5-4-2001

Agricultural Land Use and Water Quality on Sally Richmond Brook

BRISTOL COUNTY AGRICULTURAL HIGH SCHOOL

AGRICULTURAL LAND USE AND WATER QUALITY ON

SALLY RICHMOND BROOK

DIGHTON

MASSACHUSETTS


BRISTOL COUNTY
AGRICULTURAL HIGH SCHOOL
DIGHTON, MA

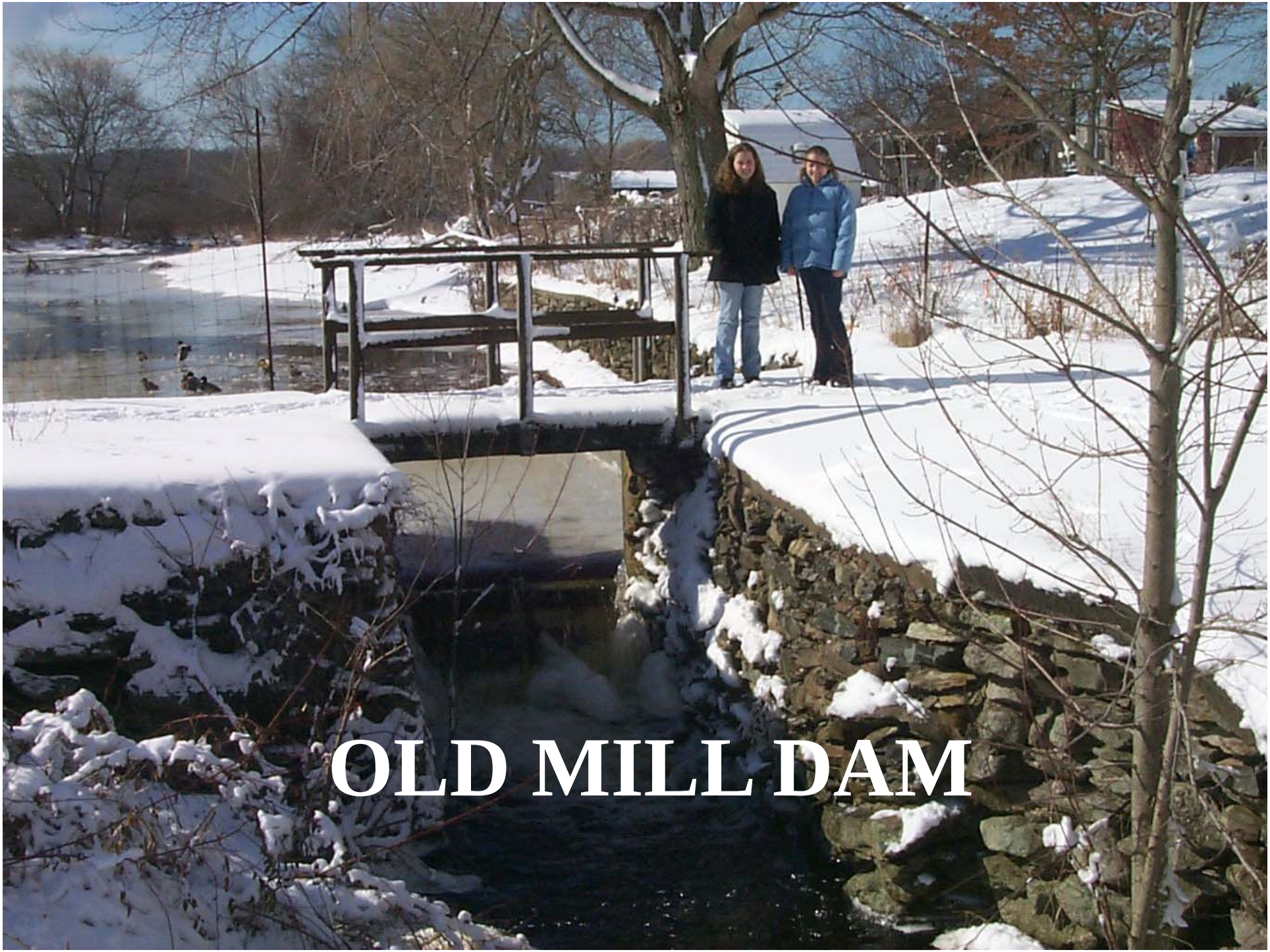
WATERSHED MAP

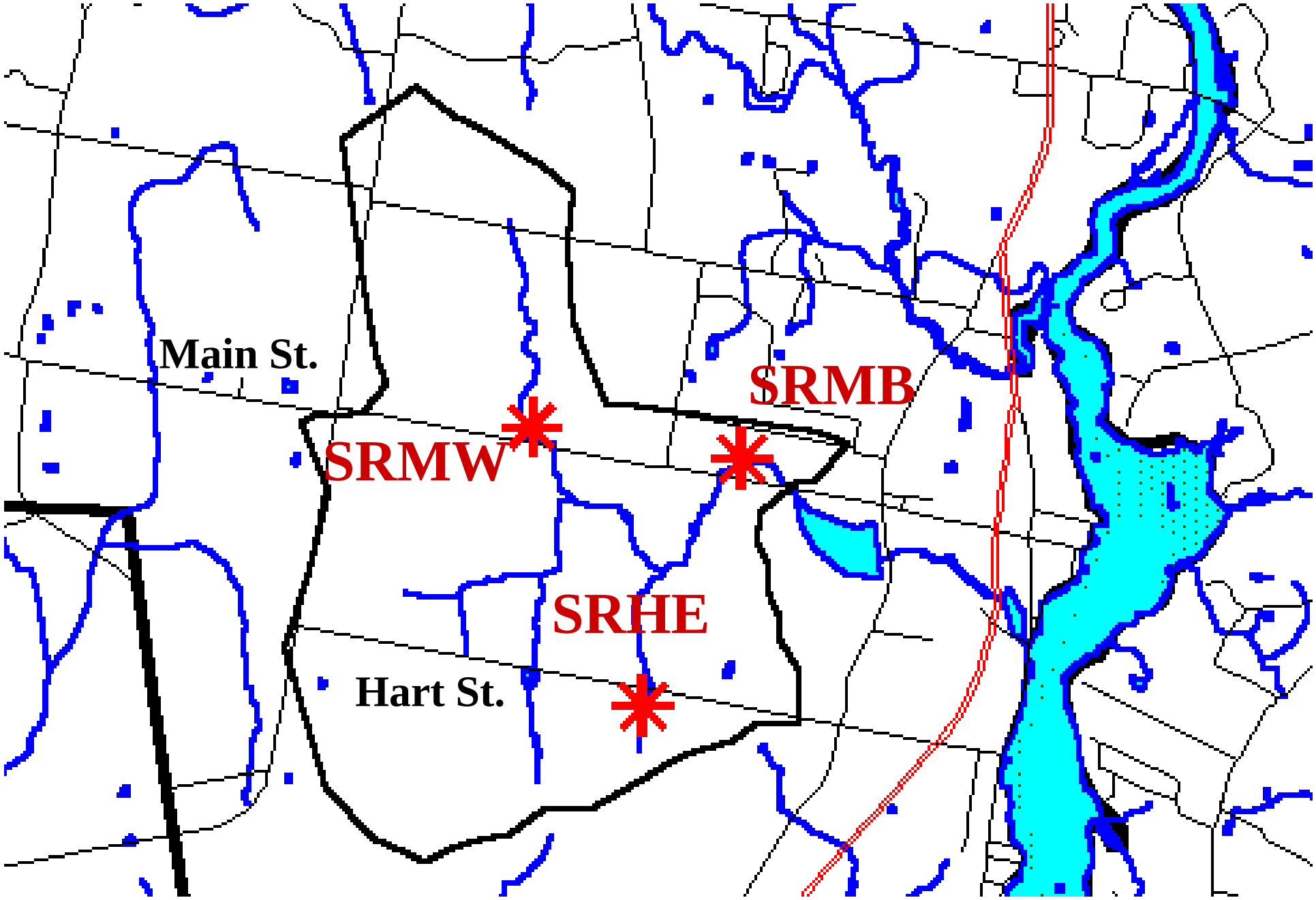
HMOND

COVE

MPLEX

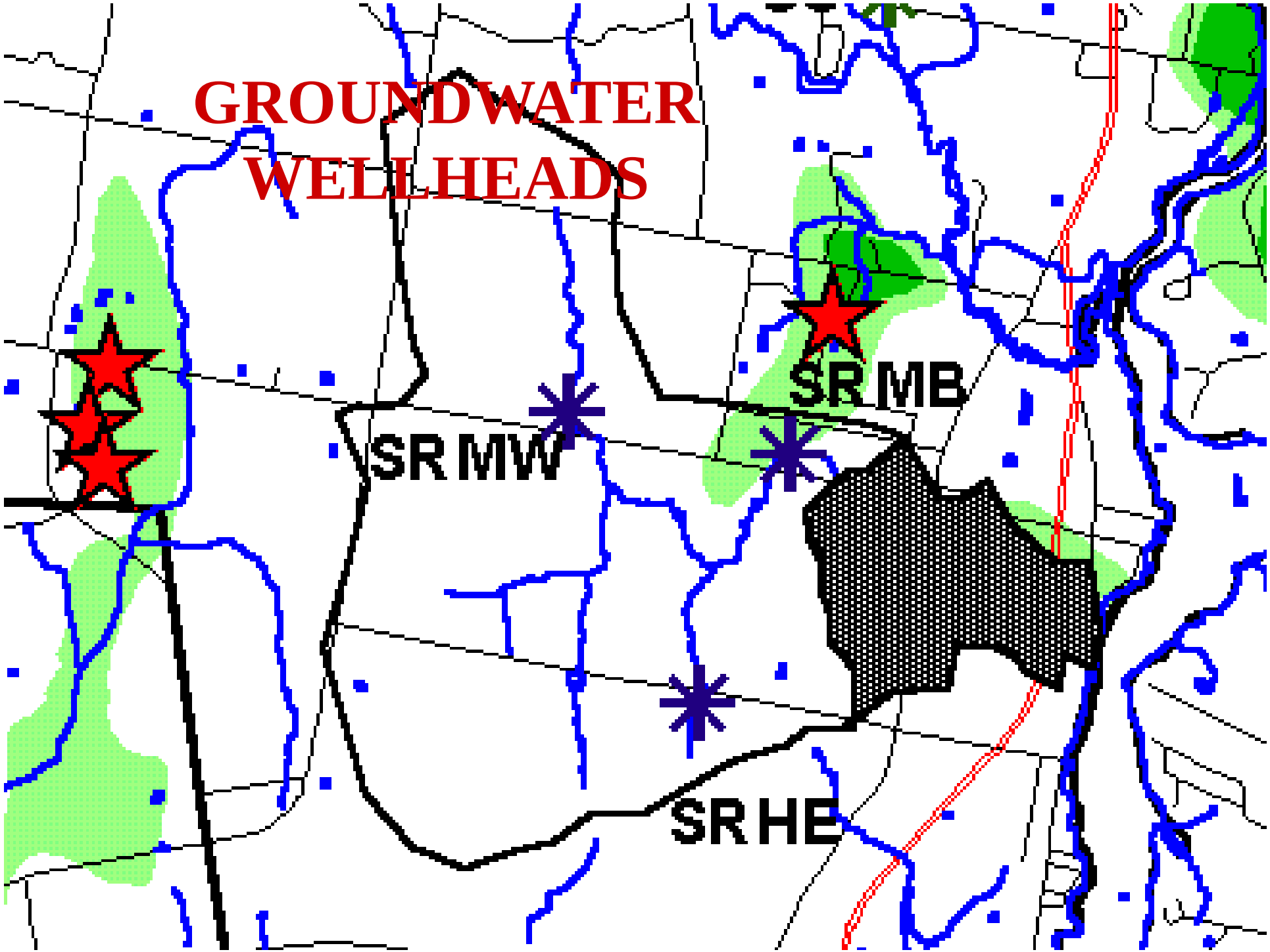
POLLUTED LOWER REACH

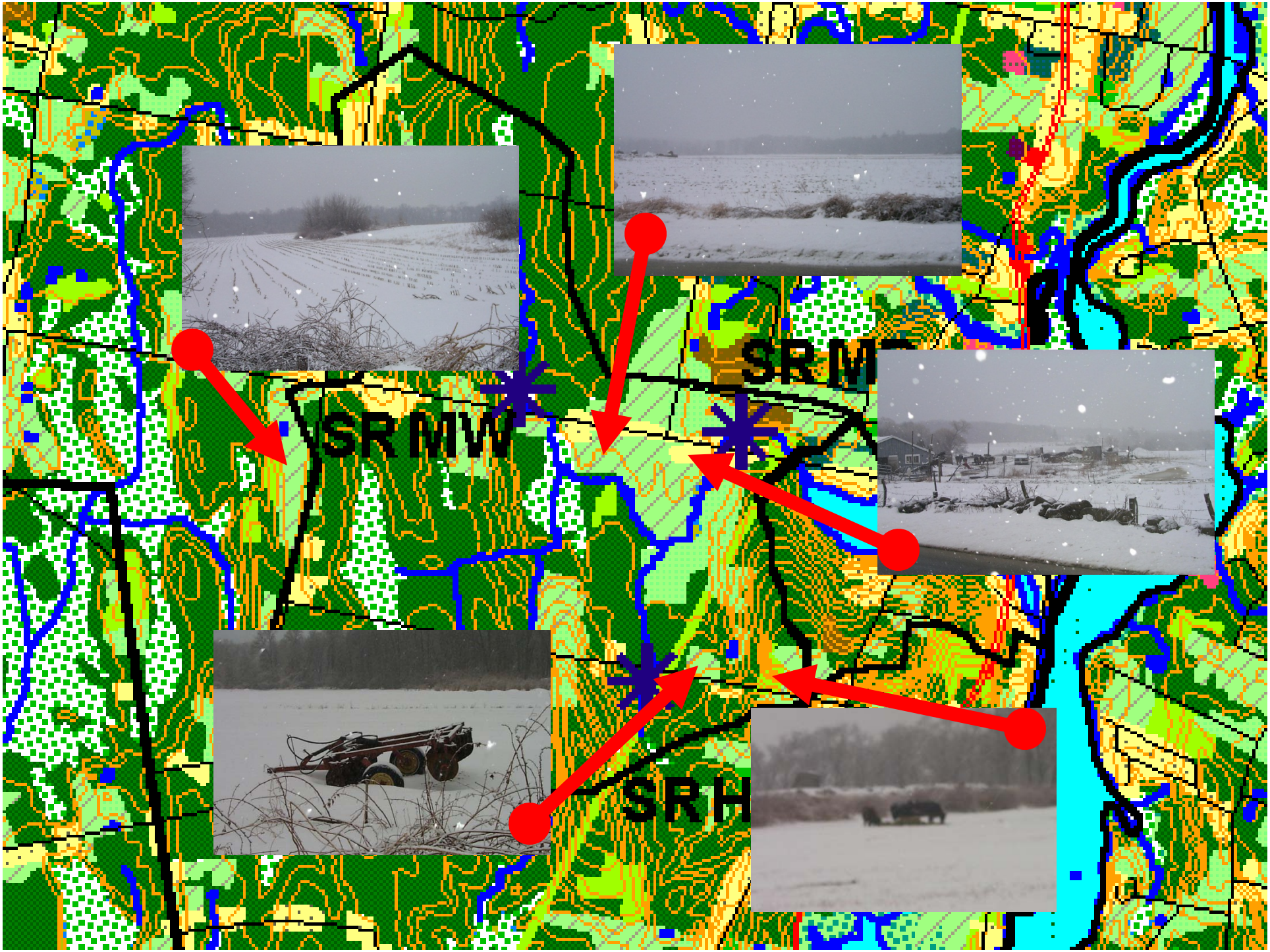

OLD MILL DAM



SALLY RICHMOND BROOK TEST SITES

TOPOGRAPHY


GROUNDWATER
WELLHEADS
SR MB
SR MW
SR HE


SR MW
SR M
SR H

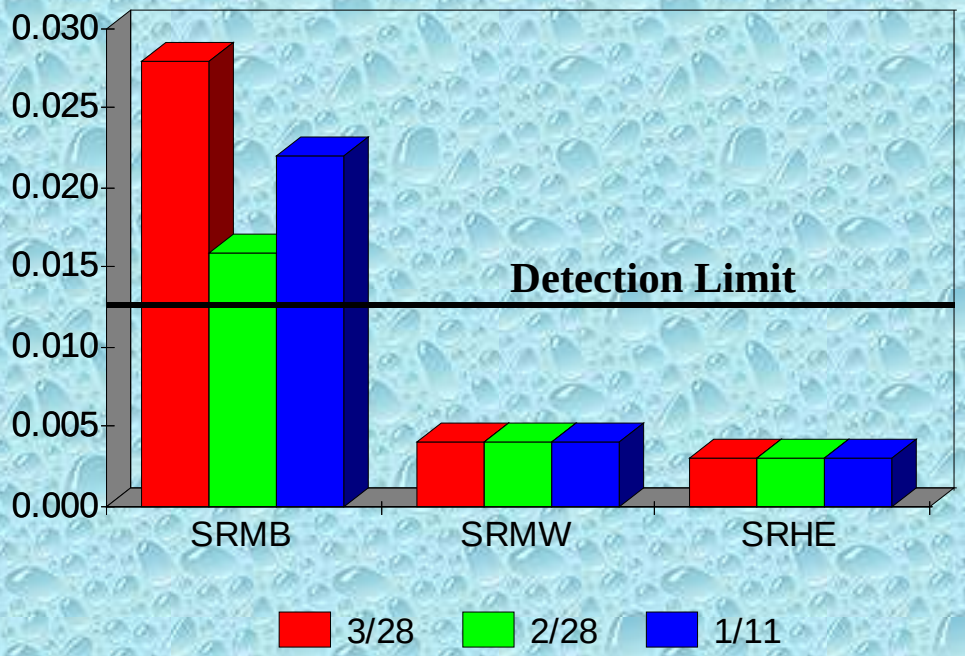
A FARMING HERITAGE


LIVESTOCK FEEDLOT

Chemicals

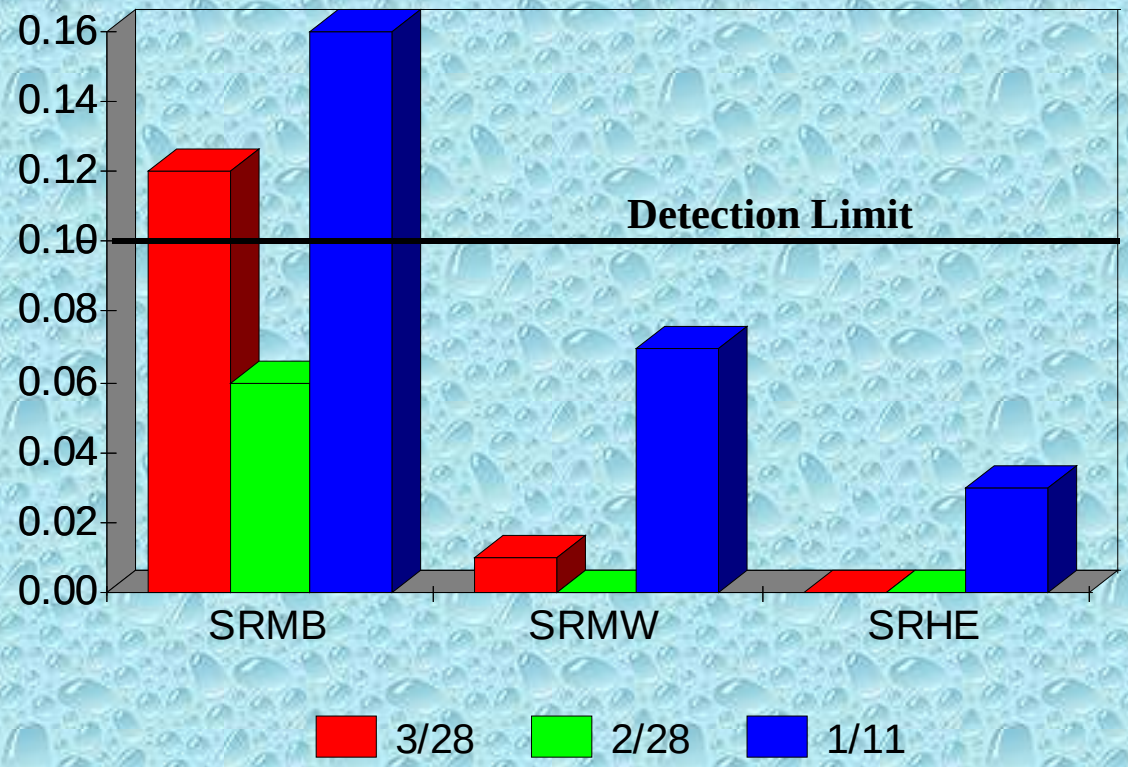
PREPARING GRAB SAMPLES

Phosphorus mg/liter



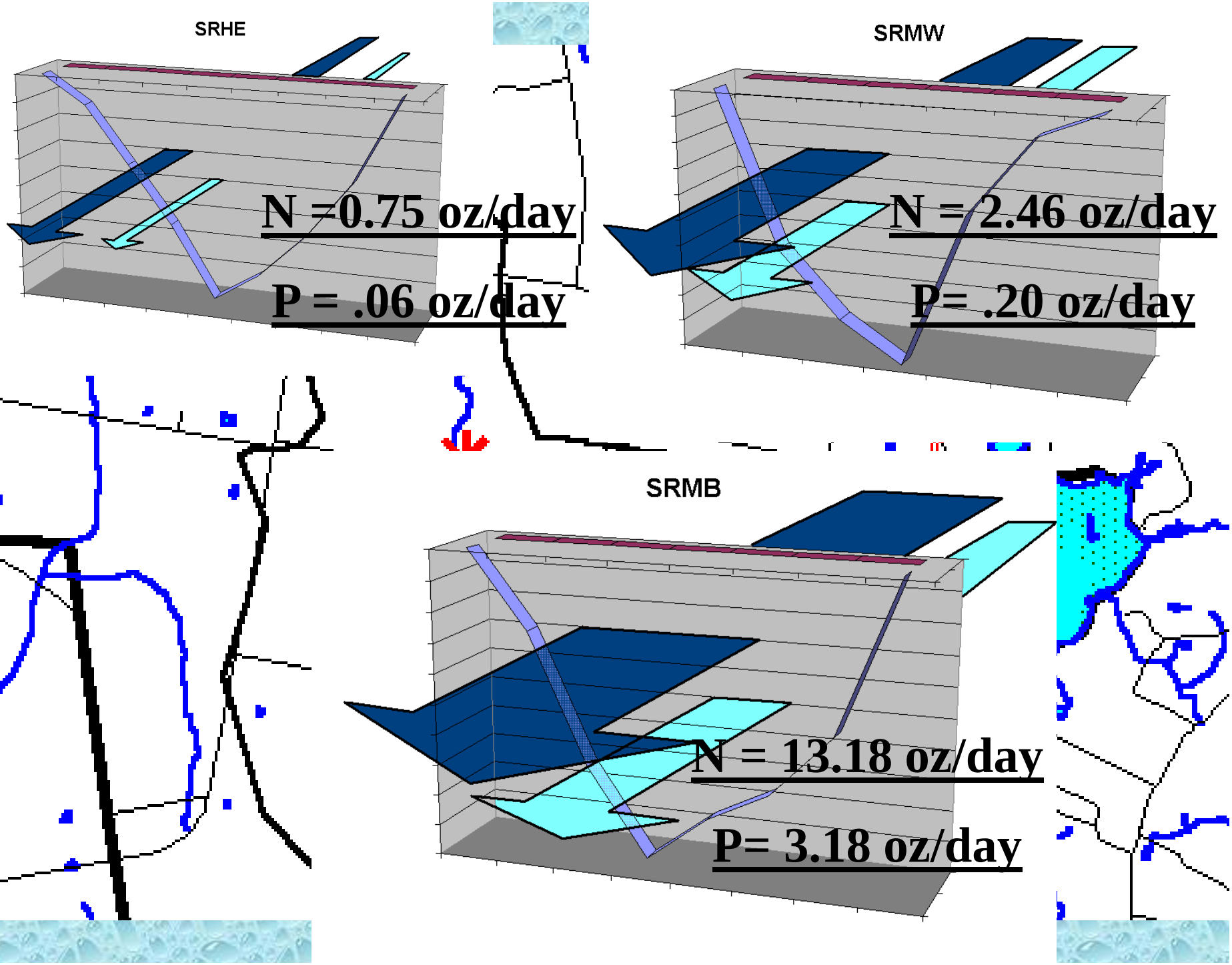
	3/28	2/28	1/11
SRMB	0.028	0.016	0.022
SRMW	0.004	0.004	0.004
SRHE	0.003	0.003	0.003

Nitrogen mg/liter



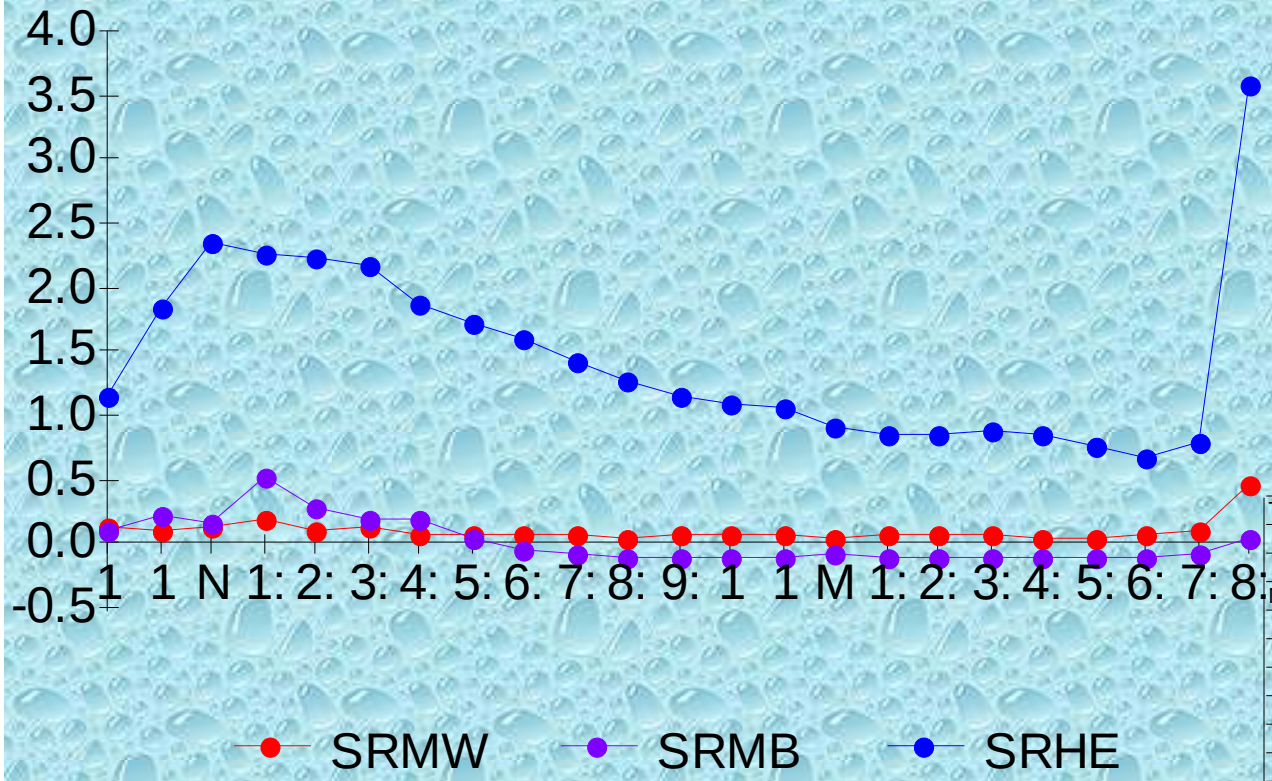
	3/28	2/28	1/11
SRMB	0.12	0.06	0.16
SRMW	0.01	0	0.07
SRHE	0	0	0.03


FLOW
TESTING


SRHE
N =0.75 oz/day
P = .06 oz/day
SRMW
N = 2.46 oz/day
P= .20 oz/day
SRMB
N = 13.18 oz/day
P= 3.18 oz/day

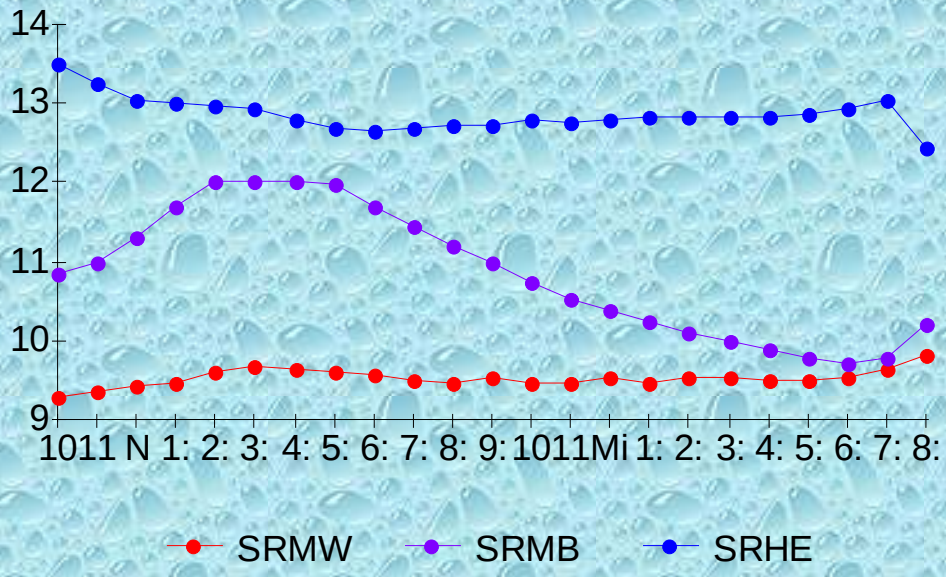

HYDROLAB
TEST
DISSOLVED OXYGEN
TEMPERATURE
pH

Temperature (°C)



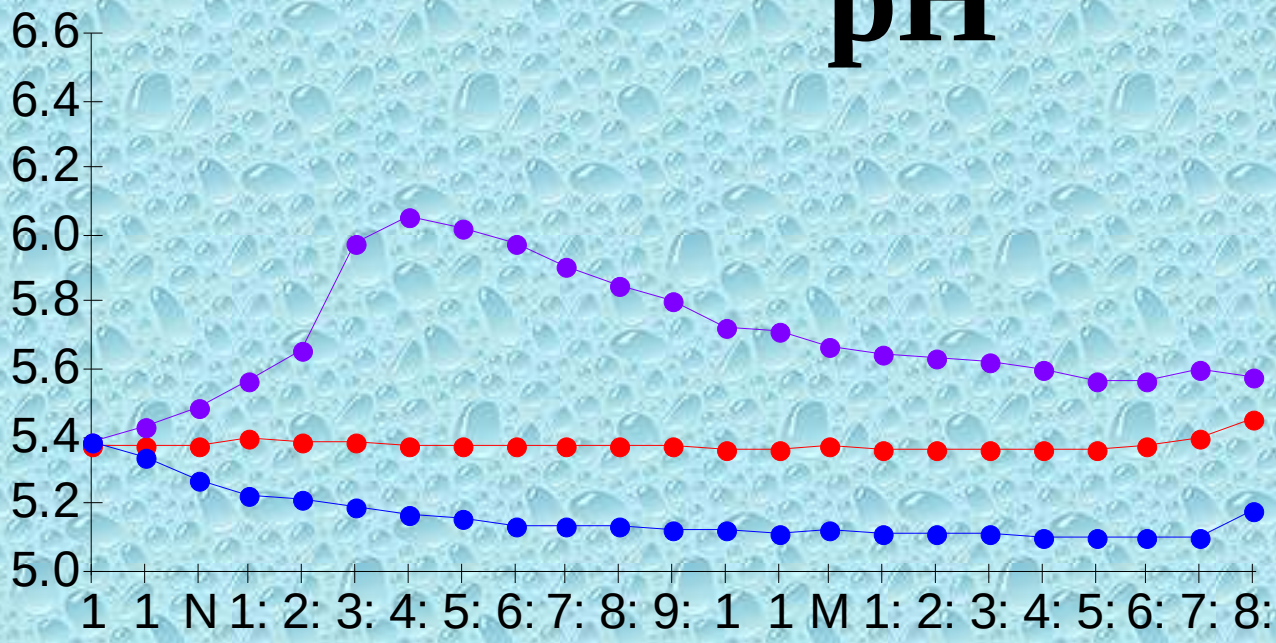
Time	SRMW	SRMB	SRHE
10:00	0.12	0.09	1.16
11:00	0.11	0.21	1.84
Noon	0.12	0.17	2.36
1:00	0.19	0.52	2.26
2:00	0.11	0.27	2.23
3:00	0.13	0.2	2.17
4:00	0.08	0.19	1.88
5:00	0.07	0.03	1.71
6:00	0.07	-0.05	1.6
7:00	0.06	-0.07	1.43
8:00	0.05	-0.11	1.27
9:00	0.06	-0.11	1.14
10:00	0.06	-0.11	1.1
11:00	0.06	-0.1	1.06
Midnight	0.05	-0.09	0.92
1:00	0.06	-0.12	0.84
2:00	0.06	-0.11	0.86
3:00	0.06	-0.1	0.88
4:00	0.05	-0.1	0.85
5:00	0.05	-0.11	0.75
6:00	0.06	-0.11	0.66
7:00	0.09	-0.09	0.78
8:00	0.46	0.03	3.59

Dissolved Oxygen



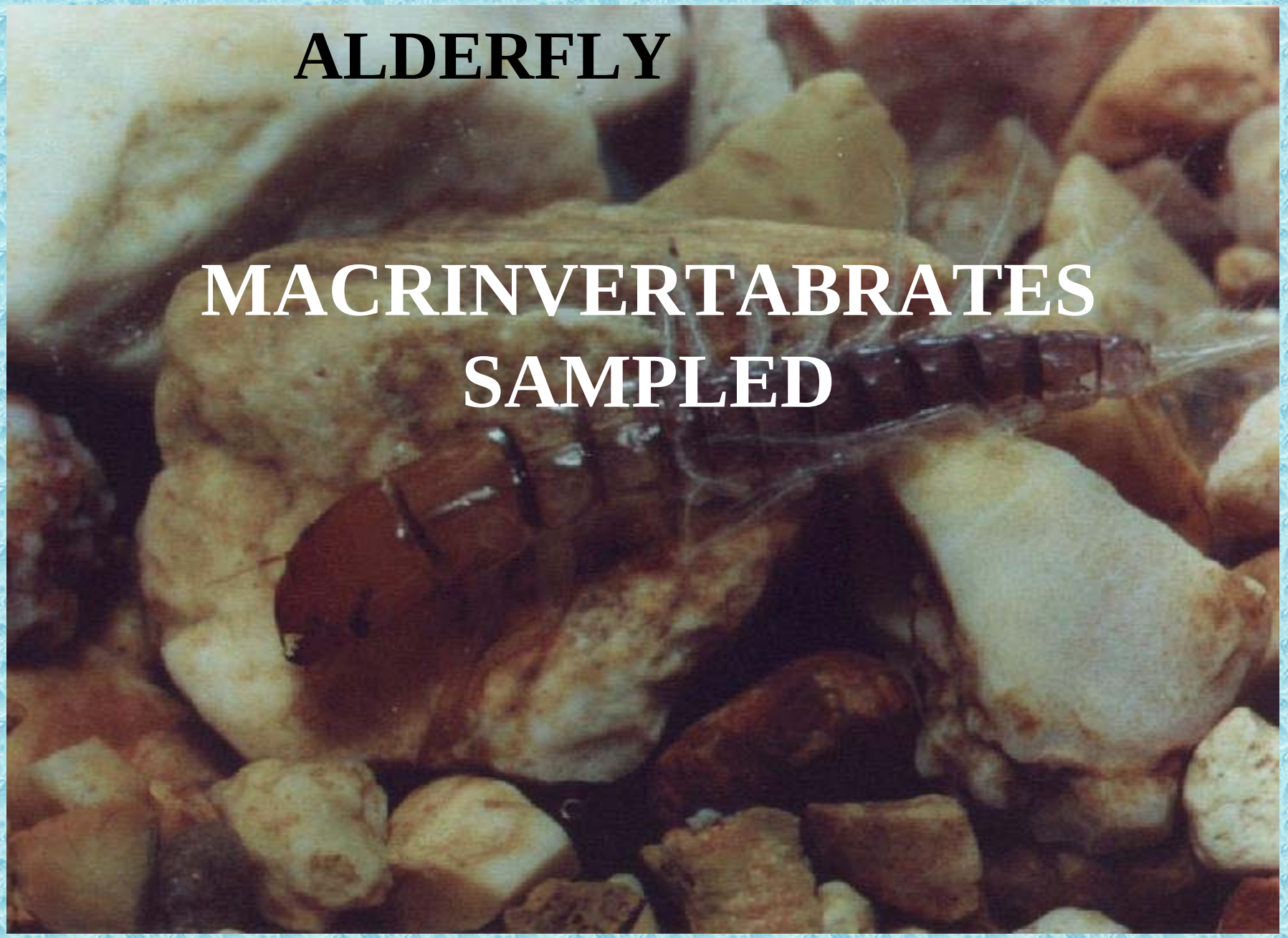
Time	SRMW	SRMB	SRHE
10:00	9.3	10.83	13.49
11:00	9.34	10.99	13.26
Noon	9.42	11.32	13.06
1:00	9.47	11.71	13
2:00	9.61	12.03	12.96
3:00	9.66	12	12.95
4:00	9.63	12.02	12.81
5:00	9.59	11.99	12.7
6:00	9.58	11.71	12.66
7:00	9.5	11.43	12.68
8:00	9.47	11.2	12.71
9:00	9.52	10.97	12.73
10:00	9.46	10.75	12.78
11:00	9.46	10.54	12.76
Midnight	9.52	10.37	12.8
1:00	9.47	10.24	12.83
2:00	9.52	10.11	12.84
3:00	9.52	9.98	12.83
4:00	9.51	9.87	12.82
5:00	9.49	9.78	12.85
6:00	9.54	9.71	12.94
7:00	9.64	9.79	13.05
8:00	9.83	10.21	12.44

pH



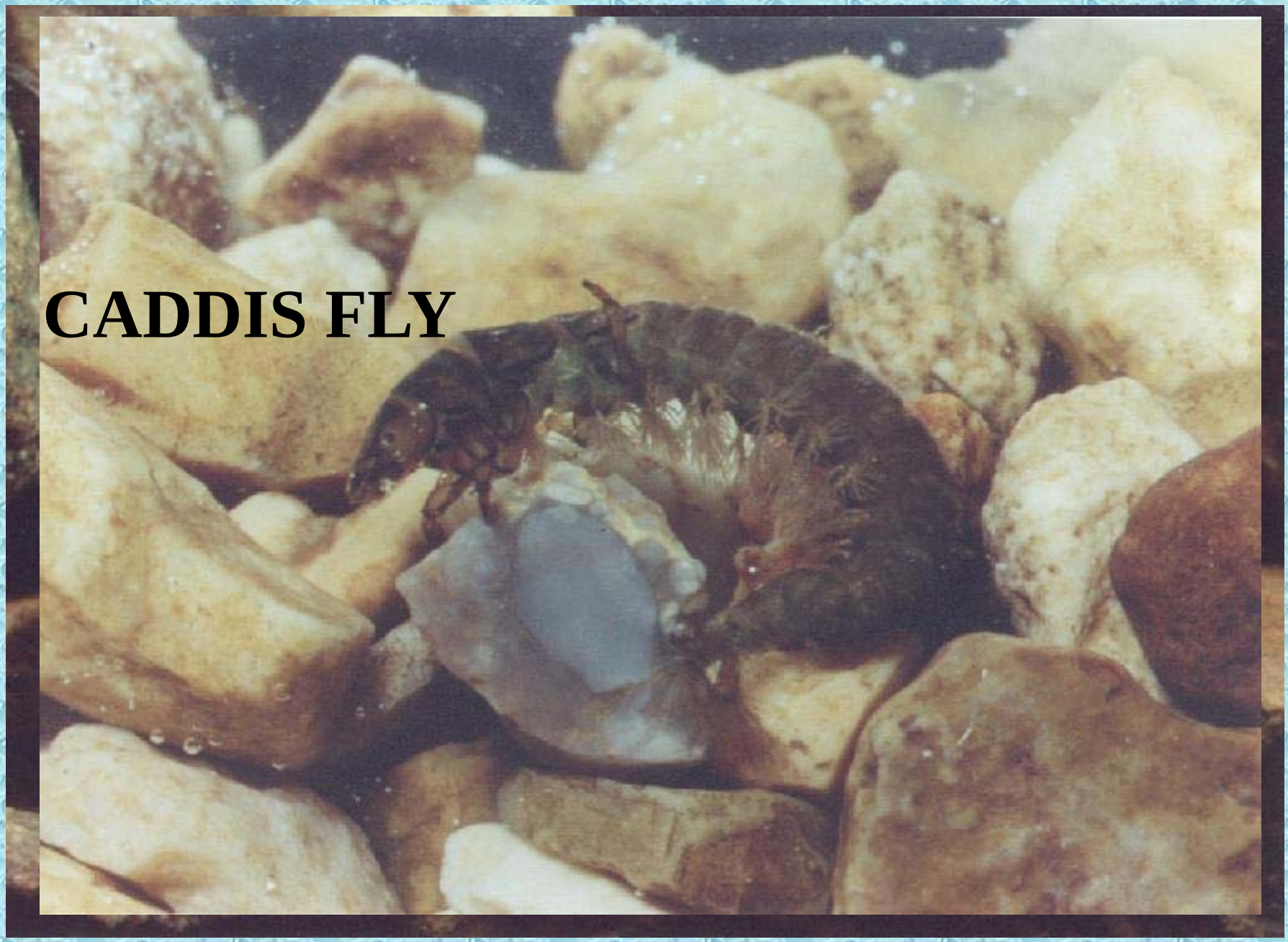
SRMW SRMB SRHE

Time	SRMW	SRMB	SRHE
10:00	5.37	5.39	5.39
11:00	5.37	5.43	5.34
Noon	5.38	5.48	5.27
1:00	5.4	5.57	5.23
2:00	5.39	5.68	5.21
3:00	5.39	5.98	5.19
4:00	5.39	6.08	5.17
5:00	5.37	6.02	5.19
6:00	5.37	5.98	5.14
7:00	5.37	5.91	5.14
8:00	5.37	5.85	5.14
9:00	5.37	5.8	5.13
10:00	5.38	5.73	5.12
11:00	5.38	5.71	5.11
Midnight	5.37	5.67	5.12
1:00	5.38	5.65	5.11
2:00	5.38	5.64	5.11
3:00	5.38	5.62	5.11
4:00	5.38	5.6	5.1
5:00	5.38	5.57	5.1
6:00	5.38	5.57	5.1
7:00	5.4	5.6	5.1
8:00	5.45	5.58	5.18



MACRINVERTABRATES SAMPLED

COLLECTIING MACROINVERTABRATE DATA


CADDIS FLY

SORTING ORGANISMS

ISSAC WALTON LEAGUE MACROINVERTEBRATE ASSESSMENT FORM

Stream Study: Sample Record and Assessment

Stream _____ Site Number _____

County or city _____ State _____

Collection date _____ Collectors _____

Weather conditions (last 3 days) _____

Average depth at site _____ Average width at site _____

Stream water temperature C° _____ F° _____

WATER QUALITY RATING

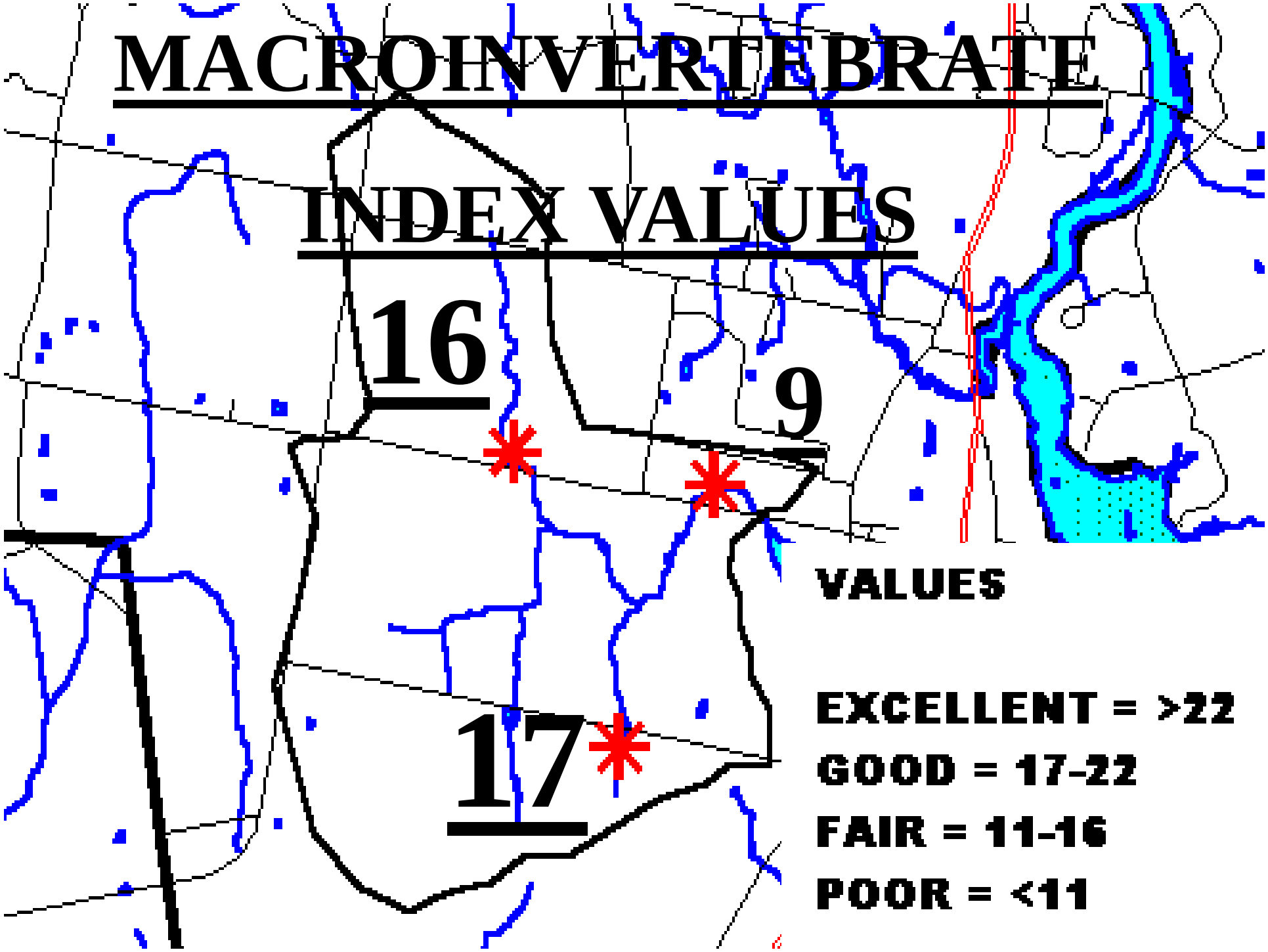
Total Index Value = _____

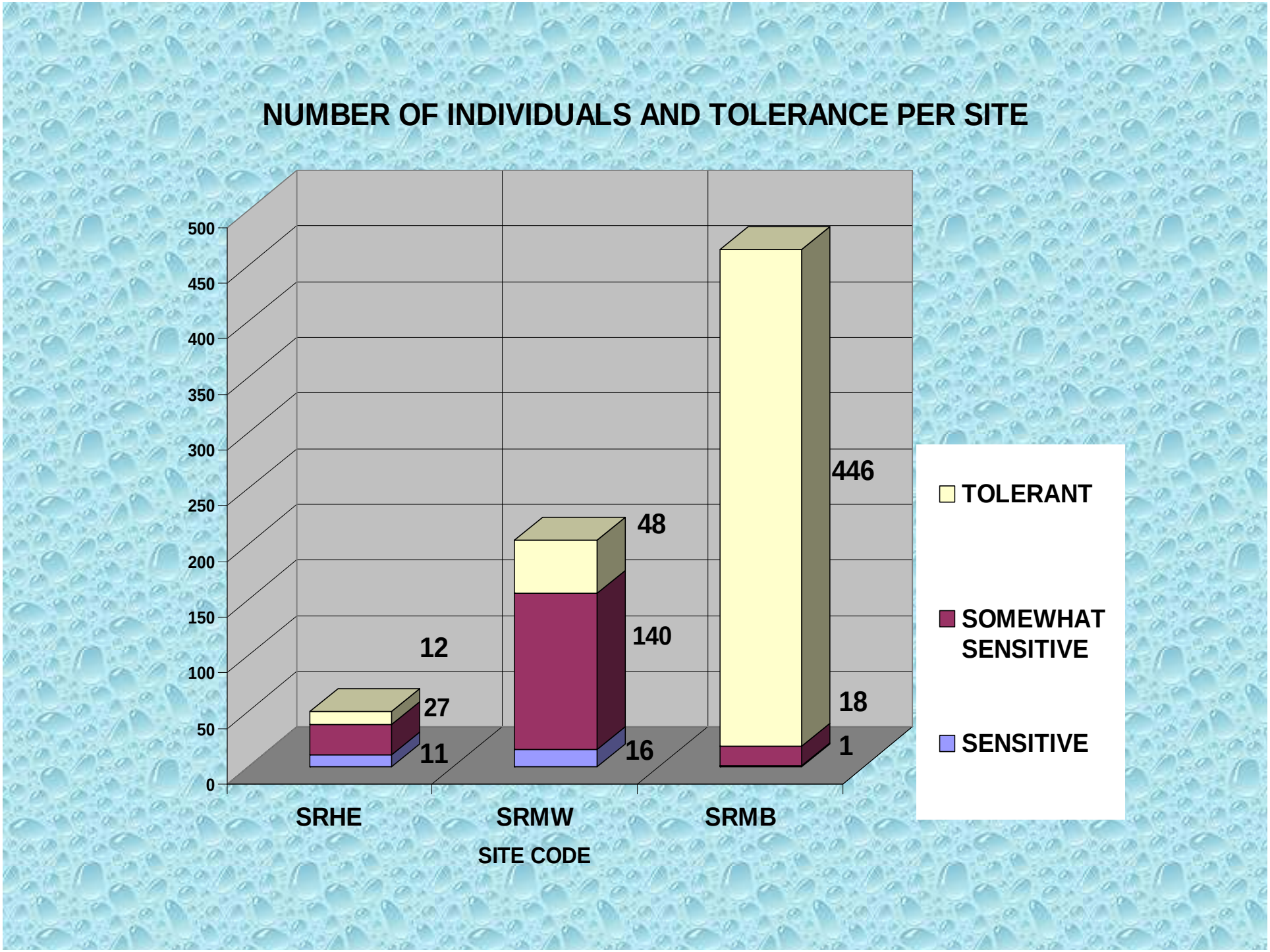
☐ Excellent (>22) ☐ Fair (11-16)

☐ Good (17-22) ☐ Poor (<11)

☐ ____ caddisfly larvae ☐ ____ hellgramite ☐ ____ mayfly larvae ☐ ____ gilled snails ☐ ____ riffle beetle adult ☐ ____ stonefly larvae ☐ ____ water penny larvae	☐ ____ beetle larvae ☐ ____ clams ☐ ____ crane fly larvae ☐ ____ crayfish ☐ ____ damselfly larvae ☐ ____ dragonfly larvae ☐ ____ scuds ☐ ____ sowbugs ☐ ____ fishfly larvae ☐ ____ alderfly larvae ☐ ____ watersnipe larvae	☐ ____ aquatic worms ☐ ____ blackfly larvae ☐ ____ leeches ☐ ____ midge larvae ☐ ____ lunged snails
boxes checked x 3 = _____ index value	boxes checked x 2 = _____ index value	boxes checked x 1 = _____ index value

		SRMB		# of Each	Total Index Value		Water Quality		
Sensitive		Hellgramite		1	3		9	Poor	
Somewhat Sensitive		Sowbugs		18	2				
Tolerant		Aquatic Worms		20	4				
		Blackfly Larvae		300					
		Leeches		1					
		Midge Larvae		125					
		SRHS		**# of Each**	**Toatl Index Value**		**Water Quality**		
Sensitive		Caddisfly Larvae		7	6		17	Good	
		Stonefly Larvae		4					
Somewhat Sensitive		Beetle Larvae		2	8				
		Clams		2					
		Sowbugs		14					
		Alderfly Larvae		9					
Tolerant		Aquatic Worms		11	3				
		Blackfly Larvae		3					
		Midge Larvae		7					
		SRMW		**# of Each**	**Total Index Value**		**Water Quality**		
Sensitive		Caddisfly Larvae		4	6		16	Fair	
		Stonefly Larvae		12					
Somewhat Sensitive		Beetle Larvae		4	8				
		Crane Fly Larvae		4					
		Scuds		51					
		Sowbugs		84					
Tolerant		Aquatic Worms		28	2				
		Blackfly Larvae		20					
	Sensitive	Somewhat S	Tolerant	Index Value					
SRMB	3	2	4	9					
SRMW	6	8	2	16					
SRHE	6	8	3	17					


MACROINVERTEBRATE
INDEX VALUES
16
9
17
VALUES
EXCELLENT = >22
GOOD = 17-22
FAIR = 11-16
POOR = <11


NUMBER OF INDIVIDUALS AND TOLERANCE PER SITE
500
450
400
350
300
250
200
150
100
50
0
12
27
11
48
140
16
446
18
1
TOLERANT
SOMEWHAT SENSITIVE
SENSITIVE
SRHE
SRMW
SRMB
SITE CODE


SRMB

ANALYSIS AND DISCUSSION


Cow Farm


Possible household detergent leakages...


OPEN SPACE
VS.
DEVELOPMENT

BEST MANAGEMENT PRACTICES

** FENCE COWS FROM STREAM

** PLANT THE BUFFER ZONE

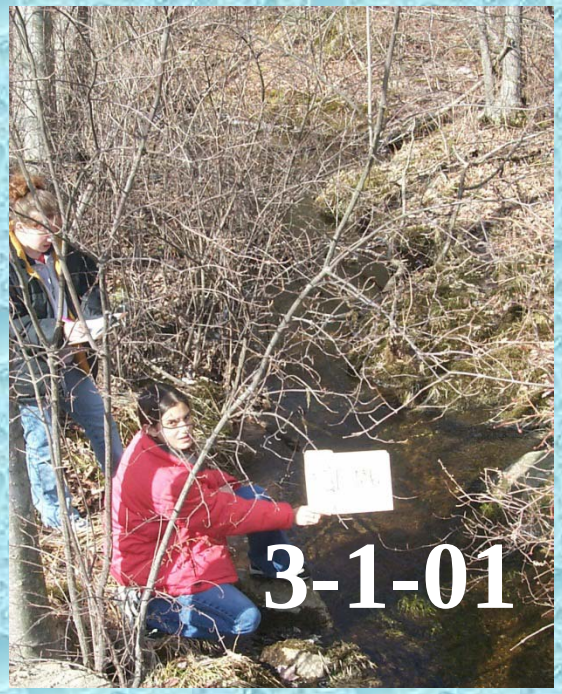
** USE “NO TILL” WHERE FEASABLE

** DO NOT OVER FERTILIZE

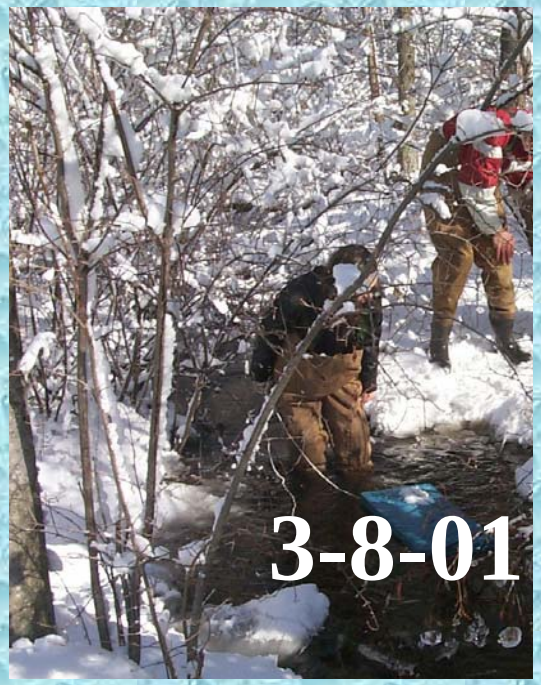
** EDUCATE PUBLIC ABOUT DETERGENTS


Dam
~~~>
~~~


SRMW
SRMB
SRHE
?



SRMW



UNPREDICTABLE SPRING WEATHER