

Volunteer Monitoring

Chapter Includes:

Project “GREEN” Monitoring

2004-2005 Volunteer Monitoring Activities

Project "GREEN" Program

South Sound GREEN (Global Rivers Environmental Education Network) is a watershed education program of the Thurston Conservation District. Currently, students from 20 schools in the North Thurston, Olympia, Tumwater, and Griffin School Districts, St. Martin's College, plus community and home-school groups are involved in this community-based, action-oriented program. The Nisqually River Education Project, which also gathers water quality data based on the GREEN protocols, currently has students from 14 schools participating, including schools from Eatonville, Yelm, North Thurston, Clover Park and Steilacoom. As participants, students monitor the chemical parameters of the Deschutes and Nisqually Rivers and several of their tributaries, and streams in the Henderson, Eld and Totten watersheds. Monitoring data, coupled with information about cultural, economic, and environmental aspects of the watershed, help students identify and prioritize issues facing the community.

Data is collected by students twice yearly, once in autumn and once in late winter. Many classes also sample benthic macroinvertebrates and conduct EPA Stream Walks on these monitoring days. Data and recommendations for addressing issues facing the local watershed are presented by students at a student congress held each spring. At this congress, students attend workshop sessions to gain skills needed to implement their recommendations. Working with community members, students plan and implement environmental action projects designed to enhance and protect local water resources. South Sound GREEN is funded by a combination of public and private funding sources including: Thurston County, Thurston Conservation District, the Cities of Olympia, Lacey and Tumwater, North Thurston School District, and Trout Unlimited.

Students also have opportunity to study Puget Sound and nearshore issues, monitor marine waters and discover and observe species living in the intertidal zone. Students collect sterile samples for fecal coliform tests for Thurston County Lab.

On monitoring day, students collect grab samples at their monitoring sites. Generally, the tests are conducted in the field. In some instances, students may transport the collected samples in a cooler and conduct the tests in their classroom. Taking the potential for operator error into consideration, three split samples are run from the same collection bottle for pH, nitrate and turbidity. For dissolved oxygen and biochemical oxygen demand, two or three samples are collected from the river in the same place at the same time. A sterile bottle is used to collect a sample for fecal coliform and three split samples are run if time and materials allow.

The chemical parameters are measured using a variety of monitoring equipment. Dissolved oxygen, biochemical oxygen demand, and nutrients are measured using either HACH or LaMotte dissolved oxygen test kits, depending on the type of equipment available at the school. Fecal coliform tests are conducted by the standard membrane filtration method using the Millipore Sterifil Aseptic filter system. The samples are incubated for 24 hours and the numbers of bacteria colonies visible on the petri dishes are counted directly. The data indicates number of fecal coliform colonies present in 100ml of water sample. Wide range indicator pH kits from HACH and LaMotte are used to measure pH while LaMotte kits are used to measure turbidity.

Total solids samples collected by South Sound GREEN students use sampling bottles from the LOTT Wastewater Treatment Facility. Samples are kept in a cooler and delivered to LOTT for analysis. The Yelm Wastewater Treatment Facility provides the total solids bottles and the analysis for the Nisqually River Education Project students.

For more information on Project GREEN, contact Anne Mills, Program Coordinator, Thurston Conservation District, (360) 754-3588, ext. 108.

The data collected for the 2004-2005 water year follows.

South Sound GREEN
Winter Monitoring Data
March 4, 2004

Parameter	DO	DO sat	FC	pH	BOD	Water Temp.	Turbidity	Total Solids*	Weather/Notes
Unit of results	mg/L	(%)	Col /100mL		mg/L	Celsius	JTUs	mg/L	
Optimal Standard	9		50	7.0-8.0	0	9.0-12.0	0	<25	
Acceptable Standard	7.0-8.0		50-100	6.5-8.5	lower the better	12-18C	lower the better	25-80	
Site									
Deschutes R. @ Pioneer Park	11	125	5	6.9	7	6	0	9.6	Sunny
Deschutes R. @ The Barn	12.5	>150	40	7.2	error	7.5	<5	1.6	Cloudy, showers Air; 8.5° C
Deschutes R. @ Golf Course	12.5	>150	NAF	7	NAF	7	0	2.4	Clear & partly cloudy; air 9° C
Deschutes R. @ Tum. Falls Pk.	10.25	100	TC^ 5 HSC 0	6	0.12	8	5	4.4	Partly cloudy; air 51° F
Ellis Creek @ Gull Harbor Rd.	9.8	96	16	7	error	NAF	2.5	2	Sunny, clear; Air 60° F
Fish Pond Creek @ Kenneydell Park	9.5	90	22	7	0	7	10	0.8	Sunny; air 55° F
Fish Trap Creek	9	85	212	6.5	error	8	1.7	2.4	Clear, few low clouds, windy; Air 8° C
Fox Ck @ Pleasant Glade Rd.	7.2	59	18	7	4	7	10	0	Sunny
Green Cove Cr. @ 36th	8.6	76	TC^ 15 HSC 28	7	NAF	7.5	NAF	NAF	Partly cloudy; air 55° F
Green Cove Cr. @ Cedrona	6.8	54	TC^ 35 HSC 34	6	NAF	8	0	NAF	Partly cloudy; air 55° F
Indian Creek @ Frederick St.	8	65	>400	7	3.85	8	5	NAF	Clear skies; air approx 50° F;
Indian Creek @ Quince St.	9	77	>500	7	4.1	9.5	6.7	NAF	Clear skies; air approx 50° F; dog may be using area for bathroom
Kennedy Creek @ Salmon Trail	10.3	85	TC^ 5 HSC 1	6.5	error	7.5	0	1.2	Sunny, windy; Air 9.5° C
McLane Cr. @ McLane Cr. Trail	11	120	19	7.2	1.2	7	0	0.4	Sunny and brief showers; Air 40° F
Mission Creek @ East Bay Dr.	11	90	E 4	7.25	3	7	0	1.6	Sunny; Air 9° C; Fecal count may not be reliable

South Sound GREEN
Winter Monitoring Data
March 4, 2004

Parameter	DO	DO sat (%)	FC Col /100mL	pH	BOD mg/L	Water Temp. Celsius	Turbidity JTUs	Total Solids* mg/L	Weather/Notes
Unit of results	mg/L				mg/L	Celsius	JTUs	mg/L	
Pattison Lk. Ditch @ Mullen Rd.	7.8	68	12	7	1.6	7	1	NAF	Overcast; Air 12° C
Percival Creek @ Sapp Rd.	9	82	NAF	7	NAF	7	5	0.8	Sunny, windy, cold; air 10° C
Percival Creek @ Chapparel Rd.	9.23	89	NAF	7	0.67	9	2.5	2.8	Windy and clear Air ; 45° F
Schneider Creek @ Reroute	10.7	94	15	7	NAF	9	2	NAF	Sunny & cool, light wind, occasional brief shower; air 12° C
Woodard Creek @ 36th	9.7	96	TC^ 20 HSC 52	7.1	0.4	NAF	15	NAF	
Woodland Creek @ Draham Rd.	8.7	80	24	7.5	1.4	8	<5	2.4	Overcast; rain previous day; air 45° F
Woodland Creek @ Lacey CC	9.1	86	8	7.5	1.7	7	<5	2.8	Partly sunny; air 45° F
Woodland Cr. @ Hollywood Dr.	9.8	95		7.5	0.9	5	15	NAF	Sunny, windy, air 48° F
NAF = Not analyzed for.									
TC^= Thurston County Env. Lab result									
HSC=High School FC Count									
* LOTT Lab Results									
error (BOD result should not be higher than DO; Error can occur from light, leakage of air into sample, or bubbles in sample)									
IR = insufficient replicates									

South Sound GREEN
Water Quality Data
October 20, 2005

Green Cove Cr. @ Cedrona	Marshall MS (MAP)	Cook	4.35	40	TC^ 70 HSC=214	6.8	NAF	12.5	IR 40	48.8	TC^ Nitrates .1 mg/L Partly cloudy
Hart Cr. @ Brectos	Tumwater MS	Fullington	10	86	HSC=7	7	-0.33	9	3.3	16.8	Light overcast
Indian Cr. @ Frederick	Avanti HS	Sogn	8.1	86	8	7.5	0.2	19	5	0.4	TC^ Nitrates .8 mg/L Partly sunny
Indian Cr. @ Quince	Avanti HS	Sogn	8.62	89	380	7.5	0.52	17	0	1.2	TC^ Nitrates .6 mg/L Cloudy, 11 ° C
Kennedy Cr. @ Salmon Trail	Capital HS	Watts	9.4	85	TC^-15 HSC=10	7	0.4	10	0	NAF	Cool, and overcast w/ sunbreaks; 17° C
McLane Cr. @ Trail	McLane Elem.	O'Neal	26.3	140+	HSC=12	7.2	17.2	9	3.2	0.4	TC^ Nitrates .3 mg/L Scattered Clouds, sunbreaks
Moxlie Creek@ Watershed Pk. (bridge)	North Thurston HS	Perry	9.6	77	HSC=34	6.9	9.1	9	0	7.2	partly sunny; air temp 11.5°
Moxlie Creek@ Watershed Pk. (spring)	Centennial Elem.	Samson	8.1	70	HSC=0	6.6	0.1	NAF	0	10	Overcast
Moxlie Creek@ Watershed Pk. (storm pipe)	Centennial Elem.	Samson	9.3	82	HSC=6.67	7.5	NAF	NAF	10	0.9	Overcast Clear/ No H2O fr. Storm pipe, came fr. Below storm pipe
Mission Cr. @ East Bay (Priest Point Park)	Roosevelt Elem.	Ferguson	11.2	100	60	7.6	2.6	11	1.16	NAF	clear
Pattison Lk. Ditch @ Mullen	Timberline HS	Marshall	5.5	53	20	9.5	1.4	13	10	1.4	Overcast
Percival Cr. @ Sapp	Tumwater MS	Jones	7.2	71	IR HSC=54	7	0.8	15	5	0.8	TC^ Nitrates .1 mg/L Cool and cloudy
Snyder Cr. @ TESC	Garfield Elem.	Baker	10.2	91	83	7.31	0.87	11.3	0	0.4	clear and cool

South Sound GREEN
Water Quality Data
October 20, 2005

Schneider Cr. Oly @ WestBay	Garfield Elem.	Rankin	12	119	HSC=9	7	1.32	15	0.33	0	partly cloudy
Schneider Cr. @ Reroute	Griffin School	Temple	5	46	159	6.75	1.7	12	27	2.4	partly cloudy
Tolmie Creek @ State Pk	Timberline HS	Marshall	9.9	96	4	9.25	1.2	14	1.6	10.8	overcast
Woodard Cr. @ Prose	Timberline HS	Koontz	10	90	0	8	NA	10	5	NAF	
Woodland Cr. @ Draham	Mtn. View Elem.	Stevens	8.2	75	29	7	1.3	11	5	0.4	TC^ Nitrates 1.6 mg/L Clear, rain previous days
Woodland Cr. @ Mark bridge (Salazar)	Mtn. View Elem.	Tarabulski	8		99	7.5	0.7	11	1.6	0.8	TC^ Nitrates 1.7 mg/L Clear
Woodland Cr. @ Pleasant Glade RD	Komachin	Skydancer	10.5	NAF	50	7.1	-3.7	12	5	NAF	partly cloudy
Woodland Cr. @ Hollywood	South Bay Elem.	Lang	NAF	NAF	NAF	7.5	NAF	NAF	5	NAF	Partly sunny; air 58 F°
Notes:											
NAF = Not analyzed for											
IR = insufficient replicates											
TC^= Thurston County Env. Lab											
HSC=High School FC Count											
* LOTT Lab Results											
error - BOD result should not be a negative number. Error can occur from light, leakage of air into sample, or bubbles in sample											

MARCH 2005

Parameter				DO	DO sat (%)	FC	pH	BOD	Water Temp. Celsius	Turbidity JTUs	Total Susp. Solids* mg/L	Weather/Notes
Unit of results				mg/L		Col/100mL		mg/L				
Optimal Standard				9	7.0-8.0	<50	7.0-8.0	0	9.0-12.0	0	<25	
								lower the		lower the		
Acceptable Standard				7.0-8.0	50-100	50-100	6.5-8.5	better	12-18C	better	25-80	
Site	School	Teacher	DO	DO sat	FC	pH	BOD	Water Temp.	Turbidity	Total Susp. Solids	Weather/Notes	
Capitol Lake @ 5th & Water	Tumwater Options	Stokesberry	12.3	112	10	8	2.4	11.4	5	5.6	sunny; air 14C°	
Deschutes R. @ Pioneer Park	Komachin MS	Reimer	12.5	105	4	7	3.5	9.5	0	5.2		
Deschutes R. @ The Barn	Saint Martin's	Peltier	10.5	88	27	7	error	8.5	5	1.6		
Deschutes R. @ Tum. Falls Pk.	Olympia HS.	Kirk	13.67	120	3	7.5	3.5	10	0	0.8	clear, sunny; air 63F°	
Deschutes R. @ Historical Pk.	McKenny Elem	Brewer	11	120	28	7.5	error	9	NAF	2	clear, calm sunny; air 9C°	
Fish Pond Cr. @ Kenneydell	Tumwater Middle	Adams										
Fish Trap Cr. @ Littlerock & 93rd	Bush MS	Cutler	9.2	79	0	6	0.7	9	5	3.2	foggy; air 11C°	
Fox Cr. @ Pleasant Glade Rd.	Komachin	Skydancer	7	58	23	6.5	NAF	8	10	5.2	Sunny; .1 in. rain in last 24 hrs	
Green Cove Cr. @ 36th	Marshall MS (MAP)	Cook	12	98	20	8	2	6.5	0	1.2	clear; air 13° C	
Green Cove Cr. @ Cedrona	Marshall MS (MAP)	Cook	6	51	0	6.5	error	7.5	3.3	2		
Hicks Cr. @ TWEET	Timberline HS	Koontz	7.8	60	1	5.5	NAF	6.5	7.3	24	foggy; air 6° C	
Indian Cr. @ Frederick St.	Avanti	Sogn	8.6	85	144	7.3	1.2	17	1.67	4	sunny	
Indian Cr. @ Quince St.	Avanti	Sogn	8.13	79	148	7.5	error	14.5	5	4.4	sunny	
Kennedy Cr. @ Salmon Trail	Capital HS	Watts	10.1	78	NAF	7	0.5	5	NAF	2	TC^ Nitrites .6 mg/L	
Leingang Cr @ Gull Harbor	Woodland Elem	Carper	10.3	100	NAF	7.25	1.3	8.5	10	3.2	sunny & clear; air 60° F	
McLane Cr. @ McLane Cr. Trail	McLane Elem.	O'Neal	11	95	18	7	error	9	5	2.4	sunny, clear; air 61° F	
Mission Cr. @ East Bay Dr.	Roosevelt Elem.	Kalman	11	95	45	7.5	2	9	5	NAF	clear, air 16° C	
Moxlie Cr. @ Watershed Pk	North Thurston HS	Perry	10.3	85	30	7	1.7	8	6.7	4	Sunny, TC^ Nitrites 2.4 mg/L	
Pattison Lk. Ditch @ Mullen Rd.	Timberline HS	Marshall	9.1	74	44	7	1	7	3	1.6	overcast, foggy; air 7C	
Percival Cr. @ Sapp Rd.	Tumwater MS	Jones	9	79	68	7	6.3	7	5	4.8	partly cloudy	
Percival Cr. @ Chapparal	Tumwater MS	Jones	13	122	3.3	7	6.4	13	5	NAF	partly cloudy	
Salmon Cr. @ Walkers	Bush Middle	Gunderson	8.4	76	NAF	6.5	3.1	7	13	1.6	foggy - 200 yd visibility	
Snyder Cr. @ TESC	Capital HS	Baker	10	95	14	7.3	error	13	0	1.6	clear, cool; air 9° C	
Schneider Cr. (Oly) @	Garfield Elem.	Rankin	10.8	NAF	NAF	5.7	0.8	8	3.2	-0.4	Sunny and clear; air 12° C	
Schneider Cr. @ 101 Reroute	Griffin School	Temple	10.5	90	5	7	NAF	9	3.3	0.8	Foggy, cool, no wind, air 7° C	
Tolmie Cr. @ Tolmie St. Pk.	Timberline HS	Marshall	10	63	60	7.5	0.6	7	4	2.4	overcast, foggy; air 7° C	
Woodard Cr. @ Prose	Timberline HS	Koontz	11.6	110	89	9.25	error	12	8.3	28		
Woodland Cr. @ Draham Rd.	Mtn. View Elem.	Stevens	7.5	64	15	7.2	0.5	9	0	2.8	Unseasonably warm & dry; air	
Woodland Cr. @ Lacey CC	Mtn. View Elem.	McGlothern	6.6	55	34	6.75	1.7	8	0	1.6	overcast air 40° F	
Woodland Cr. @ Mark St. bridge	Mtn. View Elem.	Coble	8.9	77.5	135	7	7.23	9	5	9.2	Foggy; air 41° F	
Woodland Cr. @ Pleasant Glade	Komachin	Condon	6.75	14	NAF	7.5	NAF	9	0	NAF	Clear, air 55° F	
Woodland Cr. @ Hollywood Dr.	South Bay Elem.	Lang	10	NAF	NAF	7.5	error	5	NAF	NAF		

NAF = Not analyzed for error (BOD result should not be higher than DO; Error can occur from light, leakage of air into sample, or bubbles in sample)

TC^= Thurston County Env. Lab result * LOTT Lab Results IR = insufficient replicates

South Sound GREEN
Water Quality Data
October 20, 2005

Parameter	DATE: 10/20/05	DO	DO sat (%)	FC	pH	BOD	Water Temp. Celsius	Turbidity JTUs	Total Suspended Solids* mg/L	Weather/Notes
Unit of results		mg/L		Col /100mL		mg/L	Celsius	JTUs	mg/L	
Optimal Standard		9		50	7.0-8.0	0	9.0-12.0	0	<25	Nitrates standard <1 mg/L
Acceptable Standard		7.0-8.0		50-100	6.5-8.5	lower the better	12-18C	lower the better	25-80	
Site	School	Teacher								
Beatty Creek @ Arnesen Rd	McLane Elem.	Bergholz	86	HSC=10	7	0.55	10	2.5	0.4	partly cloudy
Black Lake Ditch	YMCA Eeath Service Corps	Claire Graser	65	NAF	7.3	2.08	13	10	2	Cloudy
Deschutes R. @ Hist. Pk	McKenny Elem.	Brewer	75	HSC=81	7.5	0	8	5	29.2	Foggy, Cloudy, Dry
Deschutes R. @ The Plant Center (The Barn)	Saint Martin's College	Hartman	100	76	7.3	1.68	11.7	0	2.4	TC^ Nitrates 0.6 mg/L Overcast
Deschutes R. @ Tum. Falls Pk.	Olympia HS	Kirk	80	34	7.5	-0.9	13	8.3	1.3	Cloudy
Fish Trap Cr. @ Litterock & 93rd	Bush MS	Cutler	75	11	6	0.6	10	1.6	4.4	Overcast, 10 ° C, LaMotte 9:15 am
Fox Cr. @ Pleasant Glade Rd.	Komachin MS	Skydancer	13	41	7	NAF	8	7.5		possible error - incorrect reagent may have been received
Garfield Cr. @ Trail	Garfield Elem.	Stine	70	TC^ 265 HSC=274	7	1.7	12	2.8	2.8	TC^ Nitrates .8 mg/L Cool, partly cloudy
Green Cove Cr. @ 36th	Marshall MS (MAP)	Cook	63	HSC=188	8.5	NAF	12.5	32.5	4.4	TC^ Nitrates .2 mg/L Clear and Sunny

South Sound GREEN
Water Quality Data
October 20, 2005

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Schneider Cr. @ Reroute	Griffin School	Temple	5	46	159	6.75	1.7	12	27	2.4	partly cloudy
Tolmie Creek @ State Pk	Timberline HS	Marshall	9.9	96	4	9.25	1.2	14	1.6	10.8	overcast
Woodard Cr. @ Prose	Timberline HS	Koontz	10	90	0	8	NA	10	5	NAF	
Woodland Cr. @ Draham	Mtn. View Elem.	Stevens	8.2	75	29	7	1.3	11	5	0.4	TC^ Nitrates 1.6 mg/L Clear, rain previous days
Woodland Cr. @ Mark bridge (Salazar)	Mtn. View Elem.	Tarabulski	8		99	7.5	0.7	11	1.6	0.8	TC^ Nitrates 1.7 mg/L Clear
Woodland Cr. @ Pleasant Glade RD	Komachin	Skydancer	10.5	NAF	50	7.1	-3.7	12	5	NAF	partly cloudy
Woodland Cr. @ Hollywood	South Bay Elem.	Lang	NAF	NAF	NAF	7.5	NAF	NAF	5	NAF	Partly sunny; air 58 F°
Notes:											
NAF = Not analyzed for											
IR = insufficient replicates											
TC^= Thurston County Env. Lab											
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error - BOD result should not be a negative number. Error can occur from light, leakage of air into sample, or bubbles in sample											