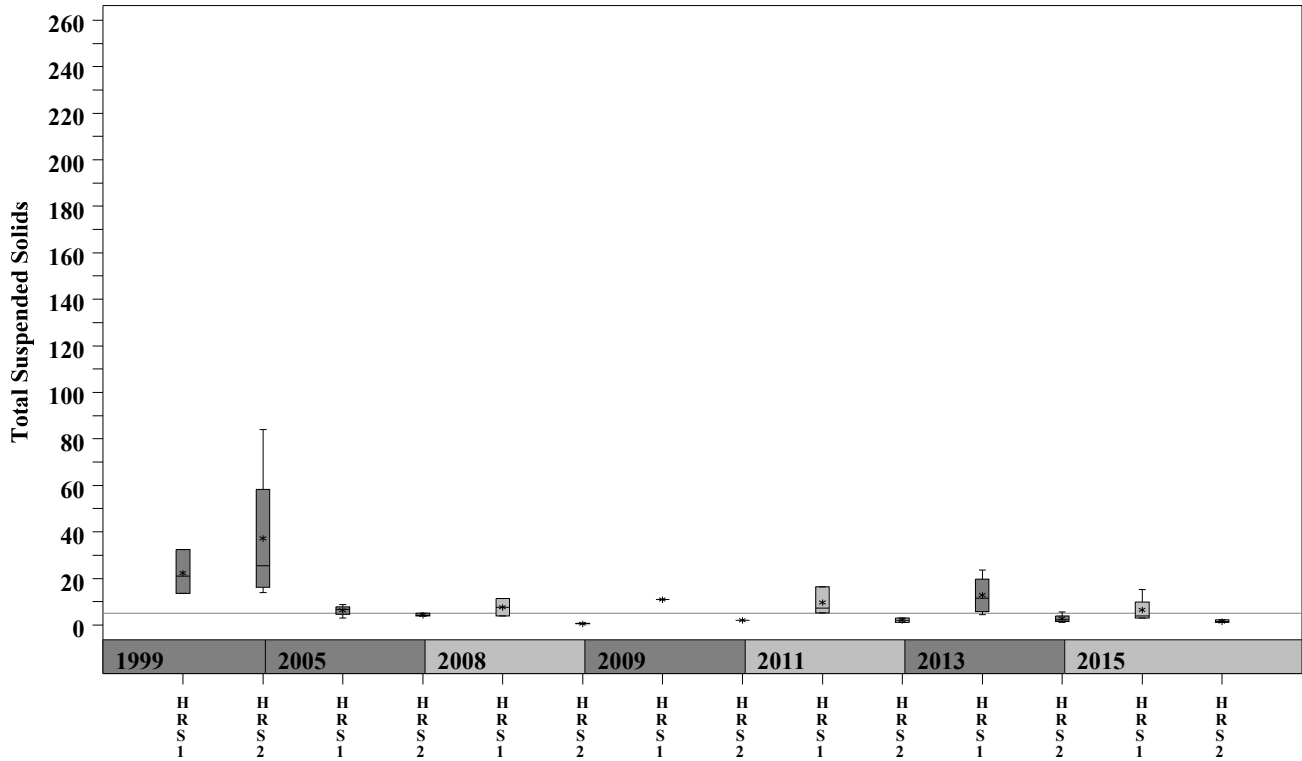
Gray highlighting indicates that the value exceeds one standard deviation from the mean of all E.I.I. sites combined.

Summary Statistics for all 2015-2016 E.I.I. Sites Combined				
Parameter	2015-2016 Average	2015-2016 Minimum	2015-2016 Maximum	1 Standard Deviation Above
NH3-N (mg/l)	0.018	0.008	0.881	0.085
NO3-N (mg/l)	1.14	0.01	12.0	3.16
Ortho-P (mg/l)	0.016	0.004	0.661	0.08
T.S.S. (mg/l)	3.7	1.0	58.2	9.7
Turbidity (NTU)	4.4	0.2	98.6	11.7

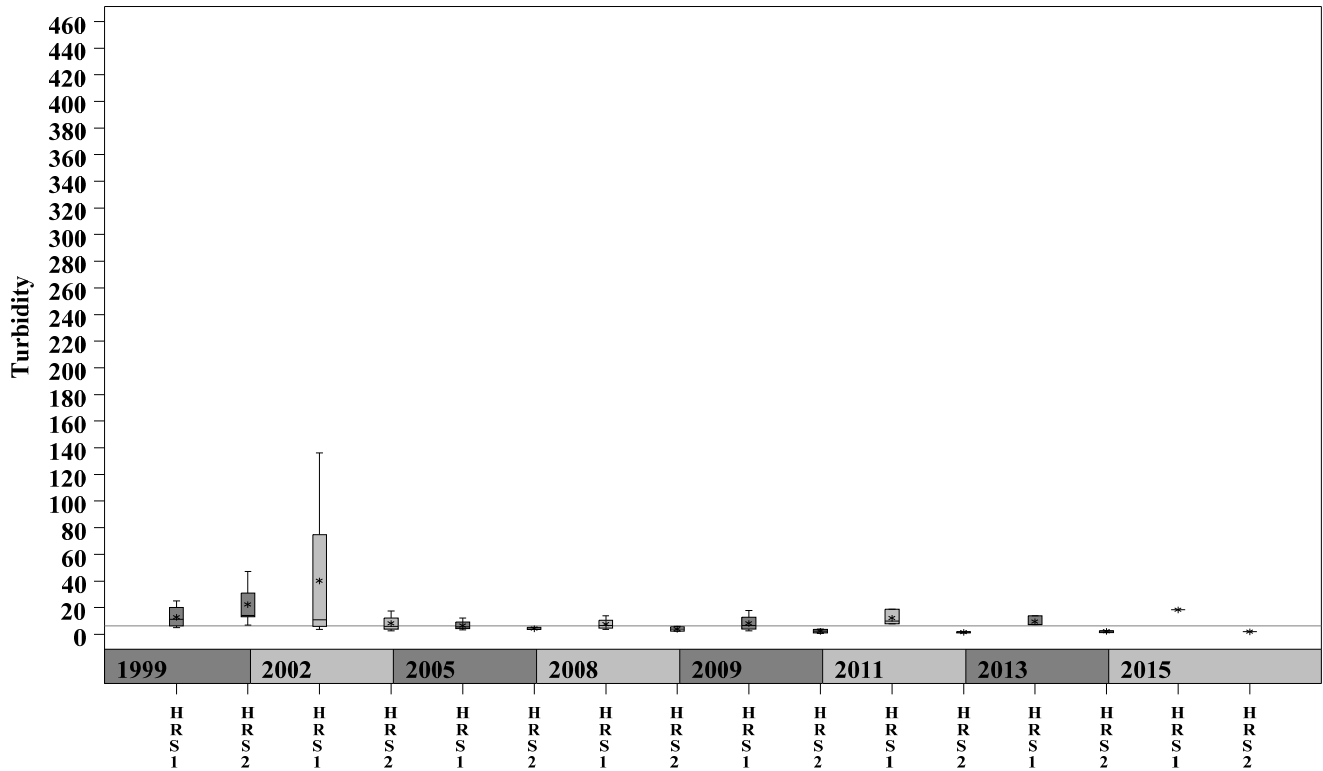
Harris Branch Watershed

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

Parameter = TOTAL SUSPENDED SOLIDS Unit = mg/L Watershed = Harris Branch



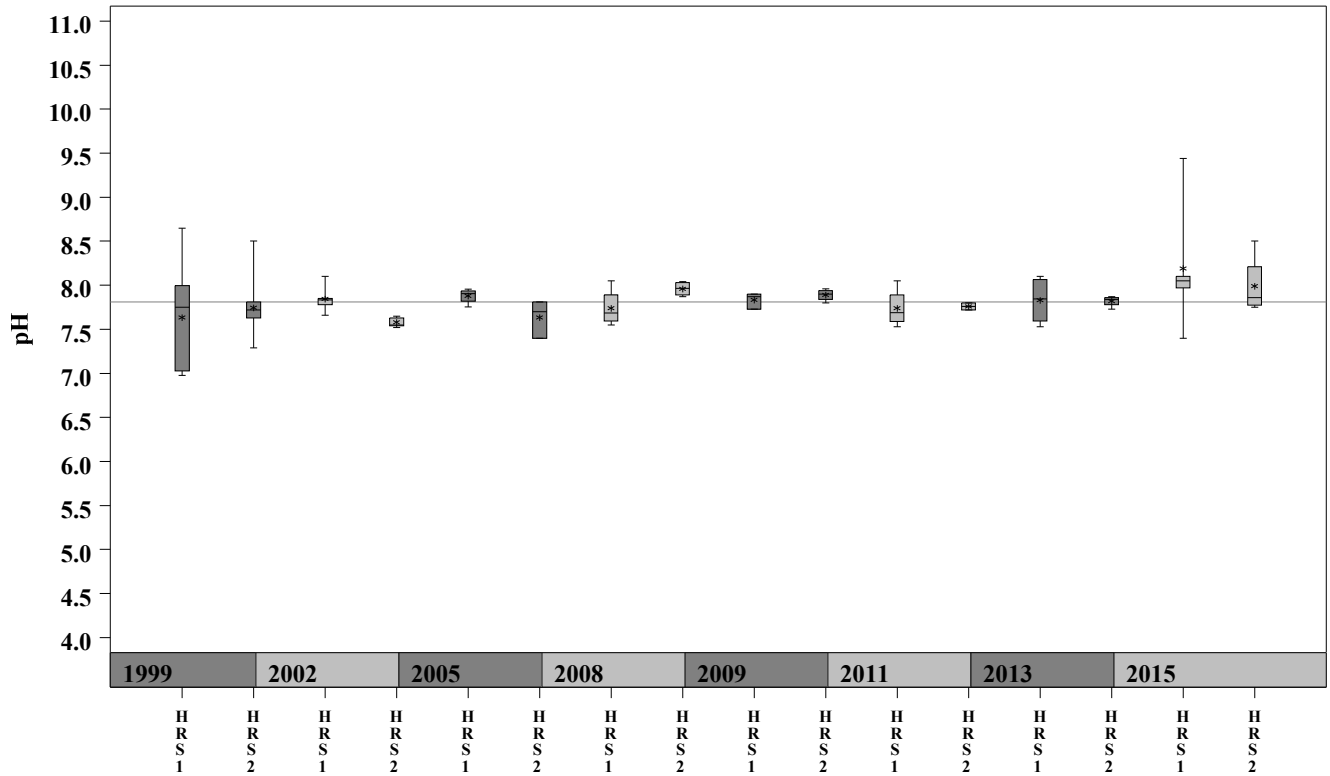
Parameter = TURBIDITY Unit = NTU Watershed = Harris Branch



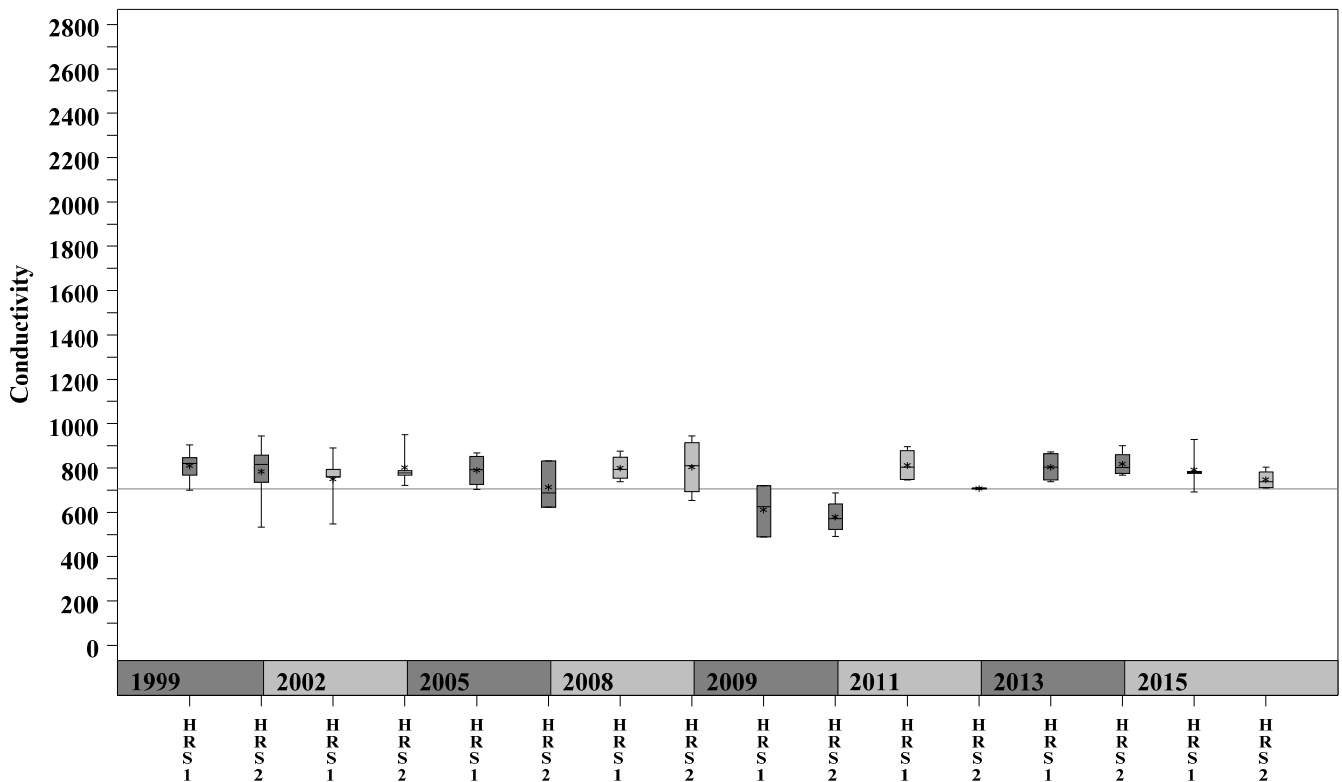
Harris Branch Watershed

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

Parameter=pH Unit=Standard Units Watershed=Harris Branch



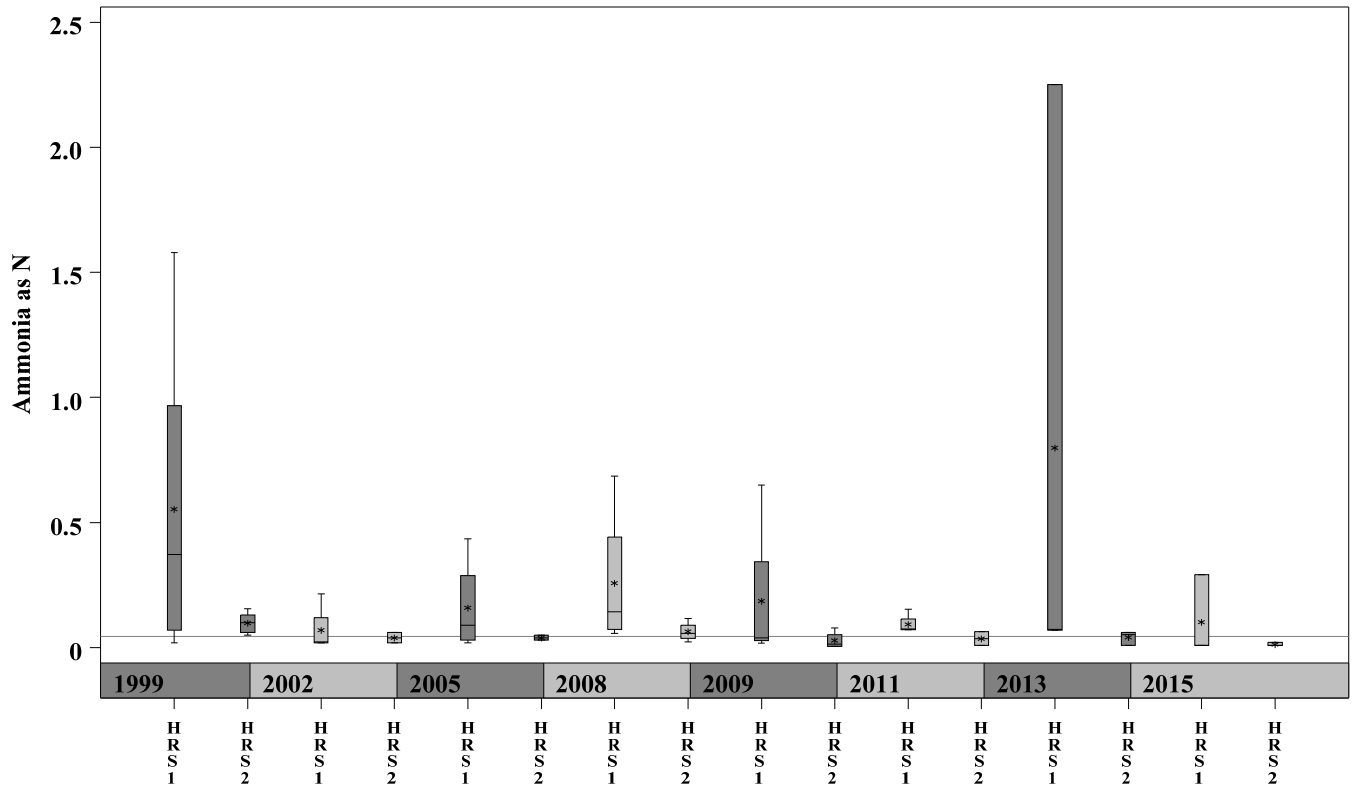
Parameter=CONDUCTIVITY Unit=uS/cm Watershed=Harris Branch



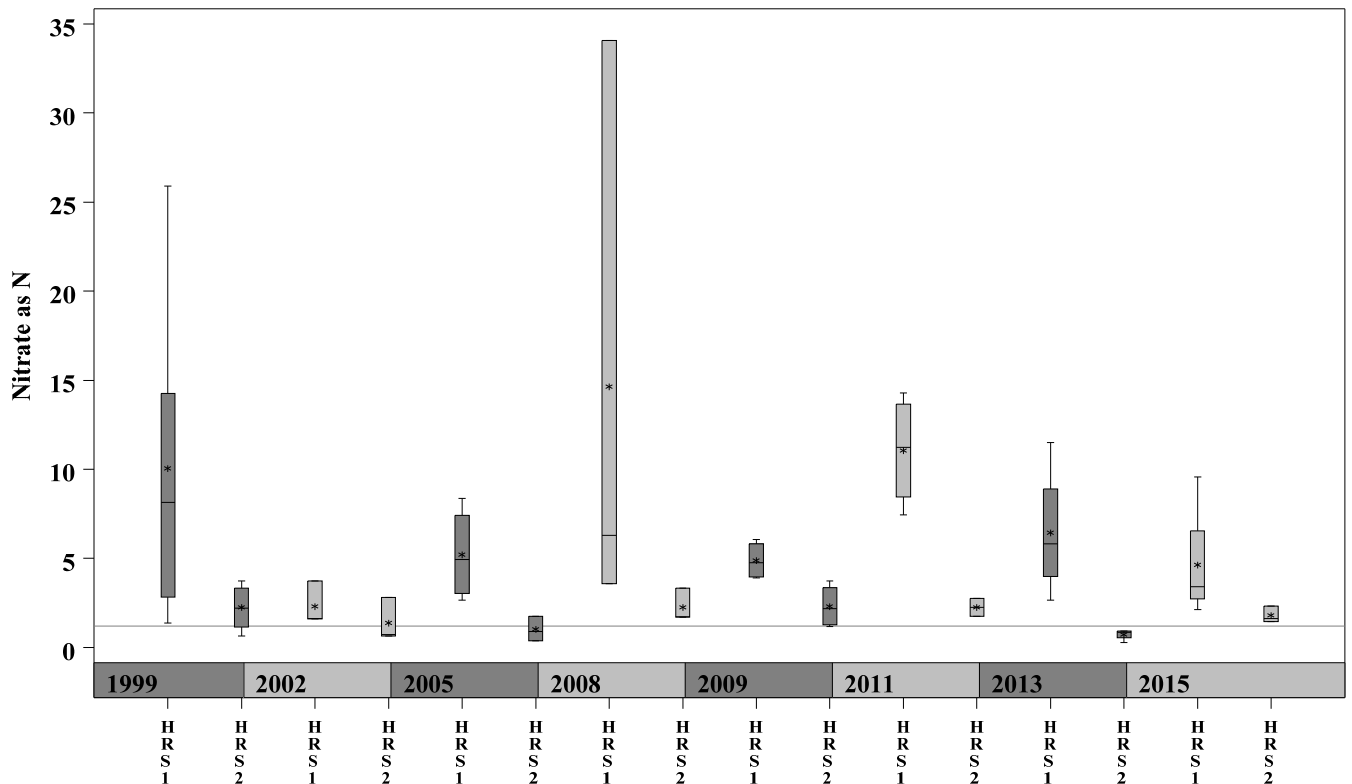
Harris Branch Watershed

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

Parameter=AMMONIA AS N Unit=mg/L Watershed=Harris Branch



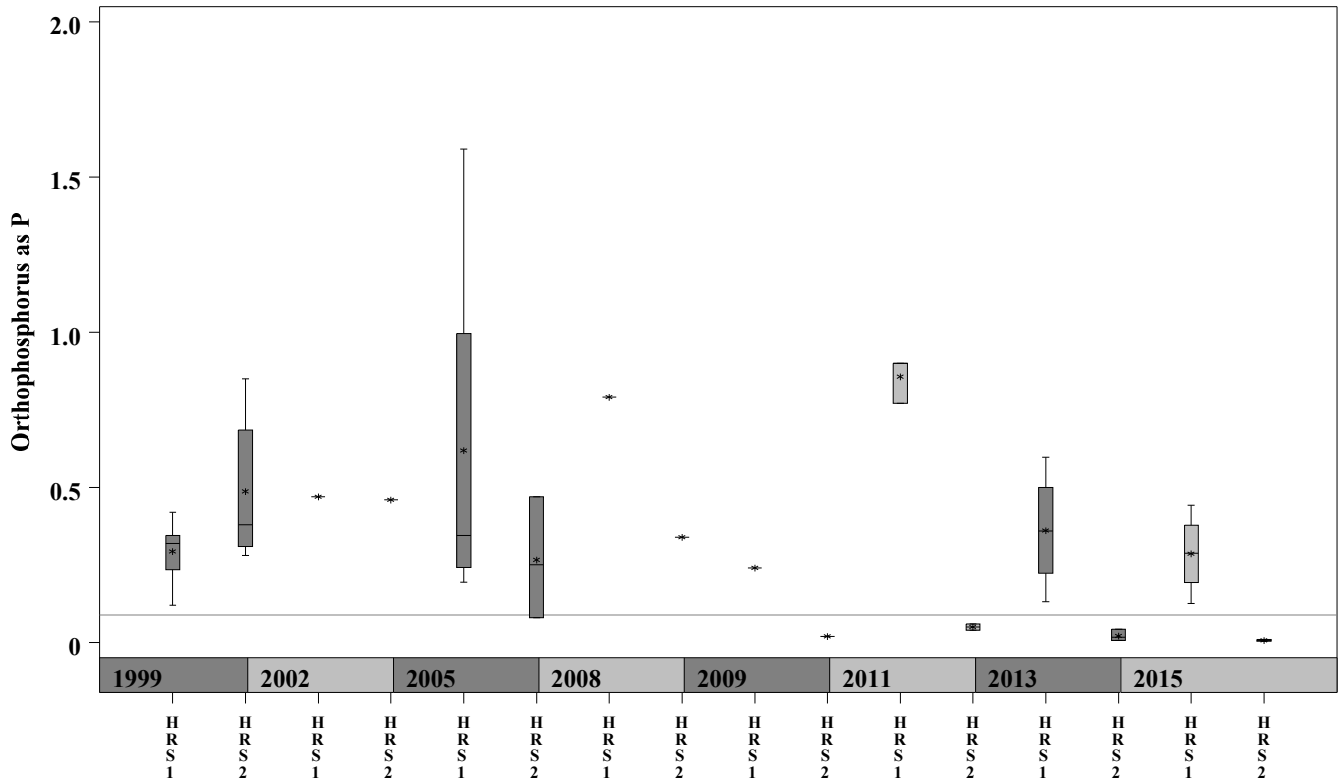
Parameter=NITRATE AS N Unit=mg/L Watershed=Harris Branch



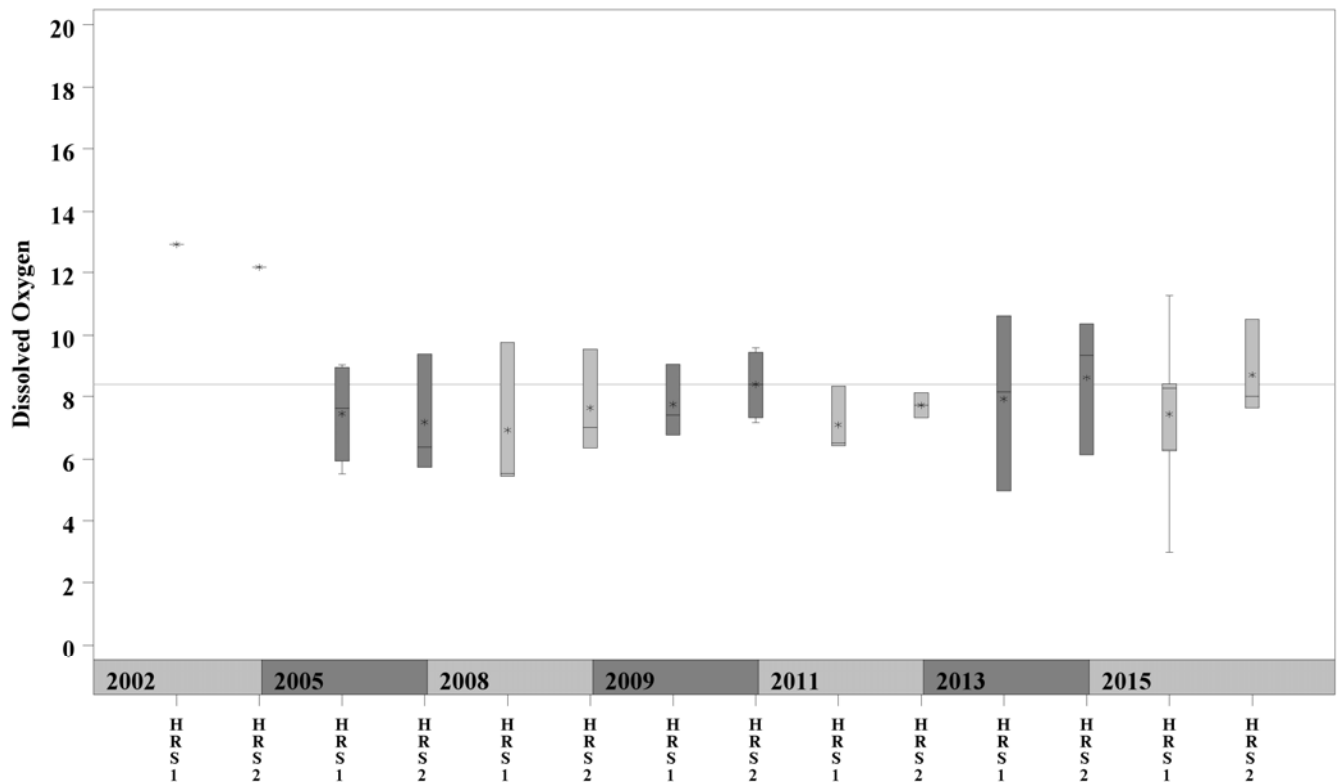
Harris Branch Watershed

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

Parameter = ORTHOPHOSPHORUS AS P Unit = mg/L Watershed = Harris Branch

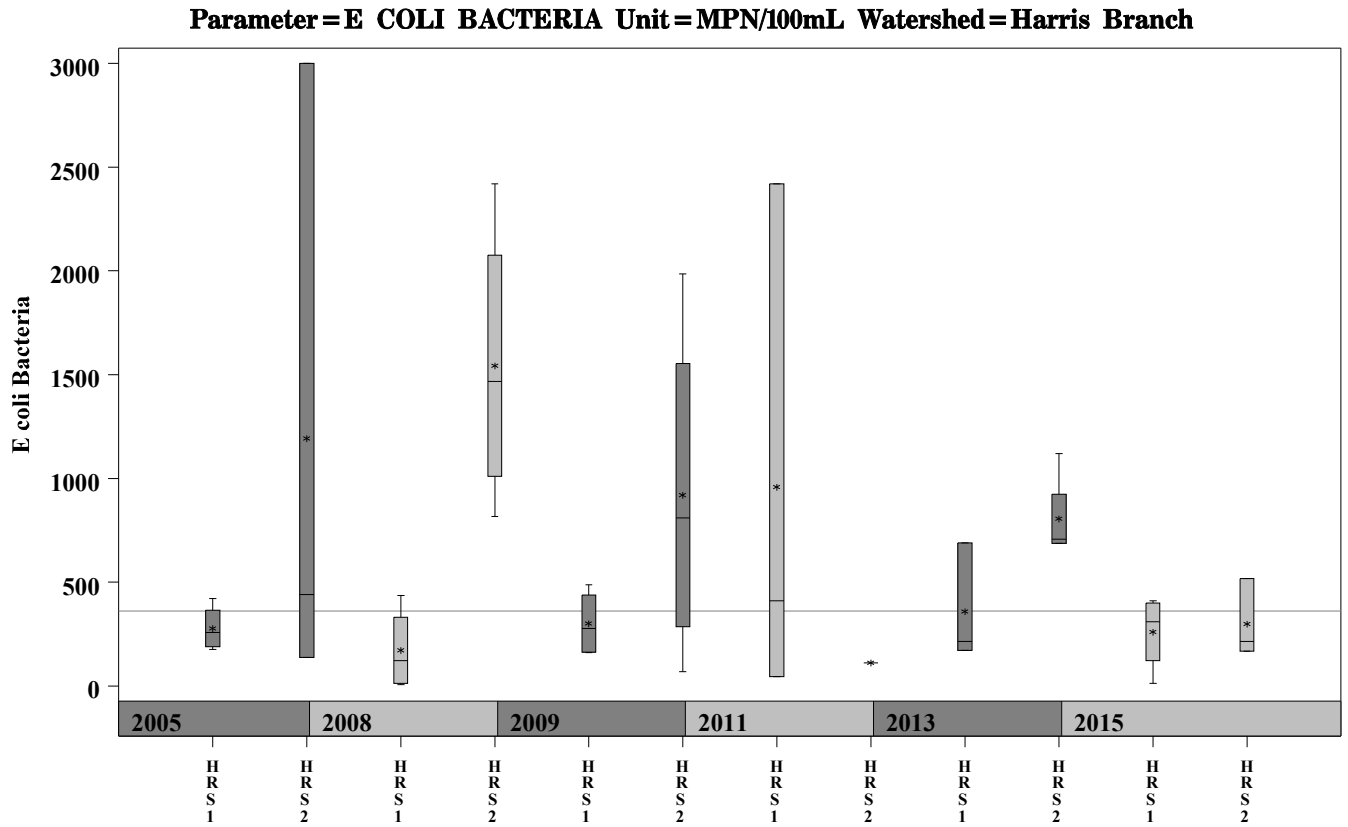


Parameter = DISSOLVED OXYGEN Unit = mg/L Watershed = Harris Branch



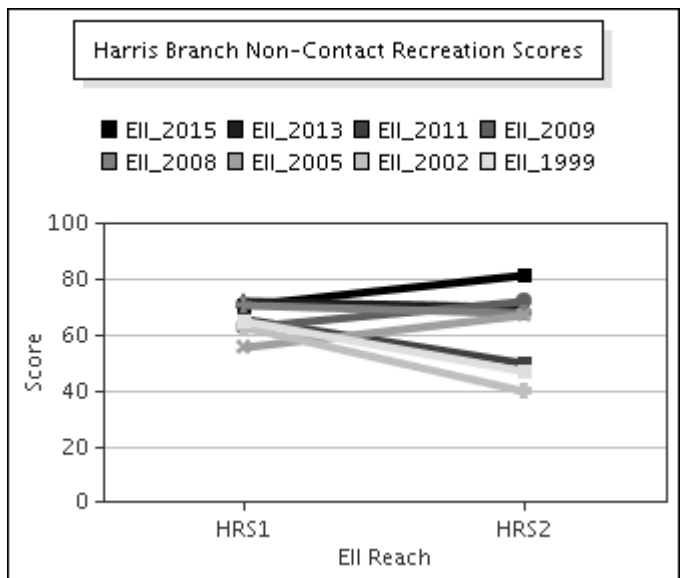
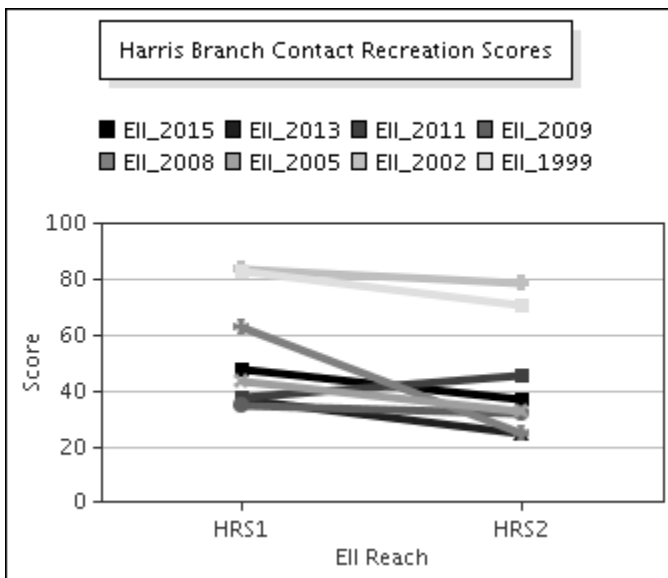
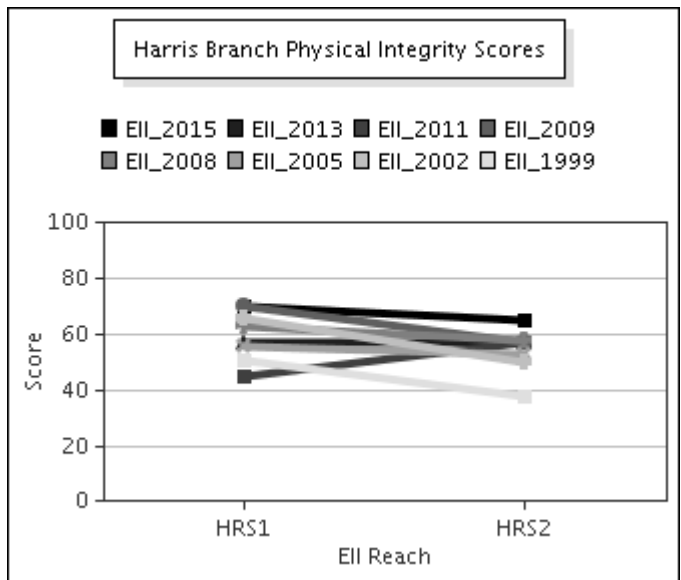
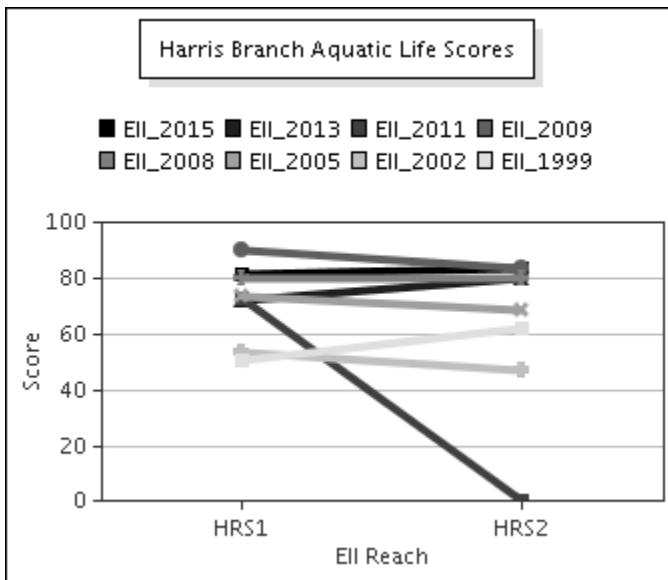
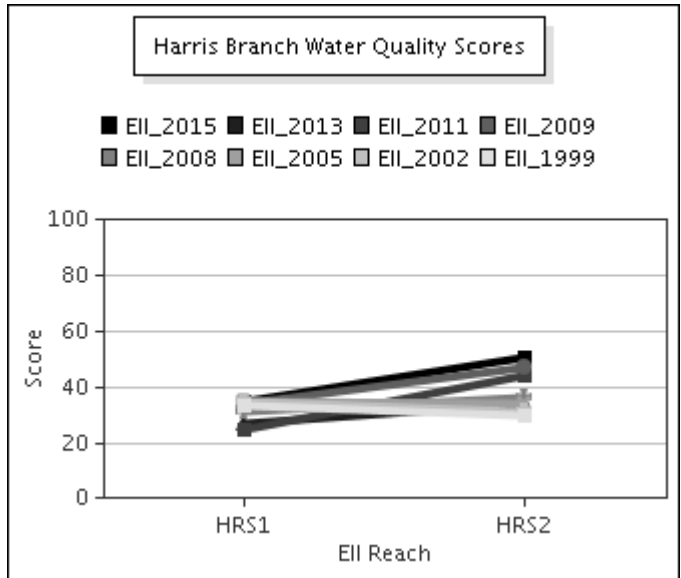
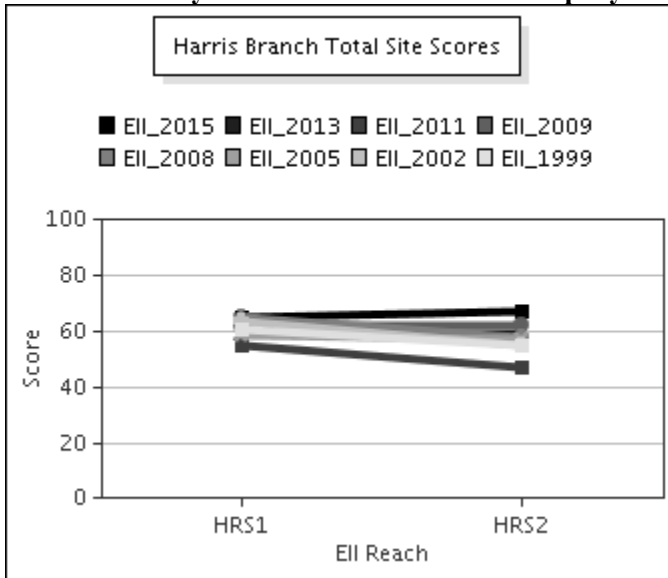
Harris Branch Watershed

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



Harris Branch Watershed

Score Summary – Reach scores for each sample year



Harris Branch Watershed

Benthic Macroinvertebrates – Taxa List, Pollution Tolerance Index & Functional Feeding Group for 2015 Sample Sites (Downstream to Upstream)

Benthic Macroinvertebrates - Harris Branch			HRS @ Crystal Bend (1199) 07/06/2015 (WRE)	HRS @ Boyce (1201) 07/06/2015 (WRE)
Benthic Macroinvertebrate ID	PTI	FFG		
Chimarra	2	FC	53	3
Farrodes Texanus	2	CG,SC	1	
Helicopsyche	2	SC		3
Hexacylloepus Ferrugineus	2	CG,SC		11
Hydroptila	2	PI,SC	2	
Microcyloepus Pusillus	2	CG,SC	1	14
Thraulodes Gonzalesi	2	CG,SC		1
Isonychia	3	FC		3
Nectopsyche	3	CG,P,SH	1	
Camelobaetidius	4	CG	19	1
Fallceon	4	CG,SC	119	46
Macrelmis	4	CG,SC		1
Neochoroterpes	4	CG		3
Psephenus	4	SC		4
Simulium	4	FC	5	105
Smicridea	4	FC	1	14
Oecetis	5	P,SH	1	
Petrophila (Moth)	5	SC	2	
Argia	6	P	24	2
Brechmorhoga Mendax	6	P	2	5
Corbicula Fluminea	6	FC		7
Cheumatopsyche	6	FC	22	145
Chironomidae	6	FC,P	48	9
Hetaerina	6	P	3	1
Hydracarina	6		1	
Rhagovelia	6	P	2	
Stenonema Femoratum	6	CG,SC	1	
Tanypodinae	6	P	4	3
Caenis	7	CG,SC		1
Stenelmis	7	CG,SC	2	13
Hyalella	8	CG,SH	1	
Oligochaeta	8	CG	2	2
Dugesia		CG,P	3	

Harris Branch Watershed

Site Photographs



1199_t00-us-03_27_2002



1199_t00-ds-03_27_2002



1199_t00-us-06_16_2008



888_t00-us-02_28_2002



888_t00-ur-02_28_2002

Harris Branch Watershed

Site Photographs



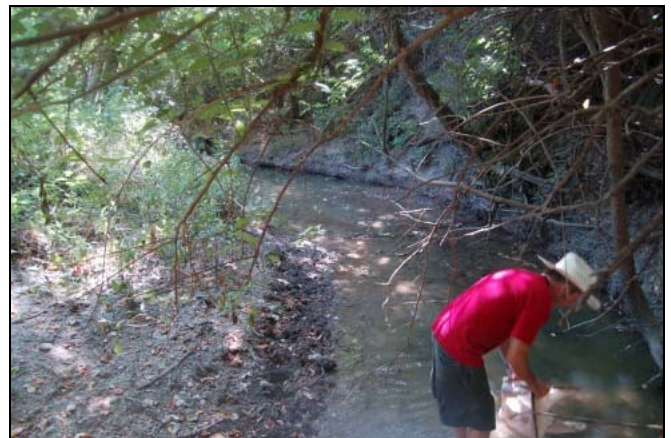
1201_t00-ur-06_17_2005



1201_t00-ds-06_17_2005



1201_t00-us-06_17_2008



1201_t00-ds-06_17_2008



1201_t00-us-05_28_2009



1201_t00-ds-05_28_2009