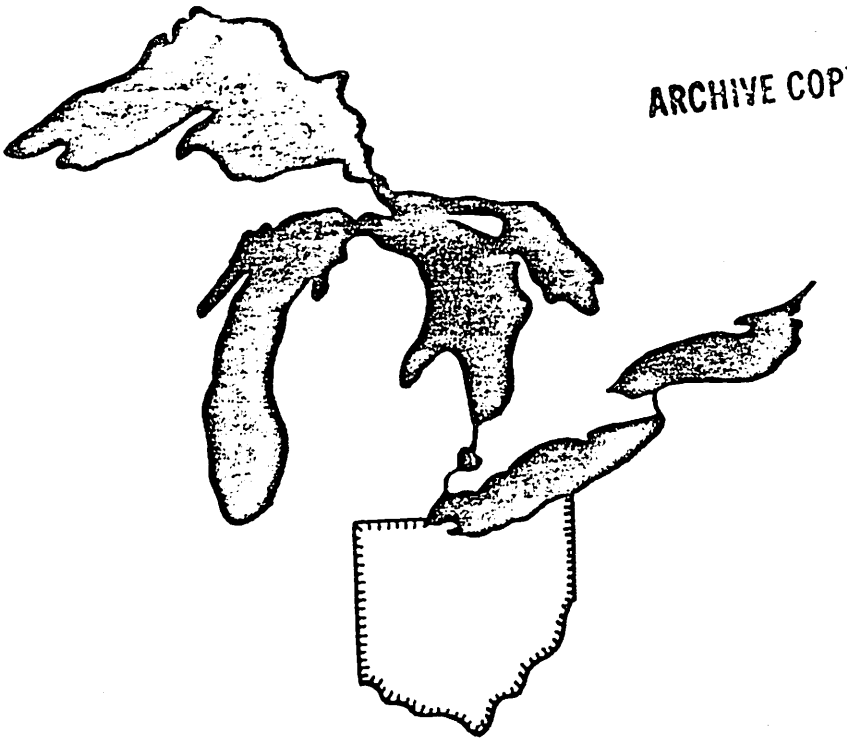
CLEAR TECHNICAL REPORT NO. 167-P



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PROGRESS REPORT

WESTERN LAKE ERIE CLADOPHORA SURVEILLANCE PROGRAM

APPENDIX

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APPENDIX TO PROGRESS REPORT
WESTERN LAKE ERIE *CLADOPHORA* SURVEILLANCE PROGRAM

The following tables serve as an appendix to CLEAR Technical Report No. 167-P. They represent the final values for the 1979 International Joint Commission, Western Lake Erie *Cladophora* Surveillance Program, which was sponsored by the U.S. Environmental Protection Agency.

The appendix consists of the following data tables:

Table 1. 1979 *Cladophora* Sampling Dates
Figure 1. *Cladophora* Surveillance Site Locations

Cladophora Site 1--Stony Point, Michigan

Appendix A: 1979 *Cladophora* Biological Data
Appendix B: 1979 *Cladophora* Tissue Nutrient Data
Appendix C: 1979 *Cladophora* Water Nutrient Data
Appendix D: 1979 *Cladophora* Physical Data

Cladophora Site 2--East Point, South Bass Island, Ohio

Appendix E: 1979 *Cladophora* Biological Data
Appendix F: 1979 *Cladophora* Tissue Nutrient Data
Appendix G: 1979 *Cladophora* Water Nutrient Data
Appendix H: 1979 *Cladophora* Physical Data

For the biological data, trace amounts represent *Cladophora* generally with a mean length of 1 cm or less with a sparse coverage. The trace amounts of *Cladophora* in the summer months consist of holdfasts with a few old basal cells. These minute filaments appear brown, with a thick coating of silt and/or epiphytes and actually represent very little *Cladophora* biomass.

Tissue nutrients are expressed as percentage of 64°C dry weight. The E x P values represent the total phophorus that was extracted in Gorham's media placed in a boiling water bath for one hour. Splash zone (s) values have been added for TTP and TTN, in addition to regularly monitored stations.

Water for water nutrient analysis was collected from approximately 1/4 m off the bottom at the station depths indicated. The OP values are representative of total filterable phosphorus.

Light readings were taken just above the surface of the water and just off the bottom.

APPENDIX A

1979 CLADOPHORA BIOLOGICAL DATA
CLADOPHORA SITE - 1

DATE	DEPTH (m)	COVERAGE (%)	LENGTH (cm) Mean	LENGTH (cm) Max.	BIOMASS IN GRAMS/m^2 Wet	Dry (64°C)	Dry (104°C)	Ash	Ash-free	BIOVOLUME (ml/m^2)
107	0.5	15	0.5	1.5	-	-	-	-	-	-
	1.0	30	0.5	6.0	-	-	-	-	-	-
	2.0	T*	0.2	0.5	T	T	-	-	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0
117	0.5	15	0.5	6.0	6.7	1.8	1.7	1.0	0.8	8
	1.0	30	0.7	7.0	8.3	2.3	2.3	1.5	0.8	10
	2.0	1	0.4	3.0	T	T	T	-		T
	3.0	0	0.0	0.0	0	0	0	0	0	0
137	0.5	45	3.0	11.0	110.0	19.6	19.0	10.4	8.1	112
	1.0	40	3.0	12.0	67.0	13.9	13.4	8.7	4.7	40
	2.0	1	<1.0	1.0	T	T	T	T	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0
151	0.5	50	8.0	25.0	195.7	54.6	53.4	36.4	17.0	162
	1.0	40	7.0	15.0	65.0	14.3	13.9	7.3	6.6	64
	2.0	1	1.5	2.0	T	T	T	T	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0
164	0.5	50	9.0	19.0	184.8	53.5	50.8	24.8	26.0	296
	1.0	40	7.0	13.0	105.9	25.1	23.6	11.2	12.5	144
	2.0	5	4.0	8.0	13.2	2.8	2.7	1.2	1.5	14
	3.0	0	0.0	0.0	0	0	0	0	0	0
179	0.5	90	20.0	26.0	307.6	66.0	61.5	21.6	39.9	444
	1.0	70	20.0	35.0	163.8	38.2	35.7	12.4	23.3	216
	2.0	25	13.0	17.0	107.7	24.9	23.5	6.6	16.8	140
	3.0	0	0.0	0.0	0	0	0	0	0	0

APPENDIX A

1979 CLADOPHORA BIOLOGICAL DATA (continued)
CLADOPHORA SITE - 1

DATE	DEPTH (m)	COVERAGE (%)	LENGTH (cm) Mean	LENGTH (cm) Max.	BIOMASS IN GRAMS/m^2 Wet	Dry (64°C)	Dry (104°C)	Ash	Ash-free	BIOVOLUME (ml/m^2)
193	0.5	90	23.0	37.0	318.7	106.7	100.4	45.4	55.0	440
	1.0	80	16.0	30.0	202.3	64.0	60.8	26.8	34.0	296
	2.0	45	13.0	19.0	124.7	30.1	28.2	9.9	18.3	144
	3.0	0	0.0	0.0	0	0	0	0	0	0
211	0.5	too turbid	9.0	18.0	119.0	44.3	42.4	25.7	16.7	144
	1.0	too turbid	10.0	25.0	142.9	49.2	46.9	27.2	19.7	176
	2.0	too turbid	7.0	15.0	11.5	4.4	4.2	2.4	1.9	14
	3.0	0	0.0	0.0	0	0	0	0	0	0
225	0.5	25	7.0	17.0	~40.0	~13.2	-	-	-	-
	1.0	20	5.0	13.0	~32.0	~10.4	-	-	-	-
	2.0	1	4.0	8.0	T	T	T	T	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0
242	0.5	20	3.0	6.0	10.0	5.0	4.9	3.8	1.1	-
	1.0	15	1.5	3.0	7.4	4.1	4.0	3.3	0.7	-
	2.0	1	1.0	3.0	T	T	T	T	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0
256	0.5	20	2.0	4.0	-	brown holdfasts			-	-
	1.0	15	1.0	2.0	-	brown holdfasts			-	-
	2.0	1	1.0	2.0	T	T	T	T	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0
271	0.5	20	2.0	4.0	-	brown holdfasts			-	-
	1.0	15	1.0	2.0	-	brown holdfasts			-	-
	2.0	1	1.0	2.0	T	T	T	T	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0

APPENDIX A

1979 CLADOPHORA BIOLOGICAL DATA (continued)
CLADOPHORA SITE - 1

DATE	DEPTH (m)	COVERAGE (%)	LENGTH (cm) Mean	LENGTH (cm) Max.	BIOMASS IN GRAMS/m^2 Wet	Dry (64°C)	Dry (104°C)	Ash	Ash-free	BIOVOLUME (ml/m^2)
278	0.5	40	2.0	4.0	-	38.2	37.4	32.0	5.4	-
	1.0	20	1.5	3.0		trace of new growth				-
	2.0	1	1.0	2.0	T	T	T	T	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0
289	0.5	45	2.0	3.0	-	22.6	22.0	18.1	4.0	-
	1.0	20	<1.0	2.0	-	-	-	-	-	-
	2.0	1	<1.0	1.0	T	T	T	T	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0
310	0.5	30	2.0	5.0	21.9	11.0	10.8	8.1	2.7	20
	1.0	10	2.0	4.0	19.6	10.4	10.3	8.0	2.3	20
	2.0	1	<1.0	3.0	T	T	T	T	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0
320	0.5	40	2.5	4.0	53.6	21.3	20.9	14.2	6.7	56
	1.0	10	2.0	3.0	13.6	6.5	6.4	4.7	1.7	12
	2.0	T	<1.0	<1.0	T	T	T	T	T	T
	3.0	0	0.0	0.0	0	0	0	0	0	0

*T stands for "trace."

APPENDIX B

1979 CLADOPHORA TISSUE NUTRIENT DATA
CLADOPHORA SITE - 1

DATE	Depth (m)	E x P (%)	TTP (%)	TTN (%)	DATE	Depth (m)	E x P (%)	TTP (%)	TTN (%)
137	0.5	-	0.130	1.72	225	0.5	0.081	0.145	2.92
	1.0	-	0.154	1.44		1.0	0.099	0.137	-
						2.0	0.196	0.216	3.36
151	0.2	0.736	0.269	4.89					
	0.5	0.314	0.275	2.39	242	0.5	0.062	0.107	2.38
	1.0	0.375	0.266	2.22		1.0	0.067	0.103	2.29
164	0.5	0.006	0.249	3.73	256	S	-	0.177	3.85
	1.0	0.243	0.282	3.59					
	2.0	0.230	0.268	2.97	278	S	-	0.229	4.78
						0.5	0.077	0.189	2.20
179	0.5	0.240	0.219	4.46					
	1.0	0.211	0.235	4.32	289	S	-	0.104	4.08
	2.0	0.533	0.411	5.14		0.5	0.115	0.221	2.59
193	S	-	0.259	4.24	310	0.5	0.149	0.253	2.50
	0.5	0.239	0.247	3.93		1.0	0.145	0.259	2.73
	1.0	0.185	0.254	4.01					
	2.0	0.310	0.300	3.90	320	S	0.317	-	5.23
						0.5	0.269	0.302	3.40
211	S	-	0.195	3.87		1.0	0.327	0.340	3.79
	0.5	0.090	0.240	3.09					
	1.0	0.134	0.265	3.35					
	2.0	0.241	0.372	3.88					

APPENDIX C

1979 CLADOPHORA WATER NUTRIENT DATA
CLADOPHORA SITE - 1

DATE	DEPTH (m)	SRP (ppb)	OP (ppb)	TP (ppb)	NH_3 (ppb)	NO_2-NO_3 (ppm)	TKN (ppb)
117	-2.0	-	5.4	43.3	35.6[a]	0.984[a]	-
137	1.0	5.8	3.5	26.6	22.3	1.011	586.08
	3.0	4.5	2.8	27.2	22.8	0.894	
151	1.0	5.1	4.3	83.1	26.8[a]	0.394[a]	745.60
	2.0	16.9	4.5	75.4	19.8[a]	0.395[a]	
164	1.0	3.0	17.1	48.7	13.3	0.757	638.17
	2.0	2.2	9.0	47.6	23.8	0.741	
	3.0	3.0	10.7	41.6	29.9	0.728	
179	0.5	1.5	5.4	36.0	33.0	0.483	
	1.0	1.1	5.2	23.5	17.0	0.483	507.95
	2.0	1.4	8.7	26.9	15.6	0.485	
	3.0	2.6	8.3	35.1	9.0	0.485	
193	0.5	6.2	11.5	31.7	28.6	0.325	
	1.0	12.1	7.2	27.0	28.8	0.324	501.44
	2.0	6.0	8.0	30.7	67.4	0.327	
	3.0	5.0	4.6	25.5	58.2	0.318	
211	0.5	6.5	-	-	20.9	1.575	
	1.0	5.1	-	105.0	20.5	1.525	1666.89
	2.0	5.7	10.6	136.5	42.5	1.535	
	3.0	3.8	7.9	143.5	46.2	1.435	
225	0.5	4.6	11.0	104.5	8.5	0.199	
	1.0	4.0	9.9	72.5	5.1	0.199	898.60
	2.0	3.3	8.4	108.0	1.5	0.208	
	3.0	3.2	11.2	249.0	6.9	0.268	

APPENDIX C

1979 CLADOPHORA WATER NUTRIENT DATA (continued)
CLADOPHORA SITE - 1

DATE	DEPTH (m)	SRP (ppb)	OP (ppb)	TP (ppb)	NH_3 (ppb)	NO_2-NO_3 (ppm)	TKN (ppb)
242	0.5	0 > 0.5[c]	7.5	101.0	10.0	0.015	
	1.0	0 > 0.5[c]	7.8	88.8	3.0	< 0.005[b]	1165.55
	2.0	0 > 0.5[c]	7.5	83.4	2.0	0 < 0.005[c]	
	3.0	0 > 0.5[c]	7.0	97.2	4.2	0.012	
256	0.5	0 > 0.5[c]	4.5	178.0	36.5	0.244	
	1.0	2.1	4.3	200.0	45.0	0.244	1530.16
	2.0	2.5	5.8	299.5	51.1	0.249	
	3.0	0 > 0.5[c]	3.6	135.0	62.1	0.245	
271	0.5	0 > 0.5[c]	3.9	53.3	1.8	0.025	
	1.0	0 > 0.5[c]	-	-	11.8	0.012	735.83
	2.0	0 > 0.5[c]	2.7	44.6	5.7	0.010	
	3.0	0 > 0.5[c]	-	-	20.9	0.153	
278	0.5	-	8.8	33.8	-	-	
	1.0	-	6.0	35.1	-	-	592.59
	2.0	-	6.5	35.2	-	-	
	3.0	-	9.4	60.1	-	-	
289	0.5	2.2	4.0	44.5	2.8	0.155	
	1.0	2.5	7.3	47.3	15.3	0.200	713.04
	2.0	2.1	3.1	52.8	12.2	0.180	
	3.0	2.1	3.3	58.1	3.0	0.114	
299	2-S	-	4.7	102.7	-	-	894.78
310	0.5	2.1	5.1	88.0	3.0	0.233	949.66
	1.0	1.2	5.9	104.1	3.6	0.234	
	2.0	1.9	8.6	83.5	8.0	0.237	
	3.0	1.6	6.5	97.0	12.8	0.236	

APPENDIX C

1979 CLADOPHORA WATER NUTRIENT DATA (continued)
CLADOPHORA SITE - 1

DATE	DEPTH (m)	SRP (ppb)	OP (ppb)	TP (ppb)	NH_3 (ppb)	NO_2-NO_3 (ppm)	TKN (ppb)
320	0.5	3.6	4.0	104.4	19.8	0.145	
	1.0	5.7	5.1	80.2	10.4	0.157	610.66
	2.0	3.8	4.9	61.3	22.3	0.158	
	3.0	5.7	3.5	97.5	9.2	0.161	

[a]Sample preserved with $HgCL_2$.

[b]Levels below detection limit, with no response.

[c]Levels below detection limits, but above baseline. Detection limits for: SRP--0.5 ppb; NH_3--1.0 ppb; NO_2-NO_3--0.005 ppm.

APPENDIX D

1979 CLADOPHORA PHYSICAL DATA
CLADOPHORA SITE - 1

DATE	DEPTH (m)	TEMPERATURE (°C) surface	TEMPERATURE (°C) bottom	LIGHT (footcandles) surface	LIGHT (footcandles) bottom	LIGHT (footcandles) % available	SECCHI (m)	WEATHER waves (ft.)	WEATHER clouds (%)
107	0.5	5.3	5.3	-	-	-	-	1	15
	1.0	5.3	5.3	-	-	-	-		
	2.4	5.3	5.3	1600	<16	<1.0	0.4		
	3.0	5.3	5.3	1600	<16	<1.0	0.4		
117	0.5	12.5	-12.5	-	-	-	-	<1	10
	1.0	12.5	-12.5	-	-	-	-		
	2.0	12.5	-12.0	4100	<41	<1.0	-		
	3.0	12.5	-12.0	-	-	-	-		
137	0.5	16.4	16.4	-	-	-	-	1+	40
	1.0	16.1	16.2	5300	970	18.3	1.0		
	2.0	16.1	15.9	6300	600	9.5	1.0		
	3.0	16.1	-15.8	5500	150	2.7	-1.0		
151	0.5	-15.0	-15.0	-	-	-	-	2	98
	1.0	-15.0	-15.0	2900	69	2.4	0.4		
	2.0	-15.0	-15.0	3200	25	0.8	0.55		
	3.0	-15.0	14.6	3700	10	0.3	0.55		
164	0.5	20.8	20.8	7500	2000	26.7	-	1	15
	1.0	20.5	20.5	7500	1300	17.3	B.O.		
	2.0	20.4	19.2	7000	650	9.3	1.2		
	3.0	20.0	19.0	7500	200	2.7	1.2		
179	0.5	22.5	22.5	7000	2500	35.7	-	<1	20
	1.0	22.3	22.3	7000	1500	21.4	B.O.		
	2.0	22.1	22.1	7000	750	10.7	1.3		
	3.0	21.6	21.6	7000	200	2.9	1.2		

APPENDIX D

1979 CLADOPHORA PHYSICAL DATA (continued)
CLADOPHORA SITE - 1

DATE	DEPTH (m)	TEMPERATURE (°C) surface	TEMPERATURE (°C) bottom	LIGHT (footcandles) surface	LIGHT (footcandles) bottom	LIGHT (footcandles) % available	SECCHI (m)	WEATHER waves (ft.)	WEATHER clouds (%)
193	0.5	25.5	25.5	6700	2300	34.3	-	calm	Hazy
	1.0	25.2	24.8	7000	1900	27.1	B.O.		
	2.0	24.9	24.7	6500	800	12.3	1.35		
	3.0	24.6	22.7	6500	310	4.8	1.3		
211	0.5	25.7	25.7	5500	17	0.31	.3	1-2	Hazy
	1.0	25.7	25.7	6700	17	0.25	.25		
	2.0	25.7	~25.0	9500	15	0.16	.45		
	3.0	25.7	~25.0	9500	0.4	0.004	.45		
225	0.5	22.6	22.6	6400	400	6.3	-	1	85
	1.0	~22.6	~22.6	7100	120	1.7	.38		Hazy
	2.0	~22.6	~22.5	3500	2.5	0.07	.38		
	3.0	~22.6	~22.5	4900	0.05	0.001	.4		
242	0.5	24.0	24.0	6800	1500	22.1	-	<1	0
	1.0	23.0	22.5	6800	320	4.7	.5		
	2.0	23.5	22.5	7000	55	0.8	.65		
	3.0	23.0	22.5	7000	42	0.6	.65		
256	0.5	22.0	22.0	-	-	-	.3	2-3	Hazy
	1.0	22.0	22.0	-	-	-	.3		
	2.0	22.0	22.0	-	-	-	-		
	3.0	22.0	22.0	-	-	-	-		
263	2.0	-	-	5600	2	0.036	.30	1	10
	3.0	-	-	5600	0.25	0.005	.35		

APPENDIX D

1979 CLADOPHORA PHYSICAL DATA (continued)
CLADOPHORA SITE - 1

DATE	DEPTH (m)	TEMPERATURE (°C) surface	TEMPERATURE (°C) bottom	LIGHT (footcandles) surface	LIGHT (footcandles) bottom	LIGHT (footcandles) % available	SECCHI (m)	WEATHER waves (ft.)	WEATHER clouds (%)
271	0.5	19.0	19.0	1600	230	14.4	-	calm	100
	1.0	19.0	19.0	1900	200	10.5	.8		
	2.0	19.0	19.0	2500	85	3.4	.9		
	3.0	19.0	19.0	4500	55	1.2	.95		
278	0.5	18.5	18.5	7000	2000	28.6	-	<1	40
	1.0	18.2	18.2	5000	550	11.0	-		
	2.0	18.2	18.2	6000	200	3.3	-		
	3.0	18.0	18.0	5000	100	2.0	-		
289	0.5	12.0	11.8	2300	370	16.1	-	1	100
	1.0	11.5	11.5	1900	240	12.6	.7		
	2.0	11.5	11.5	2600	110	4.2	.8		
	3.0	11.5	11.5	1900	3.5	0.18	.7		
299	0.5	9.8	~9.8	-	-	-	-	3	80
	1.0	9.8	~9.8	-	-	-	-		
	2.0	9.8	~9.8	3200	1.2	0.0375	0.4		
	3.0	9.8	~9.8	3700	0.12	0.0032	0.4		
310	0.5	9.5	9.5	-	-	-	0.55	2	95
	1.0	9.5	9.5	-	-	-	0.60		
	2.0	9.5	9.5	460	0.15	0.033	0.60		
	3.0	9.5	9.5	1000	0.07	0.007	0.65		
320	0.5	5.3	5.3	2600	350	13.5	0.48	1	60
	1.0	5.3	5.3	3400	150	4.4	0.53		
	2.0	5.4	5.4	3700	35	1.0	0.70		
	3.0	5.4	5.4	3400	7.8	0.2	0.77		

APPENDIX E

1979 CLADOPHORA BIOLOGICAL DATA
CLADOPHORA SITE - 2

DATE	DEPTH (m)	COVERAGE (%)	LENGTH (cm) Mean	LENGTH (cm) Max.	BIOMASS IN GRAMS/m^2 Wet	Dry (64^oC)	Dry (104^oC)	Ash	Ash-free	BIOVOLUME (ml/m^2)
138	0.5	10	0.4	0.6	T[1]	T	T	-	T	T
	1.0	60	10.0	17.0	256.2	54.5	52.7	35.9	16.8	240
	2.0	85	14.0	25.0	95.6	16.7	15.9	8.3	7.6	100
	3.0	15	6.0	10.5	7.0	1.7	1.6	1.0	0.6	6
152	0.5	75 P[2]	< 0.5	4.0	13.4	3.5	3.4	2.2	1.2	12
	1.0	50 P	-	-	131.3	38.6	37.9	30.0	7.9	120
	2.0	50	10.0	18.0	77.5	13.6	13.0	5.7	7.3	76
	3.0	10	2.5	7.0	1.6	0.4	used for chem. analysis		T	10
165	0.5	25 P	1-12	25.0	48.7	10.0	9.4	4.5	5.0	52
	1.0	50 P	1-15	30.0	251.9	47.2	44.8	19.6	25.2	370
	2.0	100	45.0	90.0	270.9	53.2	50.0	18.7	31.2	326
	3.0	10	< 1.0	2.0	0.5	0.2	used for chem. analysis		T	T
180	0.5	33 P	4.0	7.0	19.2	9.5	9.2	6.6	2.6	22
	1.0	75	30.0	45.0	392.8	74.0	69.1	24.7	44.4	540
	2.0	100	30.0	60.0	494.7	110.2	101.9	43.2	58.7	728
	3.0	1	2.0	4.0	T	T	T	-	T	T
194	0.5	5	1.5	4.0	T	T	T	-	T	T
	1.0	33	20.0	40.0	223.9	74.8	71.5	38.0	33.4	252
	2.0	33	15.0	20.0	222.6	61.5	58.2	25.6	32.6	240
	3.0	1	1.0	2.0	T	T	T	-	T	T
205	0.5	3	1.0	1.5	supplementary sampling period--biomass not sampled					
	1.0	10	2.0	4.0	supplementary sampling period--biomass not sampled					
	2.0	33	4.0	8.0	supplementary sampling period--biomass not sampled					
	3.0	0	0.0	0.0	0.0	0.0	0.0	-	0.0	

APPENDIX E

1979 CLADOPHORA BIOLOGICAL DATA (continued)
CLADOPHORA SITE - 2

DATE	DEPTH (m)	COVERAGE (%)	LENGTH (cm) Mean	LENGTH (cm) Max.	BIOMASS IN GRAMS/M^2 Wet	Dry (64°C)	Dry (104°C)	Ash	Ash-free	BIOVOLUME (ml/m^2)
212	0.5	1^3	< 0.5	0.5	T	T	T	-	T	T
	1.0	5^3	0.5	1.0	T	T	T	-	T	T
	2.0	10^3	1.0	2.0	33.3	17.8	17.3	13.4	3.9	112
	3.0	0	0.0	0.0	0.0	0.0	0.0	-	0.0	0
226	0.5	1^3	< 0.5	0.5	T	T	T	-	T	T
	1.0	1^3	0.5	1.0	T	T	T	-	T	T
	2.0	1^3	1.0	2.0	T	T	T	-	T	T
	3.0	0	0.0	0.0	0.0	0.0	0.0	-	0.0	0
243	0.5	1^3	< 0.5	0.5	T	less than 226		-	T	T
	1.0	1^3	0.5	1.0	T	less than 226		-	T	T
	2.0	1^3	1.0	2.0	T	less than 226		-	T	T
	3.0	0	0.0	0.0	0.0	0.0	0.0	-	0.0	0
258	0.5	2	1.0	3.0	T	trace of new growth		-	T	T
	1.0	2	1.0	3.0	T	trace of new growth		-	T	T
	2.0	1	1.0	2.0	T	less than 243		-	T	T
	3.0	0	0.0	0.0	0.0	0.0	0.0	-	0.0	0
271	0.5	60	2.5	5.0	supplementary sampling period--biomass not sampled					
	1.0	60	1.5	3.0	supplementary sampling period--biomass not sampled					
	2.0	1	1.0	2.0	T	same as 258		-	T	-
	3.0	0	0.0	0.0	0.0	0.0	0.0	-	0.0	0
277	0.5	60	1.5	3.0	-	10.5	9.8	7.8	2.0	20
	1.0	50	1.5	3.0	-	8.7	8.4	6.7	1.7	18
	2.0	1	1.0	2.0	T	same as 258		-	T	T
	3.0	0	0.0	0.0	0.0	0.0	0.0	-	0.0	0

APPENDIX E

1979 CLADOPHORA BIOLOGICAL DATA (continued)
CLADOPHORA SITE - 2

DATE	DEPTH (m)	COVERAGE (%)	LENGTH (cm) Mean	LENGTH (cm) Max.	BIOMASS IN GRAMS/m^2 Wet	Dry (64°C)	Dry (104°C)	Ash	Ash-free	BIOVOLUME (ml/m^2)
288	0.5	50	1.5	2.0	-	7.8	7.6	5.4	2.2	14
	1.0	30	1.5	3.0	-	4.5	4.3	3.3	1.0	8
	2.0	1	1.0	2.0	T	same as 258		-	T	T
	3.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0
309	0.5	50	1.0	2.5	14.1	7.4	7.3	5.6	1.7	-
	1.0	30	1.5	2.5	7.0	3.7	3.6	2.8	0.8	-
	2.0	1	1.5	2.5	T	T	T	-	T	T
	3.0	T	< 1.0	2.0	T	T	T	-	T	T
321	0.5	50	2.0	4.0	slight increase from 309--too cold for collection					
	1.0	30	1.5	3.0	slight increase from 309--too cold for collection					
	2.0	5	1.5	3.0	slight increase from 309--too cold for collection					
	3.0	T	1.0	2.0	T	T	T	-	T	T

[1]T stands for "trace."

[2]P stands for "patchy distribution."

[3]Holdfasts covered with mud and epiphytes.

APPENDIX F

1979 CLADOPHORA TISSUE NUTRIENT DATA
CLADOPHORA SITE - 2

DATE	DEPTH (m)	E x P (%)	TTP (%)	TTN (%)
117	0.5	-	0.372	2.82
	1.0	-	0.361	2.72
138	1.0	0.002	0.081	0.90
	2.0	0.027	0.086	1.64
	3.0	0.004	0.142	1.59
152	0.5	0.201	0.433	1.75
	1.0	1.000	0.715	2.96
	2.0	0.559	0.571	2.28
	3.0	0.391	0.420	2.34
165	0.5	0.156	0.214	3.36
	1.0	0.252	0.268	3.81
	2.0	0.240	0.285	3.31
	3.0	-	0.374	3.22
180	S	-	0.125	3.87
	0.5	0.041	0.106	1.92
	1.0	0.107	0.153	3.38
	2.0	0.231	0.296	3.96
	3.0	-	0.228	3.46
194	S	-	0.232	3.59
	1.0	0.099	0.166	2.74
	2.0	0.112	0.212	3.04
212	S	-	0.093	2.45
	2.0	-	0.145	1.22
226	S	-	0.126	3.00
243	S	-	0.099	3.17
258	S	-	0.117	3.63
277	S	-	0.102	2.63
	0.5	0.042	0.158	1.86
	1.0	0.190	0.216	2.52
288	S	-	0.232	3.47
	0.5	0.430	0.266	3.07
	1.0	0.110	0.262	2.67
309	S	-	0.094	3.79
	1.0	0.095	-	-
321	S	-	-	5.10
	0.5	0.346	0.220	3.64
	1.0	0.200	-	-

APPENDIX G

1979 CLADOPHORA WATER NUTRIENT DATA
CLADOPHORA SITE - 2

DATE	DEPTH (m)	SRP (ppb)	OP (ppb)	TP (ppb)	NH_3 (ppb)	NO_2-NO_3 (ppm)	TKN (ppb)
138	1.0	3.3	2.8	15.0	9.0	1.112	378.20
	3.0	2.4	1.3	11.8	10.4	1.128	
152	1.0	11.5	8.4	34.2	-	1.169[a]	552.54
	3.0	12.4	9.9	42.5	26.6[a]	0.915[a]	
156	1.0	15.2	12.0	23.3	-	-	
	3.0	15.0	16.1	31.6	-	-	617.11
165	1.0	6.5	6.5	30.5	6.0	0.716	
	2.0	7.6	8.7	38.0	1.0	0.750	533.17
	3.0	9.5	10.7	32.3	11.2	0.771	
180	1.0	3.0	5.7	19.0	11.2	0.475	552.54
	2.0	4.8	9.1	19.0	23.6	0.527	
	3.0	6.9	6.2	27.2	25.3	0.550	
194	0.5	8.1	17.0	26.6	72.0	0.310	
	1.0	7.2	8.4	25.4	70.7	0.311	539.63
	2.0	9.9	8.3	39.0	71.2	0.303	
	3.0	13.0	10.6	16.5	65.6	0.294	
212	0.5	2.8	-	-	11.0	0.238	
	1.0	3.0	3.8	27.6	11.0	0.252	523.48
	2.0	2.3	4.5	26.5	12.8	0.267	
	3.0	6.8	17.0[b]	40.8	24.2	0.297	
226	1.0	2.7	6.8	27.7	4.5	0.212	1101.41
	2.0	3.7	4.8	27.4	4.0	0.213	
	3.0	2.3	5.2	29.6	3.0	0.213	

APPENDIX G

1979 CLADOPHORA WATER NUTRIENT DATA (continued)
CLADOPHORA SITE - 2

DATE	DEPTH (m)	SRP (ppb)	OP (ppb)	TP (ppb)	NH_3 (ppb)	NO_2-NO_3 (ppm)	TKN (ppb)
243	1.0	0 > 0.5[c]	3.5	52.8	3.5	0.148	620.34
	2.0	3.0	10.1	49.8	12.0	0.156	
	3.0	0 > 0.5[c]	6.6	35.6	3.1	0.152	
258	1.0	2.8	8.2	38.7	23.0	0.037	646.17
	2.0	3.3	10.8	43.5	17.7	0.036	
	3.0	2.5	7.2	37.0	16.2	0.038	
271	1.0	0 > 0.5[c]	5.1	26.4	20.0	0 > 0.005[c]	
	2.0	0 > 0.5[c]	4.3	29.8	2.5	0 > 0.005[c]	465.37
	3.0	8.1	-	-	1.7	0 > 0.005[c]	
277	1.0	-	10.6	27.5	-	-	504.11
	2.0	-	17.0	29.2	-	-	
	3.0	-	13.6	25.2	-	-	
288	1.0	15.0	16.0	36.1	67.5	0.097	636.49
	2.0	13.7	16.9	40.4	63.2	0.100	
	3.0	13.9	14.9	38.9	64.0	0.100	
309	1.0	2.0	2.5	25.4	9.6	0.110	491.16
	2.0	3.9	3.0	30.5	4.0	0.123	
	3.0	3.2	5.1	39.6	5.0	0.126	
321	0.5	3.6	1.2	26.9	0 > 1.0[c]	0.133	
	1.0	3.3	1.3	26.1	0 > 1.0[c]	0.135	312.25
	2.0	2.8	1.6	27.4	0 > 1.0[c]	0.144	
	3.0	3.4	2.2	26.5	2.0	0.147	

APPENDIX G

1979 CLADOPHORA WATER NUTRIENT DATA (continued)
CLADOPHORA SITE - 2

DATE	DEPTH (m)	SRP (ppb)	OP (ppb)	TP (ppb)	NH_3 (ppb)	NO_2-NO_3 (ppm)	TKN (ppb)

[a]Sample preserved with $HgCl_2$.

[b]Sample bottle broken, possible contamination.

[c]Levels below detection limits, but above baseline. Detection limits for: SRP--0.5 ppb; NH_3--1.0 ppb; NO_2-NO_3--0.005 ppm.

APPENDIX H

1979 CLADOPHORA PHYSICAL DATA
CLADOPHORA SITE - 2

DATE	DEPTH (m)	TEMPERATURE (°C) surface	TEMPERATURE (°C) bottom	LIGHT (footcandles) surface	LIGHT (footcandles) bottom	LIGHT (footcandles) % available	SECCHI (m)	WEATHER waves (ft.)	WEATHER clouds (%)
108	2.1	4.6	4.6	1700	15	0.9	0.5	1	-
119	2.0	8.6	8.5	2900	<29	<1.0	1.0	2	40
138	0.5	16.0	16.6	-	-	-	-	<1	Hazy
	1.0	15.7	16.4	6000	700	11.7	B.O.[1]		
	2.0	15.7	16.2	-	-	-	1.5		
	3.0	15.7	15.2	6000	400	6.7	1.5		
152	0.5	15.0	14.8	-	-	-	-	0	Hazy
	1.0	15.0	14.6	2700	170	6.3	0.55		
	2.0	15.2	14.5	3600	22	0.6	0.7		
	3.0	14.8	14.3	4200	5.1	0.1	0.7		
156	1.0	15.7	15.4	-	-	-	0.9	<1	75
	3.0	15.2	14.8	-	-	-	0.9		
165	0.5	19.3	19.1	-	-	-	-	1-2	50
	1.0	19.3	19.1	7000	960	13.7	1.0		
	2.0	19.0	18.7	7200	380	5.3	1.0		
	3.0	19.0	18.7	7500	100	1.3	1.0		
180	0.5	22.3	22.3	-	-	-	-	1-2	90
	1.0	22.1	22.0	5200	970	18.7	B.O.		
	2.0	21.7	21.7	4400	320	7.3	1.5		
	3.0	21.6	21.3	4200	25	0.6	1.5		
194	0.5	23.5	23.5	450	140	31.1	-	1	100
	1.0	23.5	23.5	500	100	18.2	B.O.		
	2.0	23.6	23.6	700	68	9.7	1.45		
	3.0	23.6	23.4	770	41	5.3	1.2		

APPENDIX H

1979 CLADOPHORA PHYSICAL DATA (continued)
CLADOPHORA SITE - 2

DATE	DEPTH (m)	TEMPERATURE (°C) surface	TEMPERATURE (°C) bottom	LIGHT (footcandles) surface	LIGHT (footcandles) bottom	LIGHT (footcandles) % available	SECCHI (m)	WEATHER waves (ft.)	WEATHER clouds (%)
212	0.5	24.0	24.0	-	-	-	-	<1	Hazy
	1.0	23.7	23.7	5000	950	19.0	B.O.		
	2.0	23.7	23.4	5000	500	10.0	1.6		
	3.0	23.7	23.0	5000	42	0.8	1.7		
226	0.5	22.5	22.5					calm	75
	1.0	22.5	22.5	6500	650	10.0	B.O.		
	2.0	22.5	22.5	6000	510	8.5	1.25		
	3.0	22.5	22.5	6500	140	2.2	1.3		
243	0.5	23.0	23.0	6500	1400	21.5	-	1-2	0
	1.0	22.5	22.5	6500	600	9.2	.75		
	2.0	22.5	22.5	6500	350	5.4	1.25		
	3.0	22.5	22.0	6500	300	4.6	~1.3		
258	0.5	21.5	21.5	6200	1400	22.6		<1	10
	1.0	21.7	21.2	6000	870	14.5	1.0		
	2.0	21.5	21.2	6000	250	4.2	1.2		
	3.0	21.5	21.2	6600	75	1.1	1.25		
271	0.5	20.0	20.0	1200	370	30.8	-	calm	99
	1.0	20.0	19.5	1200	290	24.2	B.O.		
	2.0	20.0	19.5	1600	140	8.8	1.35		
	3.0	20.0	19.5	920	19	2.1	1.25		
277	0.5	~18.7	~18.7	1250	350	28.0	-	calm	100
	1.0	18.7	18.5	1350	325	24.1	-		rain
	2.0	18.5	18.5	1000	60	6.0	-		
	3.0	18.5	18.5	1000	40	4.0	-		

APPENDIX H

1979 CLADOPHORA PHYSICAL DATA (continued)
CLADOPHORA SITE - 2

DATE	DEPTH (m)	TEMPERATURE (°C) surface	TEMPERATURE (°C) bottom	LIGHT (footcandles) surface	LIGHT (footcandles) bottom	LIGHT (footcandles) % available	SECCHI (m)	WEATHER waves (ft.)	WEATHER clouds (%)
288	0.5	13.0	13.0	6800	2000	29.4	-	1	10
	1.0	12.5	12.0	7400	1200	16.2	B.O.		
	2.0	12.0	11.5	6200	250	4.0	1.1		
	3.0	11.5	12.0	6200	130	2.1	1.0		
309	0.5	9.5	9.5	7700	970	12.6	-	<1	75
	1.0	9.0	9.0	7500	650	8.7	B.O.		
	2.0	9.0	9.0	5600	350	6.3	1.05		
	3.0	9.0	9.0	5200	120	2.3	1.10		
321	0.5	7.3	7.3	4900	1500	30.6	-	1	10
	1.0	7.3	7.3	4900	760	15.5	-		
	2.0	6.8	6.8	4900	360	7.5	1.15		
	3.0	6.8	6.8	-	-		1.15		

[1]B.O. stands for "bottom out."