

Johnson Creek Watershed

Summary Sheet

Catchment	Total area	2 square miles				
	Area in recharge	1.9 square miles				
	Creek length	3 miles				
	Receiving water	Town Lake				
Demographics	2000 population	7,655				
	2030 projected population	10,820				
	30 year projected % increase	41 %				
Land Use	Impervious cover (2003 estimate)	44.2 %				
	Impervious cover (2013 estimate)	47.3 %				
Overall EII Scores	2000	2003	2006	2009	2011	2013
	53	56	47	51	36	52

Flow Regime* for Sample Sites on Johnson Creek

Site	Site Name	2001		2003					2006					2009				2010	2011				2013						
		Feb	Feb	Feb	Mar	Mar	May	Sep	Dec	Feb	May	Jul	Aug	Nov	Feb	May	May	Oct	Dec	Dec	Mar	Jun	Jun	Sep	Jan	Apr	Jun	Jun	Sep
		WQ	Bio	WQ	WQ	Bio	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	WQ	WQ	WQ	Bio	WQ	WQ	WQ	Bio	WQ
847	South Tarrytown	B	B	B	B	B	B	B	B																				
897	Woodmont			n	B	B	n	n	n	n	B	B	n	B	B	B	B	B	n	n	n	n	n	B	n	n	n	n	n

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

Index Scores* for Johnson Creek 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
JOH1	489	Johnson Creek @ Stephen F Austin Drive	2000		82		65	23				43
JOH1	847	Johnson Creek @ South Tarrytown	2000	43	82	70	87	43	34	47	20	60
JOH1	1357	Unnamed (Possum Trot) Trib US of West 7th St	2000		82		78	30				48
JOH1	847	Johnson Creek @ South Tarrytown	2003	49	60	53	71	57	39	61	16	55
JOH1	897	Johnson Creek @ Woodmont Avenue	2003		60		75	57	33	37	28	56
JOH1	897	Johnson Creek @ Woodmont Avenue	2006	44	65	24	49	45	55	36	73	47
JOH1	897	Johnson Creek @ Woodmont Avenue	2009	49	73	27	59	41	59	59	58	51
JOH1	897	Johnson Creek @ Woodmont Avenue	2011				60	48				36
JOH1	897	Johnson Creek @ Woodmont Avenue	2013	37	70	43	83	39	37	19	54	52

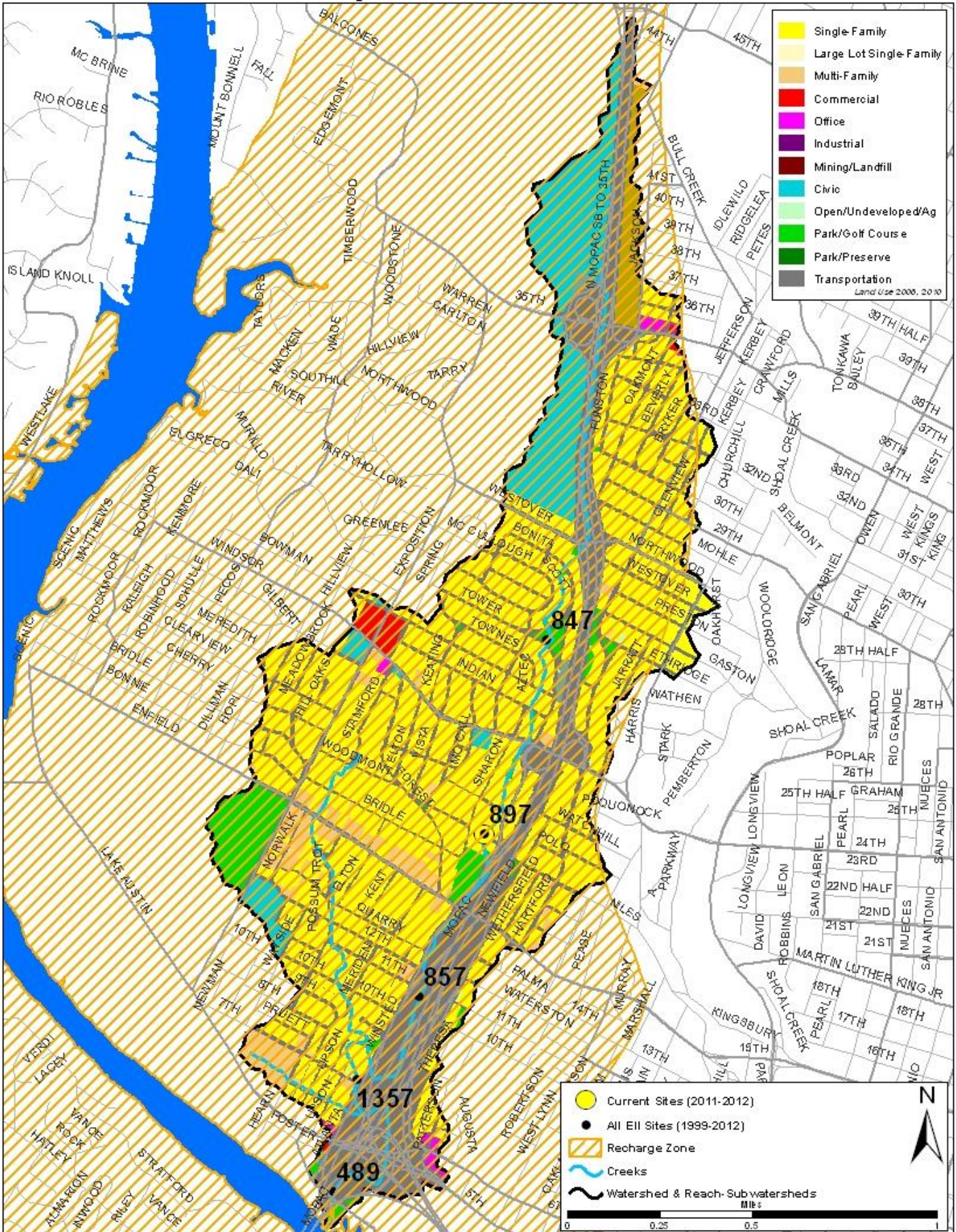
* blank cells indicate parameter was not collected, blank row indicate site was dropped

**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

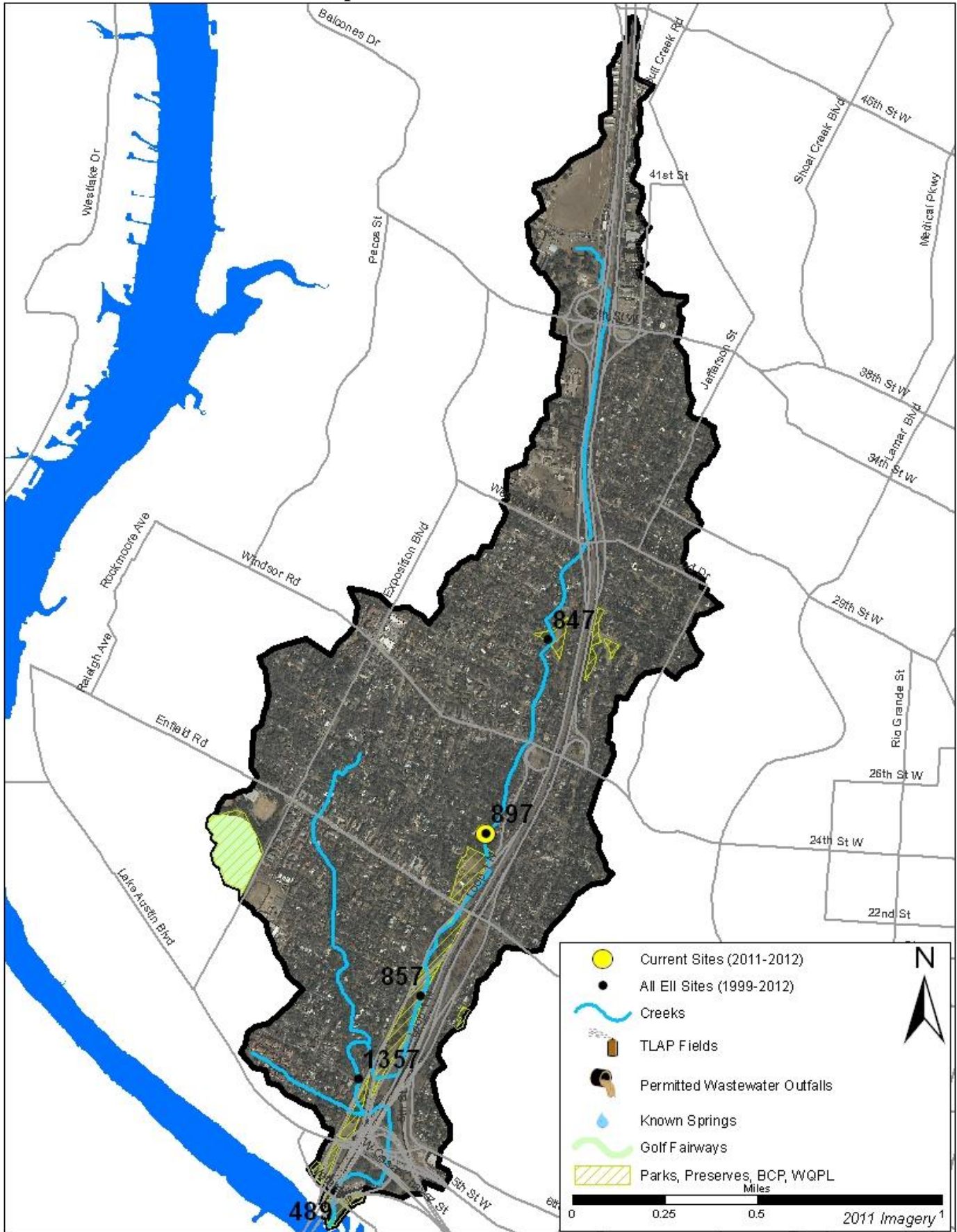
Johnson Creek Watershed

Land Use Map



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Aerial Map



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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.		Cond.		pH		D.O.		E.coli	
				<> Value	flag	<> Value	flag	<> Value	flag	<> Value	flag		
Johnson @ Woodmont Ave	897	JOH1	01/22/2013	10.9		851		7.97		9.9	R	184.2	
Site 897 Mean				10.9		851		7.97		9.9		184.2	
Watershed Mean				10.9		851		7.97		9.9		184.2	

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	

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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	flag
Johnson @ Woodmont Ave	897	JOH1	01/22/2013		0.032			0.46			<J	2.1			0.6
Site 897 Mean					0.032			0.46				2.1			0.6
Watershed Mean					0.032			0.46				2.1			0.6

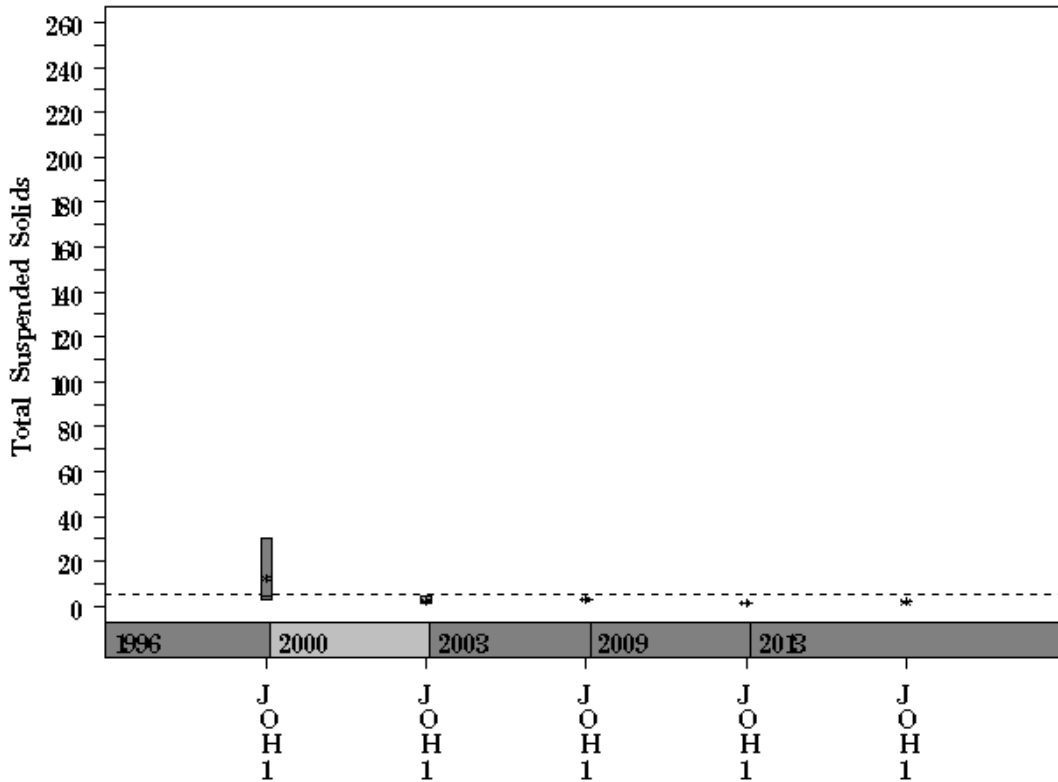
Orange highlighting indicates that the value exceeds one standard deviation from the mean of all E.I.I. sites combined.

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

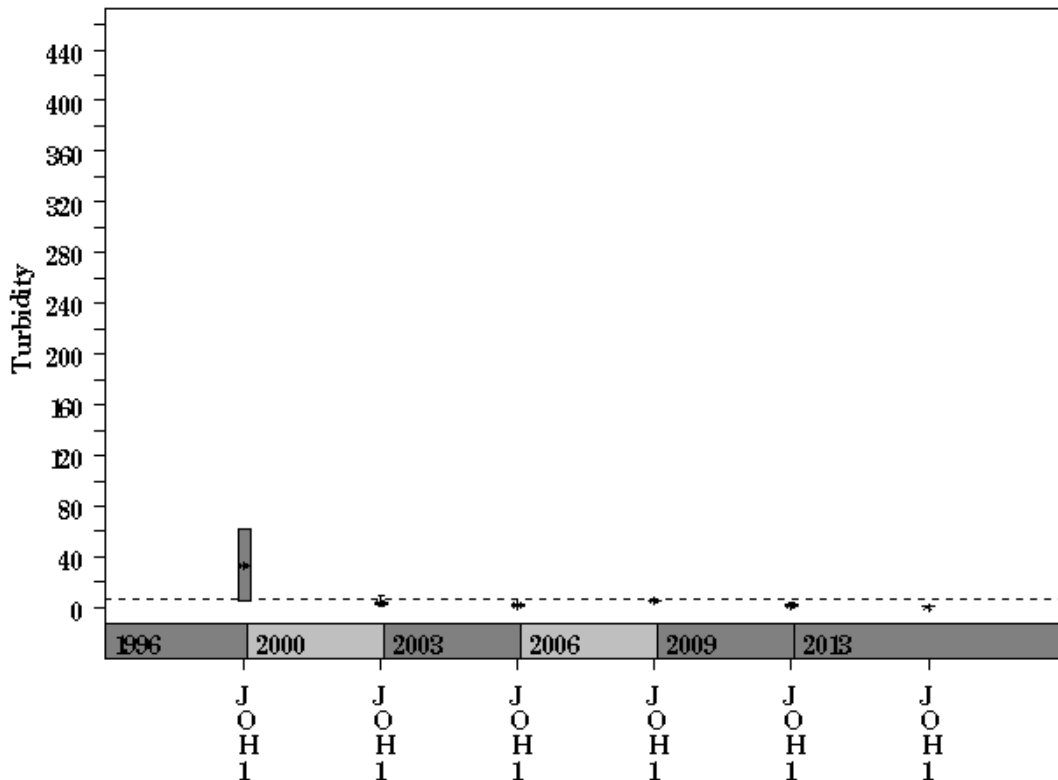
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Data Summary Graphs – Total Suspended Solids and Turbidity (Downstream to Upstream by Year)

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

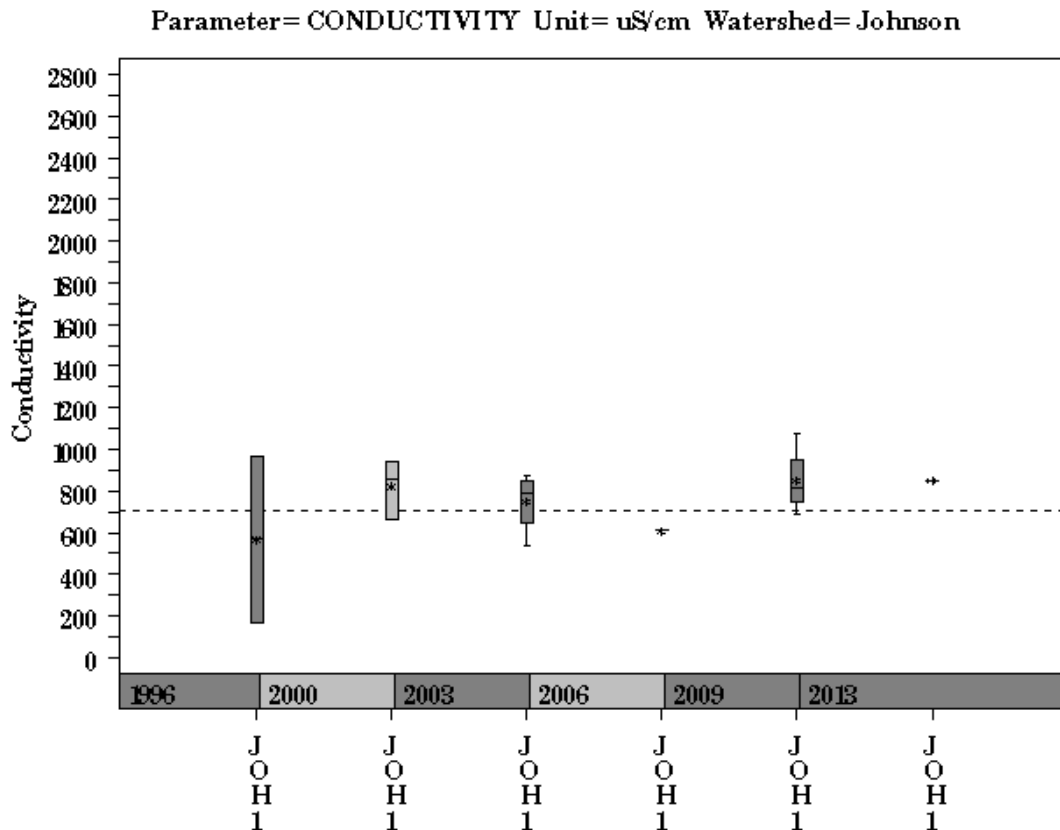
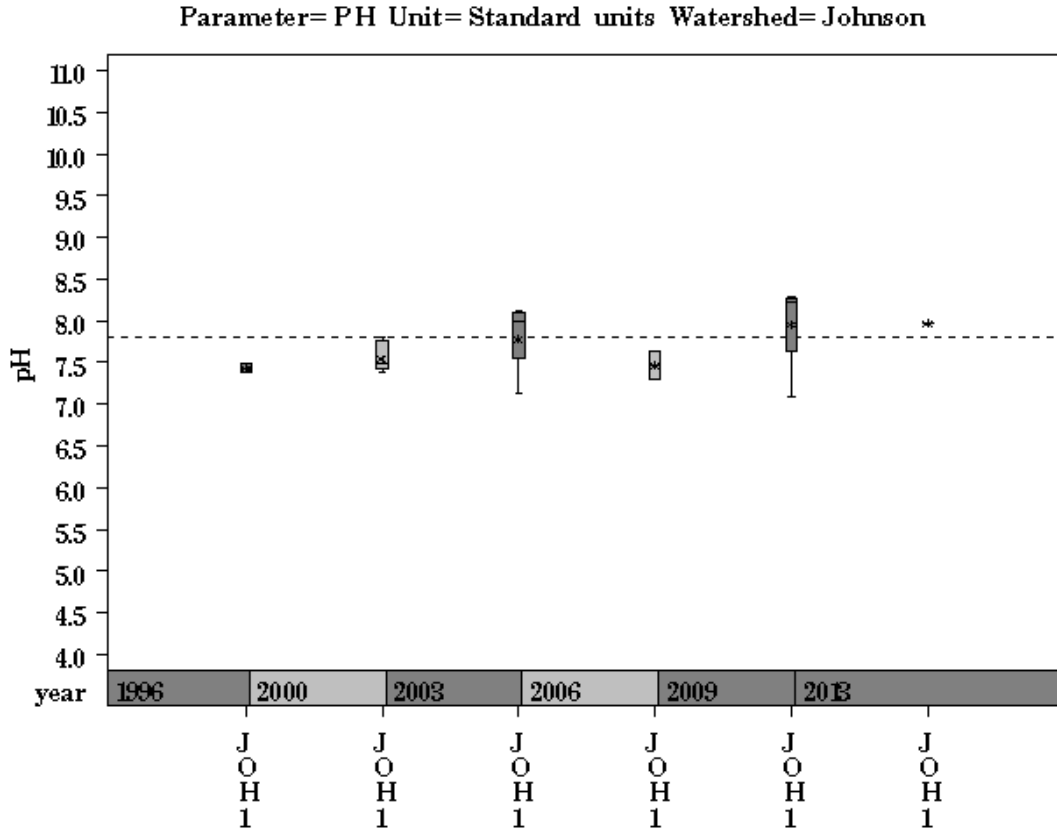


Parameter= TURBIDITY Unit= NTU Watershed= Johnson



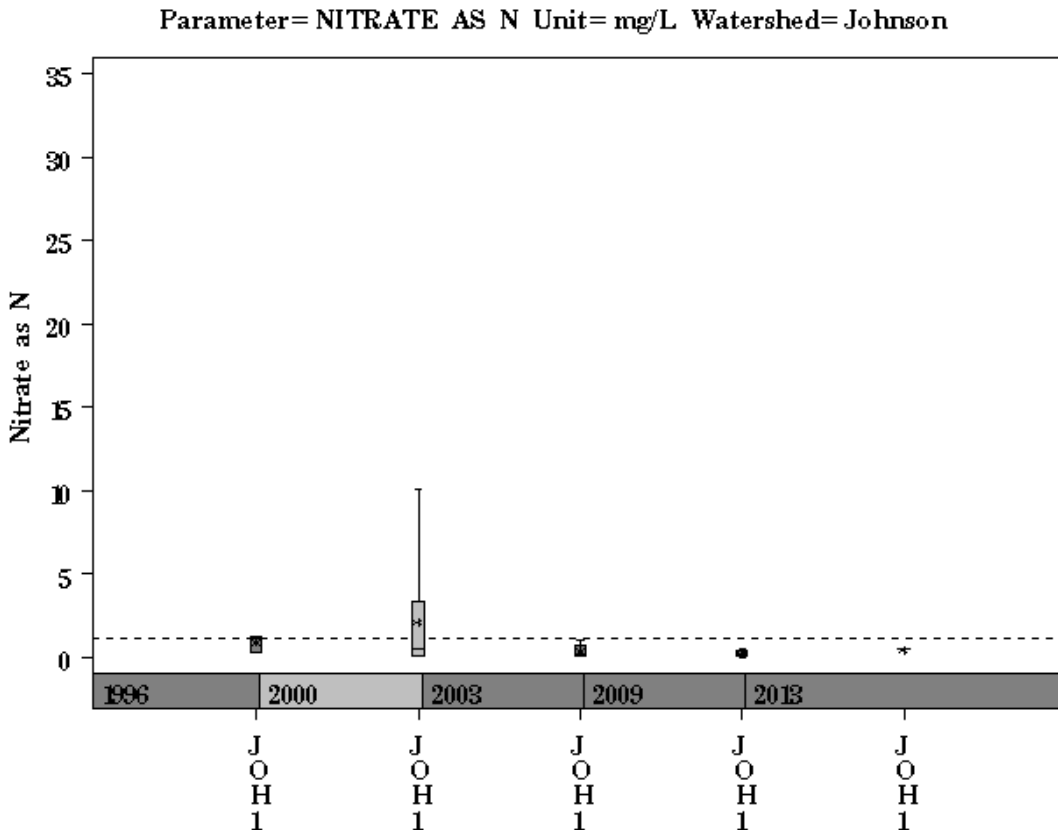
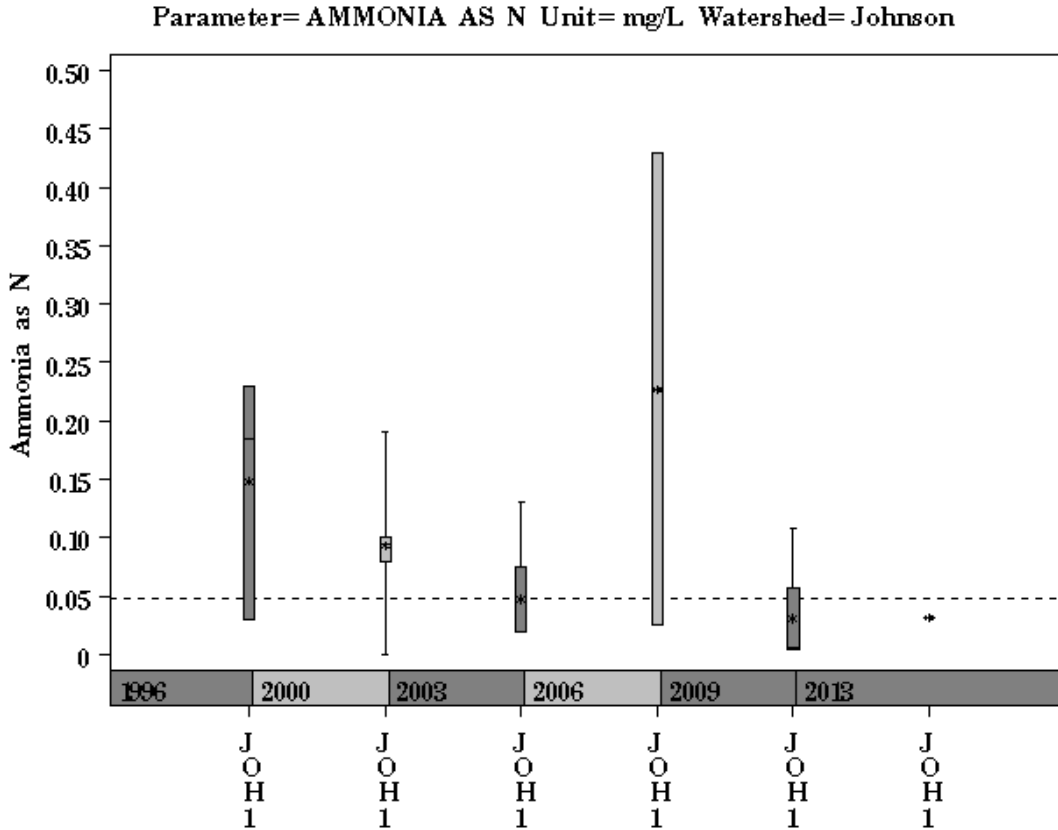
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Data Summary Graphs – pH and Conductivity (Downstream to Upstream by Year)



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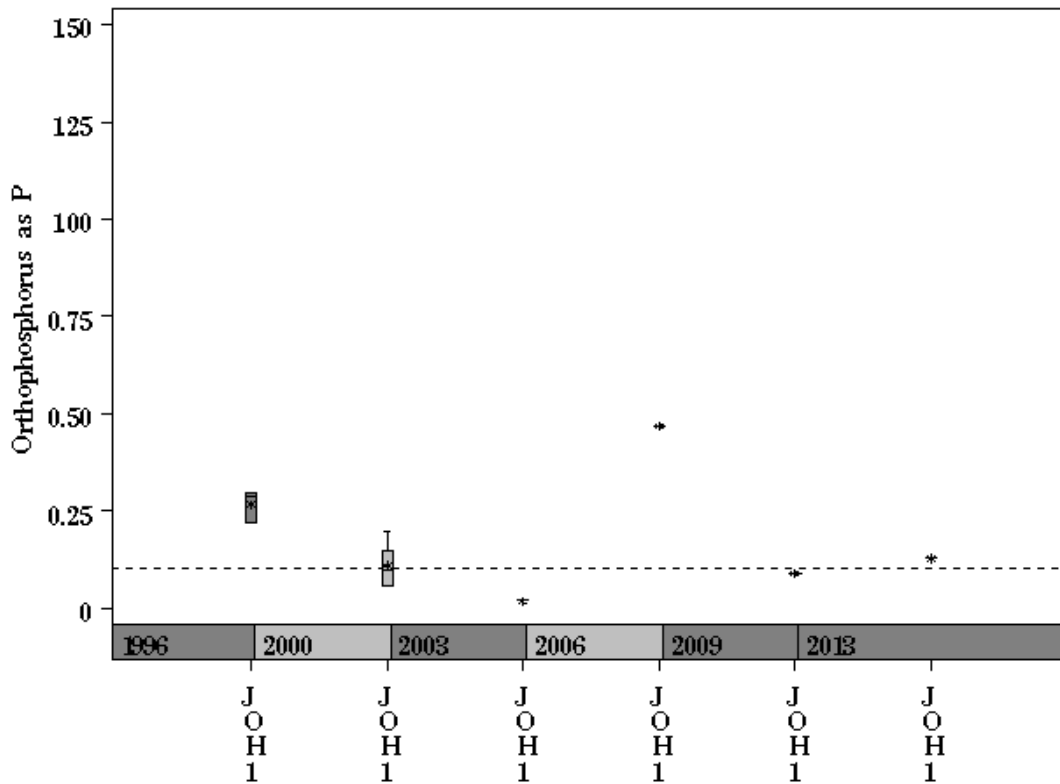
Data Summary Graphs – Ammonia and Nitrate/Nitrite (Downstream to Upstream by Year)



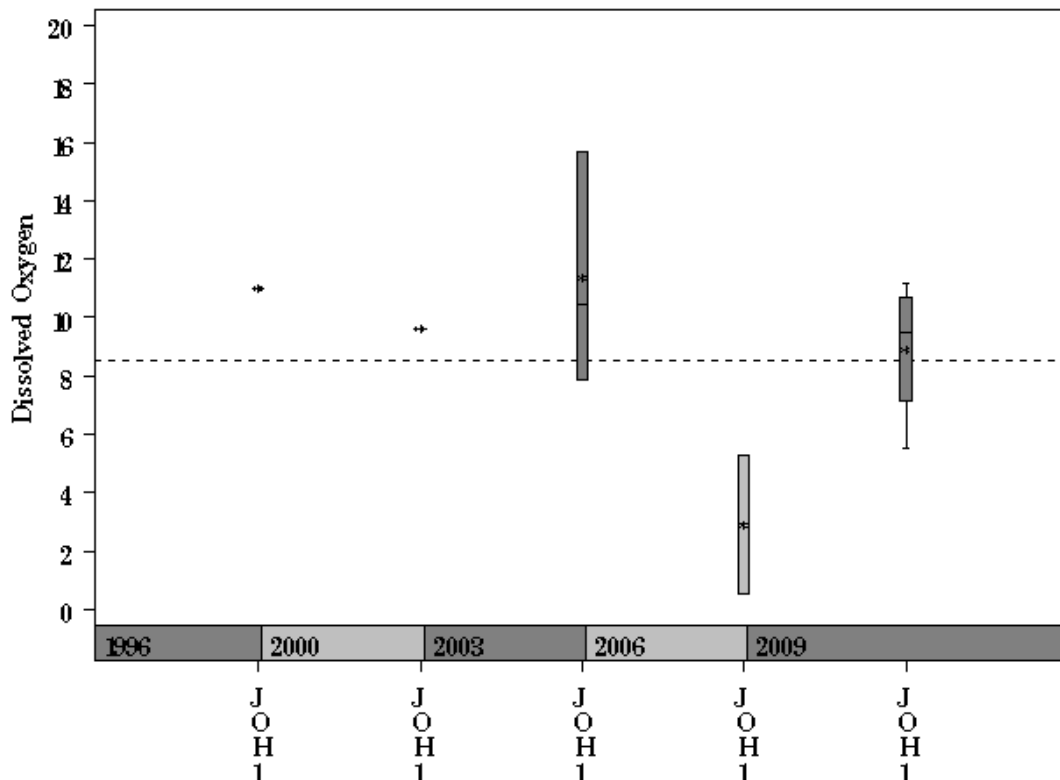
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Data Summary Graphs – Orthophosphate and – Dissolved Oxygen (Downstream to Upstream by Year)

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

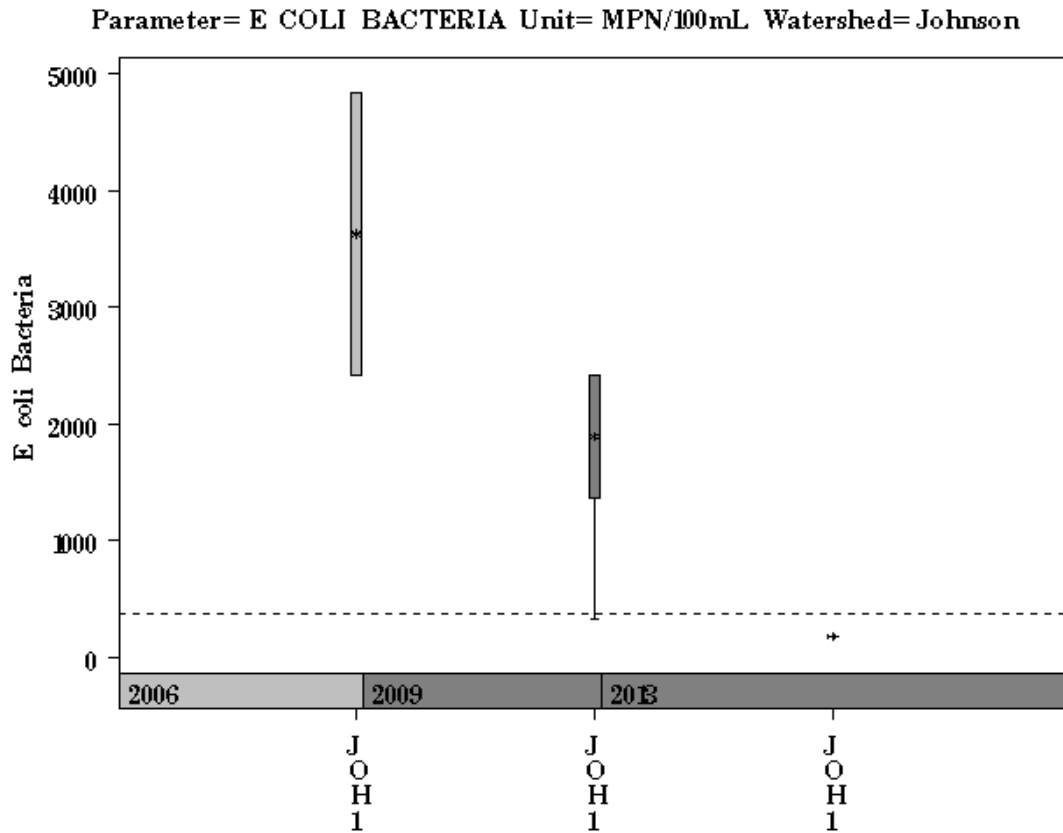


Parameter= DISSOLVED OXYGEN Unit= mg/L Watershed= Johnson



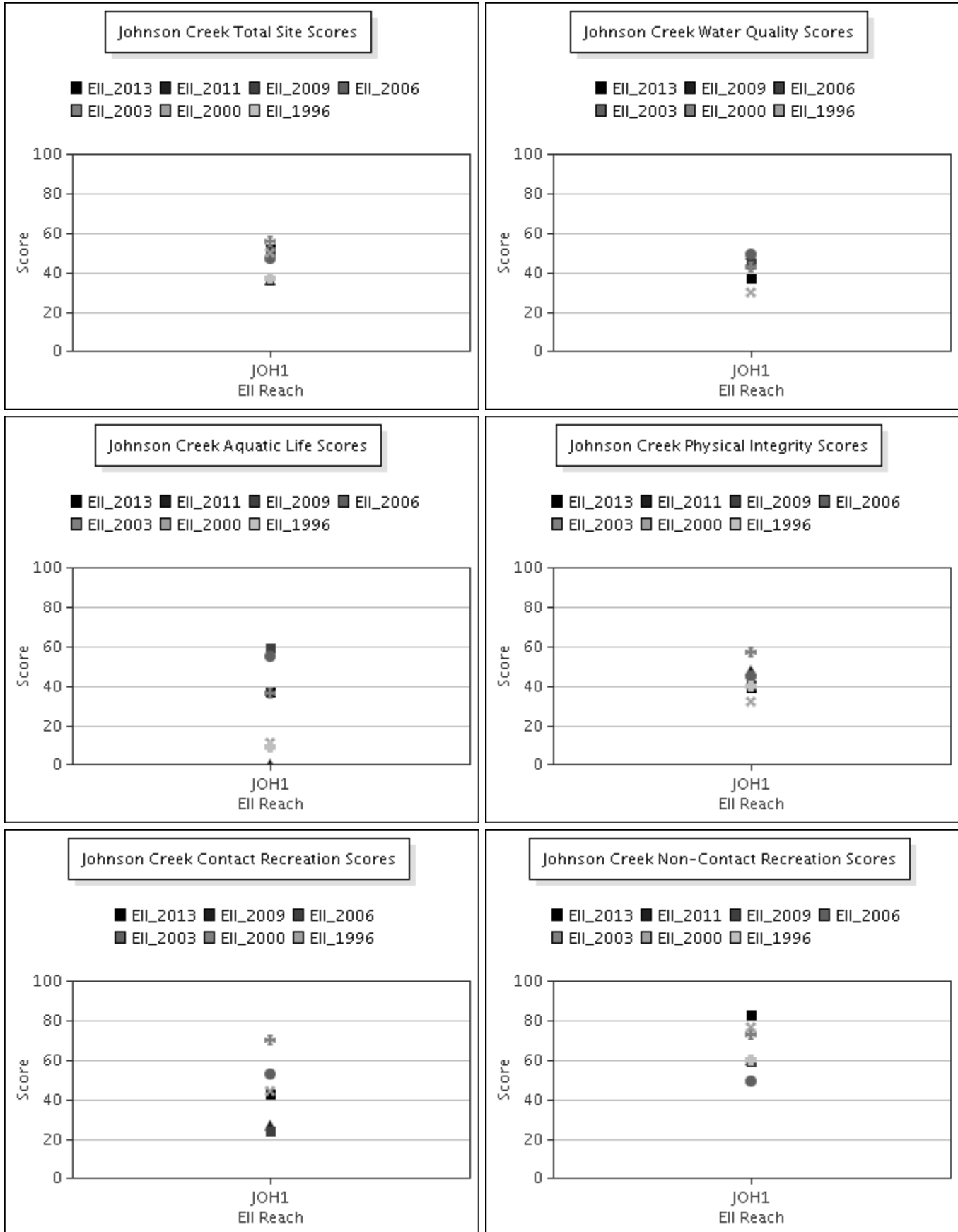
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Data Summary Graphs – *E.coli* (Downstream to Upstream by Year)



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Score Summary – Reach scores for each sample year



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

Benthic Macroinvertebrate ID	PTI	FFG	Johnson @ Woodmont Ave (Site 897)
<i>Tricorythodes</i> sp.	5	CG	1
<i>Argia</i> sp.	6	P	1
Chironomidae	6	P,FC	43
<i>Aedes</i> sp.	8		12
Hirudinea	8	P	1
Oligochaeta	8	CG	4
<i>Physella</i> sp.	9	SC	15
<i>Dugesia</i> sp.		P,CG	2

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

Scoring Metric	Johnson @ Woodmont Ave (Site 897)
Number of Taxa *	8
Hilsenhoff Biotic Index *	7.0
Number of Ephemeroptera Taxa *	1
Percent of Total as Chironomidae *	54
Number of EPT Taxa *	1
Percent of Total as EPT *	1
Percent of Total as Predator *	59
Number of Intolerant Taxa *	0
Percent Dominance (Top 3 Taxa) *	89
EPT / EPT + Chironomidae	0
Number of Diptera Taxa	2
Number of Non-Insect Taxa	4
Number of Organisms	79
Percent Dominance (Top 1 Taxa)	54
Percent of Total as Collector / Gatherer	9
Percent of Total as Dominant Guild (FFG)	59
Percent of Total as Elmidae	0
Percent of Total as Filterers	54
Percent of Total as Grazers (PI & SC)	19
Percent of Total as Tolerant Organisms	19
Percent of Trichoptera as Hydropsychidae	0
Ratio of Intolerant : Tolerant Organisms	0.01
TCEQ Qualitative Aquatic Life Use Score	18
TCEQ Quantitative Aquatic Life Use Score	17

* **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%.

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

Diatom Species Name	PTI	Johnson @ Woodmont Ave (Site 897)
<i>Amphora inariensis</i>	4	25
<i>Achnanthes exigua</i>	3	1
<i>Amphora pediculus</i>	3	102
<i>Aulacoseira granulata</i>	3	2
<i>Gomphonema clavatum</i>	3	2
<i>Halamphora montana</i>	3	1
<i>Navicula cryptotenella</i>	3	1
<i>Navicula kotschyi</i>	3	3
<i>Navicula radiosa</i>	3	1
<i>Nitzschia fonticola</i>	3	3
<i>Rhoicosphenia abbreviata</i>	3	64
<i>Tabularia fasciculata</i>	3	2
<i>Tryblionella angustata</i>	3	2
<i>Achnantheiopsis lanceolata</i>	2	10
<i>Navicula recens</i>	2	2
<i>Navicula trivialis</i>	2	1
<i>Navicula veneta</i>	2	2
<i>Nitzschia amphibia</i>	2	114
<i>Nitzschia inconspicua</i>	2	65
<i>Sellaphora pupula</i>	2	1
<i>Gomphonema parvulum</i>	1	2
<i>Nitzschia palea</i>	1	3
<i>Sellaphora seminulum</i>	1	2
<i>Cocconeis placentula</i> var. <i>lineata</i>		3
<i>Eolimna minima</i>		86

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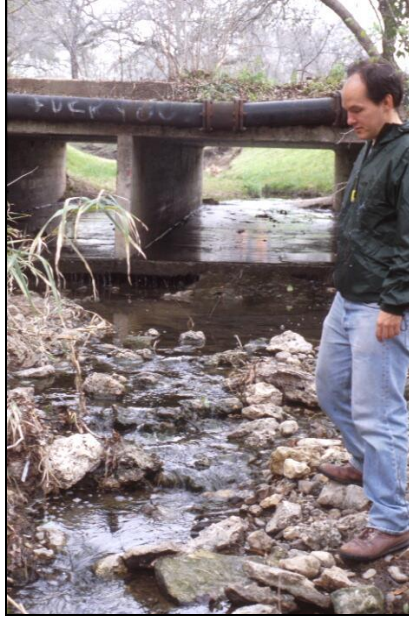
Diatoms – Metric Summary for 2013 Sample Sites (Downstream to Upstream)

Scoring Metric	Johnson @ Woodmont Ave (Site 897)
<i>Cymbella</i> Richness	0
Number of organisms	500
Number of taxa	25
Percent motile taxa	40
Percent similarity to reference condition	17
Pollution tolerance index	2.55

- * **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.

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Site Photographs



847_t00-us-03_10_2003



847_t00-ur-03_10_2003



847_t00-us-02_12_2001



847_t00-ds-02_12_2001



489_t00-us-02_12_2001



489_t00-ds-02_12_2001

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Site Photographs



897_t00-us-02_13_2001



897_t00-ds-02_13_2001



897_t00-ds-07_07_2006



897_t00-us1-07_07_2006



897-t00-us-05-28-2009



897-t00-ds-05-28-2009

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