



Tennessee Nutrient Assessment

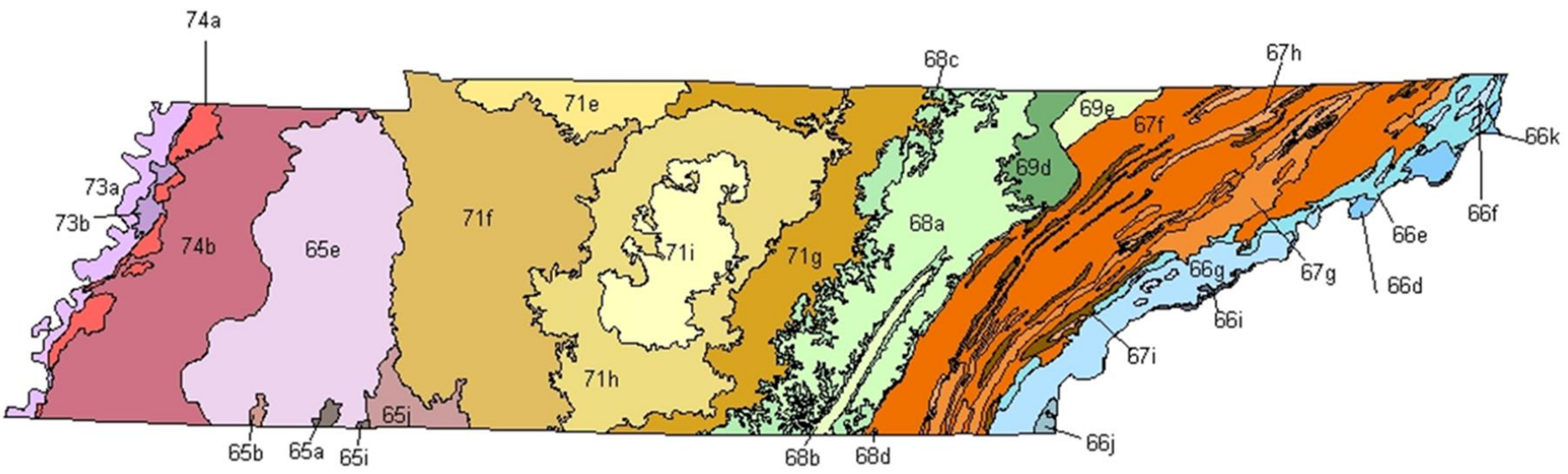
Water Quality Standards, Criteria, Monitoring, Assessment,
Reporting & ATTAINs

Tennessee's Water Quality Standards

Narrative Nutrient Criteria

- Rule 0400-03-.03(3)(k) Nutrients
- The waters shall not contain nutrients in concentrations that **stimulate aquatic plant and/or algae growth** to the extent that aquatic habitat is substantially reduced and/or the **biological integrity fails to meet regional goals.**
- Additionally, the quality of downstream waters shall not be detrimentally affected.

Tennessee's Ecoregions



Tennessee's Water Quality Standards

Narrative Nutrient Criteria

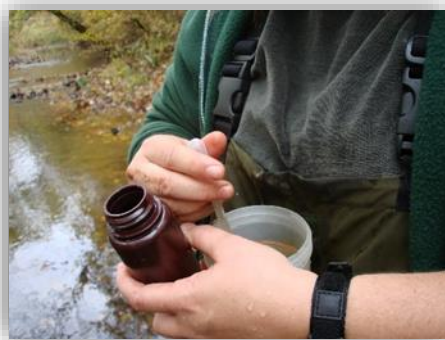
- Rule 0400-03-.03(3)(k) Nutrients
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- Additionally, the quality of downstream waters shall not be detrimentally affected.

Do nutrients stimulate aquatic plant and/or algae growth?



Diatom Metrics- Partnered with Alabama, George, Kentucky, EPA & TetraTech

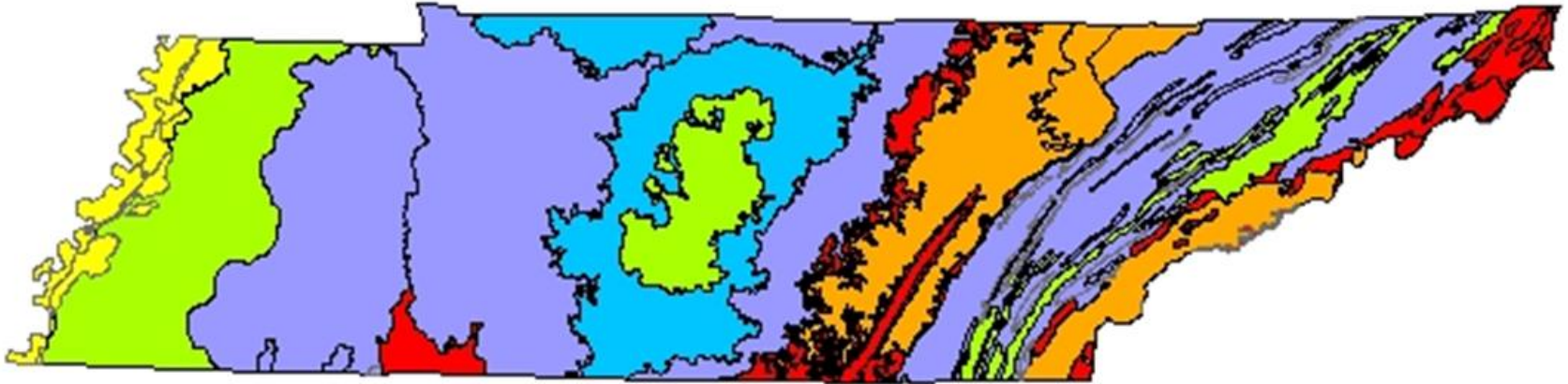
Tennessee Diatom Index (TDI)



- % Abundance of Sensitive Taxa ↓*
- % Taxa indicating Low Total Nitrogen ↓*
- % Taxa requiring 50% O₂ Saturation ↑*
- % Taxa tolerant to Land Disturbance ↑*
- % Navicula taxa (motile genus tolerant of fine sediment) ↑*
- % Taxa tolerant of High Phosphorus ↑*
- % Centric lentic taxa tolerant of nutrients ↑*
- % Abundance of highly Tolerant Taxa ↑*

*Response to Stress ↑ or ↓

Tennessee Diatom Index Target by Ecoregion



Level IV ecoregion	TDI Target
73ab, 74a	40
67g, 71i, 74b	60
71eh	65
65abei, 67fhi, 71fg	70
65j, 66defijk, 68bc	75
66g, 68ad, 69de	80

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Does Biological Integrity Fail to Meet Regional Goals?

Semi-Quantitative Single Habitat Macroinvertebrate (SQSH)

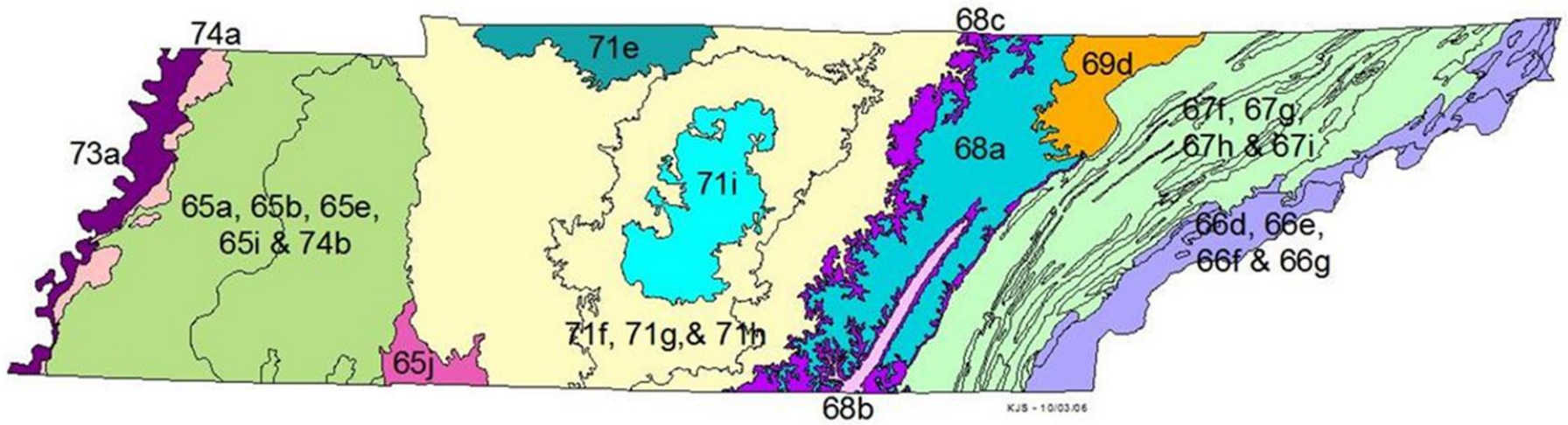


Riffle Kick



Bank

Macroinvertebrate Bioregions



SQSH Metrics

TN Macroinvertebrate Index (TMI)

- Taxa Richness
- EPT Richness
- % EPT – Cheumatopsyche
- % Oligochaetes & Chironomidae
- NCBI modified North Carolina Biotic Index
- % Clingers – Cheumatopsyche
- **% TN Nutrient Tolerant Organisms**



Cheumatopsyche

TN Nutrient Tolerant Organisms



Cheumatopsyche



Stenelmis



Caenis



Isopoda



Gastropoda



Polypedilum



*Cricotopus &
Cricotopus/
Orthocladius*



Oligochaeta

Tennessee's Nutrient Criteria continued

- Examples of **parameters** associated with criterion include but are not limited to:
 - Nitrogen
 - Phosphorus
 - Potassium
 - Calcium
 - Magnesium
- And various forms of each



Tennessee's Nutrient Criteria continued

- Interpretation of this provision may be made using the document *Development of Regionally-based Interpretations of Tennessee's Narrative Criterion* and/or other scientifically defensible method.

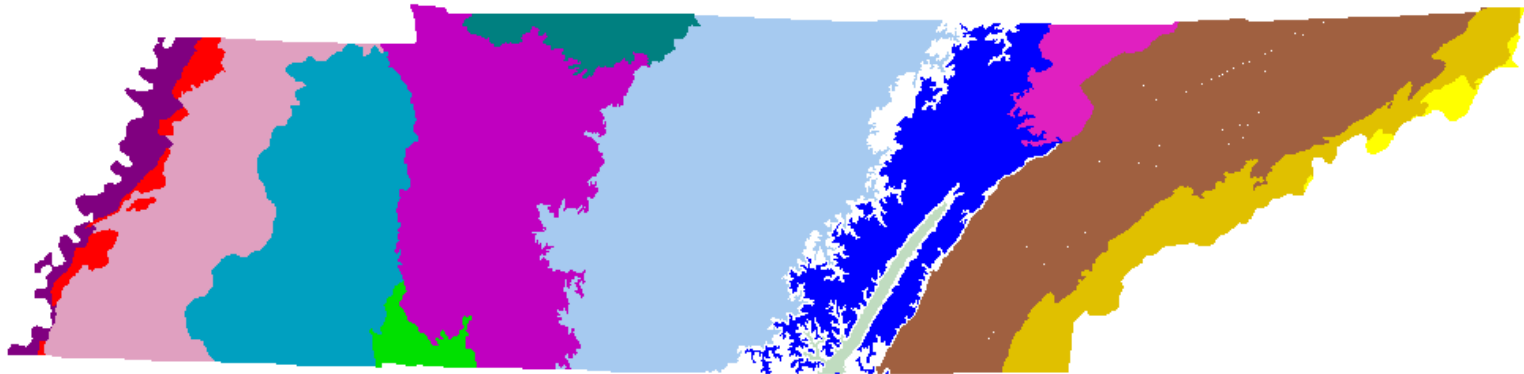
**DEVELOPMENT OF
REGIONALLY-BASED
INTERPRETATIONS OF TENNESSEE'S
NARRATIVE NUTRIENT CRITERION**



Tennessee Department of Environment and Conservation
Division of Water Pollution Control
7th Floor L & C Annex
401 Church Street
Nashville, TN 37243-1534

Regionally-based Interpretations of Tennessee's Narrative Criterion (Guidance)

Nitrate + Nitrite nutrient regions



73a = 0.34
74a = 0.22
74b = 1.10
65a, 65b, 65e, & 65i = 0.34
65j = 0.22
71e = 3.48
71f = 0.38
71g, 71h & 71i = 0.94
68a = 0.23
68b = 0.45
68c = 0.31
69d = 0.27
67f, 67g, 67h & 67i = 1.22
66d = 0.48
66e, 66f & 66g = 0.30

Regionally-based Interpretations of Tennessee's Narrative Criterion (Guidance)

Total Phosphorus nutrient regions



73a	= 0.25
74a	= 0.12
74b	= 0.11
65a, 65b, 65e & 65i	= 0.04*
65j	= 0.04*
71e, 71f, & 71g	= 0.05
71h	= 0.10
71i	= 0.22
68a & 68c	= 0.03
68b	= 0.07
69d	= 0.02
67f, 67h, & 67i	= 0.04
67g	= 0.09
66d, 66e, & 66g	= 0.01
66f	= 0.03

Monitoring for Nutrients



SQSH



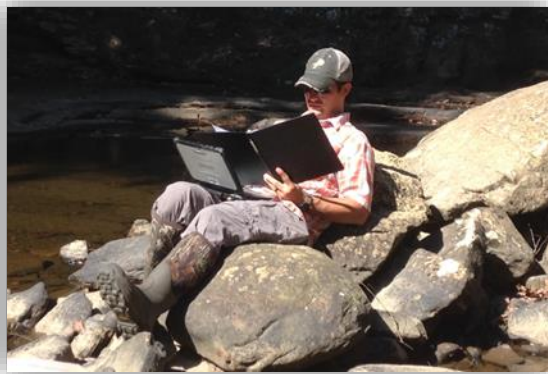
Diatoms



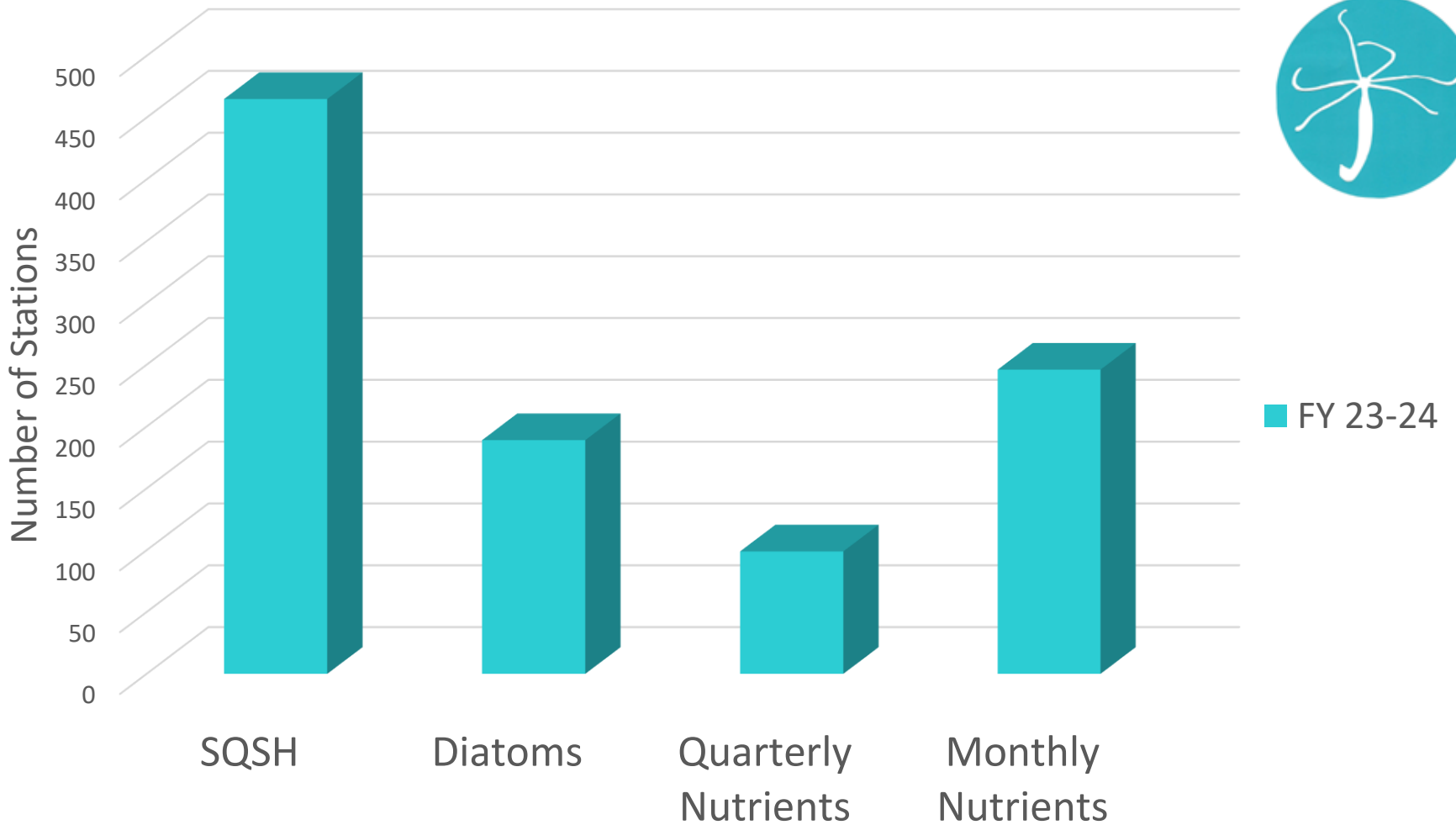
Field Parameters:
DO, pH, Temp. &
Conductivity



Nutrients:
 $\text{NO}_3 + \text{NO}_2$,
TP, NH_3 , TKN



Monitoring Workplans Nutrient Sampling



Assessment Summary

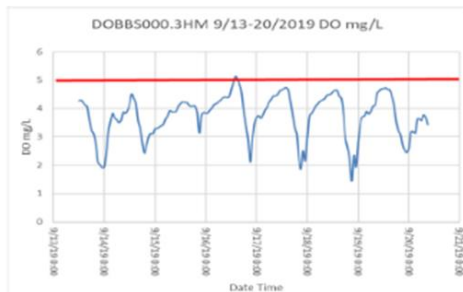
Waterbody ID: TN060200011244_0100 **Name:** Dobbs Branch
DWR Station ID: DOBBS000.3HM **Name:** Dobbs Branch
Category: 5 **Size:** 5.3 **EFO:** CHEFO
Location: Branch on Corner of Burnette Street
Current Assessment: NS FAL; NS REC **DA:** 6.19 **Lat:** 35.0218 **Long:** -85.2986
ECO IV: 6/1 **u/s ECO:**

Biology Results

Biorecon:	DWR Station ID	Date	Method	Org	Sampler	SOP	TR-BR	EPT-BT	Intol-BR	Index-BR	Comments												
C1505034	DOBBS000.3HM	5/8/2015	Br Fam	CHEFO	CFWUHD	2021	5	0	0	3													
C0605002	DOBBS000.3HM	5/26/2005	Br Fam	CHEFO	DPS	2021	4	0	0	3	MAB REVISITED 3/30/10 NO SAMPLE SITE WAS STILL IN POOR CONDITION-BLANKET MUD/SILT												
SQSH:	DWR Station ID	Date	Method	Org	Sampler	SOP	TR-SQSH	EPT-SQSH	%EPT-Ch	%OC	NCBI	%ClingP	%TNuTol	ETO	%CRMOL	TMI	Comments						
TRC1509002	DOBBS000.3HM	9/9/2015	SQKICK	CHSW	CHSW	2021	16	1	0	96.4	6.8	0.5	89.6	-	-	4	Polypodium = 86.5%						
Diatoms:	DWR Station ID	Date	Method	Org	Algae	Type	Condition	O3	High P	Navicula	Centric	Bc 5	Bahls 3	Optcat L1	Ptpv TN	TDI	Comment						
NZ002126-01	DOBBS000.3HM	9/20/2019	RPS	CHEFO	High	Filamentous	Stressed	51	45	32	92	89	41	75	23	56	-						
Habitat:	DWR Station ID	Date	Habitat Type	Org	Hab Assessor	Epifaunal Substrate	Embed-dedness	Velocity/ Depth	Sediment Dep.	Flow Status	Channel Alt	Freq Reox.	Bank Stab LDB	Bank Stab RDB	Veg Prot LDB	Veg Prot RDB	RipWidth LDB	RipWidth RDB	Channel Subst.	Pool Vari.	Channel Sinu.	Habitat Score	Comments
CFW0920201901	DOBBS000.3HM	9/20/2019	HG	CHEFO	CFWNRG	6	8	6	10	15	8	2	2	2	6	6	8	6				85	Highly urbanized system
C1505034	DOBBS000.3HM	5/8/2015	HG	CHEFO	CFW	11	15	6	12	11	8	2	3	3	8	8	6	6				101	COBBLE RIFPLE/RUN NATURALLY NOT PRESENT, SEWER LINE HAS BECOME LOW HEAD DAM.
Field Observation	DWR Station ID	Date	Flow	Sediment	Sed. Type	Turbidity	Foam	Mod. disturb.	High disturb.	Manmade modifications	Other info.	Comments											
CFW0920201901	DOBBS000.3HM	9/20/2019	Low	Moderate	Silt	Slight	None		Urban Residential; Riparian	Bridge	RPS = 10 pool rocks; Macroinvertebrates not collected due to lack of habitat.												

Field Parameters/Bacteriological/Nutrient Results

Field Log No	DWR Station ID	Date	DO	pH	Temp	Cond.	E. Coli	E. Coli Q	Geomean	NO3+NO2	NO3+NO2 Q	TP	TP Q	NH3	NH3 Q	TKN	TKN Q	Turb.	Turb. Q	NO3	NO3 Q	NO2	NO2 Q	Chloride	TDS
CFW0716201908	DOBBS000.3HM	7/16/2019	4.85	7.77	23.61	497.5	461.3		1.42	1.42	0.0412 J	0.967				1.2									
CFW0808201908	DOBBS000.3HM	8/8/2019	4.81	7.35	22.4	517.7	307.6		1.61	1.61	0.0502 J	1.16				1.26									
CFW0910201908	DOBBS000.3HM	9/10/2019	4.37	7.3	21.86	470.1	141.4		1.85	1.85	0.0349 J	0.957				1.24									
CFW0920201901	DOBBS000.3HM	9/20/2019	4.35	7.3	20.87	517																			
JKR1001201908	DOBBS000.3HM	10/1/2019	7.3	22.02	499.4	1553.1		1.22		0.0624 J	1.29					1.59									
NRG1105201908	DOBBS000.3HM	11/5/2019	6.95	7.38	15.21	523.9	261.3		1.72	1.72	0.0355 J	0.813				1									
CFW1205201908	DOBBS000.3HM	12/5/2019	7.56	6.99	12.93	529.9	248.1		2.33	2.33	0.0312 J	1.44				1.21									
CFW1116202008	DOBBS000.3HM	1/16/2020	7.74	7	15.91	263.1	2419.6 LL		1.05	1.05	0.0533 J	0.673				0.836									
CFW0309202008	DOBBS000.3HM	3/9/2020	8.98	7.51	12.57	473.3	2419.6 LL		2.63	2.63	0.0345 J	3.39				3.32									
NRG0402202008	DOBBS000.3HM	4/2/2020	7.01	7.23	14.4	448.9	410.6		1.85	1.85	0.0303 J	1.5				1.68									
NRG0513202008	DOBBS000.3HM	5/13/2020	6.74	7.38	16.54	420.6	1119.9		1.81	1.81	0.0258 J	1.45				1.56									
NRG0611202008	DOBBS000.3HM	6/11/2020	5.06	7.21	21.71	437.7	686.7		1.68	1.68	0.0367 J	1.39				1.54									



Data Used to Assess Nutrient Impairment

Method	Org	Sampler	SOP	TR-BR	EPT-BT	Intol-BR	Index-BR	Comments							
Br Fam	CHEFO	CFWJHD	2021	5	0	0	3								
Br Fam	CHEFO	DPS	2021	4	0	0	3	MAB REVISITED 3/30/10 NO SAMPLE SITE WAS STILL IN POOR CONDITION-BLANKET MUD/SILT							
Method	Org	Sampler	SOP	TR-SQSH	EPT-SQSH	%EPT-Ch	%OC	NCBI	%ClingP	%TNuTol	ETO	%CRMOL	TMI	Comments	
SQKICK	CHSW	CHSW	2021	16	1	0	96.4	6.8	0.0	89.6	-	-	4	Polypodium = 86.5%	
Method	Org	Algae	Type	Condition	O3	High P	Navicula	Centric	Bc 5	Bahls 3	Optcat L1	Ptpv TN	TDI		
RPS	CHEFO	High	Filamentous	Stressed	51	45	32	92	89	41	75	23	56		
Habitat Type	Org	Hab Assessor	Epifaunal Substrate	Embed- edness	Velocity/ Depth	Sediment Dep.	Flow Status	Channel Alt	Freq Reox.	Bank Stab LDB	Bank Stab RDB	Veg Prot LDB	Veg Prot RDB	RipWidth LDB	RipWidth RDB
HG	CHEFO	CFWNRG	6	8	6	10	15	8	2	2	2	6	6	8	6
HG	CHEFO	CFW	11	15	6	12	11	8	2	3	3	8	8	8	6
Flow	Sediment	Sed. Type	Turbidity	Foam	Mod. disturb.	High disturb.	Manmade modifications			Other info. Comments					
Low	Moderate	Silt	Slight	None		Urban Residential: Riparian	Bridge			RPS = 10 pool rocks; Macroinvertebrates not collected					

DO	pH	Temp	Cond.	E. Coli	E. Coli Q	Geomean	NO3+NO2	NO3+NO2 Q	TP	TP Q	NH3	NH3 Q	TKN	TKN Q	Turb.
4.85	7.77	23.61	497.5	461.1			1.42		0.0412	J	0.957		1.2		
4.81	7.35	22.4	517.7	307.6			1.61		0.0502	J	1.16		1.26		
4.37	7.3	21.66	470.1	141.4			1.85		0.0349	J	0.957		1.24		
4.35	7.3	20.87	517												
	7.3	22.02	499.4	1553.1			1.22		0.0624		1.29		1.59		
	6.95	7.38	15.21	523.9	261.3		1.72		0.0355	J	0.813		1		
	7.56	6.99	12.93	529.9	248.1		2.33		0.0312	J	1.44		1.21		
	7.74	7	15.91	263.1	2419.6	LL	1.05		0.0533	J	0.673		0.836		
	8.98	7.51	12.57	473.3	2419.6	LL	2.63		0.0345	J	3.38		3.32		
	7.01	7.23	14.4	448.9	410.6		1.85		0.0303	J	1.5		1.68		
	6.74	7.38	16.54	420.6	1119.9		1.81		0.0258	J	1.45		1.56		
	5.08	7.21	21.71	437.7	686.7		1.68		0.0367	J	1.39		1.54		

Waterbody Assessment Report

Waterbody Information

AU ID:	TN060200011244_0100	Cycle Year	2024
AU Name:	Dobbs Branch	Cycle Last Assessed:	2024
		EPA IR Category:	5
Water Type (Size):	RIVER (5.3 Miles)		
Location:	Dobbs Branch from Chattanooga Creek to headwaters. Ecoregion 67f Hamilton County		

Designated Use Support Information

Use Name	Use Support				Threatened
	Fully Supporting	Not Supporting	Insufficient Information	Not Assessed	
Fish and Aquatic Life		X			
Irrigation	X				
Livestock Watering and Wildlife	X				
Recreation		X			

Impairment Information

Parameter	Status	Cycle First Listed?	Associated Actions	Associated Uses	Use Attainment
AMMONIA, UN-IONIZED	Cause	2012		Fish and Aquatic Life	Not meeting criteria
DISSOLVED OXYGEN	Cause	2012		Fish and Aquatic Life	Not meeting criteria
ESCHERICHIA COLI (E. COLI)	Cause	2012	39244	Recreation	Not meeting criteria
NITRATE/NITRITE (NITRITE + NITRATE AS N)	Meeting Criteria			Fish and Aquatic Life	Meeting criteria
NUTRIENTS	Cause	2024		Fish and Aquatic Life	Not meeting criteria
OTHER ANTHROPOGENIC SUBSTRATE ALTERATIONS	Cause	2012	30624	Fish and Aquatic Life	Not meeting criteria
PHOSPHORUS, TOTAL	Meeting Criteria			Fish and Aquatic Life	Meeting criteria

Listing History

WATERBODY: Chattanooga Creek from Nickajack Reservoir to Georgia stateline.

ASSESSMENT: 2015 TDEC biorecon station at mile 0.3 (just above mouth). Zero EPT families, zero intolerant, 5 total families. Biorecon score = 3. Habitat score = 101. Conductivity elevated (502).

2014-2015 TDEC chemical station at mile 0.3 (just above mouth). Two low DOs (4.59 & 4.93 mg/L). Four out of 11 E. coli observations over 941 cfu. Elevated ammonia (but not criteria violations). Elevated conductivities, NO2+NO3, TKN, and some total phosphorus.

2009-2010 TDEC chemical station at mile 0.3 (just above mouth). Two low DOs (3.78 & 4.4 mg/L). Three out of 9 E. coli observations over 941 cfu. July - August 2009 geo mean of 5 E. coli observations = 250.3 cfu. Elevated ammonia, NO2+NO3, and total phosphorus.

2005-06 City of Chattanooga pathogen monitoring at mile 0.3 (u/s mouth). Seven out of 17 E. coli observations over 941 cfu.

Last Modified Date: 2022-12-15
Last Modified By: HYDROPSYCHE

1 of 2

Listing History

2005 TDEC biorecon station at mile 0.3 (just above mouth). Zero EPT families, zero intolerant, 4 total families. Biorecon score = 3. Habitat score = 60. Conductivity elevated (515).

2004-2005 TDEC chemical station at mile 0.3 (just above mouth). Two low DOs (3.53 & 4.64 mg/L). Five out of 13 E. coli observations over 941 cfu. Elevated ammonia, NO2+NO3, and total phosphorus.

City of Chattanooga fecal and chemical monitoring. Pathogens elevated at Rossville Blvd site. Low DO.

Listing Rationale

No recent benthic sample due to lack of available habitat. 2019 Diatom sample at RM 0.3 showed a Stressed community, and high filamentous growths observed. Habitat survey, sampler observations, and aerial imagery document extensive channel alterations. Fish & Aquatic Life shall remain not supported. 2019-2020 monthly chemical and pathogen data: Nutrients frequently elevated. 4/11 dissolved oxygen grab samples violate criteria, and Sept 2019 diurnal D.O. chronically below 5.0 ppm. Two chronic ammonia violations, and TKN consistently elevated. 7/11 E. coli violate criteria, several quite high - Recreation use is not supported.

Last Modified Date: 2022-12-15
Last Modified By: HYDROPSYCHE

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Panasonic CF-20

TOUGHBOOK

questions - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Developer

Clipboard Font Alignment Number Styles Cells Editing

Calibri -11 A A Wrap Text

General Conditional Formatting Table Styles Insert Delete Format Sort & Find & Filter Select

K2

A B C D E F G H I J K L M

Questions ?

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Sheet1 Sheet2 Sheet3

Ready

