CLEAN LAKES STUDY

LAKES SALLIE AND DETROIT

PELICAN RIVER WATERSHED

1988 AND 1989 DATA COLLECTION SUMMARY

February, 1990

By

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CONSULTING ENGINEERS

DETROIT LAKES, MINNESOTA

CLEAN LAKES STUDY
Lakes Sallie and Detroit
Pelican River Watershed

1988 and 1989
DATA COLLECTION SUMMARY

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4	Detroit Lake 1988	
5	Detroit Lake 1989	
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GENERAL DATA

DESCRIPTION	PAGE
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B. 1988 Daily Precipitation Summary	
C. 1989 Daily Evaporation Summary	
D. 1989 Daily Precipitation Summary	

1988 EVAPORATION

TOTAL ANNUAL

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1988 TOTAL
1					0.472	0.489	0.449	0.657	0.280				
2					0.663	0.348	0.202	0.306	0.308				
3					0.466	0.406	0.416	0.226	0.423				
4					0.325	0.402	0.500	0.286	0.349				
5					0.360	0.477	0.404	0.228	0.352				
6					0.293	0.556	0.740	0.522	0.252				
7					0.530	0.543	0.530	0.615	0.366				
8					0.219	0.509	0.211	0.380	0.350				
9					0.309	0.466	0.392	0.354	0.492				
10					0.396	0.490	0.261	0.470	0.370				
11					0.301	0.626	0.337	0.579	0.355				
12					0.405	0.696	0.338	0.461	0.158				
13					0.382	0.253	0.375	0.622	0.124				
14					0.348	0.251	0.479	0.150	0.258				
15					0.435	0.076	0.482	0.273	0.239				
16					0.117	0.320	0.546	0.352	0.095				
17					0.266	0.334	0.358	0.427	0.003				
18					0.666	0.416	0.412	0.082	0.189				
19					0.504	0.334	0.438	0.290	M*				
20					0.084	0.570	0.316	0.248	0.113				
21					0.208	0.628	0.360	0.347	0.066				
22					0.032	0.308	0.360	0.254	0.010				
23					0.243	0.362	0.482	0.352	0.168				
24					0.473	0.266	0.505	0.406	0.230				
25					0.265	0.434	0.381	0.496	0.250				
26					0.468	0.389	0.474	0.460	0.110				
27					0.328	0.431	0.475	0.282	0.187				
28					0.258	0.570	0.647	0.352	0.167				
29					0.301	0.512	0.280	0.236	0.000				
30					0.517	0.462	0.523	0.234	0.042				
31					0.496		0.540	0.396					
TOTAL					11.130	12.924	13.213	11.343	6.306				54.916

1988 PRECIPITATION

TOTAL ANNUAL

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1988 TOTAL
1	0	0	0	0	.02	T	0	0	.90	.01	0	T	
2	0	0	T	0	0	0	.01	2.10	0	0	0	0	
3	T	0	0	.21	0	T	0	.13	.04	.05	0	0	
4	0	T	0	0	0	0	0	T	0	0	T	0	
5	0	0	0	T	0	0	0	.09	0	0	T	0	
6	0	T	0	0	0	0	0	0	0	0	0	0	
7	0	0	T	0	.10	0	1.10	.06	0	0	0	0	
8	0	.02	.15	0	.18	0	.40	.52	0	0	.09	0	
9	0	0	.17	0	.22	0	0	0	0	0	.08	T	
10	0	0	0	0	T	0	.19	0	0	0	0	0	
11	.90	T	.18	0	0	0	0	.52	0	0	0	0	
12	0	T	.52	0	.38	0	0	.14	T	0	.20	0	
13	.02	.01	T	0	.24	.02	.70	0	0	0	.10	T	
14	T	.01	0	0	0	.42	0	.48	0	0	0	.17	
15	0	0	0	0	T	T	0	0	0	0	.02	0	
16	T	T	0	0	.23	.05	0	0	.51	.02	.14	T	
17	0	0	0	0	0	0	0	0	.31	.05	T	.02	
18	0	0	T	0	0	0	0	T	0	.20	.01	0	
19	0	T	0	0	.07	0	0	0	2.00	.20	.42	0	
20	T	T	T	0	.05	0	.55	0	.28	0	T	0	
21	0	T	T	0	.54	.36	.02	0	T	.16	T	T	
22	.02	T	0	0	.56	.56	0	2.05	T	0	0	0	
23	.15	T	T	0	.02	.20	0	.14	0	.22	0	.13	
24	.04	0	.02	T	0	.20	.63	0	0	.01	0	T	
25	0	0	.16	0	0	0	0	0	0	0	0	T	
26	T	0	.15	0	0	0	0	0	0	0	0	.02	
27	T	.01	.03	0	.17	0	0	.04	0	0	.21	.60	
28	0	T	T	0	0	0	0	0	T	.11	T	.03	
29	0	0	T	0	T	0	.91	0	.33	0	0	T	
30	.11		0	0	0	0	0	0	0	0	T	T	
31	0		0		T		.35	0		.01		0	
TOTAL	1.24	.05	1.38	.21	2.78	1.81	4.86	6.27	4.37	1.04	1.27	.97	26.25

1989 PRECIPITATION

TOTAL ANNUAL

Date	Jan.	Feb.	March	April	May	Jan. - May TOTAL
1	T	T	0		.14	
2	T	.01	0	T	T	
3	.04	T	.10	.24		
4	0	0	.22	.04		
5	0	0	T		.33	
6	0	T	0	T	T	
7	.67	T	0			
8	.16	.02	.01	.22	.34	
9	.03	0	0	T	.22	
10	T	T	0			
11	.05	0	T	.05		
12	.02	0	T			
13	0	.05	.08			
14	0	T	.20			
15	T	T	.06			
16	.03	0	.04		.02	
17	0	T	T	.04		
18	T	0	0		.41	
19	0	0	0		T	
20	T	0	T		.14	
21	0	0	0	T		
22	0	0	0			
23	0	0	0		.16	
24	0	0	0		.58	
25	T	0	T	.02		
26	0	T	T	.05	.10	
27	0	0	T	.02		
28	0	.12	0	.09	.01	
29	0		T	.01	.29	
30	0		.55	.12		
31	0		T		T	
TOTAL	1.00	.20	1.26	.90	2.74	6.10

1989 EVAPORATION

MONTH	PAN EVAPORATION (inches/month)	ADJUSTED EVAPORATION (inches/month)
May	8.995	6.297
June	8.491	5.944
July	11.473	8.031
August	10.315	7.221
September	5.900	4.130

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LAKE SALLIE 1988

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H.	P_T - Isopleth	
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J.	Chlorophyll-a (Surface)	
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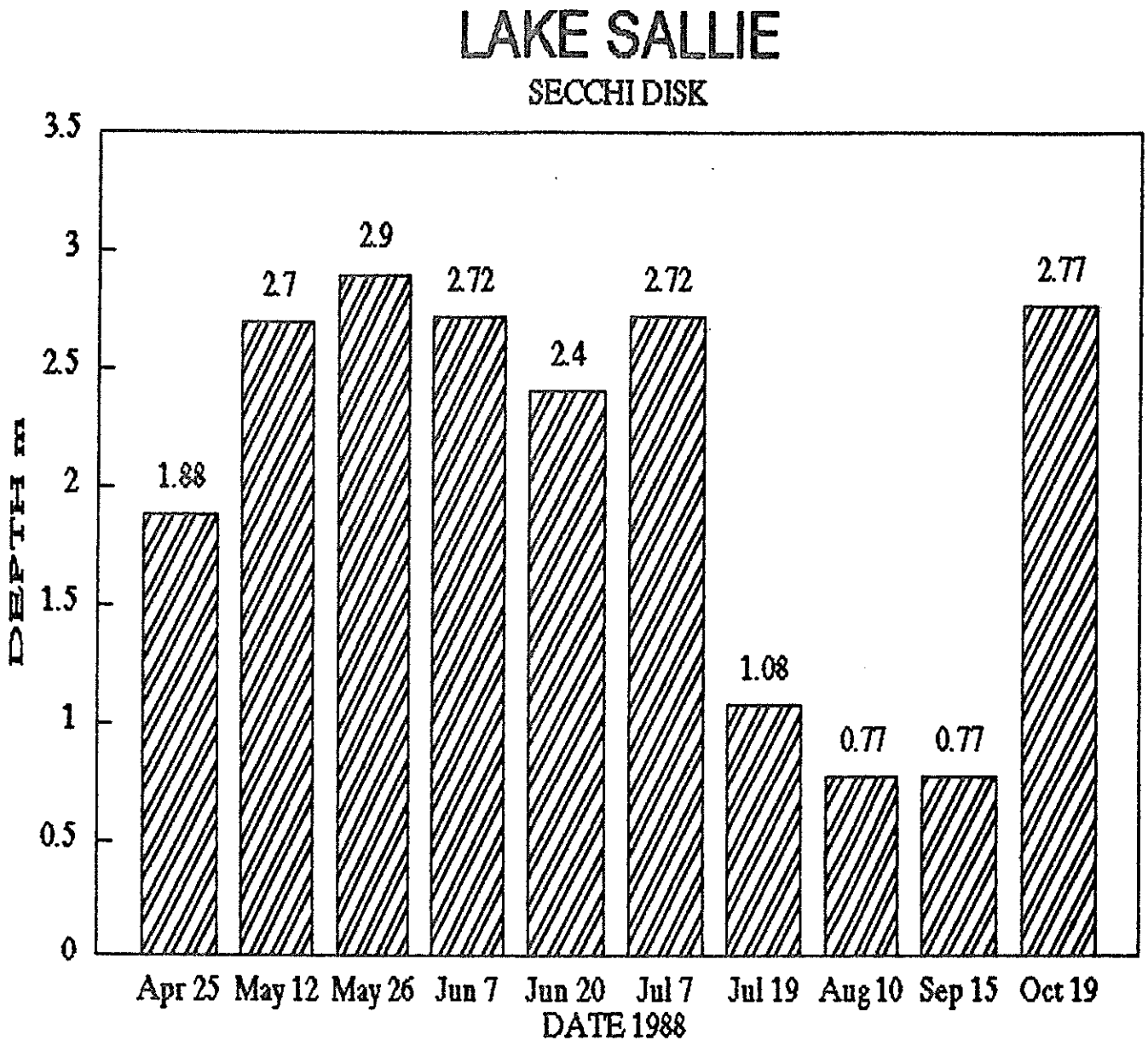
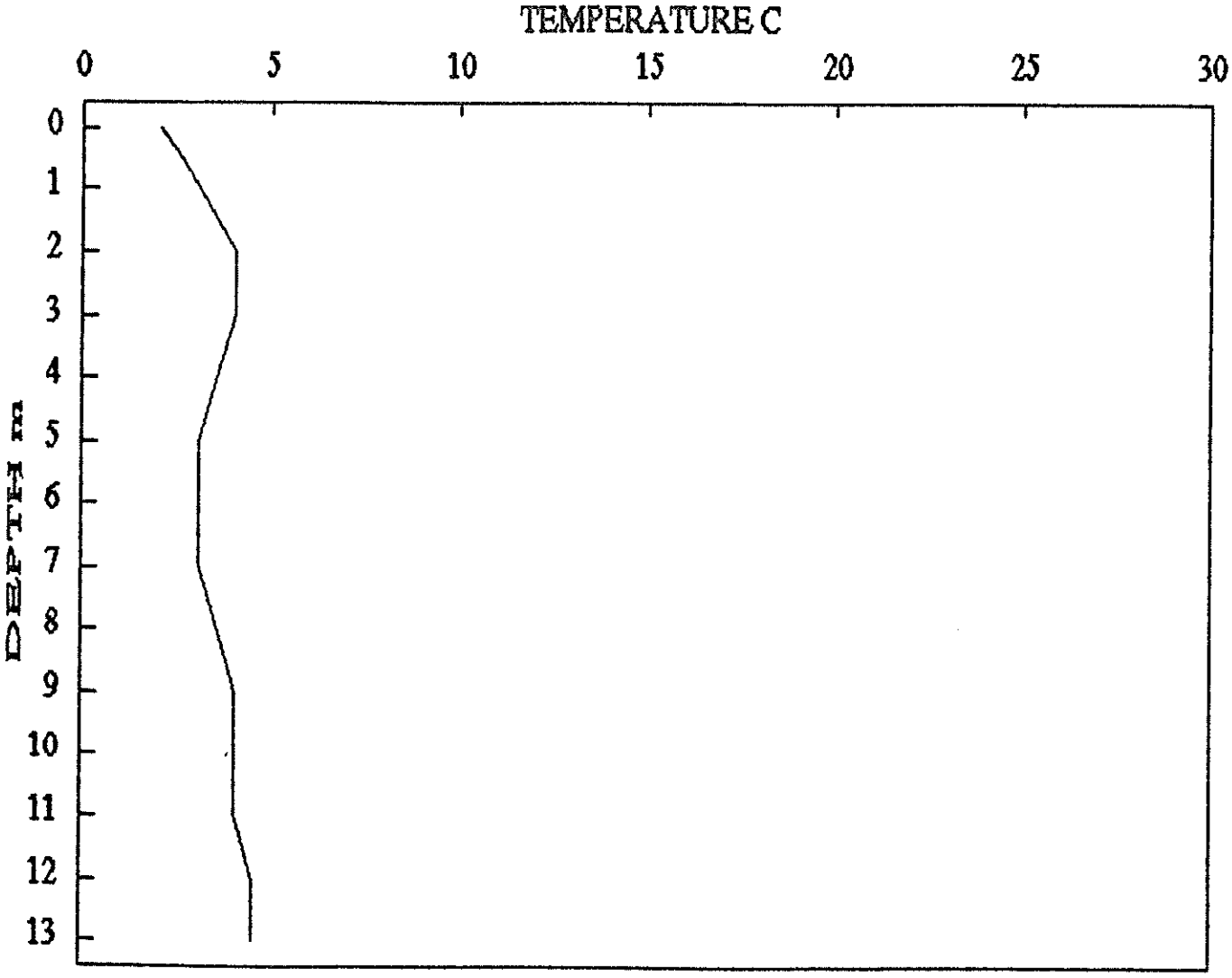
P.	Inflow and Outflow Sampling - P_T and TSS (Graphical)	


LAKE SALLIE
SECCHI DISK
DEPTH m
3.5
3
2.5
2
1.5
1
0.5
0
1.88
2.7
2.9
2.72
2.4
2.72
1.08
0.77
0.77
2.77
Apr 25
May 12
May 26
Jun 7
Jun 20
Jul 7
Jul 19
Aug 10
Sep 15
Oct 19
DATE 1988

LAKE SALLIE

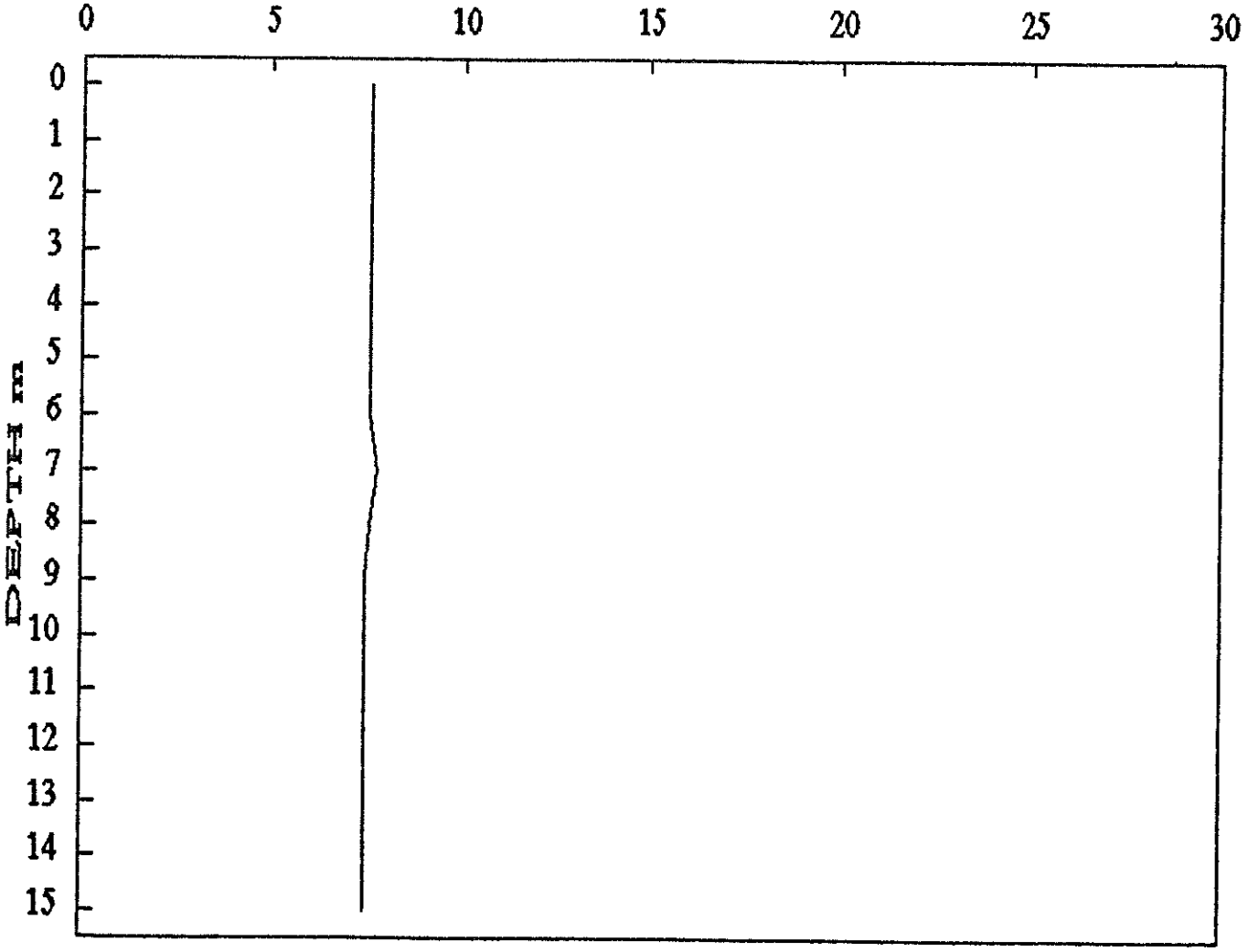
March 30,1988



LAKE SALLIE

April 25,1988

TEMPERATURE C



LAKE SALLIE

May 12,1988

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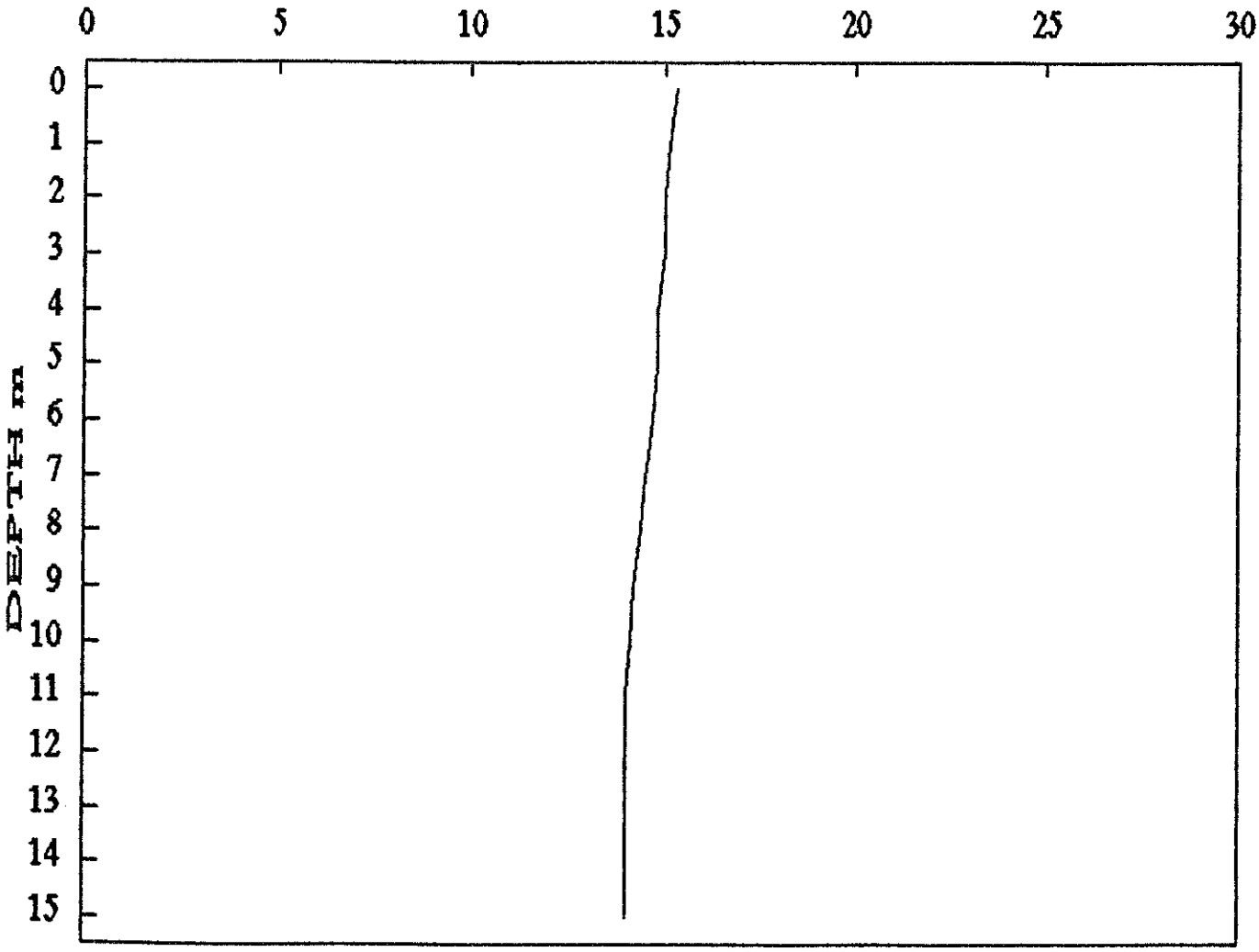
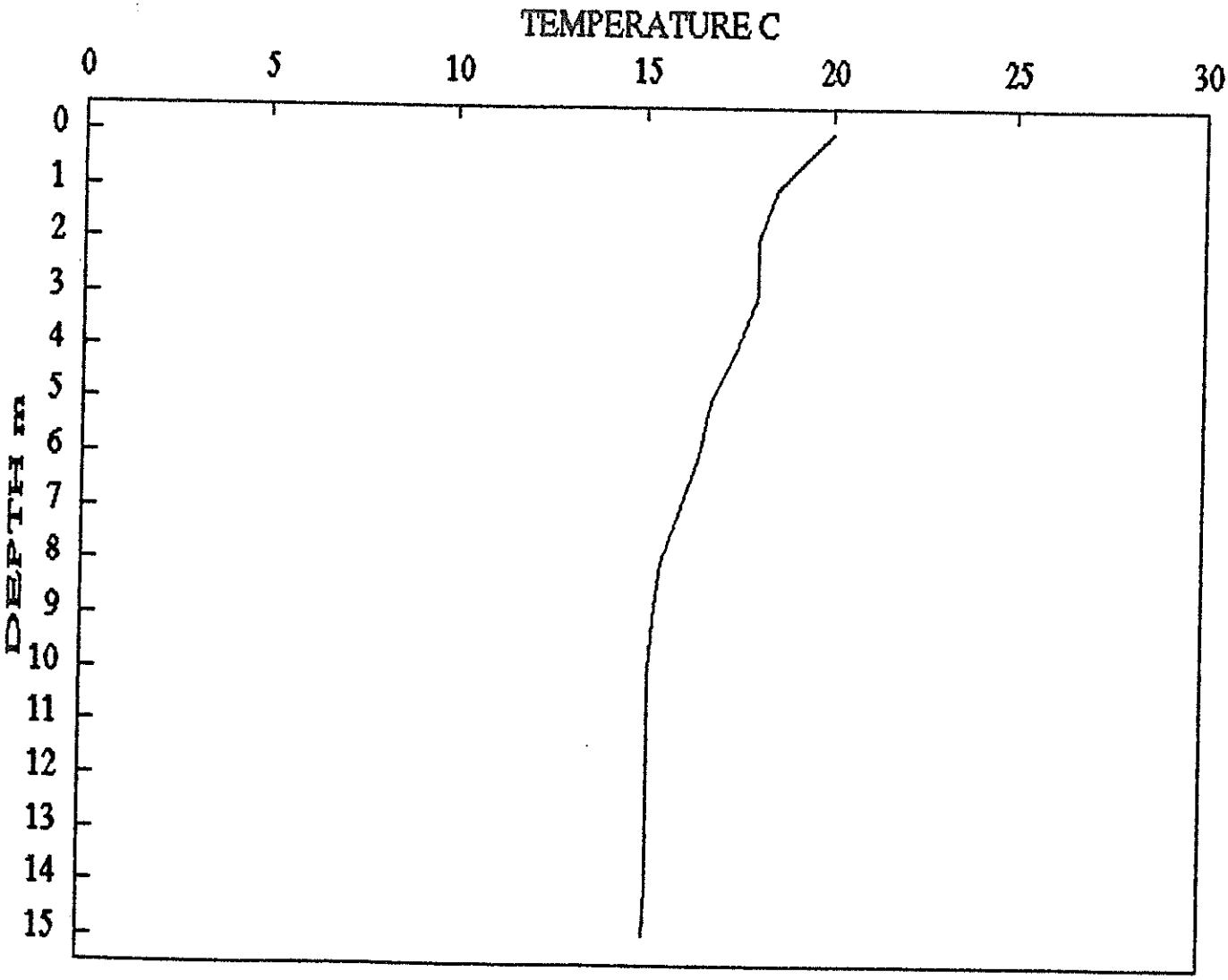


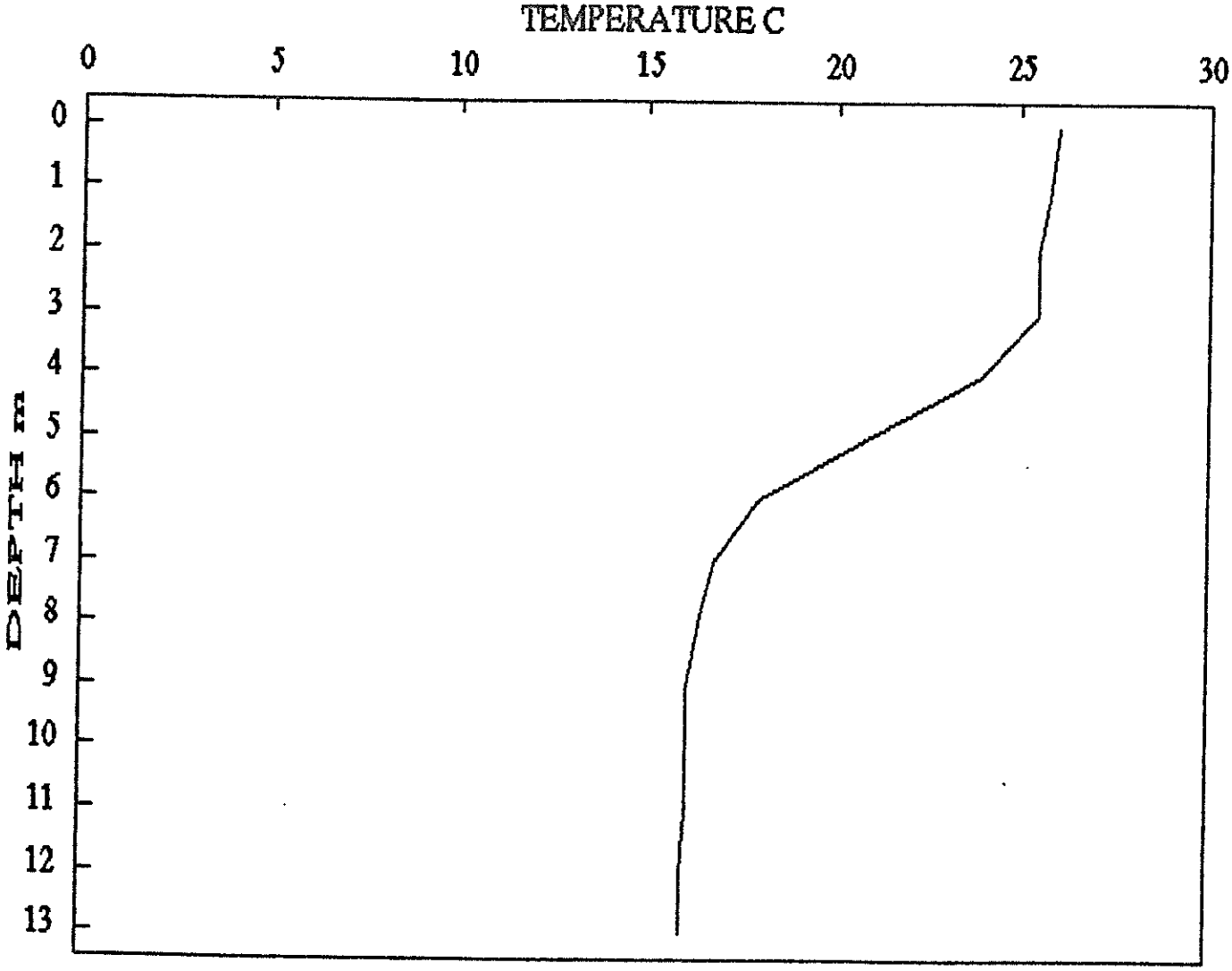
LAKE SALLIE

May 26,1988



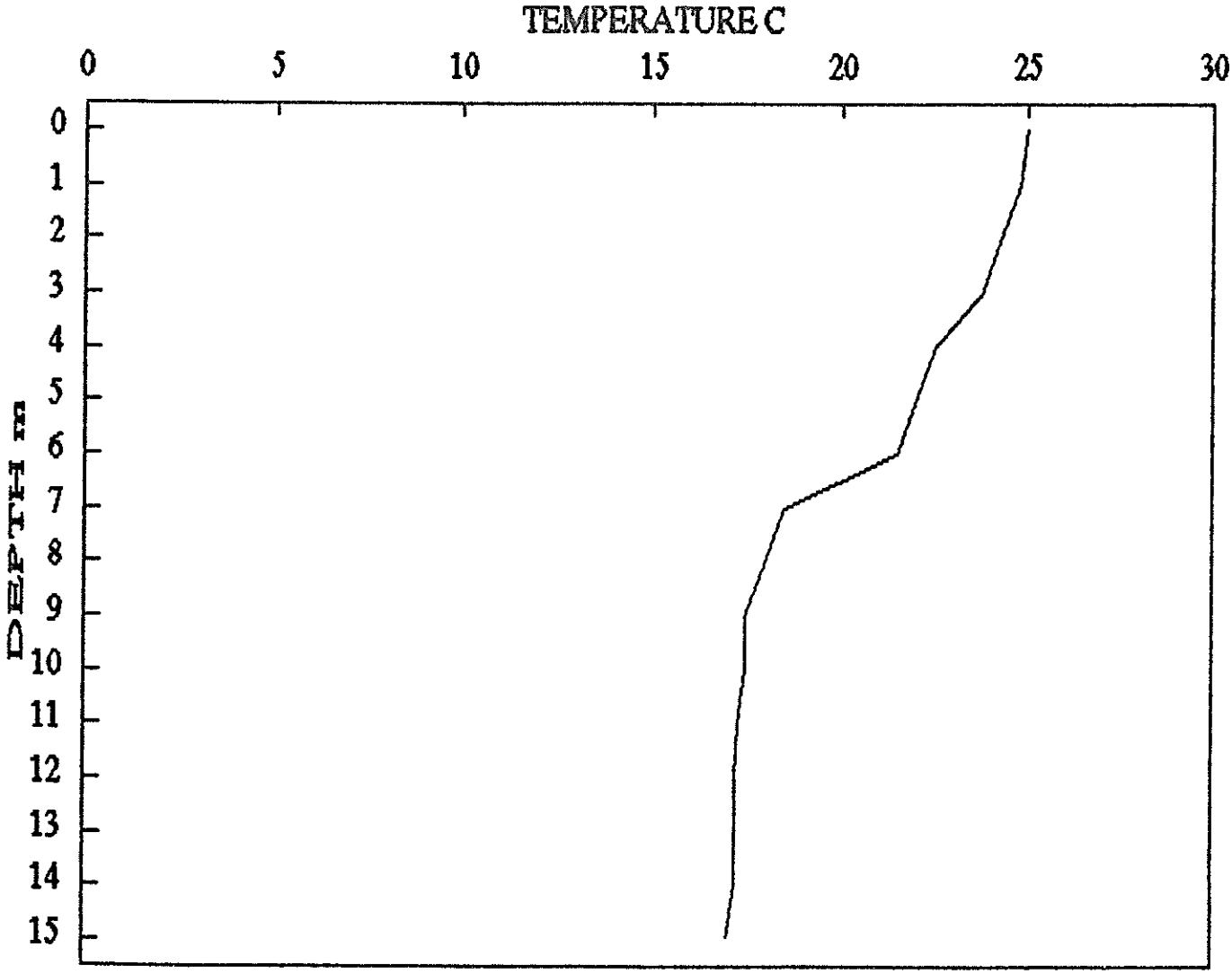
LAKE SALLIE

June 7,1988



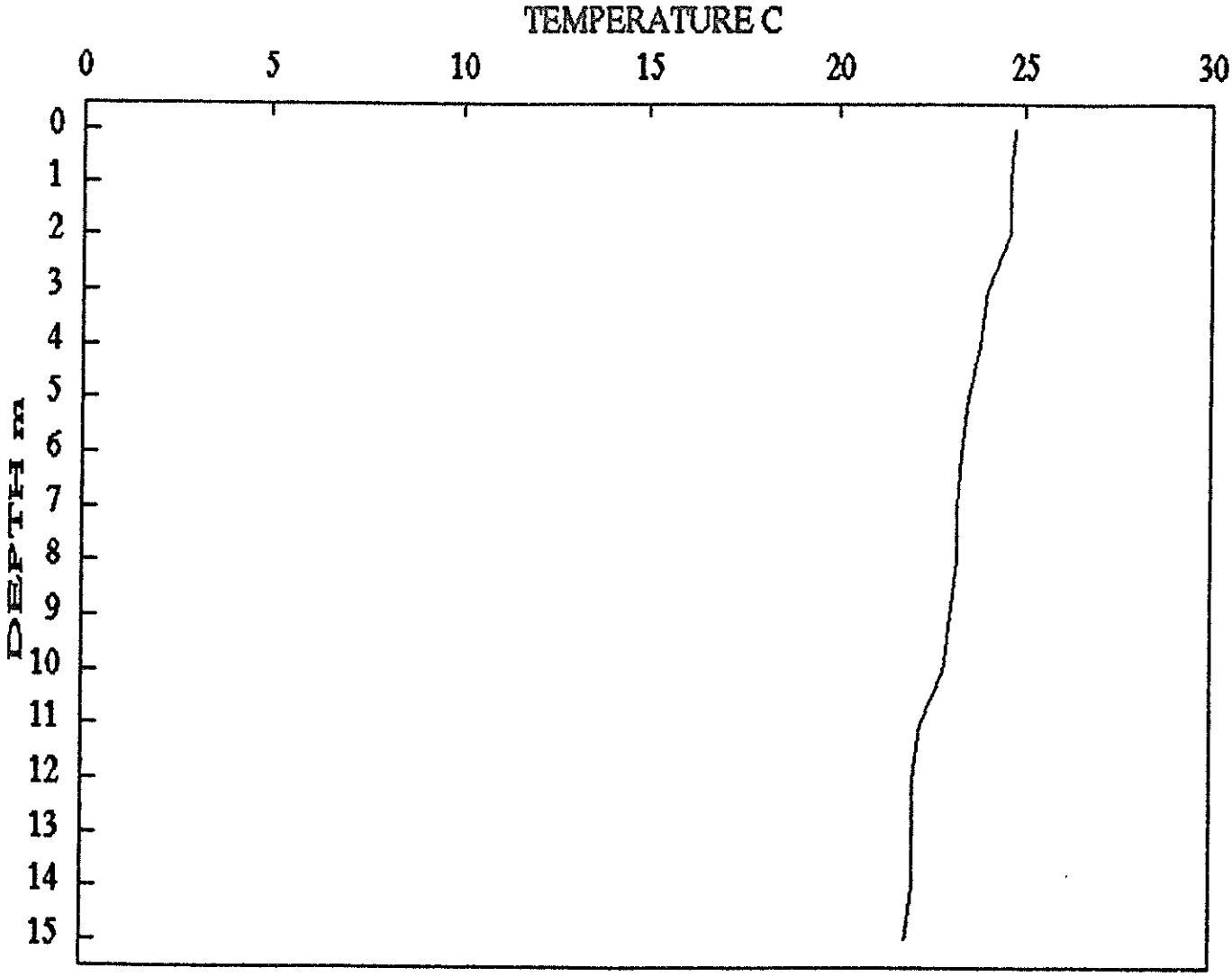
LAKE SALLIE

June 20,1988



LAKE SALLIE

July 7,1988



LAKE SALLIE

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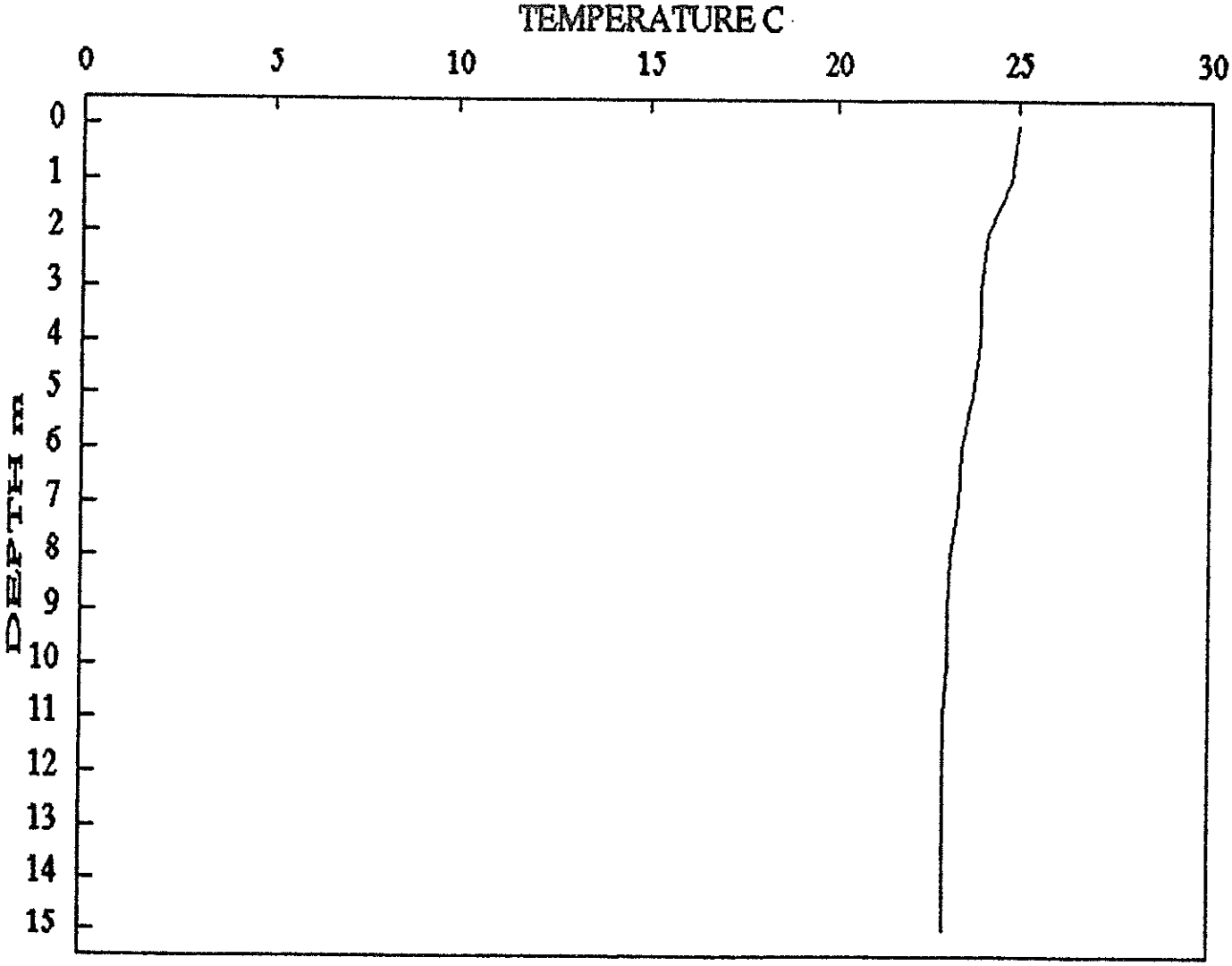
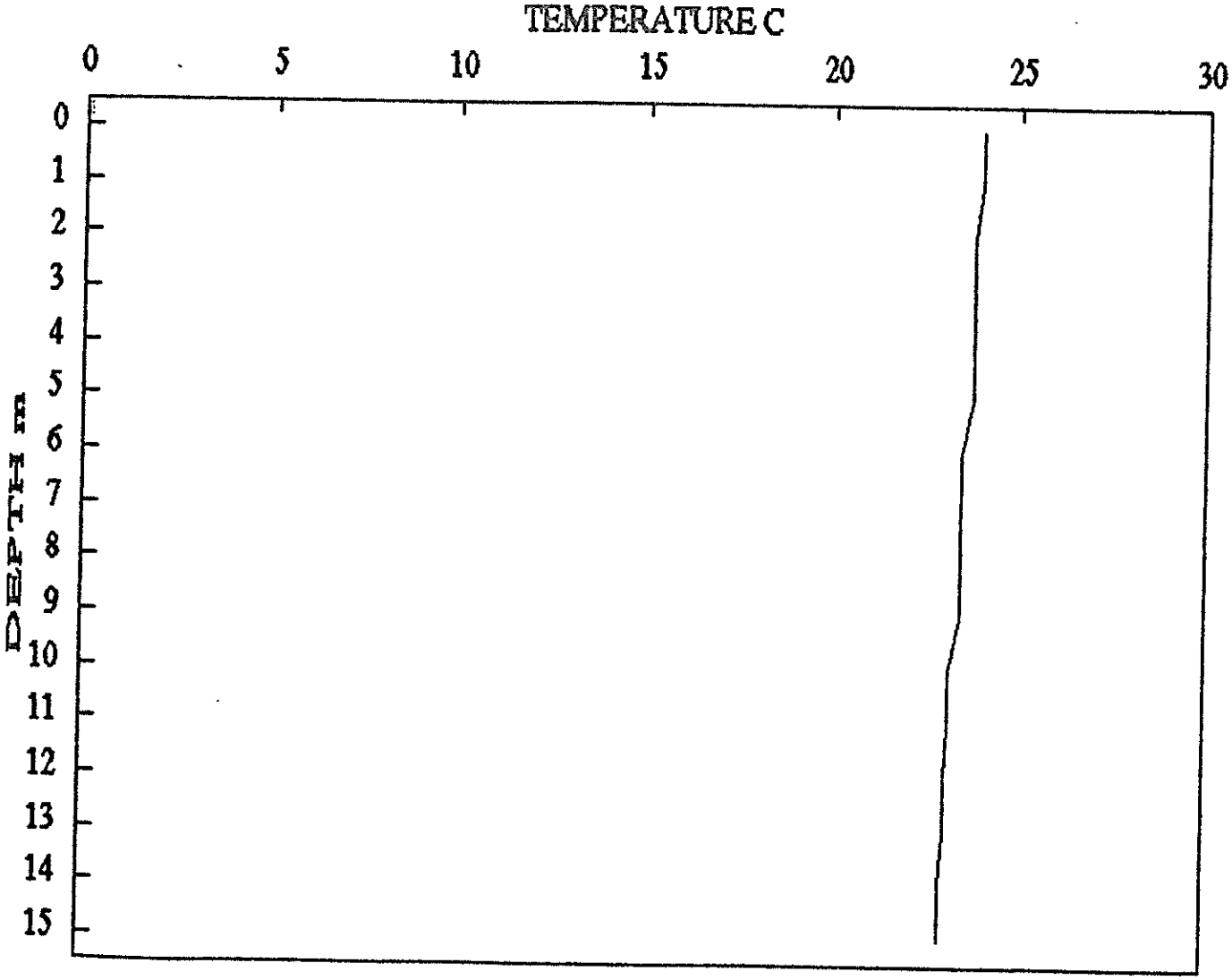


LAKE SALLIE

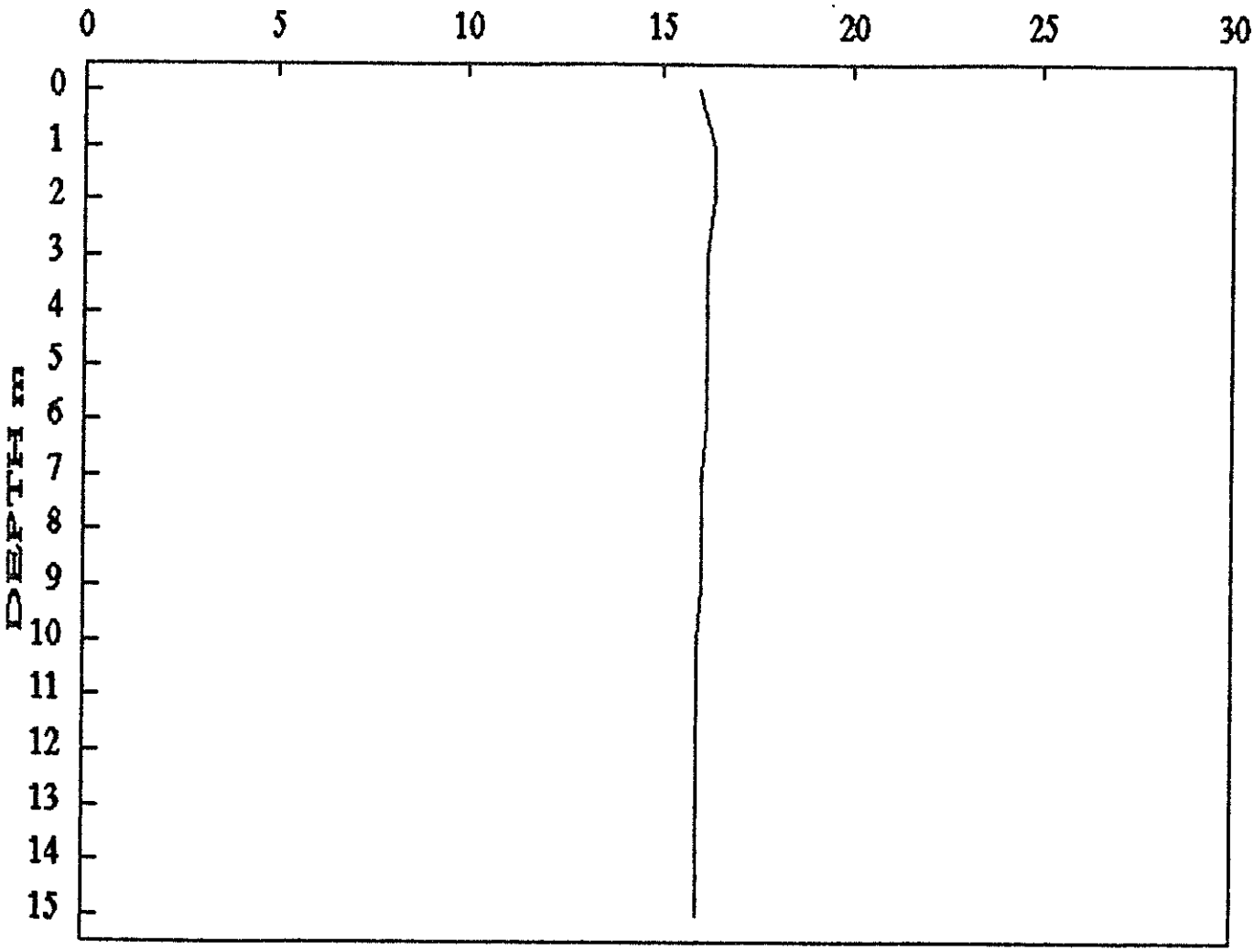
August 10,1988



LAKE SALLIE

September 15,1988

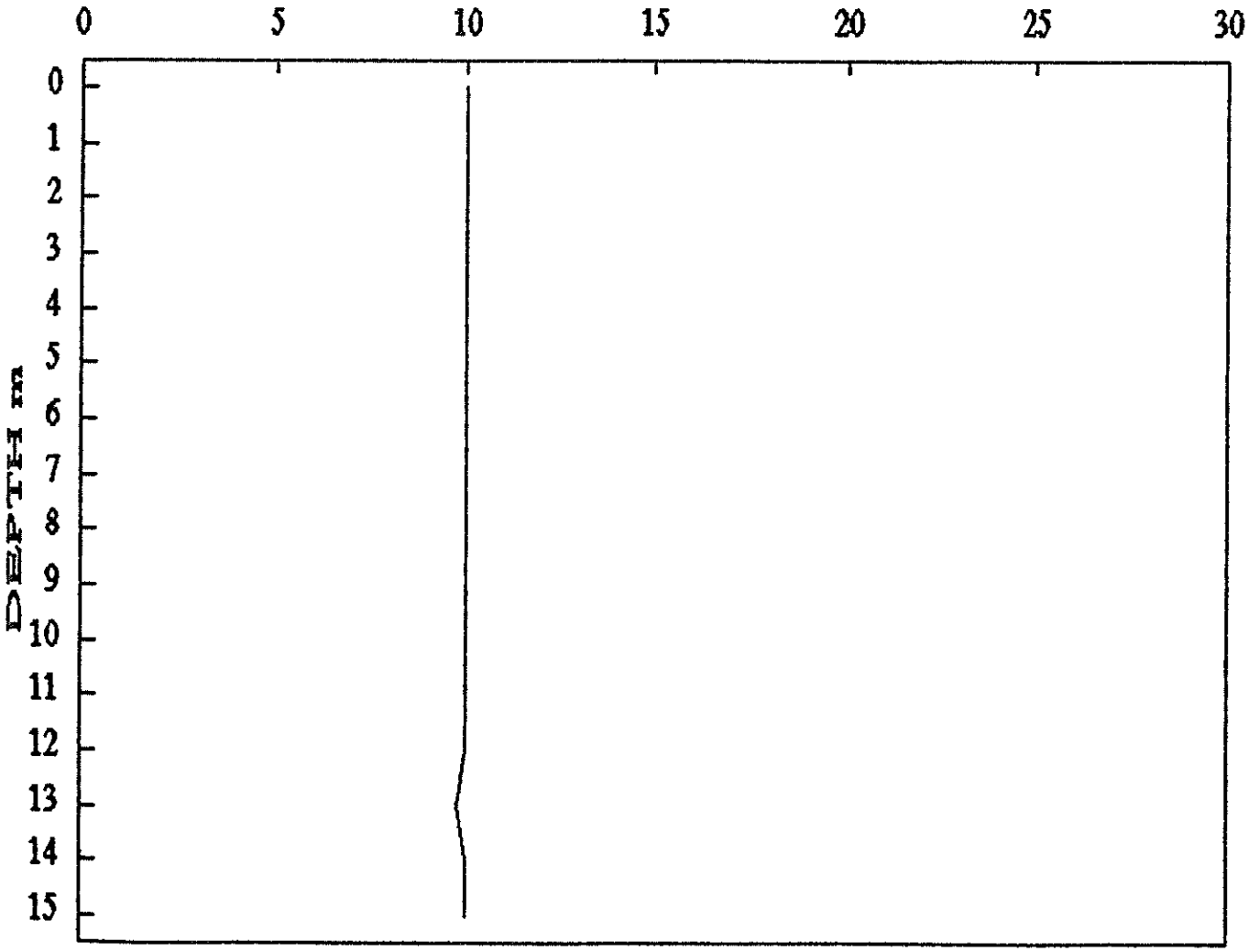
TEMPERATURE C



LAKE SALLIE

November 19,1988

TEMPERATURE C



LAKE SALLIE

December 13,1988

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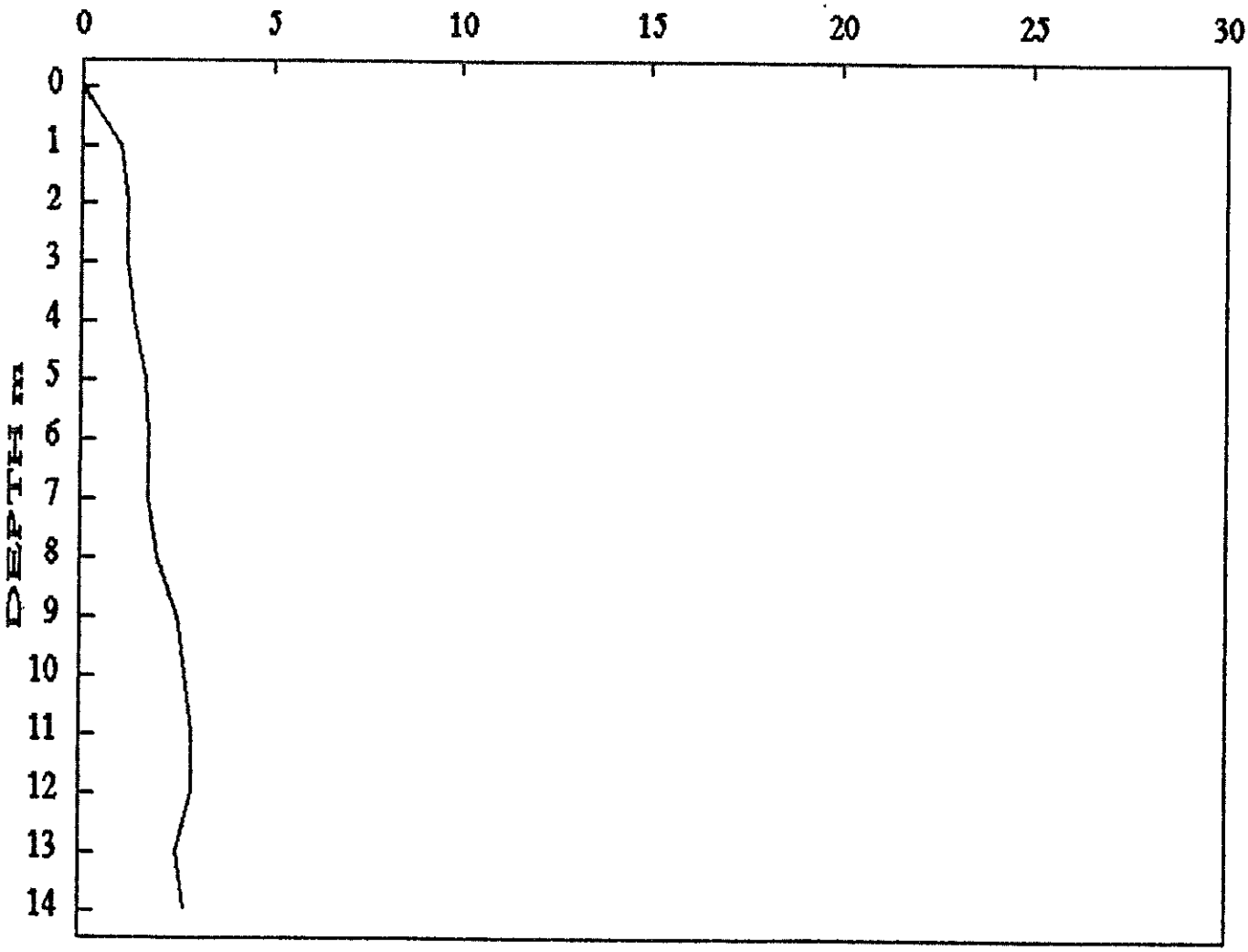
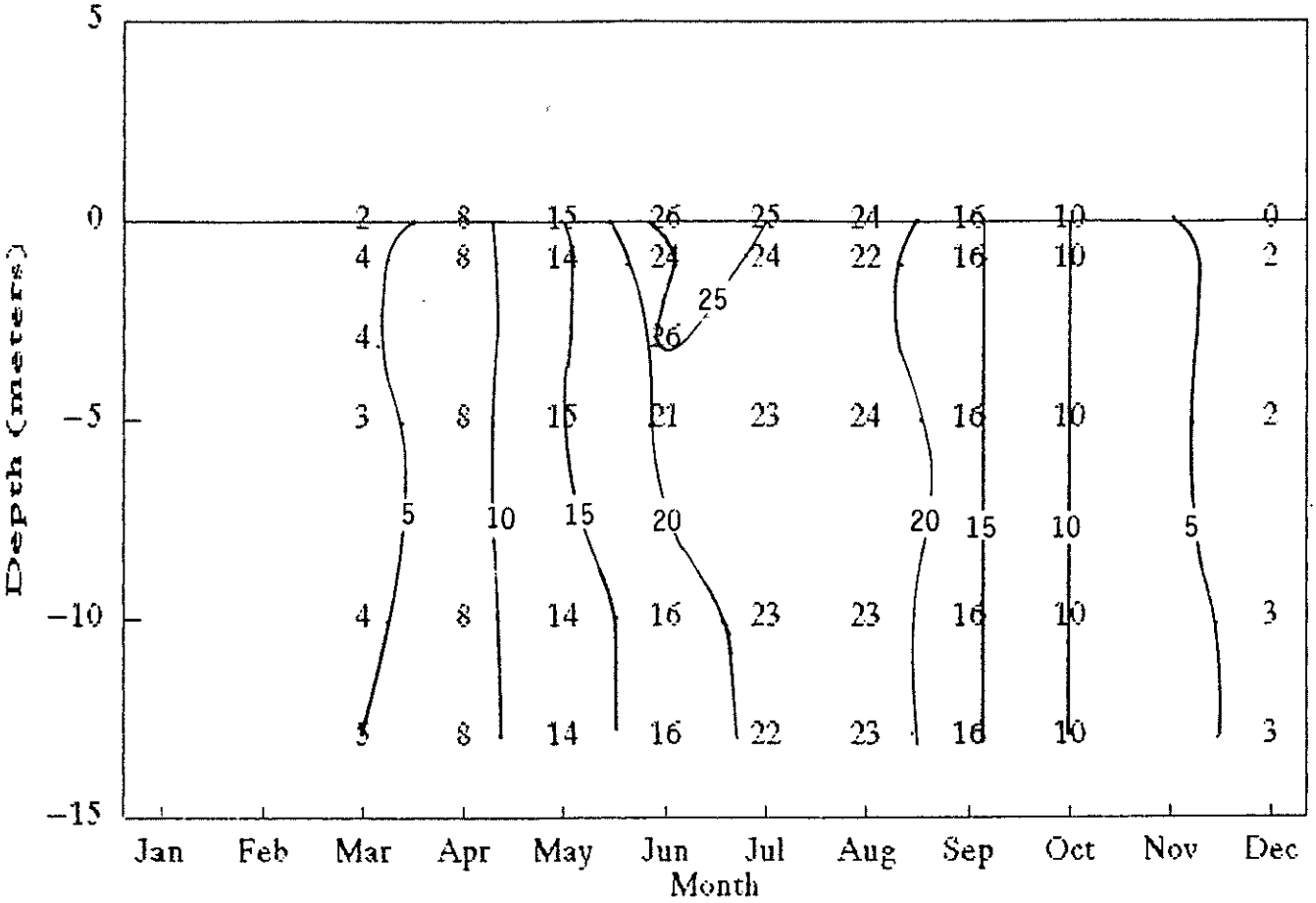


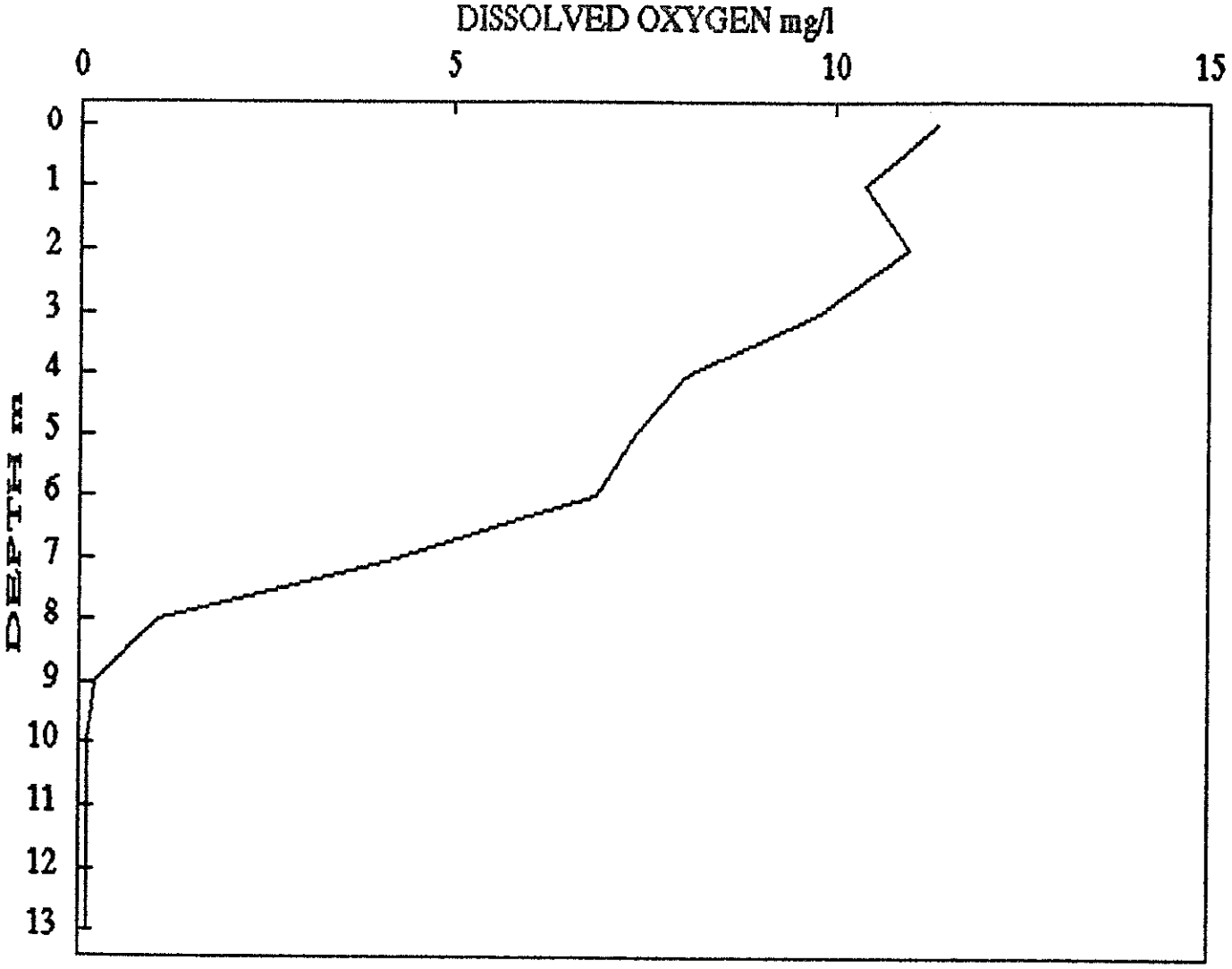
LAKE SALLIE

TEMPERATURE – 1988



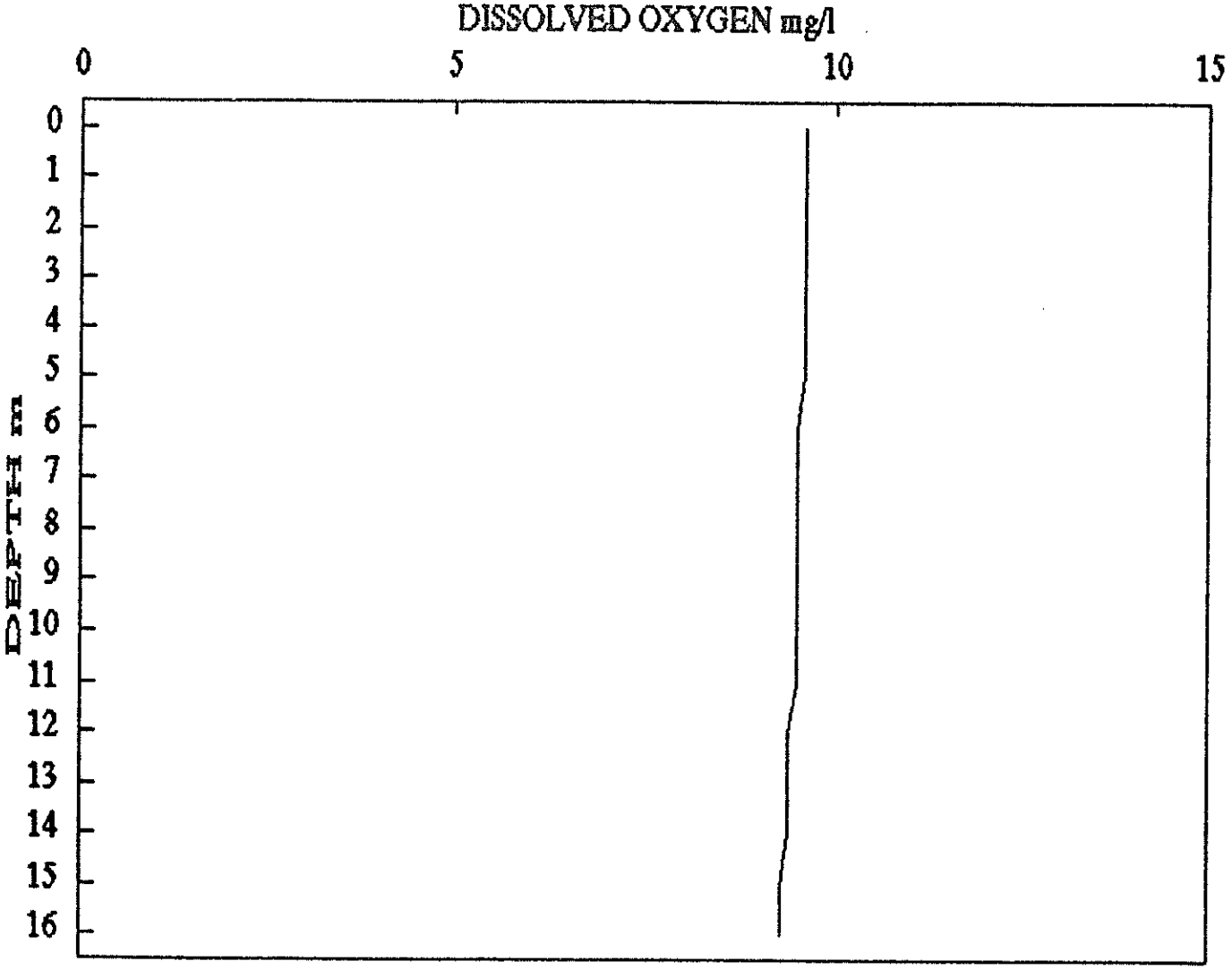
LAKE SALLIE

March 30,1988



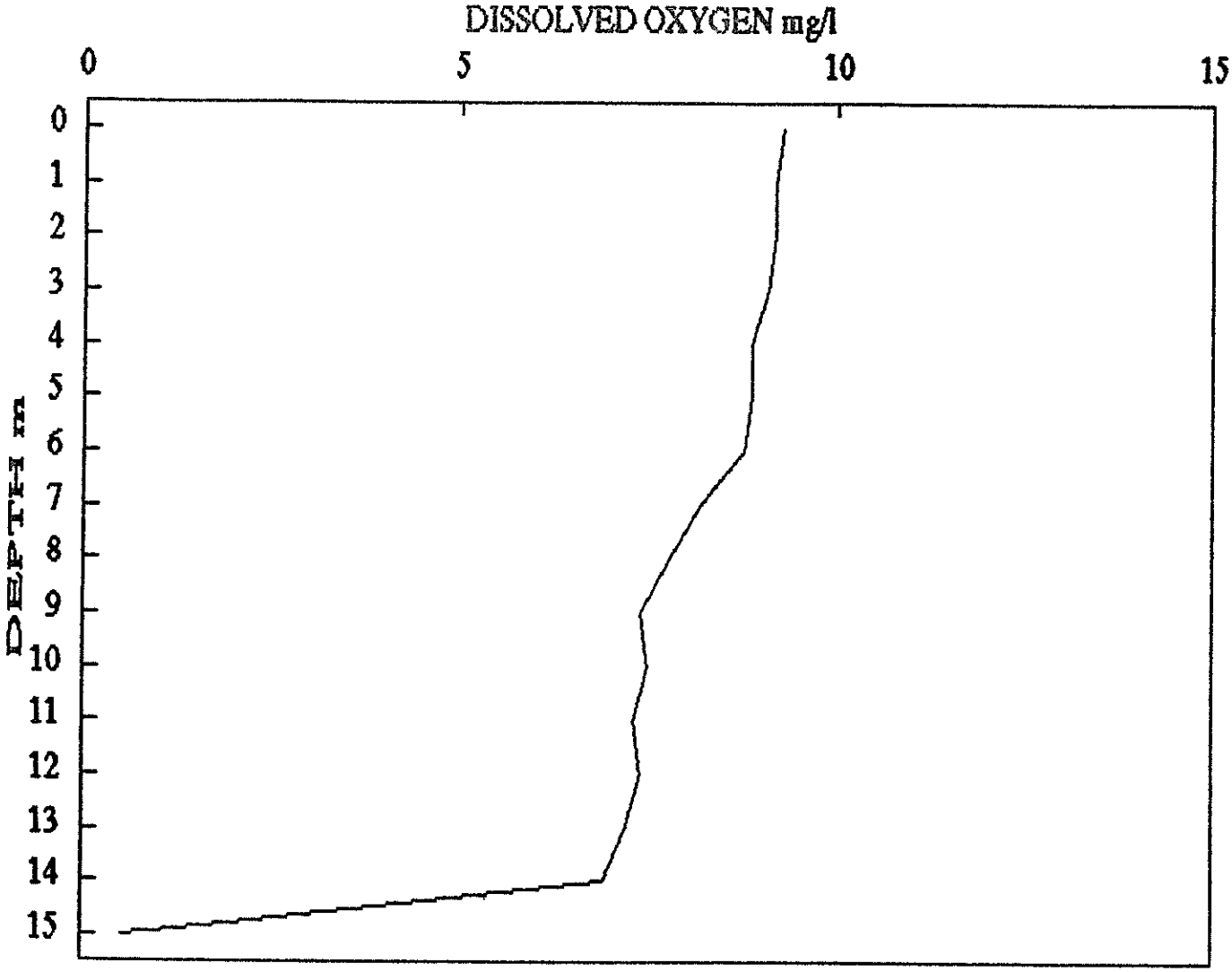
LAKE SALLIE

April 25,1988



LAKE SALLIE

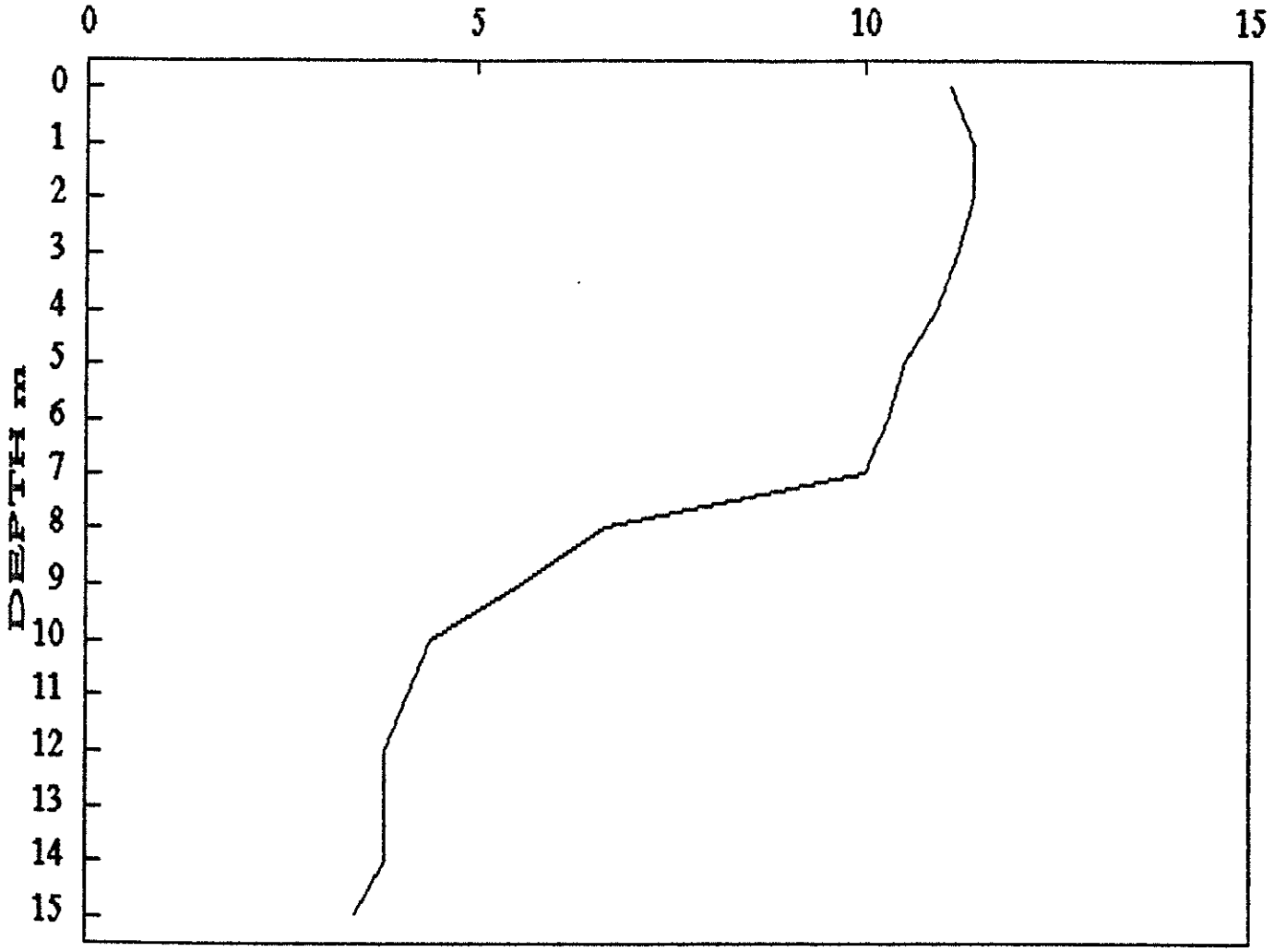
May 12,1988



LAKE SALLIE

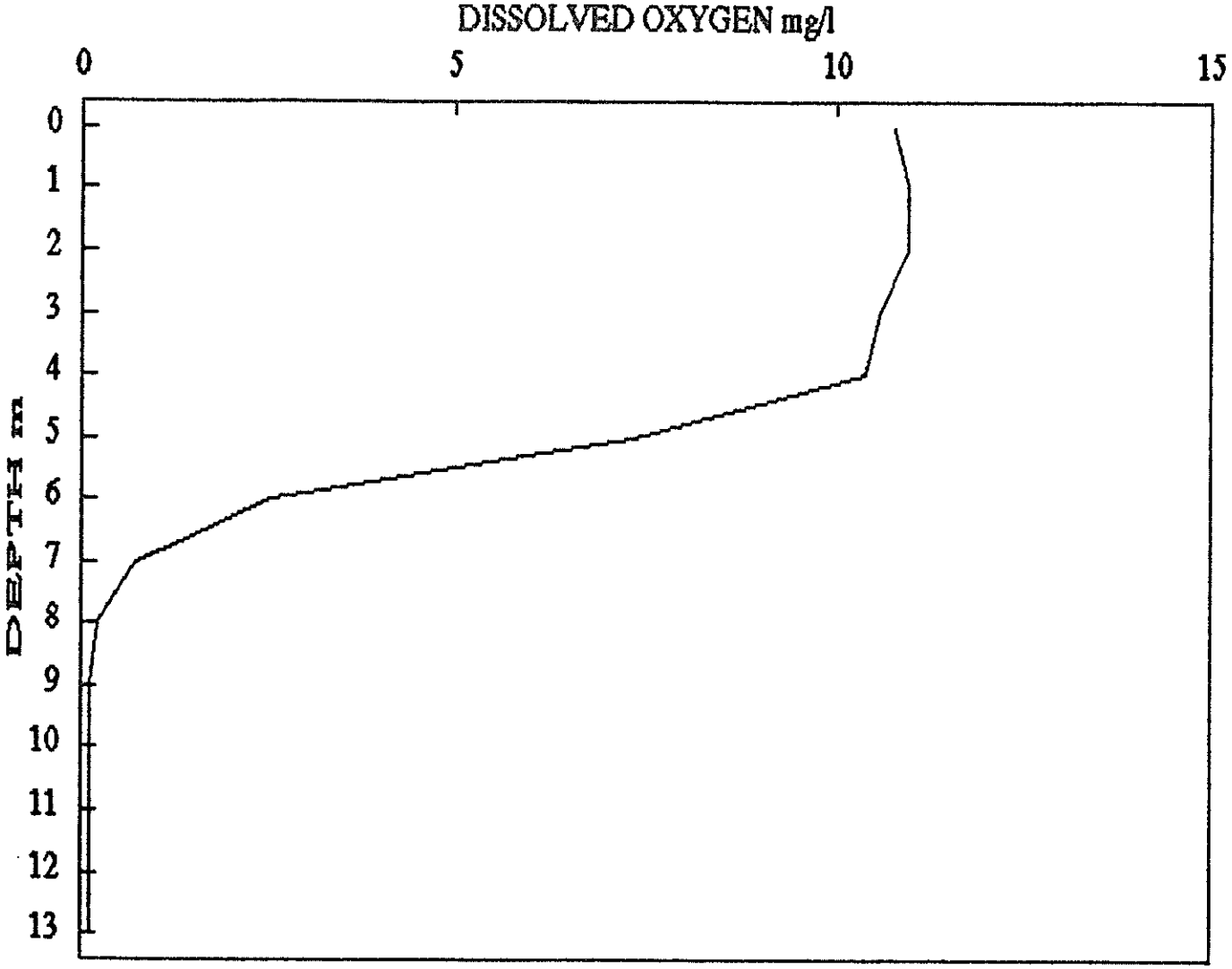
May 26,1988

DISSOLVED OXYGEN mg/l



LAKE SALLIE

June 7,1988



LAKE SALLIE

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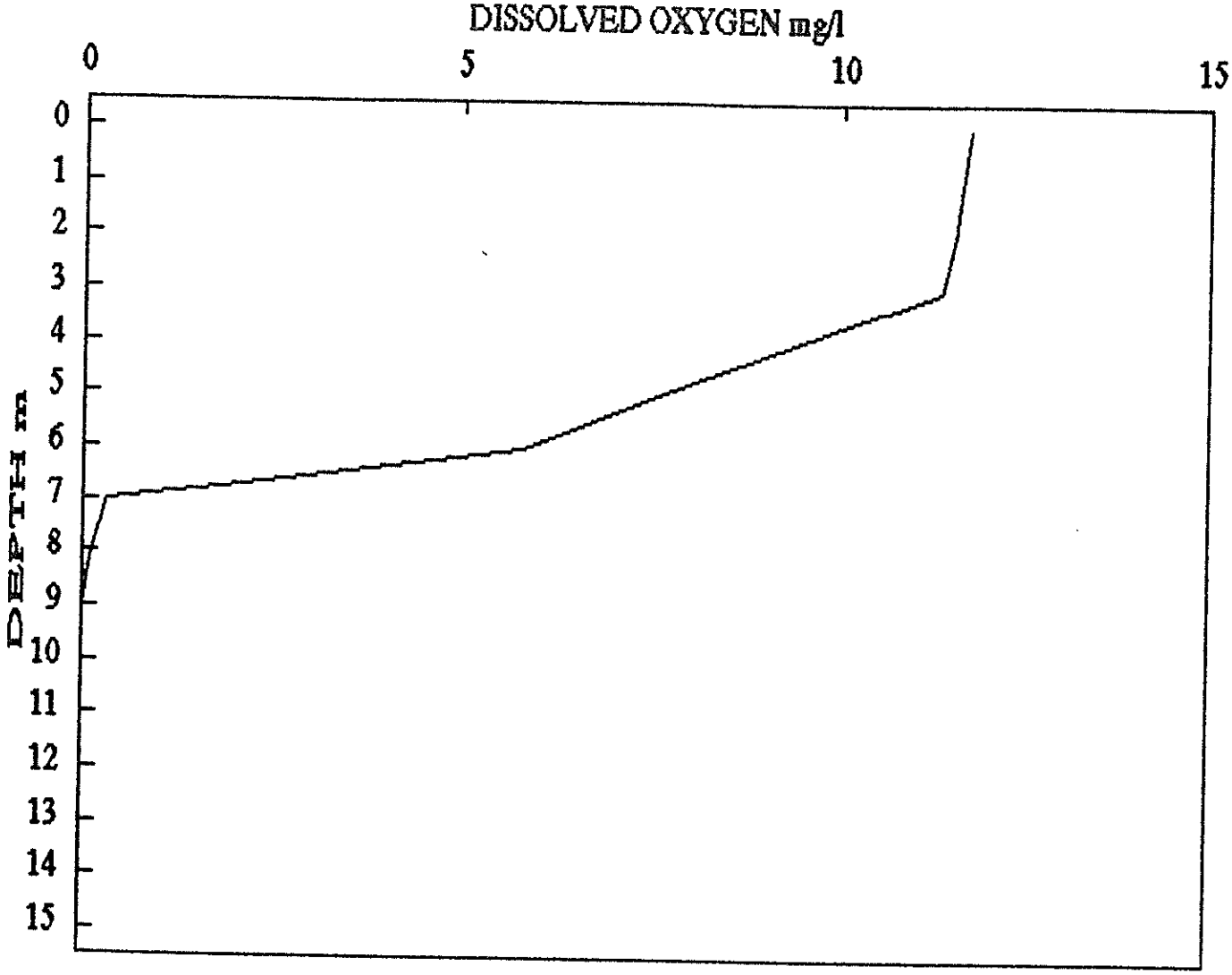
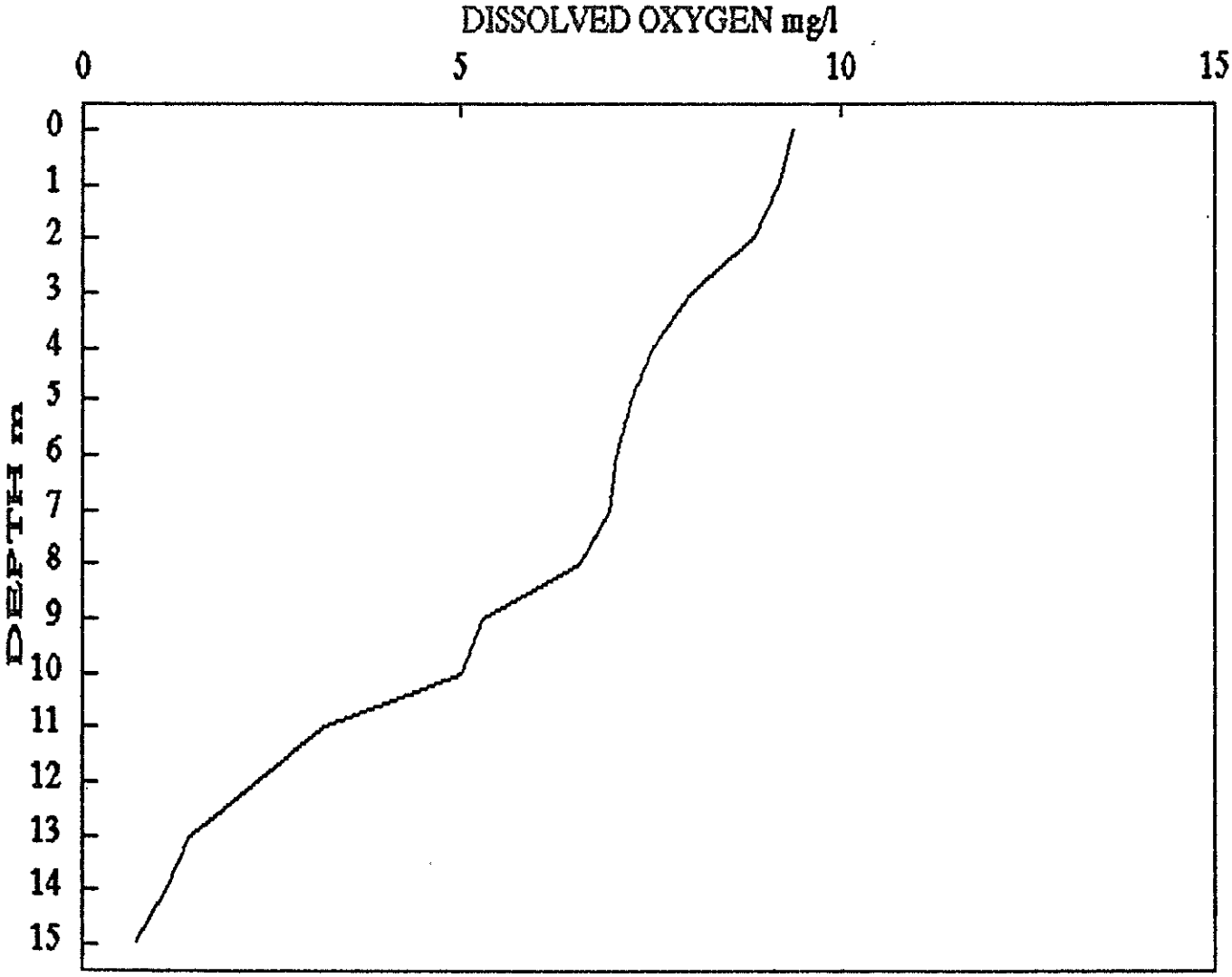


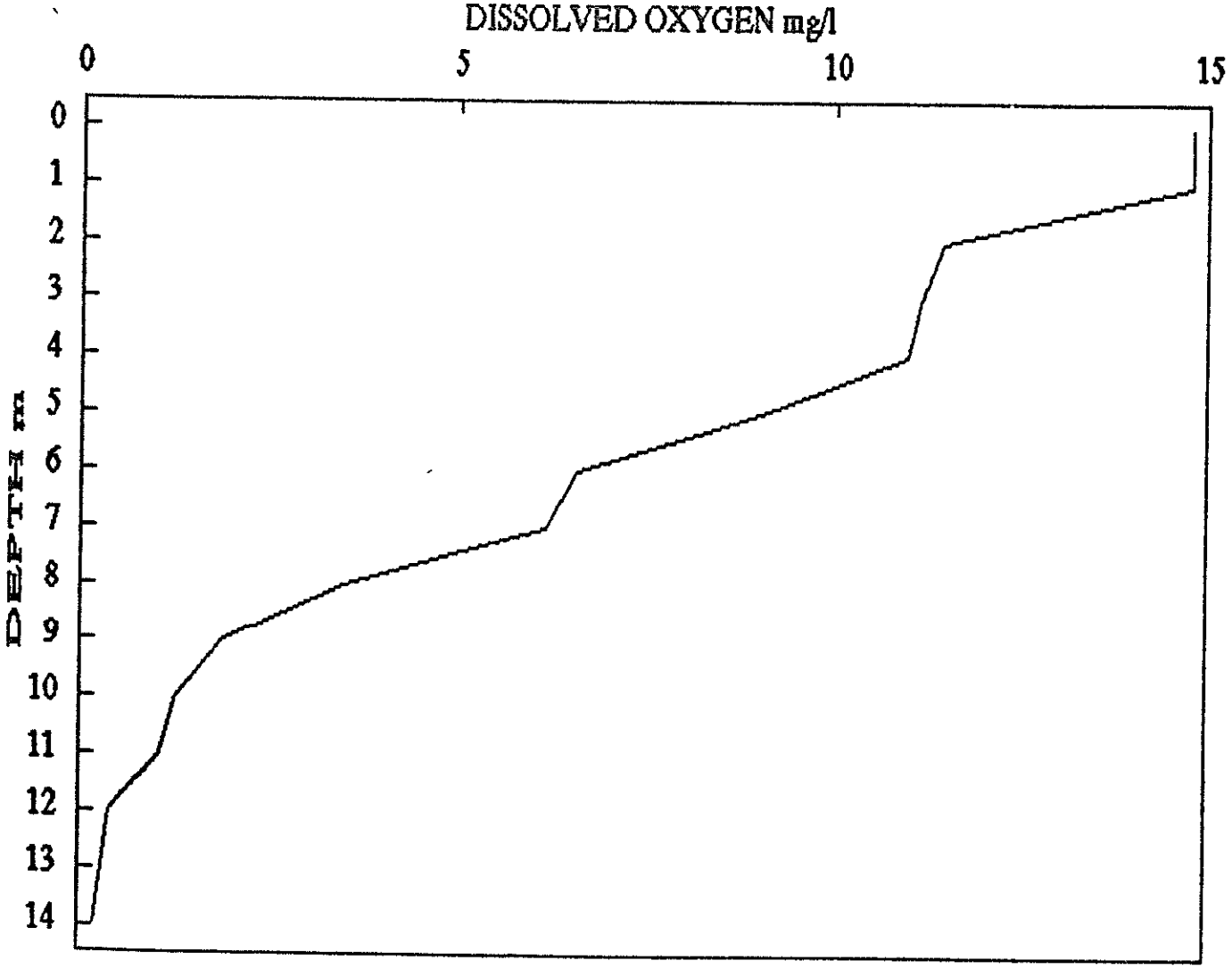
LAKE SALLIE

July 7,1988



LAKE SALLIE

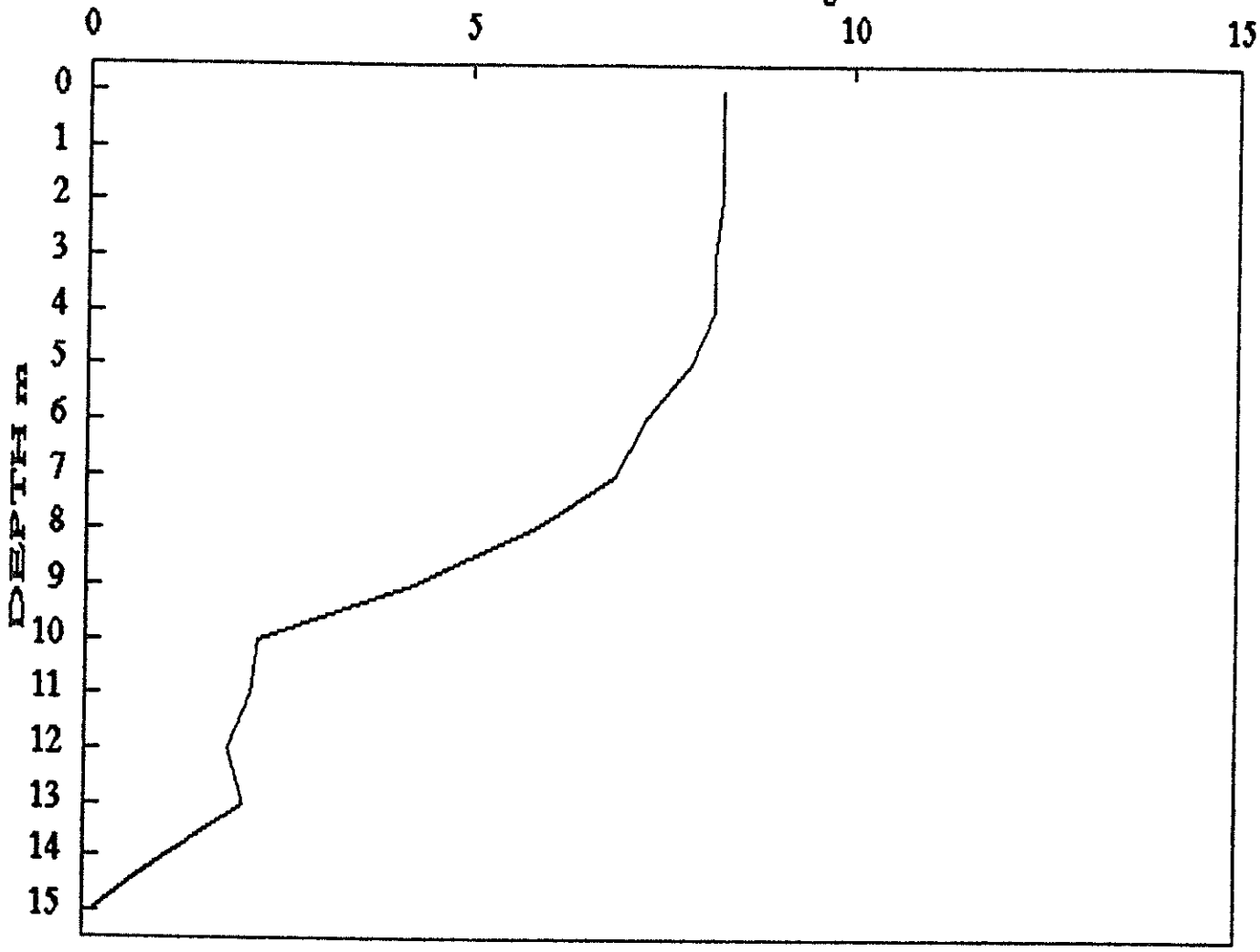
July 19,1988



LAKE SALLIE

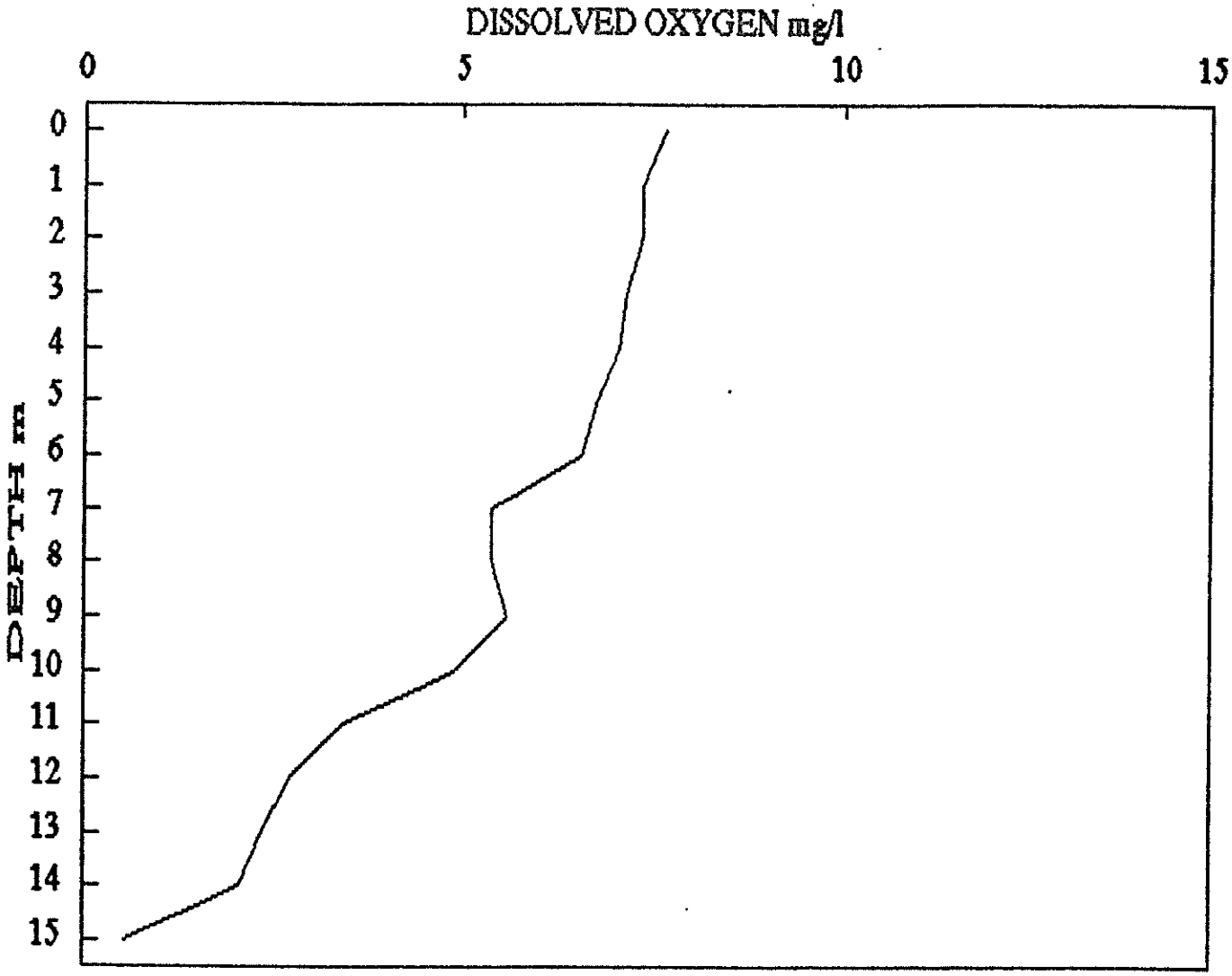
August 10,1988

DISSOLVED OXYGEN mg/l



LAKE SALLIE

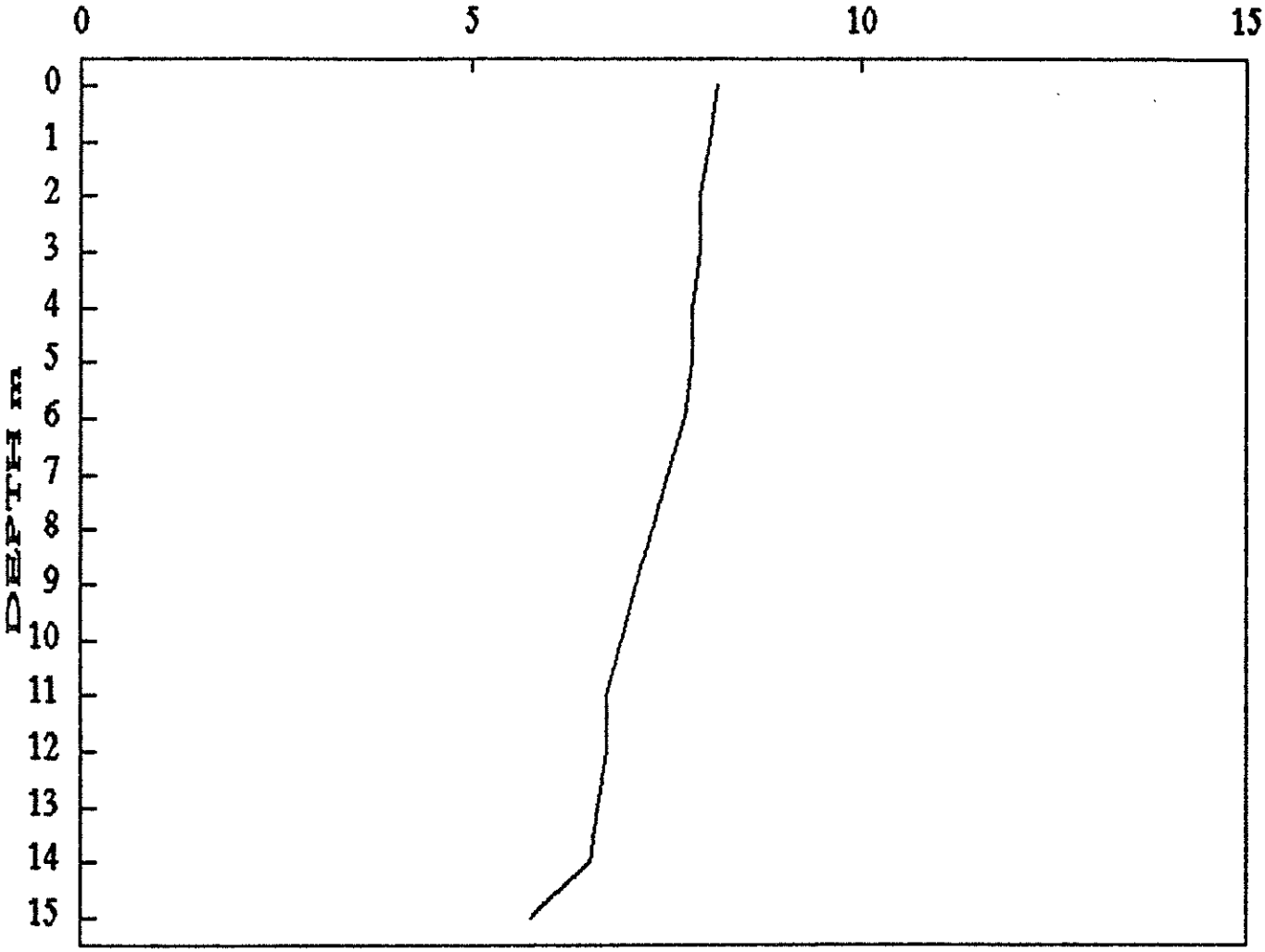
September 15,1988



LAKE SALLIE

November 19,1988

DISSOLVED OXYGEN mg/l



LAKE SALLIE

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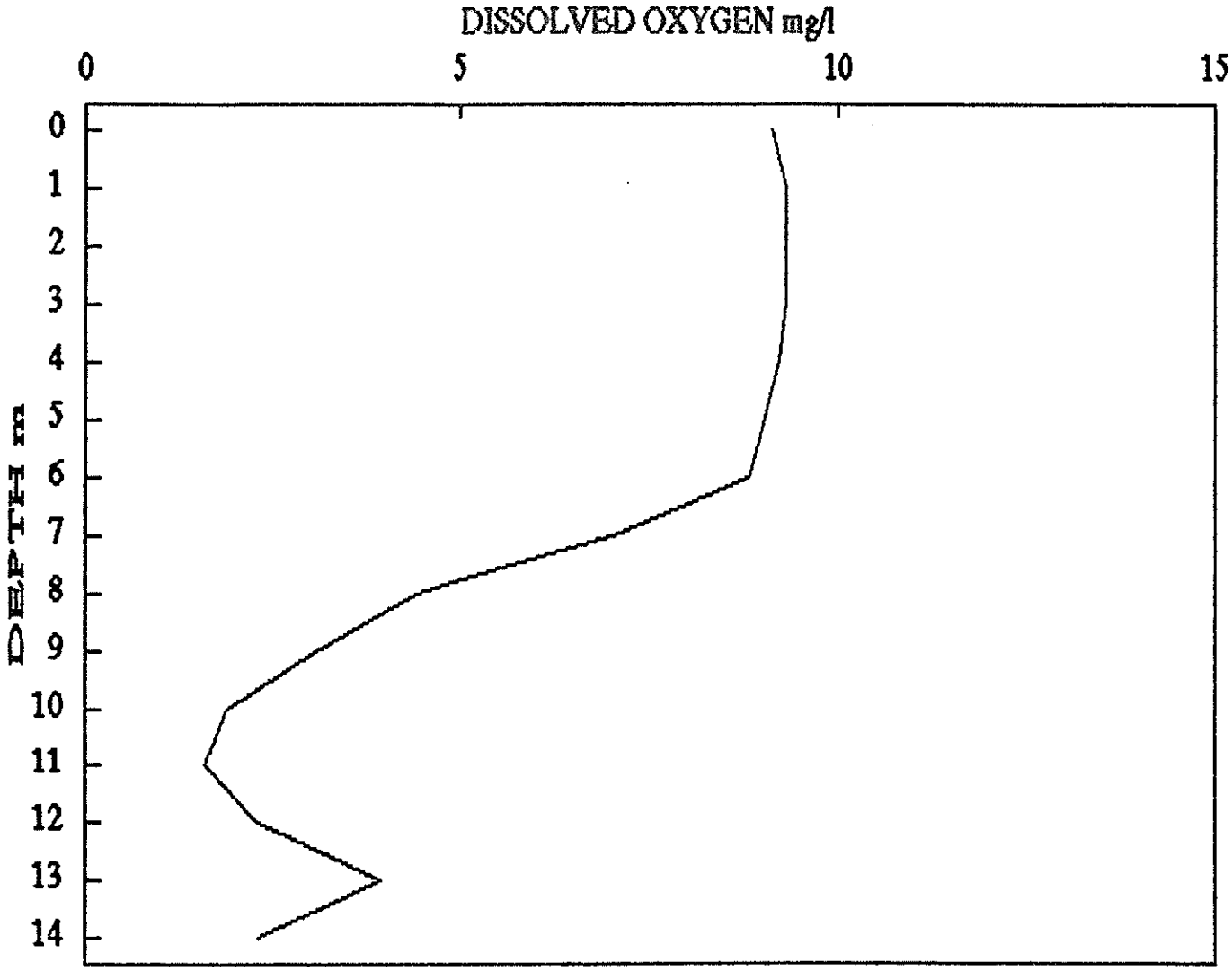
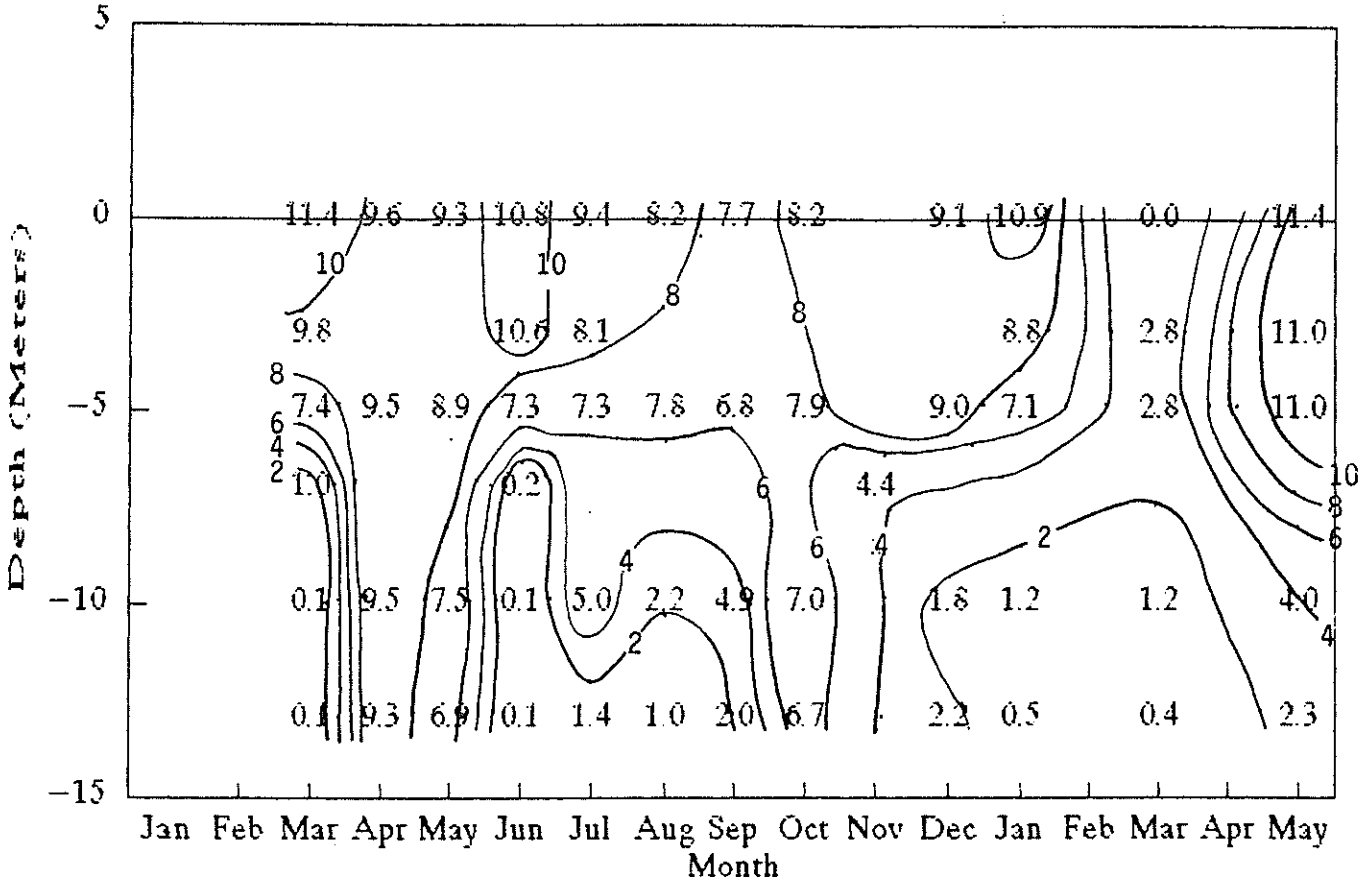


LAKE SALLIE

DISSOLVED OXYGEN – 1988 & 1989



Jan., 1988 to May, 1989

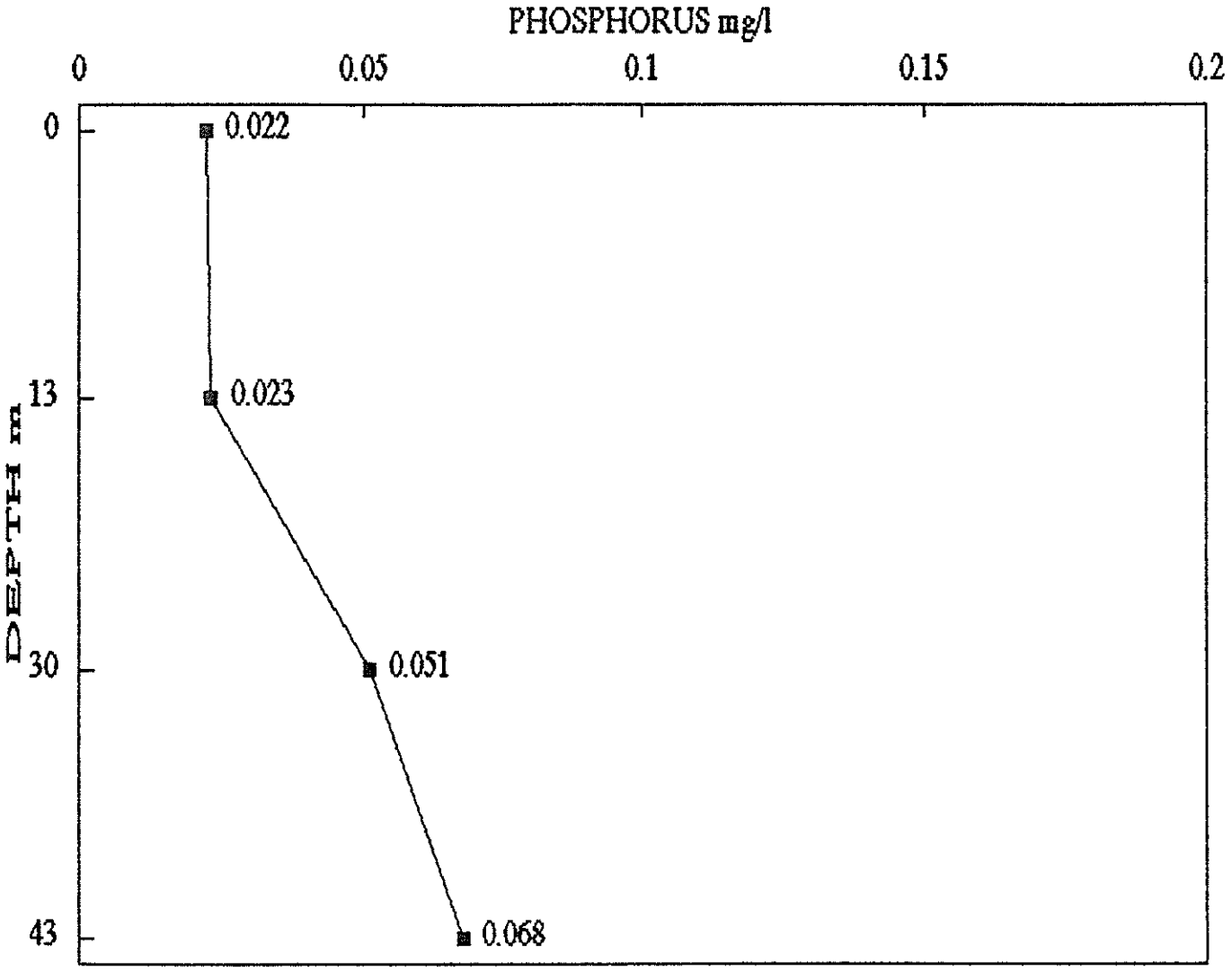
LAKE SALLIE

1988 IN-LAKE SAMPLING RESULTS

	3/30/88	4/25/88	5/12/88	5/26/88	6/8/88	6/20/88	7/7/88	7/19/88	8/10/88	8/22/88	9/15/88	10/20/88	11/14/88	12/13/88
Surface														
Po	0.012	<0.01	0.002	0.010	0.008	0.006	0.002	0.008	0.008	0.014	0.008	0.002	0.006	0.008
P_T	0.022	0.03	0.025	0.041	0.025	0.023	0.039	0.038	0.069	0.079	0.058	0.026	0.056	0.015
Kjl-N	0.98	1.5	1.2	1.43	1.4	1.2	1.6	2.0	3.0	2.68	2.0	1.6	1.08	1.36
Org-N	0.78													
NH_3-N	0.20	0.02	0.01		0.02	0.008	<0.01	0.01	<0.01	0.06	0.05	0.03	0.04	0.04
NO_2-N+	0.18													
Chlor-a	4.01	3.74		2.2	2.4		18.6	16.0	17.2	18.8	37.5	10.7		
TSS	4.0													
PH	8.3													
Conduct	370.0													
Alk.														
Secchi Disk(m)	1.8		2.7	2.9	2.72	2.4	2.72	1.08	0.77	0.62	0.77	2.77	3.69	
Fecal Coli.	<2.0		35.0		<2.0		2.0		<2.0			<2.0		
Four Meter Sample														
Po	0.010	0.01	0.01	0.003	0.004	0.004	0.002	0.008	0.006	0.014	0.008	0.008	0.004	0.005
PT	0.023	0.04	0.013	0.065	0.011	0.026	0.037	0.055	0.057	0.067	0.051	0.025	0.028	0.015
TSS	2.4	5.80	4.67	3.84	1.8	3.5	7.41	7.0	10.9	11.6	11.0	9.7	2.9	1.1
Nine Meter Sample														
Po	0.020	0.01	<0.01	0.006	0.010	0.072	0.004	0.024	0.006	0.012	0.012	0.004	0.004	0.005
PT	0.051	0.04	0.011	0.080	0.027	0.120	0.035	0.062	0.055	0.068	0.055	0.023	0.025	0.013
$N\text{-}NO_2+NO_3$	0.84		0.01		0.01	0.001	<0.01	0.02	<0.01	0.05	0.06	0.05	0.02	0.08
Thirteen Meter Sample (Bottom)														
Po	0.0270	<0.01	0.002	0.004	0.006	0.080	0.058	0.036	0.012	0.018	0.024	0.002	0.004	0.005
PT	0.068	0.03	0.023	0.140	0.014	0.160	0.096	0.039	0.069	0.065	0.063	0.025	0.025	0.015
Kjl-N	1.91	0.8	1.20	1.40	1.76	1.80	1.28	2.28	2.88	2.28	1.88	1.76	1.48	1.36

LAKE SALLIE

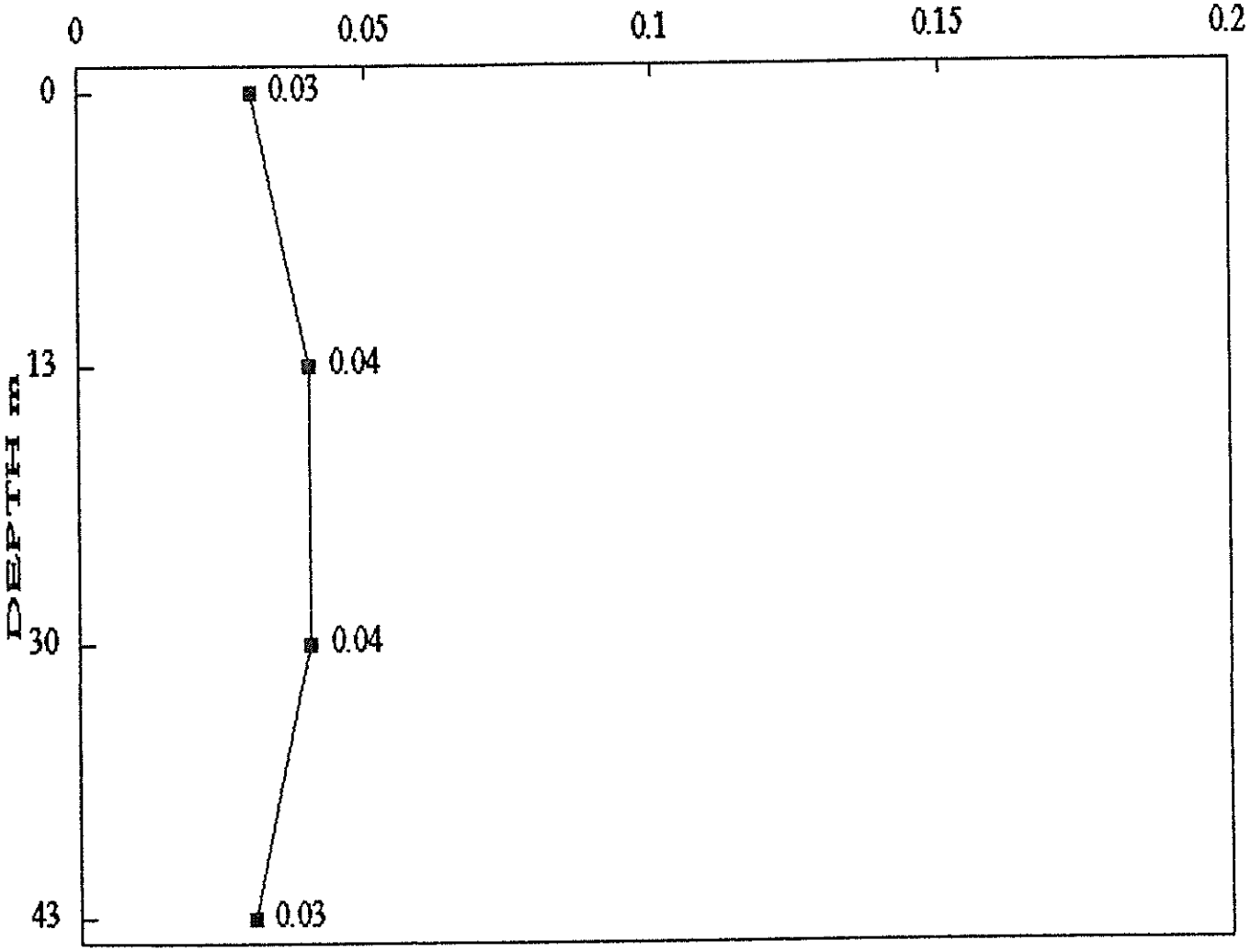
March 30,1988



LAKE SALLIE

April 25,1988

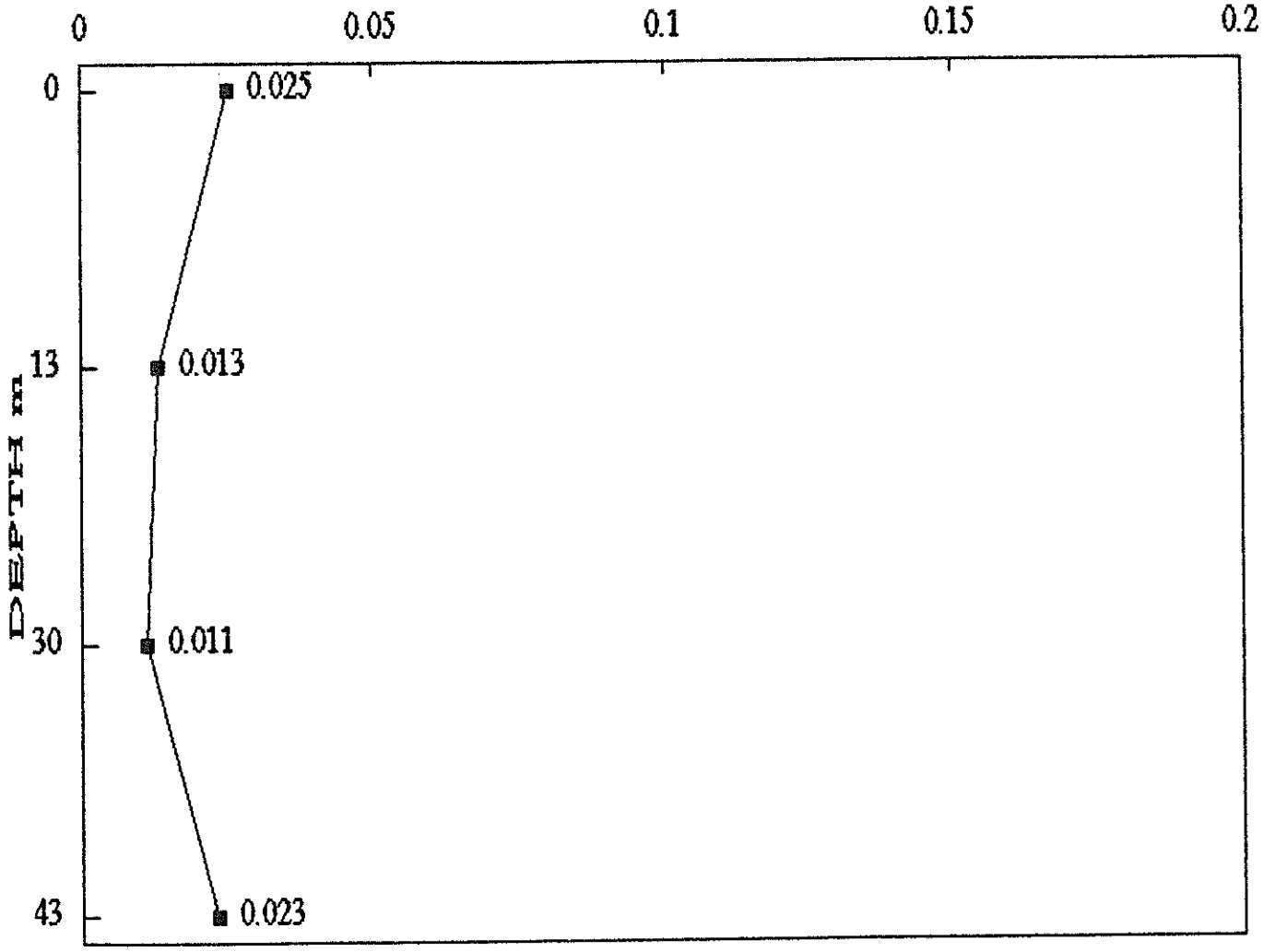
PHOSPHORUS mg/l



LAKE SALLIE

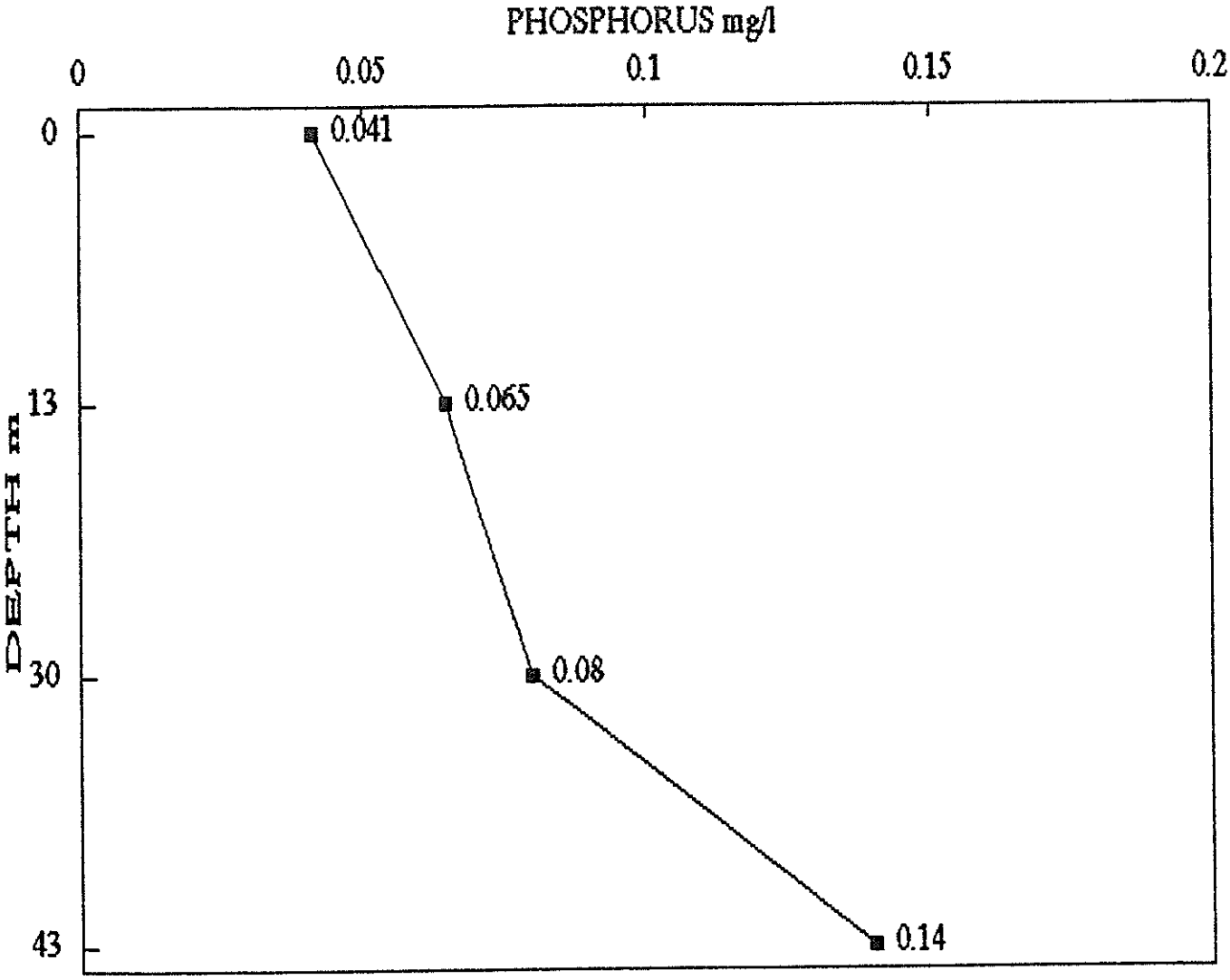
May 12,1988

PHOSPHORUS mg/l



LAKE SALLIE

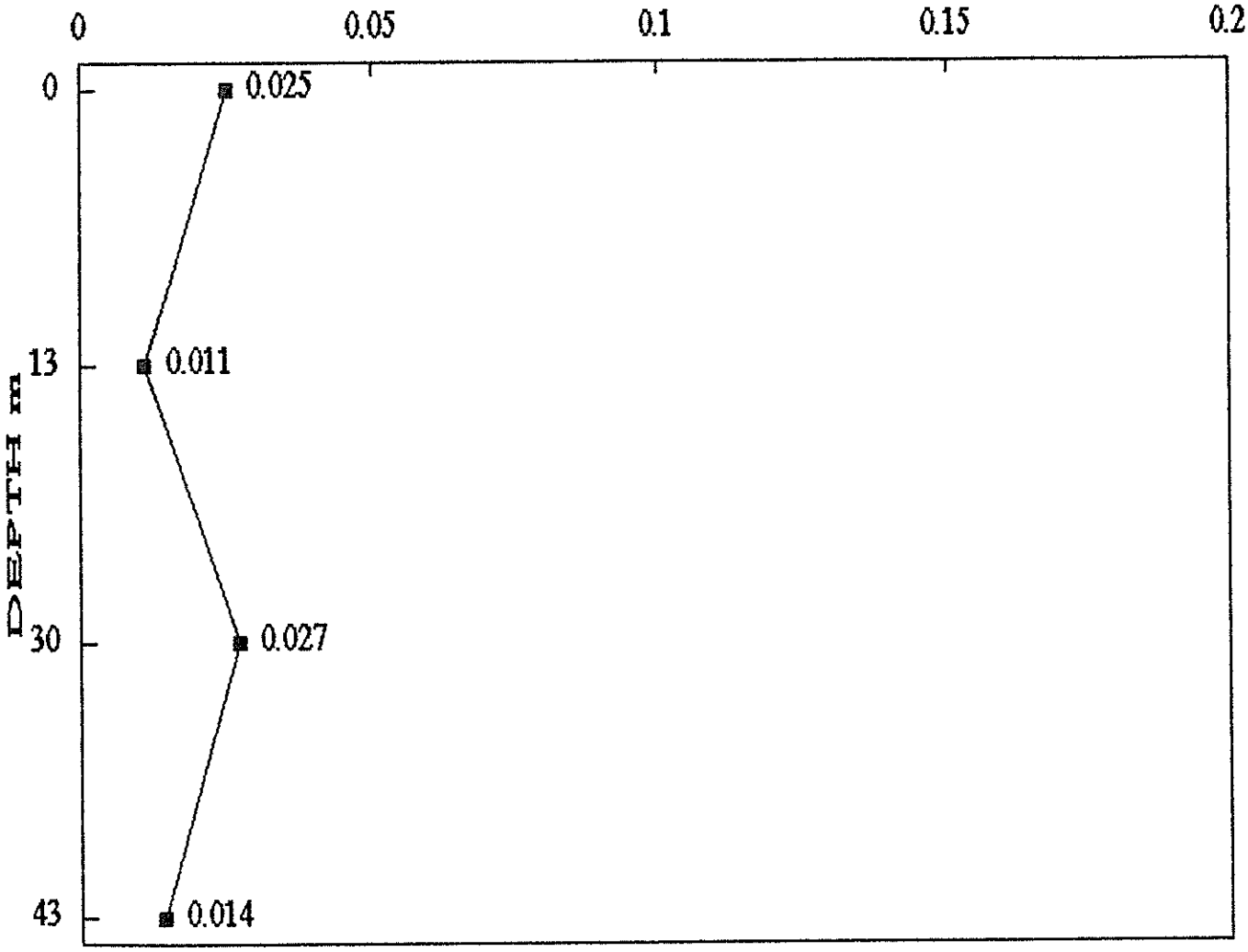
May 26,1988



LAKE SALLIE

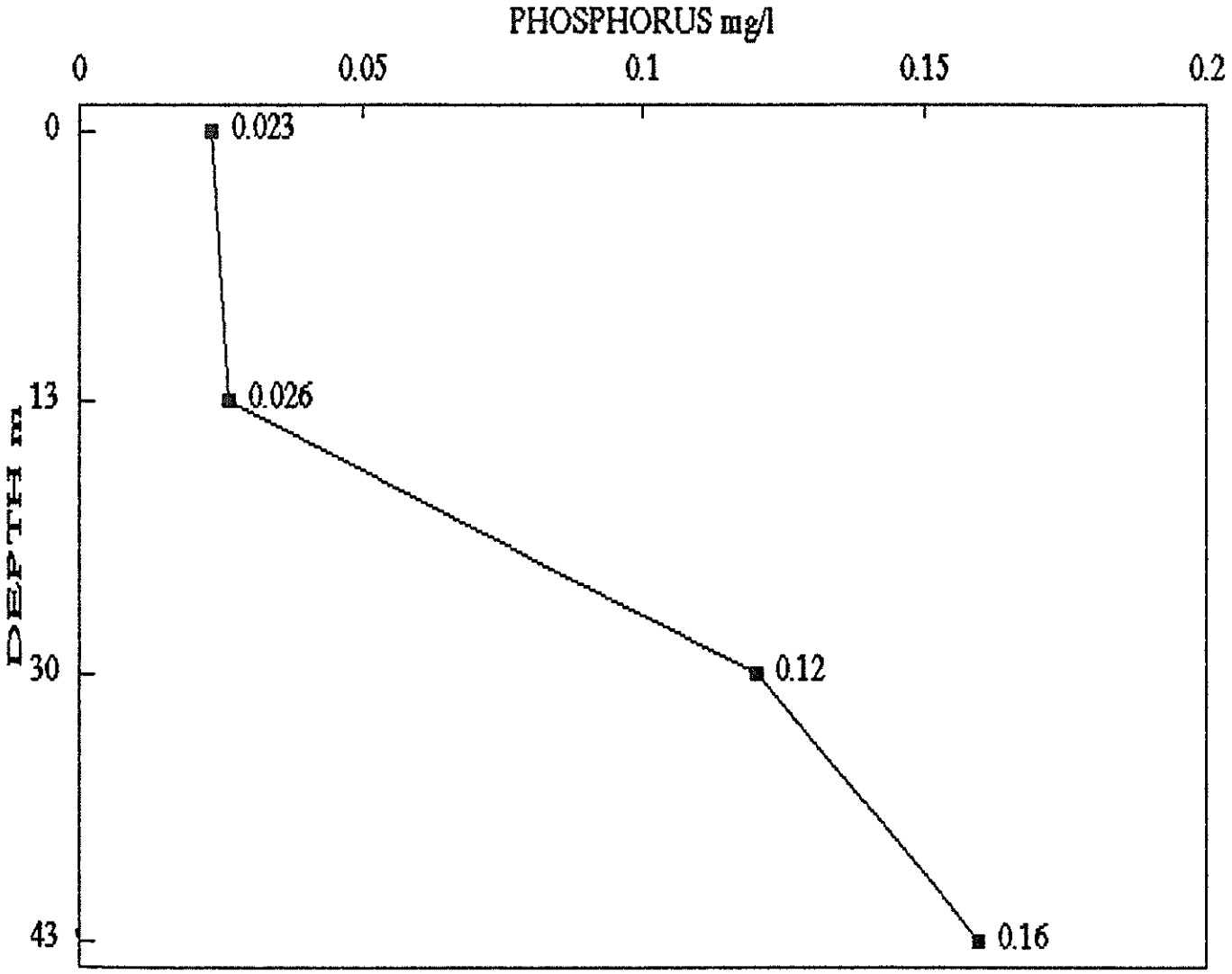
June 8,1988

PHOSPHORUS mg/l



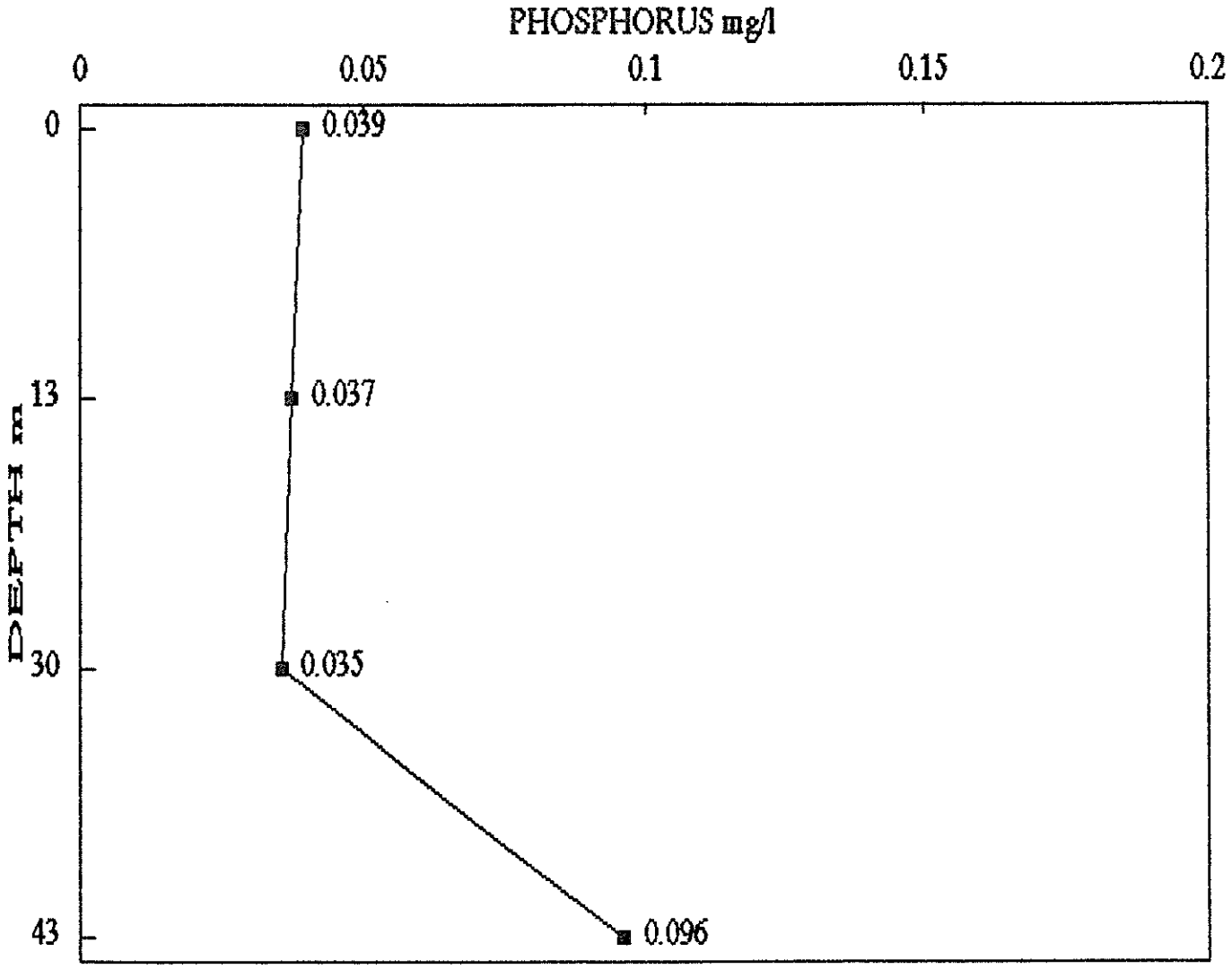
LAKE SALLIE

June 20,1988



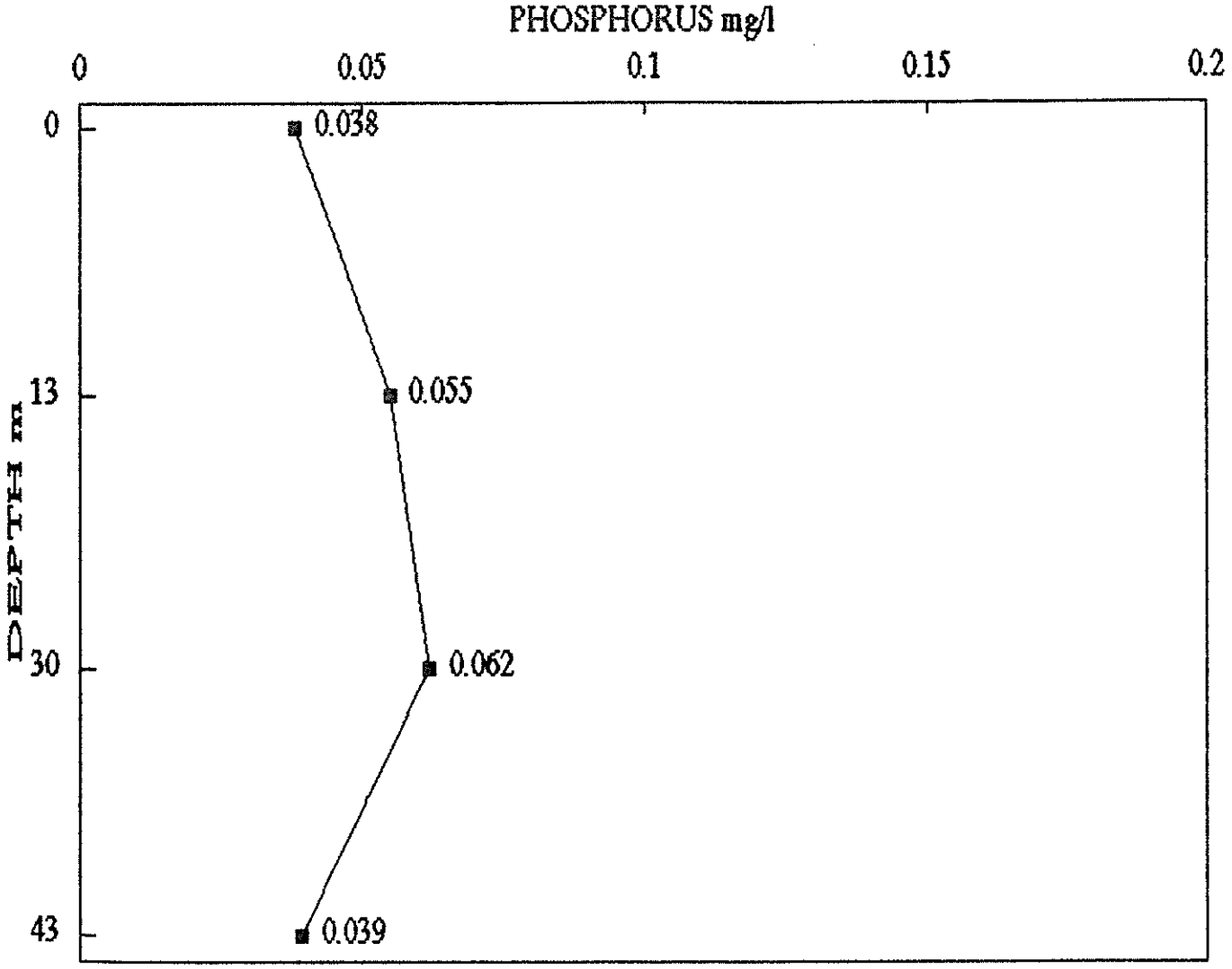
LAKE SALLIE

July 7,1988



LAKE SALLIE

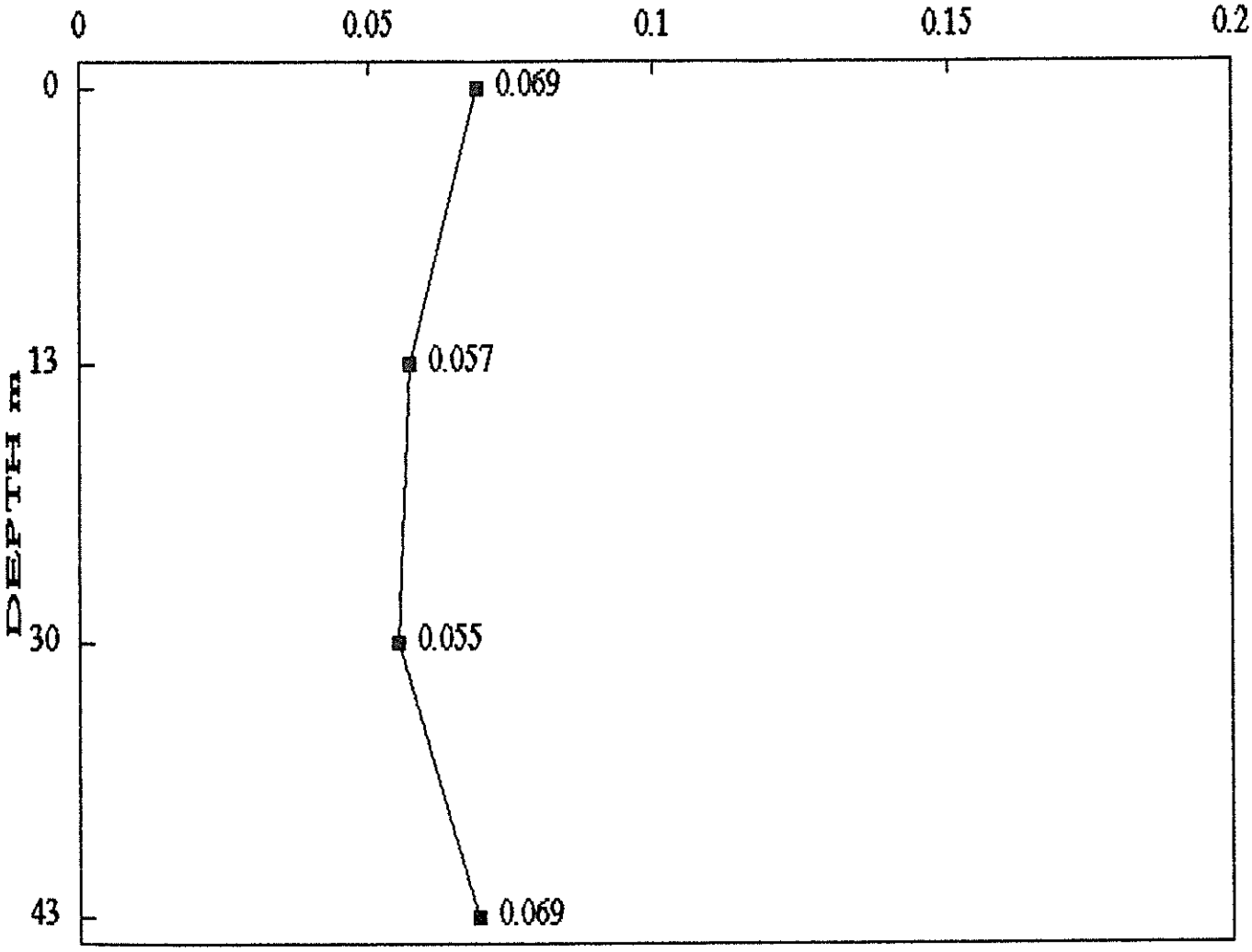
July 19,1988



LAKE SALLIE

August 10,1988

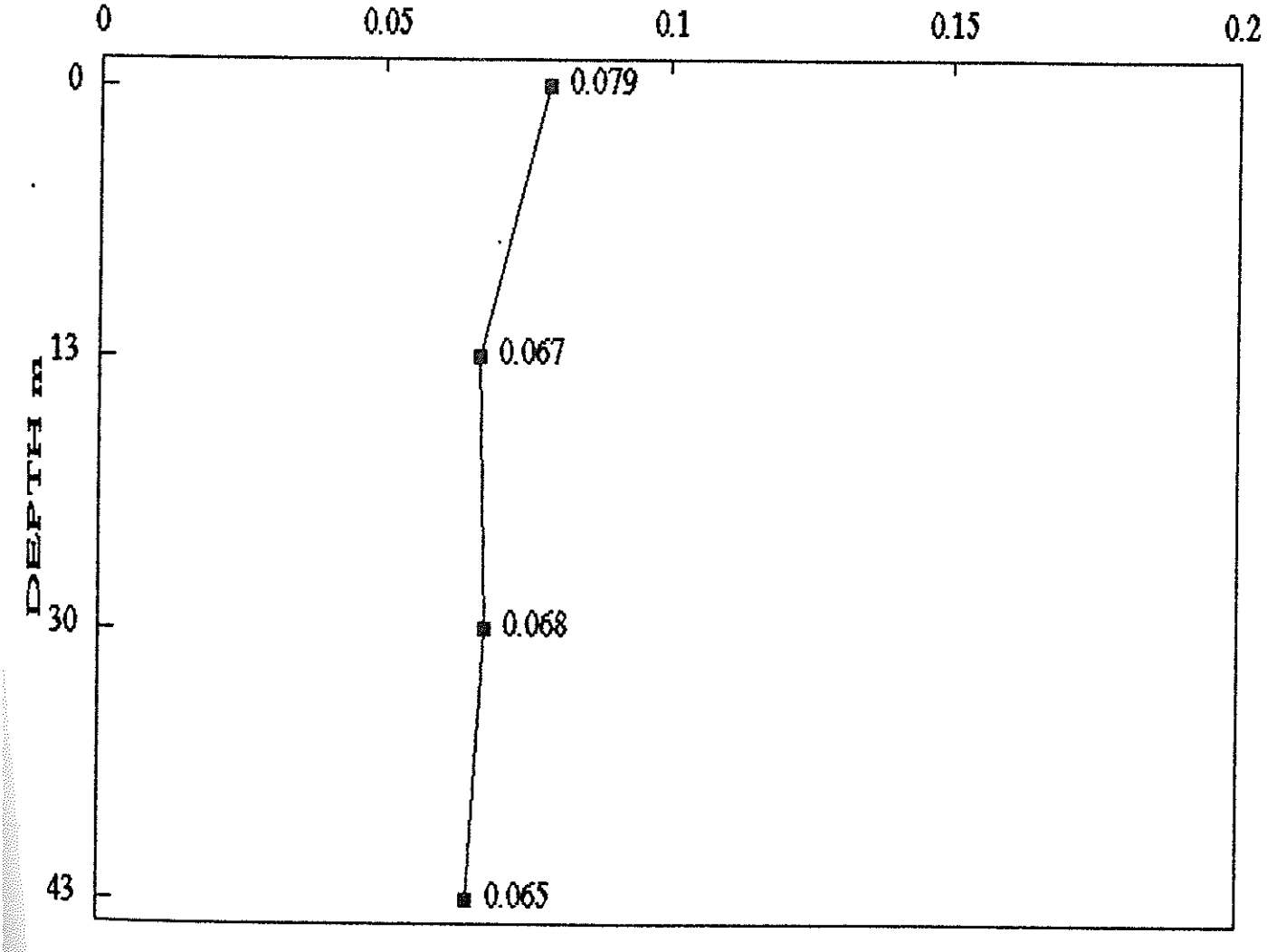
PHOSPHORUS mg/l



LAKE SALLIE

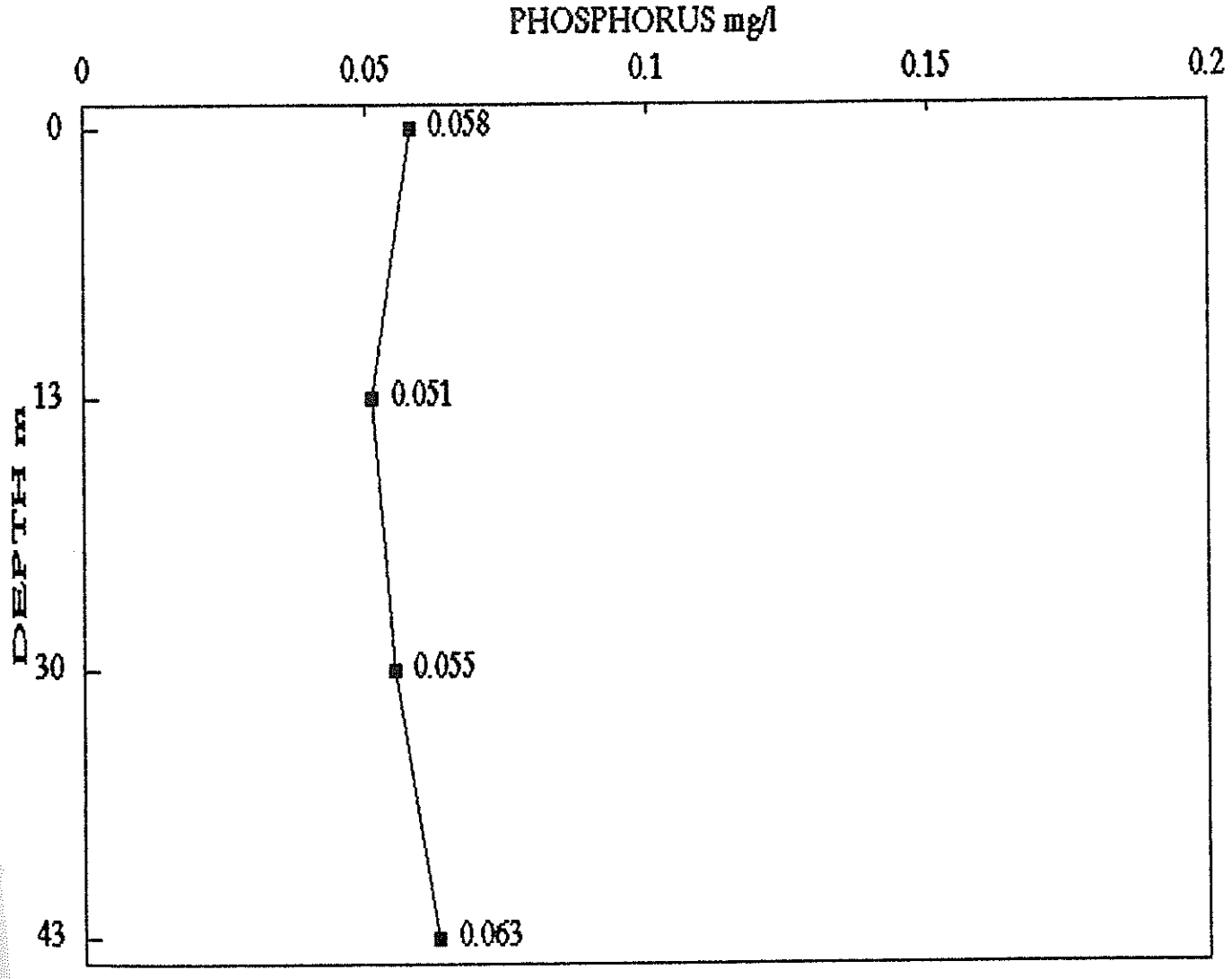
August 22,1988

PHOSPHORUS mg/l



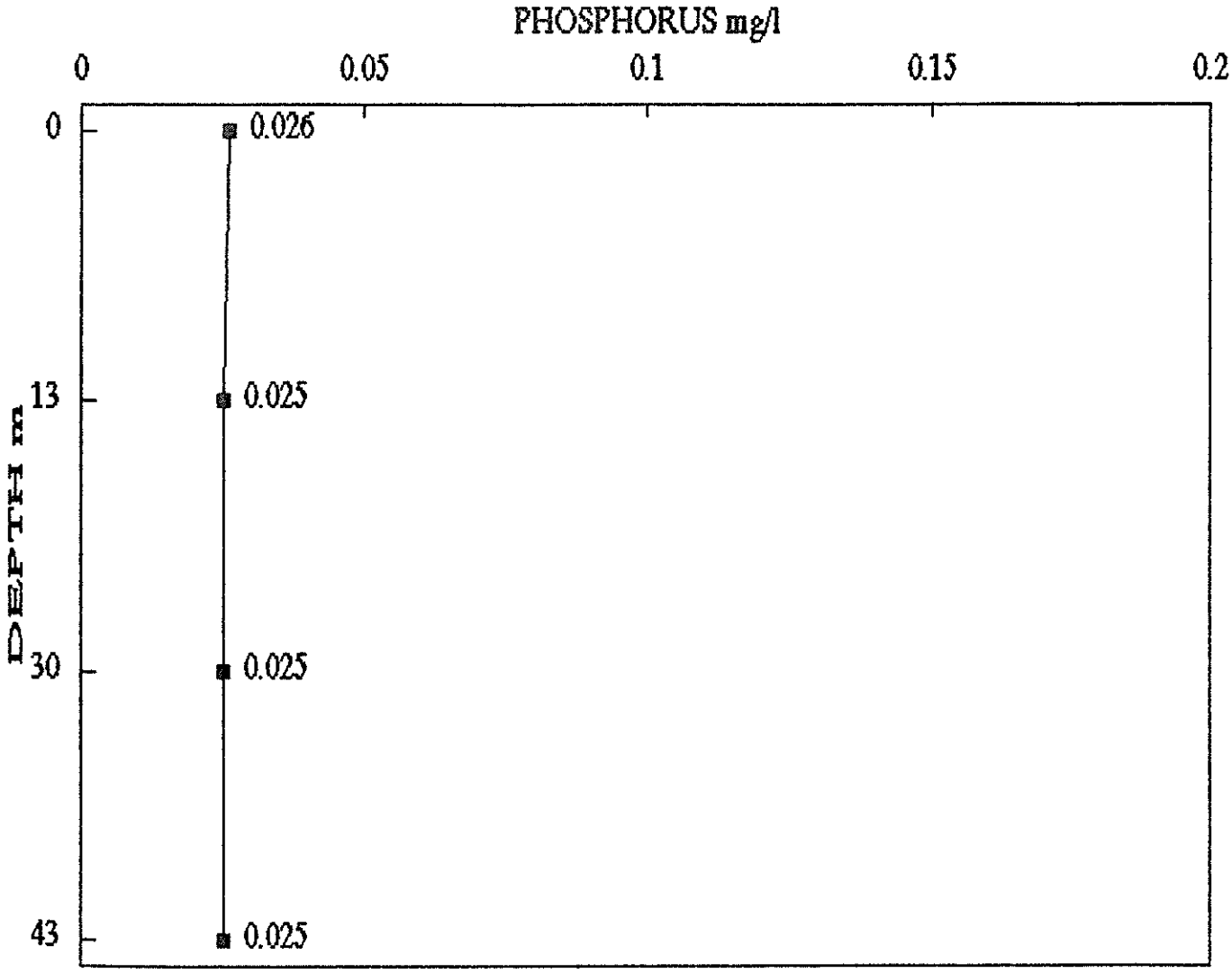
LAKE SALLIE

September 15,1988



LAKE SALLIE

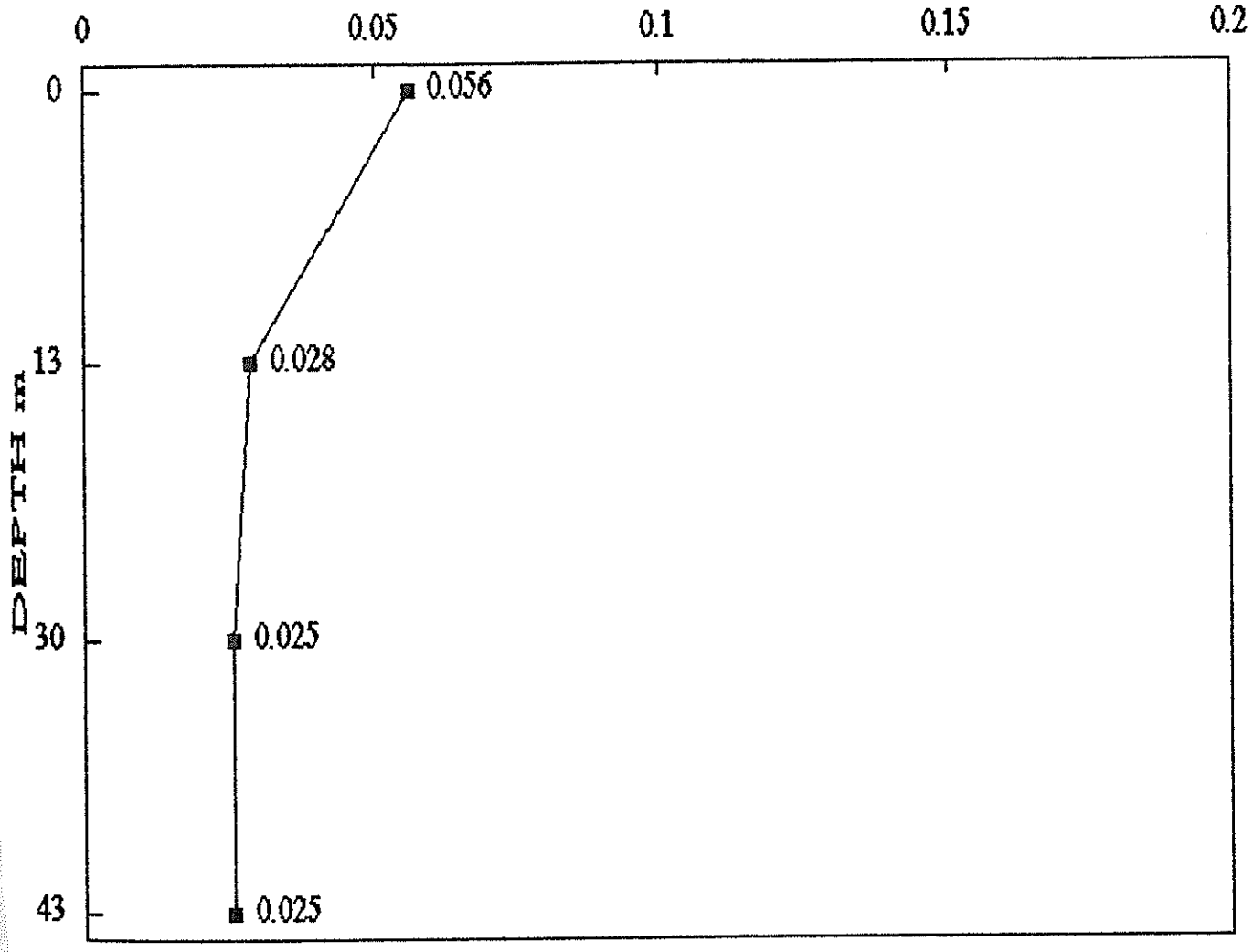
October 20,1988



LAKE SALLIE

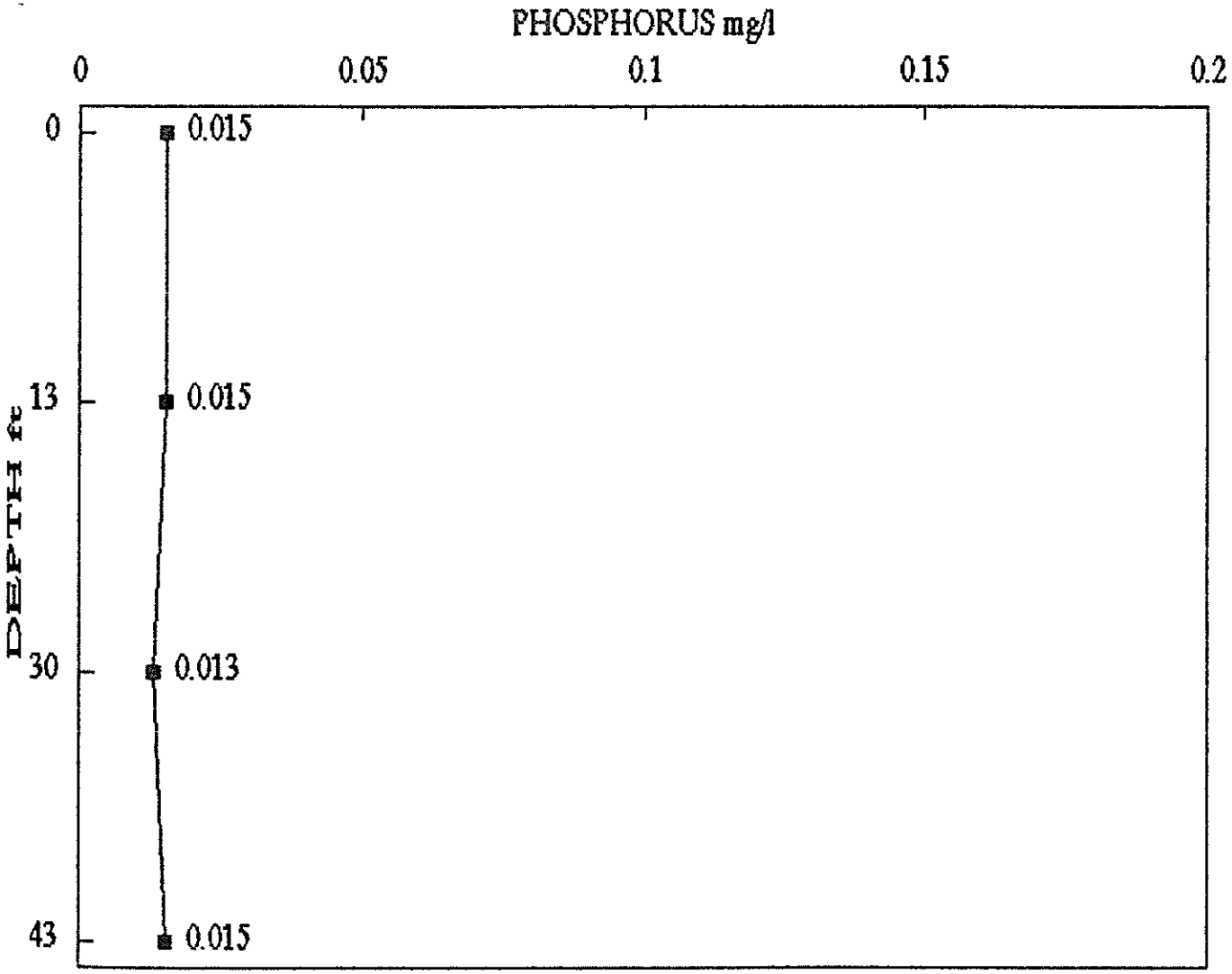
November 14,1988

PHOSPHORUS mg/l



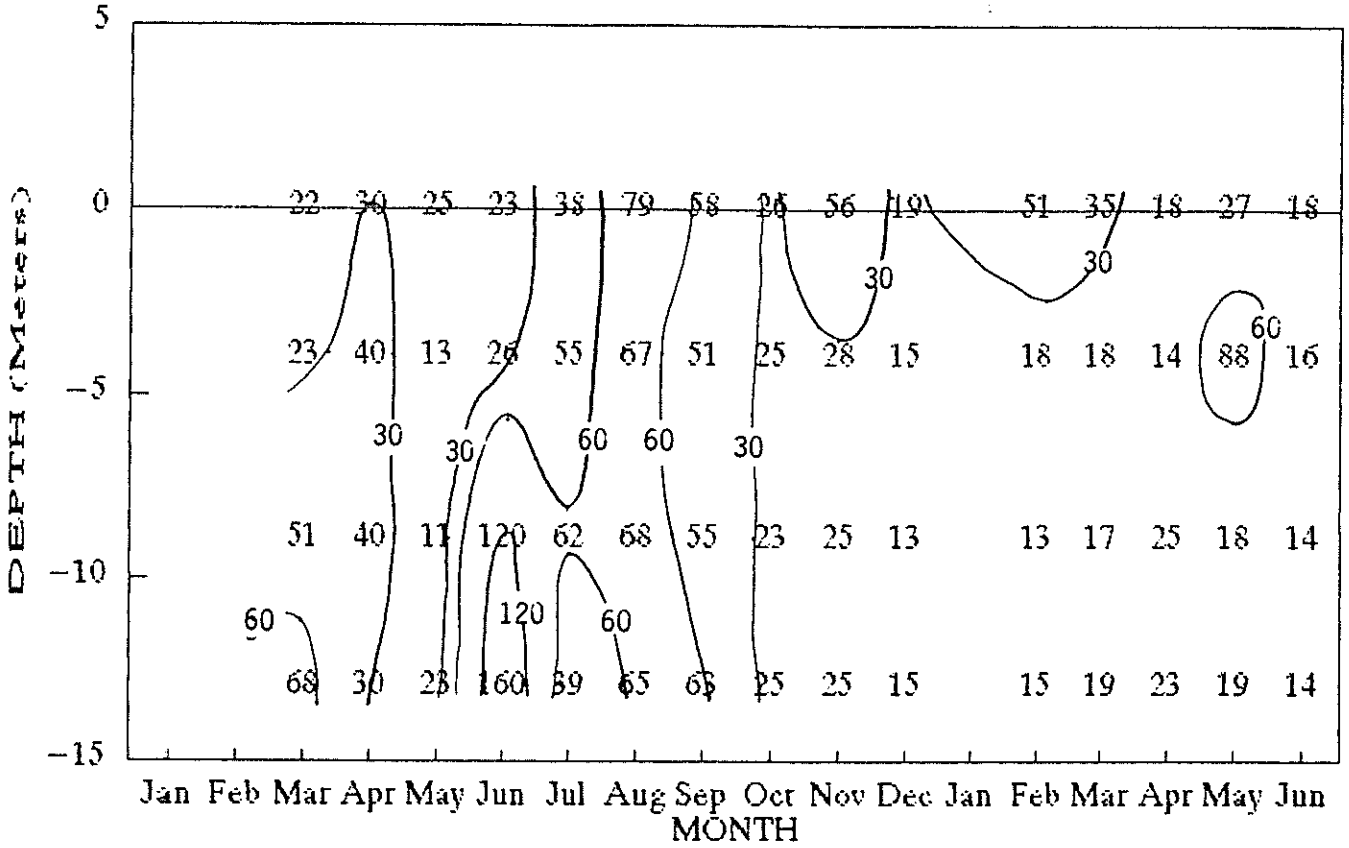
LAKE SALLIE

December 13,1988



LAKE SALLIE

TOTAL PHOSPHORUS – 1988 & 1989

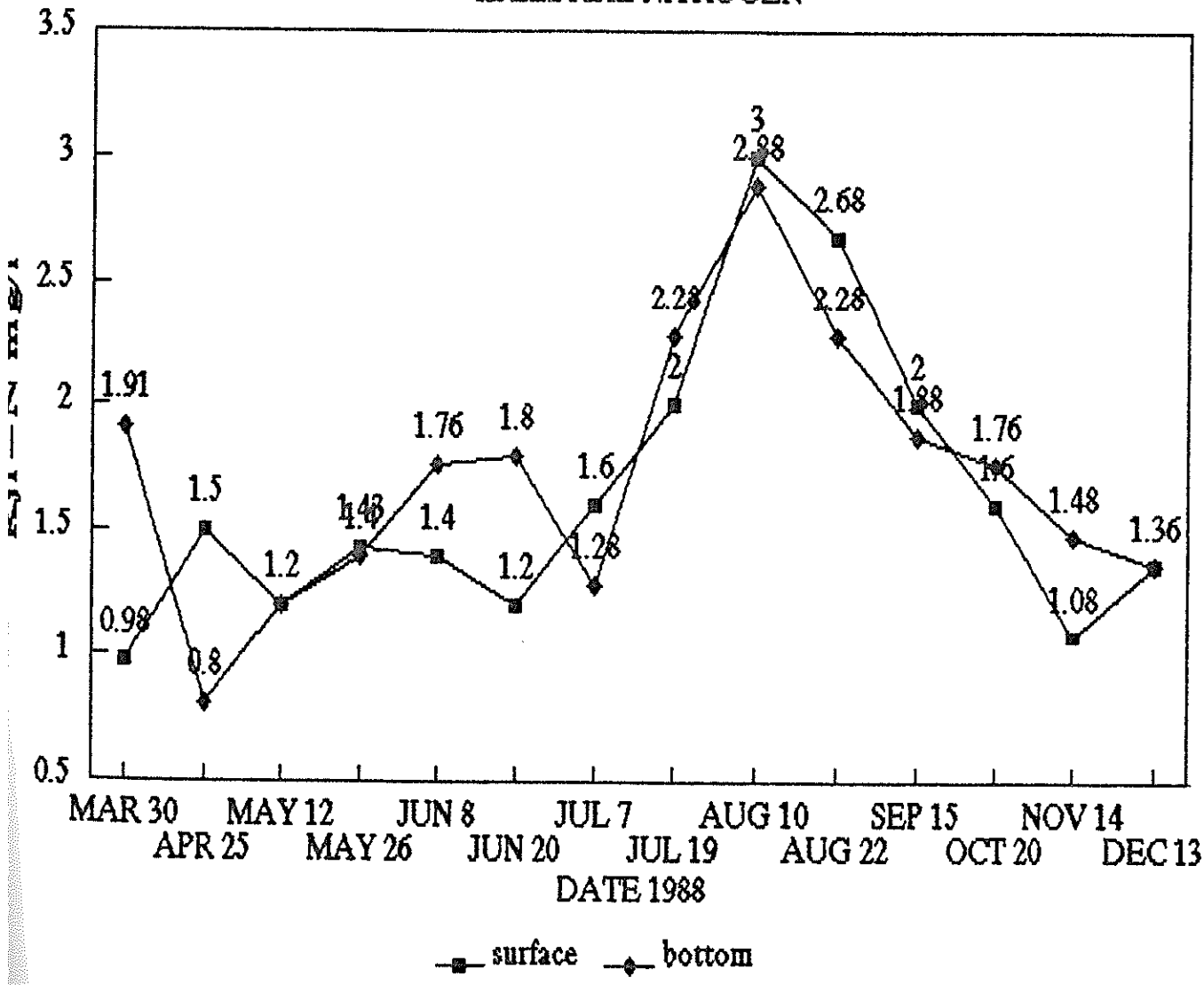


January, 1988 to June, 1989

* All concentrations in micrograms/liter

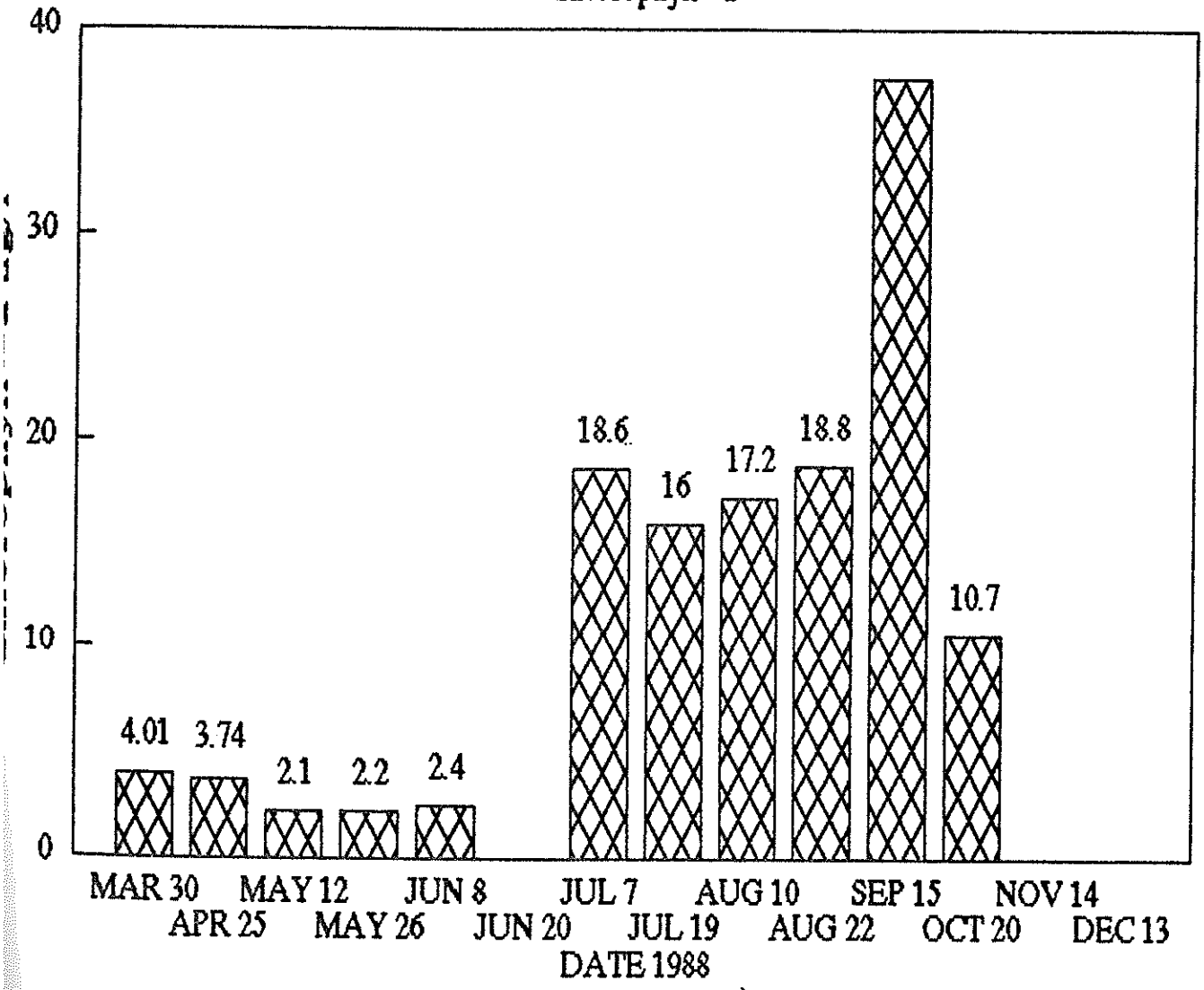
LAKE SALLIE

KJELDAHL NITROGEN



LAKE SALLIE

Chlorophyll–a



LAKE SALLIE
1988 PHYTOPLANKTON SAMPLING
DATA ANALYSIS

June 23, 1989

	5-12-88	6-7-88	6-20-88	7-7-88	8-10-88	9-12-88	10-19-88	11-14-88
Anabaena								
circinalis	-	-	1,684,800	416,480	448,000	-	-	-
flos-aquae	-	-	-	-	608,000	-	-	-
macrospora	-	-	-	425,600	1,200,000	18,240	-	-
Aphanizomenon								
flos-aquae	-	-	320,000	635,360	5,440,000	72,960	2,109	3,555
Aphanothece								
ridulans	-	-	-	-	320,000	-	-	-
Asterionella								
formosa	26,320	-	-	-	-	-	-	158
Aulacoseira								
spp.	-	-	-	-	32,000	79,040	798	553
Botryococcus								
braunii	-	96,000	-	-	-	-	-	3,555
Ceratium								
hirundinella	-	1,600	-	-	3,200	-	-	-
Chroomonas								
acuta	17,360	-	-	6,080	-	-	57	-
Coelosphairium								
naegelianum	-	-	-	-	1,920,000	942,400	10,260	-
Cosmarium								
protuberans	-	1,600	-	3,040	-	-	-	-
Cryptomonas								
erosa	560	3,200	9,600	6,080	16,000	12,160	399	237
Dictyosphaerium								
pulchellum	40,880	-	-	-	-	-	171	-
Dinobryon								
sertularia	22,400	19,200	8,000	3,040	-	-	-	-
Elakatothrix								
viridis	-	-	-	-	-	-	114	-
Fragilaria								
capucina	1,680	-	-	-	-	-	-	3,397
Fragilaria								
crotonensis	4,480	121,600	425,600	9,120	-	-	-	553
Gloeocapsa								
spp.	-	-	18,240	-	-	-	-	-
Gomphosphaeria								
aponina	-	-	565,440	800,000	-	-	-	-
lacustris	-	-	-	96,000	-	-	-	-
Lyngbya								
bergii	-	-	-	36,480	-	-	-	-
Mallomonas								
pseudocoronata	-	-	-	-	-	3,040	-	-
sp.	-	1,600	3,200	-	-	-	-	-
Microcystis								
aeruginosa	-	-	160,000	-	9,920,000	-	-	-
Nitzschia								
sp.	1,680	-	-	-	-	-	-	-
Oocystis								
parva	-	-	-	-	-	-	228	-
sp.	-	6,400	16,000	-	-	-	-	-
Oscillatoria								
princeps	-	-	-	-	-	18,240	-	-
tenuis	-	-	-	-	16,960,000	1,246,400	-	-
Pandorina								
morum	-	25,600	-	97,280	-	-	-	-
Peridinium								
inconspicuum	-	-	-	-	6,400	-	-	-
Pinnularia								
spp.	-	-	-	3,040	-	-	-	-
Quadrigula								
chodatii	-	-	12,800	-	-	-	-	-
Scenedesmus								
bijuga	1,120	-	-	-	-	-	-	-
Stephanodiscus								
alpinus	3,360	-	-	-	-	-	-	-
niagare	-	-	-	-	-	-	2,451	1,738
spp.	-	-	-	-	-	36,480	-	-
Synedra								
spp.	5,040	-	-	-	-	-	-	79
Total (Cells/l)	125,860	276,800	2,640,000	2,225,280	37,769,600	2,428,960	16,587	13,825
Total taxa (S)	11	9	9	1.65358	1.51364	1.10213	1.23498	1.7114
Diversity (H', bits)	1.26	0.935	0.768	2.56495	2.63906	2.19722	2.19722	2.19722
Diversity (H-max)	1.66	1.522	1.522	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SALLIE LAKE ZOOPLANKTON SUMMARY

DATE: 12 May 1988

ORGANISM	no.	density (#/m3)	% of total	average size	min. size	max. size
Daphnia pulex	8	6736	3.8	1.25	0.6	1.5
Daphnia galeata	2	1684	0.9	0.8	0.8	0.8
Daphnia retrocurva						
unknown Daphnia						
Bosmina sp.	6	5052	2.9	0.35	0.25	0.5
Total Cladocera	16	13473	7.6	0.86	0.25	1.5
Mesocyclops edax						
Juvenile cyclopoid	75	63157	35.7	0.82	0.5	1.3
Diaptomus oregonensis						
Cyclops bicuspidatus t.	8	6737	3.8	1.08	0.9	1.4
Juvenile calanoid	6	5052	2.9	0.77	0.6	0.9
Nauplial stages	43	36210	20.5	0.18	0.1	0.3
Total Copepod	132	111156	62.9	0.63	0.1	1.4
Ostracods						
Rotifers	62	52209	29.5	0.21	0.1	0.5
Total Organisms	210	176838	100	0.52	0.1	1.5

SALLIE LAKE ZOOPLANKTON SUMMARY

DATE: 9 June 1988

ORGANISM	no.	density (#/m3)	% of total	average size	min. size	max. size
Daphnia pulex	2	42	1.2	1.1	1.1	1.1
Daphnia galeata	56	1179	34.8	1.45	1	1.8
Daphnia retrocurva						
unknown Daphnia						
Bosmina sp.						
Total Cladocera	58	1221	36	1.43	1	1.8
Mesocyclops edax	8	168	5	1.39	1.3	1.45
Juvenile cyclopoid	4	84	2.5	0.82	0.75	0.9
Diaptomus oregonensis	4	84	2.5	1.33	1.2	1.45
Epischura lacustris						
Juvenile calanoid	2	42	1.2	0.7	0.7	0.7
Nauplial stages	8	168	5	0.15	0.1	0.25
Total Copepod	26	547	16.2	0.86	0.1	1.45
Ostracods	4	84	2.5	0.43	0.35	0.5
Rotifers	73	1537	45.3	0.12	0.1	0.15
Total Organisms	161	3389	100	0.72	0.1	1.8

SALLIE LAKE

ZOOPLANKTON SUMMARY

DATE: 9 June 1988

ORGANISM	no.	density (#/m3)	% of total	average size(mm)	min. size(mm)	max. size(mm)
Daphnia pulex	26	547.4	23.2	1.32	1	2
Daphnia galeata	36	757.9	32.1	1.86	1	2.3
Daphnia retrocurva	12	252.6	10.7	0.9	0.7	1.1
unknown Daphnia	22	463.1	19.6	0.8	0.4	1.2
Bosmina sp.						
Total Cladocera	96	2021	85.7	1.35	0.4	2.3
Macrocyclops albidus	2	42.1	1.79	1.6	1.6	1.6
Juvenile cyclopoid						
Diaptomus oregonensis	10	210.5	8.93	1.28	1.1	1.5
Epischura lacustris	2	42.1	1.79	1.8	1.8	1.8
Juvenile calanoid	2	42.1	1.79	0.7	0.7	0.7
Total Copepod	16	336.8	14.29	1.3	0.7	1.8
Ostracods						
Total Organisms	112	2357.8	100	1.34	0.4	2.3

SALLIE LAKE ZOOPLANKTON SUMMARY

DATE: 20 June 1988

ORGANISM	no.	density (#/m3)	% of total	average size(mm)	min. size(mm)	max. size(mm)
Daphnia pulex	4	168.4	4.6	1.7	1.6	1.8
Daphnia galeata	52	2189.4	59.1	1.5	0.9	2
Daphnia retrocurva	16	673.7	18.2	1	0.6	1.4
unknown Daphnia	12	505.3	13.6	0.65	0.6	0.7
Bosmina sp.						
Total Cladocera	84	3536.8	95.5	1.3	0.6	2
Macrocyclops albidus						
Juvenile cyclopoid						
Diaptomus oregonensis	2	84.2	2.3	0.8	0.8	0.8
Epischura lacustris						
Juvenile calanoid	2	84.2	2.3	1.3	1.3	1.3
Total Copepod	4	168.4	4.6	1.1	0.8	1.3
Ostracods						
Total Organisms	88	3705.2	100	1.3	0.6	2

SALLIE LAKE ZOOPLANKTON SUMMARY

DATE: 7 July 1988

ORGANISM	no.	density (#/m3)	% of total	average size(mm)	min. size(mm)	max. size(mm)
Daphnia pulex	92	9684	79.3	1.4	1	1.8
Daphnia galeata						
Daphnia retrocurva	14	1473.7	12.1	1.6	1.4	1.7
unknown Daphnia	8	842.1	6.9	0.6	0.4	0.7
Bosmina sp.						
Total Cladocera	114	11999.7	98.3	1.4	0.4	1.8
Macrocyclops albidus						
Juvenile cyclopoid						
Diaptomus oregonensis	2	210.5	1.7	1.2	1.2	1.2
Epischura lacustris						
Juvenile calanoid						
Total Copepod	2	210.5	1.7	1.2	1.2	1.2
Ostracods						
Total Organisms	116	12210.3	100	1.4	0.4	1.8

SALLIE LAKE

ZOOPLANKTON SUMMARY

DATE: 10 August 1988

ORGANISM	no.	density (#/m3)	% of total	average size	min. size	max. size
Daphnia pulex	43	1810	39.5	1.33	0.6	1.6
Daphnia galeata						
Daphnia retrocurva	8	337	7.3	1.17	1	1.3
unknown Daphnia	4	168	3.7	0.5	0.4	0.6
Bosmina sp.						
Sida crystallina	2	84	1.8	1	1	1
Total Cladocera	57	2400	52.3	1.24	0.4	1.6
Mesocyclops edax	10	421	9.2	1.4	1.1	1.6
Juverile cyclopoid	2	84	1.8	0.8	0.8	0.8
Diaptomus oregonensis	4	168	3.7	1.2	1.2	1.2
Epischura lacustris						
Juvenile calanoid	6	253	5.5	0.97	0.9	1
Naupliar stages	6	253	5.5	0.17	0.1	0.2
Total Copepod	28	1179	25.7	0.97	0.1	1.6
Ostracods	2	84	1.8	0.5	0.5	0.5
Rotifers	20	842	18.4	0.17	0.15	0.2
Total Organisms	109	4589	100	1.06	0.1	1.6

SALLIE LAKE

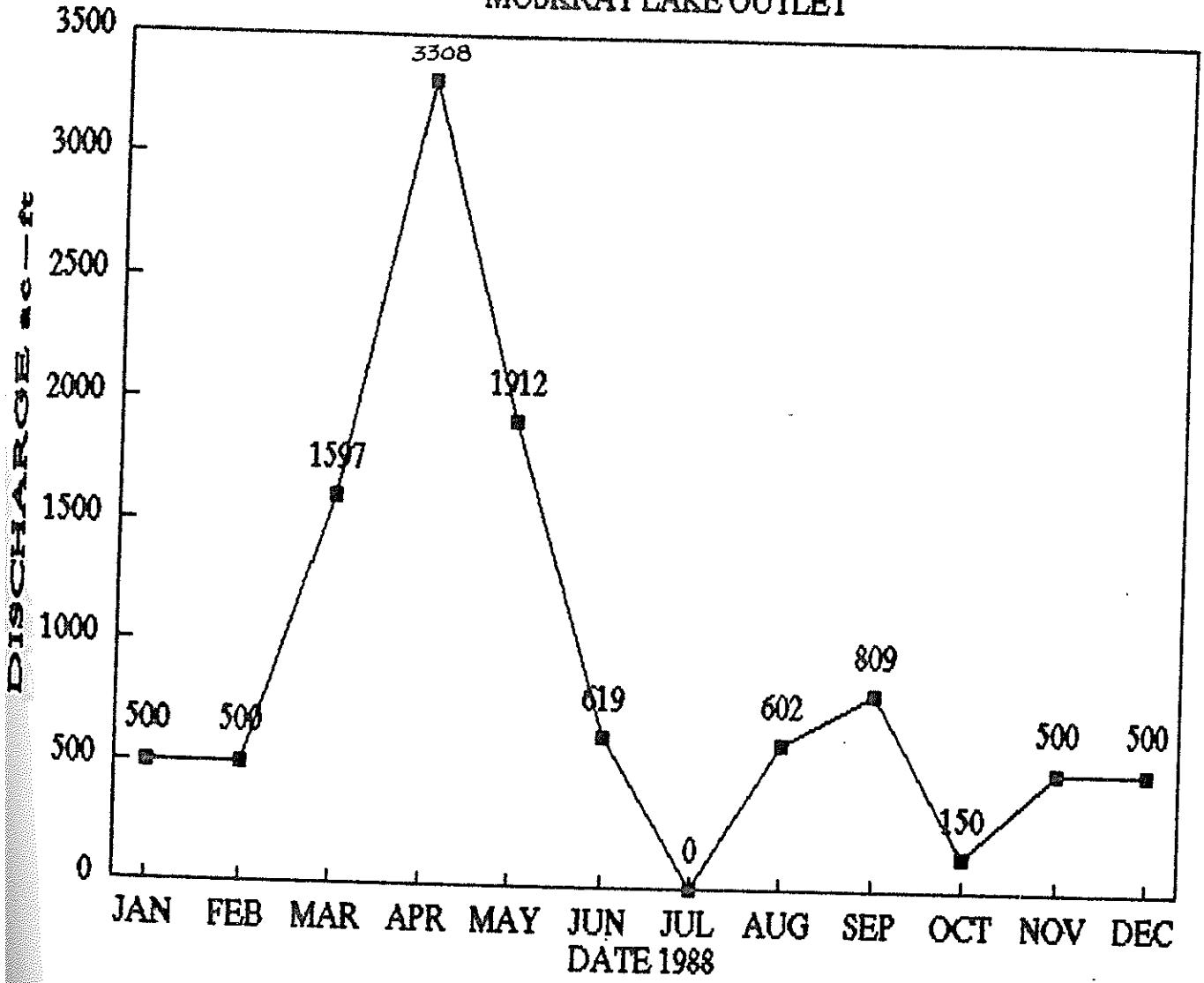
ZOOPLANKTON SUMMARY

DATE: 14 November 1988

ORGANISM	no.	density (#/m3)	% of total	average size	min. size	max. size
Daphnia pulex	74	7789	52.9	1.32	0.8	2.5
Daphnia galeata	46	4842	32.9	1.32	1	1.6
Daphnia retrocurva						
unknown Daphnia						
Bosmina sp.	2	210	1.4	0.4	0.4	0.4
Sida crystallina						
Total Cladocera	122	12842	87.1	1.3	0.4	2.5
Mesocyclops edax						
Juvenile cyclopoid	6	632	4.3	0.57	0.5	0.6
Diaptomus oregonensis	2	211	1.4	1.3	1.3	1.3
Epischura lacustris						
Juvenile calanoid	6	632	4.3	0.97	0.9	1
Naupliar stages	2	211	1.4	0.15	0.15	0.15
Total Copepod	16	1684	11.4	0.76	0.15	1.3
Ostracods						
Rotifers	2	211	1.4	0.1	0.1	0.1
Total Organisms	140	14737	100	1.22	0.1	2.5

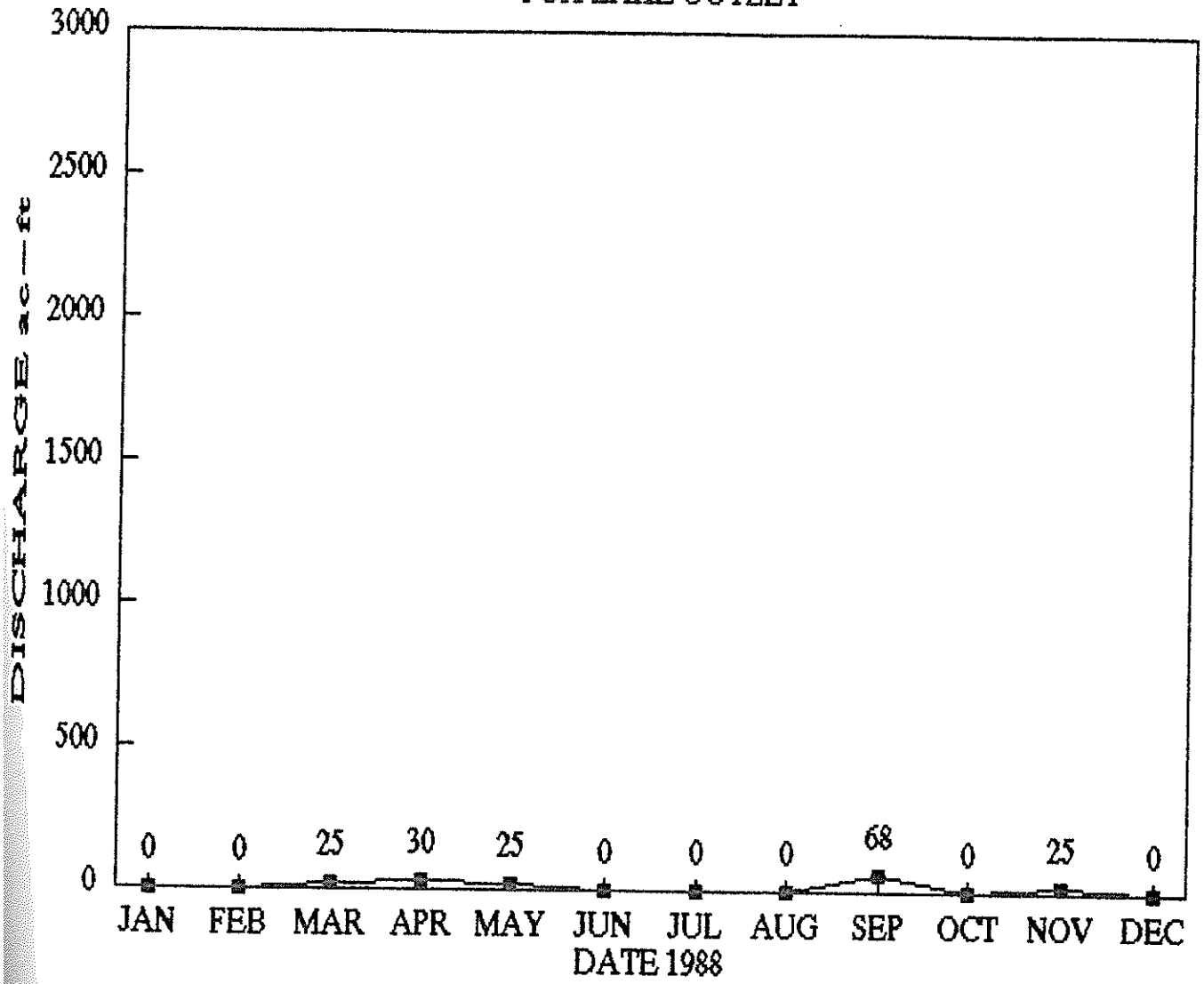
LAKE SALLIE

MUSKRAT LAKE OUTLET



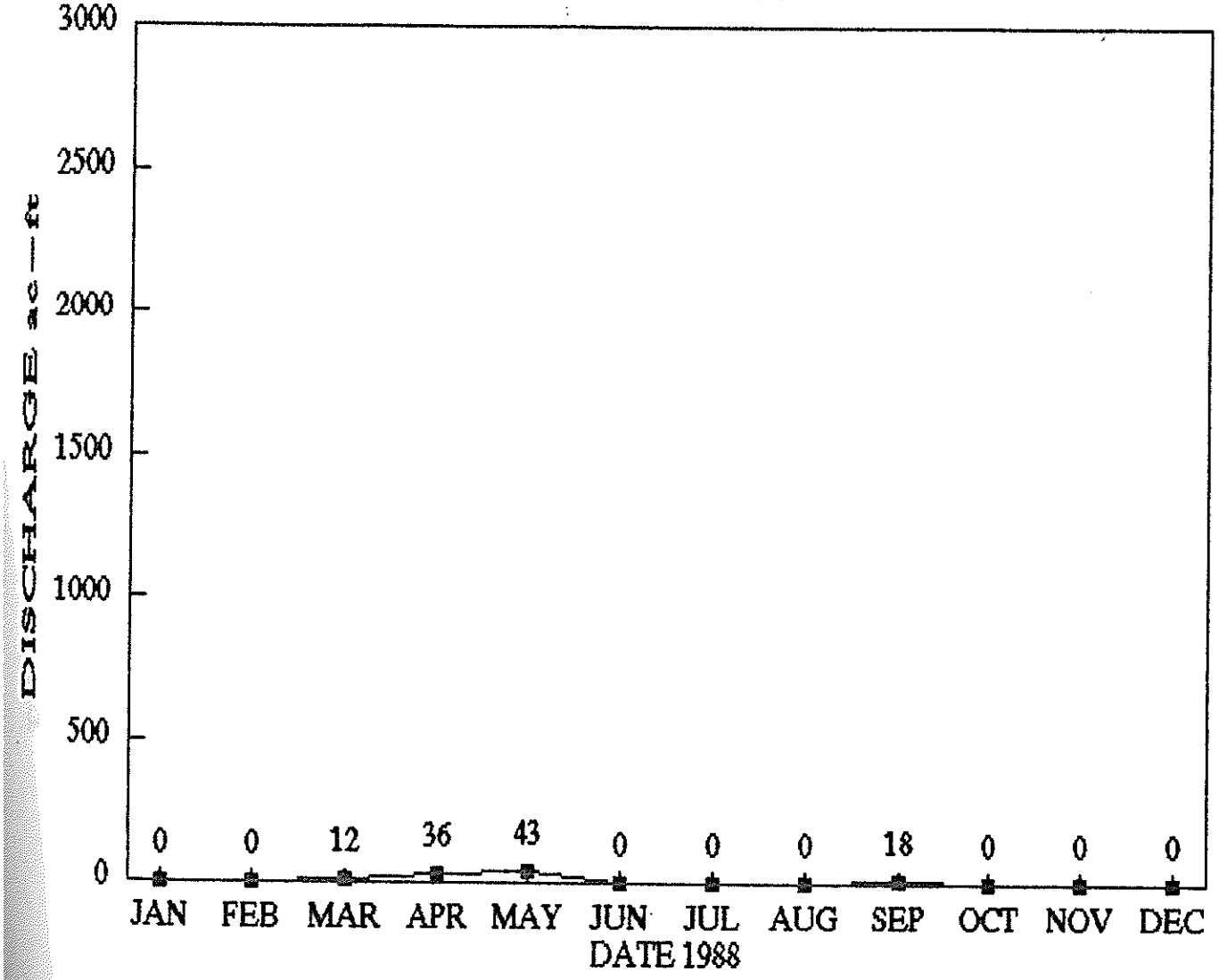
LAKE SALLIE

FOX LAKE OUTLET



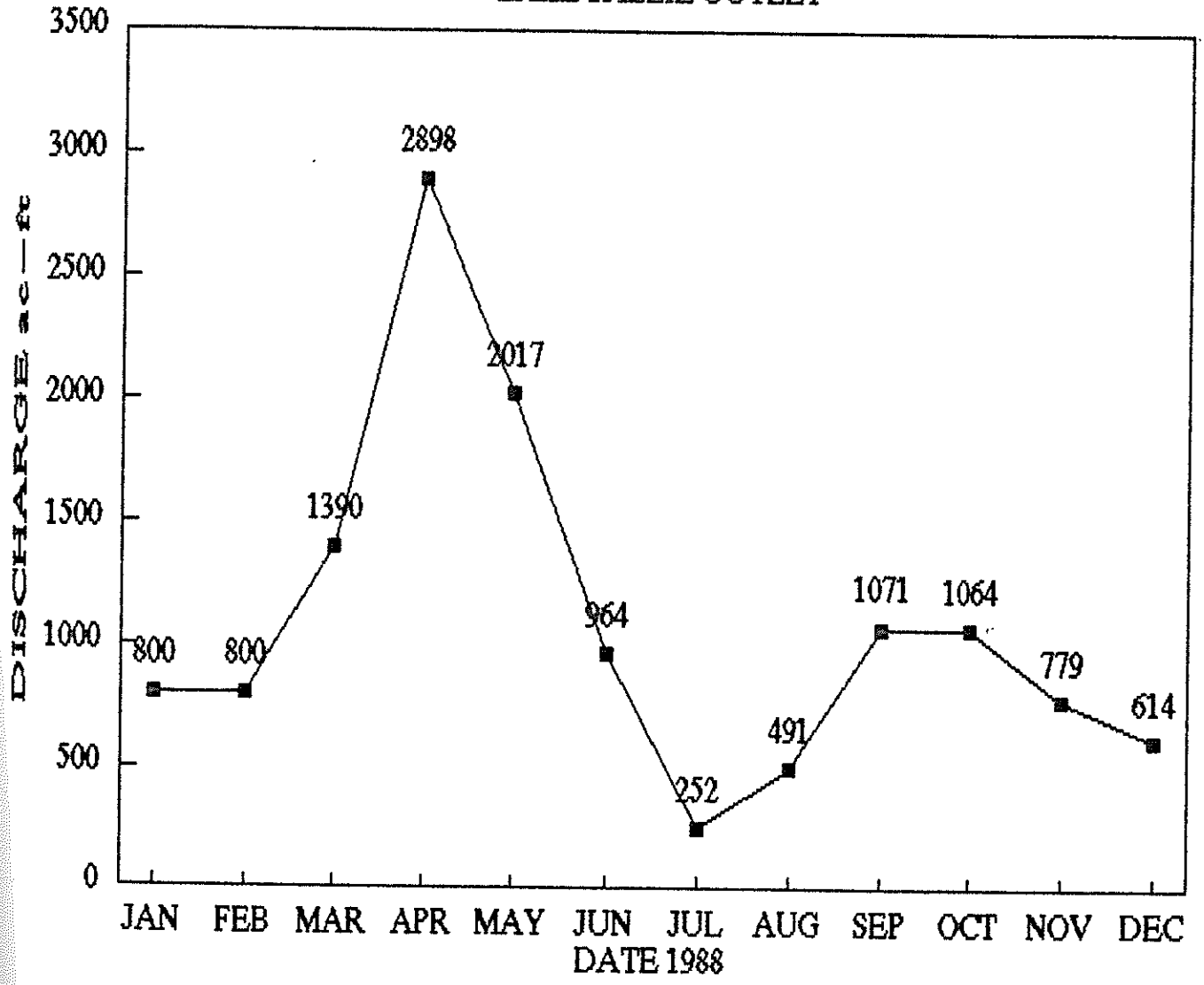
LAKE SALLIE

MONSON LAKE



LAKE SALLIE

LAKE SALLIE OUTLET



LAKE SALLIE

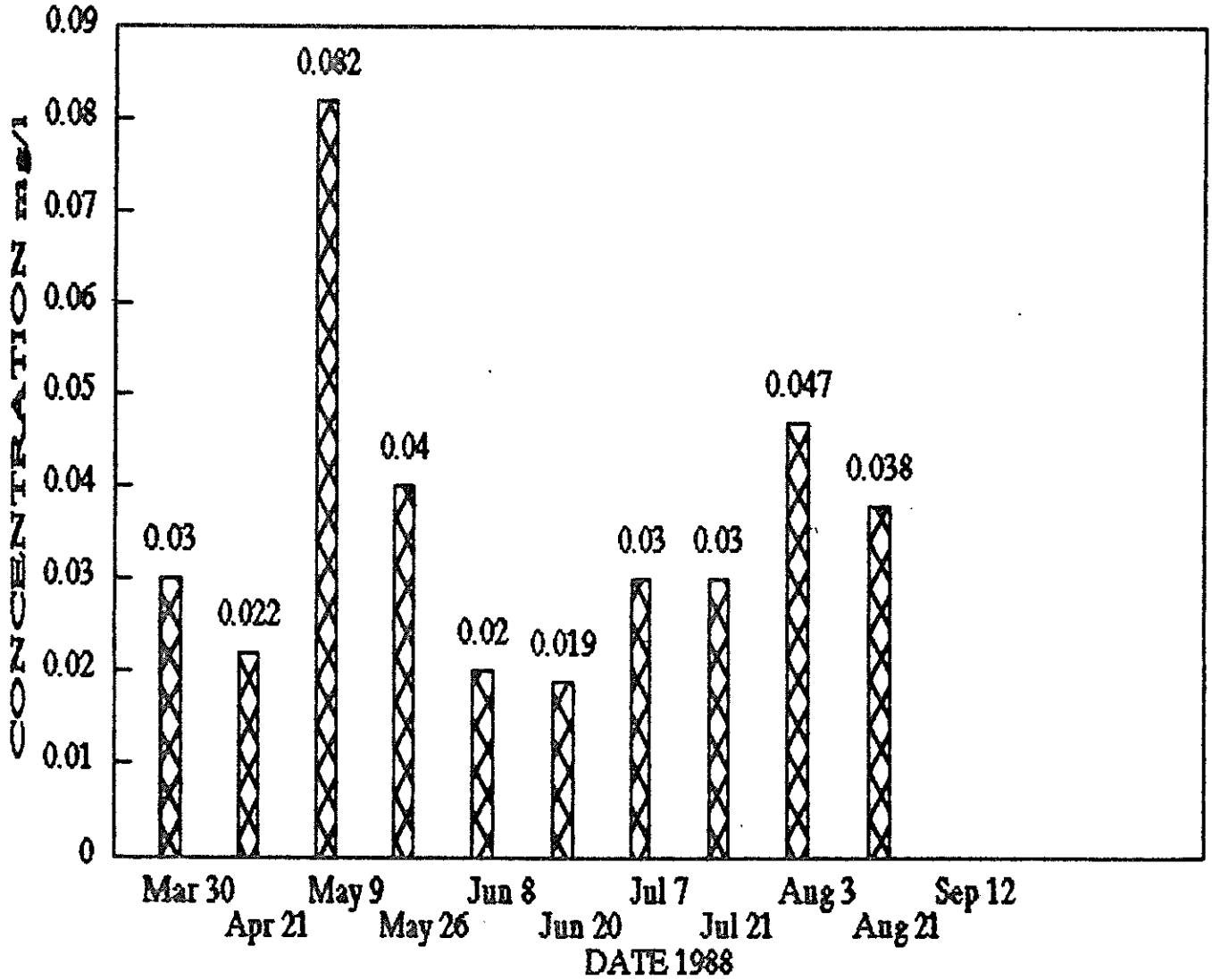
1988 INFLOW SAMPLING

Phosphorus	3/30/88	4/21/88	5/9/88	5/26/88	6/8/88	6/20/88	7/7/88	7/21/88	8/3/88	8/21/88	8/22/88	9/12/88	9/20/88
S-1 Sallie Outlet		0.03	0.004	0.130	0.022	0.027	0.031	0.035	0.076	0.053	0.060	0.051	0.045
S-2 Fox Lake Outlet		0.01	0.027		0.038						0.029		
S-3 Monson Lake		0.01	0.010		0.023						0.032	0.026	0.036
S-3A Rearing Ponds		0.02	0.043										
S-4 Sallie Lake Inlet		0.03	0.022	0.082	0.040	0.020	0.019	0.030	0.030	0.047	0.048	0.038	

Total Suspended Solids													
S-1 Sallie Outlet		4.05	9.5	3.2	3.7	2.0	3.6	6.0	26.7	7.8	8.2	7.3	7.6
S-2 Fox Lake Outlet		3.19	1.8		0.6						1.4		
S-3 Monson Lake		2.01	0.6		0.9						5.3	4.0	
S-3A Rearing Ponds		0.55	1.6										
S-4 Sallie Lake Inlet		1.83	2.6	2.4	3.8	1.8	0.6	3.0	1.1	13.5	10.7	7.8	6.7

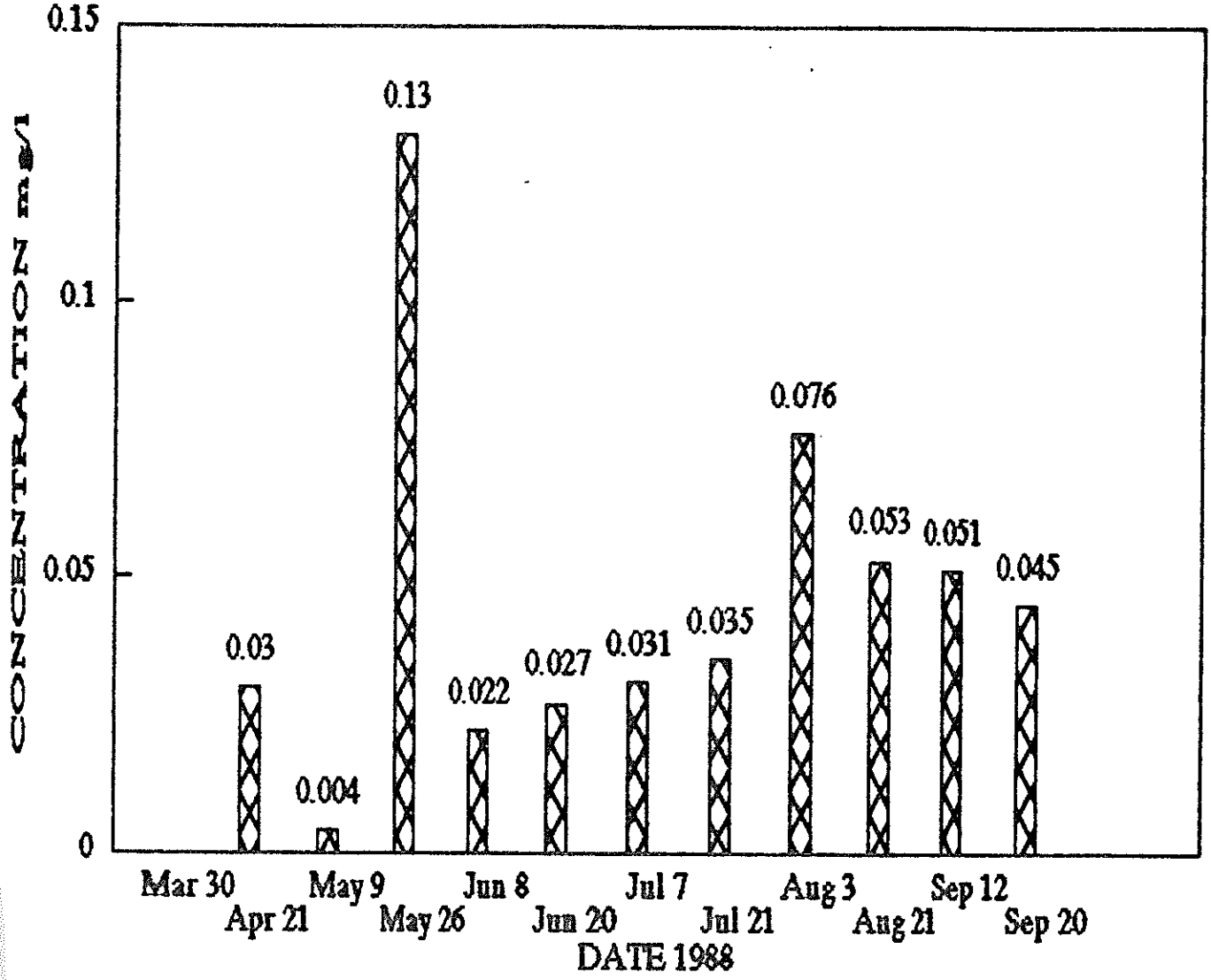
MUSKRAT LAKE OUTLET

PHOSPHORUS



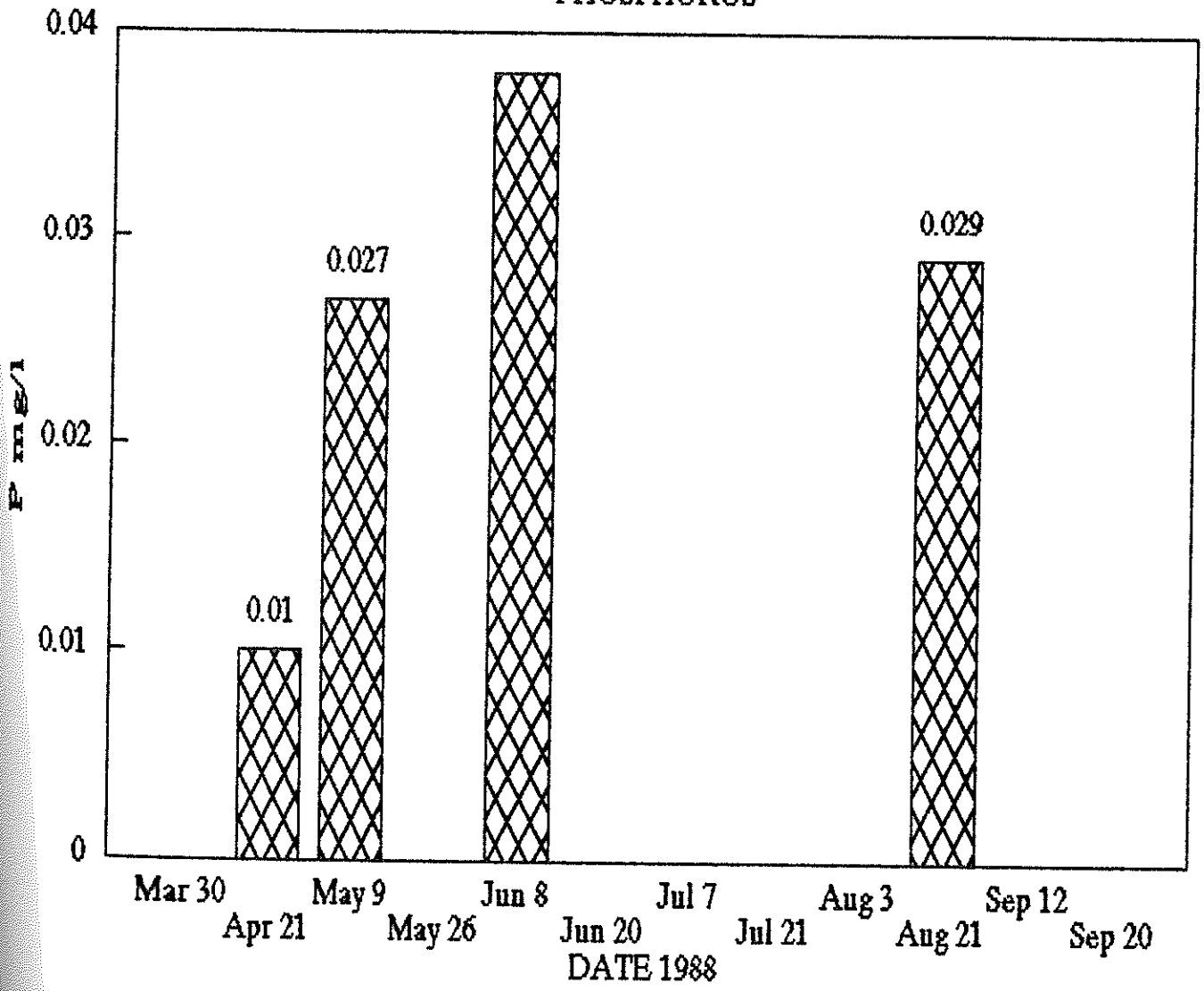
LAKE SALLIE OUTLET

PHOSPHORUS



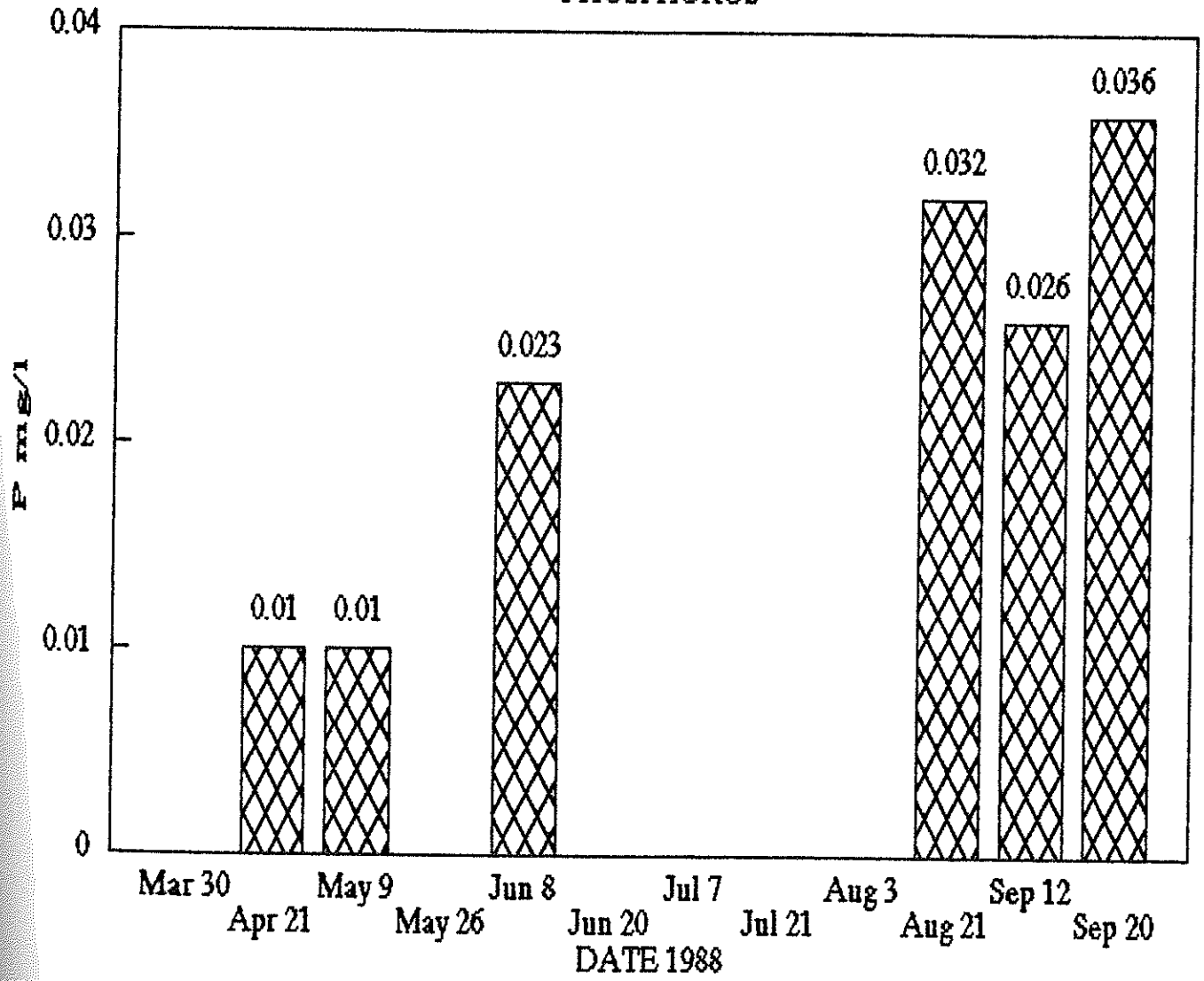
FOX LAKE OUTLET

PHOSPHORUS



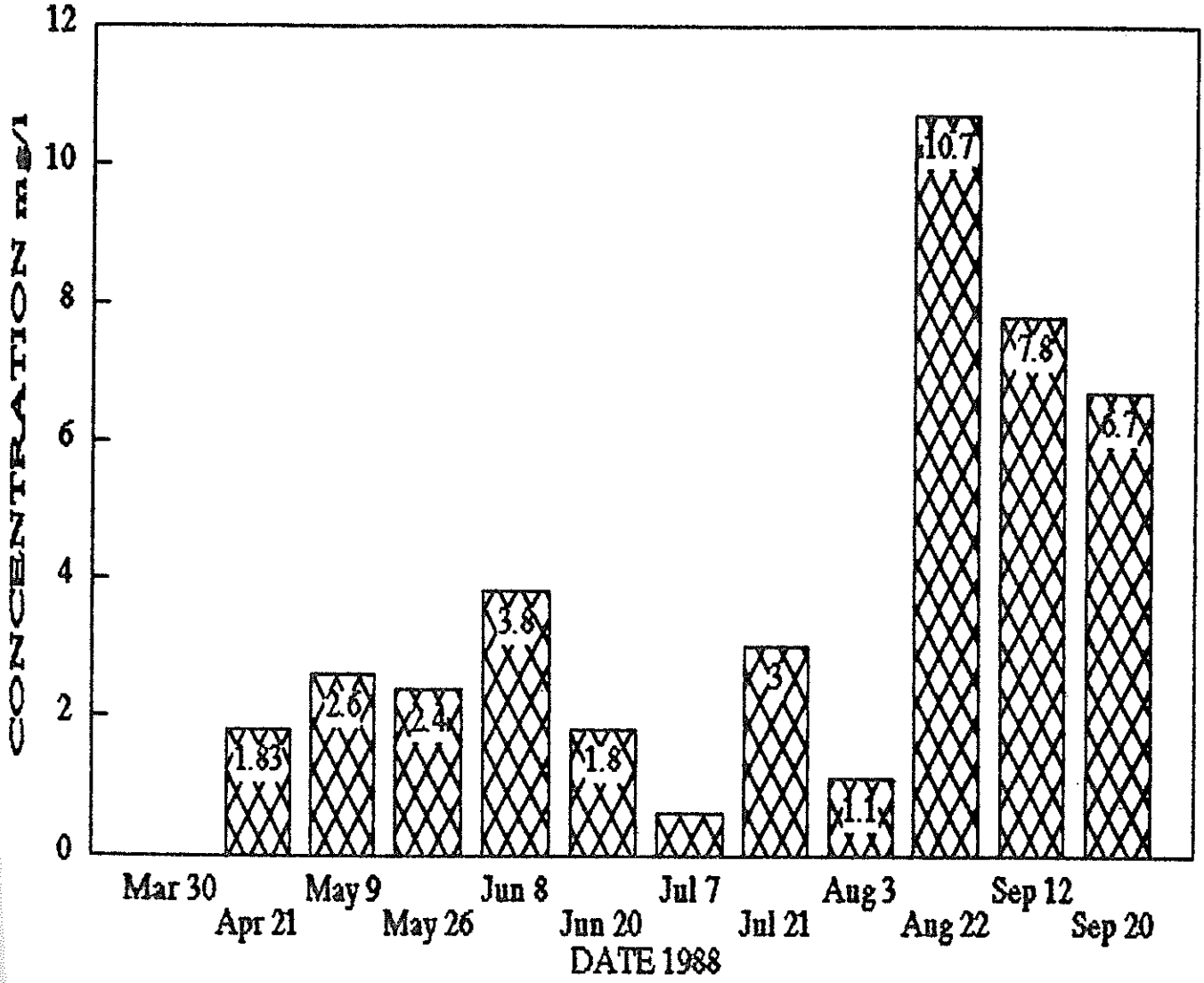
MONSON LAKE

PHOSPHORUS



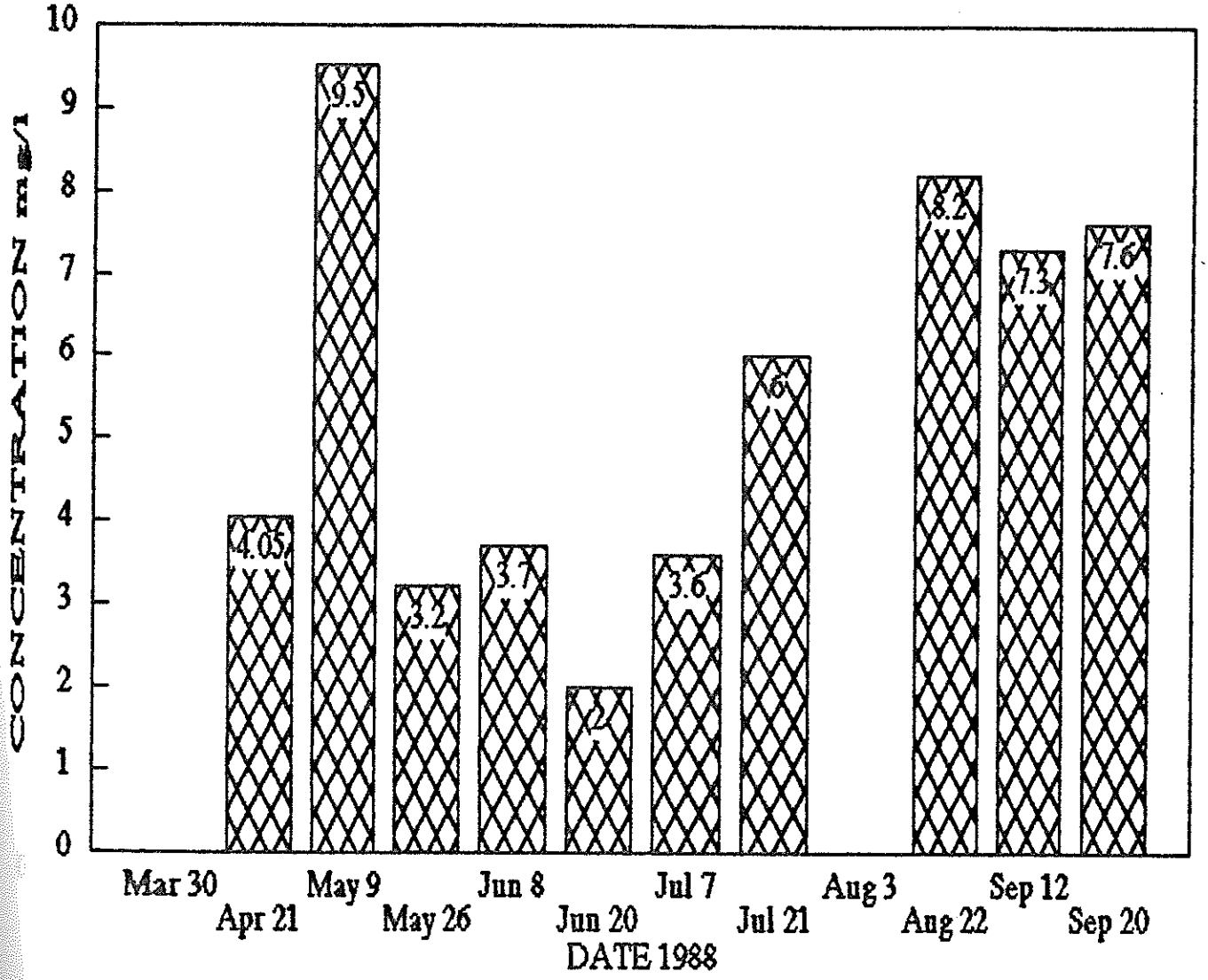
MUSKRAT LAKE OUTLET

TOTAL SUSPENDED SOLIDS



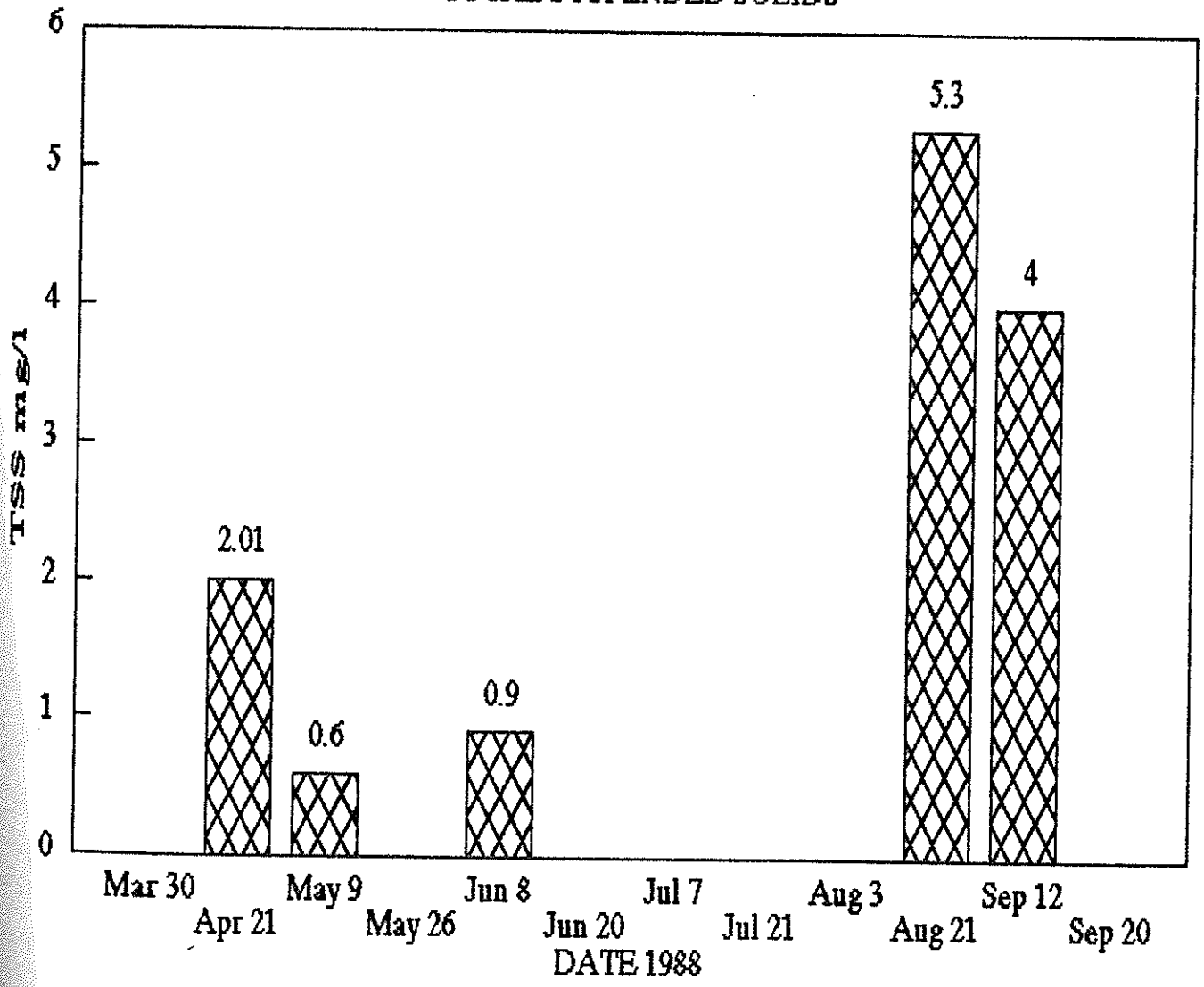
LAKE SALLIE OUTLET

TOTAL SUSPENDED SOLIDS



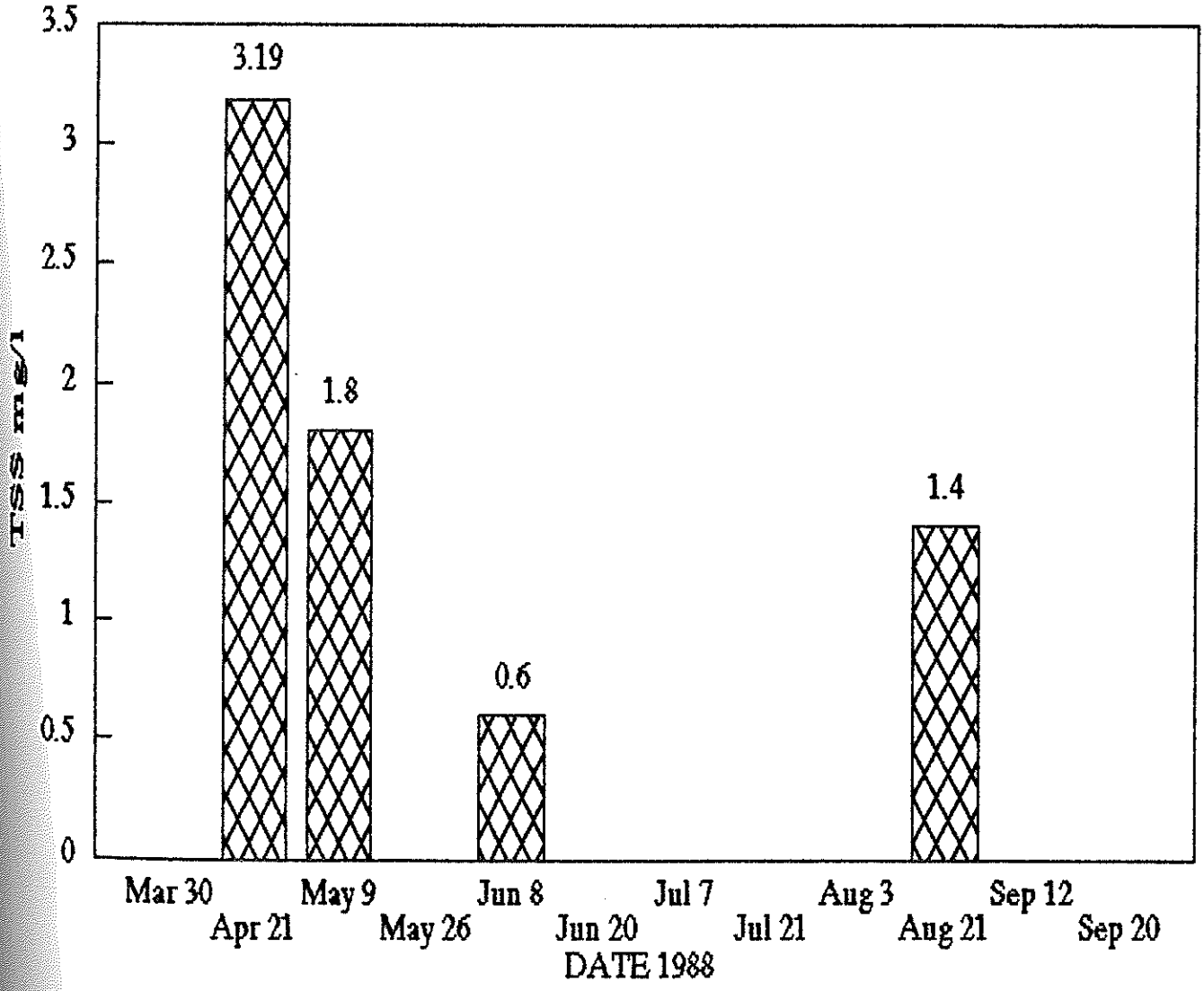
MONSON LAKE

TOTAL SUSPENDED SOLIDS



FOX LAKE OUTLET

TOTAL SUSPENDED SOLIDS



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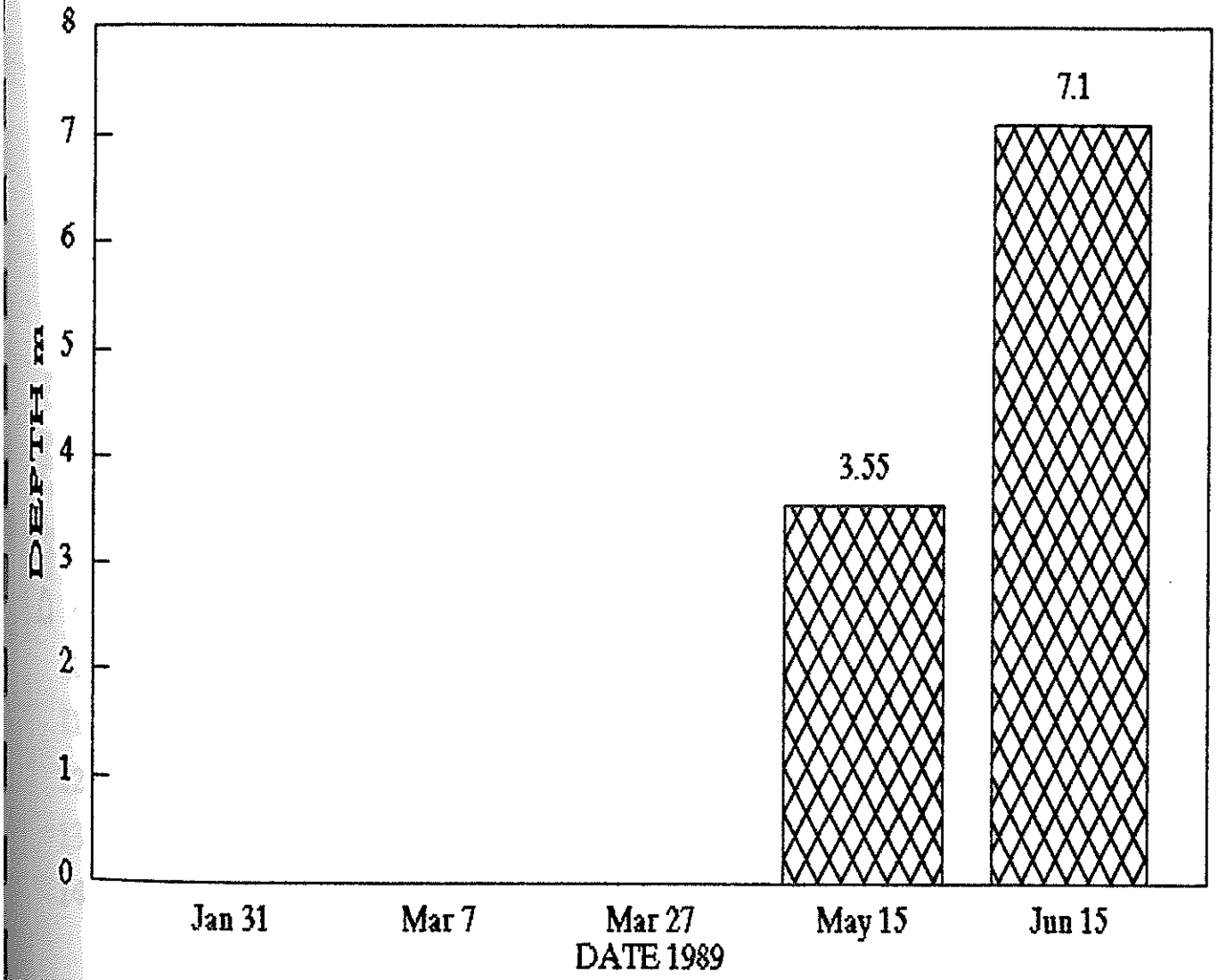
LAKE SALLIE

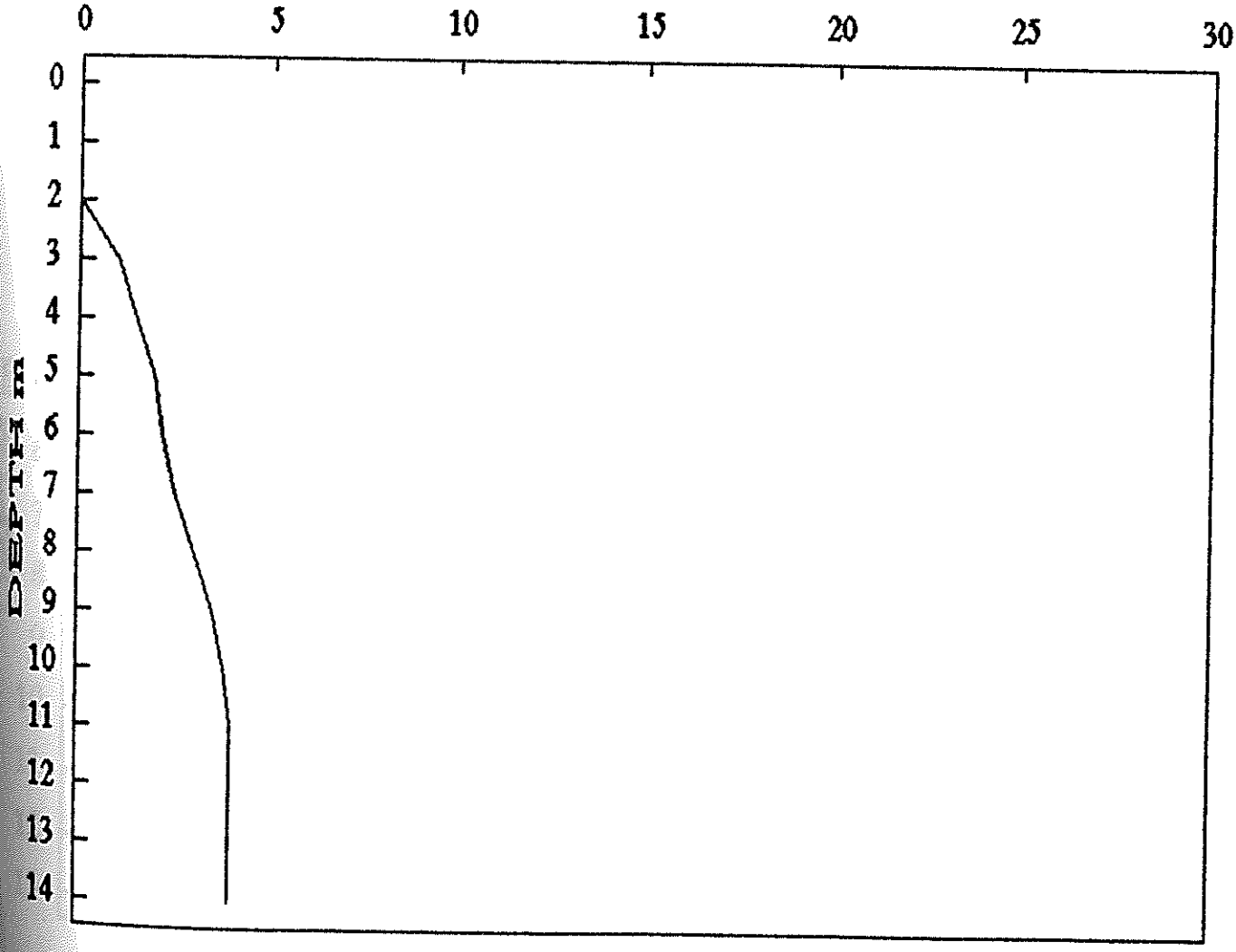
SECCHI DISK



LAKE SALLIE

January 31,1989

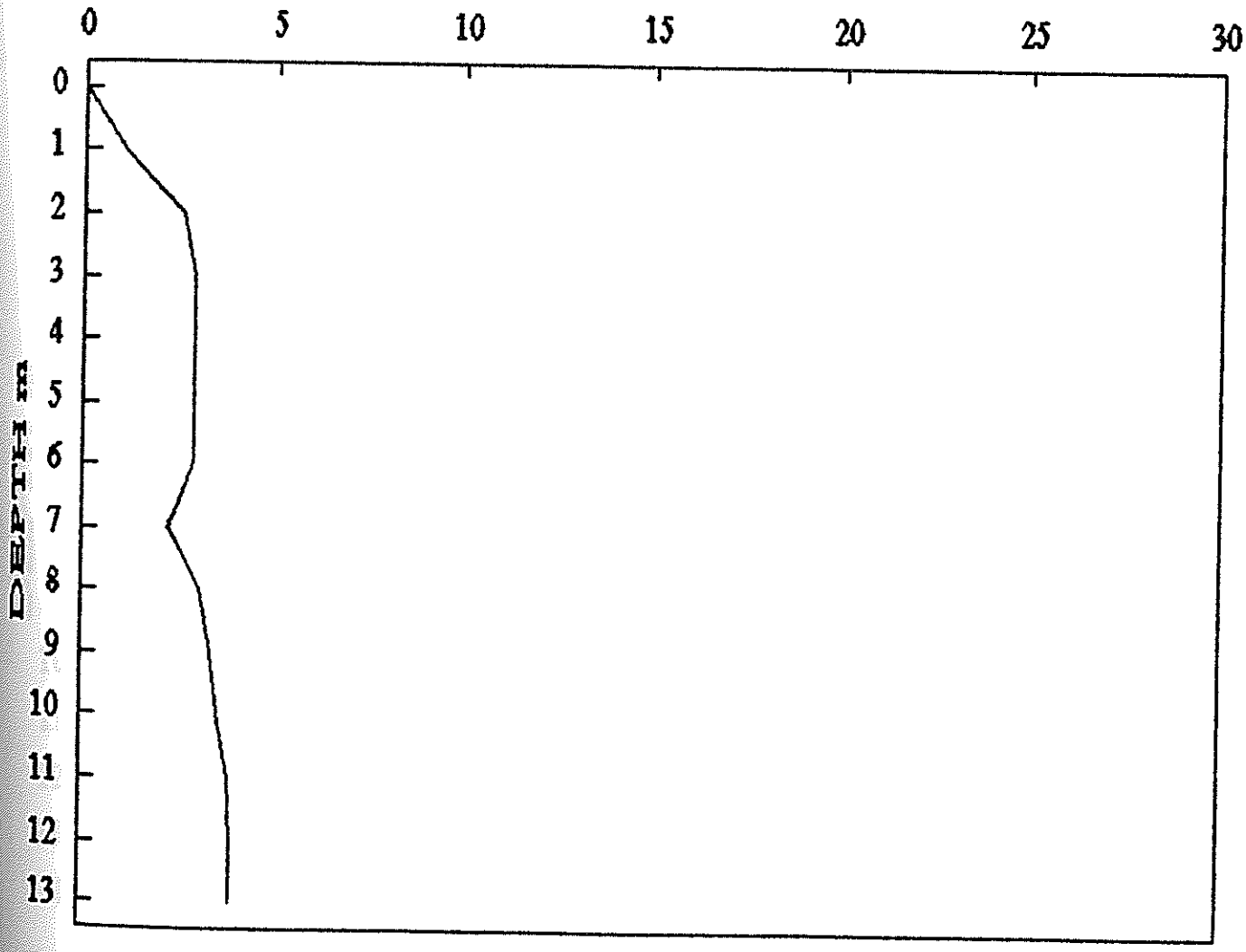
TEMPERATURE C



LAKE SALLIE

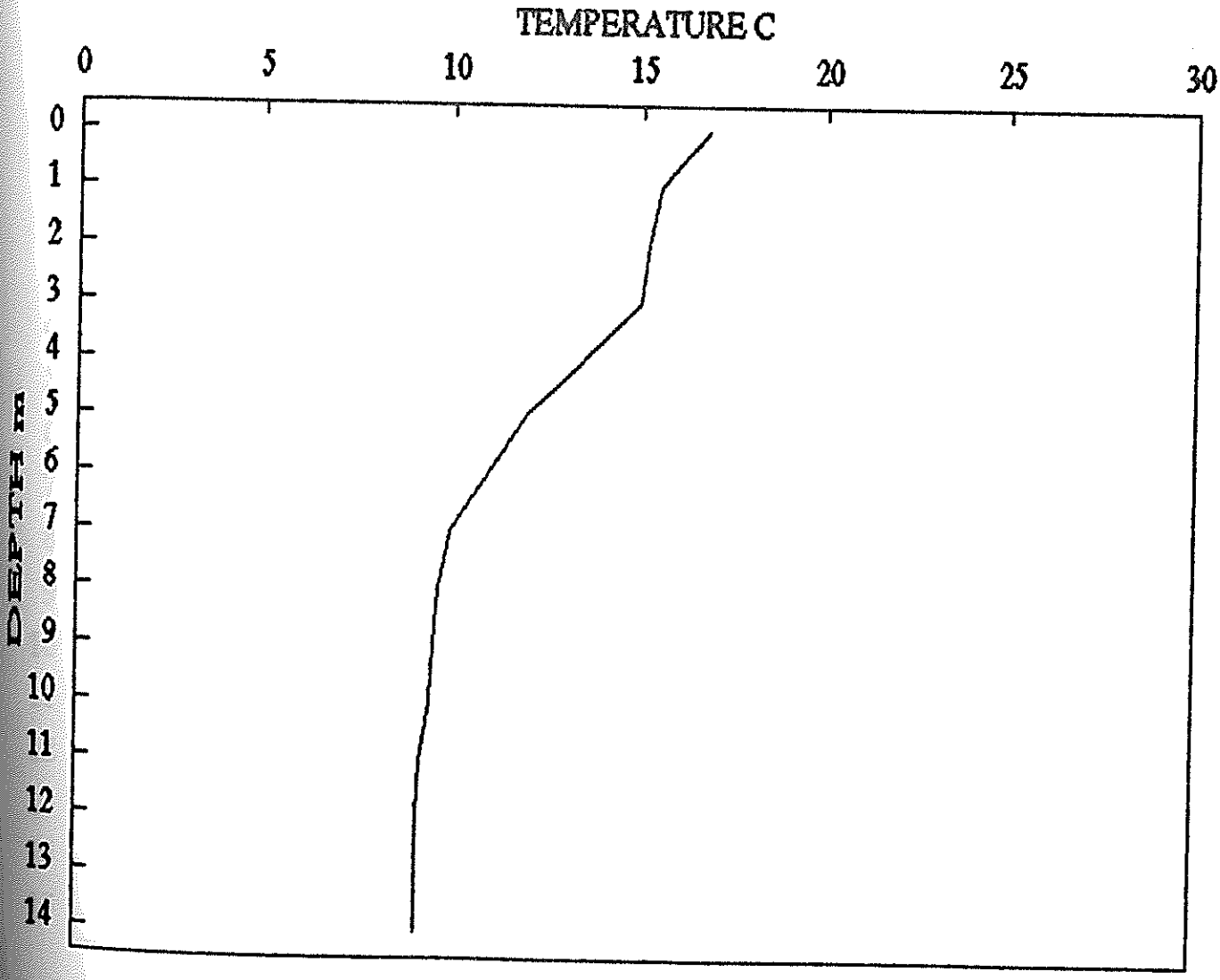
March 27,1989

TEMPERATURE C



LAKE SALLIE

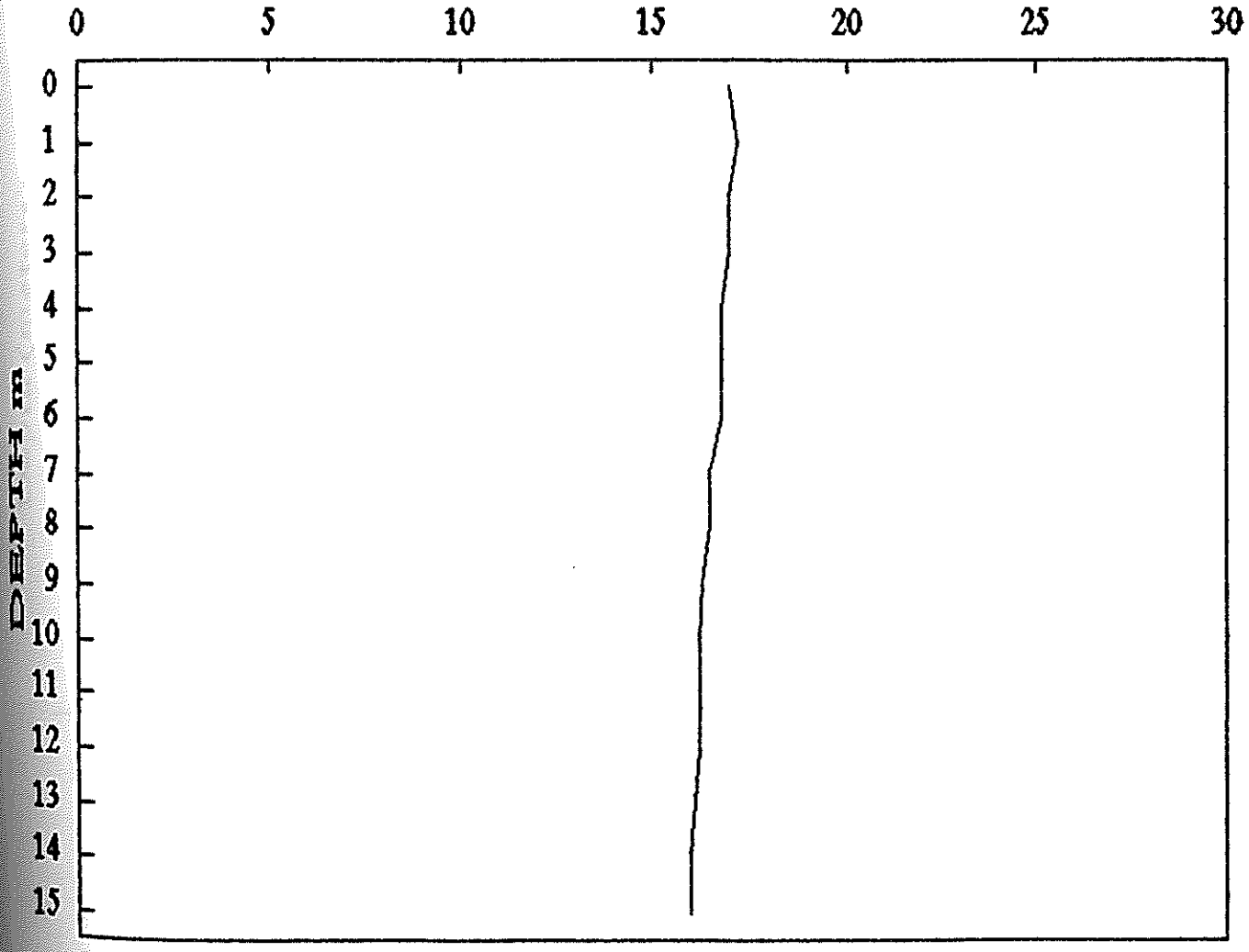
May 15,1989



LAKE SALLIE

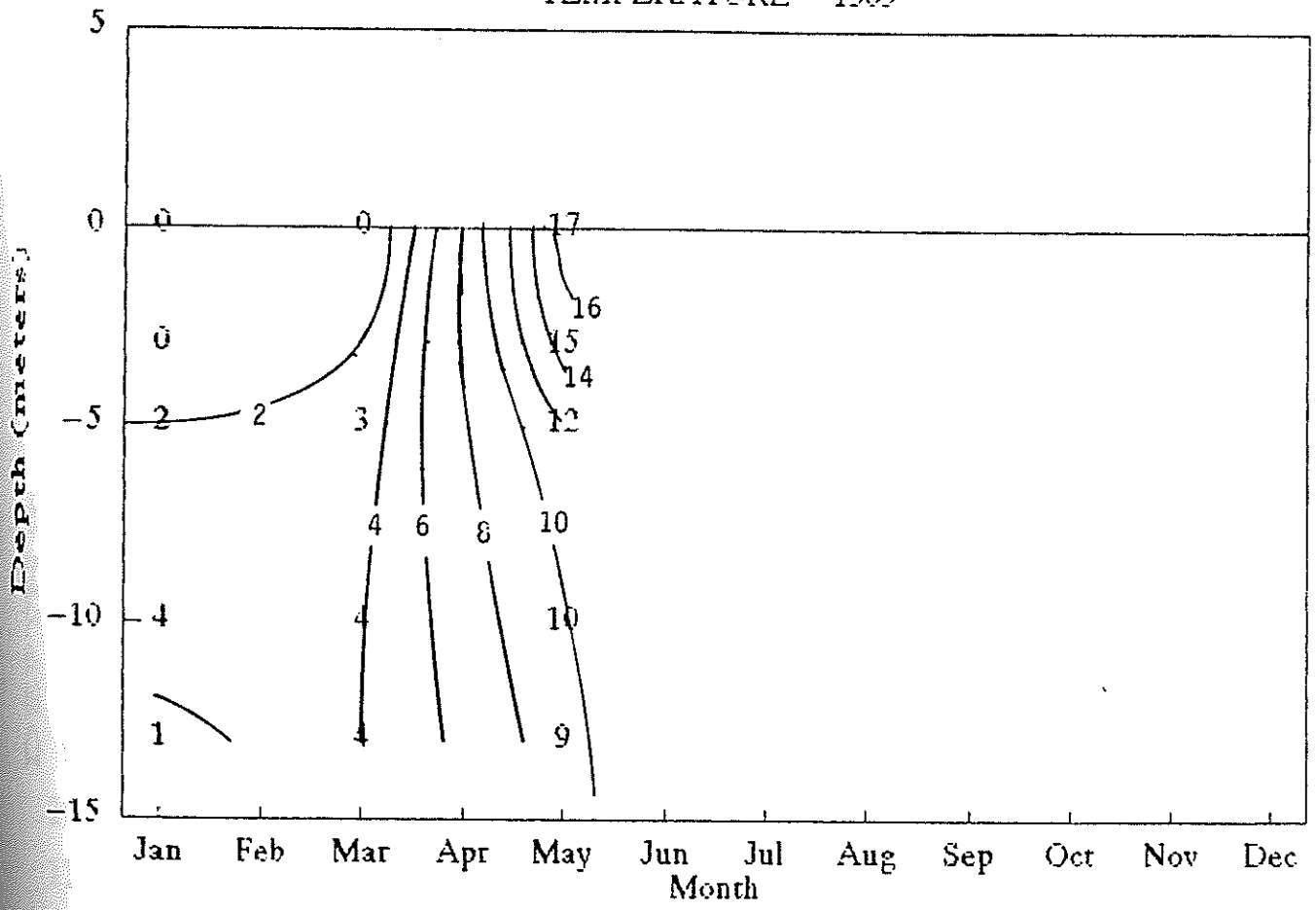
June 15,1989

TEMPERATURE C



LAKE SALLIE

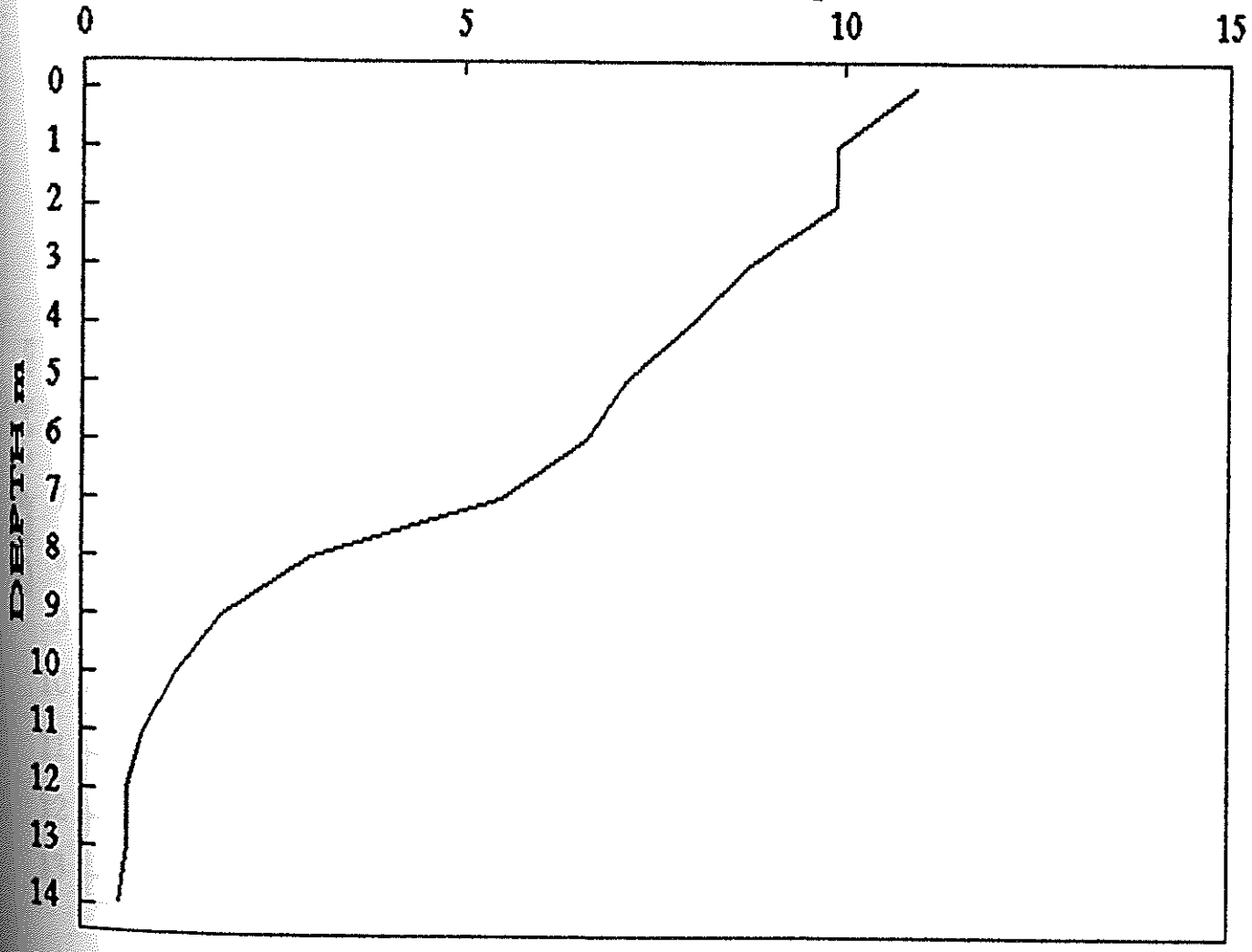
TEMPERATURE – 1989



LAKE SALLIE

January 31,1989

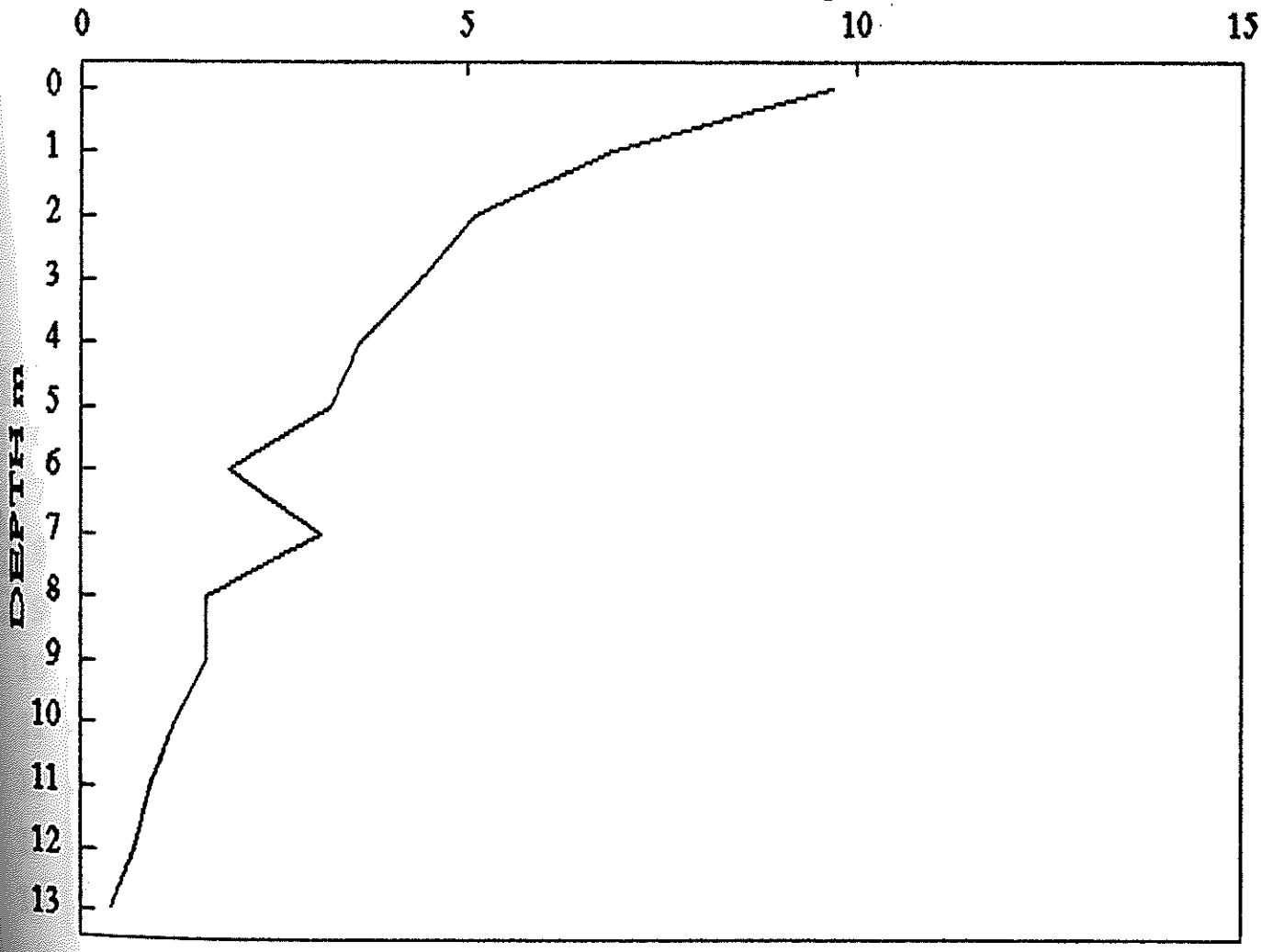
DISSOLVED OXYGEN mg/l



LAKE SALLIE

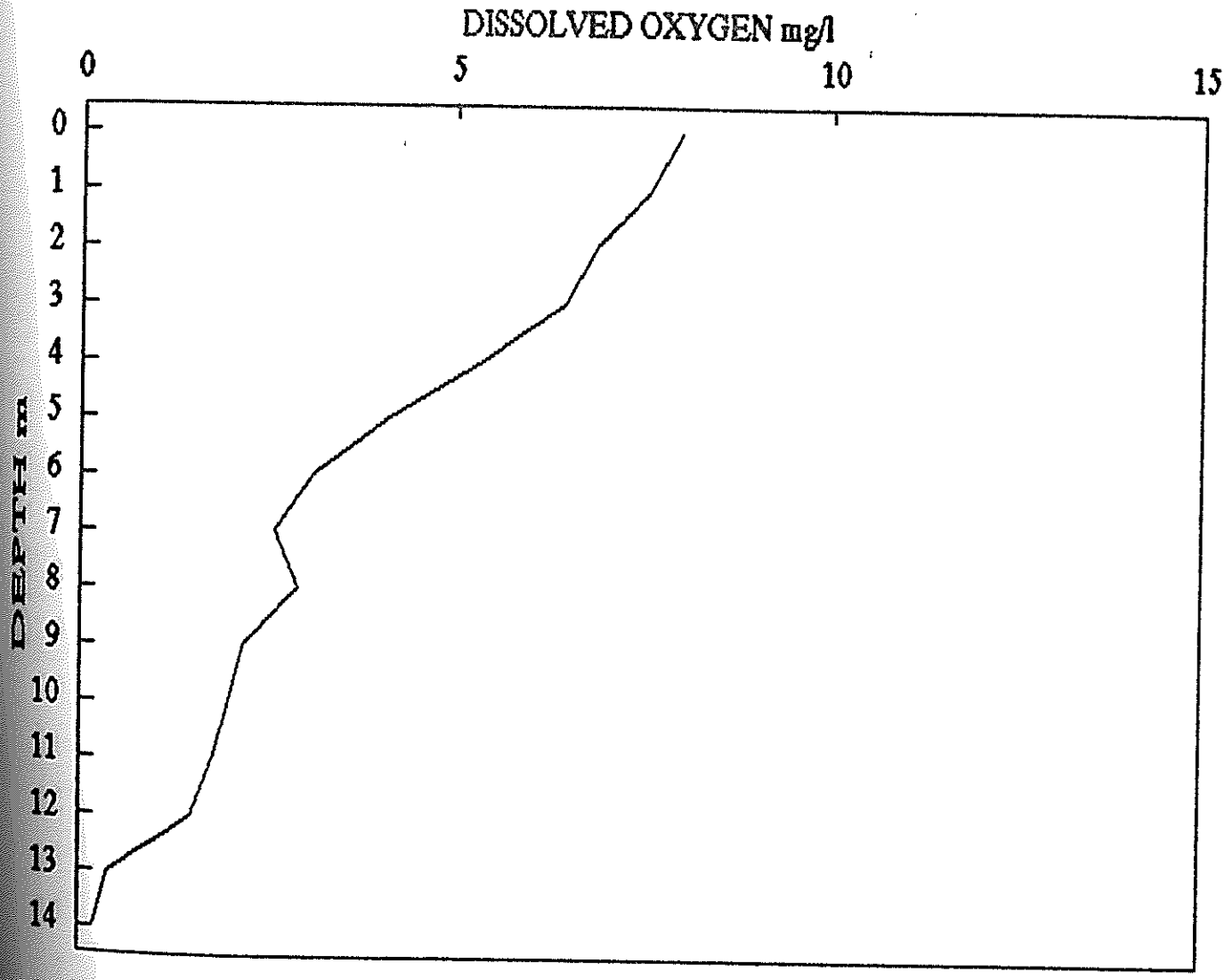
March 27,1989

DISSOLVED OXYGEN mg/l



LAKE SALLIE

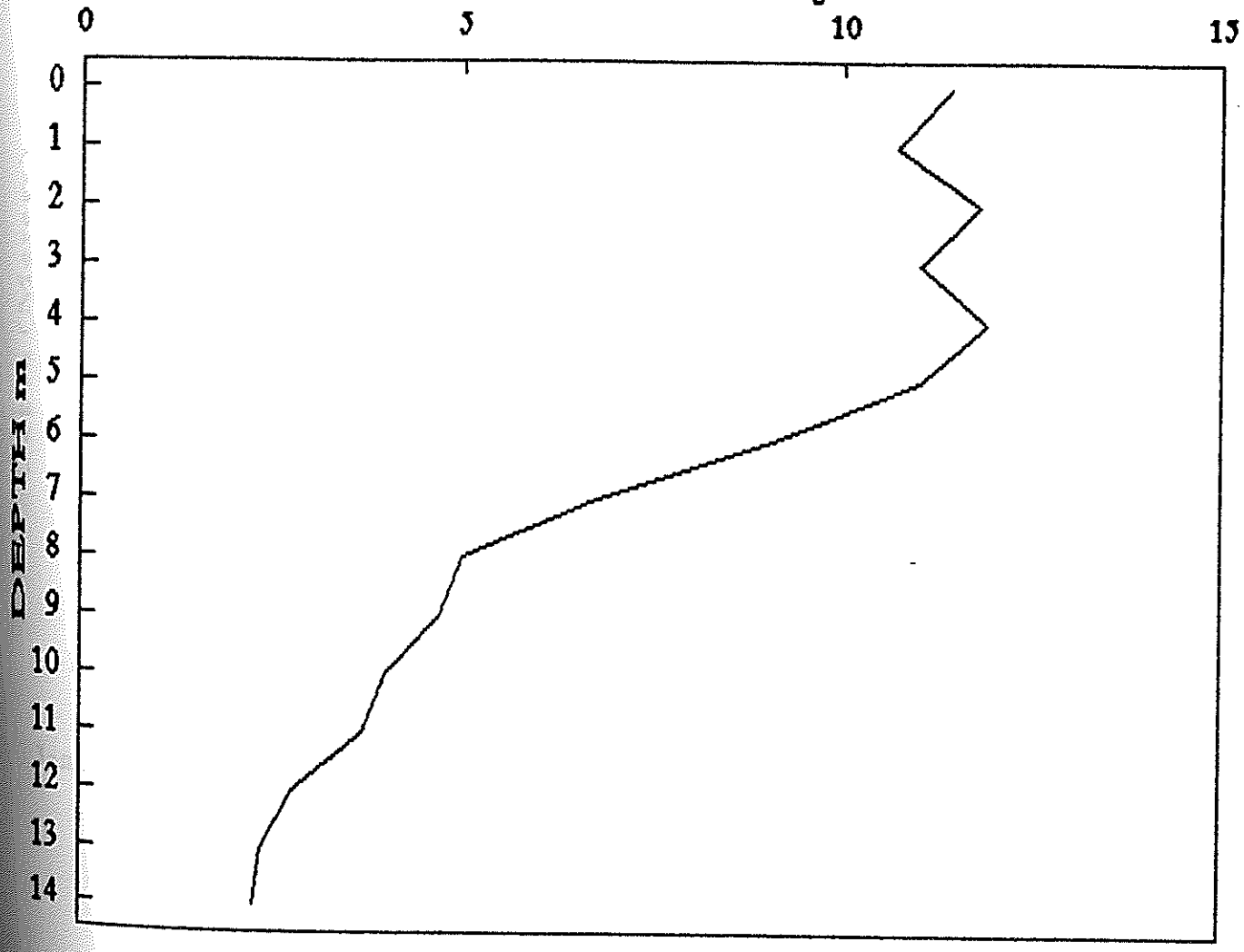
May 15,1989



LAKE SALLIE

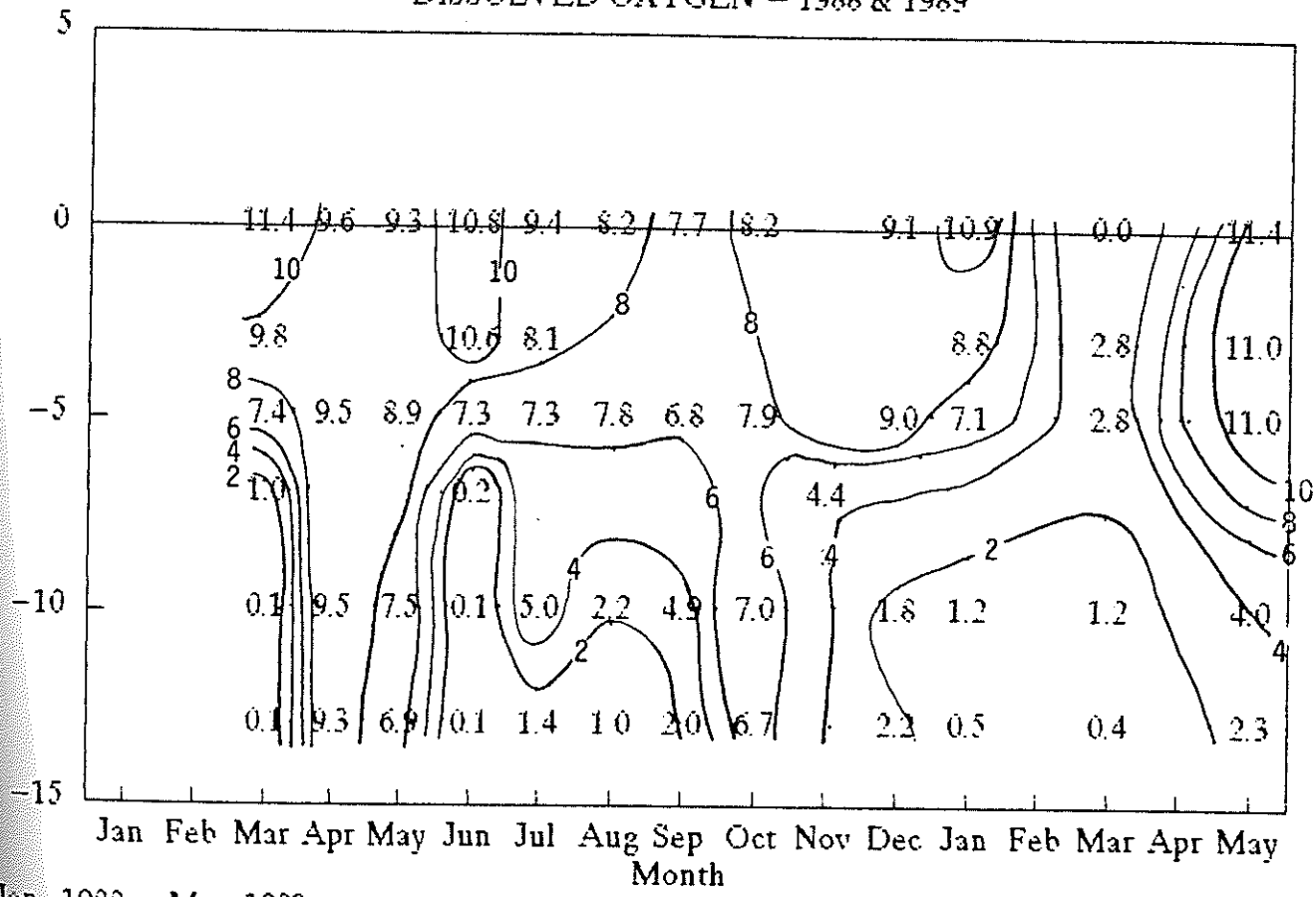
June 15,1989

DISSOLVED OXYGEN mg/l



LAKE SALLIE

DISSOLVED OXYGEN – 1988 & 1989



Jan., 1988 to May, 1989

LAKE SALLIE

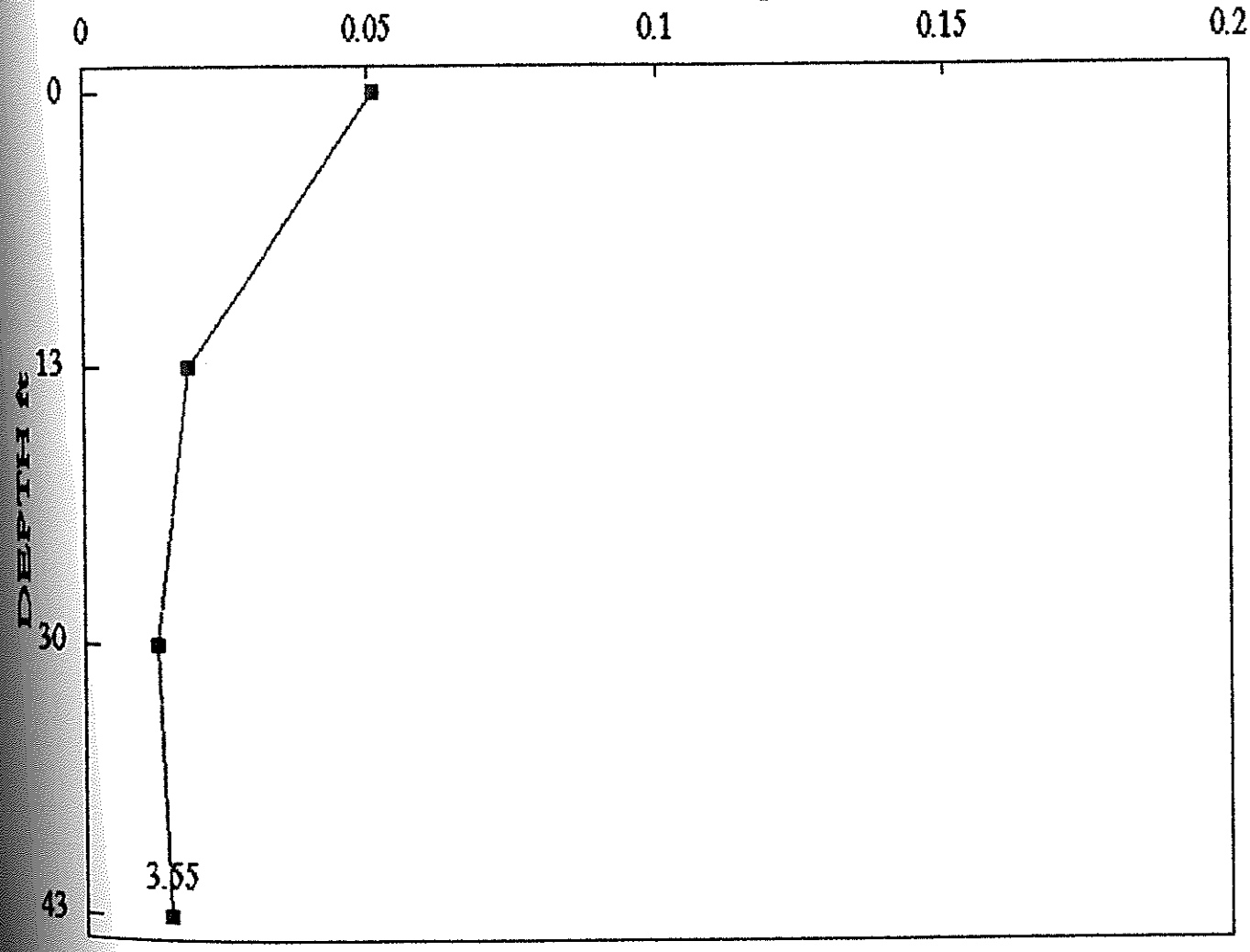
1989 IN-LAKE SAMPLING RESULTS

	1/31/89	3/07/89	3/27/89	5/15/89	6/15/89
Surface					
Po	0.007	0.008	0.008	0.002	0.006
P_T	0.051	0.035	0.018	0.027	0.018
Kjl-N	1.00	1.72	1.44	0.72	1.24
Org-N					
NH_3-N	<0.01	0.04	0.06	0.05	0.01
NO_2-N+					
Chlor-a	<1.0	<1.0	<1.0		
TSS					
PH	7.90				
Conduct					
Alk.					
Secchi Disk(m)				3.55	7.10
Fecal Coli.					
Four Meter Sample					
Po	0.013	0.008	0.008	0.003	0.008
PT	0.018	0.018	0.014	0.088	0.016
TSS	1.0	0.6	1.3	4.7	2.2
Nine Meter Sample					
Po	0.008	0.011	0.024	0.002	0.006
PT	0.013	0.017	0.025	0.018	0.014
$N\text{-}NO_2+NO_3$	<0.01	0.04	0.07	0.03	0.01
Thirteen Meter Sample (Bottom)					
Po	0.011	0.011	0.016	0.002	0.010
PT	0.015	0.019	0.023	0.019	0.014
Kjl-N	0.88	2.32	2.50	0.68	1.20

LAKE SALLIE

January 31,1989

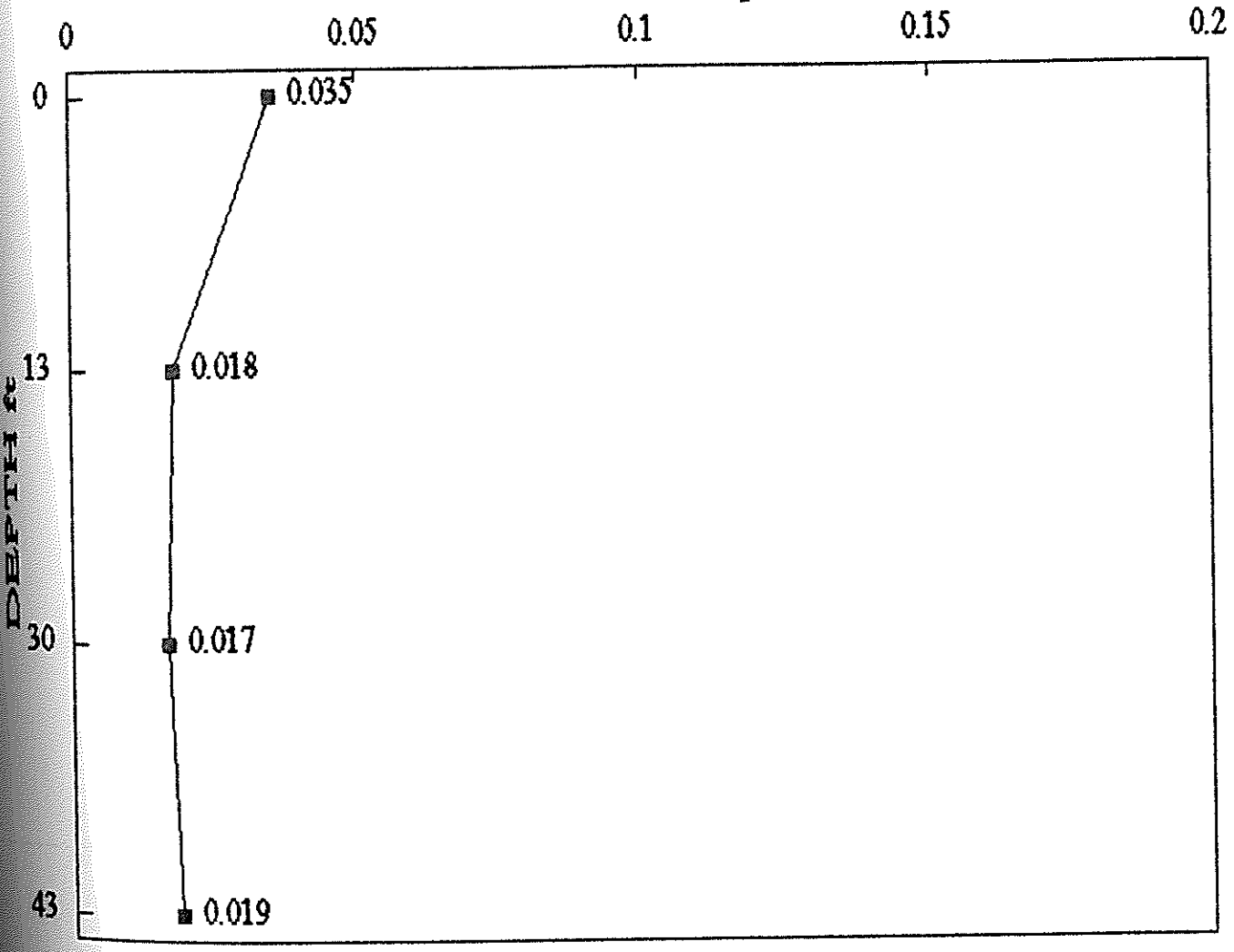
PHOSPHORUS mg/l



LAKE SALLIE

March 7,1989

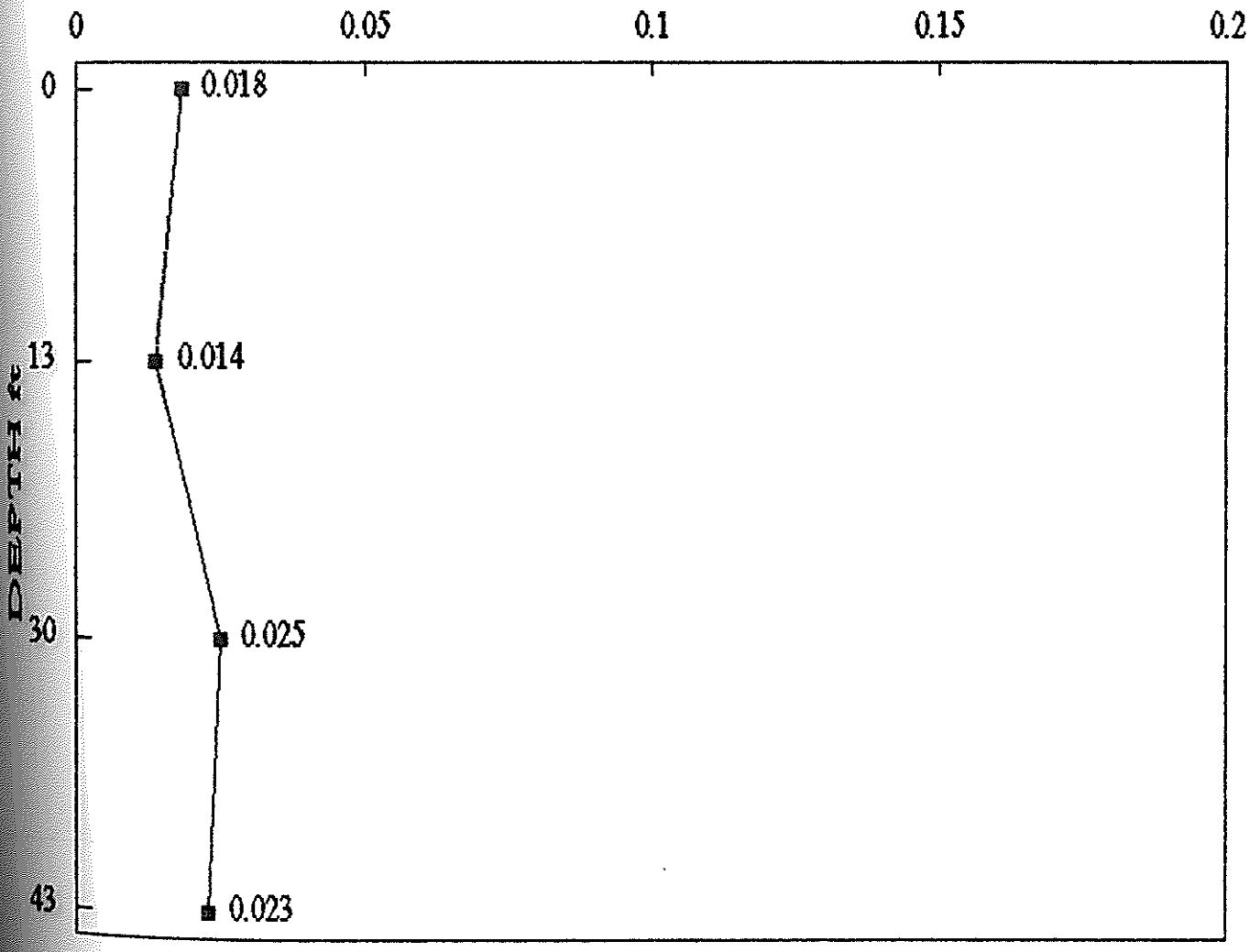
PHOSPHORUS mg/l



LAKE SALLIE

March 27,1989

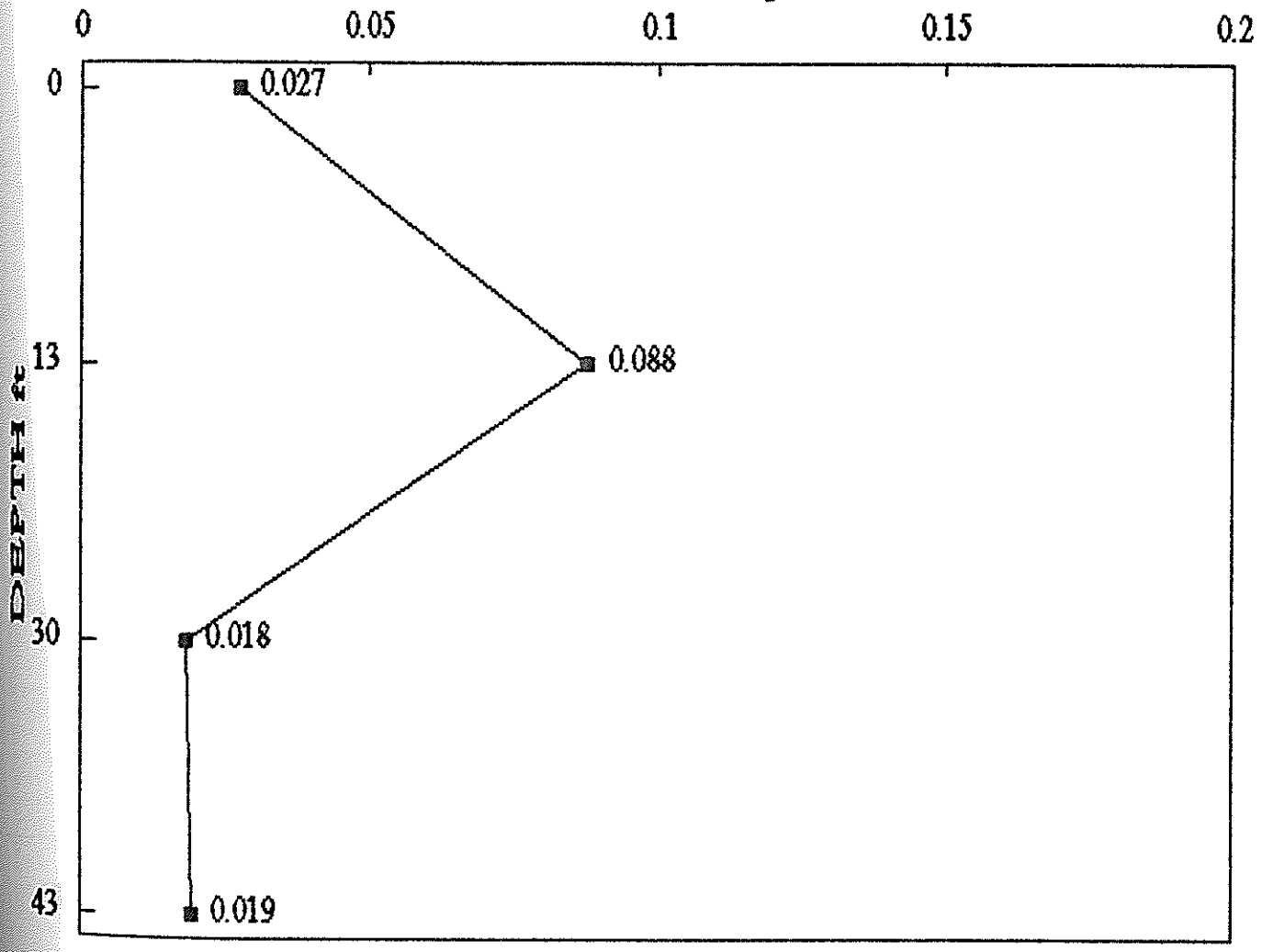
PHOSPHORUS mg/l



LAKE SALLIE

May 15,1989

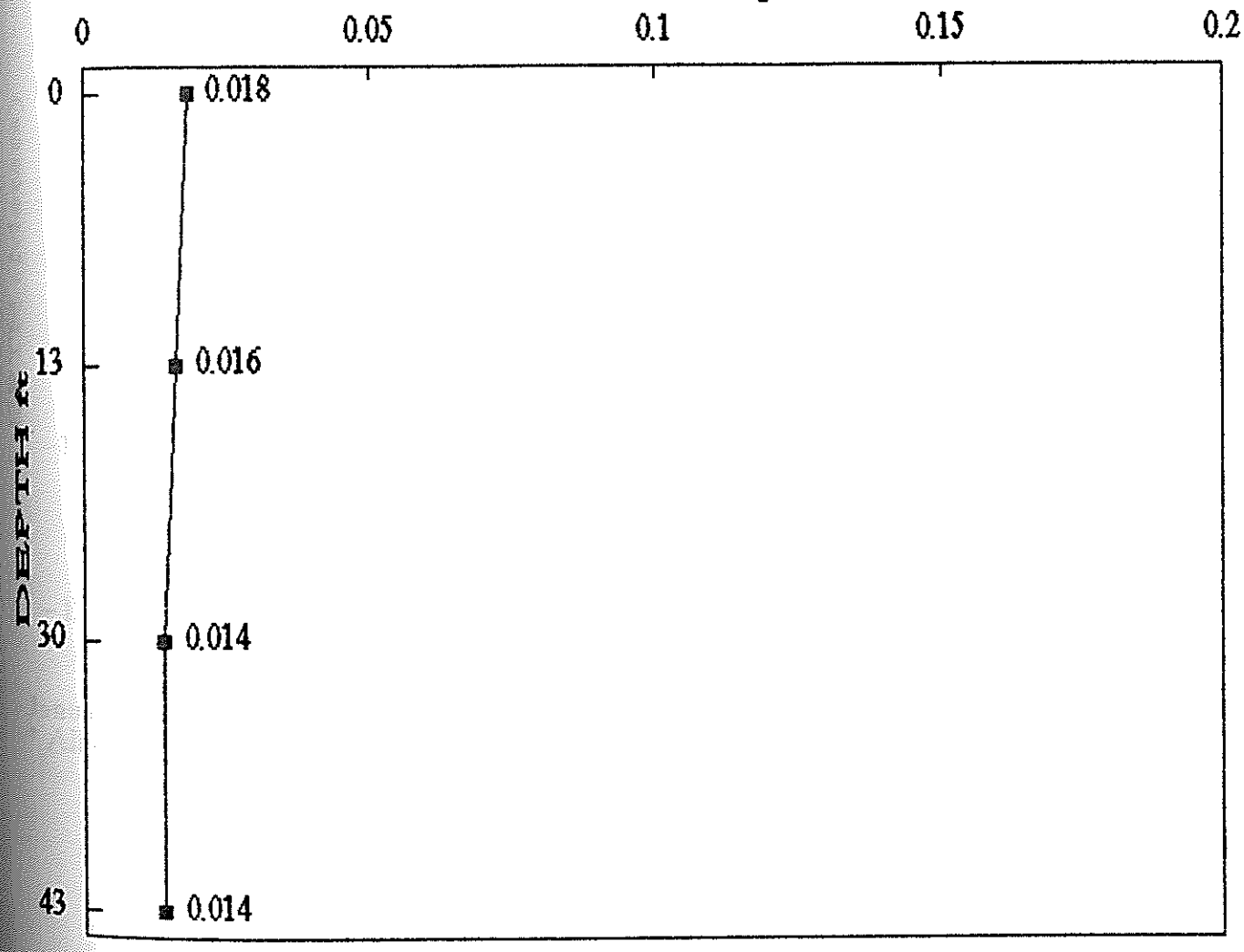
PHOSPHORUS mg/l



LAKE SALLIE

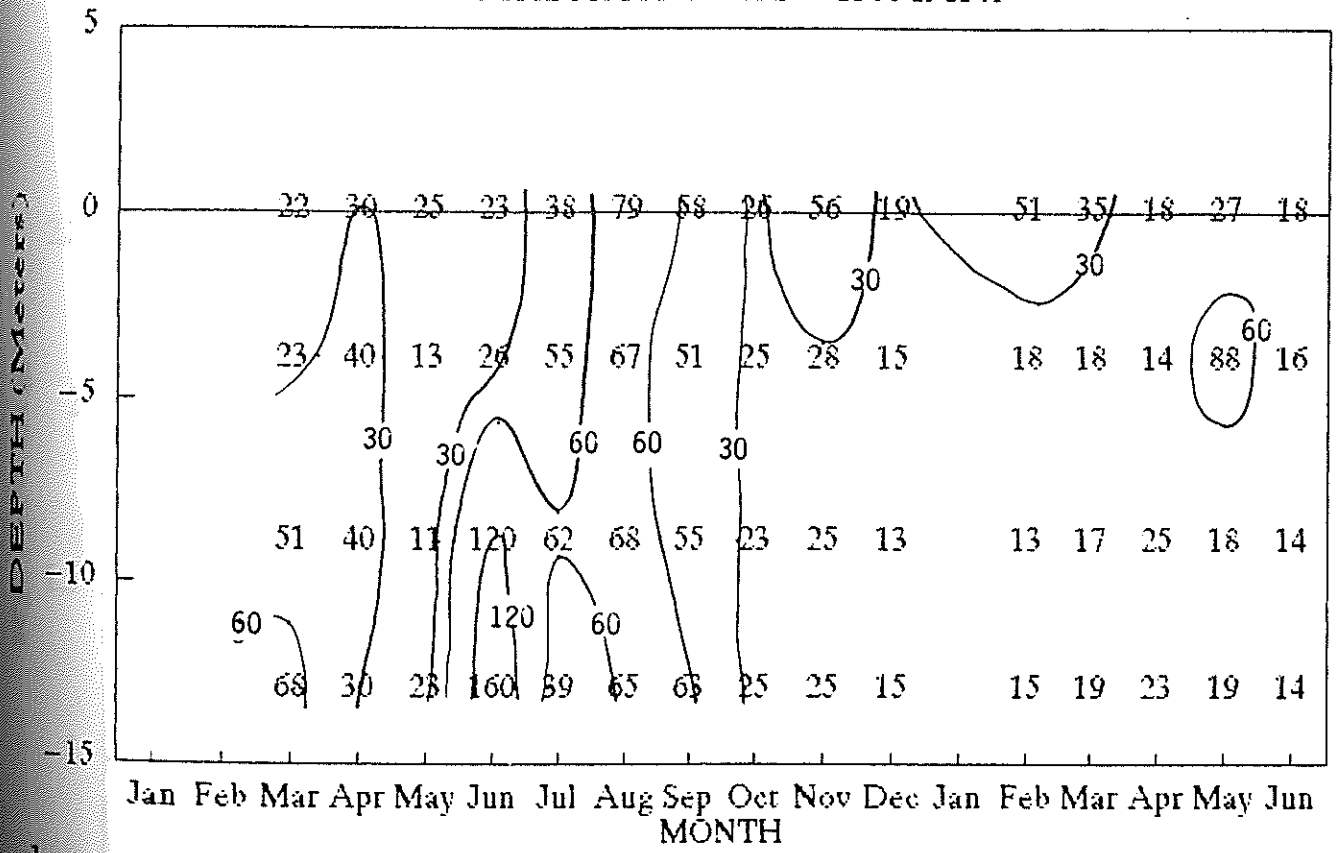
June 15,1989

PHOSPHORUS mg/l



LAKE SALLIE

TOTAL PHOSPHORUS – 1988 & 1989

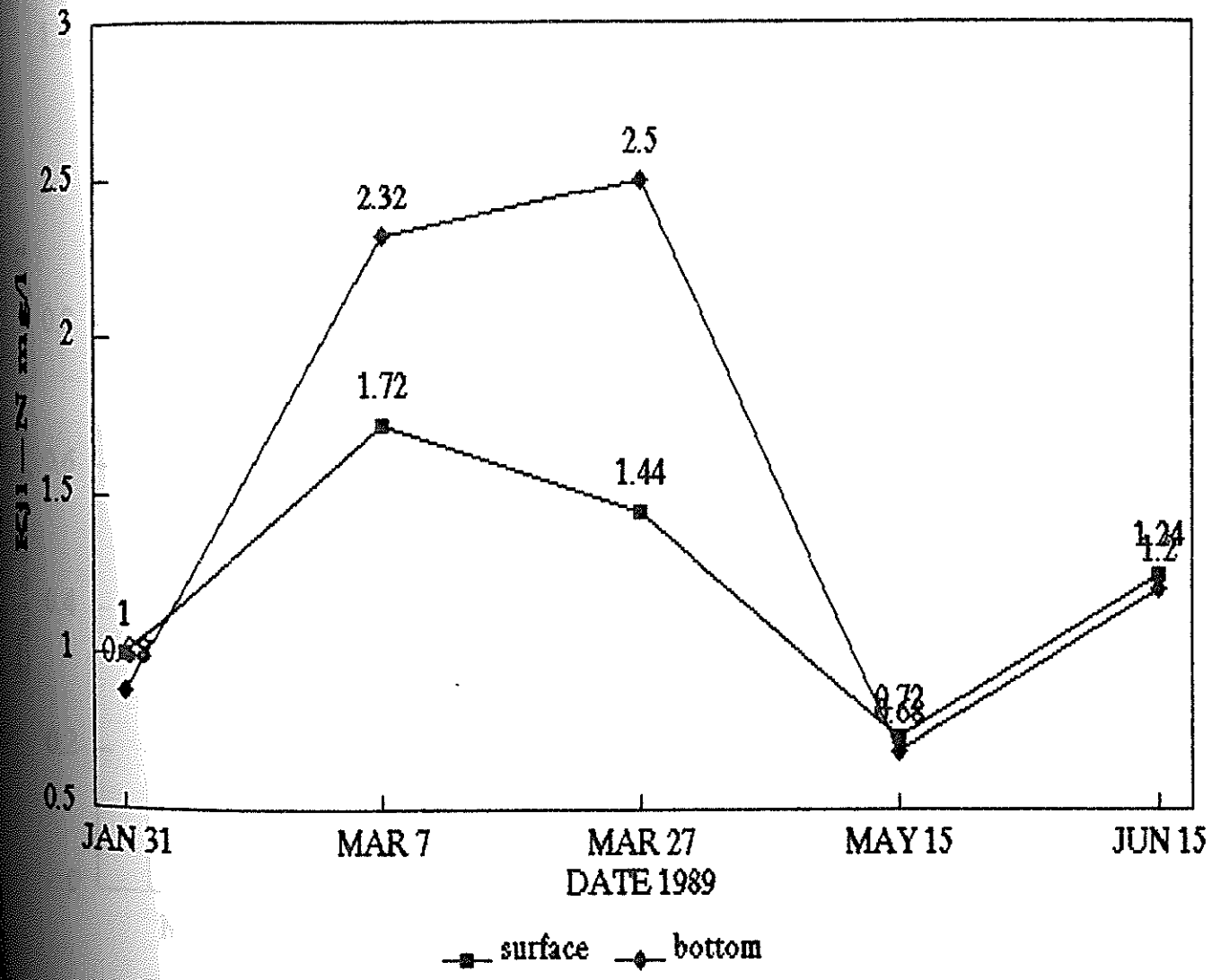


January, 1988 to June, 1989

* All concentrations in micrograms/liter

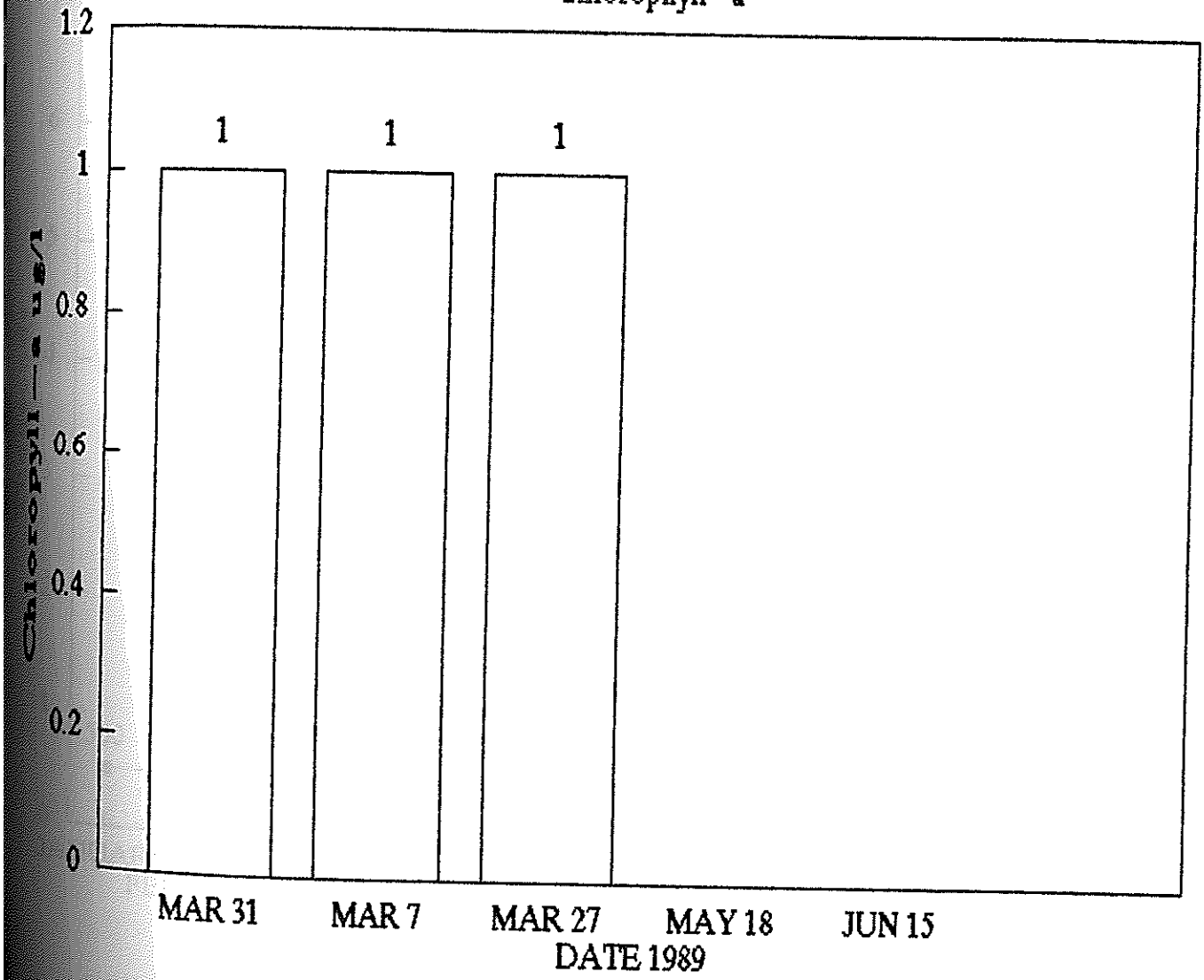
LAKE SALLIE

KJELDAHL NITROGEN



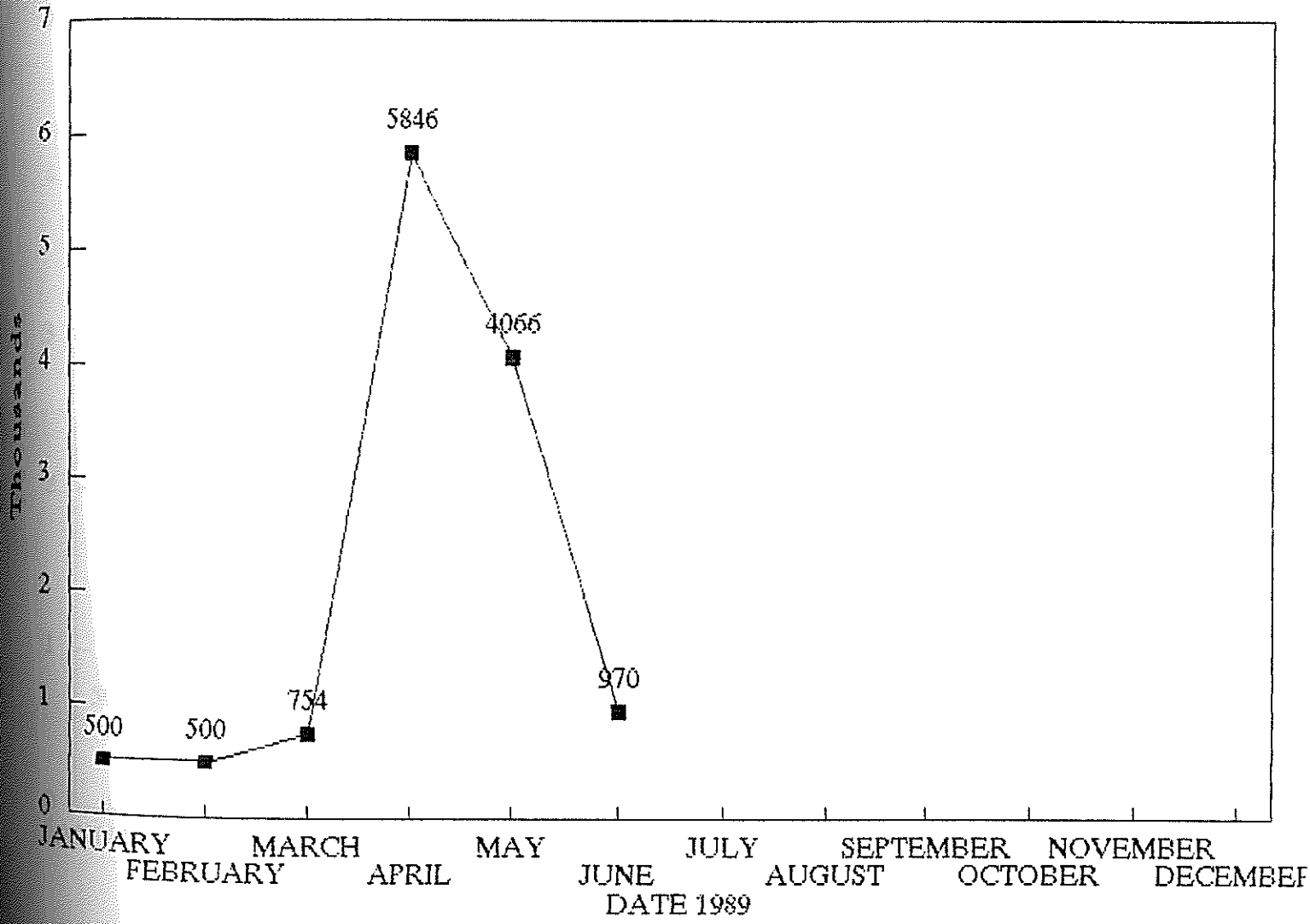
LAKE SALLIE

Chlorophyll–a



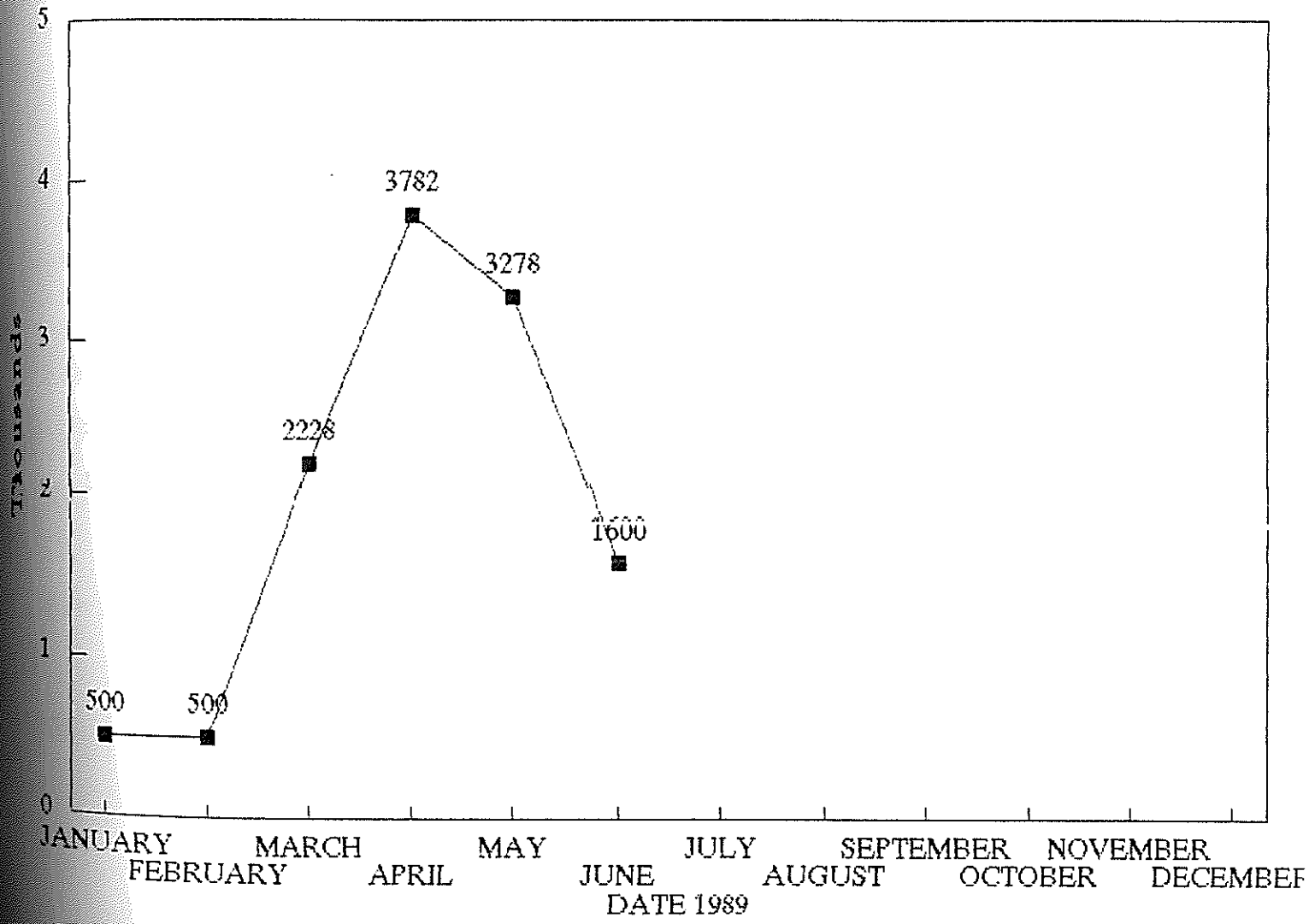
LAKE SALLIE

MUSKRAT LAKE OUTLET



LAKE SALLIE

PELICAN RIVER OUTLET



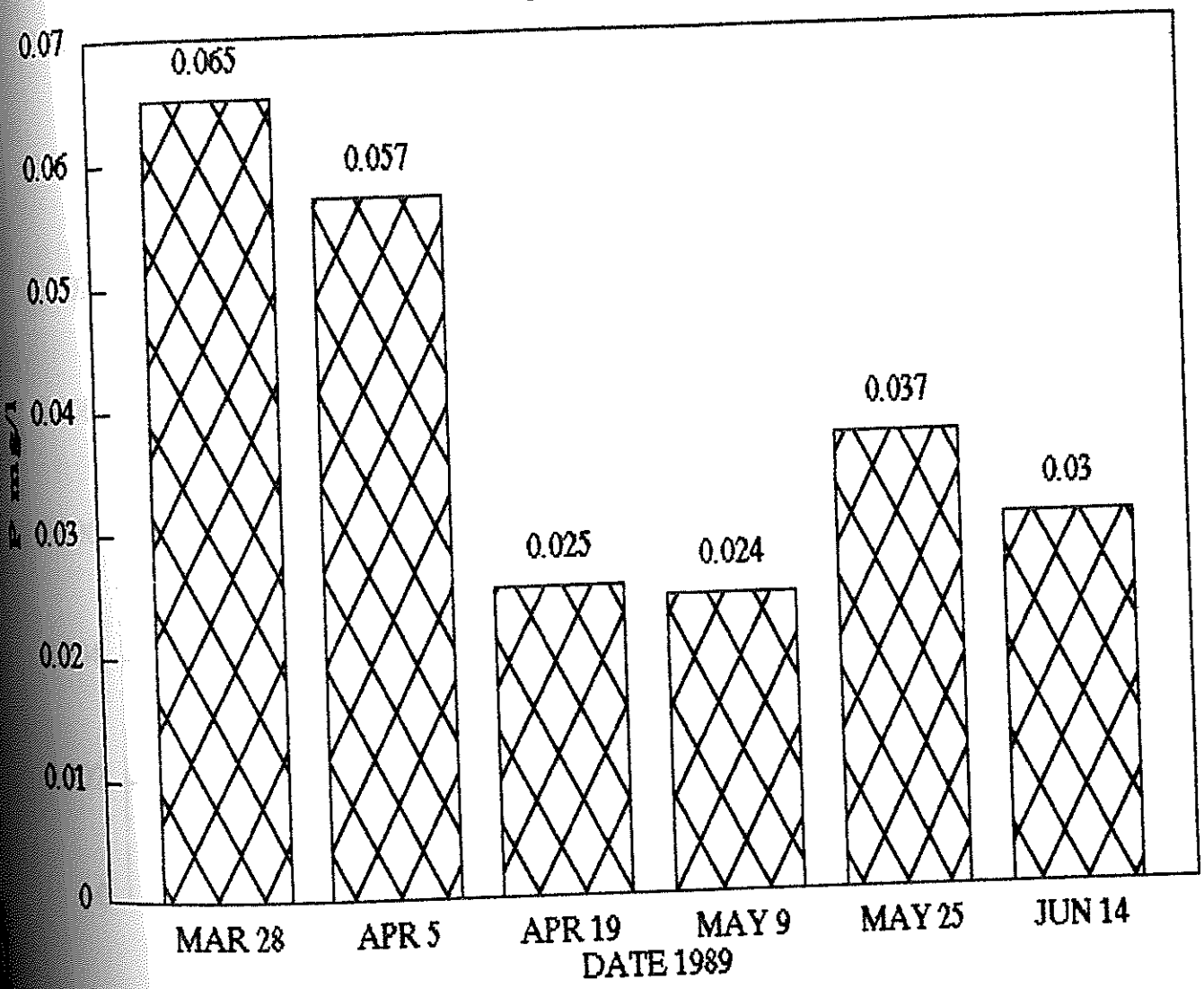
LAKE SALLIE

1989 INFLOW SAMPLING

	3/28/89	4/5/89	4/19/89	5/9/89	5/25/89	6/14/89
Phosphorus						
S-1 Sallie Outlet	0.018	0.018	0.006	0.020	0.007	0.015
S-2 Fox Lake Outlet	0.018	0.008		0.012		
S-3 Monson Lake		0.017				
S-3A Rearing Ponds						
S-4 Sallie Lake Inlet	0.065	0.057	0.025	0.024	0.037	0.030
Total Suspended Solids						
S-1 Sallie Outlet	1.1	0.4	1.4	2.5	0.7	3.7
S-2 Fox Lake Outlet	18.7	0.6		3.6		
S-3 Monson Lake		2.3				
S-3A Rearing Ponds						
S-4 Sallie Lake Inlet	2.7	2.7	2.3	2.0	3.3	1.5

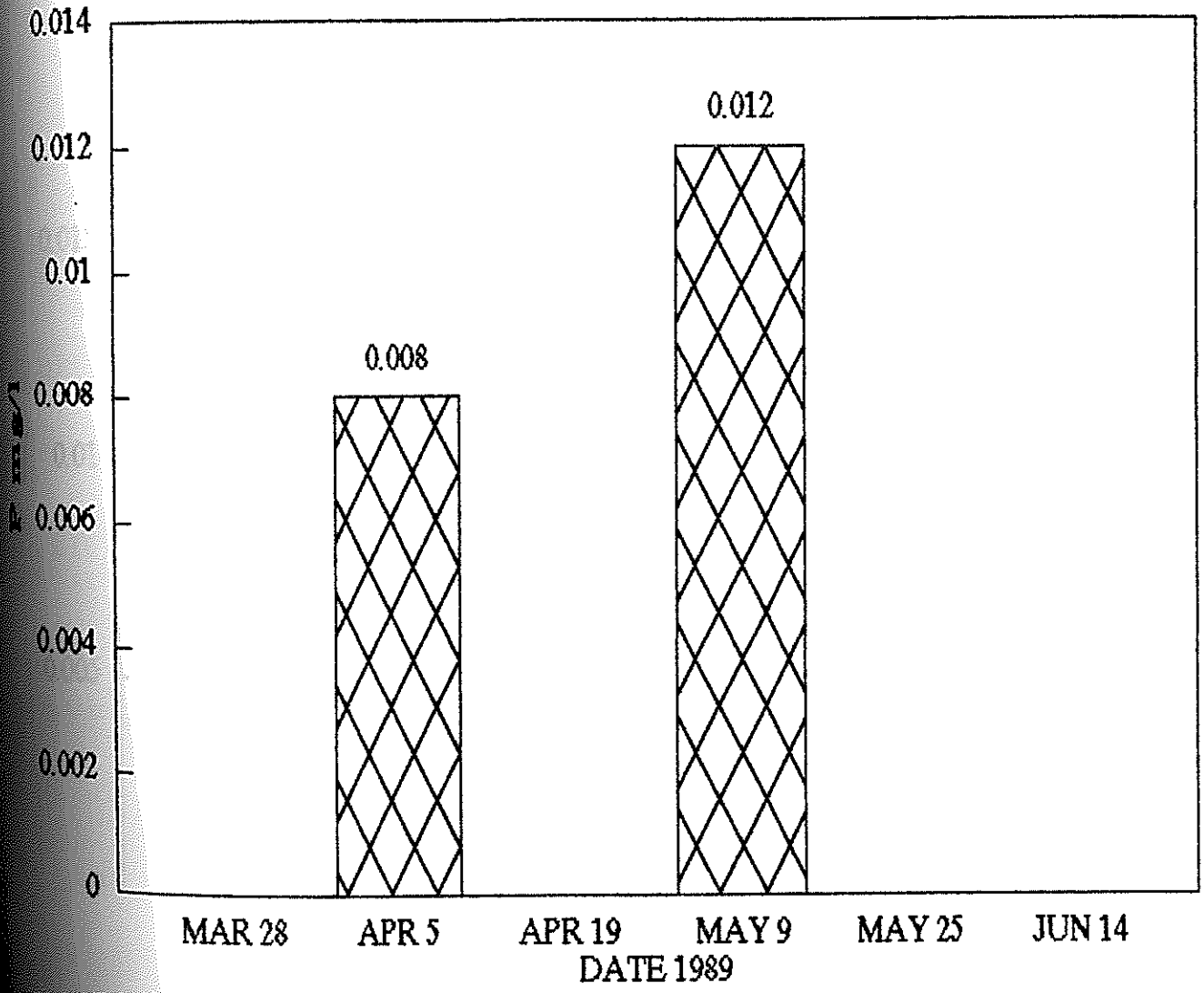
MUSKRAT LAKE OUTLET

PHOSPHORUS



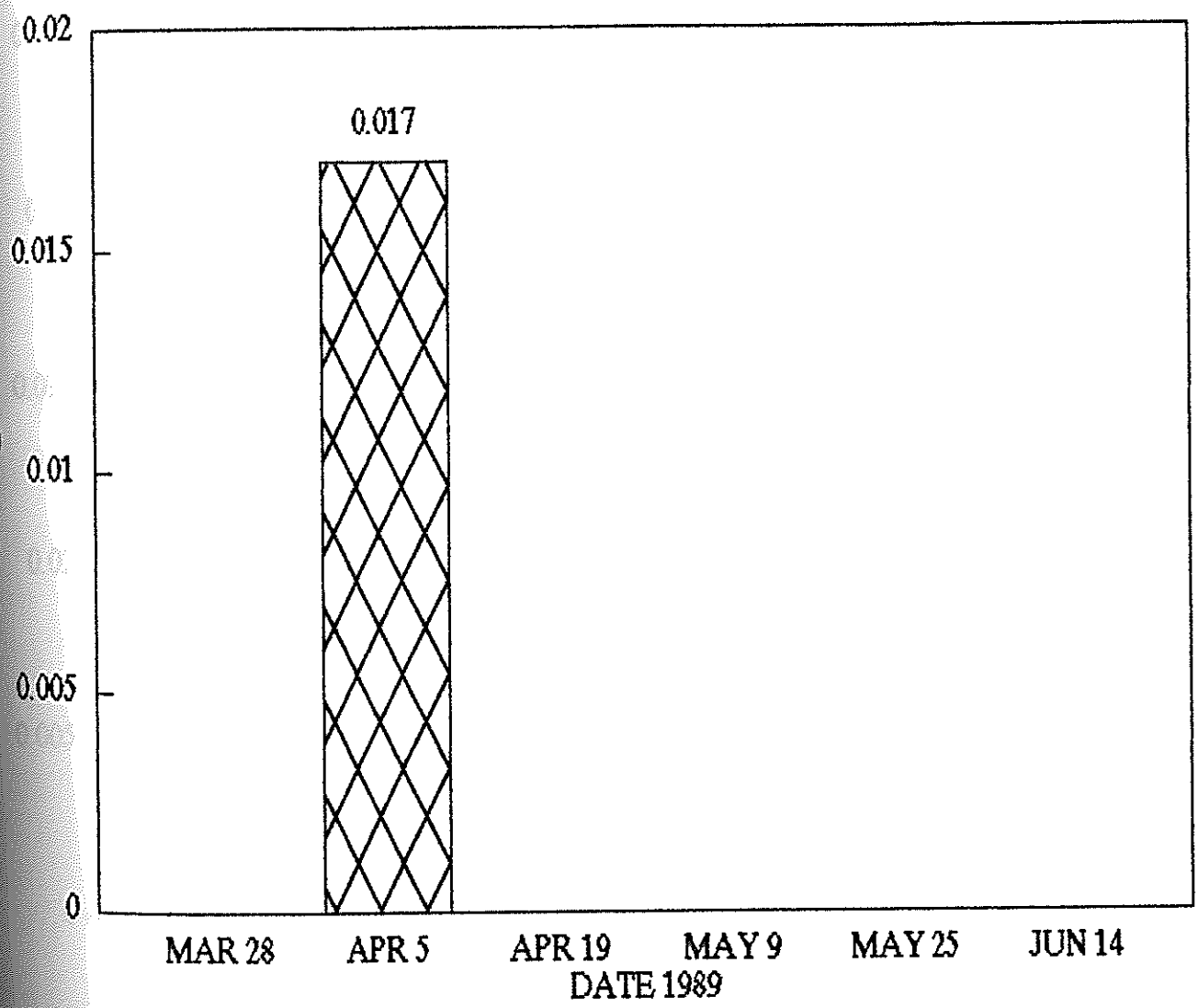
FOX LAKE OUTLET

PHOSPHORUS



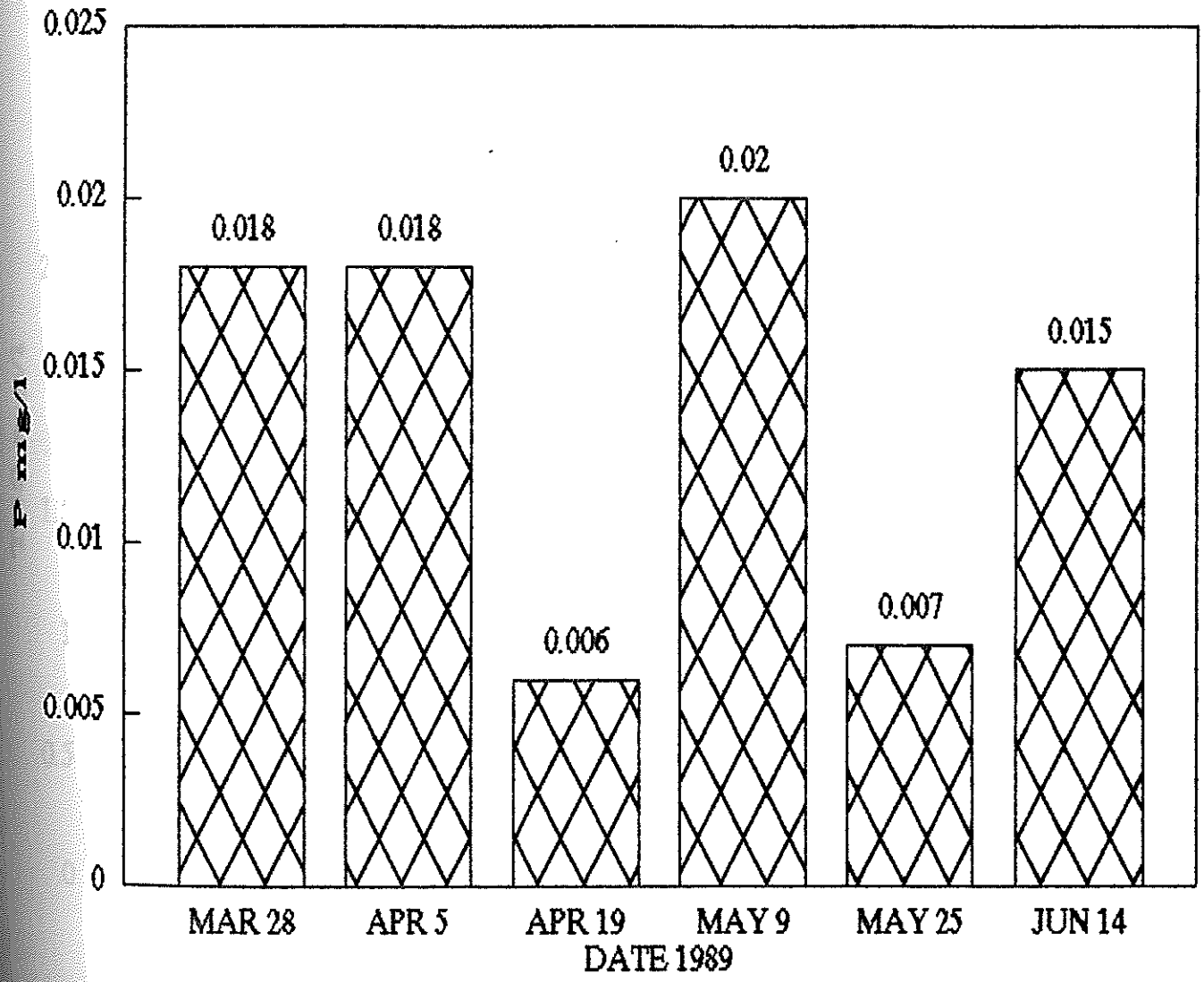
MONSON LAKE

PHOSPHORUS



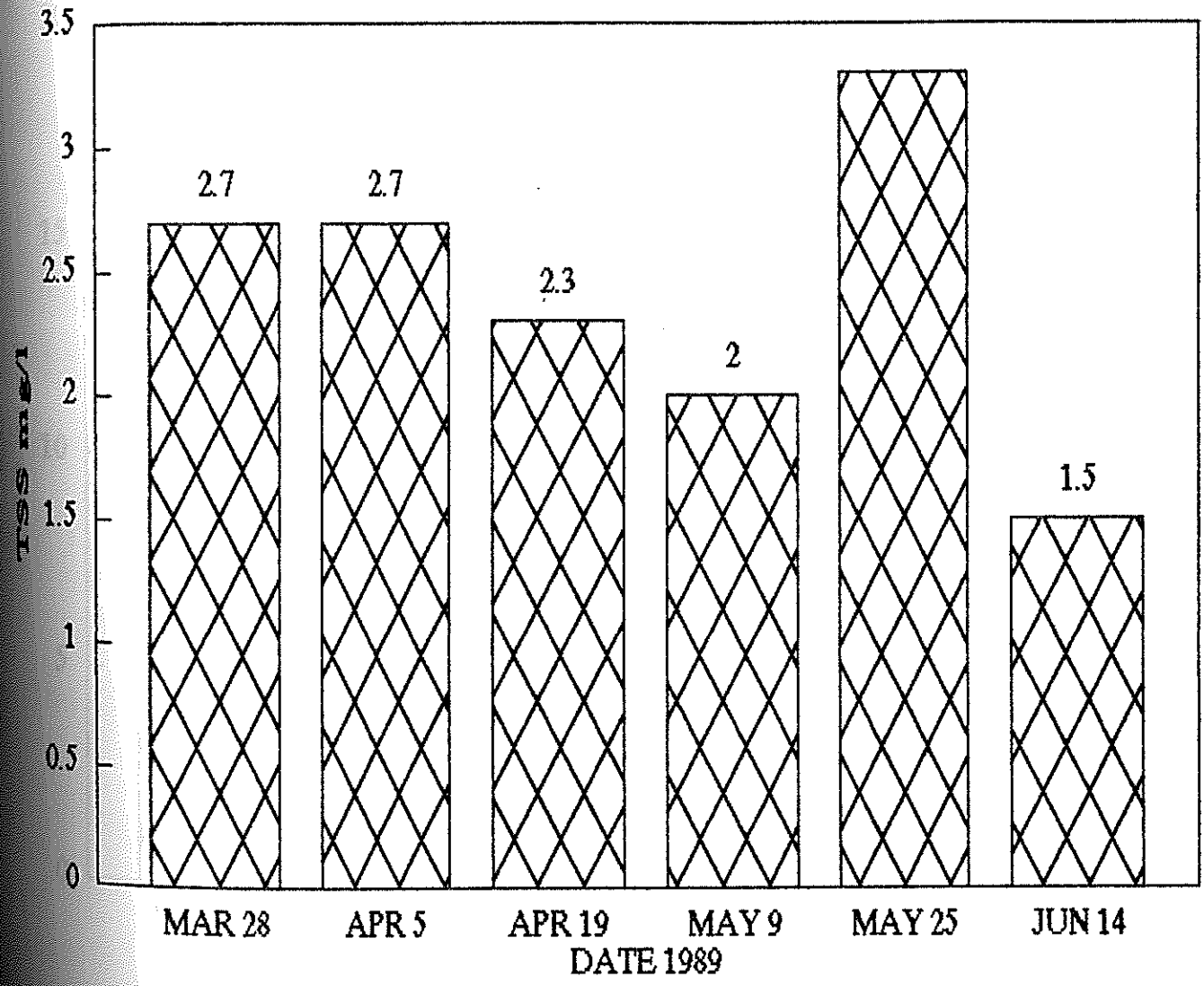
LAKE SALLIE OUTLET

PHOSPHORUS



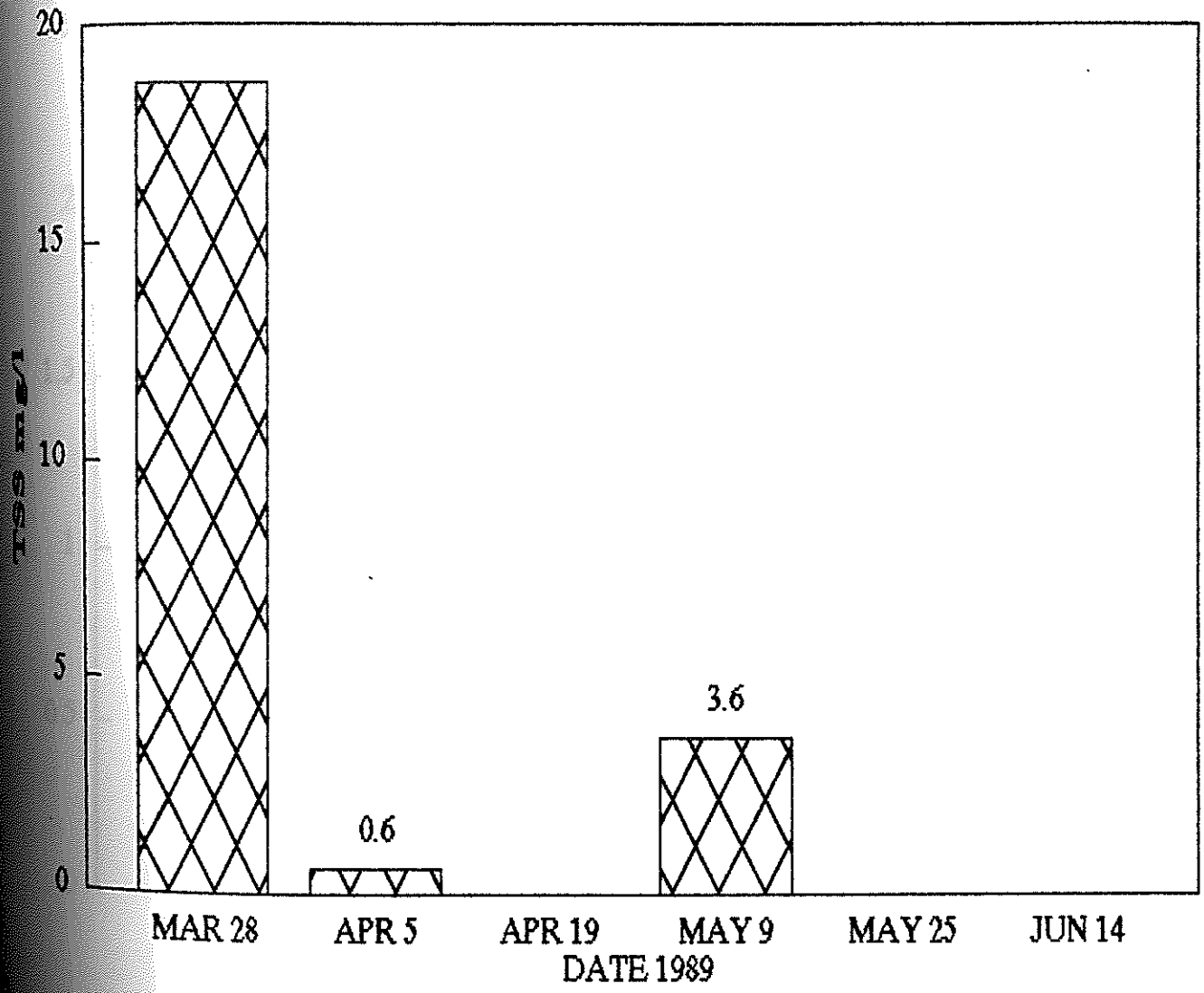
MUSKRAT LAKE OUTLET

TOTAL SUSPENDED SOLIDS



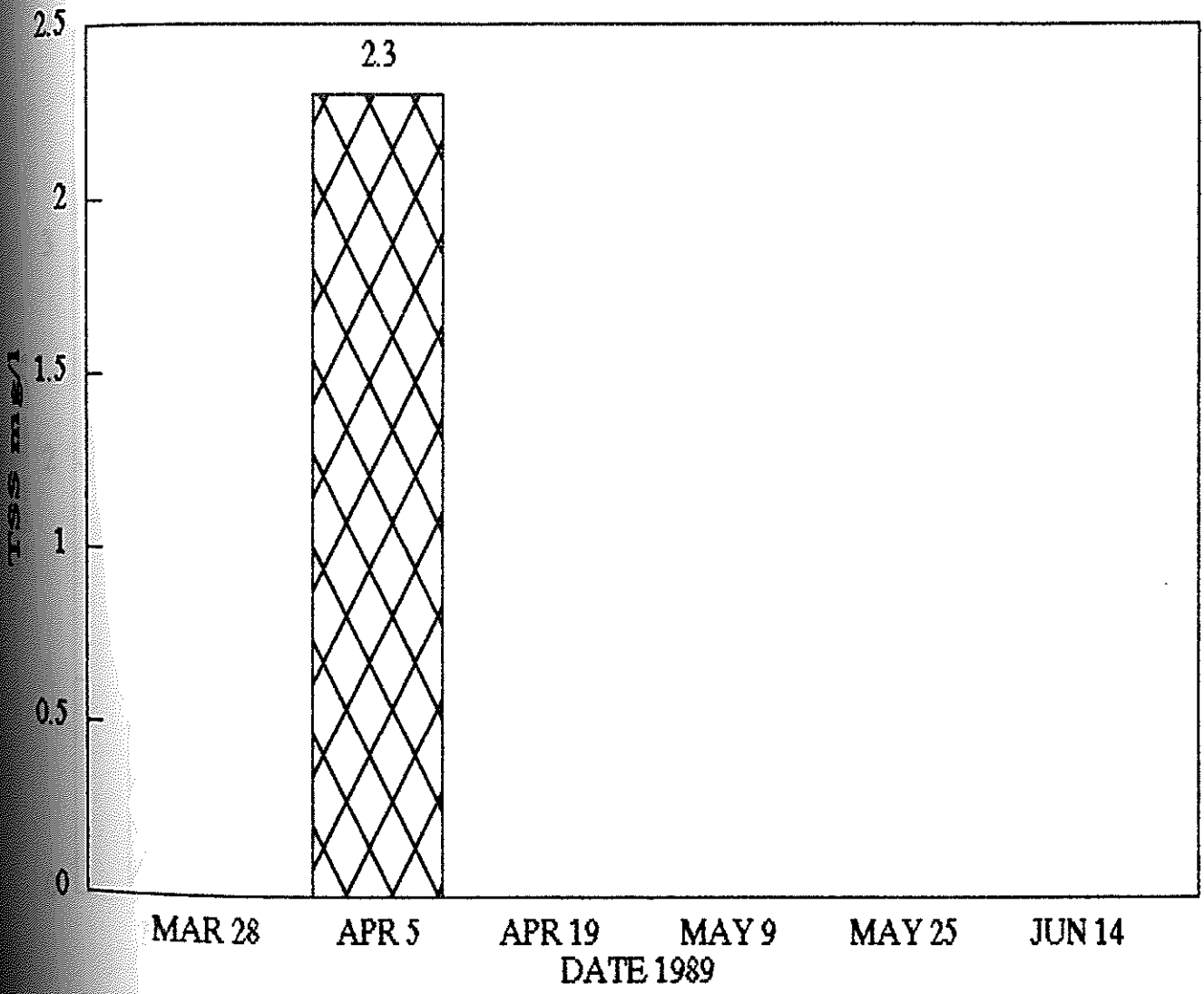
FOX LAKE OUTLET

TOTAL SUSPENDED SOLIDS



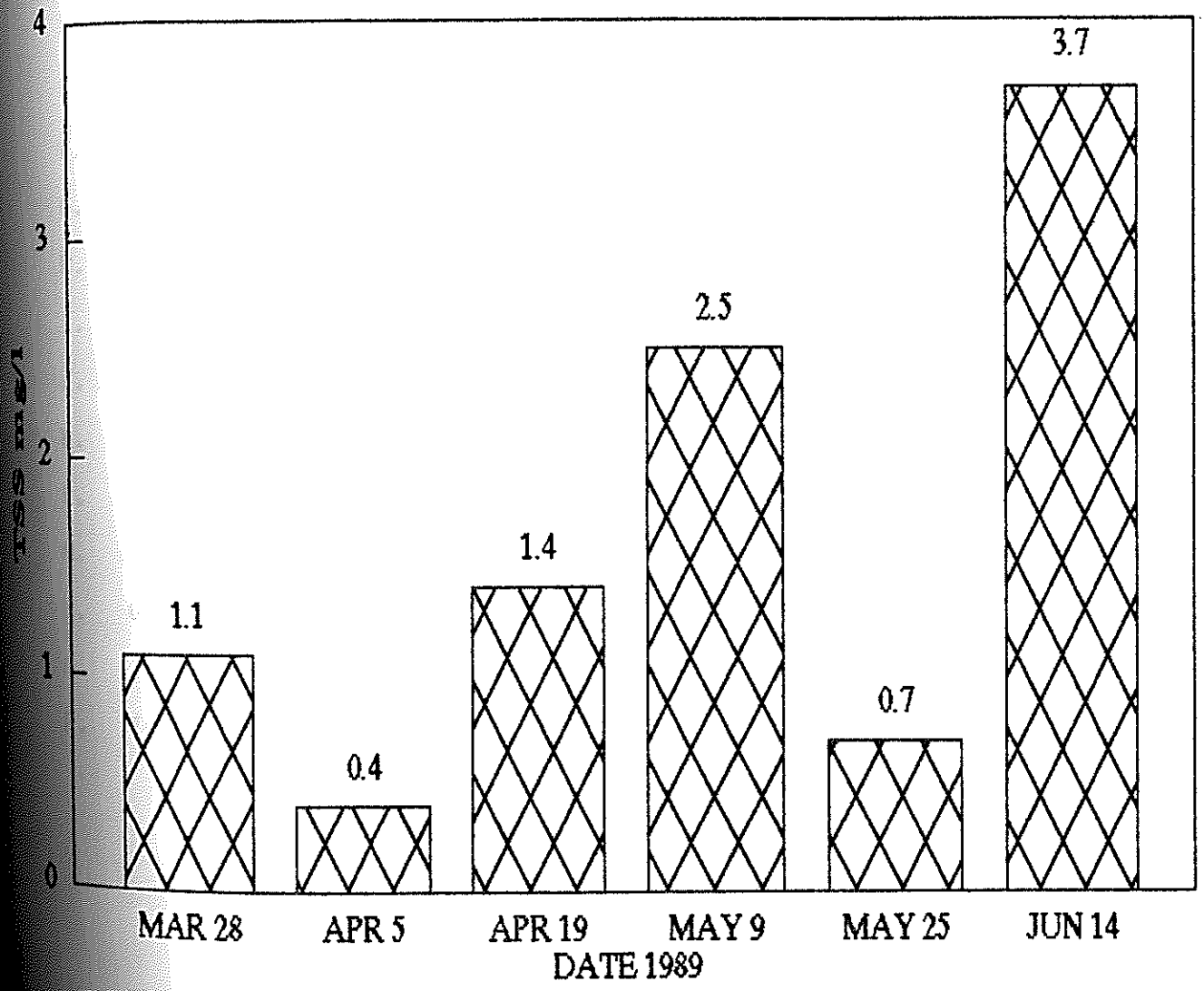
MONSON LAKE

TOTAL SUSPENDED SOLIDS



LAKE SALLIE OUTLET

TOTAL SUSPENDED SOLIDS



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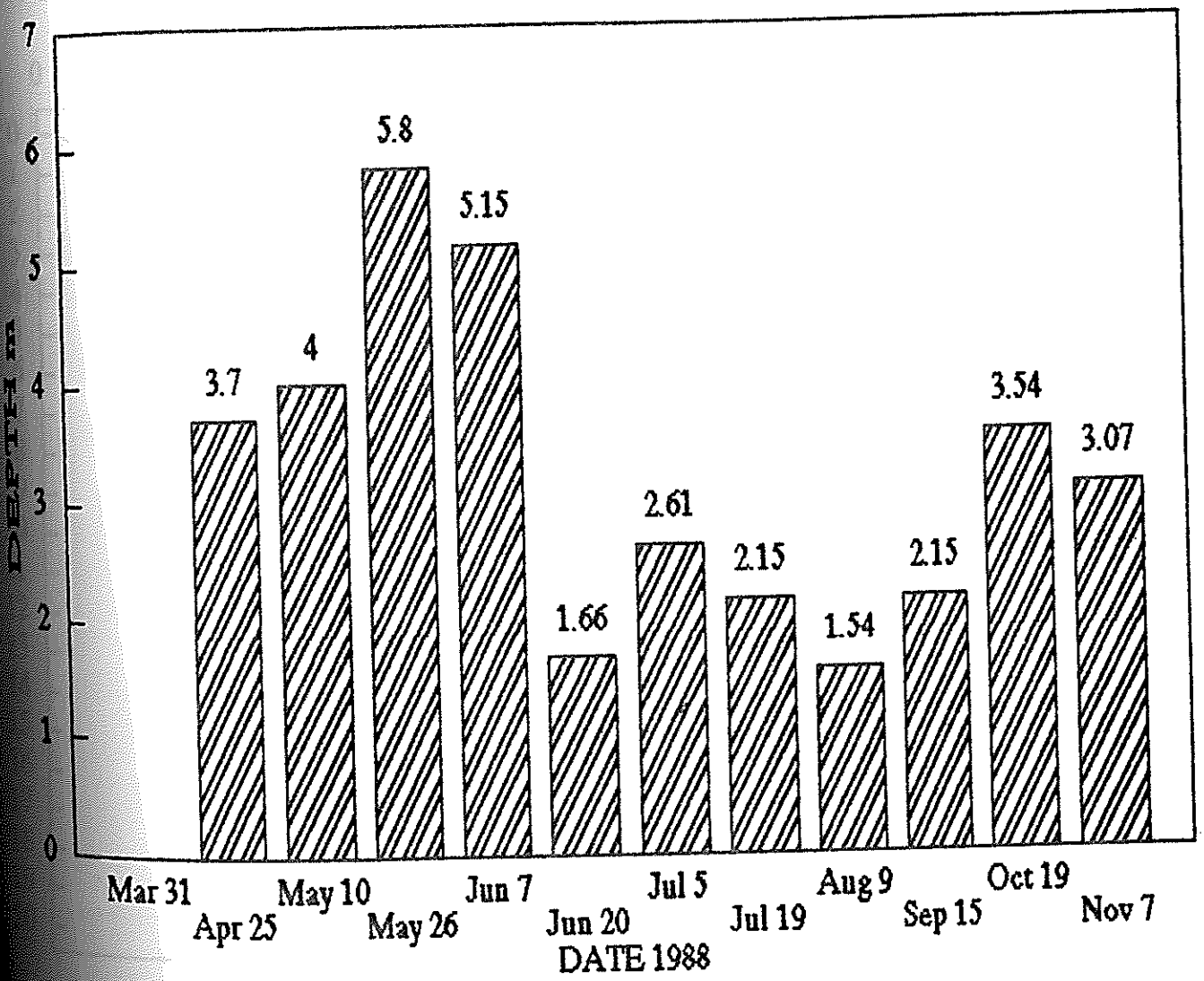
DETROIT LAKE

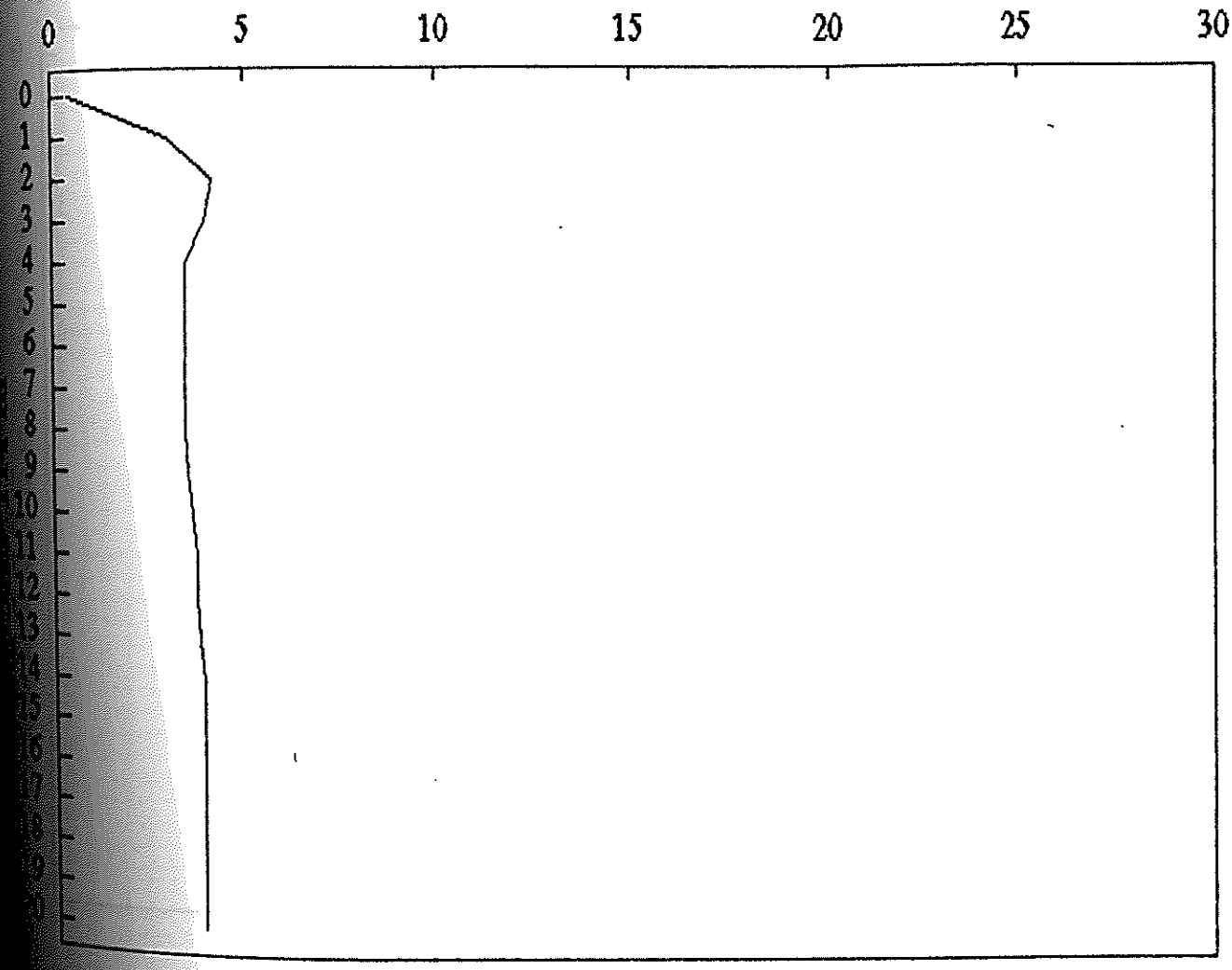
SECCHI DISK



DETROIT LAKE

March 31,1988

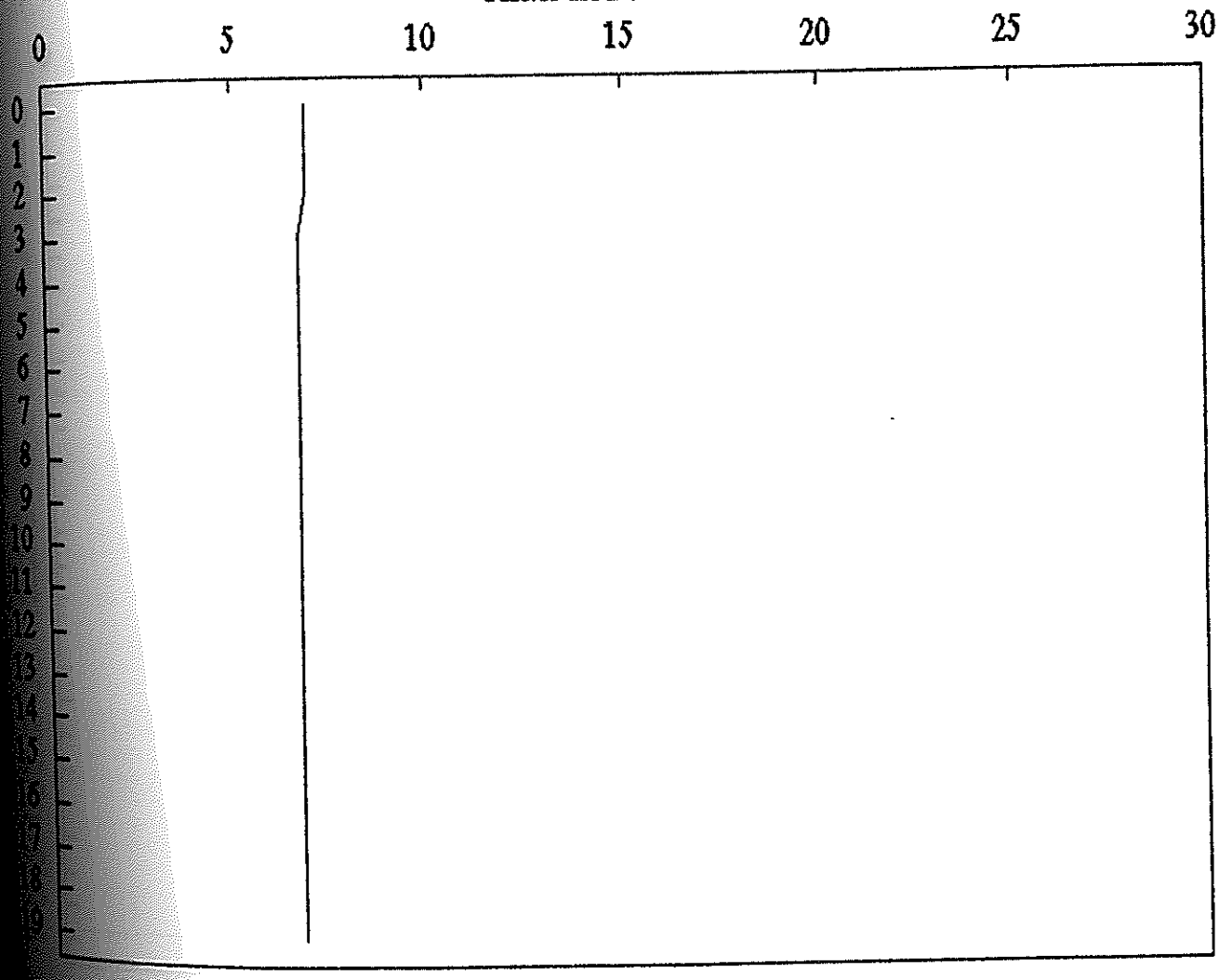
TEMPERATURE C



DETROIT LAKE

April 25,1988

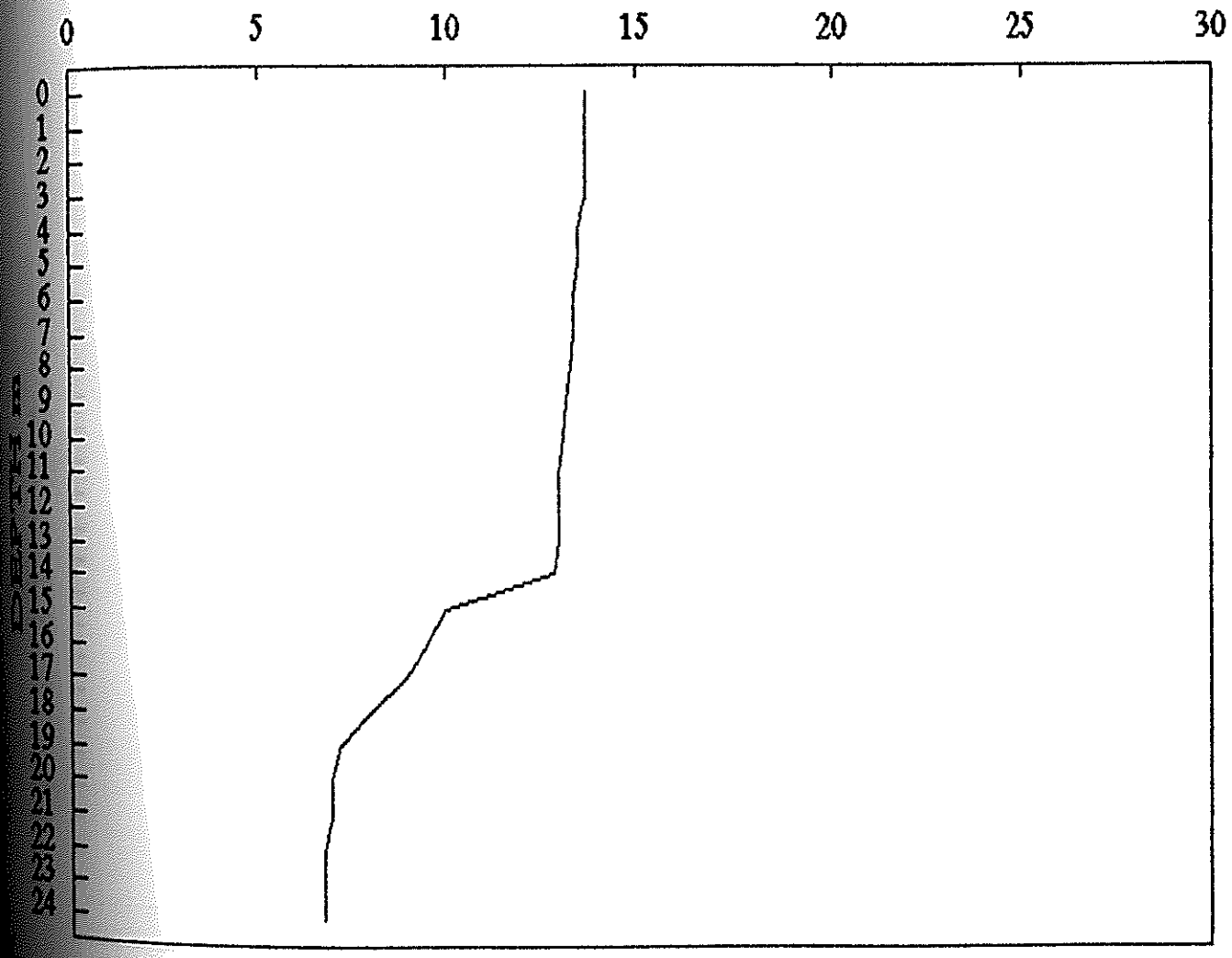
TEMPERATURE C



DETROIT LAKE

May 10,1988

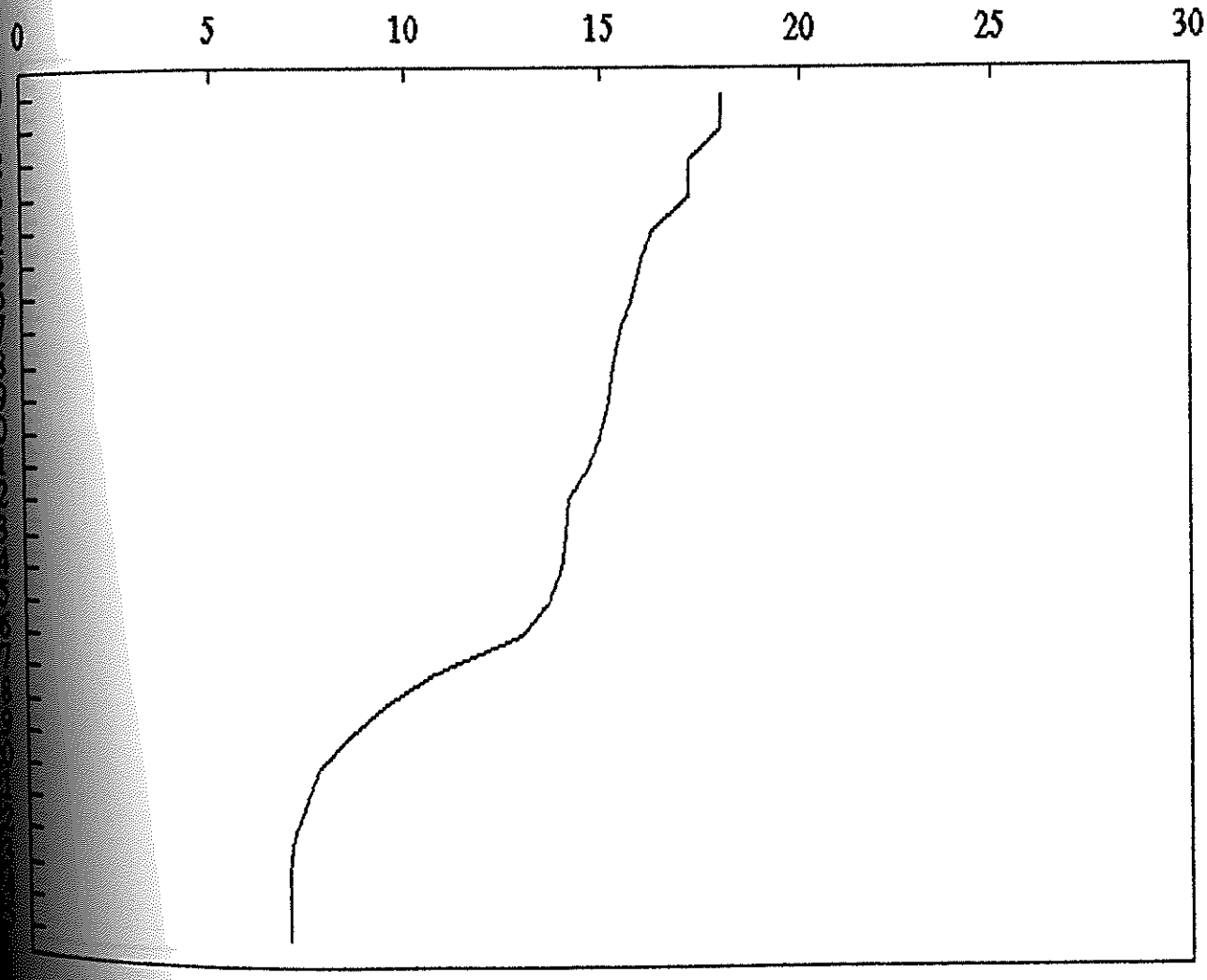
TEMPERATURE C



DETROIT LAKE

May 26,1988

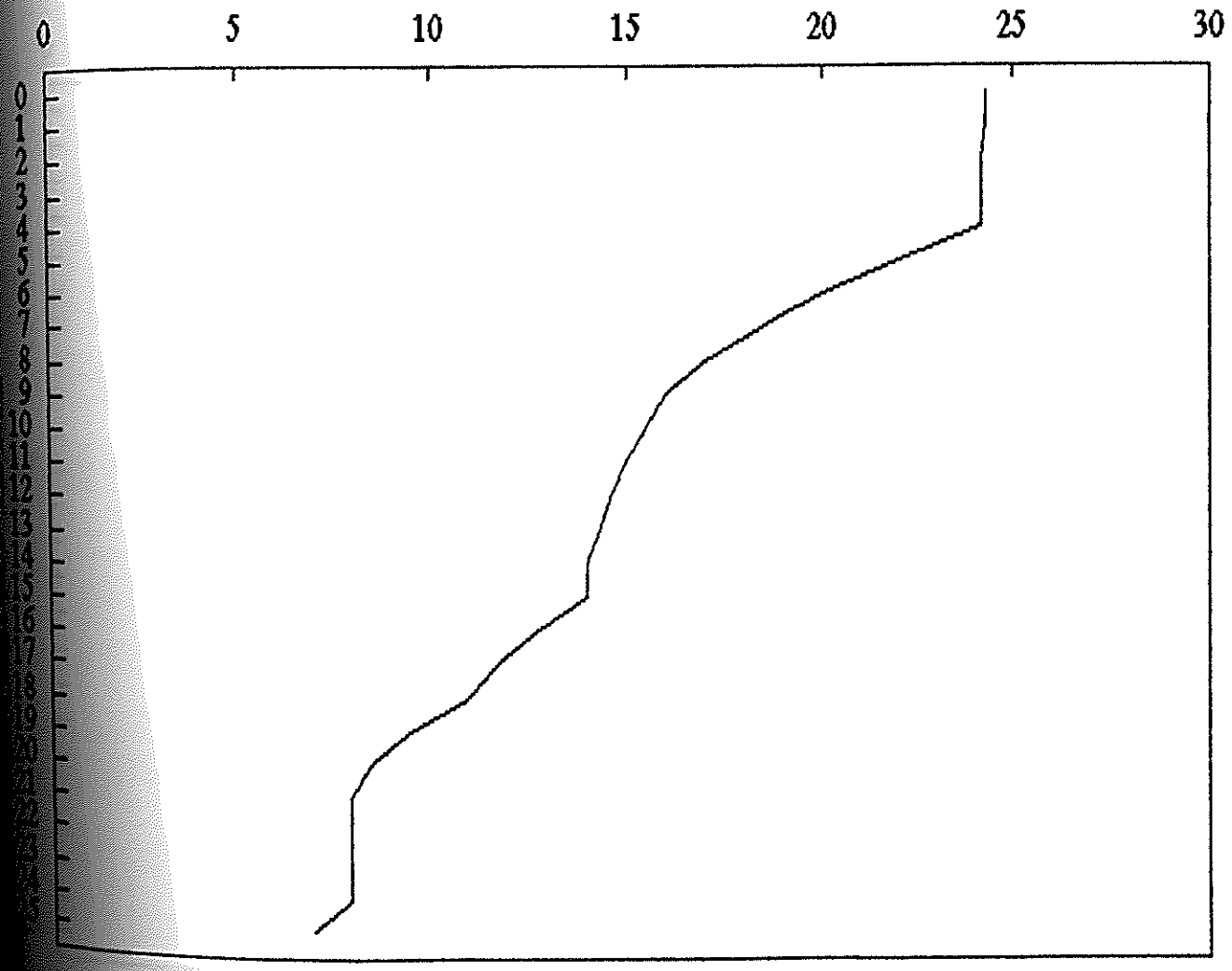
TEMPERATURE C



DETROIT LAKE

June 7,1988

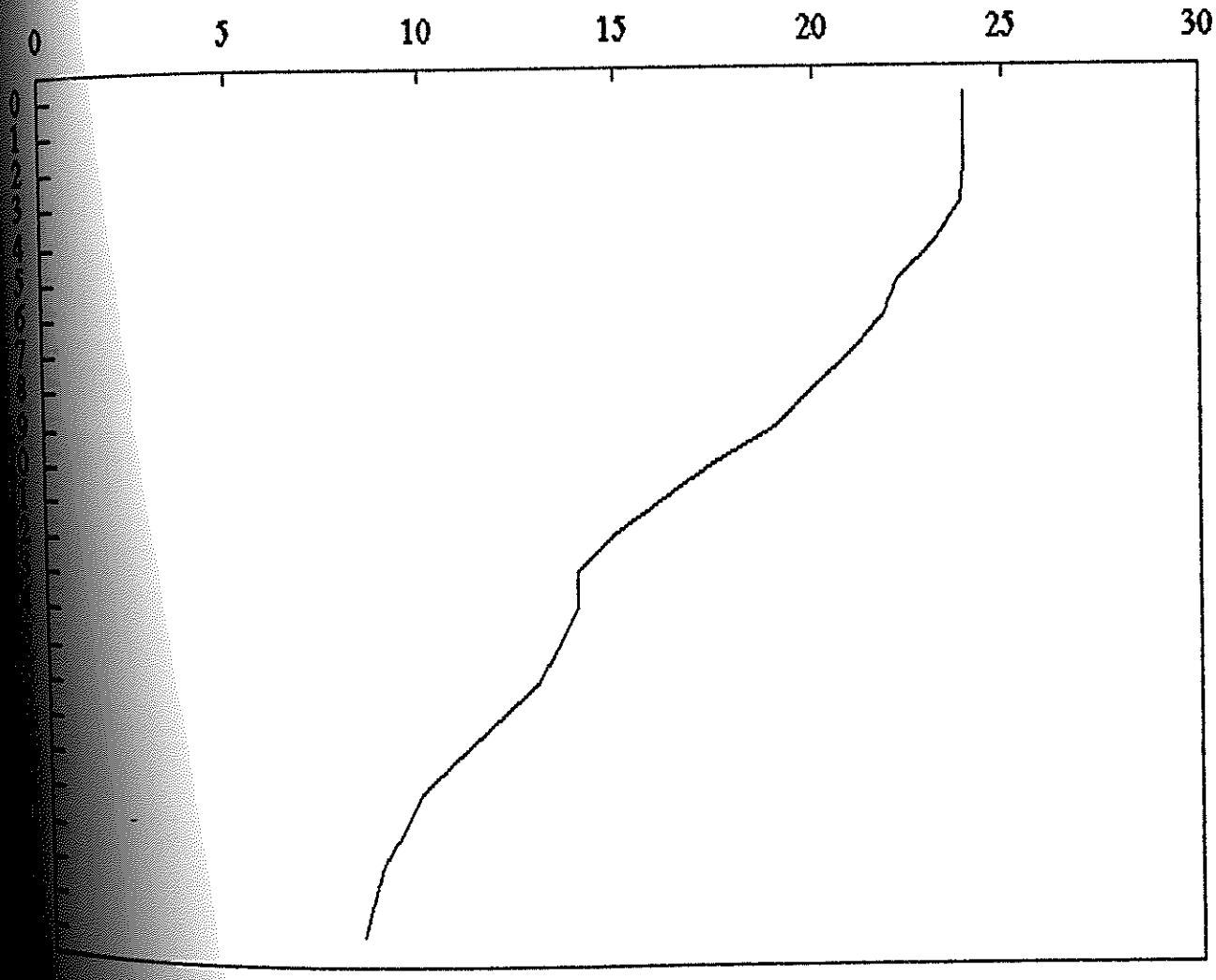
TEMPERATURE C



DETROIT LAKE

June 20,1988

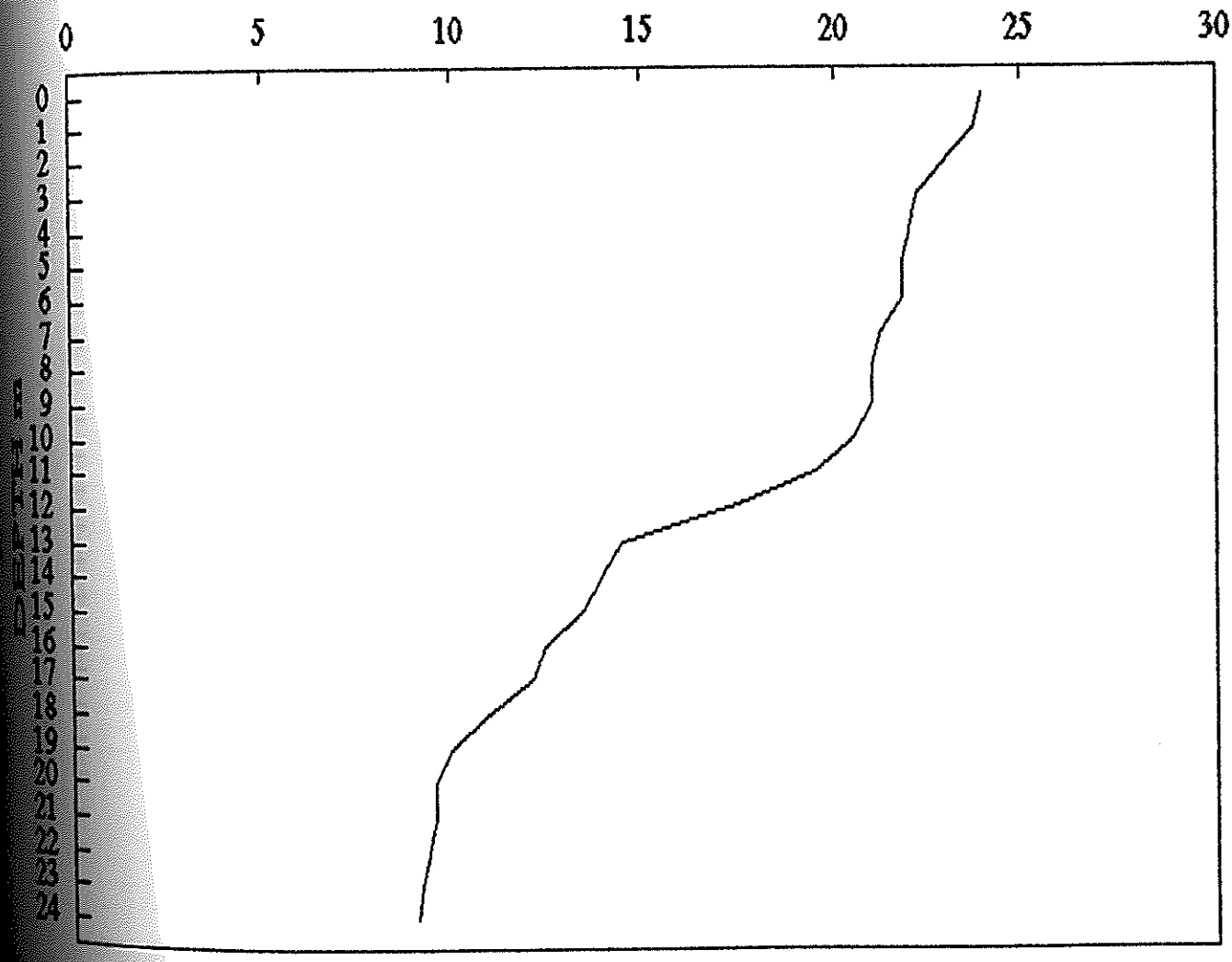
TEMPERATURE C



DETROIT LAKE

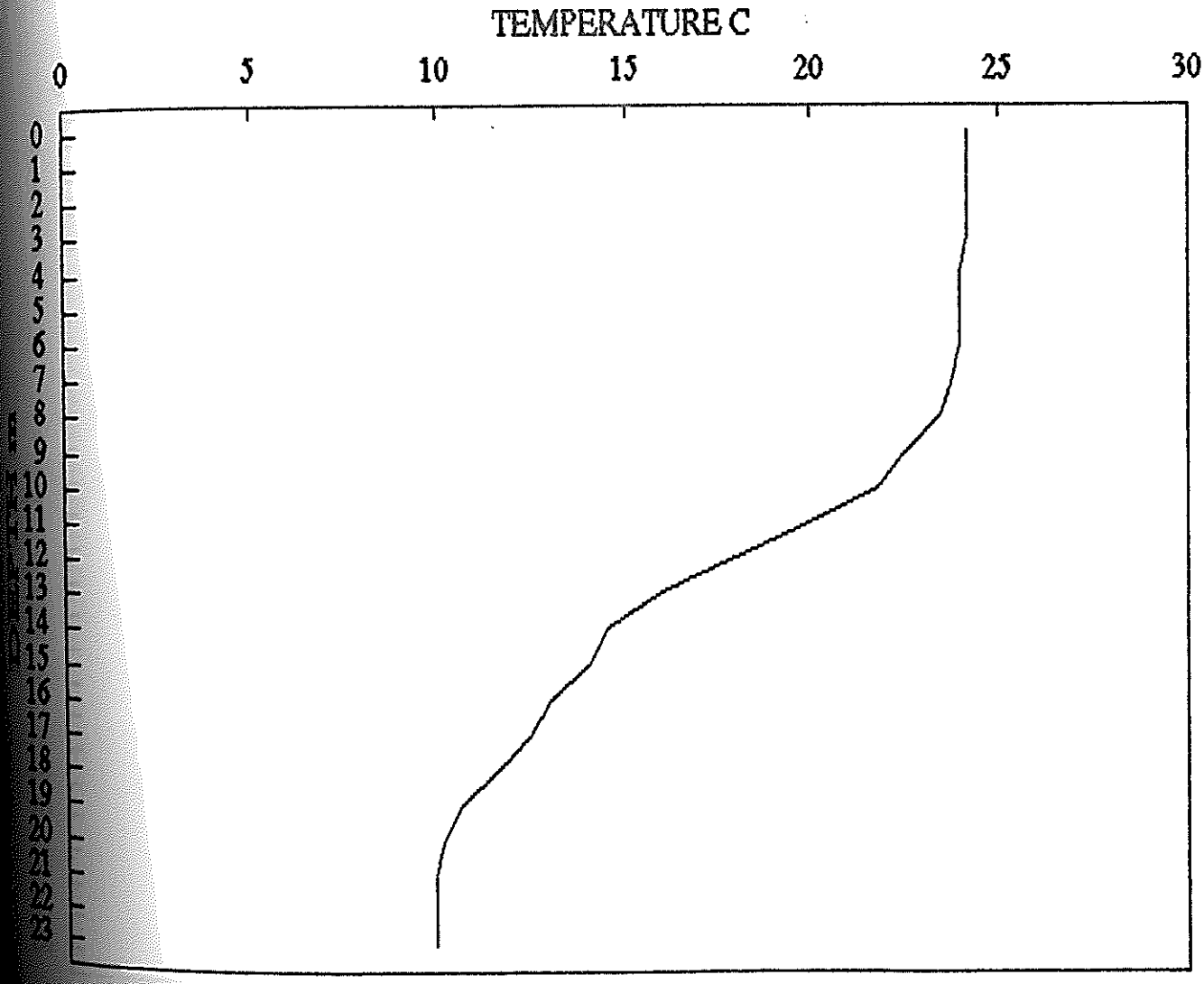
July 5,1988

TEMPERATURE C



DETROIT LAKE

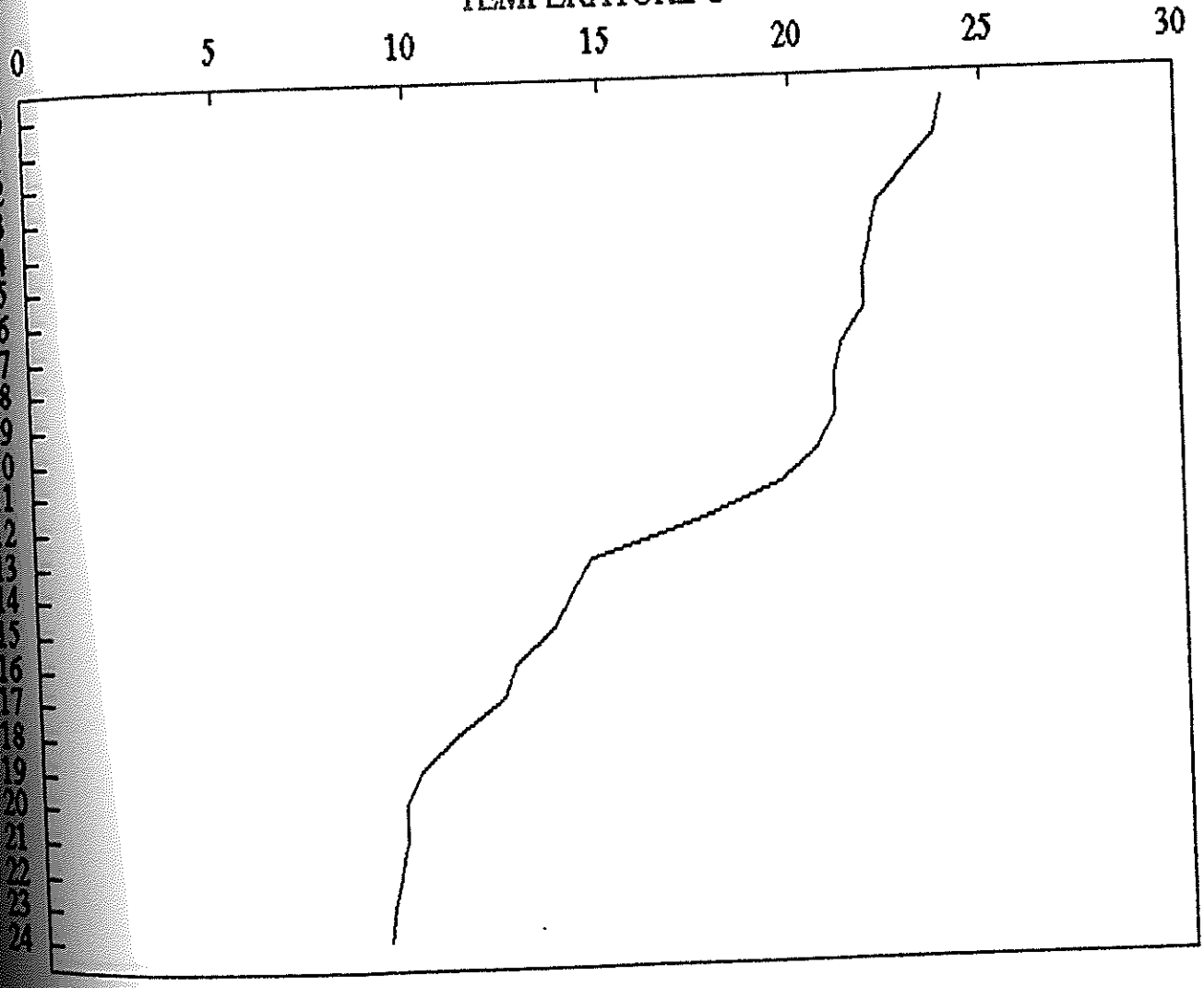
July 19,1988



DETROIT LAKE

August 9,1988

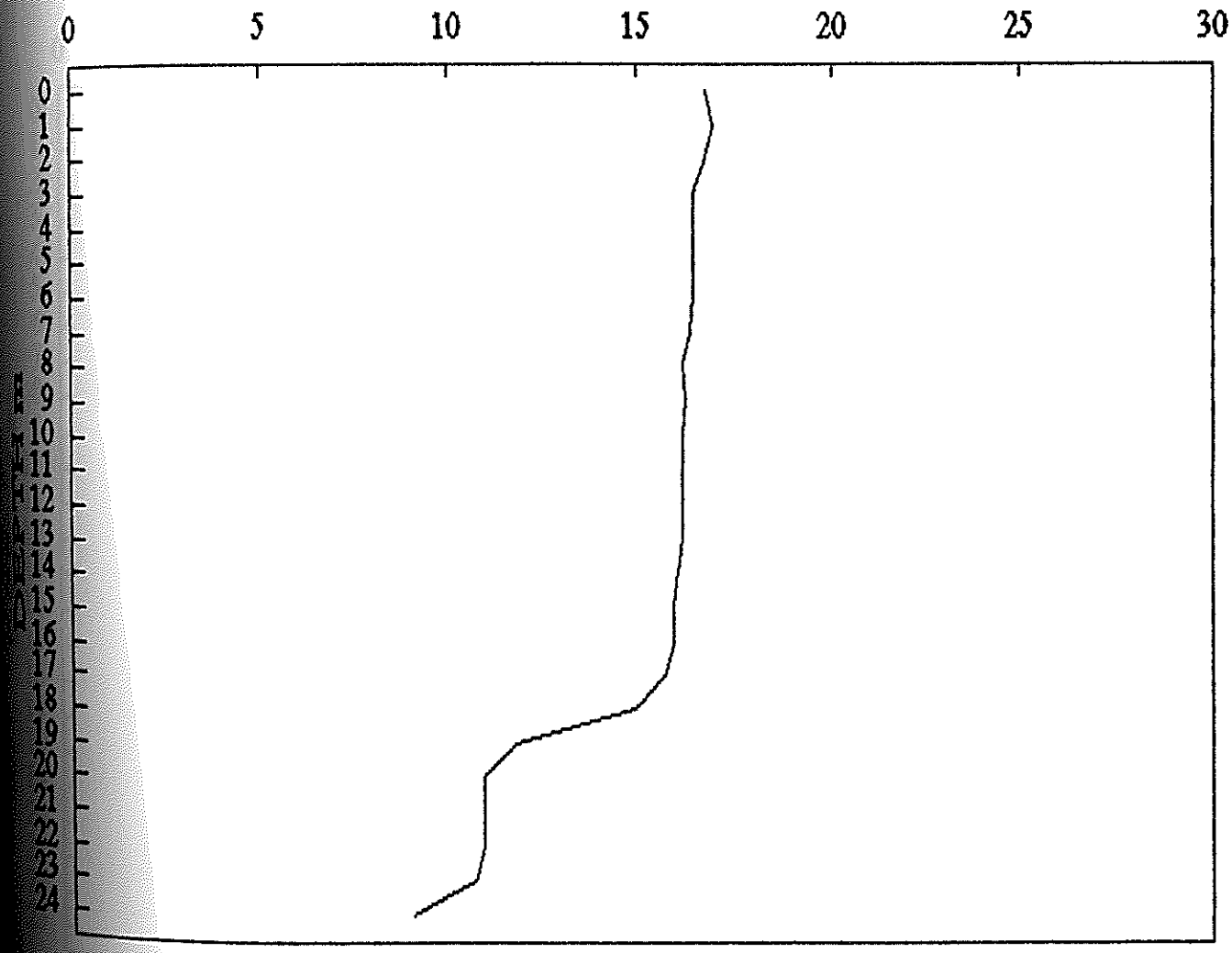
TEMPERATURE C



DETROIT LAKE

September 15,1988

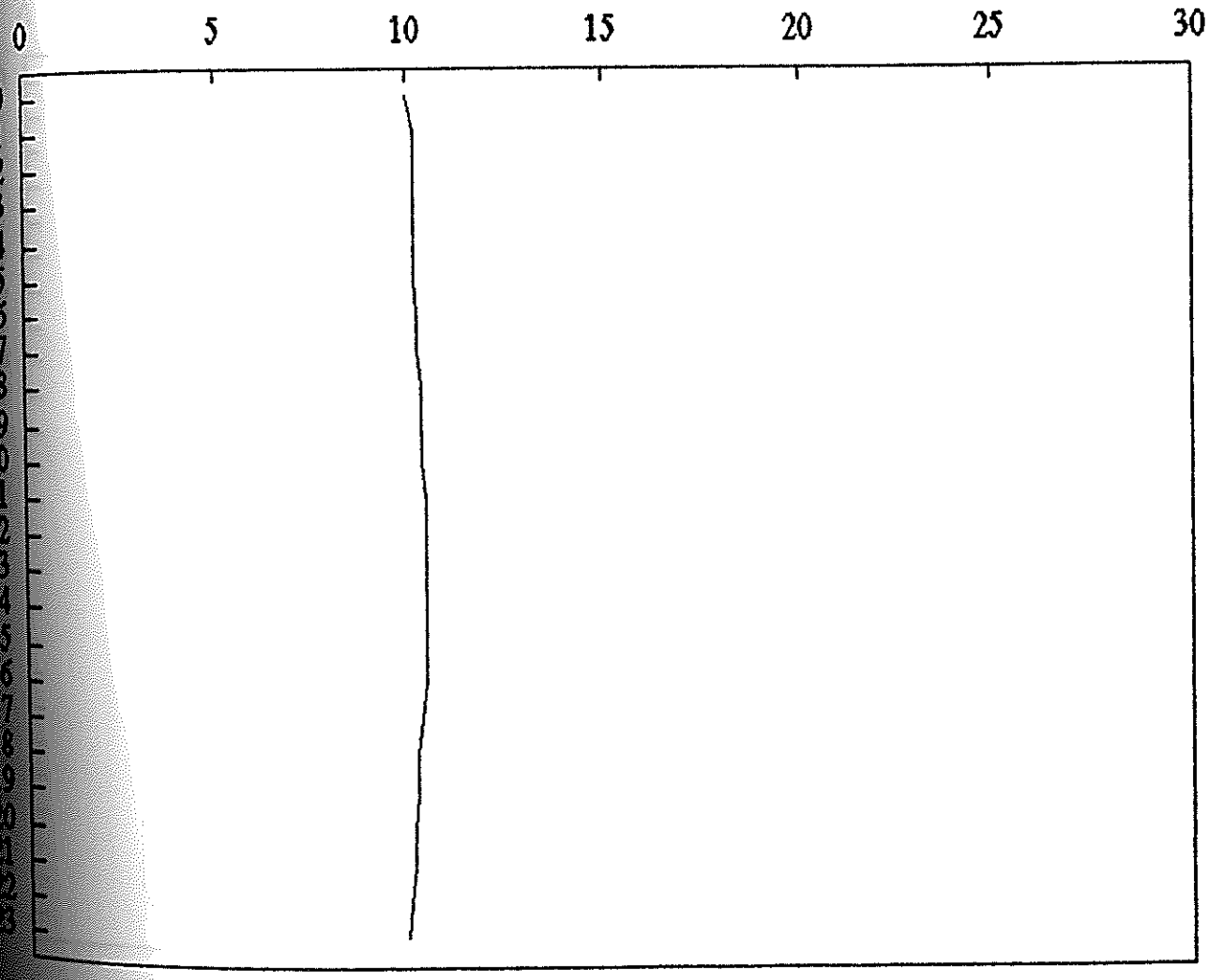
TEMPERATURE C



DETROIT LAKE

October 19,1988

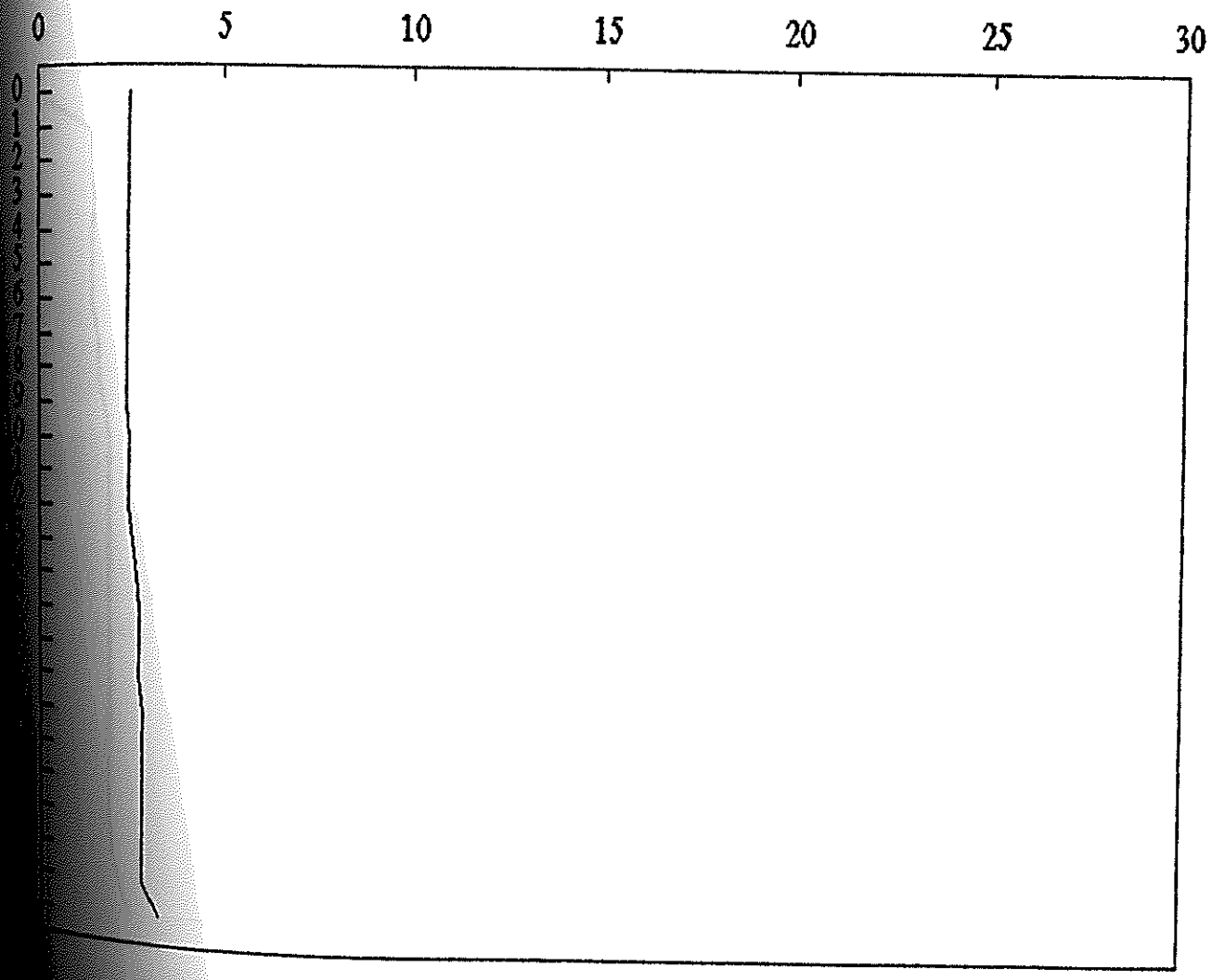
TEMPERATURE C



DETROIT LAKE

November 7,1988

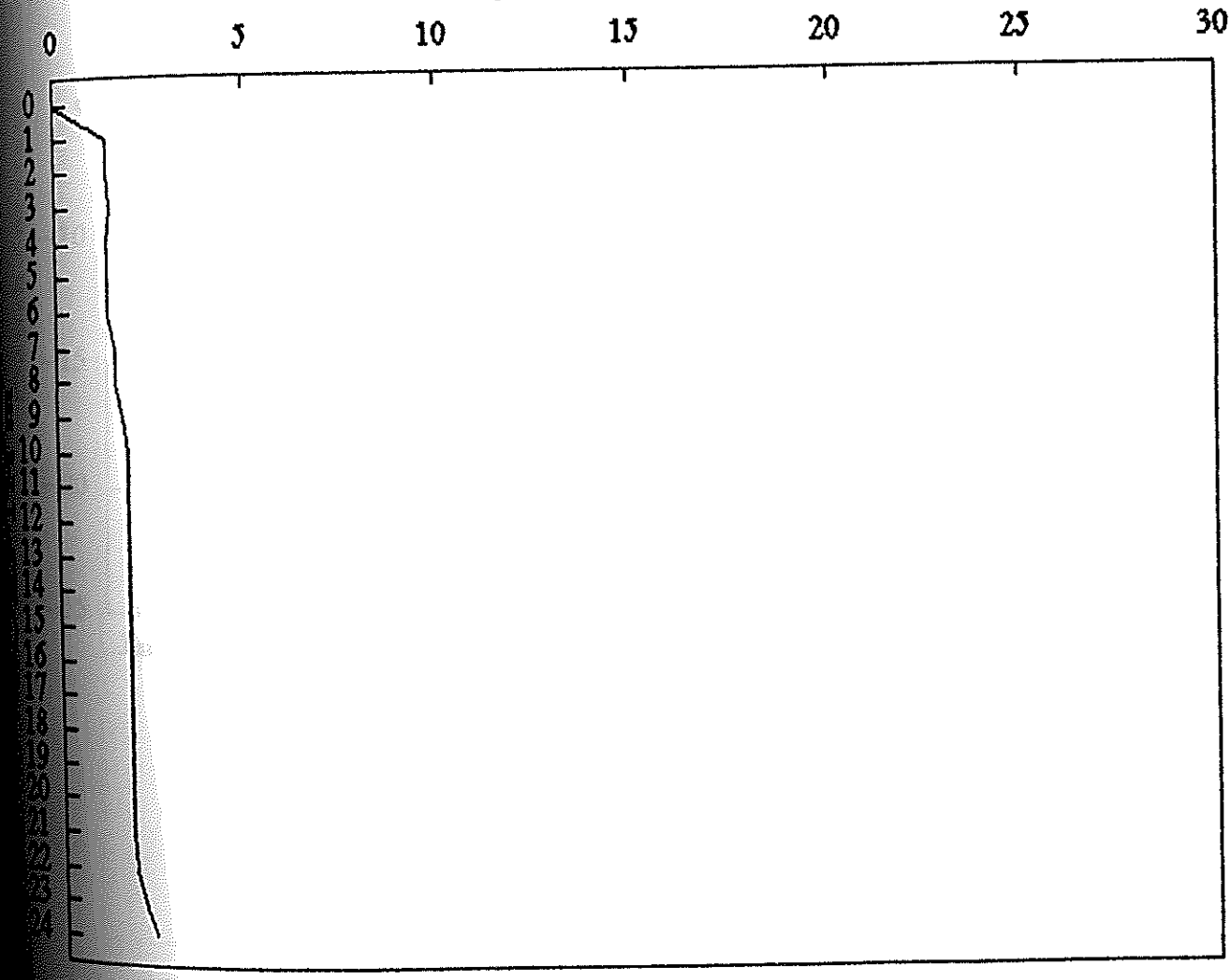
TEMPERATURE C



DETROIT LAKE

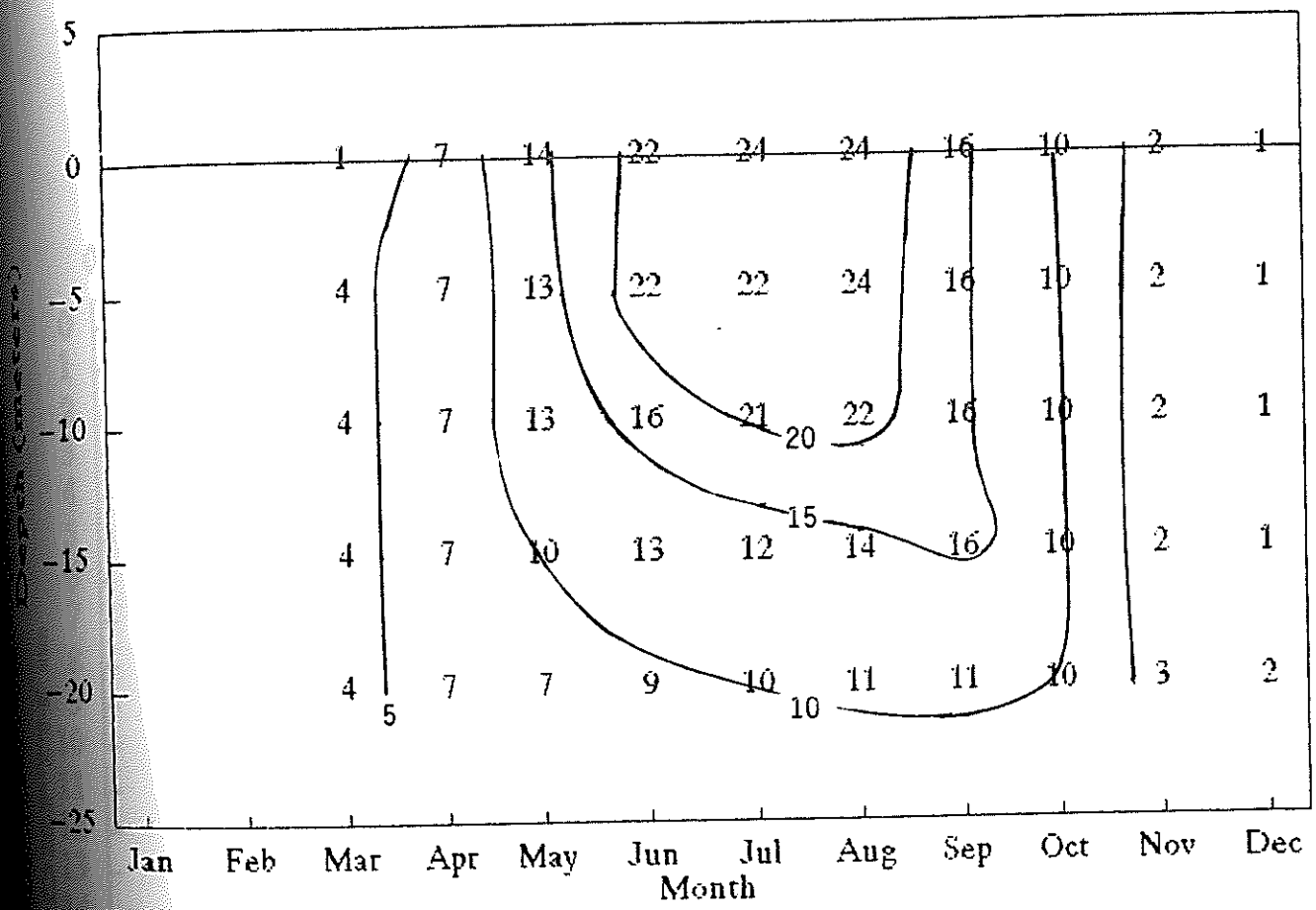
December 15,1988

TEMPERATURE C



DETROIT LAKE

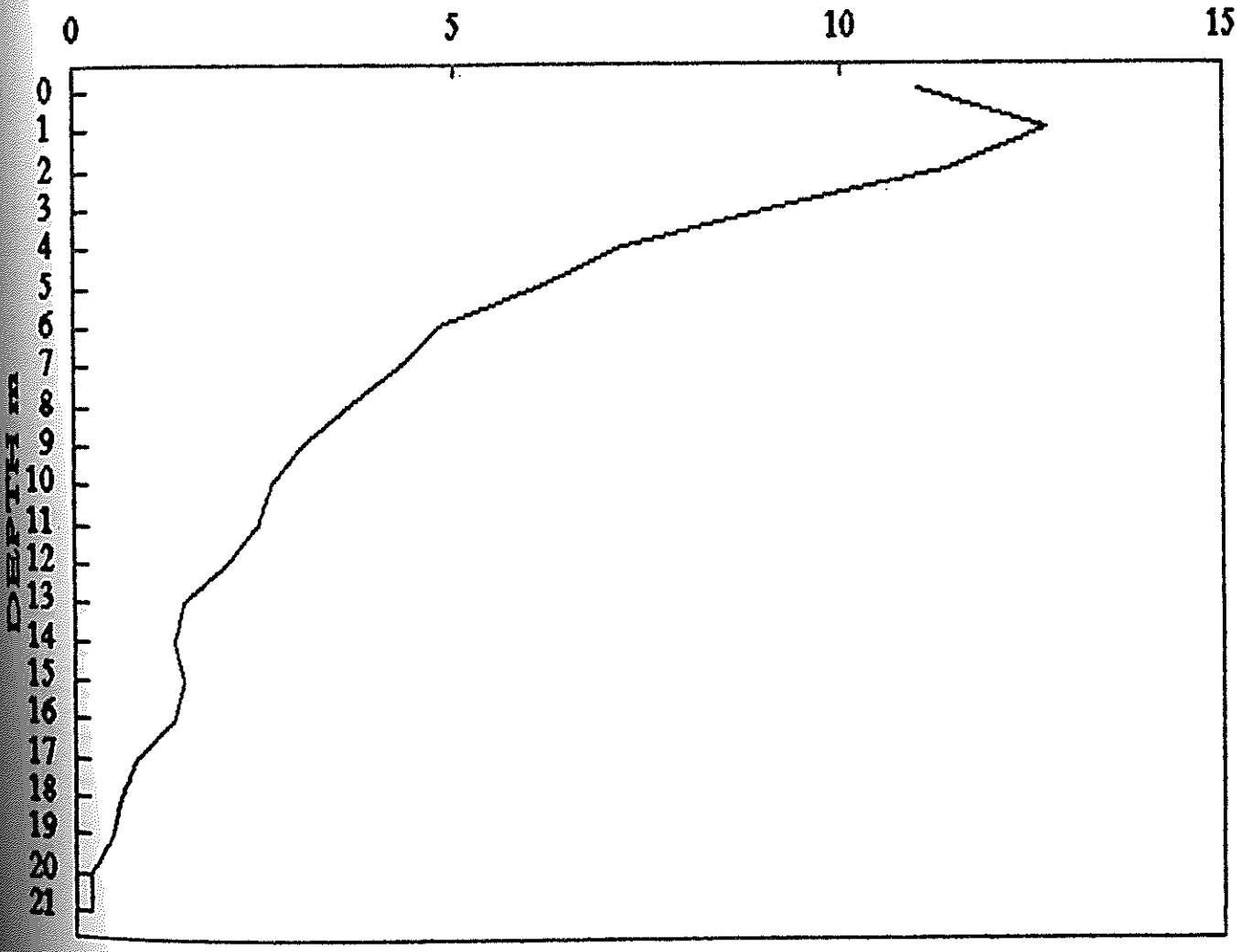
TEMPERATURE – 1988



DETROIT LAKE

March 31,1988

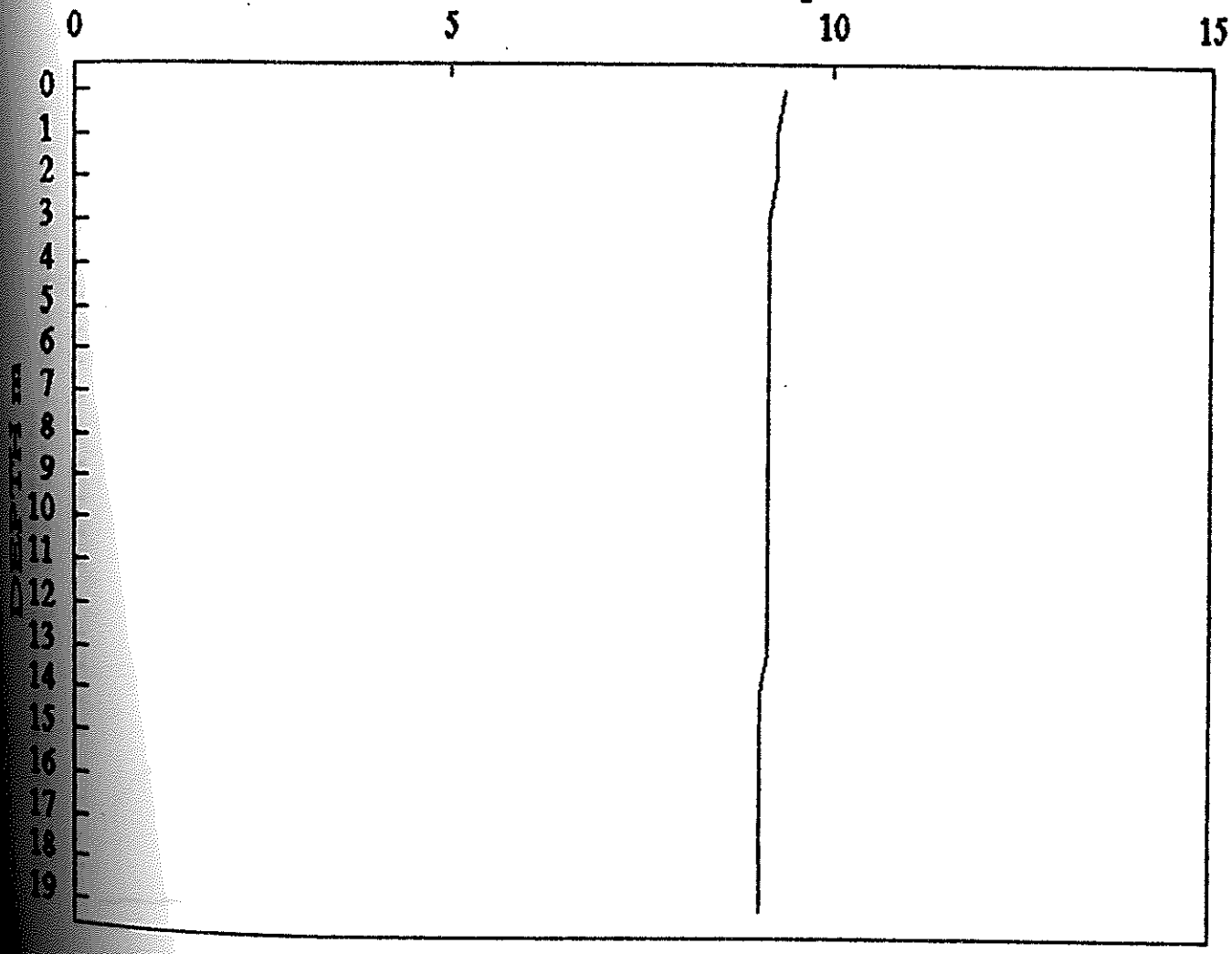
DISSOLVED OXYGEN mg/l



DETROIT LAKE

April 25,1988

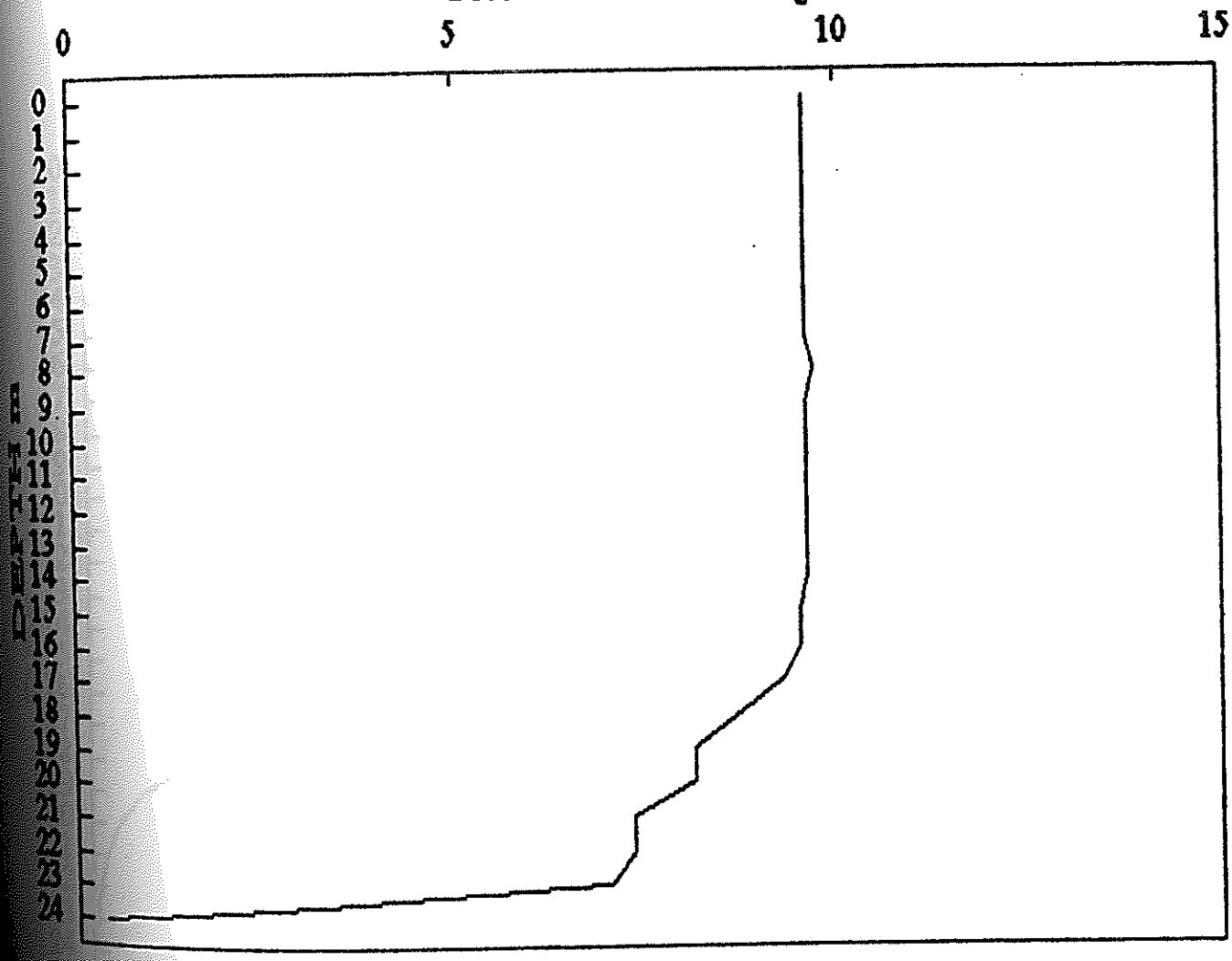
DISSOLVED OXYGEN mg/l



DETROIT LAKE

May 10,1988

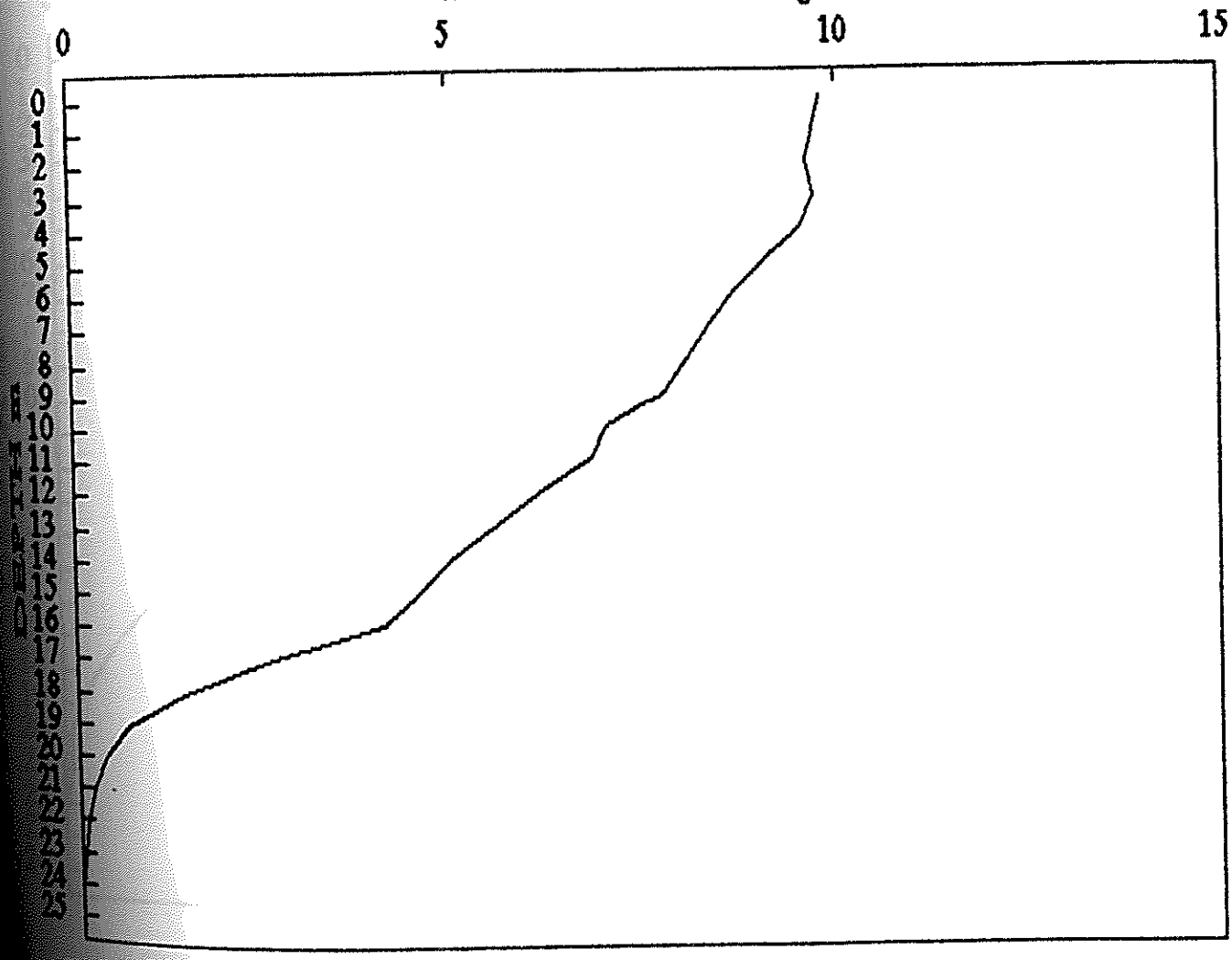
DISSOLVED OXYGEN mg/l



DETROIT LAKE

May 26,1988

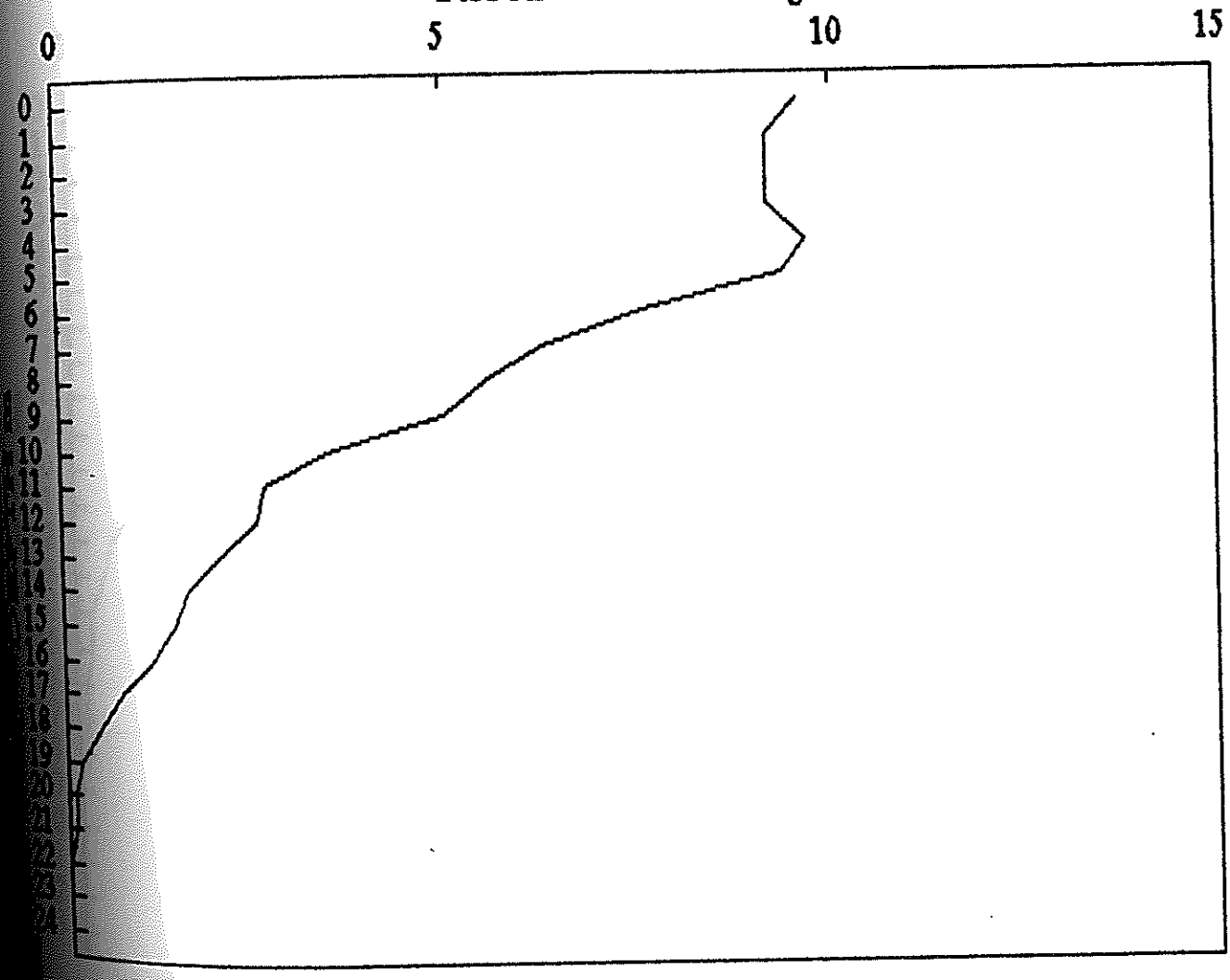
DISSOLVED OXYGEN mg/l



DETROIT LAKE

June 7,1988

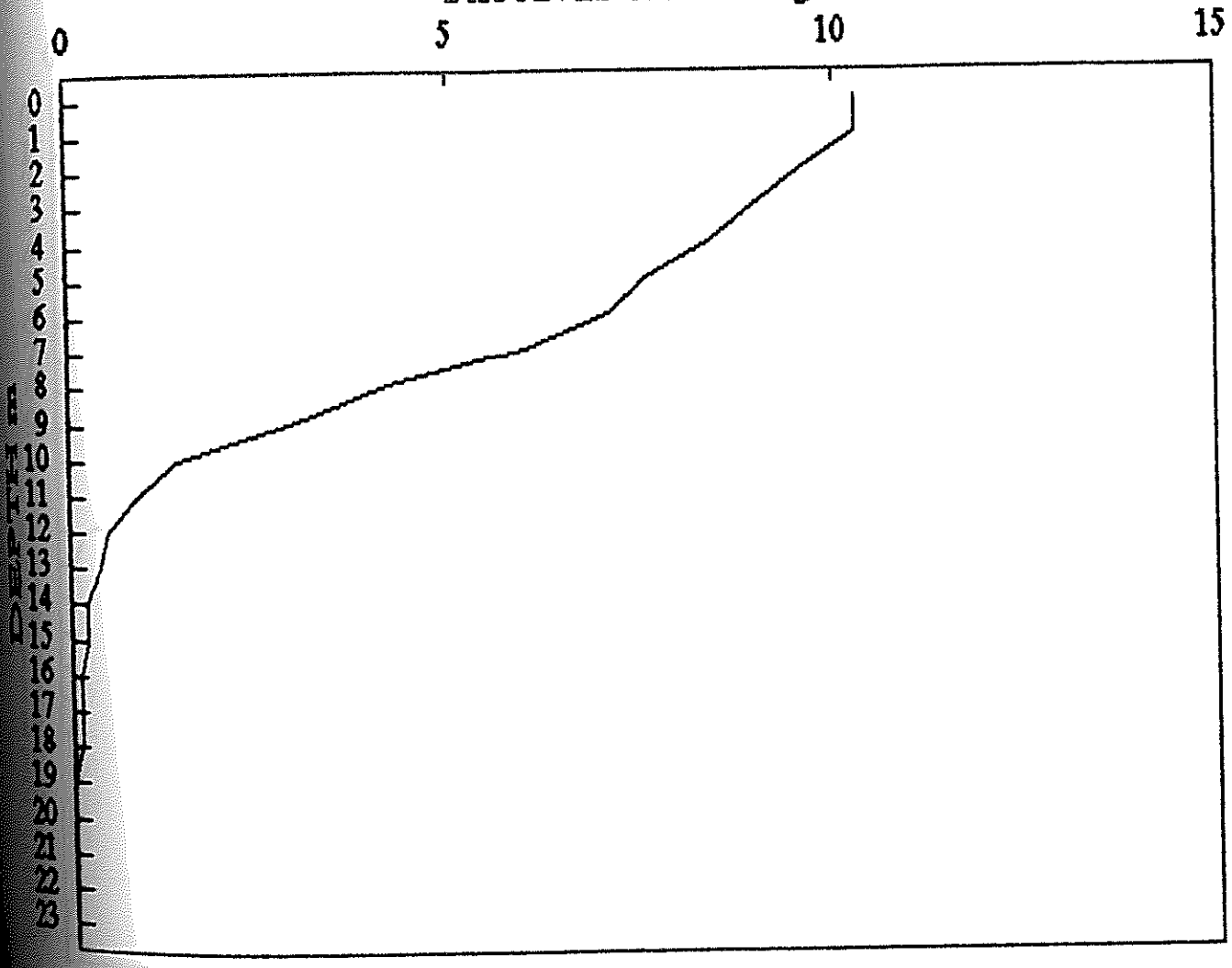
DISSOLVED OXYGEN mg/l



DETROIT LAKE

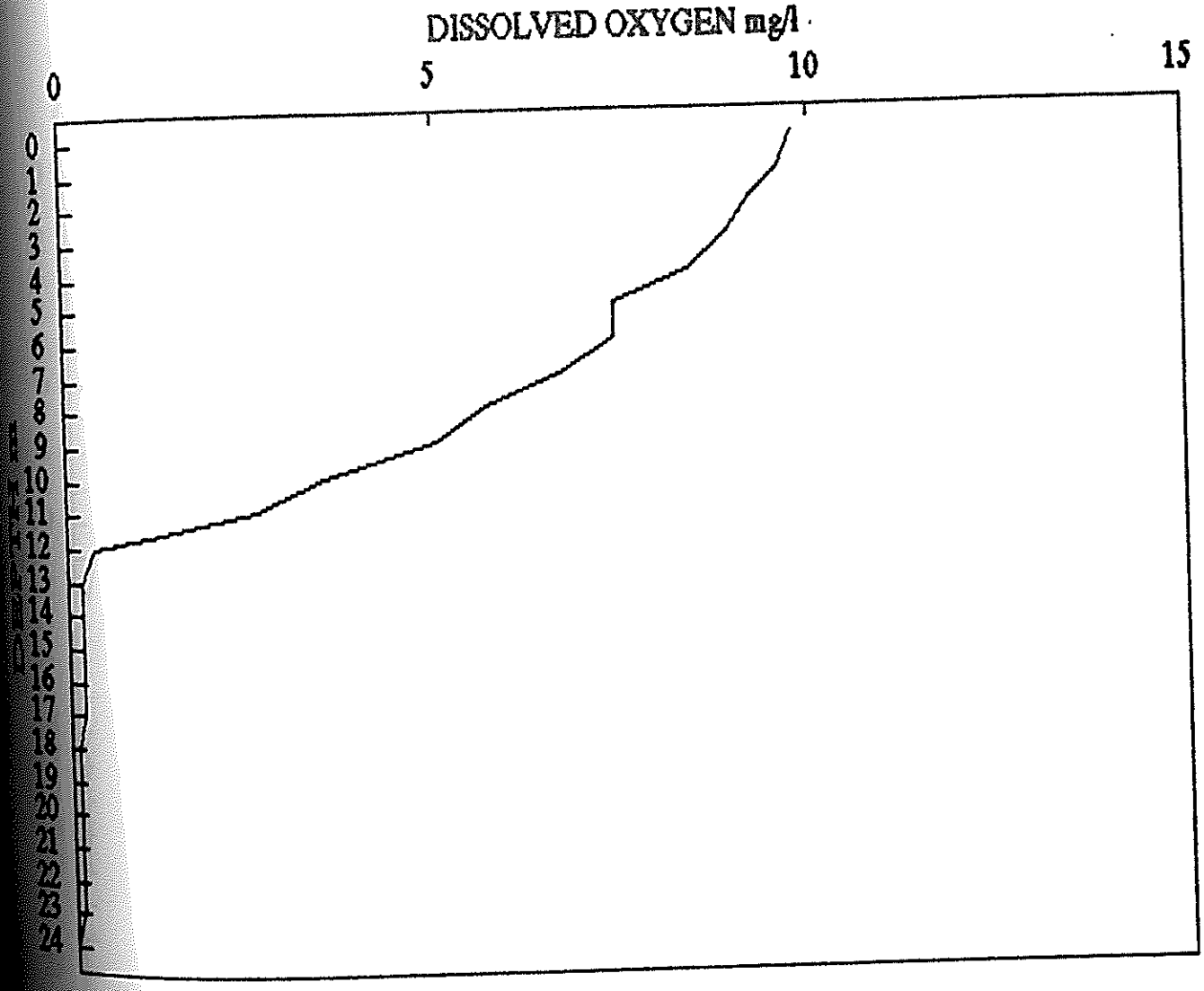
June 20,1988

DISSOLVED OXYGEN mg/l



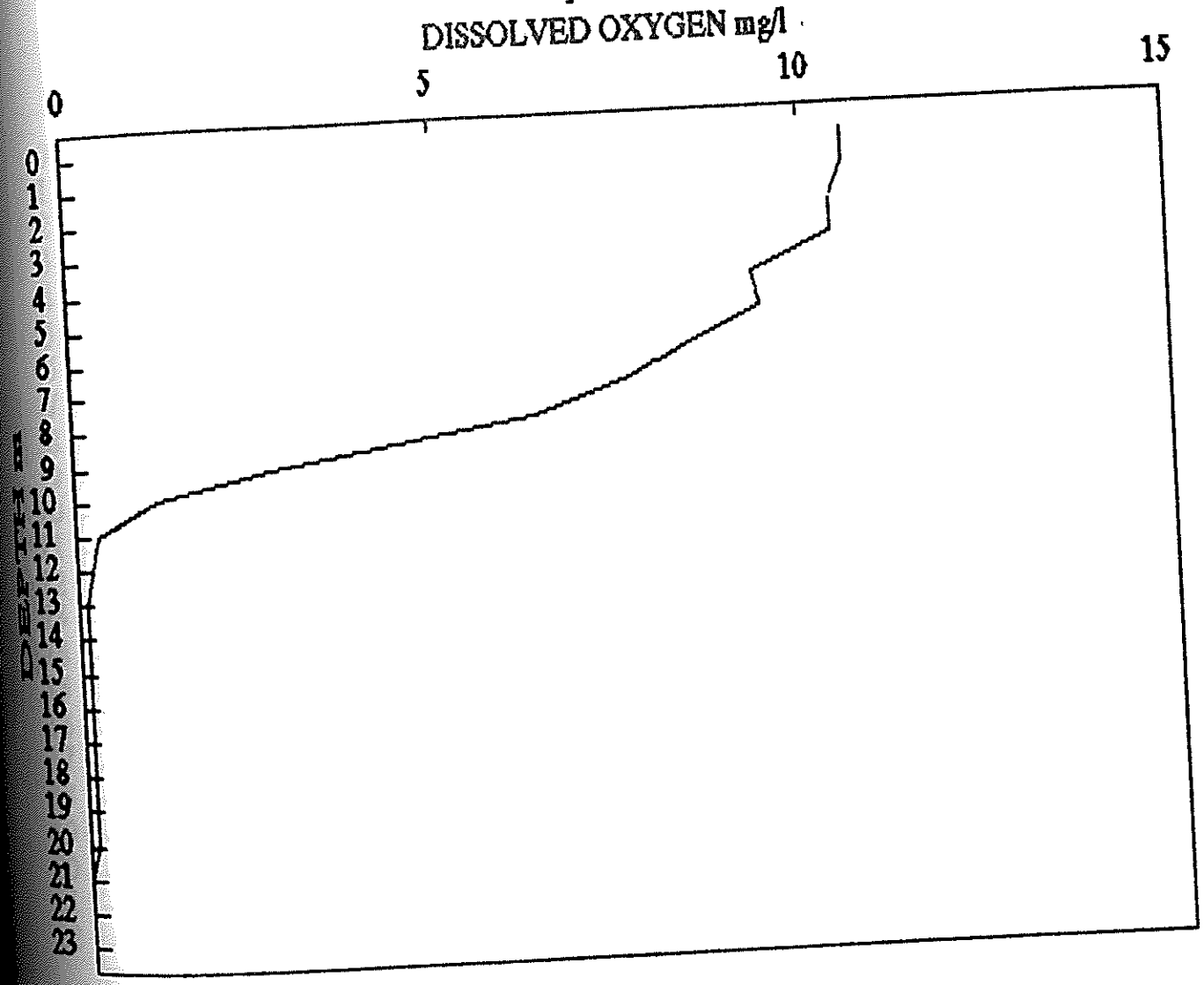
DETROIT LAKE

July 5,1988



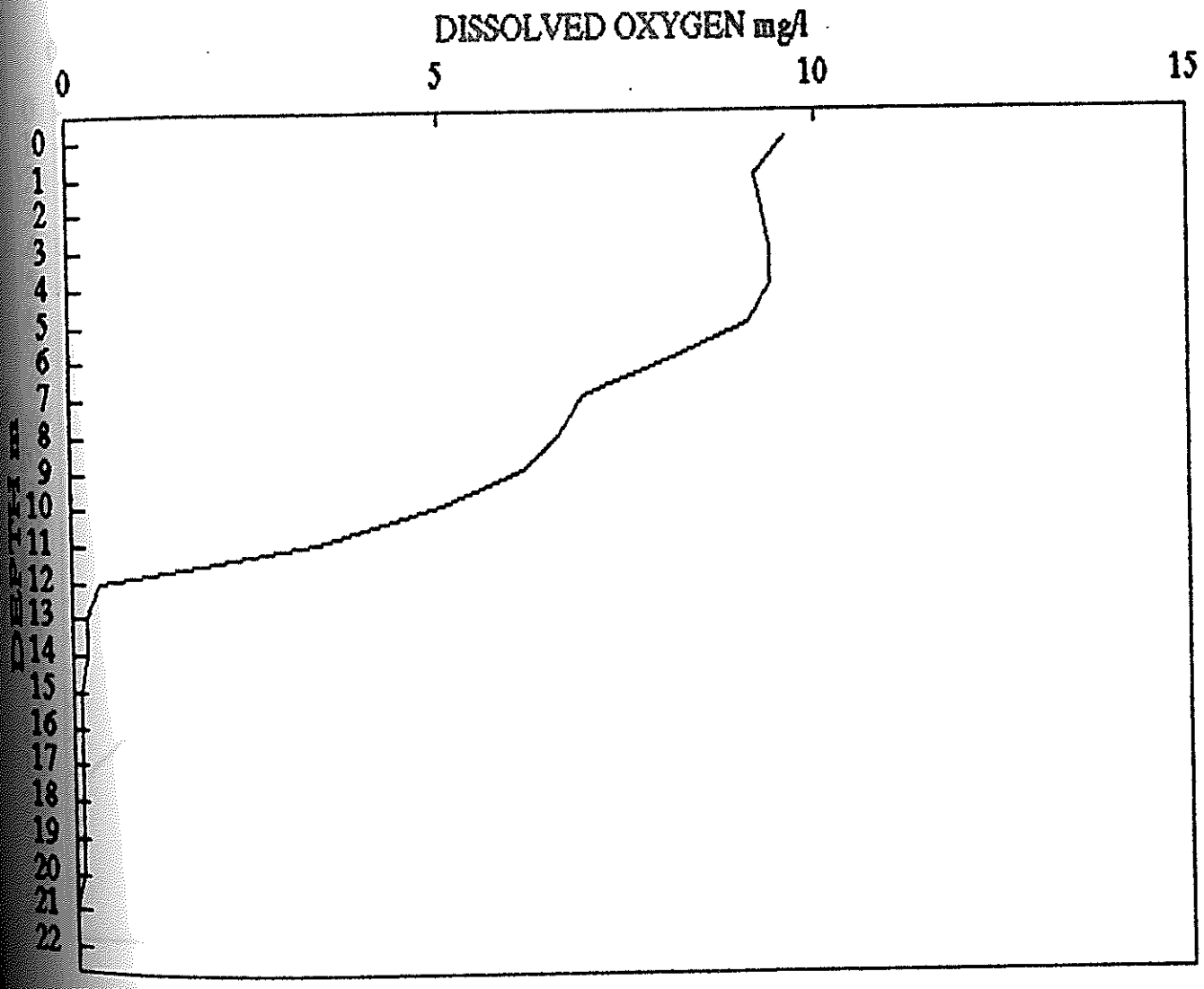
DETROIT LAKE

July 19,1988



DETROIT LAKE

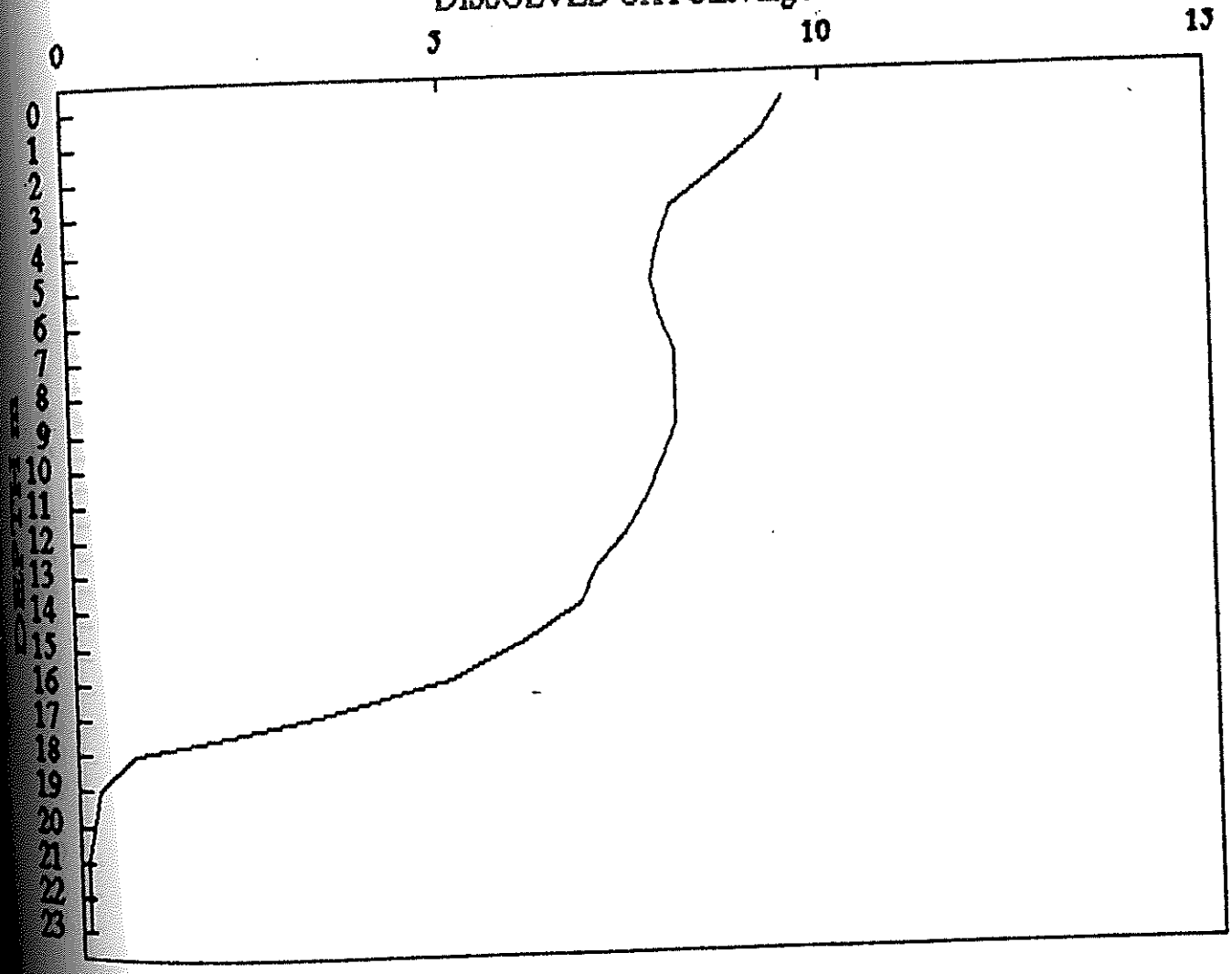
August 9,1988



DETROIT LAKE

September 15,1988

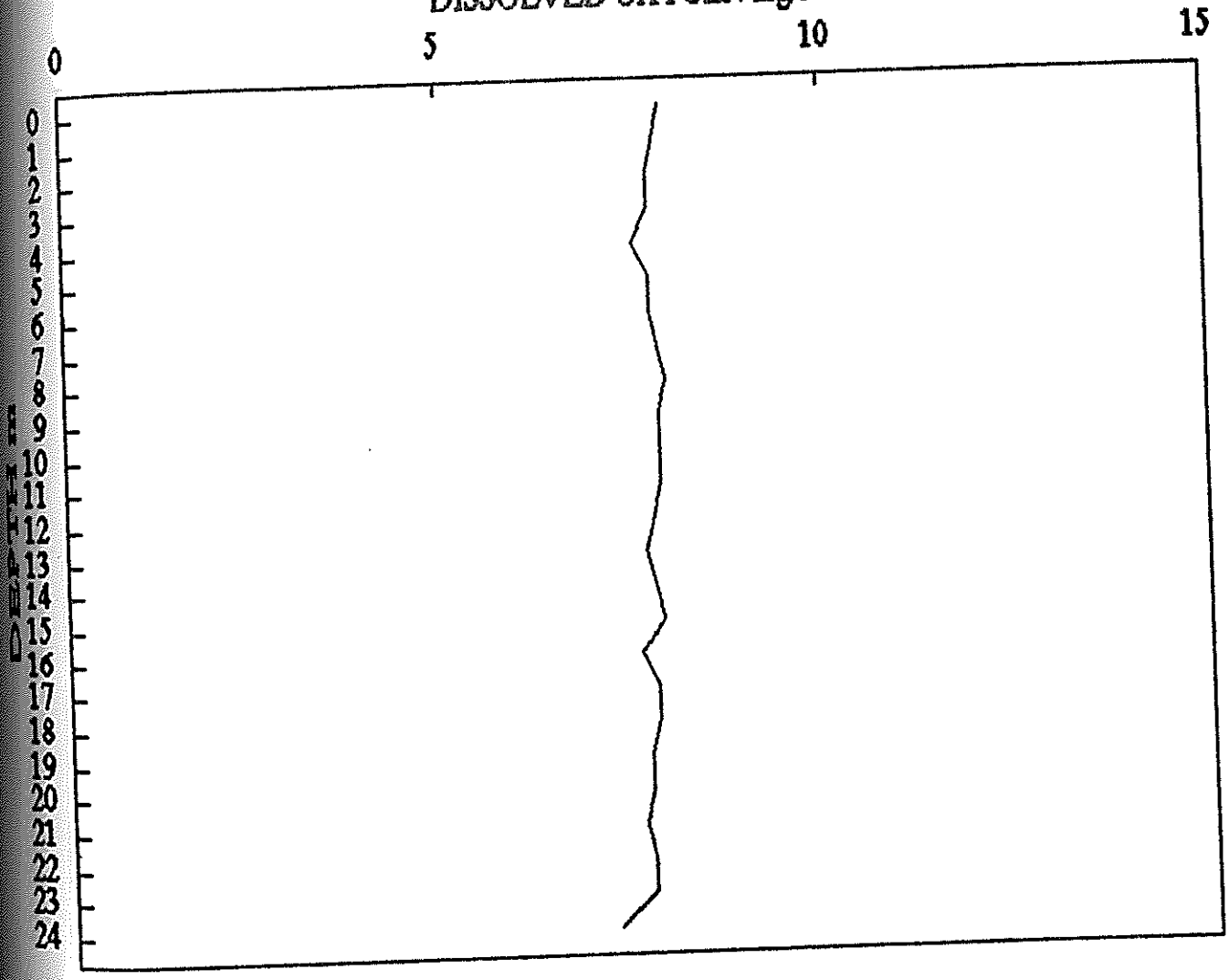
DISSOLVED OXYGEN mg/l



DETROIT LAKE

October 19,1988

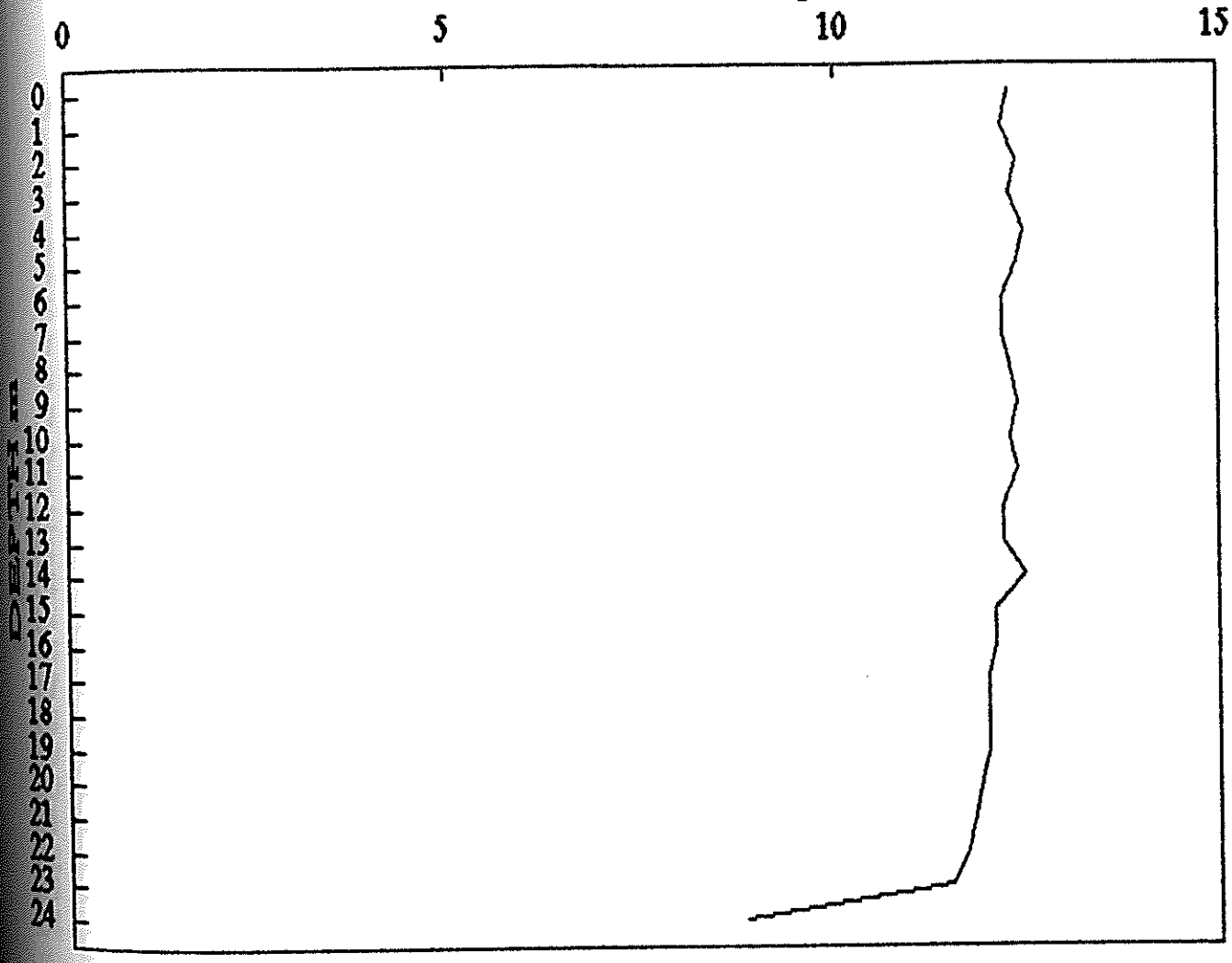
DISSOLVED OXYGEN mg/l



DETROIT LAKE

November 7,1988

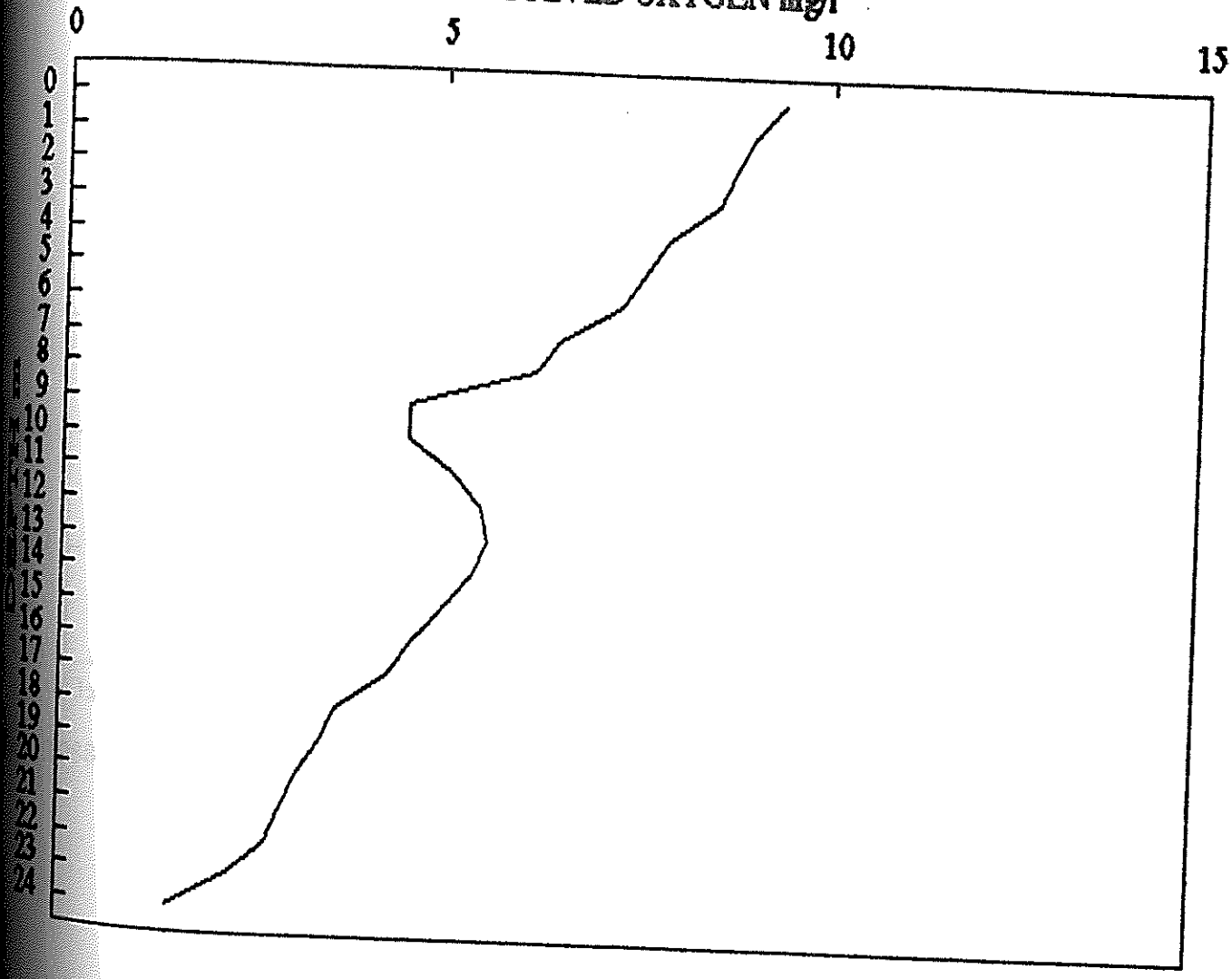
DISSOLVED OXYGEN mg/l



DETROIT LAKE

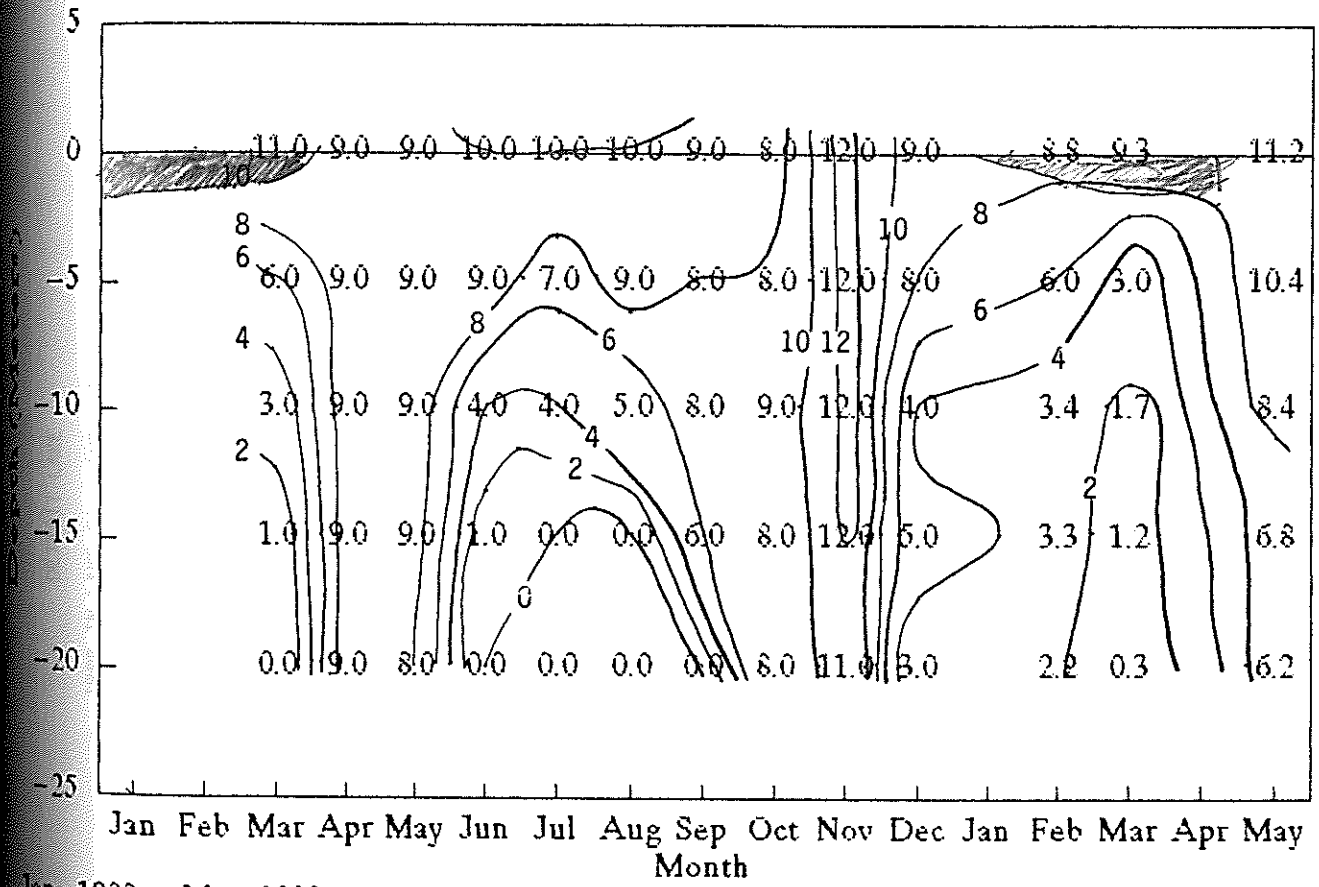
December 15,1988

DISSOLVED OXYGEN mg/l



DETROIT LAKE

DISSOLVED OXYGEN – 1988 & 1989



Jan., 1988 to May, 1989

DETROIT LAKE

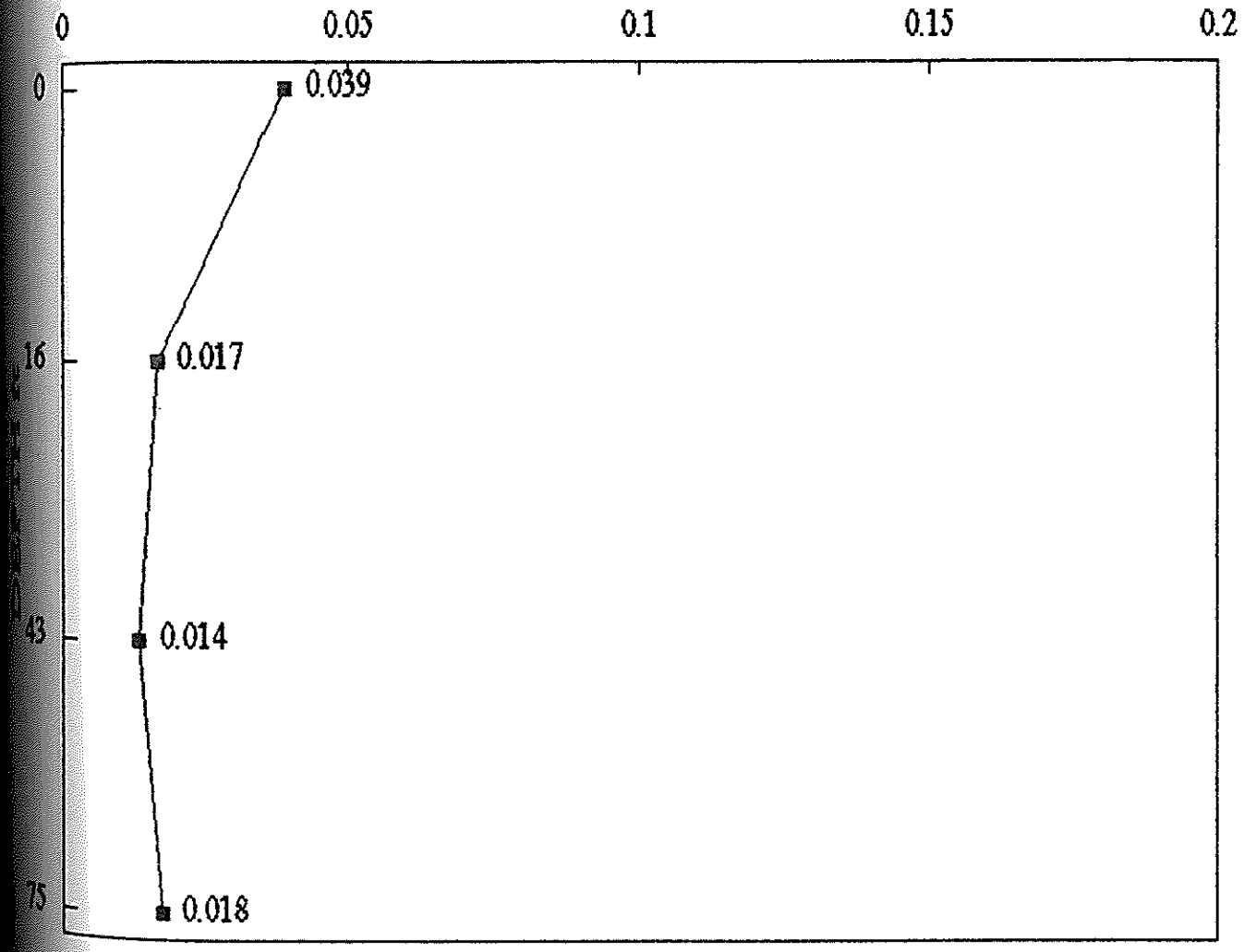
1988 IN-LAKE SAMPLING RESULTS

	3/31/88	4/25/88	5/10/88	5/26/88	6/7/88	6/21/88	7/5/88	7/19/88	8/9/88	8/23/88	9/15/88	10/19/88	11/7/88	12/15/88
Surface														
Po	0.027	<0.01	0.004	0.002	0.006	0.008	0.004	ND	0.008	0.008	0.006	0.002	0.008	0.002
P_T	0.039	0.01	0.012	0.015	0.026	0.020	0.018	0.030	0.034	0.030	0.024	0.015	0.015	0.012
Kjl-N	0.78	1.2	1.4	1.03	1.2	1.08	0.68	2.08	1.8	1.48	0.92	1.72	1.40	1.12
Org-N	0.57													
NH_3-N	0.21	0.02	0.23		0.09	0.001	<0.01	ND	<0.01	0.06	0.04	0.02	0.05	0.04
NO_2-N+	0.20													
Chlor-a	3.20	14.7	2.1	3.9	1.9		3.3	4.9	10.3	7.3	5.4	3.4		
TSS	4.0													
PH	8.3													8.0
Conduct	320.0													
Alk.	150													
Secchi Disk(m)		3.7	4.0	5.8	5.15	1.66	2.61	2.15	1.54	1.69	2.15	3.54	3.07	
Fecal Coli		2.0	4.0		<2.0				<2.0			4.0		
Five Meter Sample														
Po	0.017	<0.01	0.004	0.008	0.004	0.004	0.005	ND	0.004	0.006	0.002	0.002	0.008	0.002
PT	0.017	0.02	0.09	0.011	0.027	0.012	0.018	0.035	0.039	0.030	0.019	0.016	0.027	0.009
TSS	0.8	1.5	1.1	1.7	1.0	1.2	2.1	1.0	4.9	4.8	5.4	4.3	4.0	0.5
Thirteen Meter Sample														
Po	0.008	<0.01	0.008	0.008	0.004	0.004	0.005	0.002	0.016	0.012	0.004	0.002	0.008	0.005
PT	0.014	0.01	0.010	0.015	0.012	0.023	0.020	0.030	0.036	0.040	0.018	0.016	0.022	0.014
$N\text{-}NO_2+NO_3$	0.06	0.01	0.01		0.04	0.01	<0.01	ND	<0.01	0.06	0.04	0.02	0.02	0.04
Twenty-Three Meter Sample (Bottom)														
Po	0.011	<0.01	0.005	0.056	0.088	0.056	0.081	0.082	0.106	0.116	0.162	0.002	0.008	0.040
PT	0.018	0.02	0.016	0.067	0.103	0.065	0.106	0.110	0.135	0.140	0.172	0.015	0.019	0.052
Kjl-N	0.68	1.1	1.4	1.76	1.4	1.48	1.48	2.38	2.12	2.48	3.00	1.40	1.04	1.52

LAKE DETROIT

March 31,1988

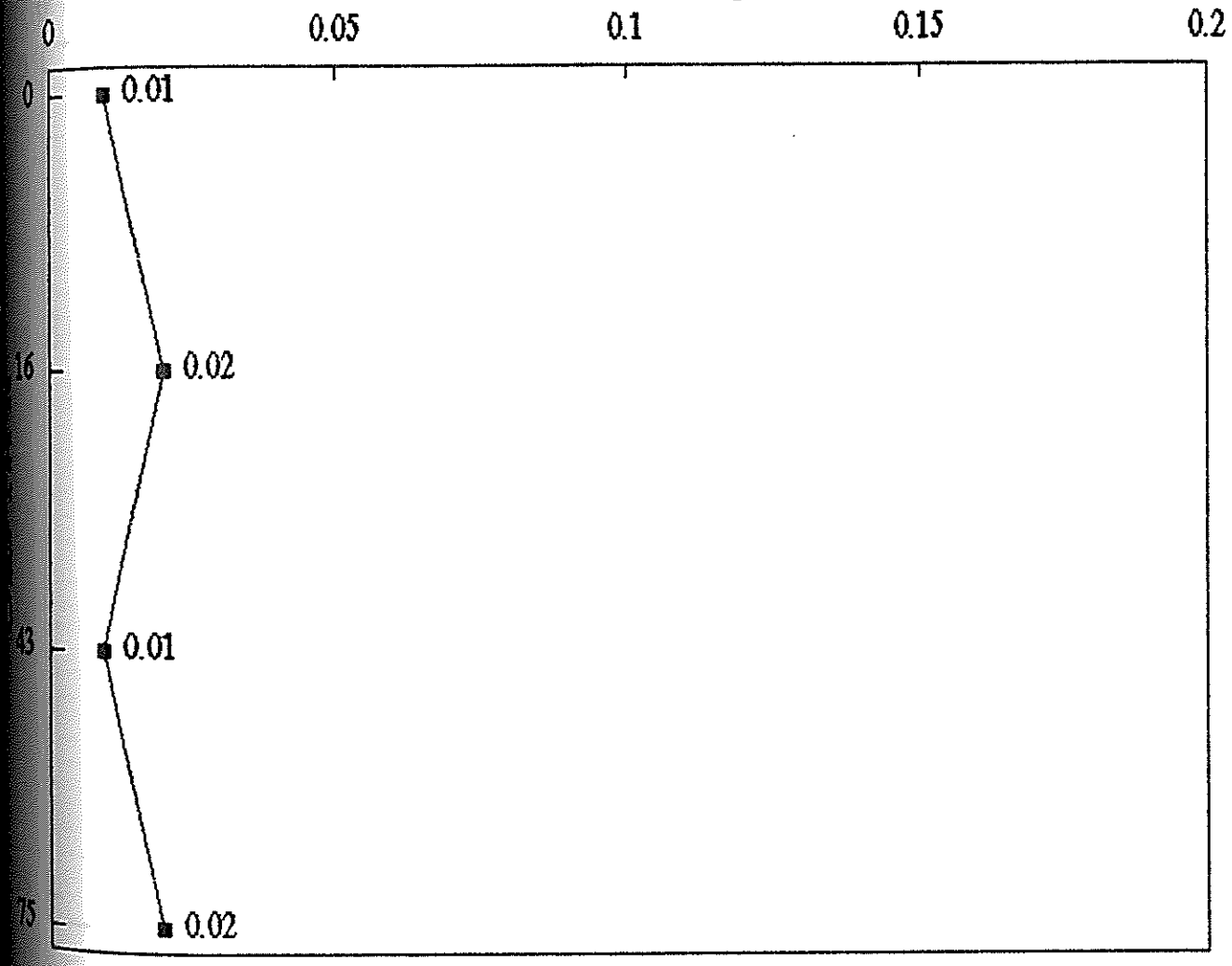
PHOSPHORUS mg/l



LAKE DETROIT

April 25,1988

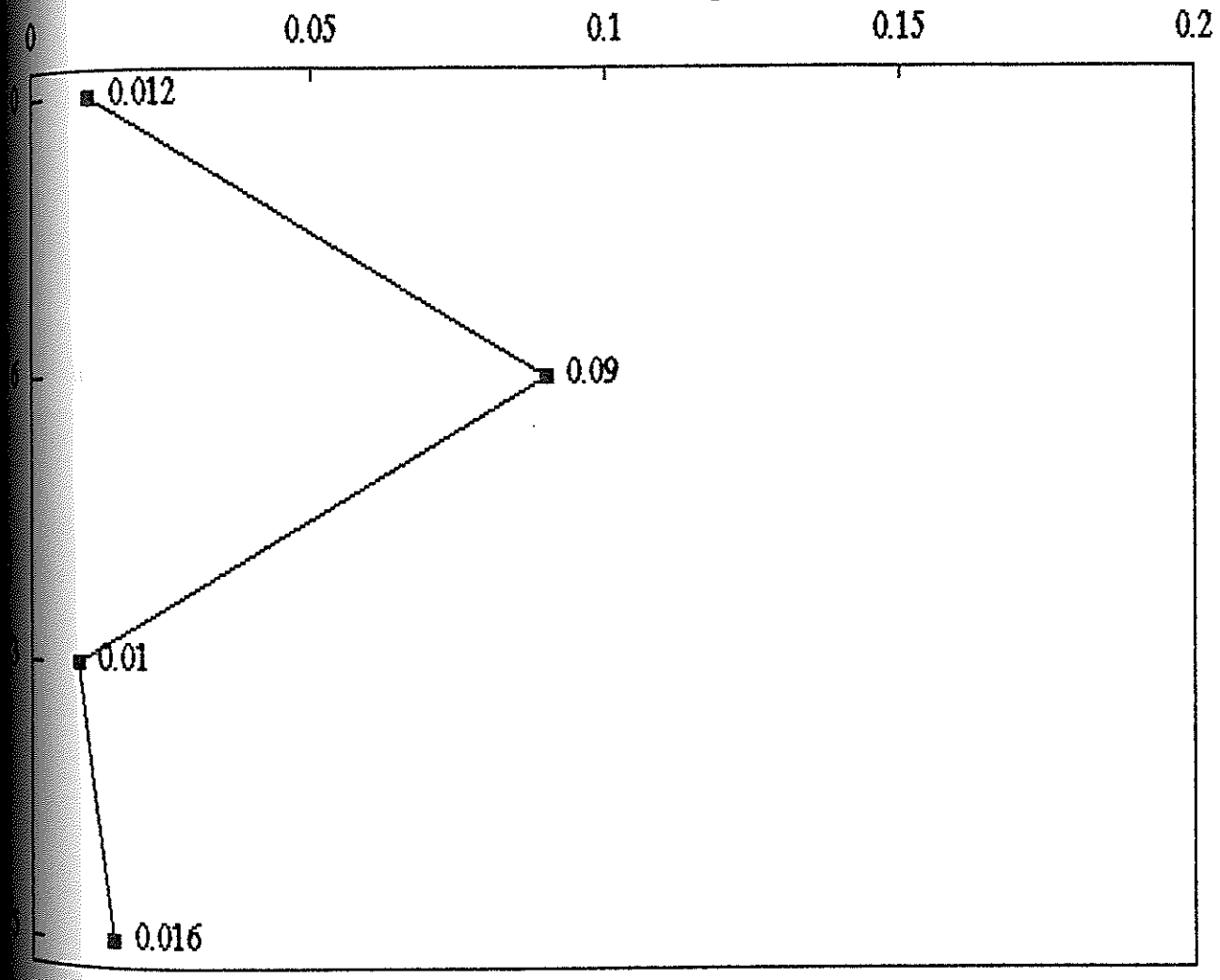
PHOSPHORUS mg/l



LAKE DETROIT

May 10,1988

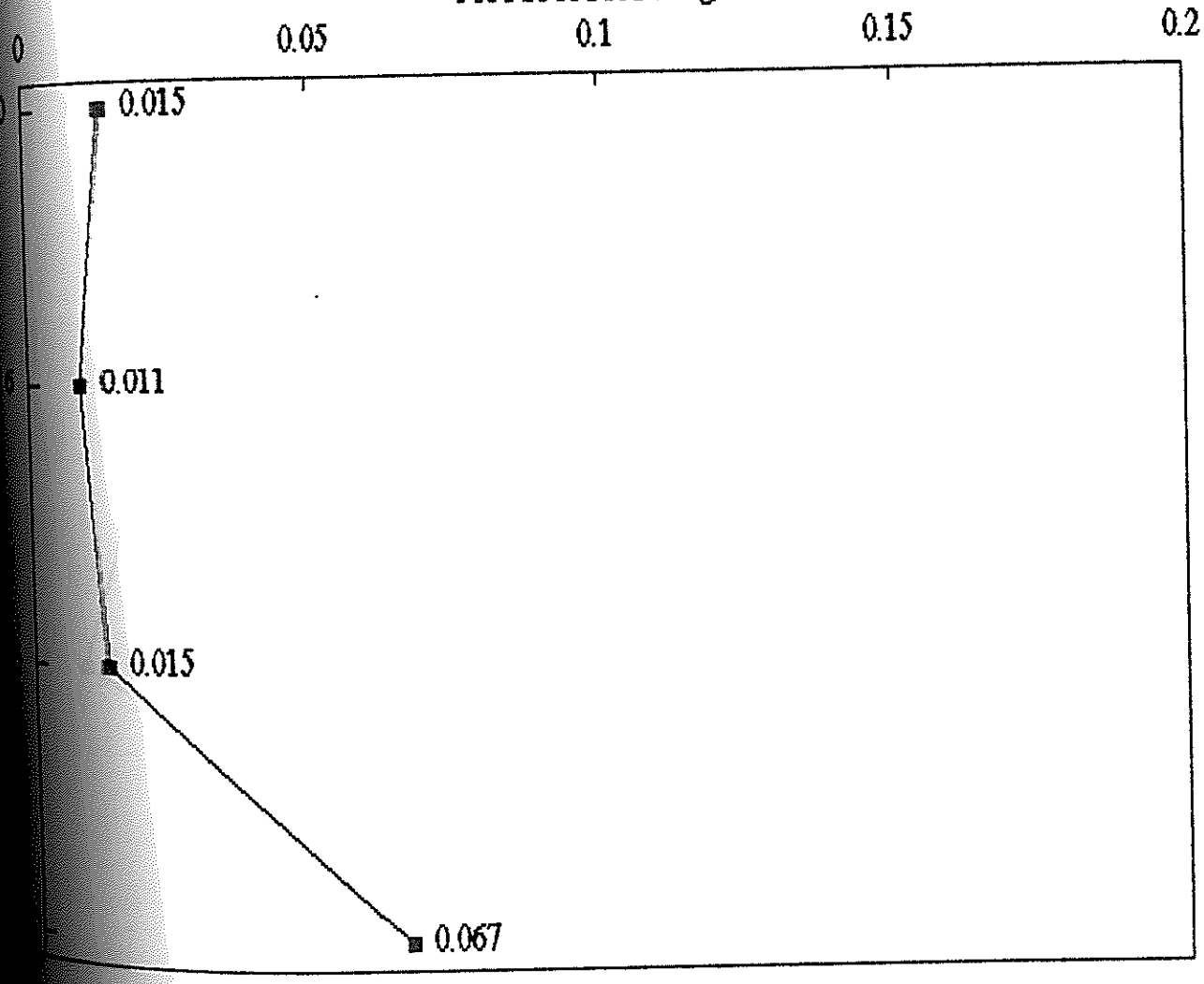
PHOSPHORUS mg/l



LAKE DETROIT

May 26,1988

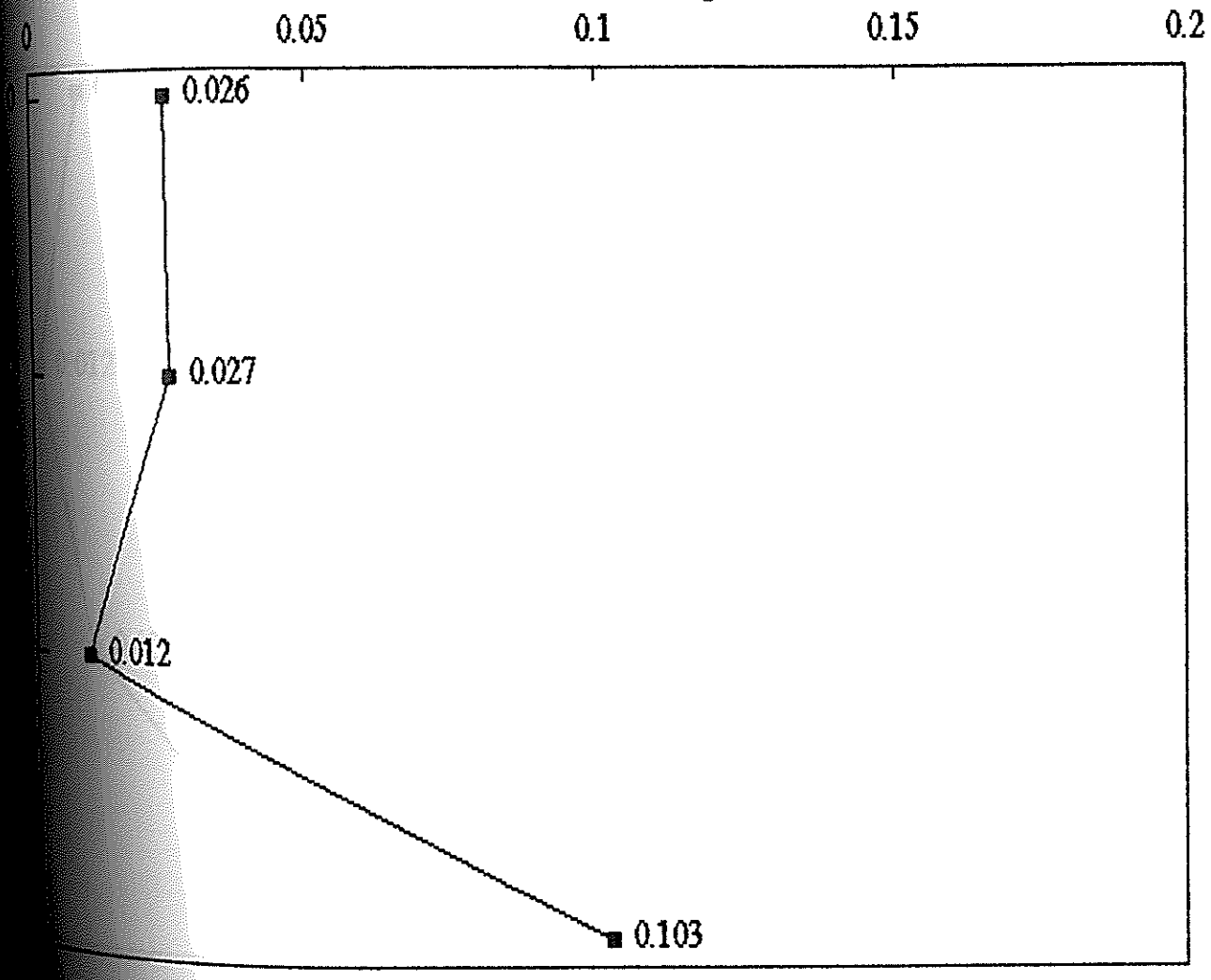
PHOSPHORUS mg/l



LAKE DETROIT

June 7,1988

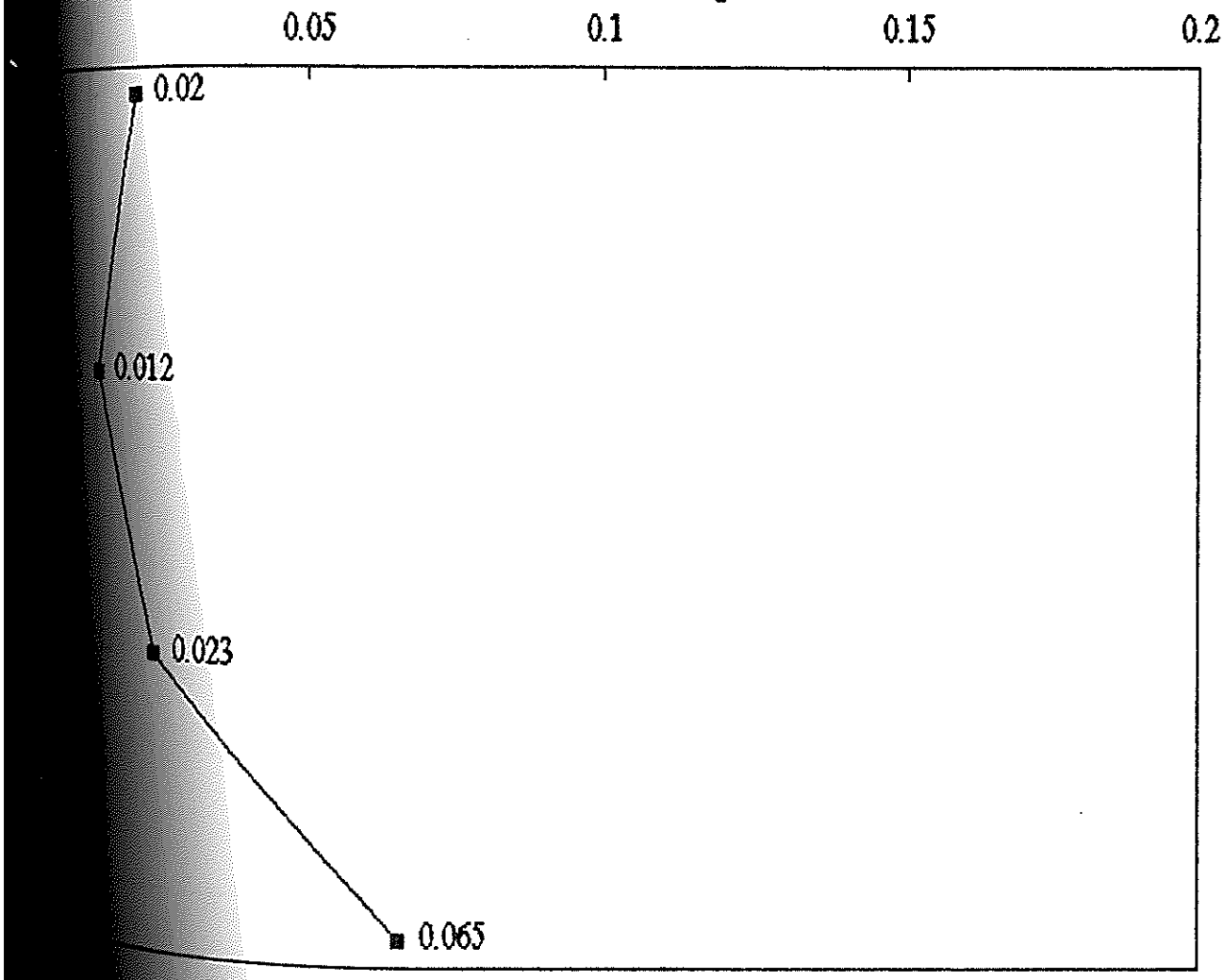
PHOSPHORUS mg/l



LAKE DETROIT

June 21,1988

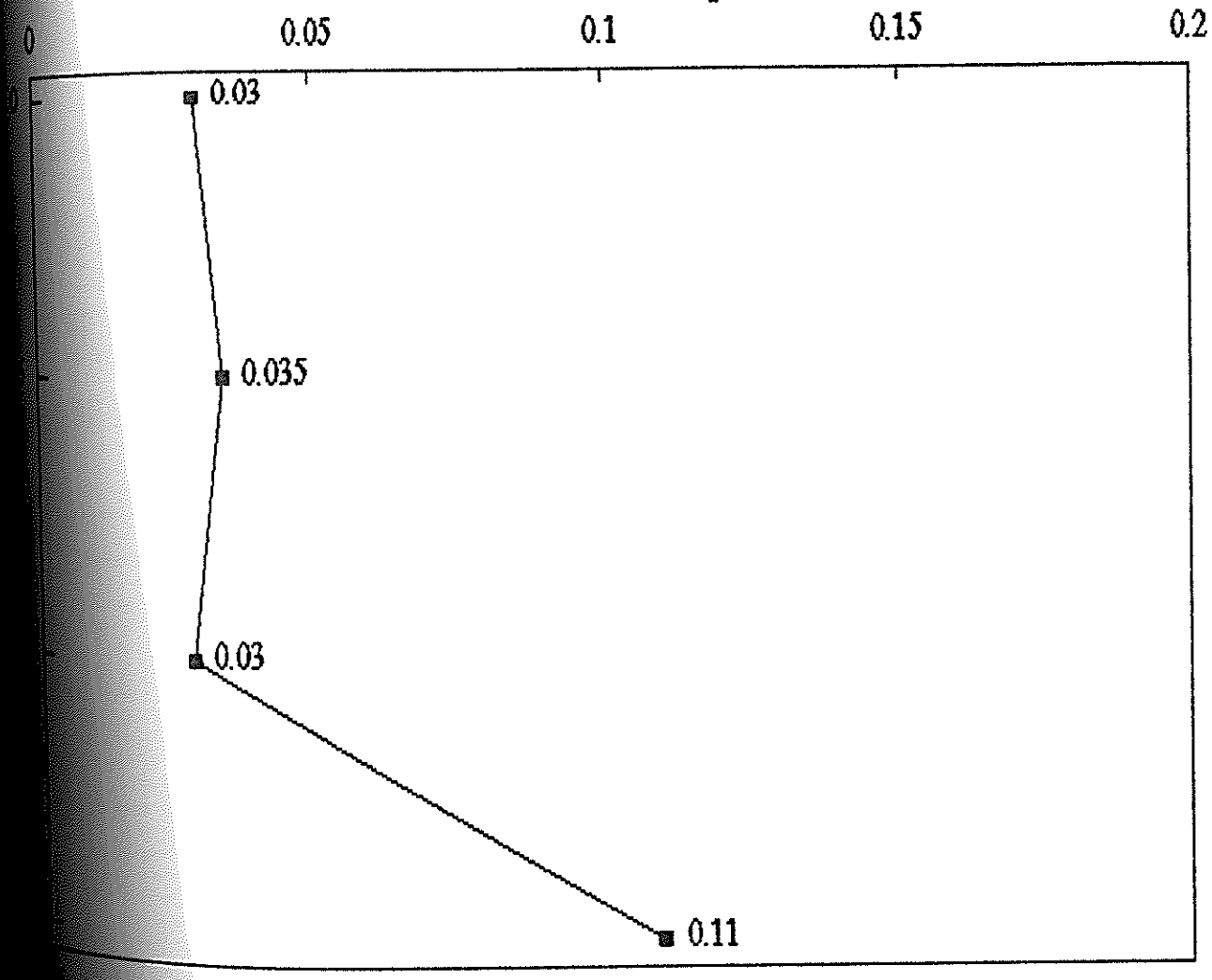
PHOSPHORUS mg/l



LAKE DETROIT

July 19,1988

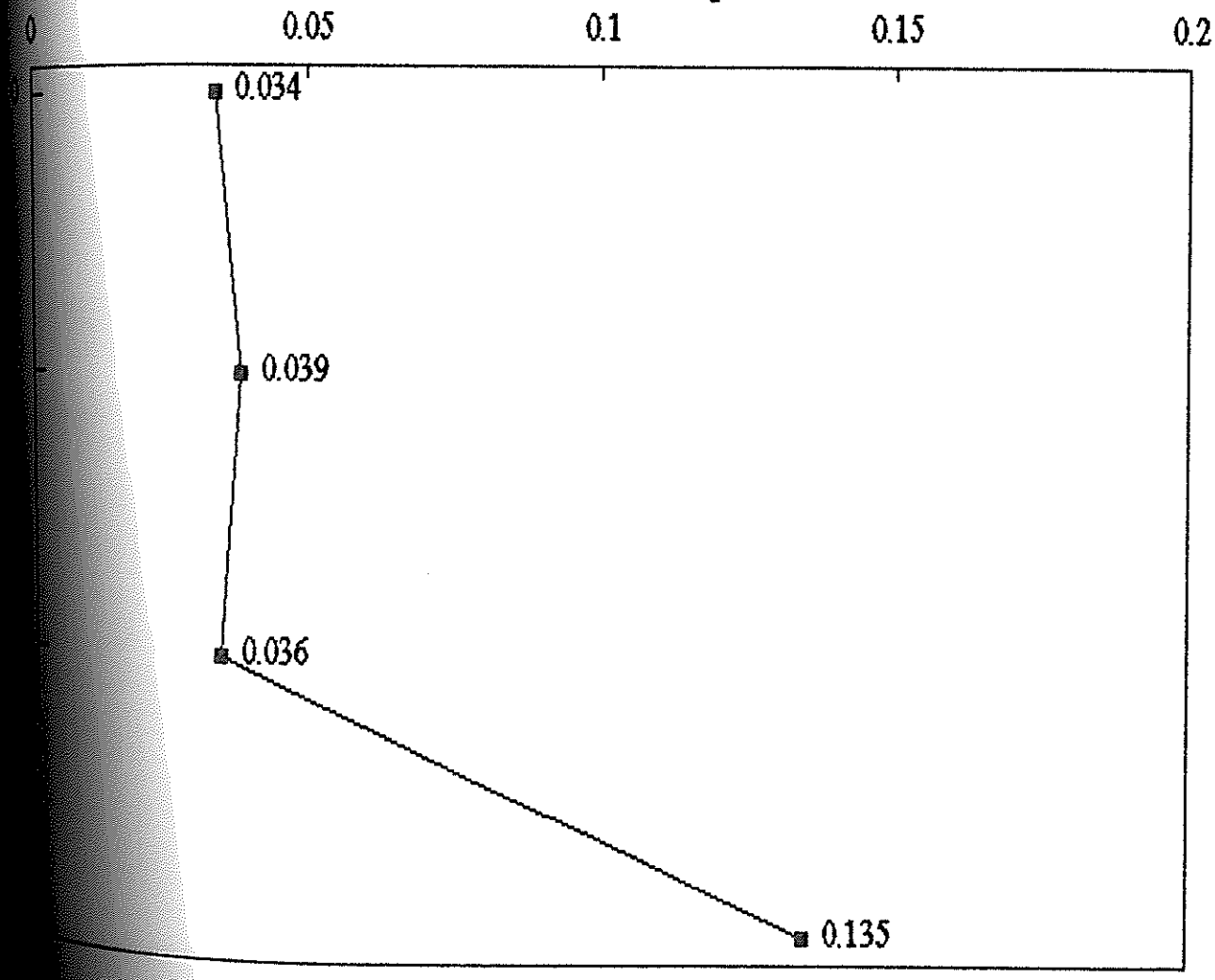
PHOSPHORUS mg/l



LAKE DETROIT

August 9,1988

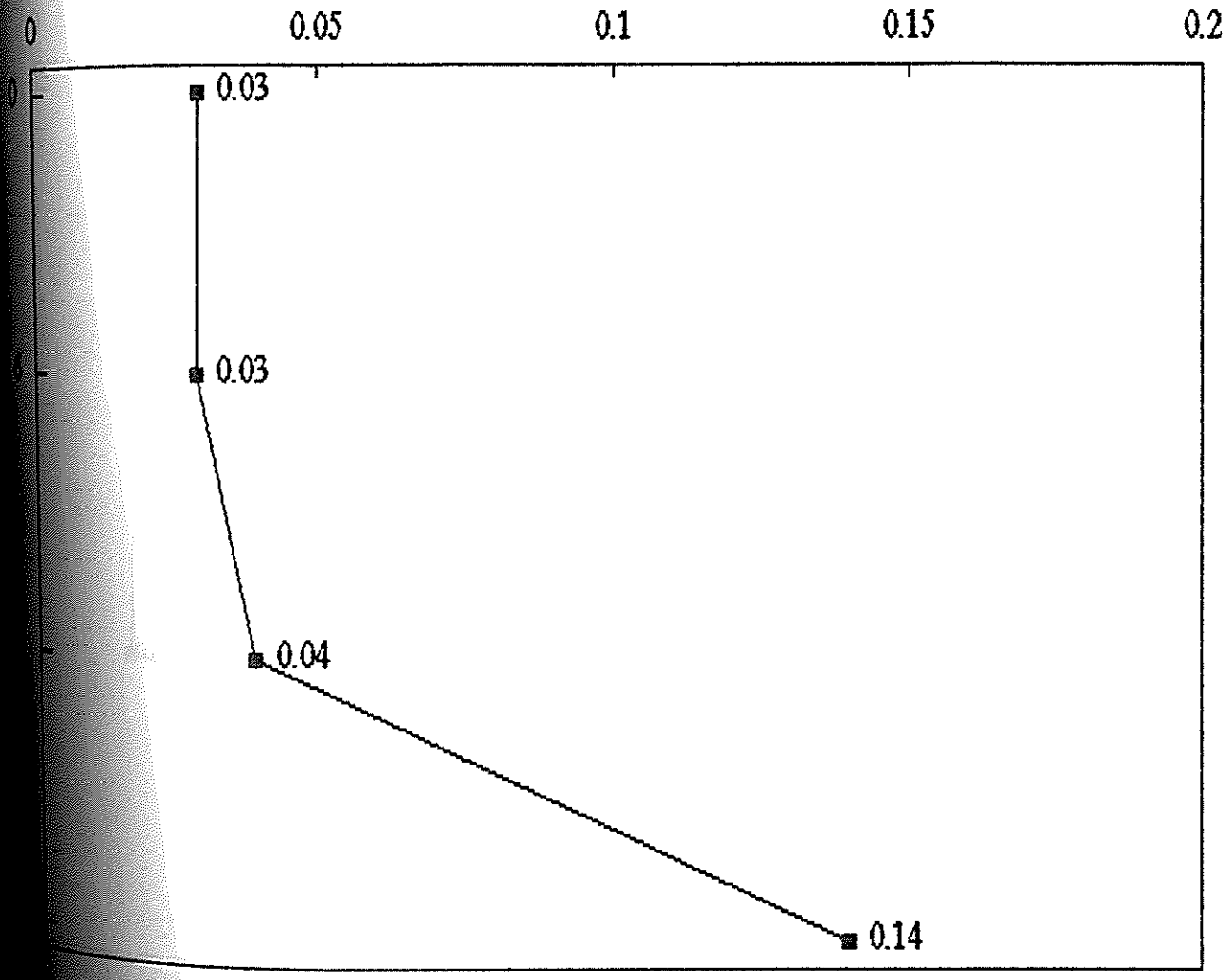
PHOSPHORUS mg/l



LAKE DETROIT

August 23,1988

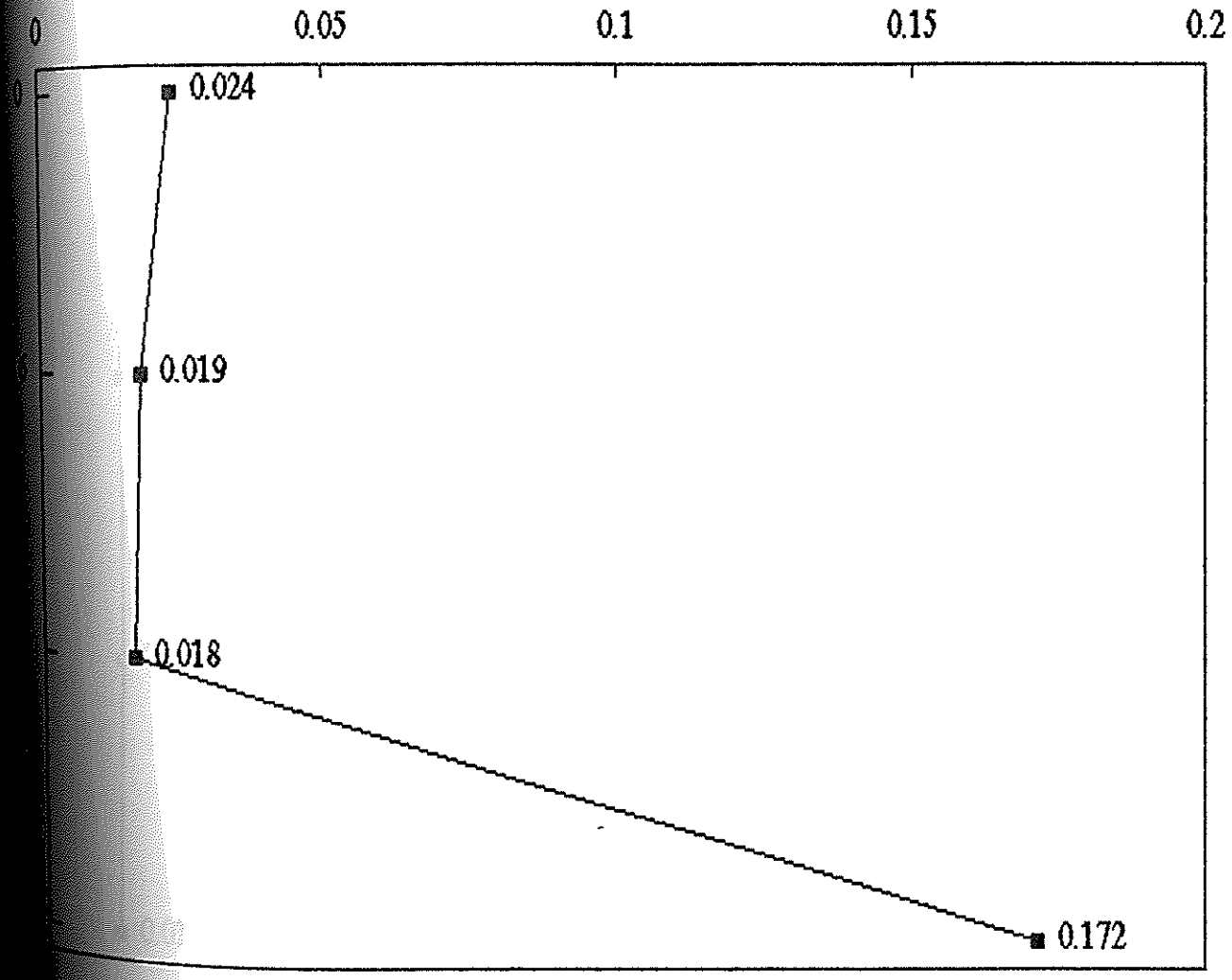
PHOSPHORUS mg/l



LAKE DETROIT

September 15,1988

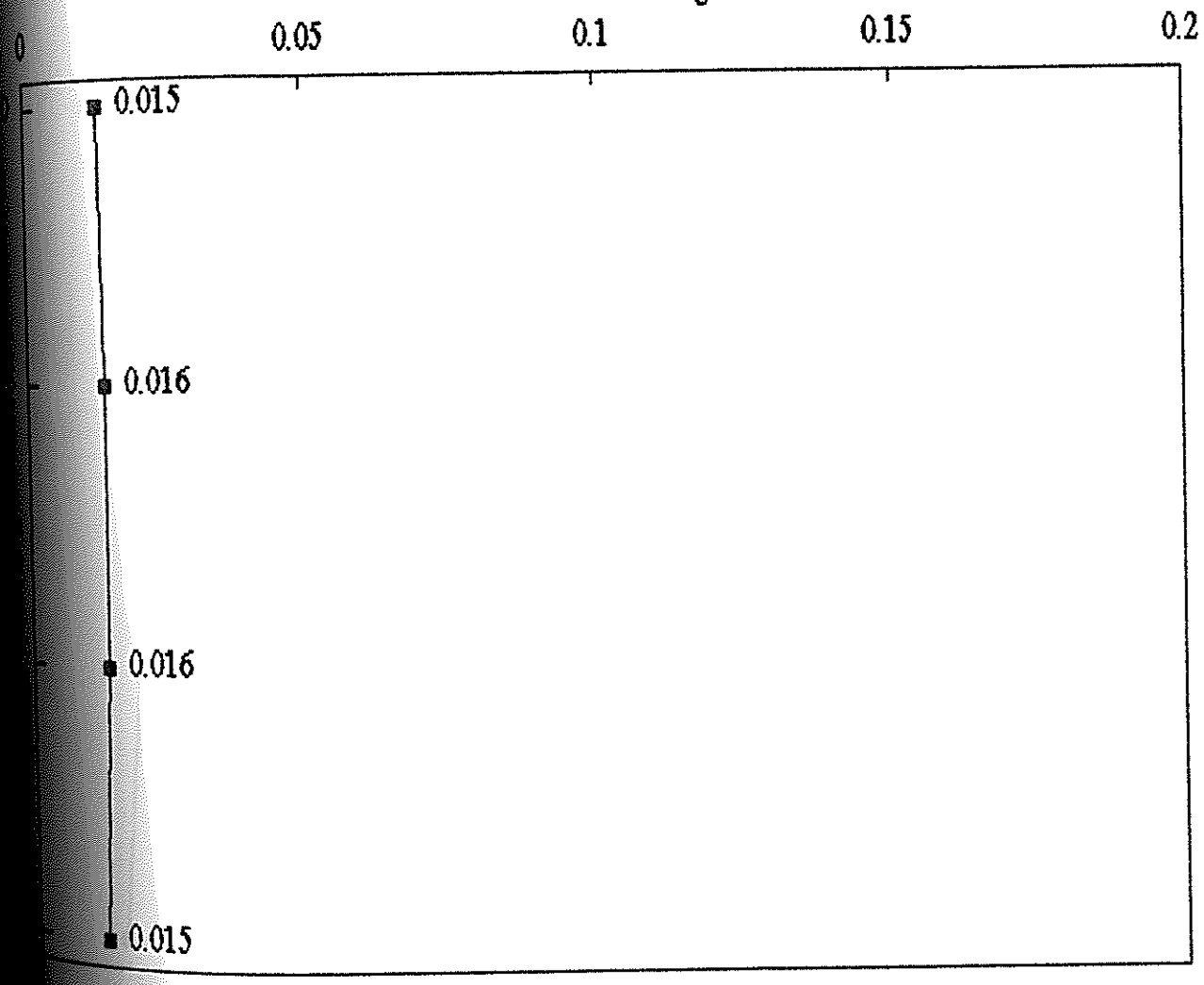
PHOSPHORUS mg/l



LAKE DETROIT

October 19,1988

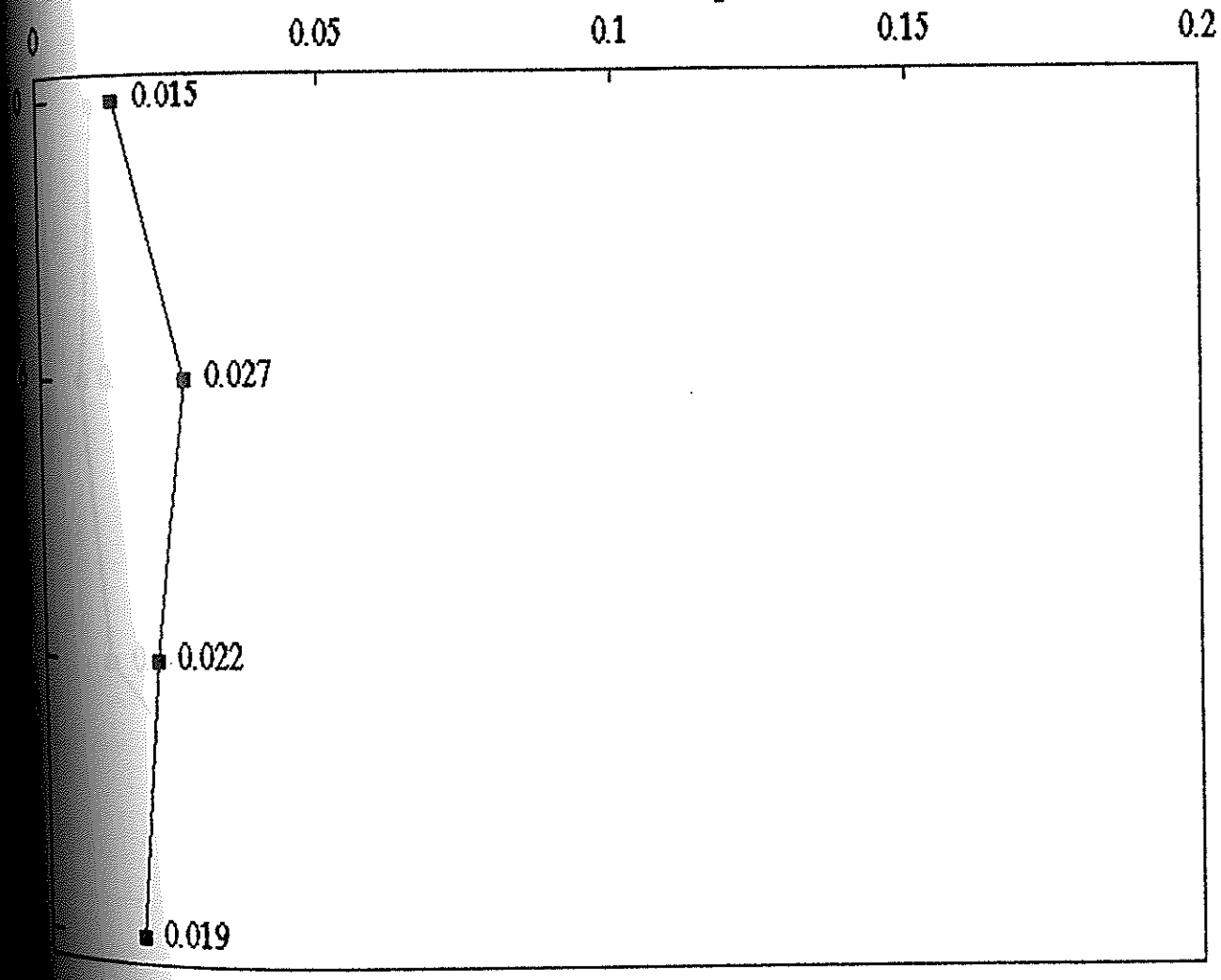
PHOSPHORUS mg/l



LAKE DETROIT

November 7,1988

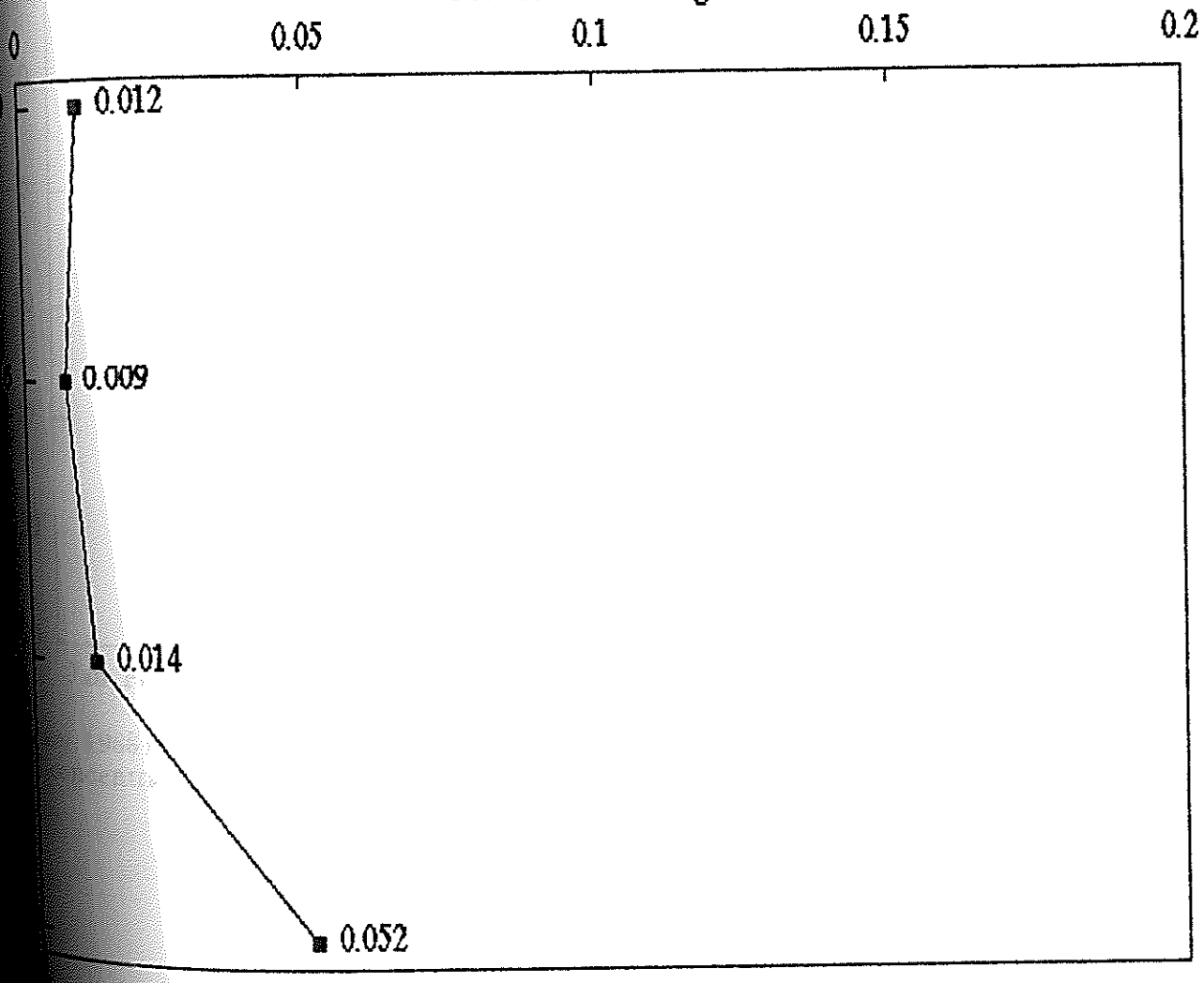
PHOSPHORUS mg/l



LAKE DETROIT

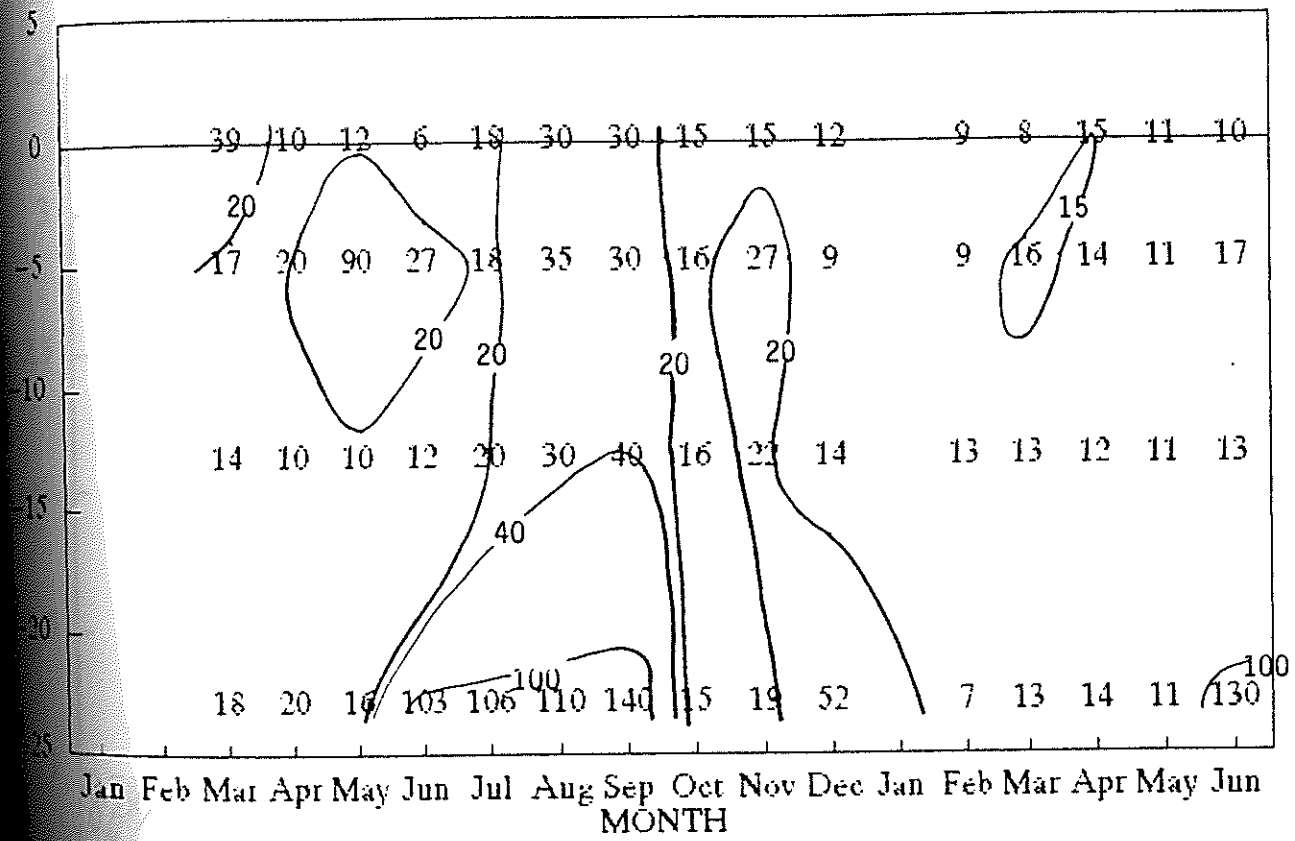
December 15,1988

PHOSPHORUS mg/l



DETROIT LAKE

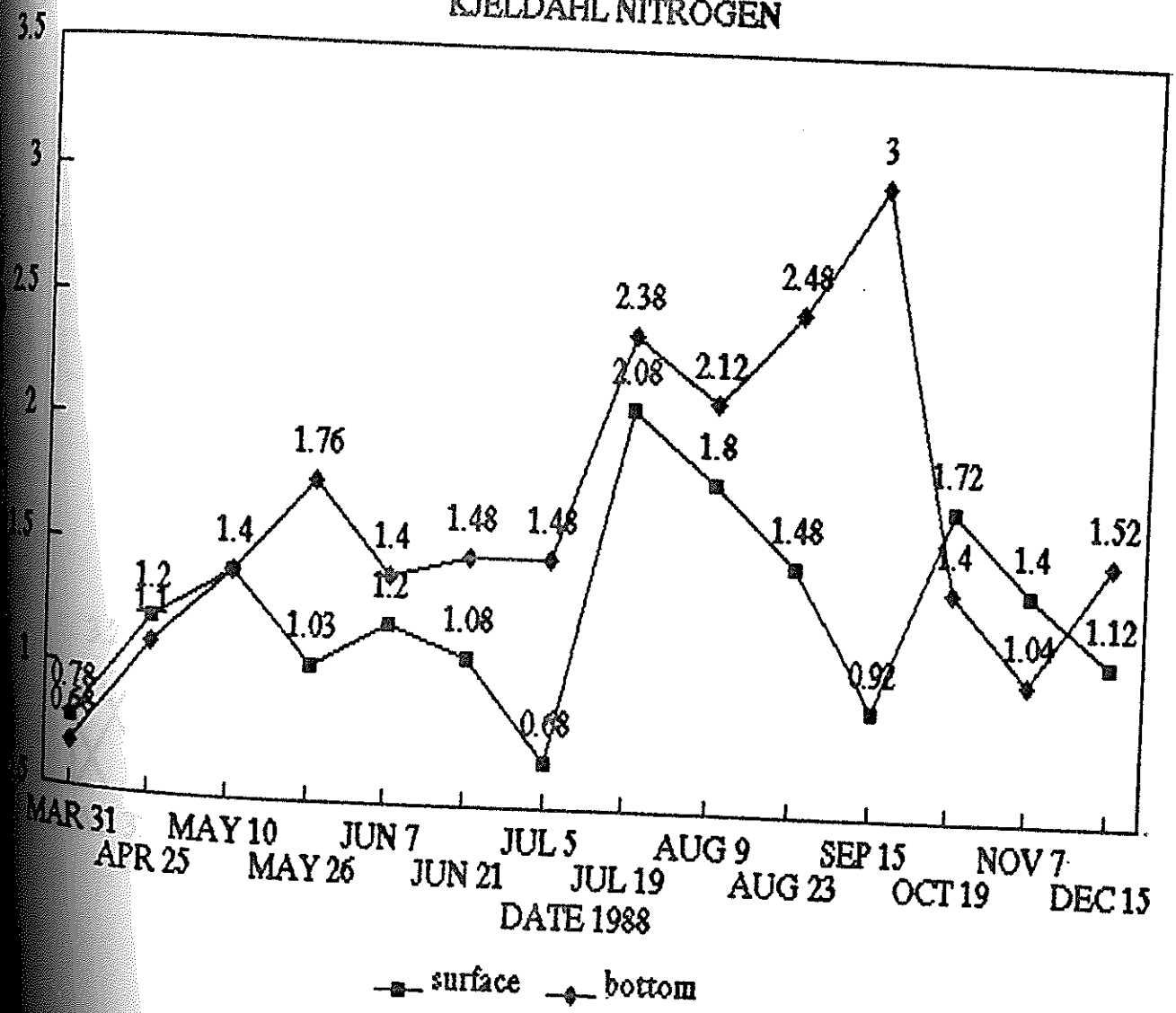
TOTAL PHOSPHORUS – 1988 & 1989



uary, 1988 to June, 1989
ll concentrations in micrograms/liter

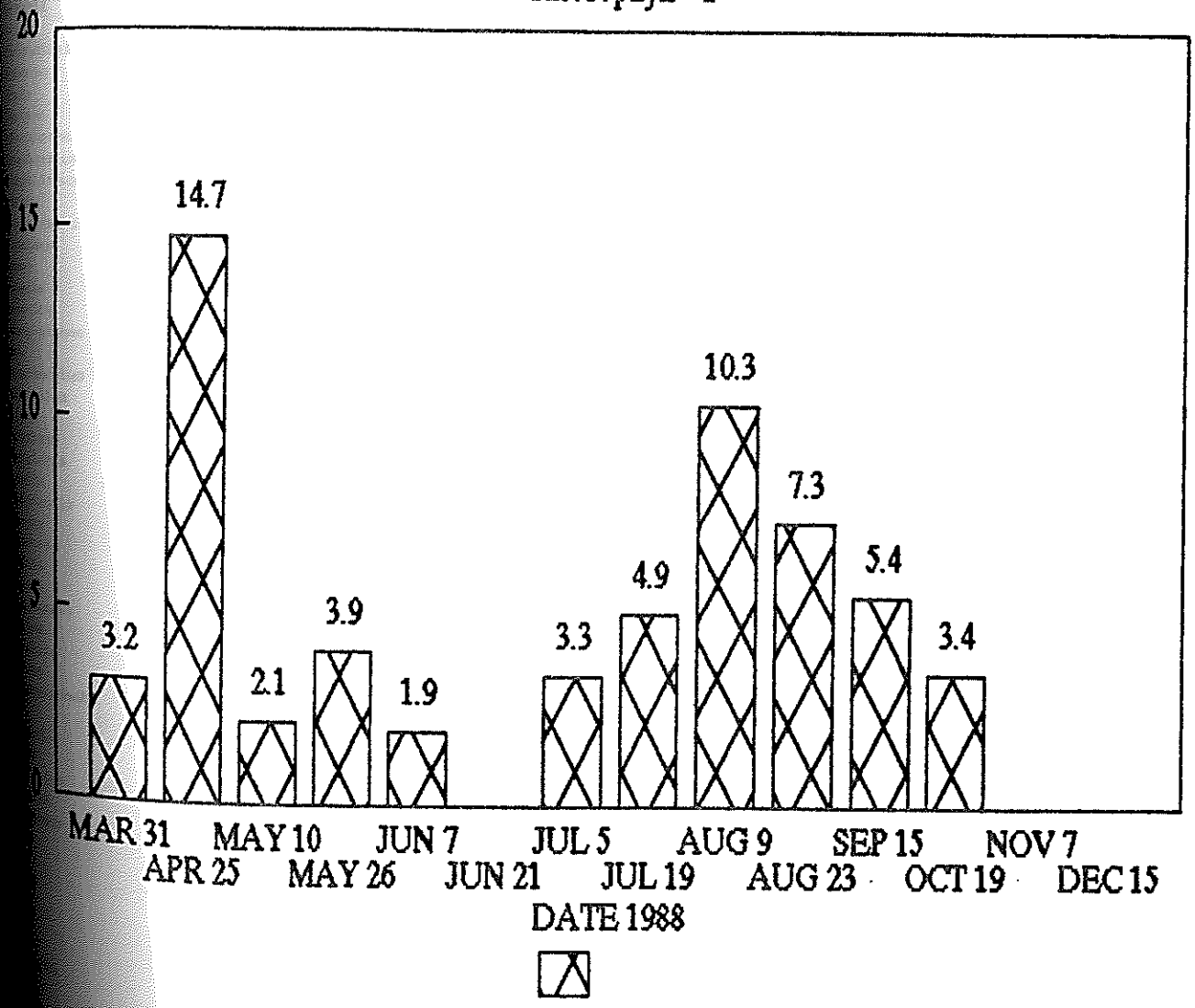
DETROIT LAKE

KJELDAHL NITROGEN



DETROIT LAKE

Chlorophyll–a



DETROIT LAKE
1988 PHYTOPLANKTON SAMPLING
DATA ANALYSIS

June 23, 1989

	5-12-88	6-7-88	6-20-88	7-7-88	8-10-88	9-12-88	10-19-88	11-07-88
Chrumthes microcephalum	587	-	-	-	-	-	-	-
Cymbella cincinalis	-	-	191,540	244,800	229,680	-	-	-
Flos-aquae	-	-	-	-	63,360	42,560	-	-
Histrodesmum falcatus	-	-	-	533	-	-	-	-
Anizomenon flos-aquae	-	-	79,040	-	89,760	48,640	-	-
Gomphonema ridulane	-	-	-	-	-	72,960	-	-
Asterionella formosa	1,173	-	-	-	-	-	484	4,590
Diatoms spp.	-	-	-	13,600	10,560	-	-	-
Micrococcus brunii	-	-	-	-	-	364,800	1,760	-
Cyclotella bilundinella	-	-	3,040	2,720	5,280	-	-	-
Cyclotella	15,838	-	3,040	-	-	-	-	-
Cyclotella	-	-	-	43,520	-	-	-	-
Cyclotella	-	15,990	-	-	660,000	-	-	-
Cyclotella	-	-	3,040	-	-	-	-	-
Cyclotella	-	-	-	2,720	-	3,040	-	-
Cyclotella	-	1,599	3,040	-	-	-	-	-
Cyclotella	-	-	3,040	-	-	-	-	-
Cyclotella	-	-	-	-	2,640	-	44	90
Cyclotella	6,159	16,523	-	40,800	-	-	-	-
Cyclotella	-	-	-	2,720	-	-	-	180
Cyclotella	37,249	-	148,960	100,640	-	-	-	270
Cyclotella	6,159	13,858	27,360	65,280	-	18,240	2,904	2,430
Cyclotella	-	-	-	-	21,120	-	-	-
Cyclotella	293	-	-	-	-	-	-	-
Cyclotella	-	-	-	65,280	-	85,120	-	-
Cyclotella	-	-	-	320,960	79,200	638,400	-	-
Cyclotella	-	-	-	2,720	-	6,080	-	-
Cyclotella	-	-	3,040	-	-	-	-	-
Cyclotella	-	-	-	-	253,440	-	-	-
Cyclotella	-	-	-	-	-	-	2,816	-
Cyclotella	-	-	-	924,800	330,000	608,000	2,200	-
Cyclotella	-	-	-	-	-	-	-	90
Cyclotella	-	-	-	-	10,560	3,040	-	360
Cyclotella	2,053	-	-	-	-	-	-	-
Cyclotella	-	-	-	-	-	152,000	-	-
Cyclotella	5,279	-	6,080	-	-	-	-	-
Cyclotella	-	3,198	12,160	-	10,560	-	-	-
Cyclotella	2,053	-	6,080	10,880	10,560	3,040	44	270
(1)	76,845	51,701	483,360	1,841,440	1,768,800	2,045,920	10,252	8,280
(2)	10	6	13	1.57462	1.80388	1.71887	1.53338	1.24219
(3) bits)	1.10	0.971	1.094	2.63906	2.63906	2.56495	1.94591	2.07944
(4)	1.60	1.241	1.777	14	14	13	0.788001	0.597368
	0.6878	[illegible]						

DETROIT LAKE ZOOPLANKTON SUMMARY

DATE: 12 May 1988

ORGANISM	no.	density (#/m3)	% of total	average size	min. size	max. size
Daphnia pulex	4	2050	3.2	1.25	1	1.5
Daphnia galeata	4	2050	3.2	0.9	0.8	1
Daphnia retrocurva						
Chydorus sphaericus	2	1025	1.6	0.3	0.3	0.3
Bosmina sp.	4	2050	3.2	0.28	0.25	0.3
Sida crystallina						
Total Cladocera	14	7176	11.1	0.74	0.25	1.5
Mesocyclops edax						
Juvenile cyclopoid	52	26653	41.3	0.78	0.5	1
Diaptomus oregonensis						
Epischura lacustris						
Juvenile calanoid	4	2050	3.2	0.68	0.6	0.75
Nauplier stages	44	22553	34.39	0.21	0.1	0.4
Total Copepod	100	51257	79.4	0.53	0.1	1
Ostracods						
Rotifers	12	6151	9.5	0.18	0.15	0.2
Total Organisms	126	64585	100	0.52	0.1	1.5

DETROIT LAKE ZOOPLANKTON SUMMARY

DATE: 9 June 1988

ORGANISM	no.	density (#/m3)	% of total	average size(mm)	min. size(mm)	max. size(mm)
Daphnia pulex	18	23.1	24.3	1.5	0.6	1.6
Daphnia galeata	32	41	43.2	1	0.4	1.8
Daphnia retrocurva						
unknown Daphnia						
Bosmina sp.	2	2.6	2.7	0.25	0.25	0.25
Total Cladocera	52	66.6	70.3	1.2	0.25	1.8
Macrocyclops albidus	2	2.6	2.7	1.7	1.7	1.7
Juvenile cyclopoid	4	5.1	5.4	0.7	0.55	0.85
Diaptomus oregonensis	2	2.6	2.7	0.9	0.9	0.9
Epischura lacustris	2	2.6	2.7	1.8	1.8	1.8
Juvenile calanoid	6	7.7	8.11	0.8	0.65	0.95
Nauplian stages	2	2.6	2.7	0.2	0.2	0.2
Total Copepod	18	23.1	24.3	0.9	0.2	1.8
Rotifera	2	2.6	2.7	0.15	0.15	0.15
Diptera	2	2.6	2.7	9	9	9
Total Organisms	74	94.8	100	1.3	0.15	9

DETROIT LAKE ZOOPLANKTON SUMMARY

DATE: 9 June 1988

ORGANISM	no.	density (#/m3)	% of total	average size	min. size	max. size
Daphnia pulex	2	26	1.3	1.5	1.5	1.5
Daphnia galeata						
Unknown Daphnia	2	27	1.3	0.55	0.55	0.55
Chydorus sphaericus						
Bosmina sp.						
Sida crystallina	8	102	5.2	1.05	0.7	1.3
Total Cladocera	12	154	7.8	1.04	0.55	1.5
Mesocyclops edax	2	26	1.3	1.4	1.4	1.4
Juvenile cyclopoid						
Diaptomus oregonensis						
Epischura lacustris	2	26	1.3	1.1	1.1	1.1
Juvenile calanoid						
Naupliar stages	18	231	11.7	0.18	0.1	0.3
Total Copepod	22	282	14.3	0.38	0.1	1.4
Ostracods						
Rotifers	120	1538	77.9	0.16	0.1	0.5
Total Organisms	154	1973	100	0.26	0.1	1.5

DETROIT LAKE

ZOOPLANKTON SUMMARY

DATE: 20 June 1988

ORGANISM	no.	density (#/m3)	% of total	average size(mm)	min. size(mm)	max. size(mm)
Daphnia pulex	6	7.7	5.5	1.95	1.9	2
Daphnia galeata	88	112.8	80	1.25	0.6	2
Daphnia retrocurva						
unknown Daphnia	8	10.3	7.3	0.35	0.3	0.4
Bosmina sp.						
Total Cladocera	102	130.7	92.7	1.25	0.3	2
Macrocyclops albidus	2	2.6	1.8	1.5	1.5	1.5
Juvenile cyclopoid						
Diaptomus oregonensis						
Epischura lacustris						
Juvenile calanoid	2	2.6	1.8	0.6	0.6	0.6
Naupliar stages						
Total Copepod	4	5.1	3.6	1.05	0.6	1.5
Rotifera						
Ostracods	4	5.1	3.6	0.45	0.3	0.6
Total Organisms	110	141	100	1.2	0.3	2

DETROIT LAKE

ZOOPLANKTON SUMMARY

DATE: 5 July 1988

ORGANISM	no.	density (#/m3)	% of total	average size(mm)	min. size(mm)	max. size(mm)
Daphnia pulex	10	42.7	12.8	1.3	1.1	1.9
Daphnia galeata	30	128.1	38.5	1.2	1	1.3
Daphnia retrocurva	10	42.7	12.8	1.2	1	1.5
unknown Daphnia	16	68.3	20.5	0.5	0.3	0.65
Bosmina sp.						
Total Cladocera	66	281.9	84.6	1.05	0.3	1.9
Macrocyclops albidus						
Juvenile cyclopoid	4	17.1	5.1	0.6	0.5	0.65
Diaptomus oregonensis						
Epischura lacustris						
Juvenile calanoid	8	34.2	10.3	1	0.9	1.1
Nauplier stages						
Total Copepod	12	51.3	15.4	0.85	0.5	1.1
Rotifera						
Ostracods						
Total Organisms	78	333.2	100	1.05	0.3	1.9

DETROIT LAKE

ZOOPLANKTON SUMMARY

DATE: 9 August 1988

ORGANISM	no.	density (#/m3)	% of total	average size	min. size	max. size
Daphnia pulex						
Daphnia galeata	4	26	7	1.25	1.2	1.3
Daphnia retrocurva	39	250	68.4	1.19	0.8	1.5
Chydorus sphaericus						
Bosmina sp.						
Sida crystallina						
Total Cladocera	43	276	75.4	1.2	0.8	1.5
Mesocyclops edax	2	13	3.5	1.4	1.4	1.4
Juvenile cyclopoid	4	26	7	0.45	0.4	0.5
Diaptomus oregonensis						
Epischura lacustris						
Juvenile calanoid	4	26	7	1.05	1	1.1
Nauplliar stages						
Total Copepod	10	64	17.5	0.88	0.4	1.4
Ostracods						
Rotifers						
Total Organisms	57	365	100	0.88	0.4	1.5

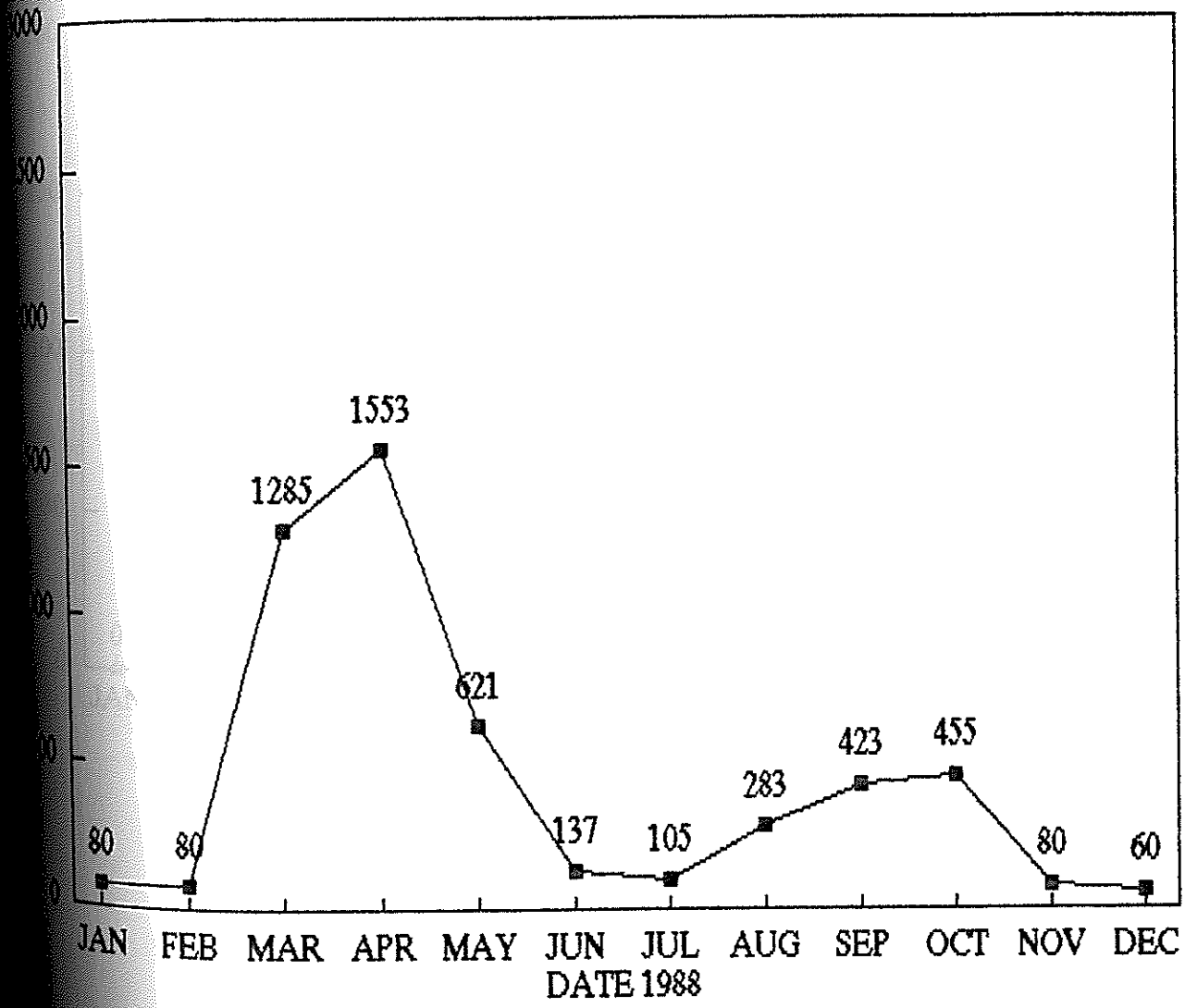
DETROIT LAKE ZOOPLANKTON SUMMARY

DATE: 14 November 1988

ORGANISM	no.	density (#/m3)	% of total	average size	min. size	max. size
Daphnia pulex	2	26	2.4	0.6	0.6	[illegible]
Daphnia galeata	32	410	39	1.33	1	[illegible]
Daphnia retrocurva						
Chydorus sphaericus	10	128	12.2	0.29	0.25	[illegible]
Bosmina sp.	2	26	2.4	0.28	0.25	[illegible]
Sida crystallina						
Total Cladocerans	46	590	56.1	1.03	0.25	[illegible]
Mesocyclops edax						
Juvenile cyclopoid	10	128	12.2	0.66	0.6	[illegible]
Diaptomus oregonensis	15	192	18.3	1.27	1.2	[illegible]
Cyclops bicuspidatus t.	2	26	2.4	1.1	1.1	[illegible]
Juvenile calanoid	2	26	2.4	1	1	
Naupliar stages						
Total Copepod	29	371	35.4	1.03	0.6	[illegible]
Ostracods						
Rotifers	7	90	8.5	0.16	0.15	[illegible]
Total Organisms	82	1051	100	0.96	0.15	[illegible]

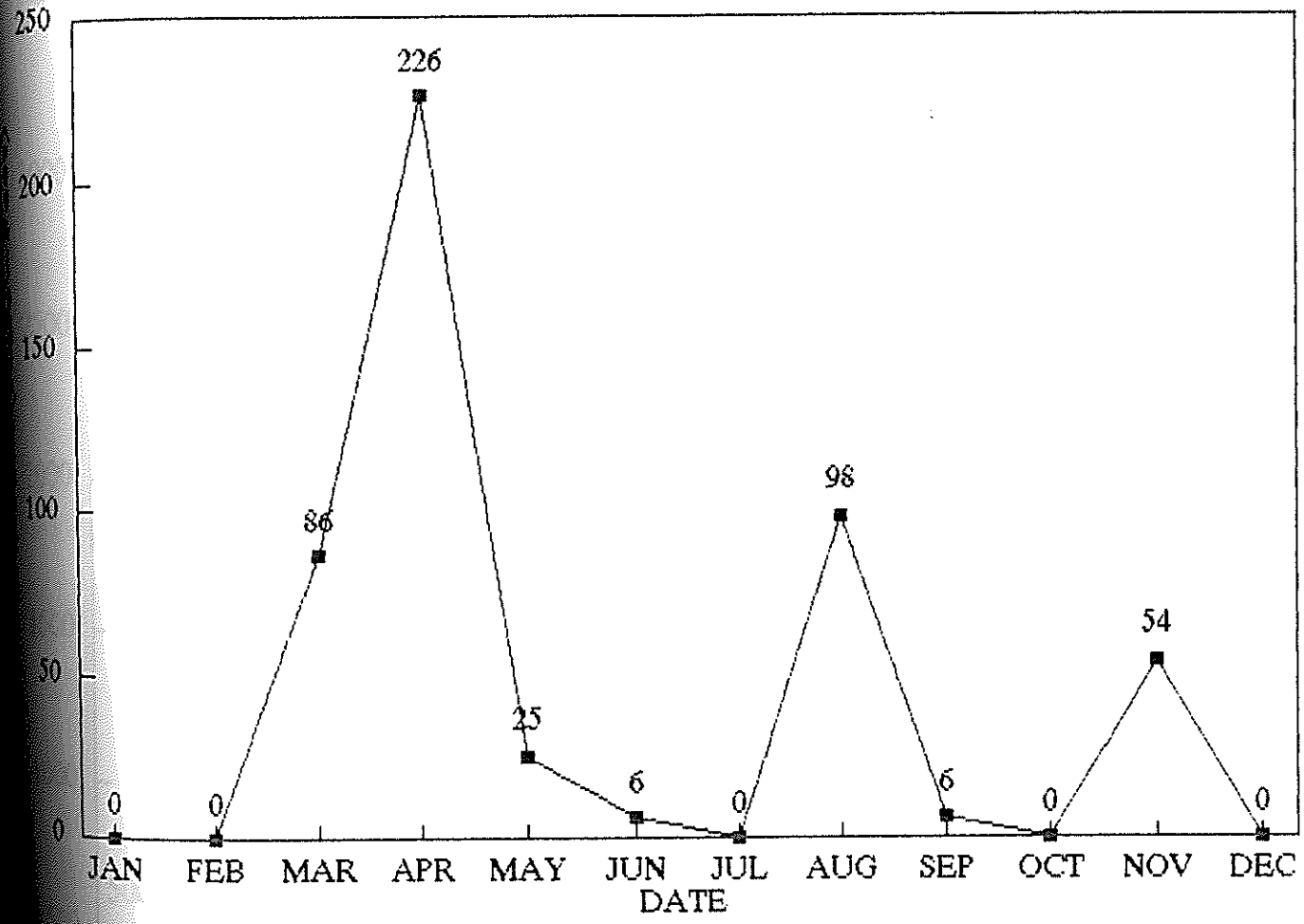
DETROIT LAKE

PELICAN RIVER INLET



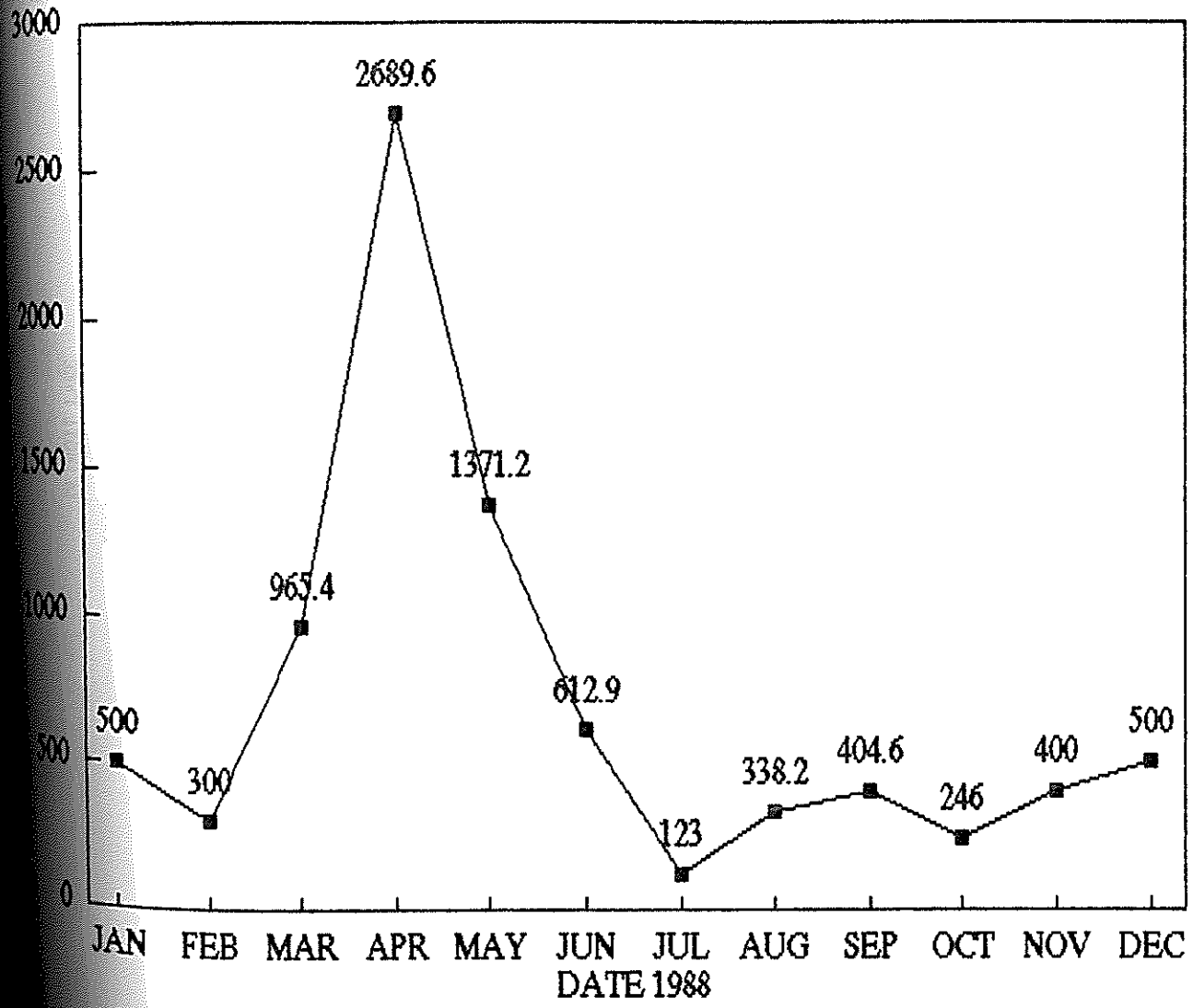
1988 MONTHLY FLOWS – EAST SHORE INLET

DETROIT LAKE



DETROIT LAKE

PELICAN RIVER OUTLET



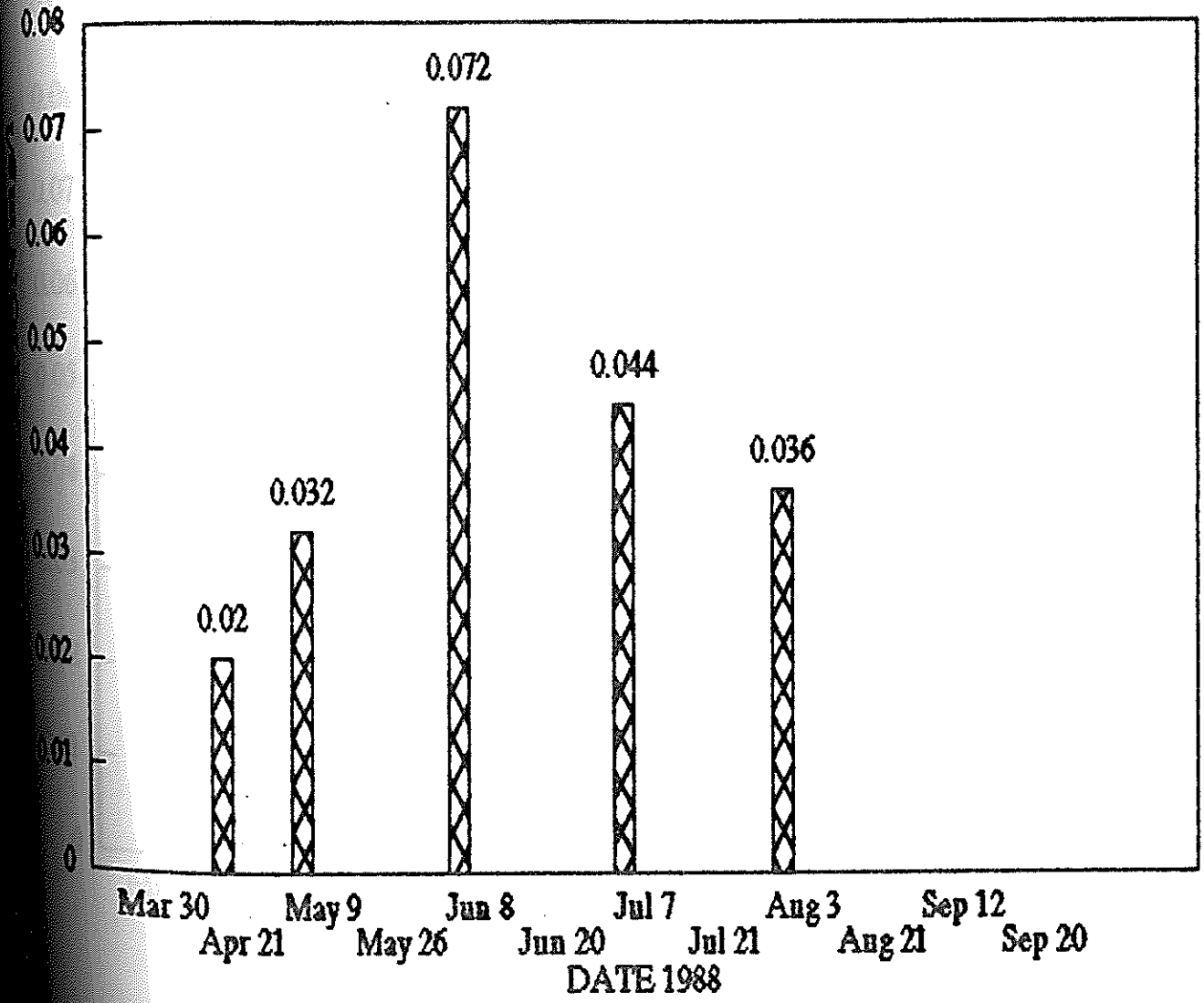
DETROIT LAKE

1988 INFLOW SAMPLING

	3/30/88	4/21/88	5/9/88	5/26/88	6/8/88	6/20/88	7/7/88	7/21/88	8/3/88	8/21/88	8/22/88	9/12/88	9/20/88
hosphorus													
-1 Detroit Lake Outlet		<0.01	0.011	0.018	0.018	0.027	0.015	0.031	0.017	0.027	0.021	0.018	0.018
-2 Detroit Lake Inlet	0.05	0.03	0.025	0.037	0.048	0.020		0.031		0.105	0.059	0.019	0.053
-3 Inlet: East Shore Dr.		0.03	0.058								0.081		
-4 Sucker Creek		0.02	0.032		0.072		0.044		0.036				
otal Suspended Solids													
-1 Detroit Lake Outlet		1.67	2.6	0.6	1.1	2.0	1.0	2.0	1.9	5.7	2.0	2.2	3.3
-2 Detroit Lake Inlet	5.3	2.25	4.2	2.8	5.2	1.8		10.0		27.7	3.0	1.1	2.5
-3 Inlet: East Shore Dr.		1.54	4.3								4.1		
-4 Sucker Creek		2.04	4.9		6.5		7.4		2.6				

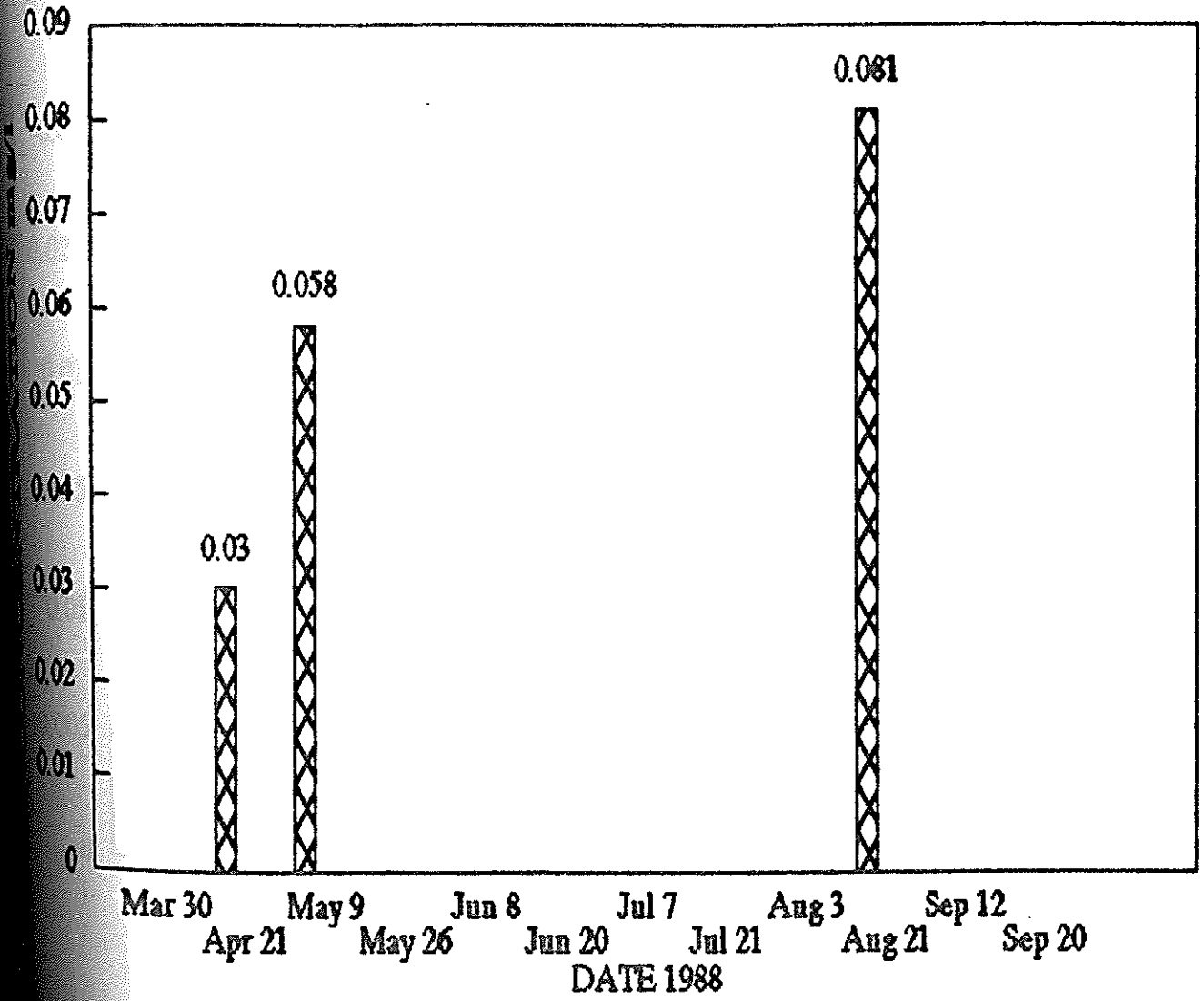
DETROIT LAKE – SUCKER CREEK

PHOSPHORUS



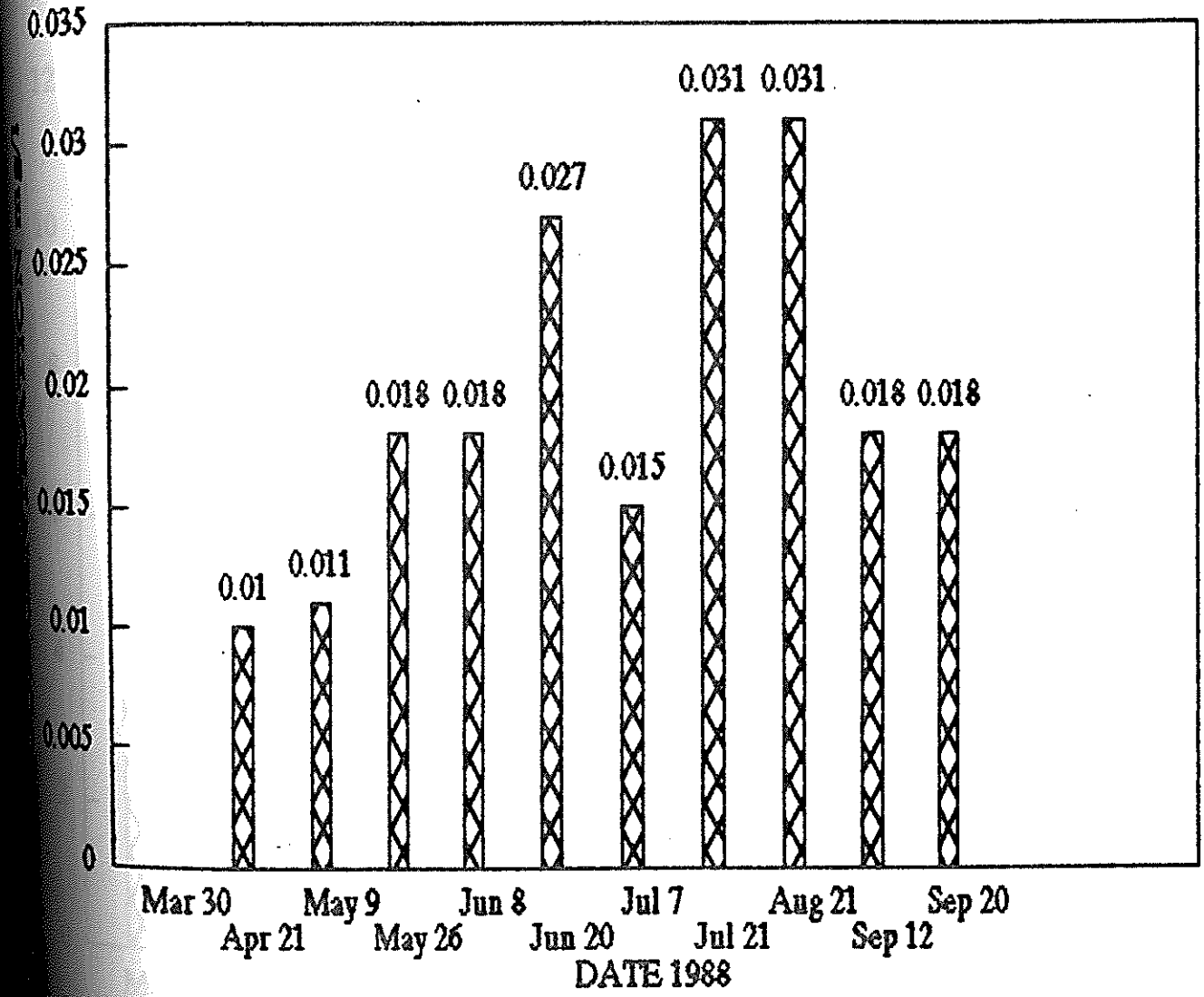
DETROIT LAKE – EAST SHORE DRIVE

PHOSPHORUS



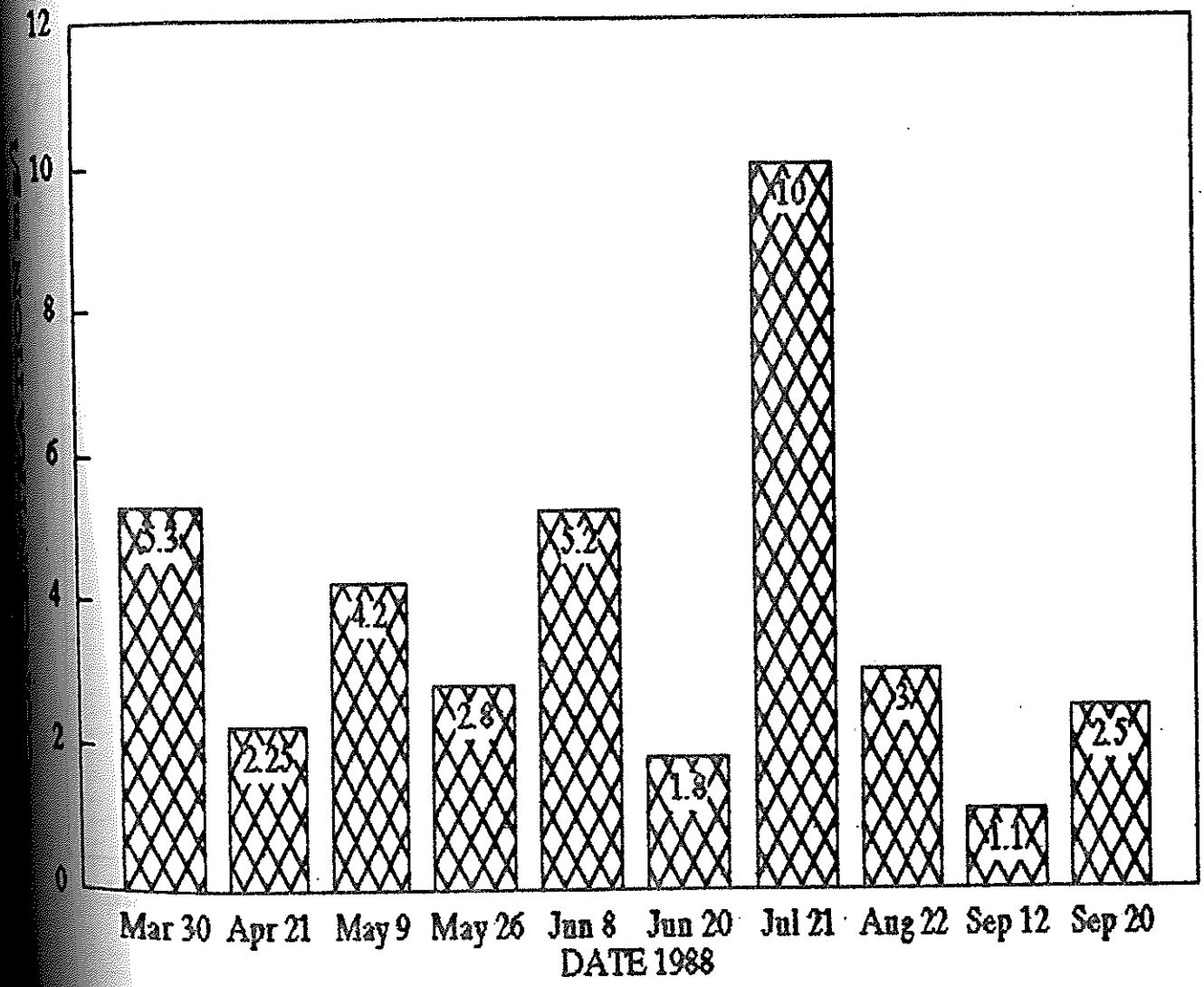
DETROIT LAKE OUTLET

PHOSPHORUS



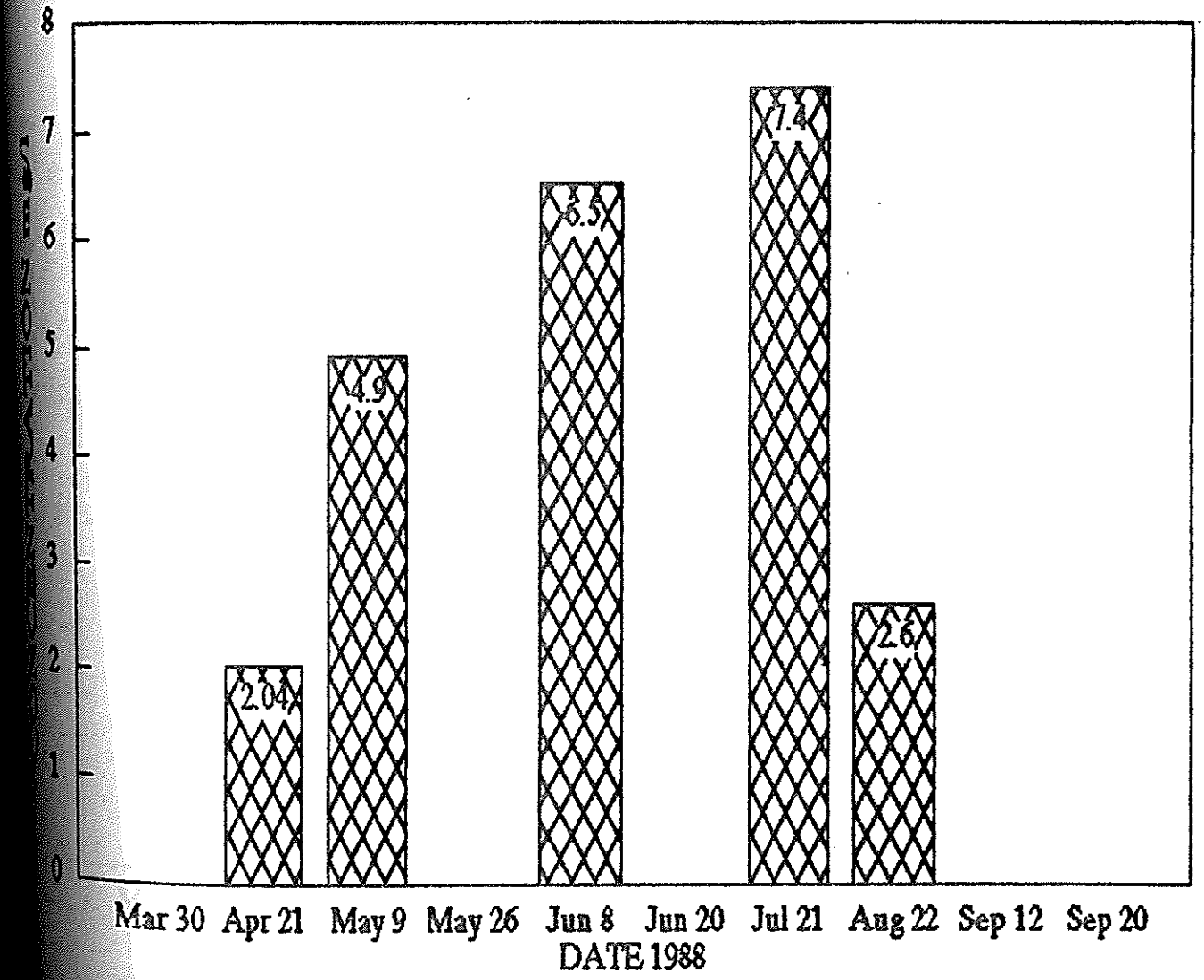
DETROIT LAKE INLET

TOTAL SUSPENDED SOLIDS



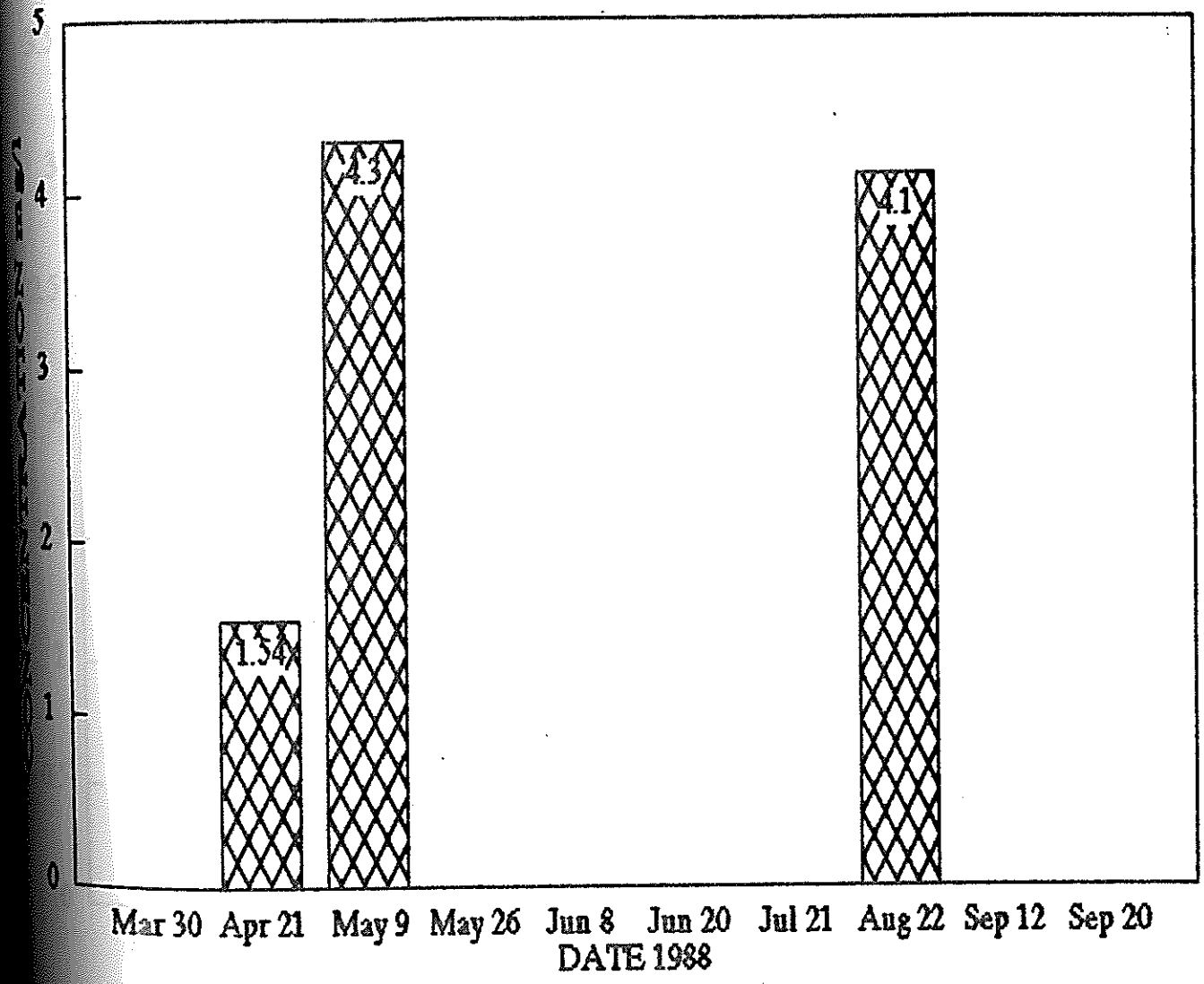
DETROIT LAKE – SUCKER CREEK

TOTAL SUSPENDED SOLIDS



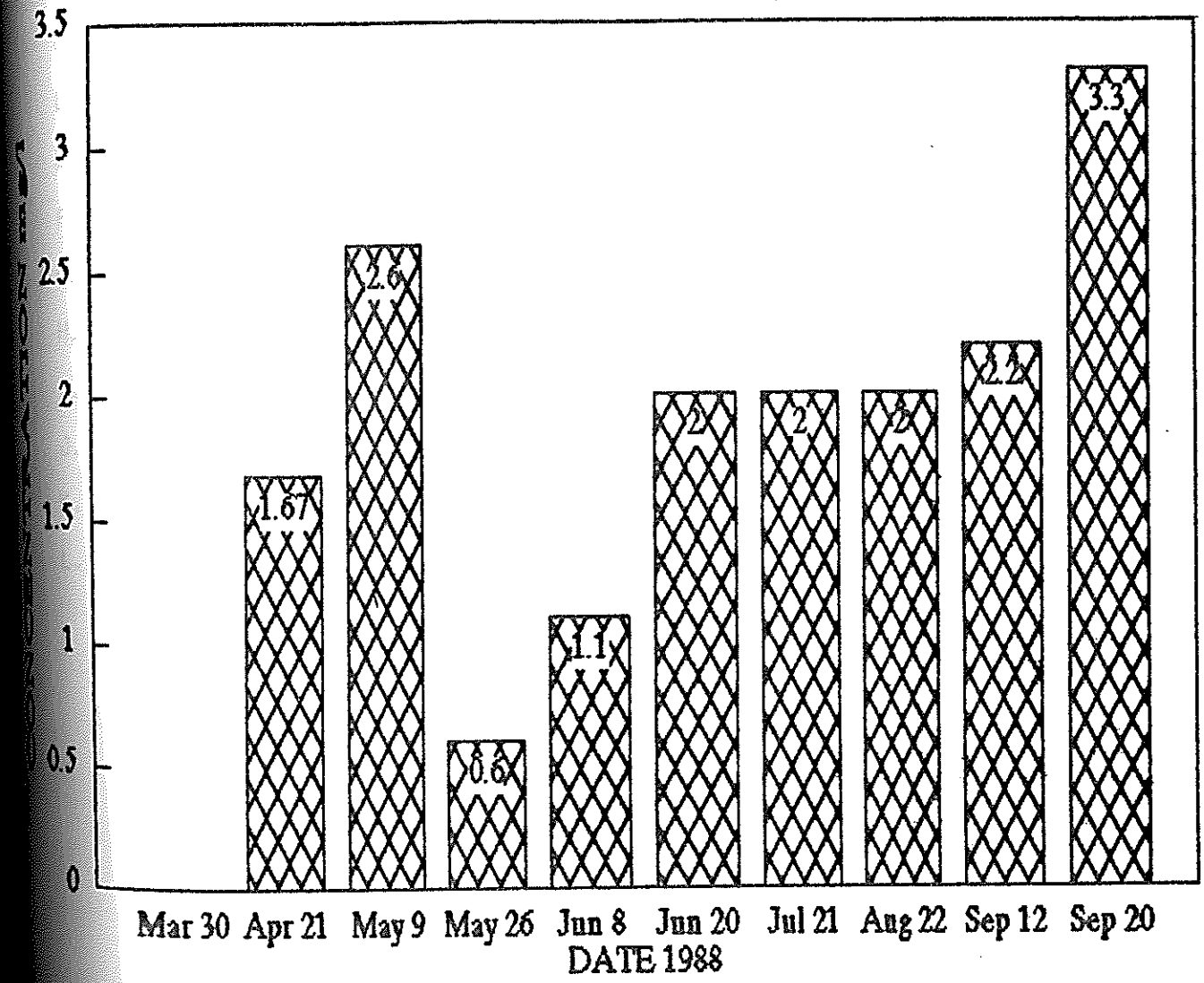
DETROIT LAKE – EAST SHORE DRIVE

TOTAL SUSPENDED SOLIDS



DETROIT LAKE OUTLET

TOTAL SUSPENDED SOLIDS



SECTION 5 INDEX

DETROIT LAKE 1989

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B. Temperature	
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H. Phosphorus - Isopleth	
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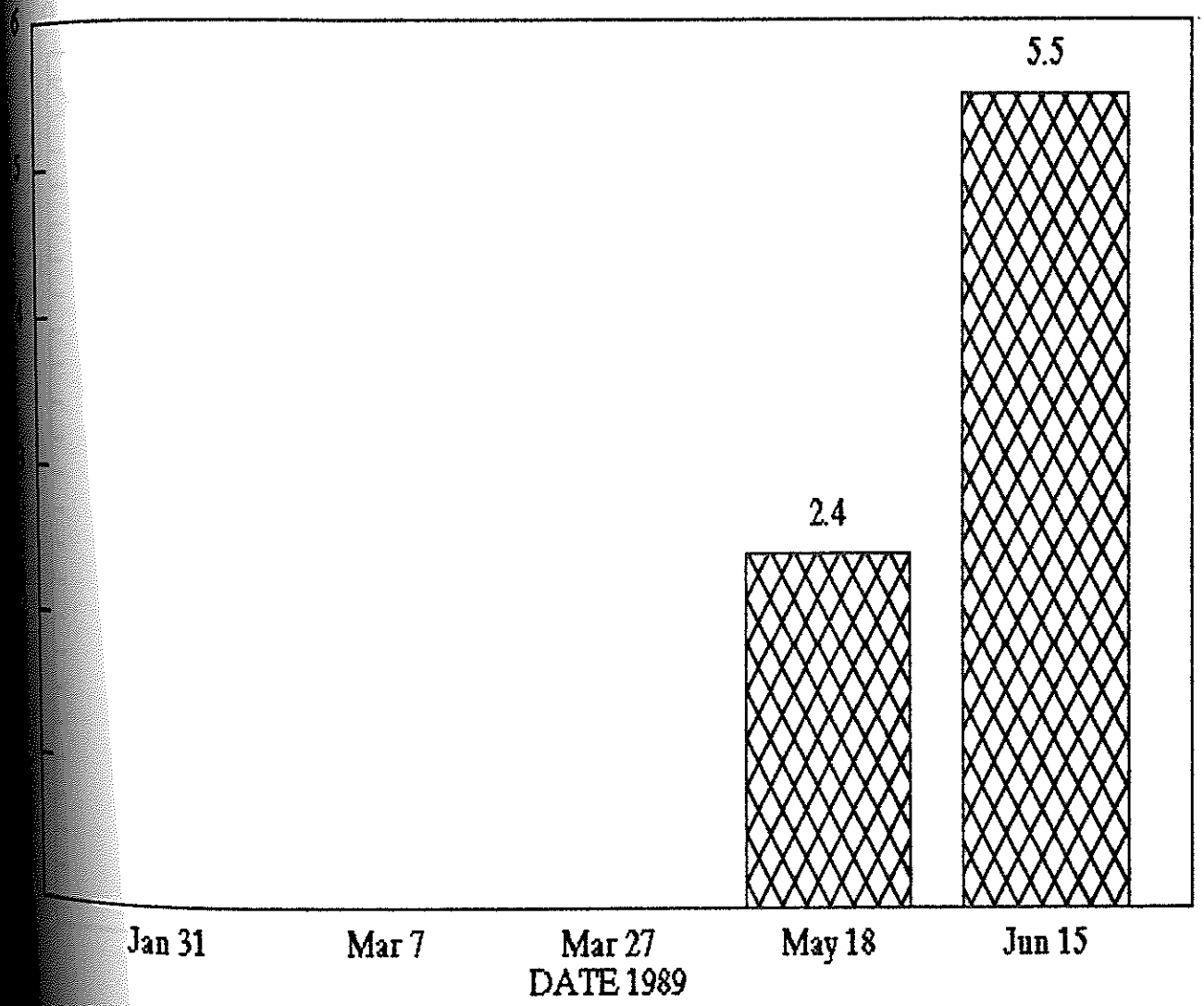
J. Chlorophyll-a	
K. Inlets and Outlet - Monthly Flows (Acre-feet)	
L. Inlet and Outlet Sampling Results - P_T and TSS (Table) and Outlet Sampling Results - P_T and TSS (Graphical)	

DETROIT LAKE

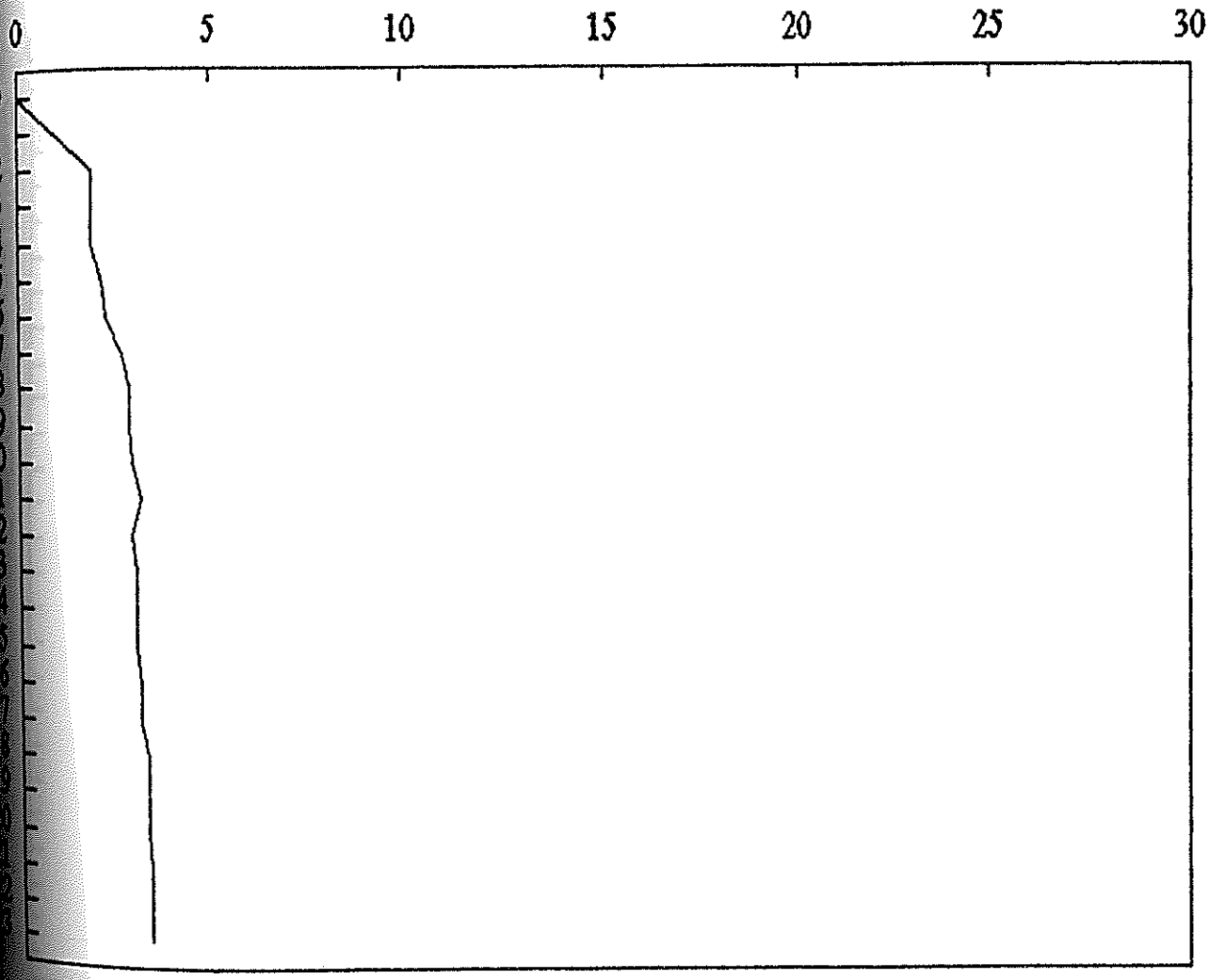
SECCHI DISK



DETROIT LAKE

January 31,1989

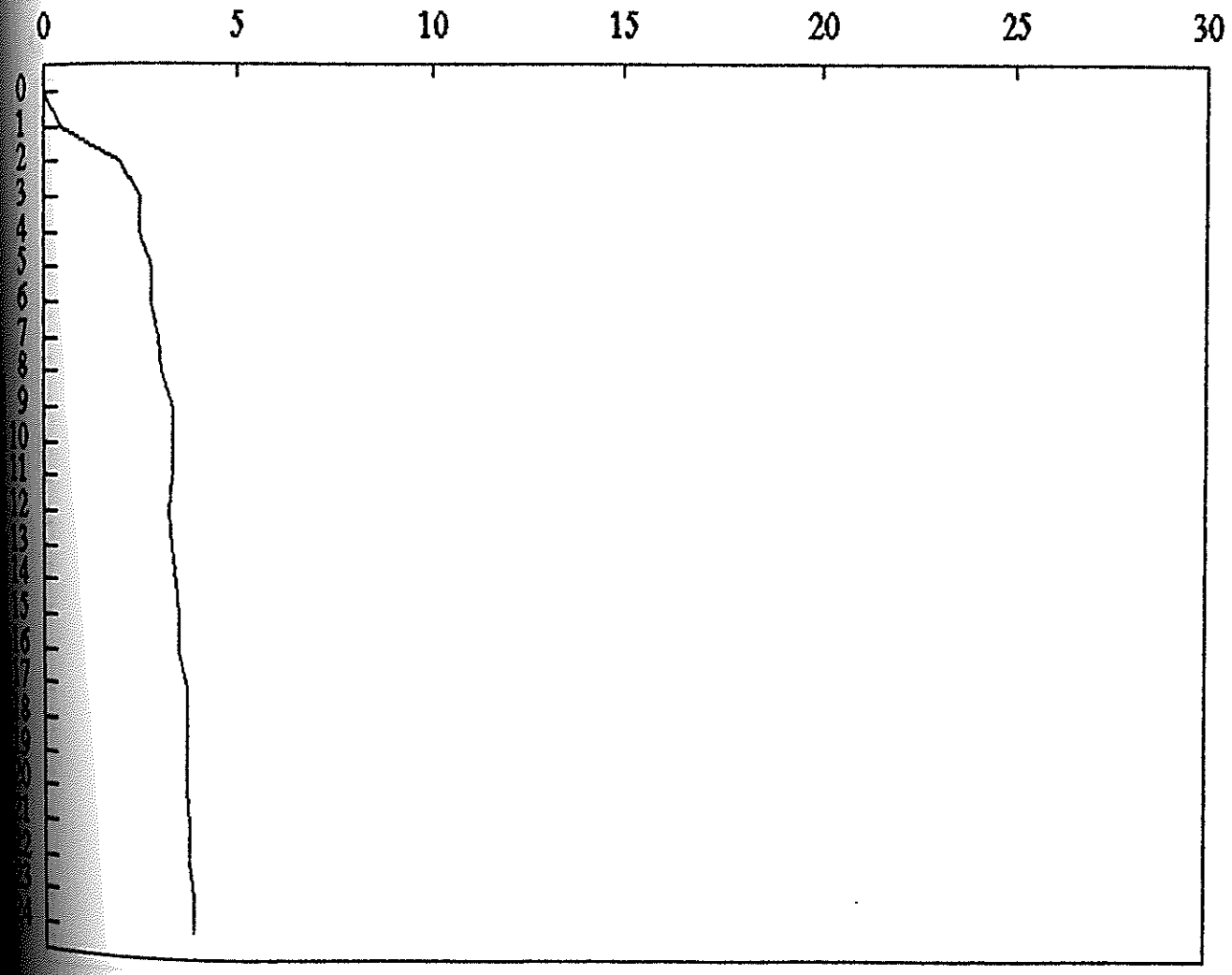
TEMPERATURE C



DETROIT LAKE

March 7,1989

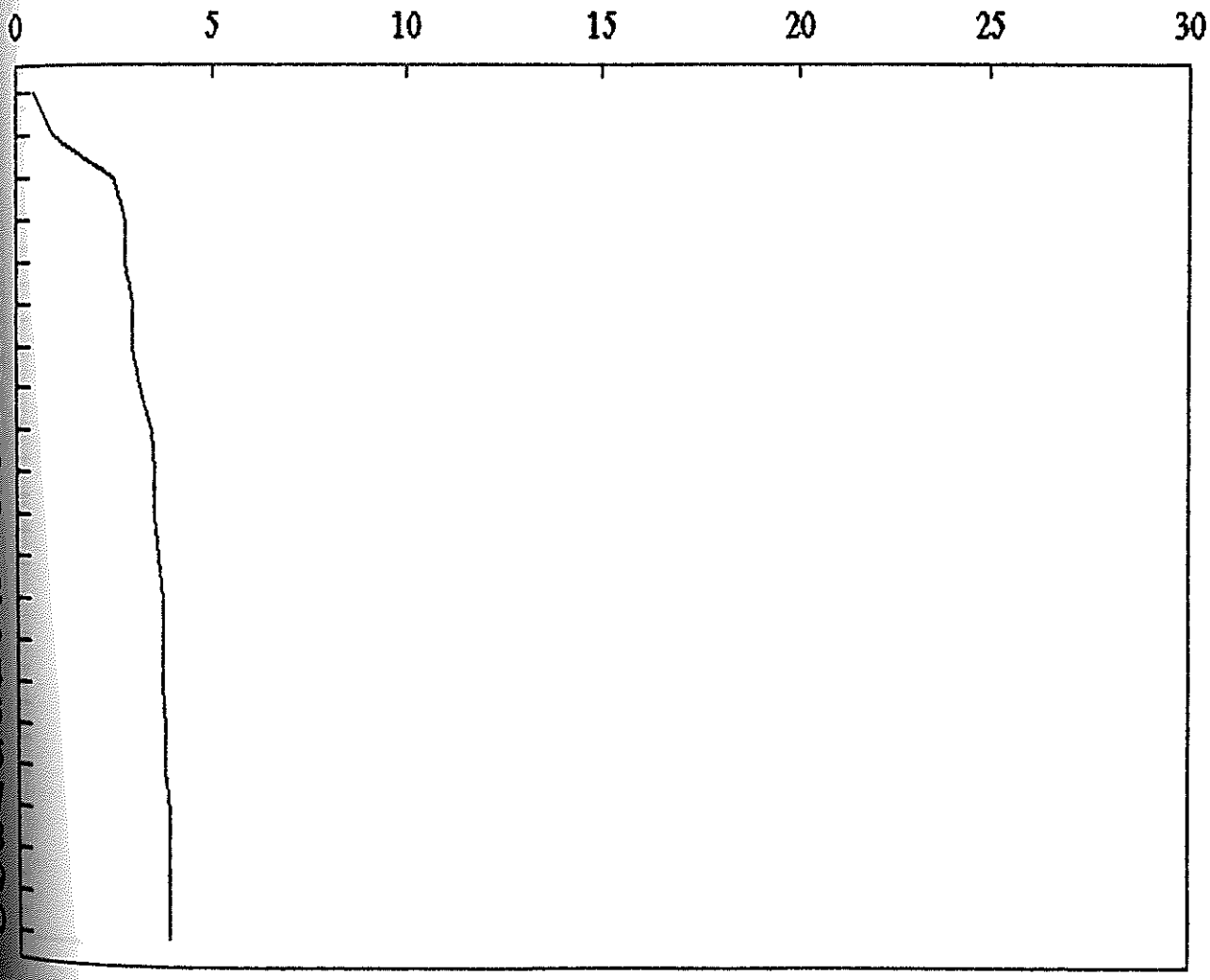
TEMPERATURE C



DETROIT LAKE

March 27,1989

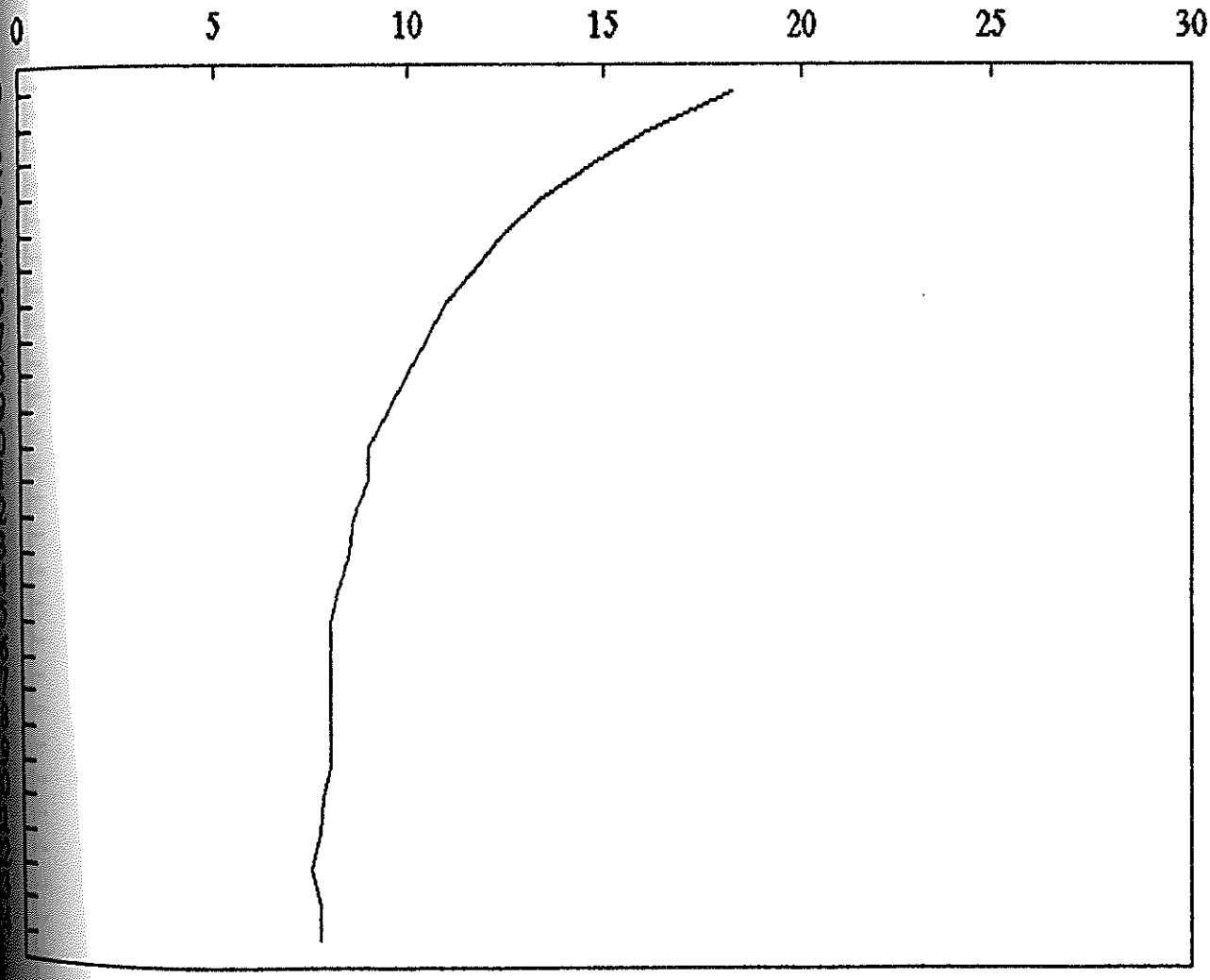
TEMPERATURE C



DETROIT LAKE

May 15,1989

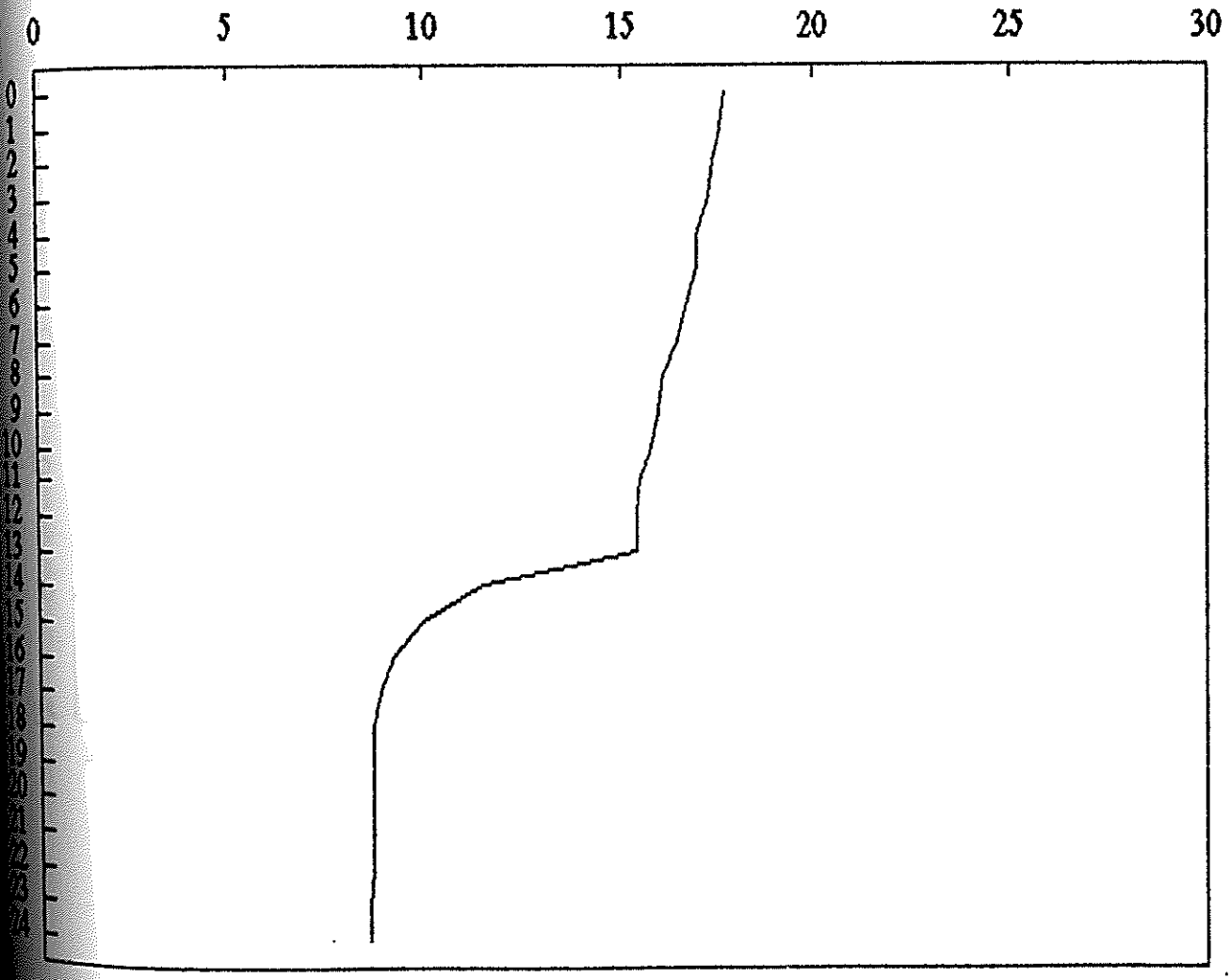
TEMPERATURE C



DETROIT LAKE

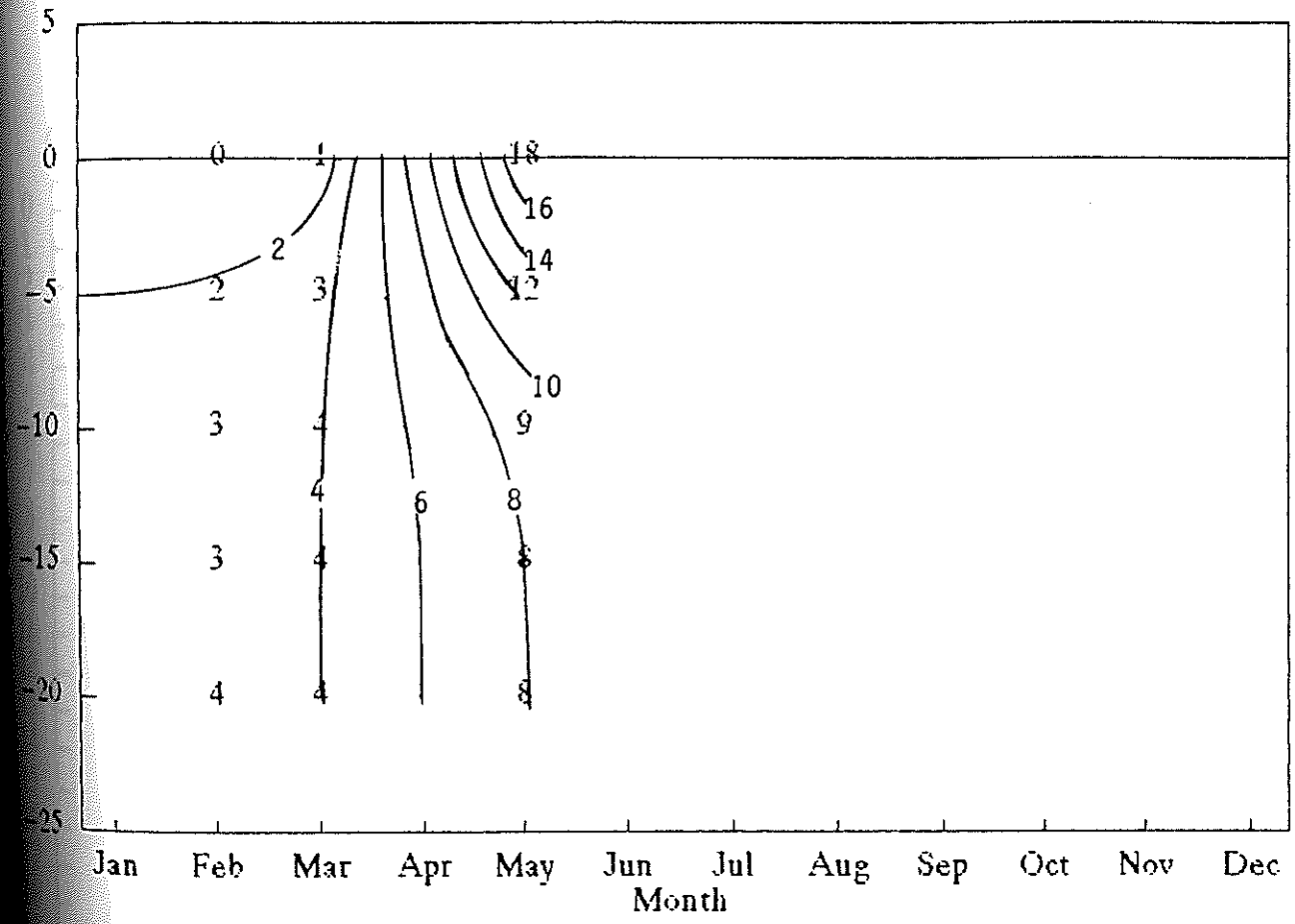
June 15,1989

TEMPERATURE C



DETROIT LAKE

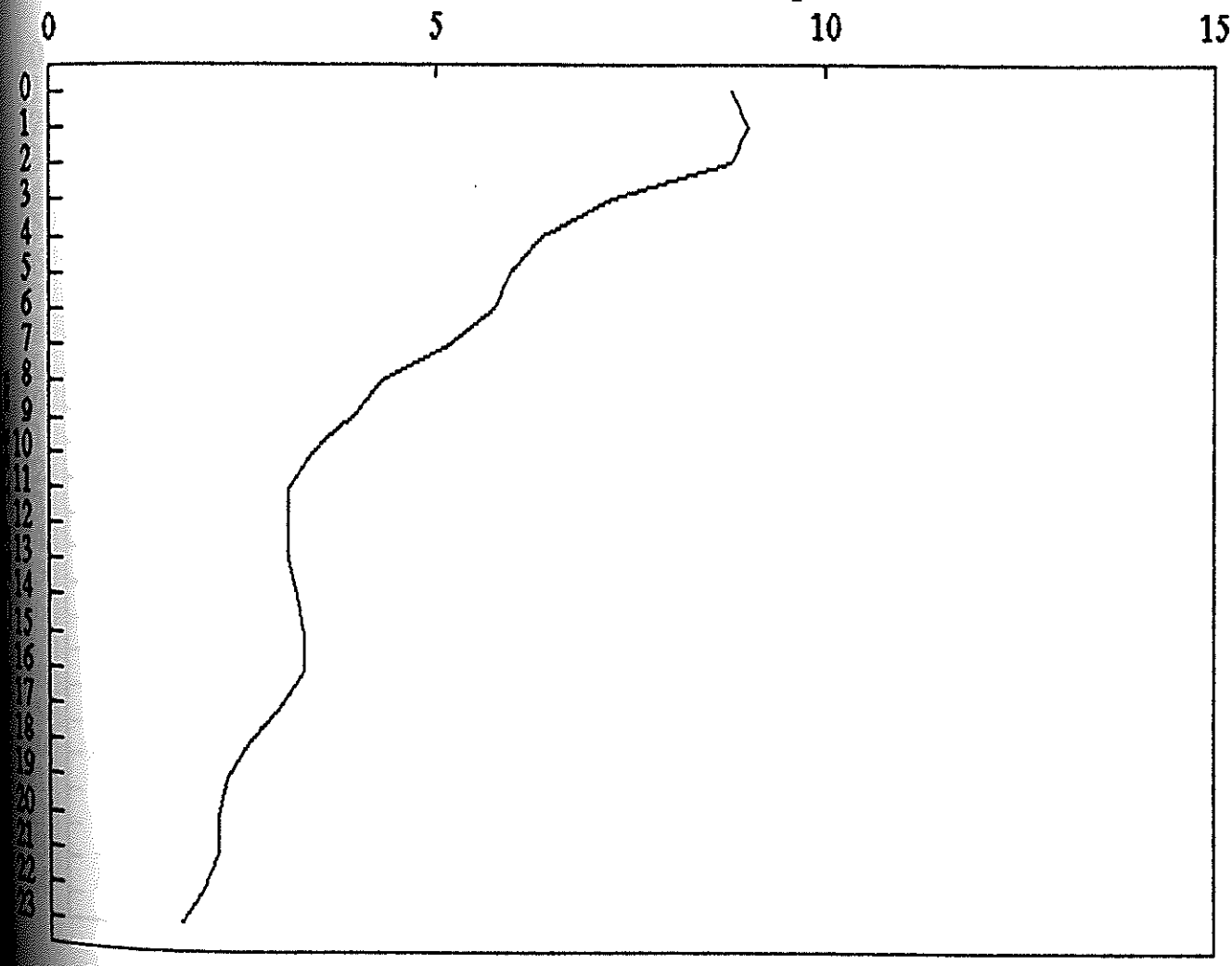
TEMPERATURE – 1989



DETROIT LAKE

January 31,1989

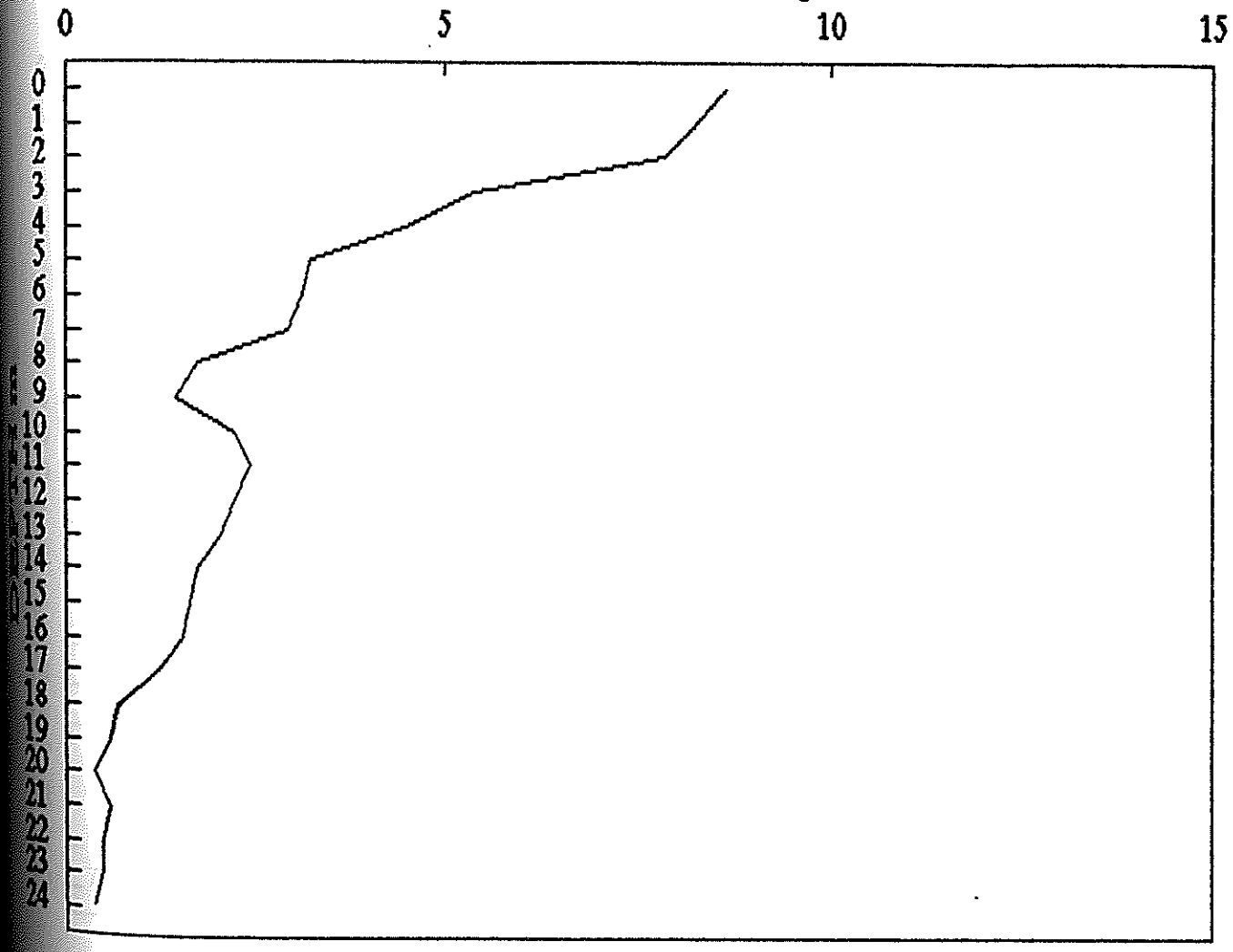
DISSOLVED OXYGEN mg/l



DETROIT LAKE

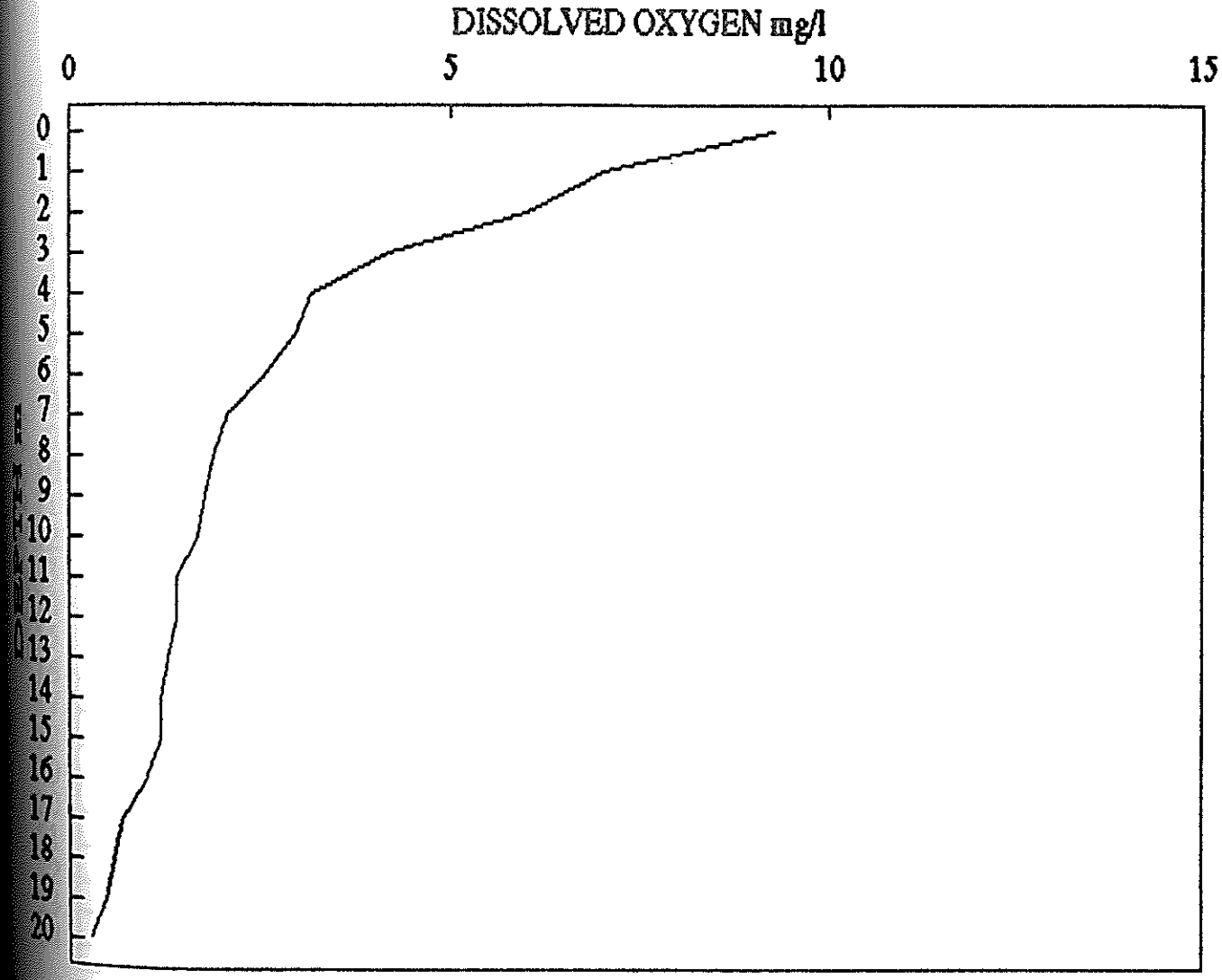
March 7,1989

DISSOLVED OXYGEN mg/l



DETROIT LAKE

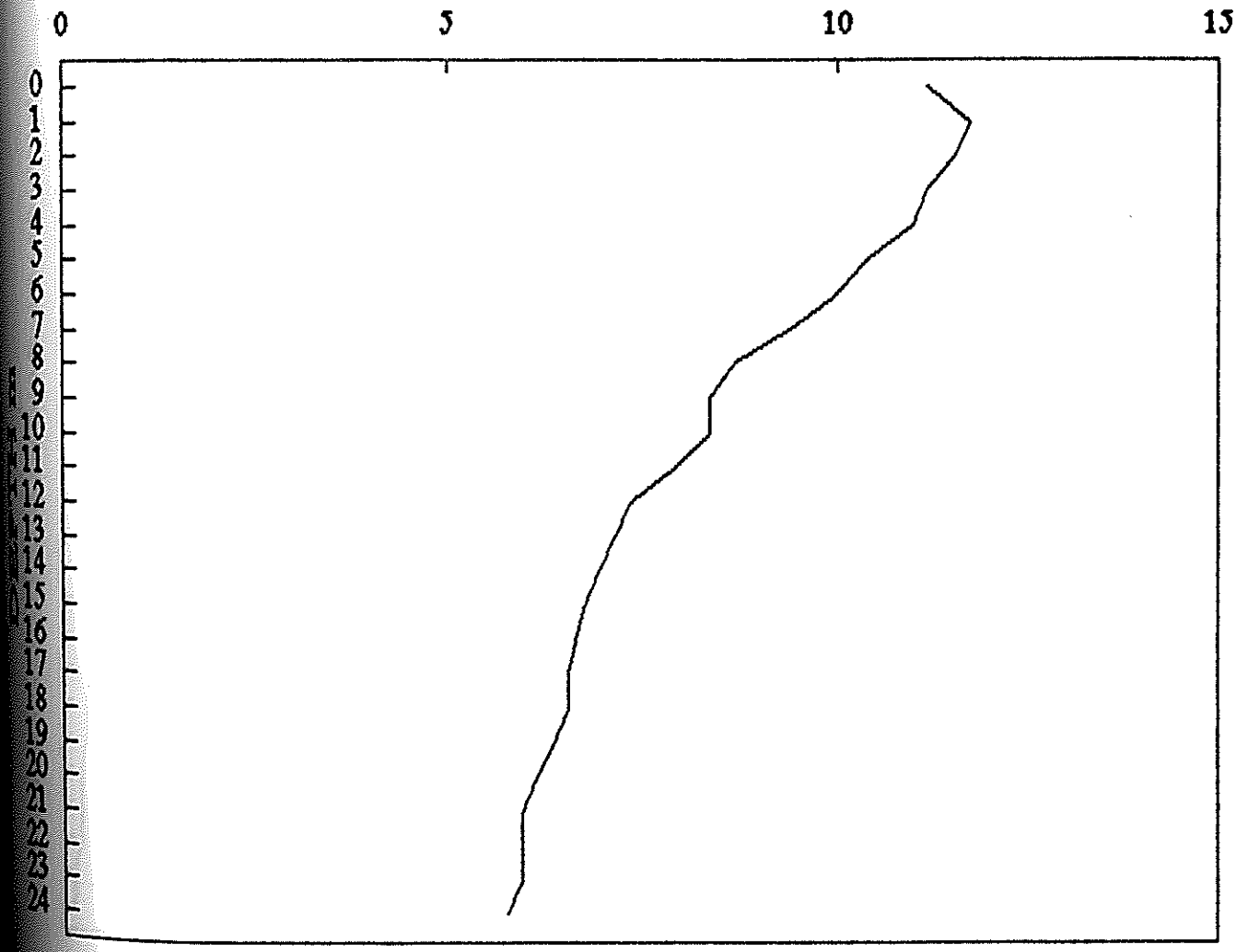
March 27,1989



DETROIT LAKE

May 15,1989

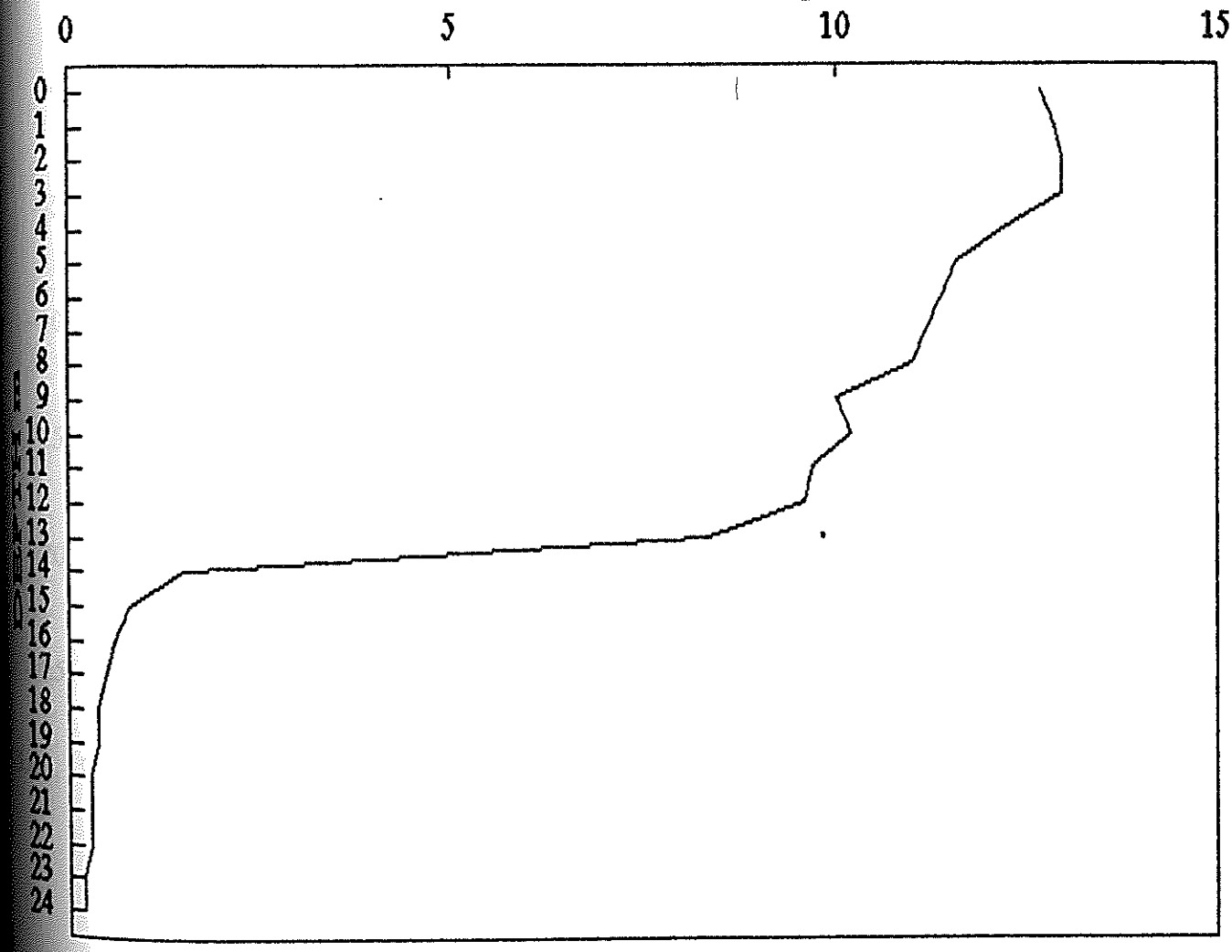
DISSOLVED OXYGEN mg/l



DETROIT LAKE

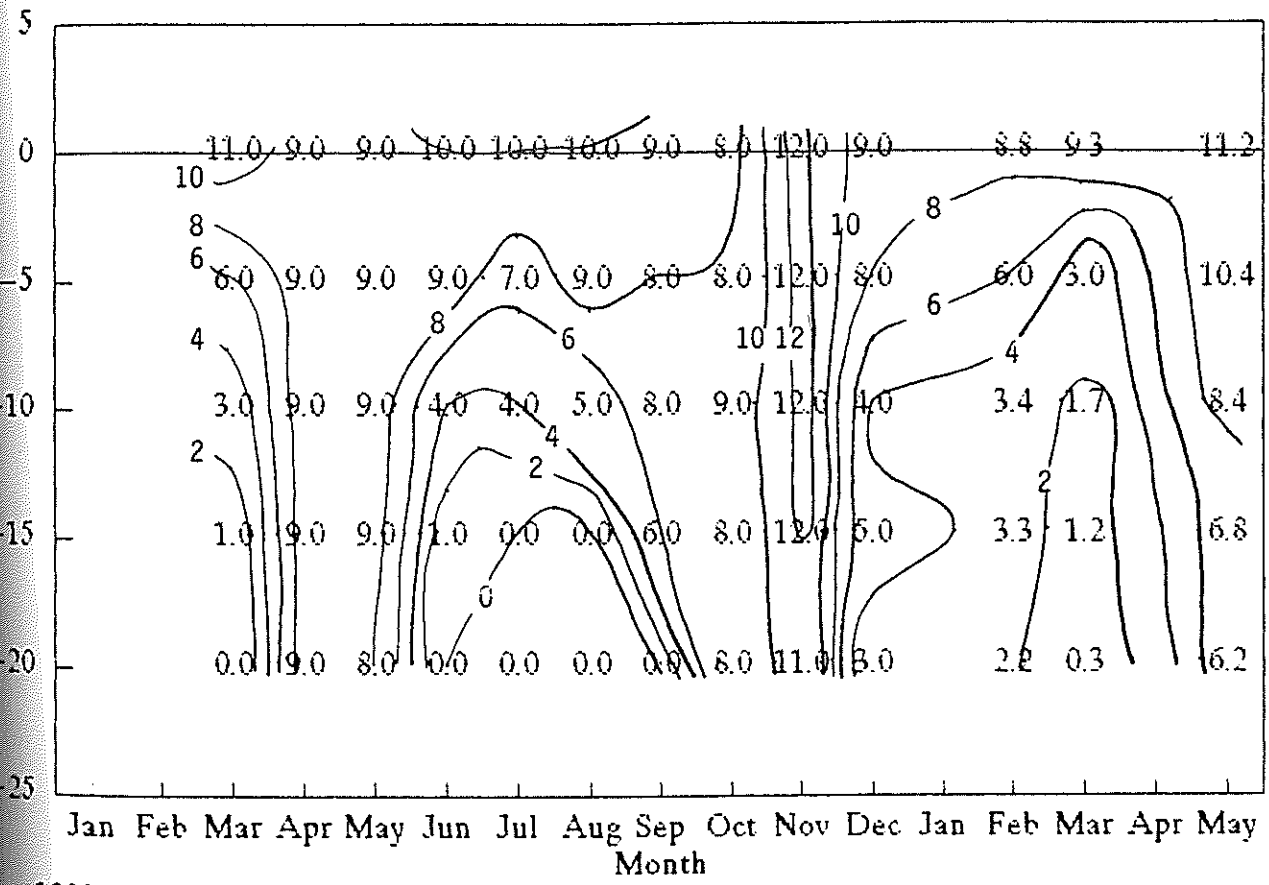
June 15,1989

DISSOLVED OXYGEN mg/l



DETROIT LAKE

DISSOLVED OXYGEN – 1988 & 1989



Jan., 1988 to May, 1989

DETROIT LAKE

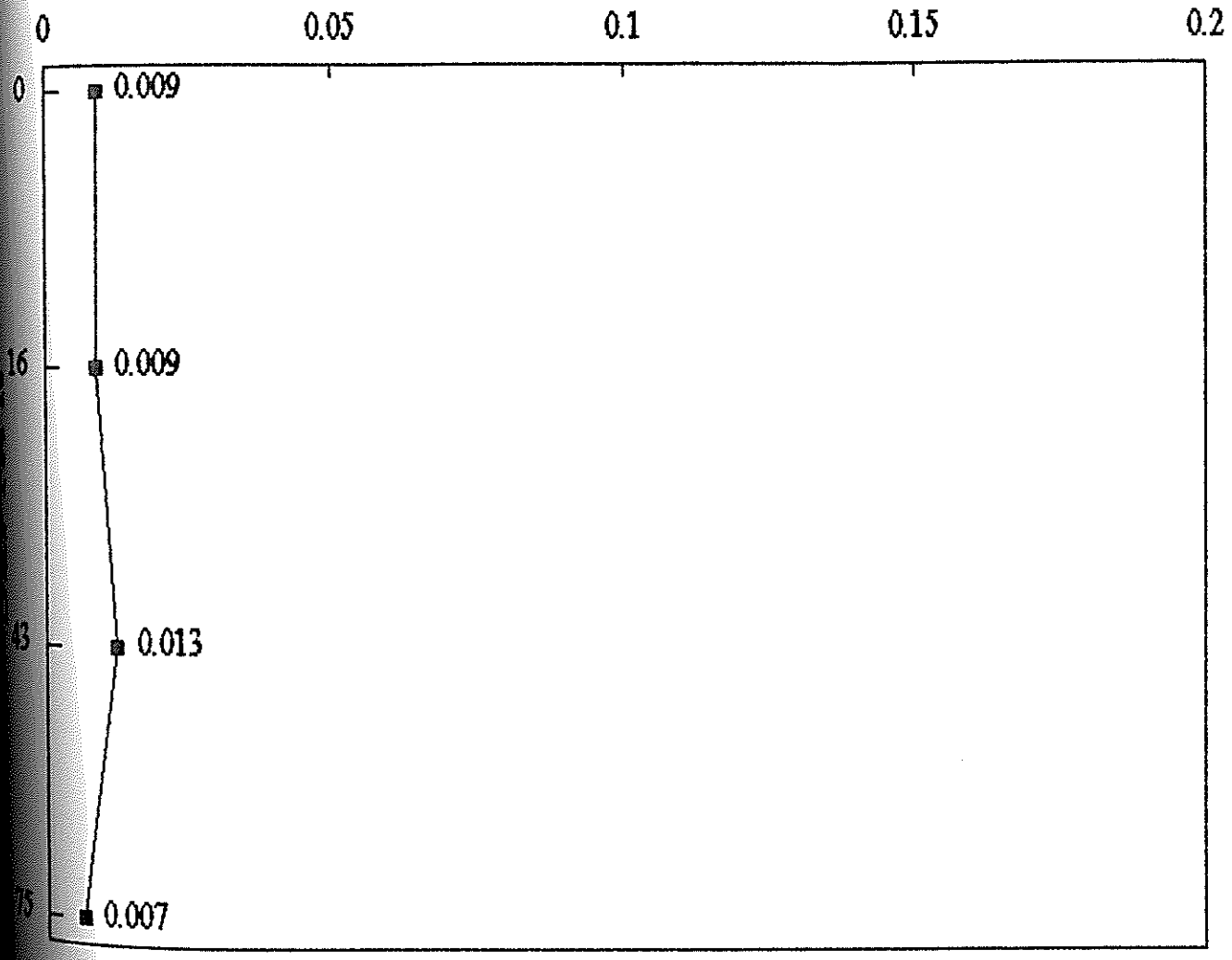
1989 IN-LAKE SAMPLING RESULTS

	1/31/89	3/07/89	3/27/89	5/18/89	6/15/89
Surface					
Po	0.007	0.005	0.004	0.002	0.004
P_T	0.009	0.008	0.015	0.011	0.010
Kjl-N	1.2	1.28	1.32	0.64	1.28
Org-N					
NH_3-N	<0.01	0.04	0.06	0.01	0.01
NO_2-N+					
Chlor-a	<1.0	1.3	5.4		
TSS					
PH					
Conduct					
Alk.					
Secchi Disk(m)					
Fecal Coli					
Five Meter Sample					
Po	0.007	0.008	0.006	0.002	0.005
PT	0.009	0.016	0.014	0.011	0.017
TSS	0.5	0.3	0.5	0.6	2.0
Thirteen Meter Sample					
Po	0.008	0.012	0.010	0.002	0.004
PT	0.013	0.013	0.012	0.011	0.013
$N\text{-}NO_2+NO_3$	0.06	0.10	0.12	0.01	0.01
Twenty-Three Meter Sample (Bottom)					
Po	0.007	0.010	0.008	0.002	0.050
PT	0.007	0.013	0.014	0.011	0.130
Kjl-N	1.12	1.28	0.96	0.68	1.40

LAKE DETROIT

January 31,1989

PHOSPHORUS mg/l



LAKE DETROIT

March 7,1989

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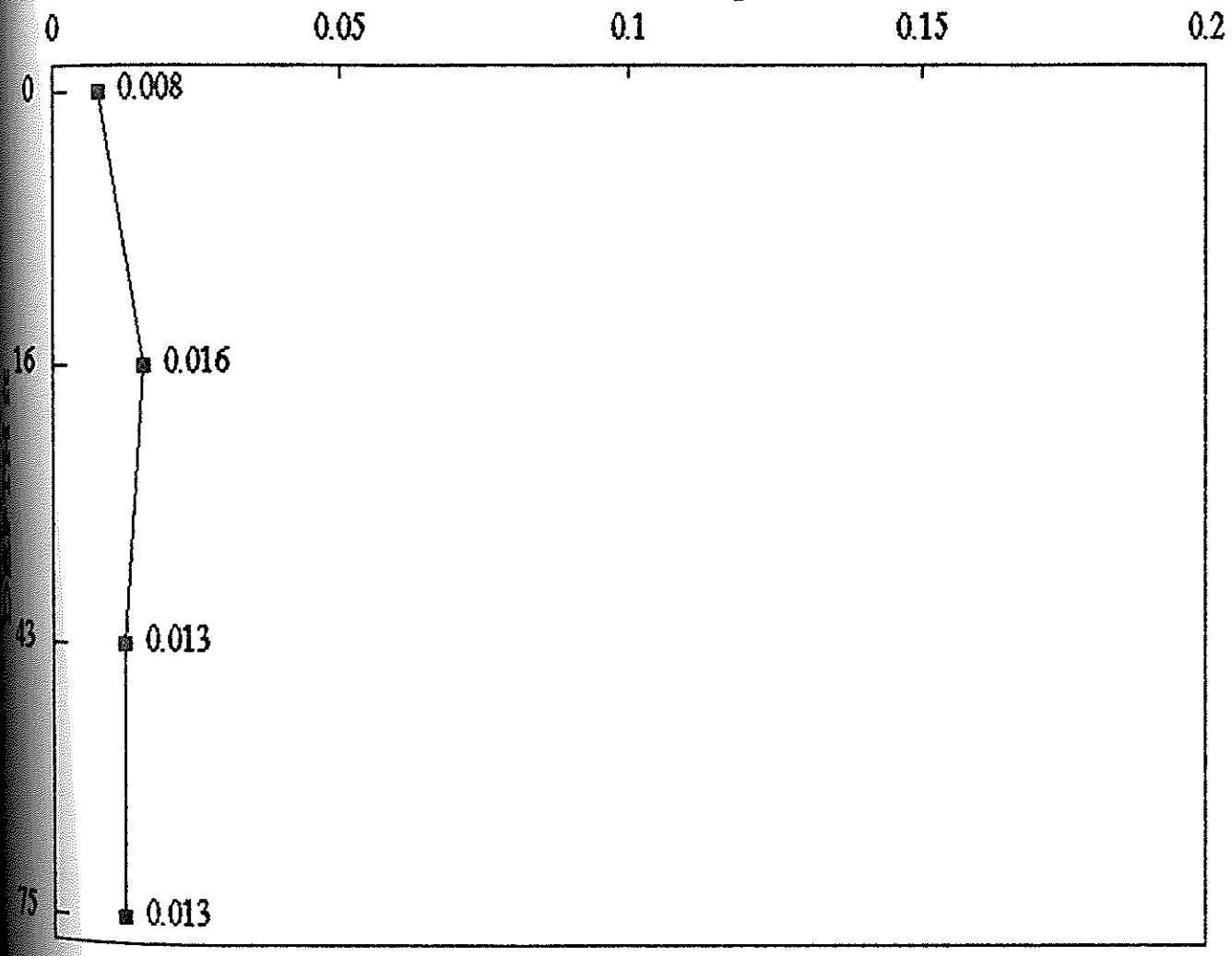

LAKE DETROIT

March 27,1989

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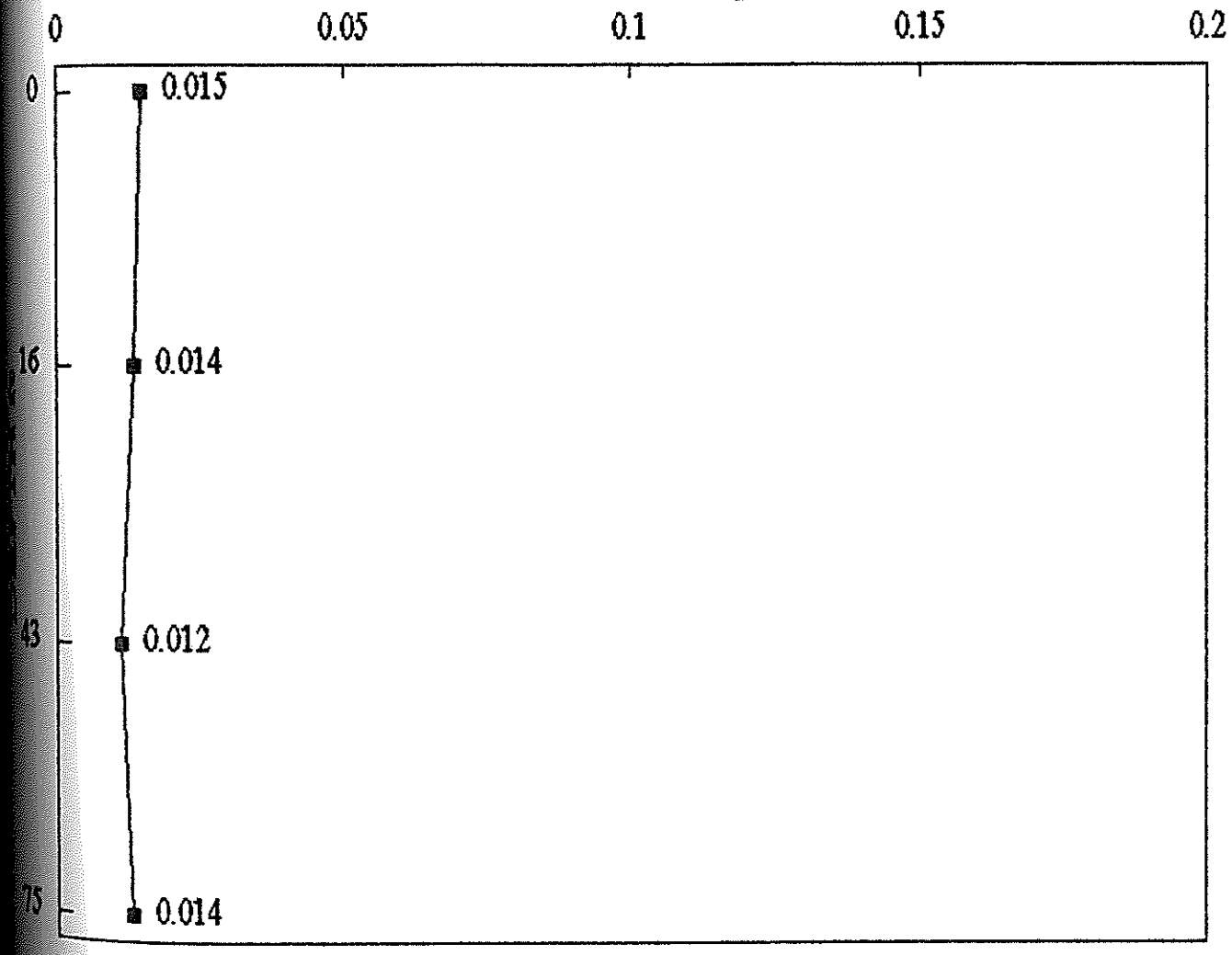
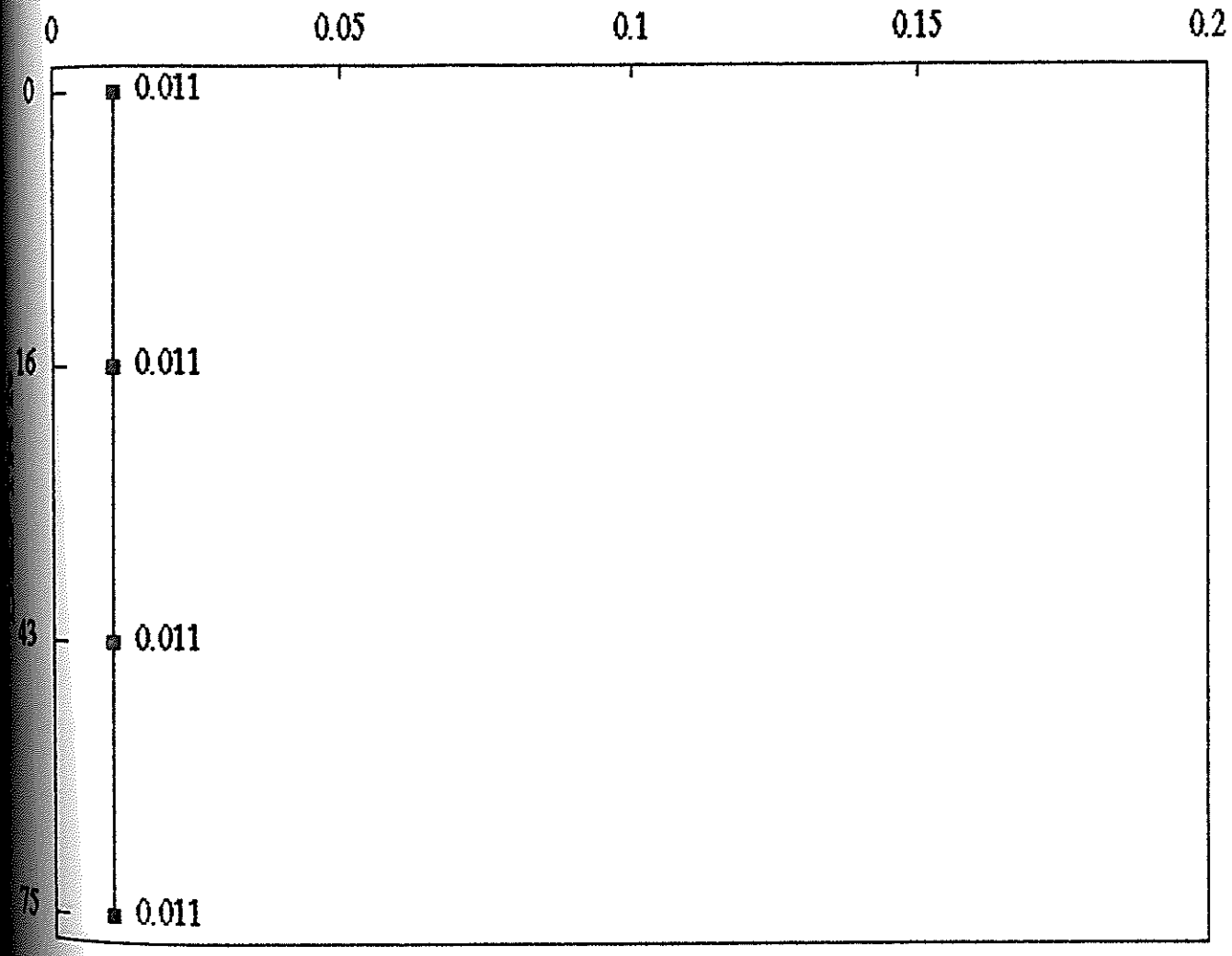


LAKE DETROIT

May 18,1989

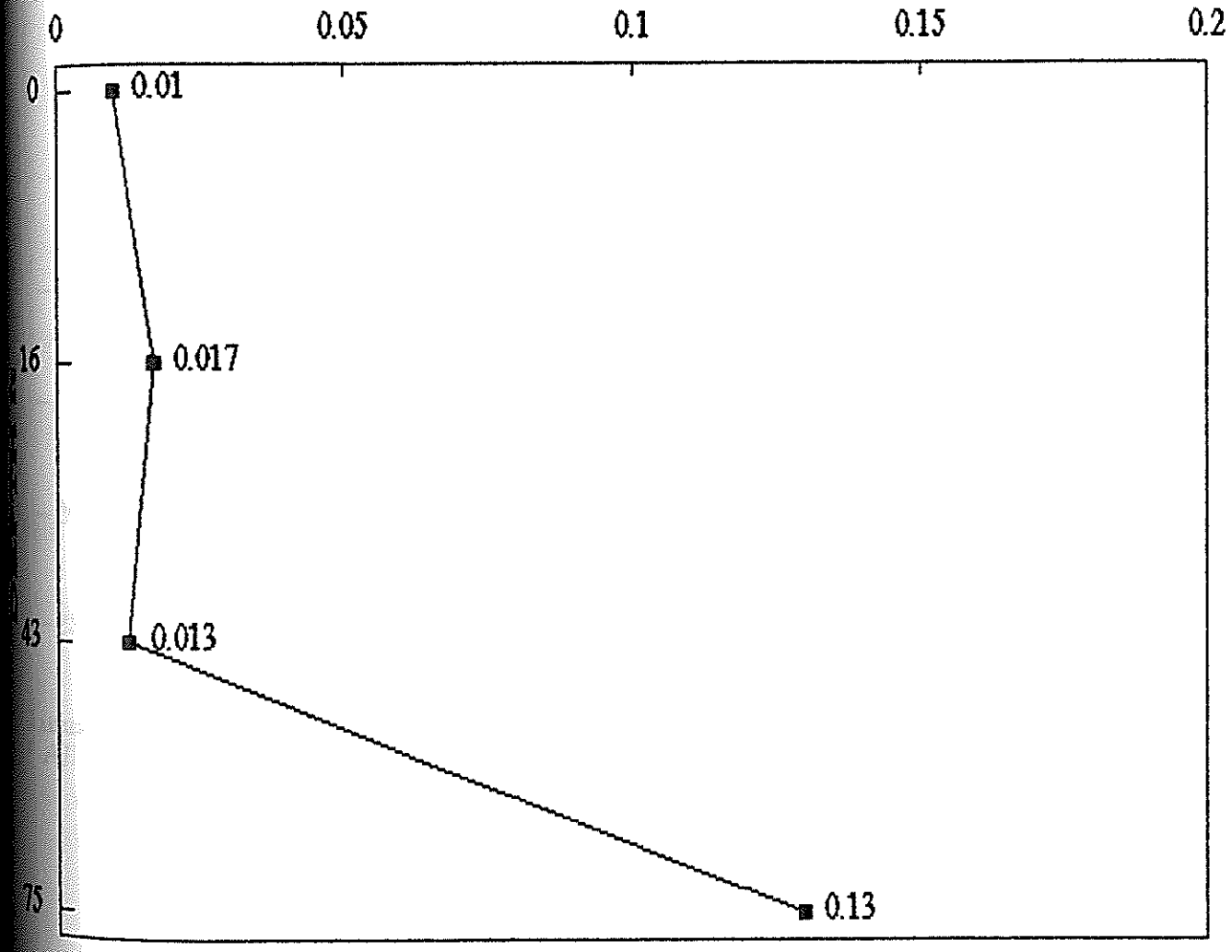
PHOSPHORUS mg/l



LAKE DETROIT

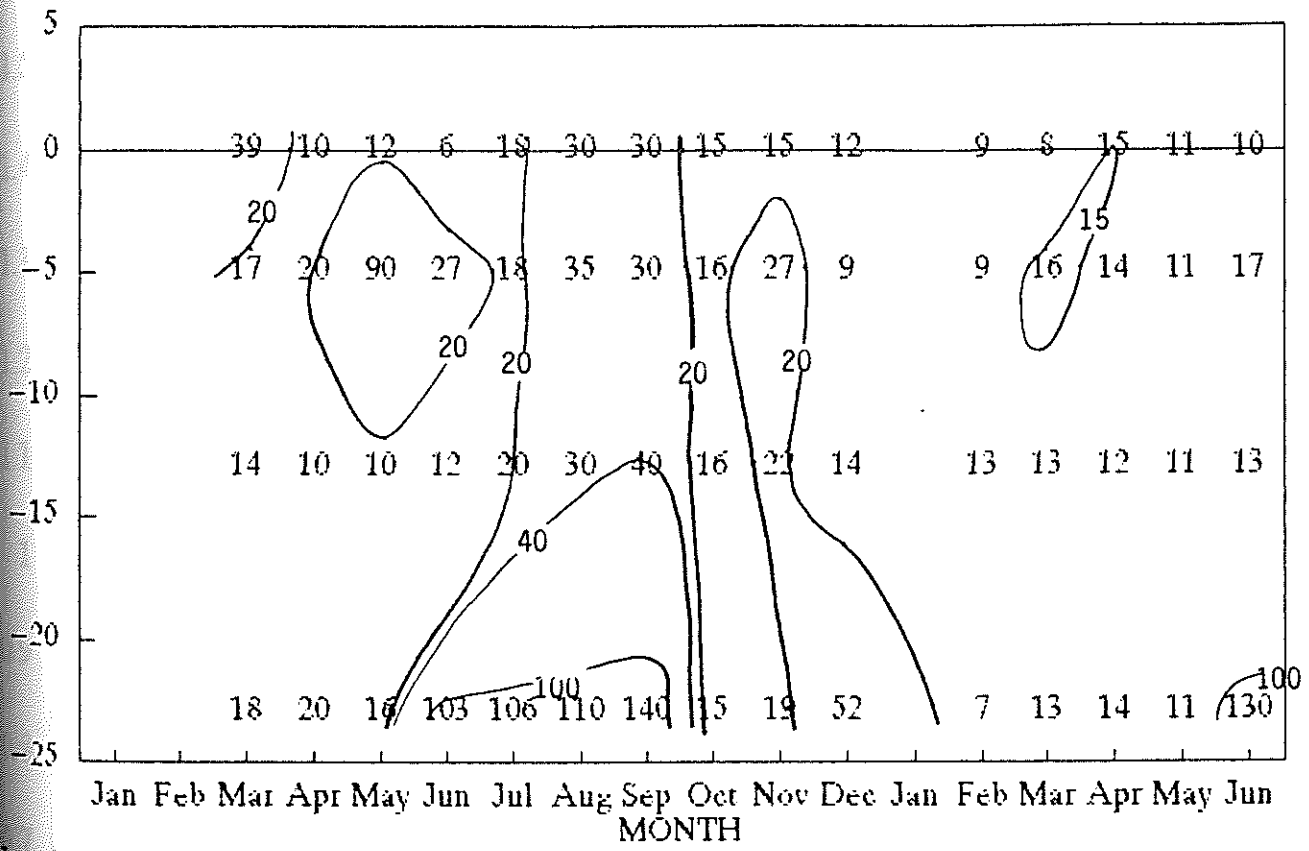
June 15,1989

PHOSPHORUS mg/l



DETROIT LAKE

TOTAL PHOSPHORUS – 1988 & 1989

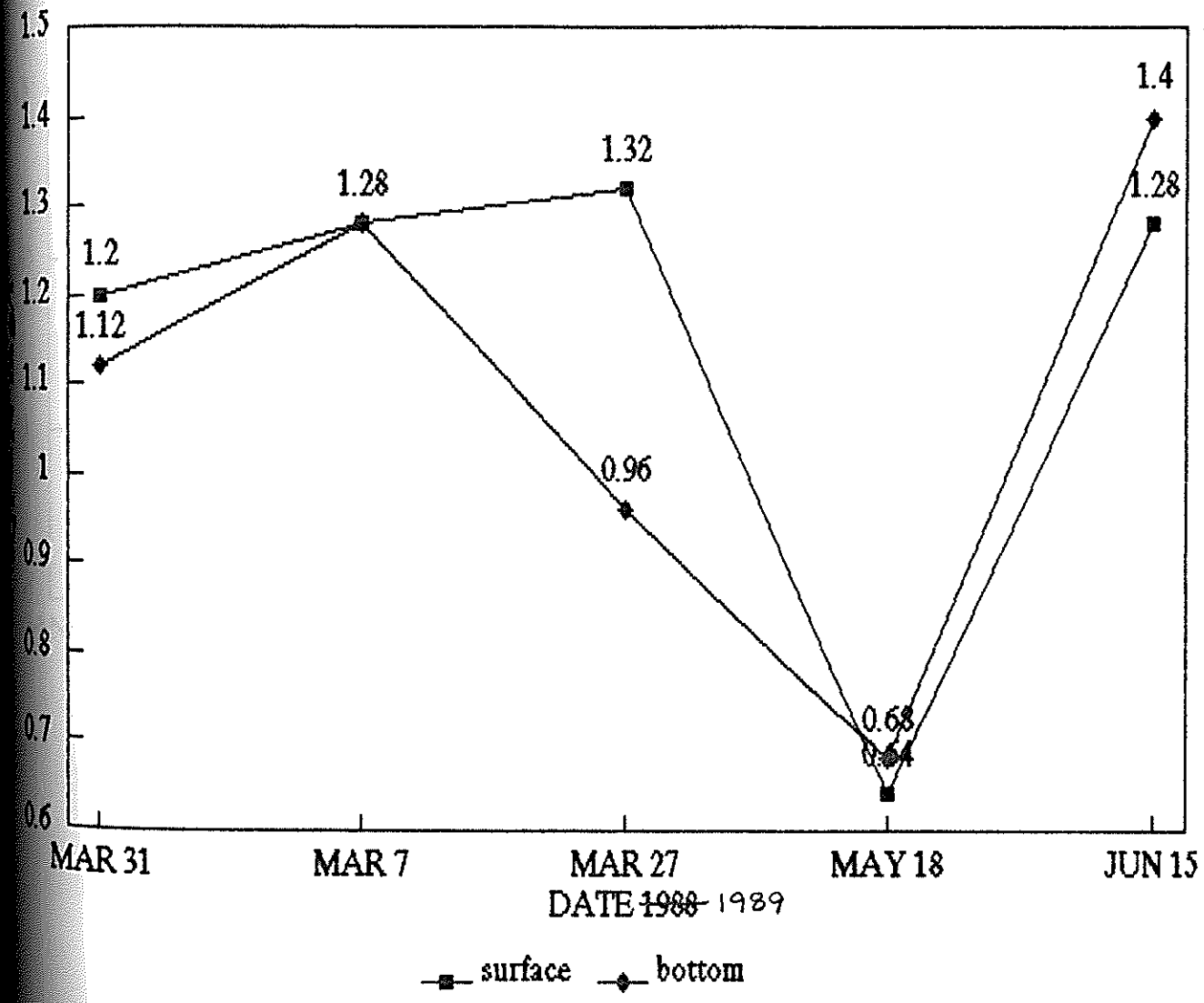


January, 1988 to June, 1989

† All concentrations in micrograms/liter

DETROIT LAKE

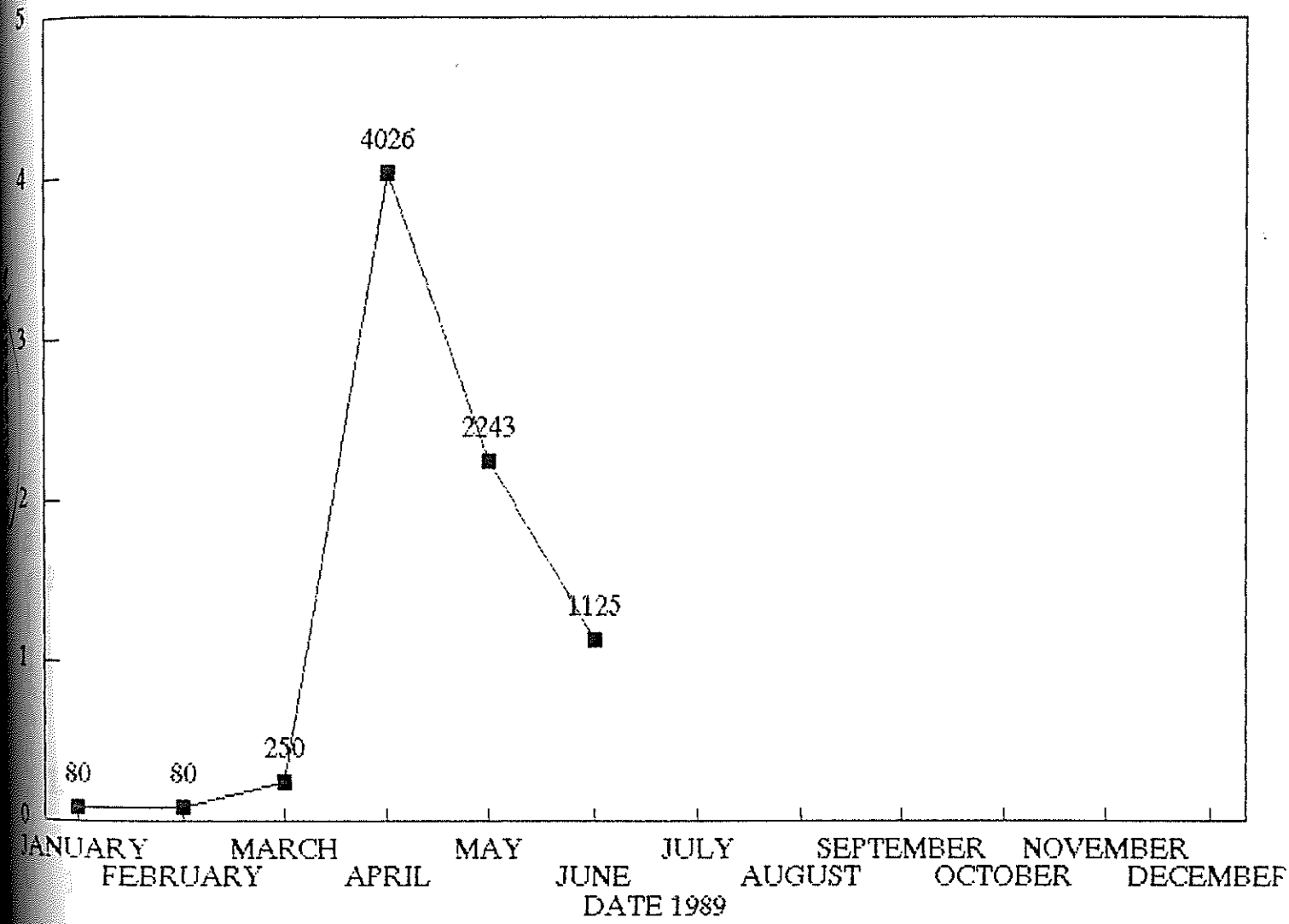
KJELDAHL NITROGEN



Flow IN AC-FT

DETROIT LAKE

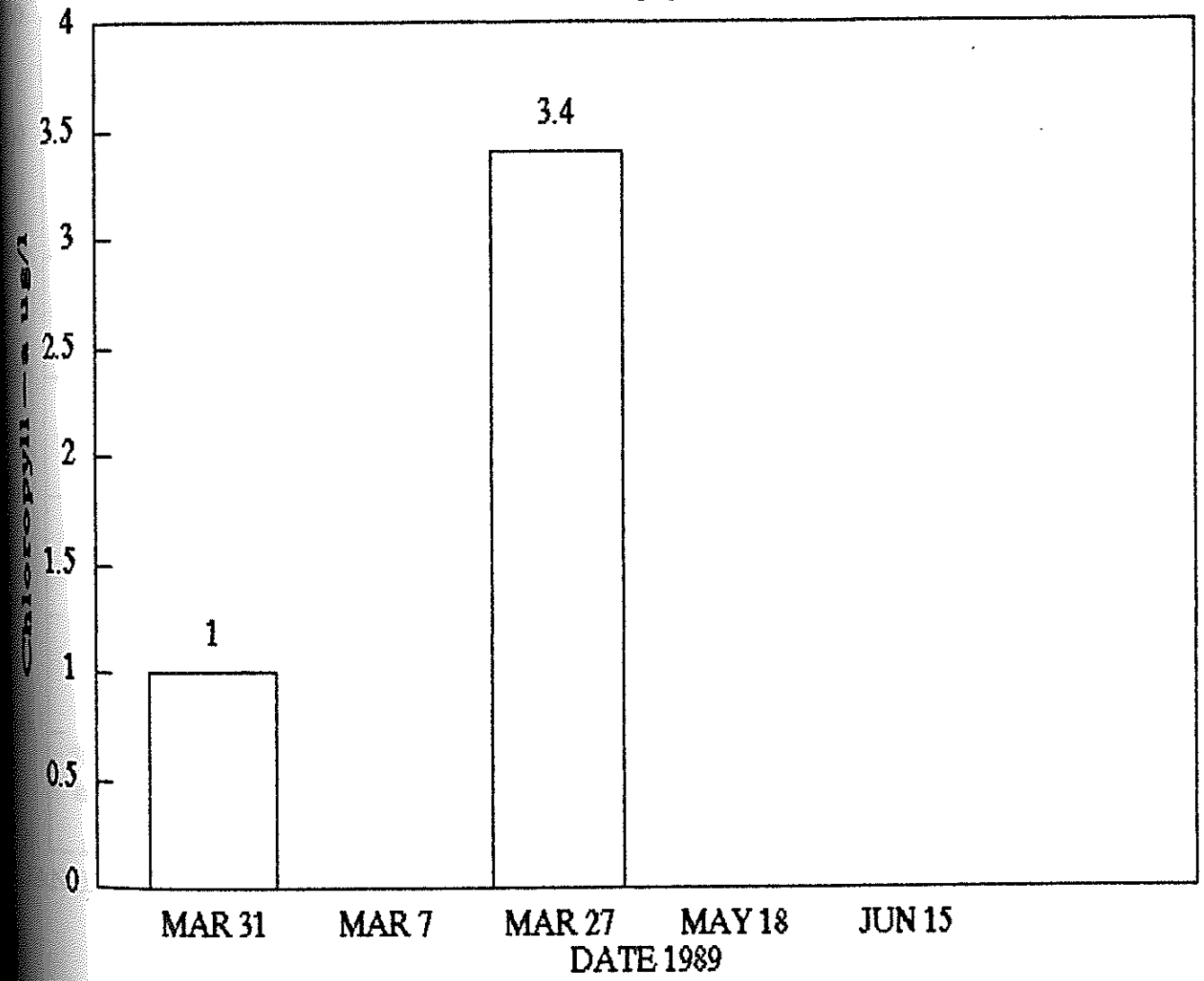
PELICAN RIVER INLET



3/28	4/5/80	4/19/	5/9	5/25	6/14
.084	0.093	.039	0.024	.042	.037

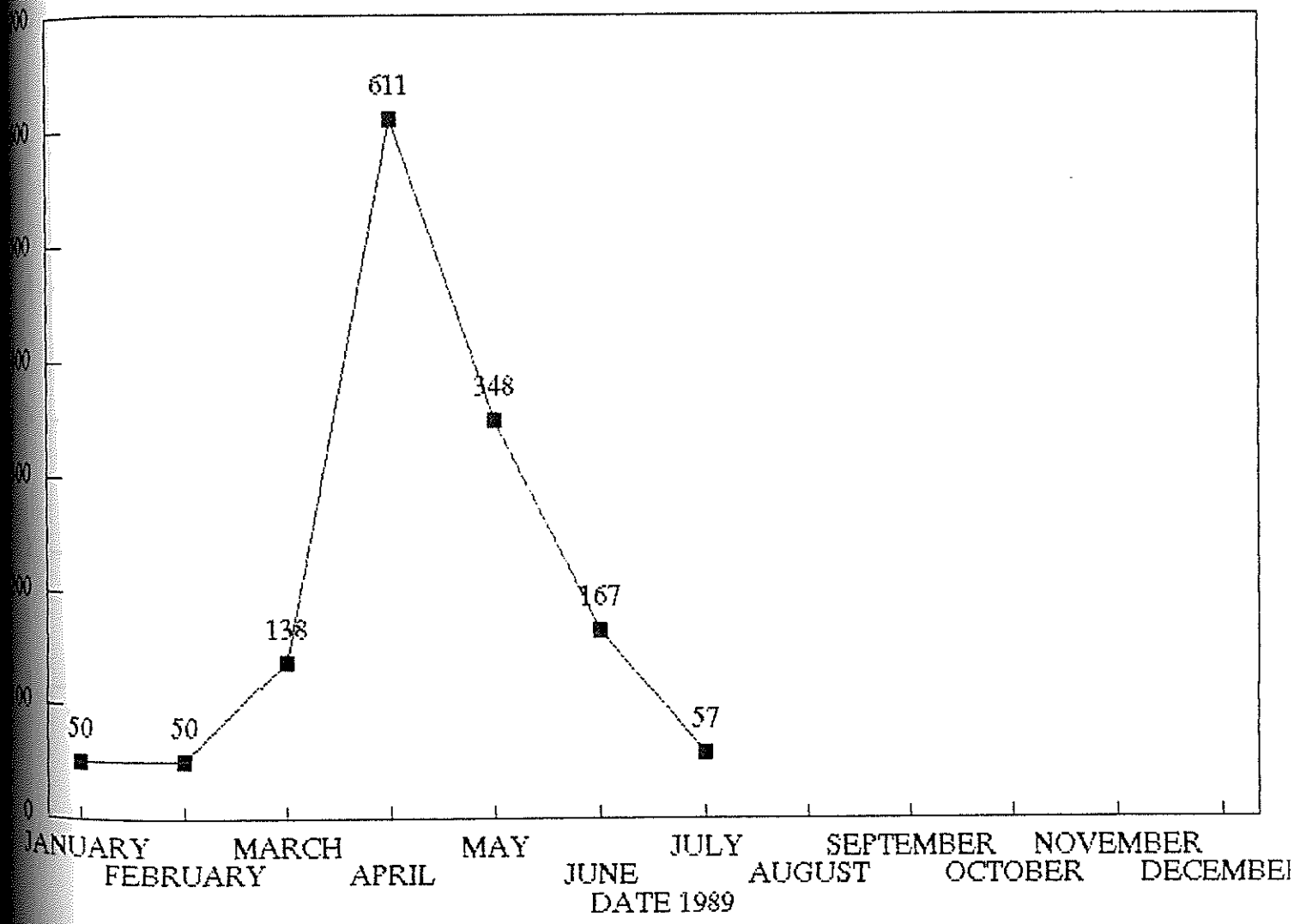
DETROIT LAKE

Chlorophyll–a



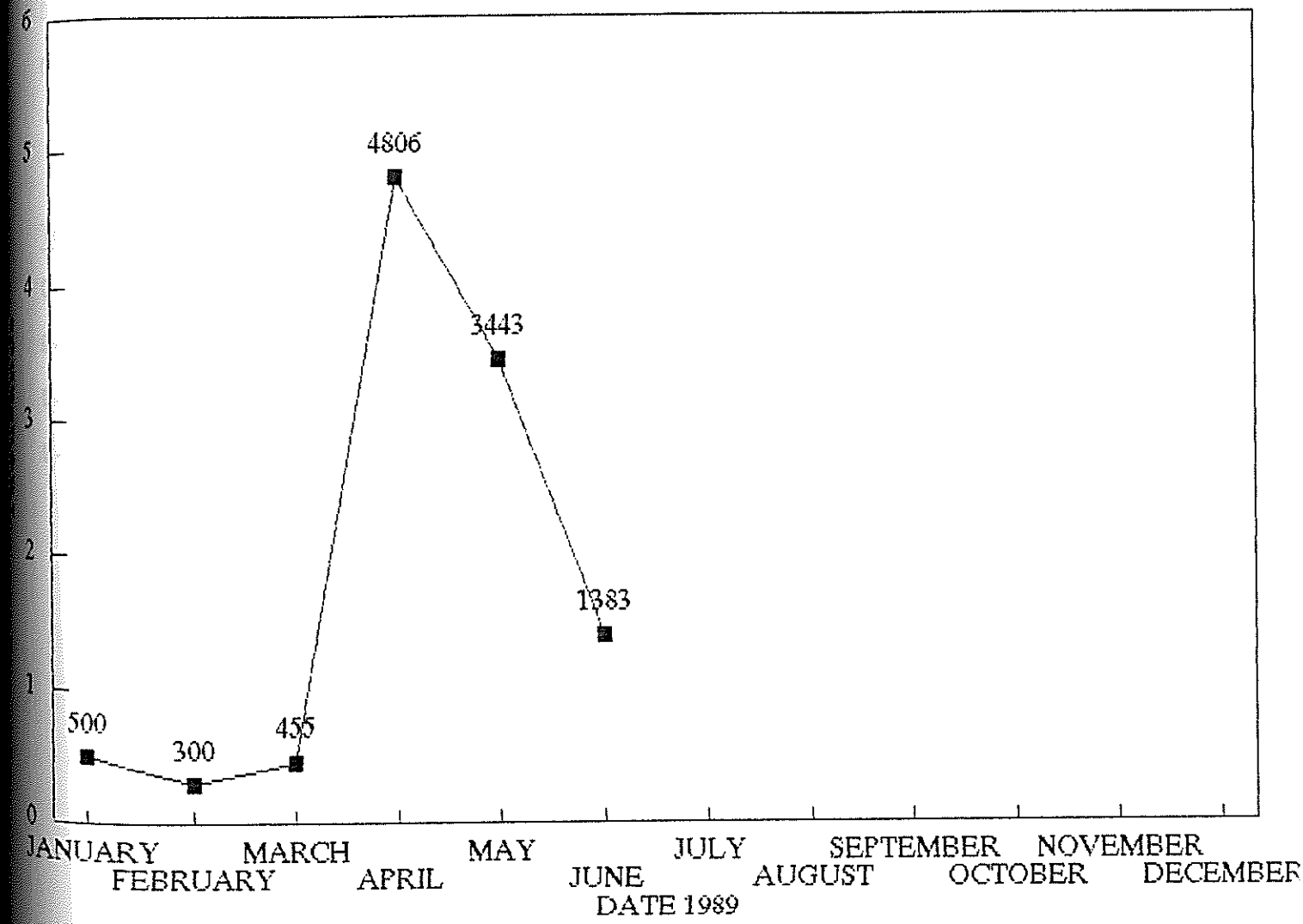
DETROIT LAKE

SUCKER CREEK INLET



DETROIT LAKE

PELICAN RIVER OUTLET



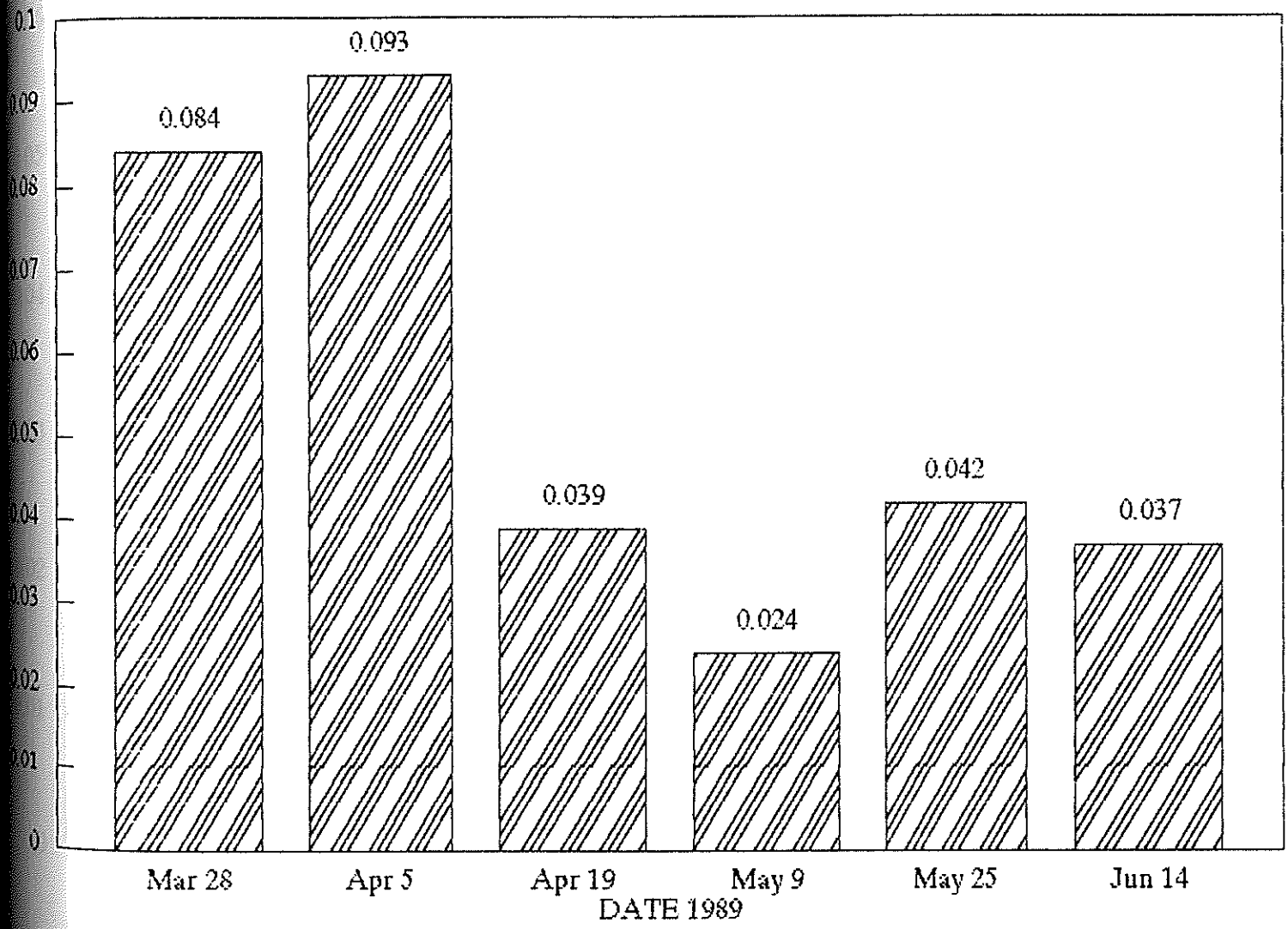
DETROIT LAKE

1989 INFLOW SAMPLING

	3/28/89	4/5/89	4/19/89	5/9/89	5/25/89	6/14/89
Phosphorus						
D-1 Detroit Lake Outlet	.017	.014	.018	.013	.011	.009
D-2 Detroit Lake Inlet	.084	.093	.039	.024	.042	.037
D-3 Inlet: East Shore Dr.	-	.057	-	-	-	-
D-4 Sucker Creek	.028	.024	-	.022	-	-
Total Suspended Solids						
D-1 Detroit Lake Outlet	1.1	.6	2.9	2.0	2.5	4.0
D-2 Detroit Lake Inlet	8.8	40.3	6.9	4.7	10	6.5
D-3 Inlet: East Shore Dr.	-	3.3	-	-	-	-
D-4 Sucker Creek	4.0	2.3	-	4.3	-	-

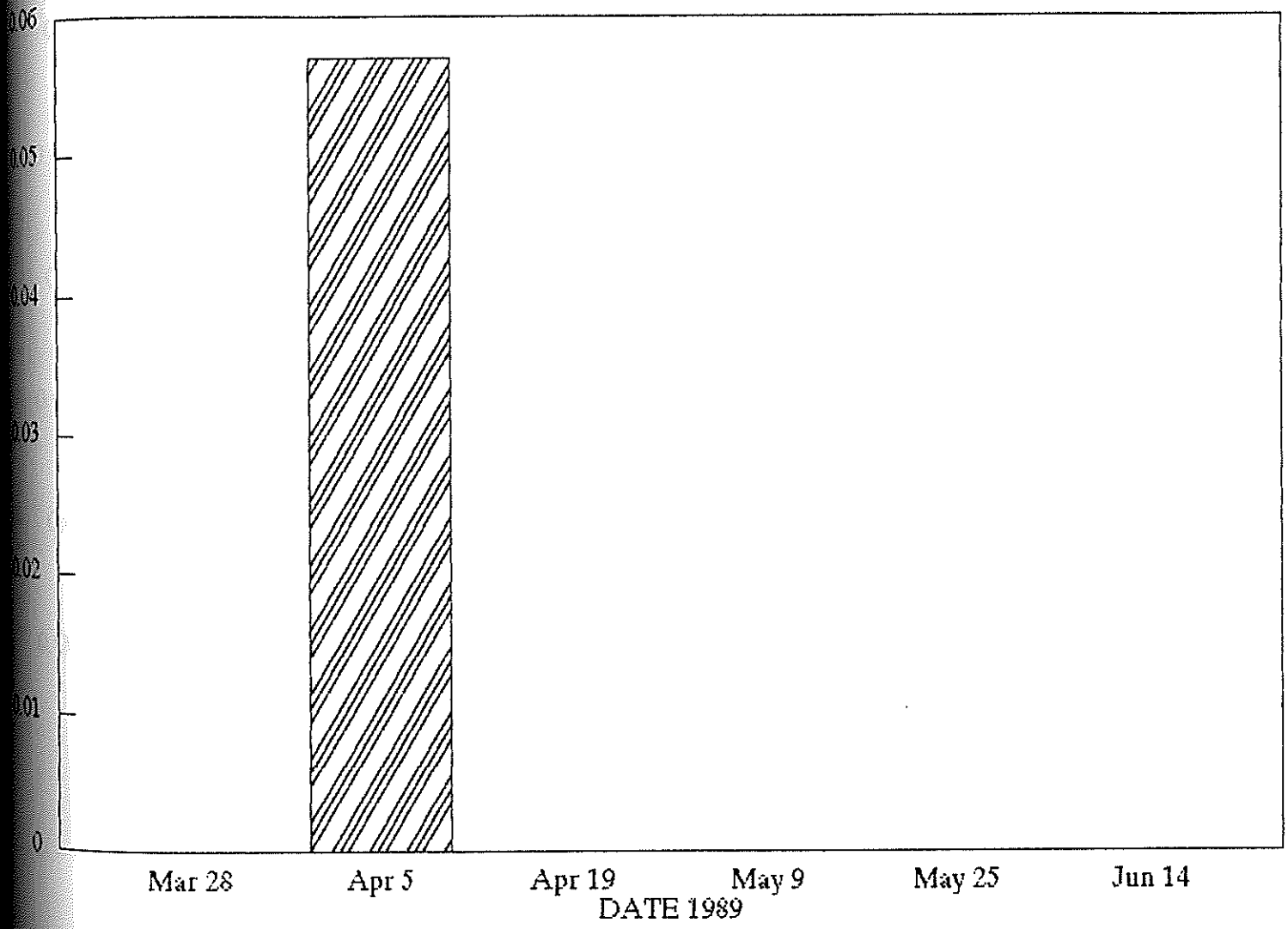
DETROIT LAKE

TOTAL PHOSPHORUS



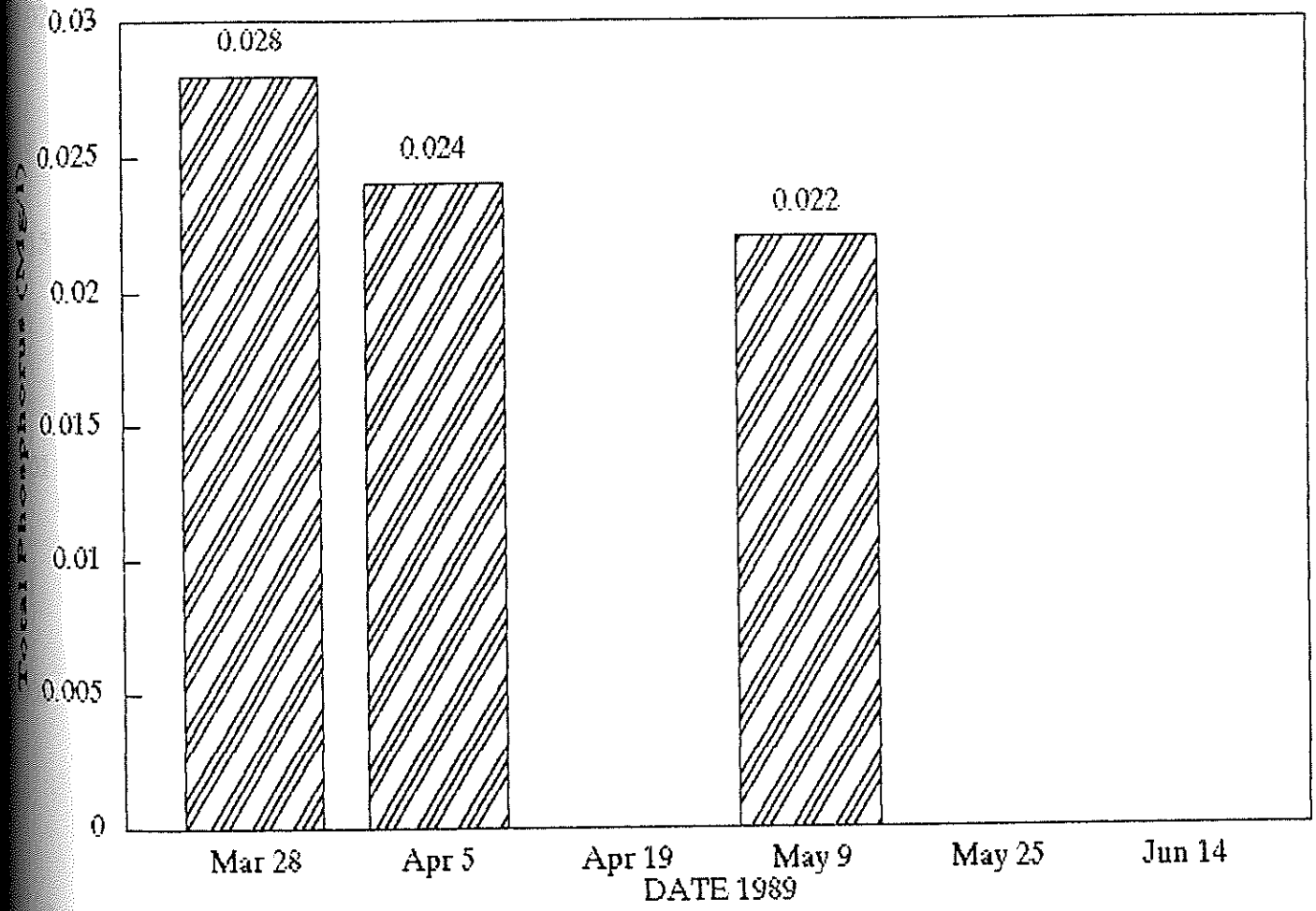
EAST SHORE DRIVE

TOTAL PHOSPHORUS



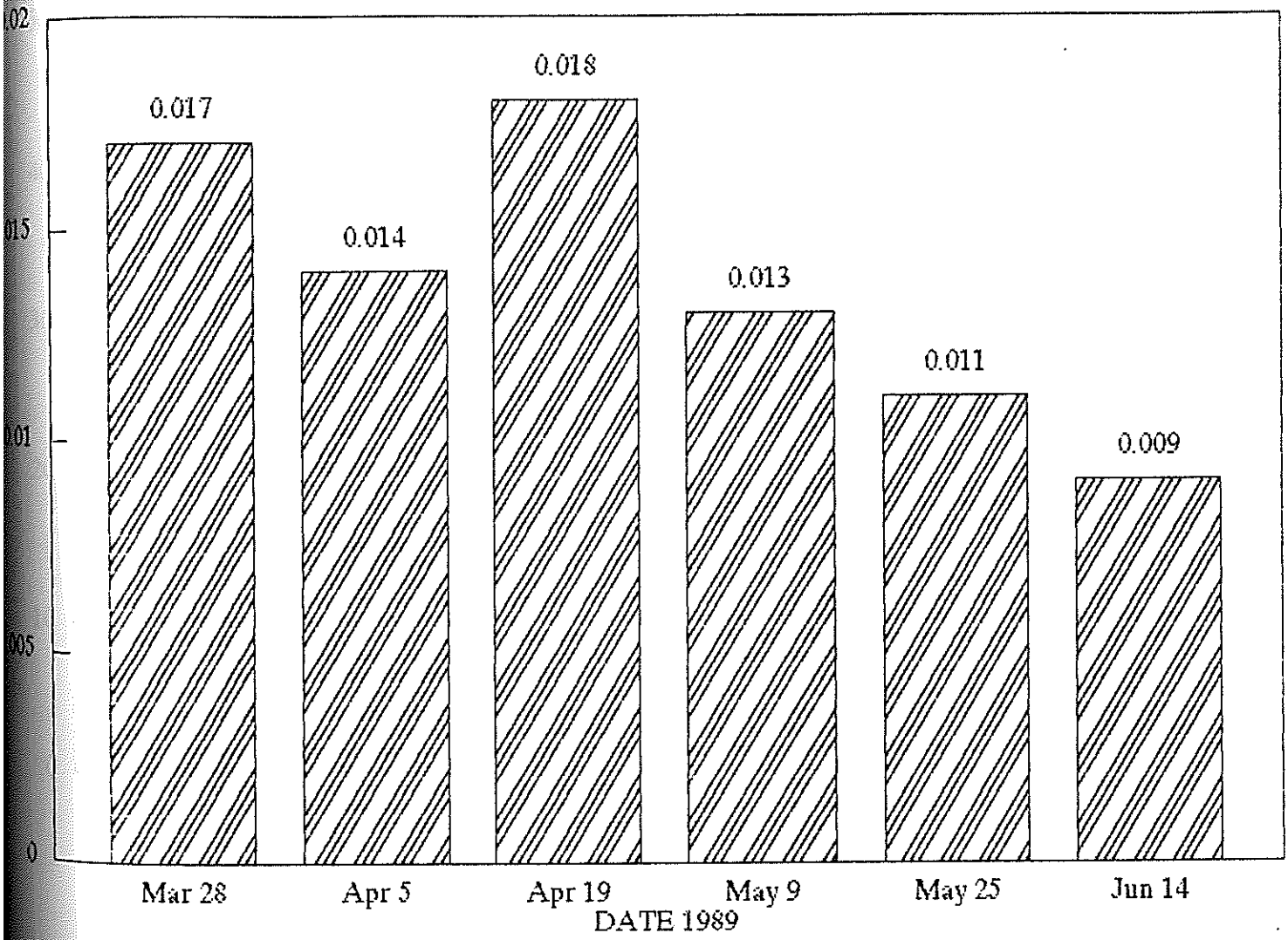
SUCKER CREEK

TOTAL PHOSPHORUS



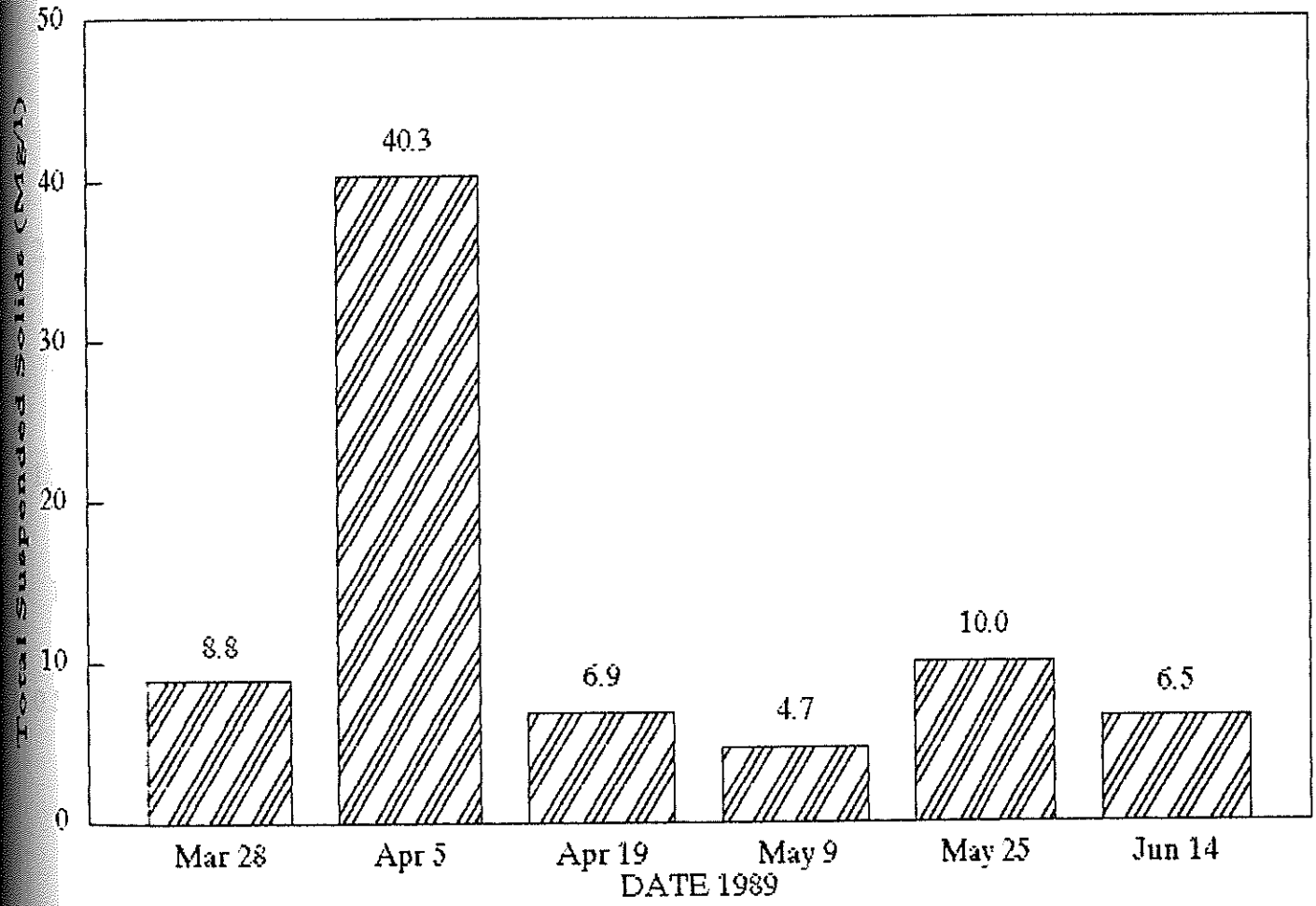
DETROIT LAKE OUTLET

TOTAL PHOSPHORUS



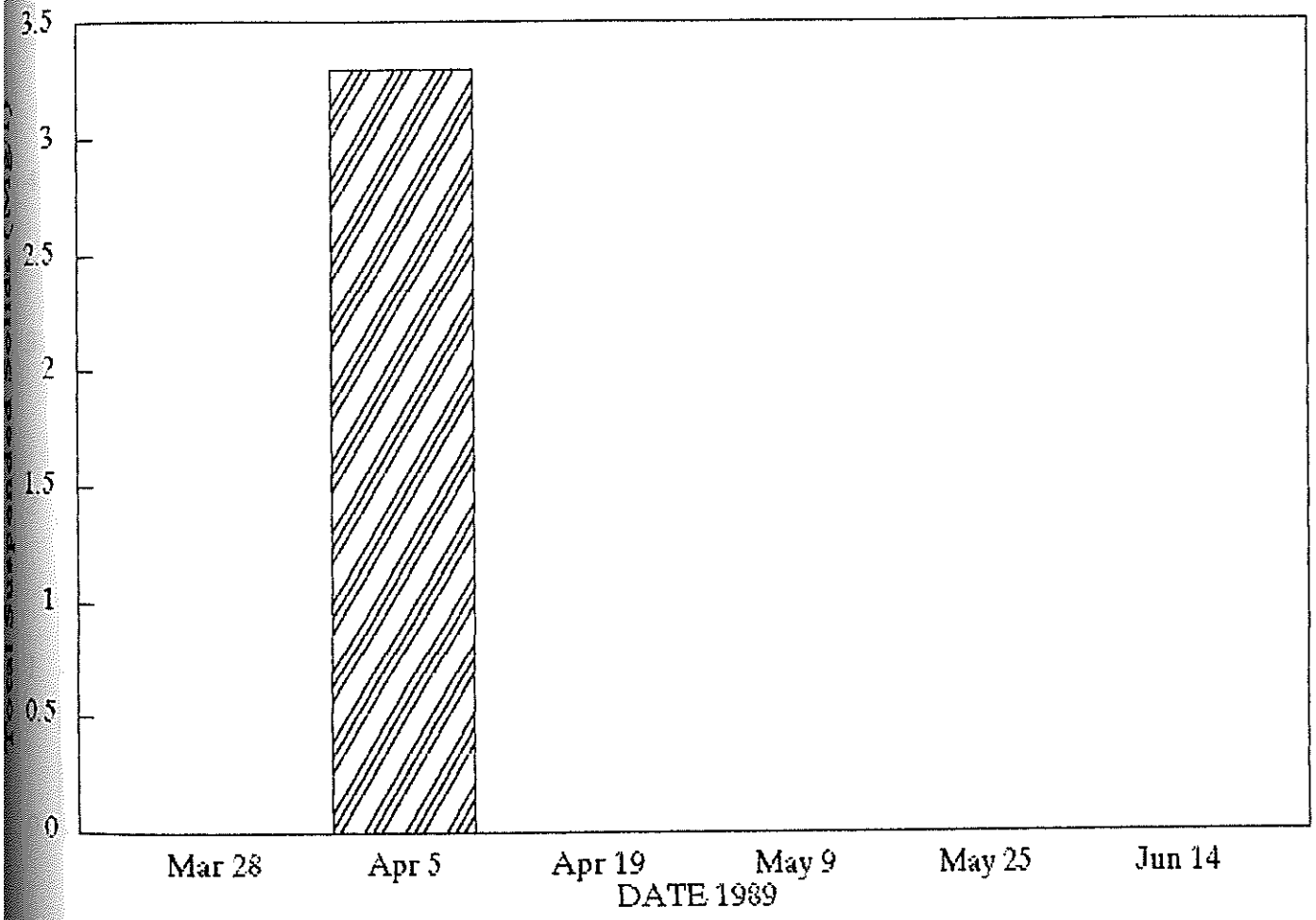
DETROIT LAKE INLET

TOTAL SUSPENDED SOLIDS



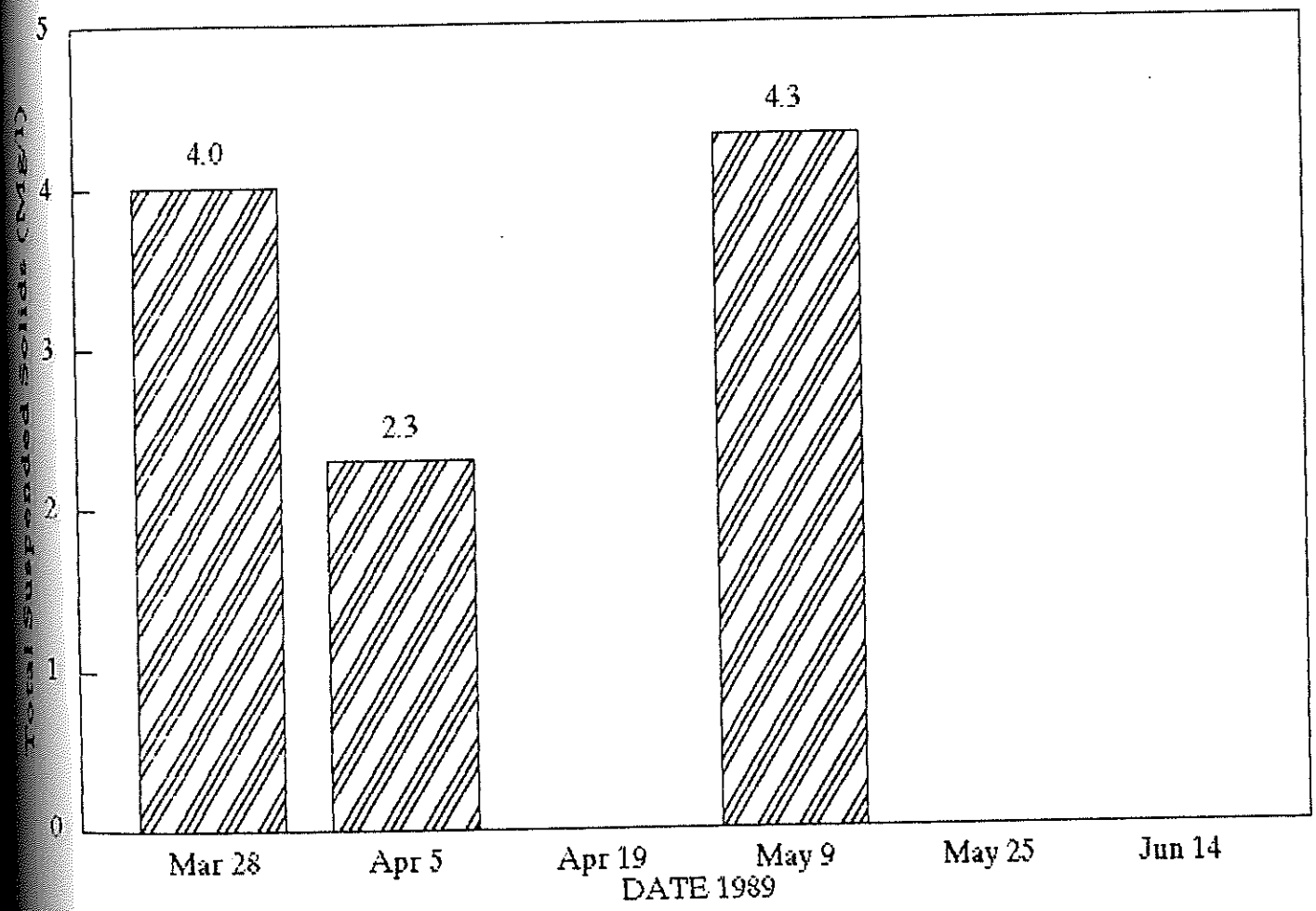
EAST SHORE DRIVE

TOTAL SUSPENDED SOLIDS



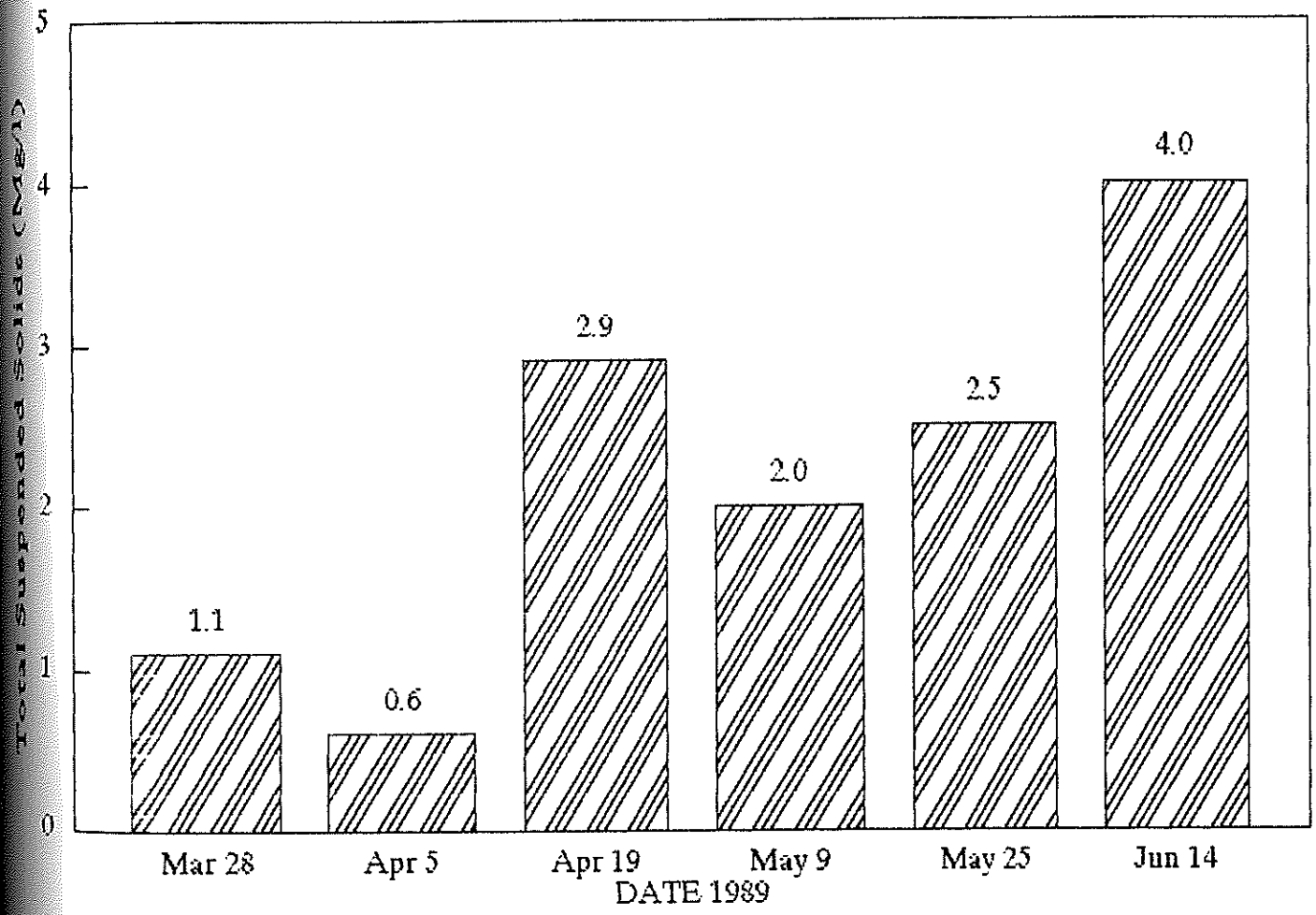
SUCKER CREEK

TOTAL SUSPENDED SOLIDS



DETROIT LAKE OUTLET

TOTAL SUSPENDED SOLIDS



SECTION 6 INDEX

STREAM SAMPLING 1988

DESCRIPTION	PAGE
A. Stream Sampling - P_T and TSS	

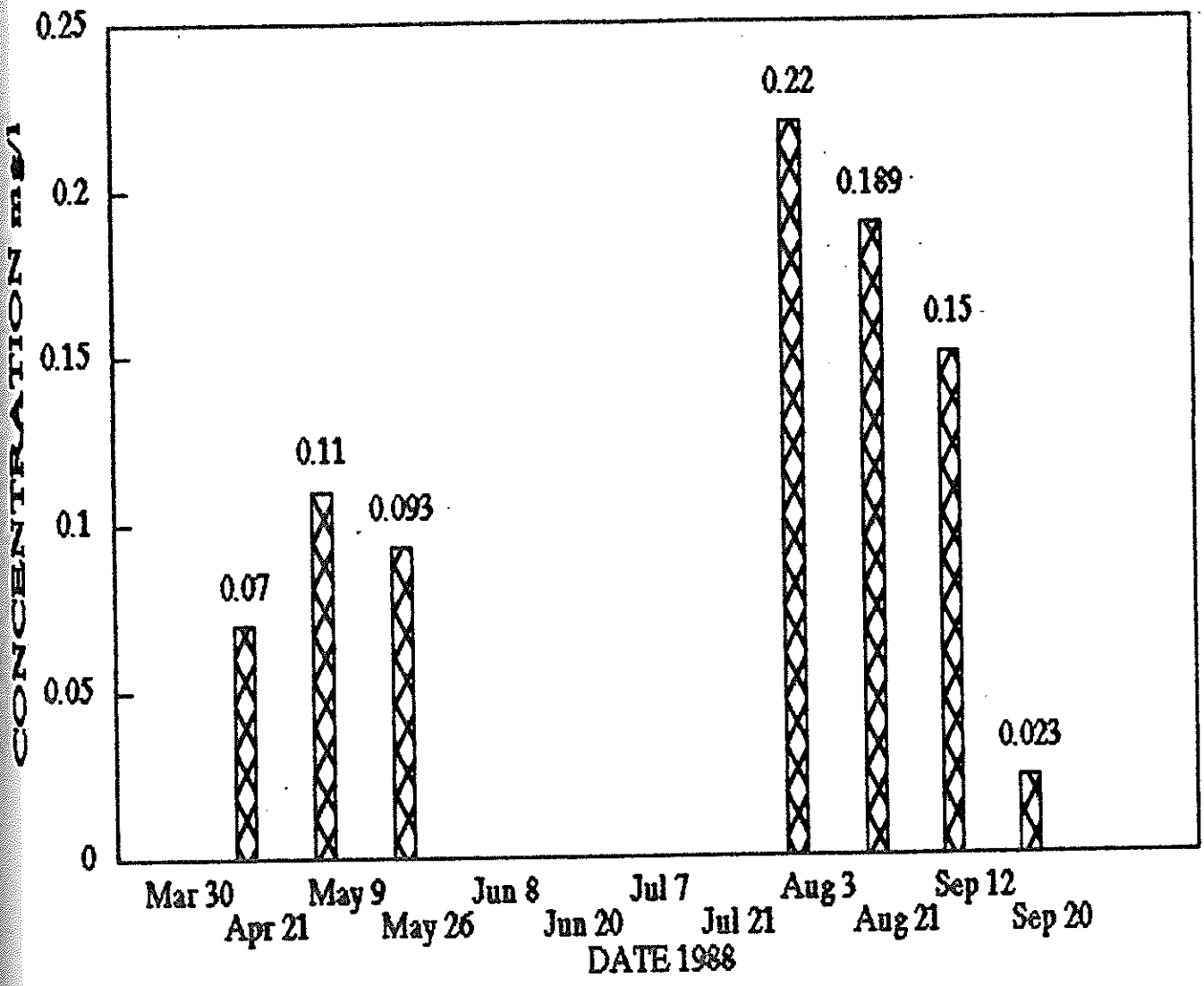
PELICAN RIVER WATERSHED

1989 STREAM SAMPLING RESULTS

	3/28/89	4/05/89	4/11/89	4/19/89	5/09/89	5/25/89	6/14/89
Phosphorus							
C-1 St. Clair Outlet	0.205	0.160			0.043		
C-2 St. Clair Inlet E. Ditch	0.092	0.145			0.079		
C-3 St. Clair Inlet N. Ditch							
L-1 Long Lake Outlet	0.015				0.010		
P-1 Pelican River and Highway No. 34	0.097	0.200			0.024	0.034	0.035
F-1 Floyd Lake Outlet					0.010		0.011
F-2 Campell Creek	0.490	0.475	0.161	0.062	0.020		
Total Suspended Solids							
C-1 St. Clair Outlet	4.8	5.5			6.8		
C-2 St. Clair Inlet E. Ditch	6.4	3.8			6.7		
C-3 St. Clair Inlet N. Ditch							
L-1 Long Lake Outlet	1.6				2.6		
P-1 Pelican River and Highway No. 34	8.9	33.2			4.7	4.8	5.6
F-1 Floyd Lake Outlet			100.6	38.3	1.4		2.7
F-2 Campell Creek	15.7	70.3			11.5		

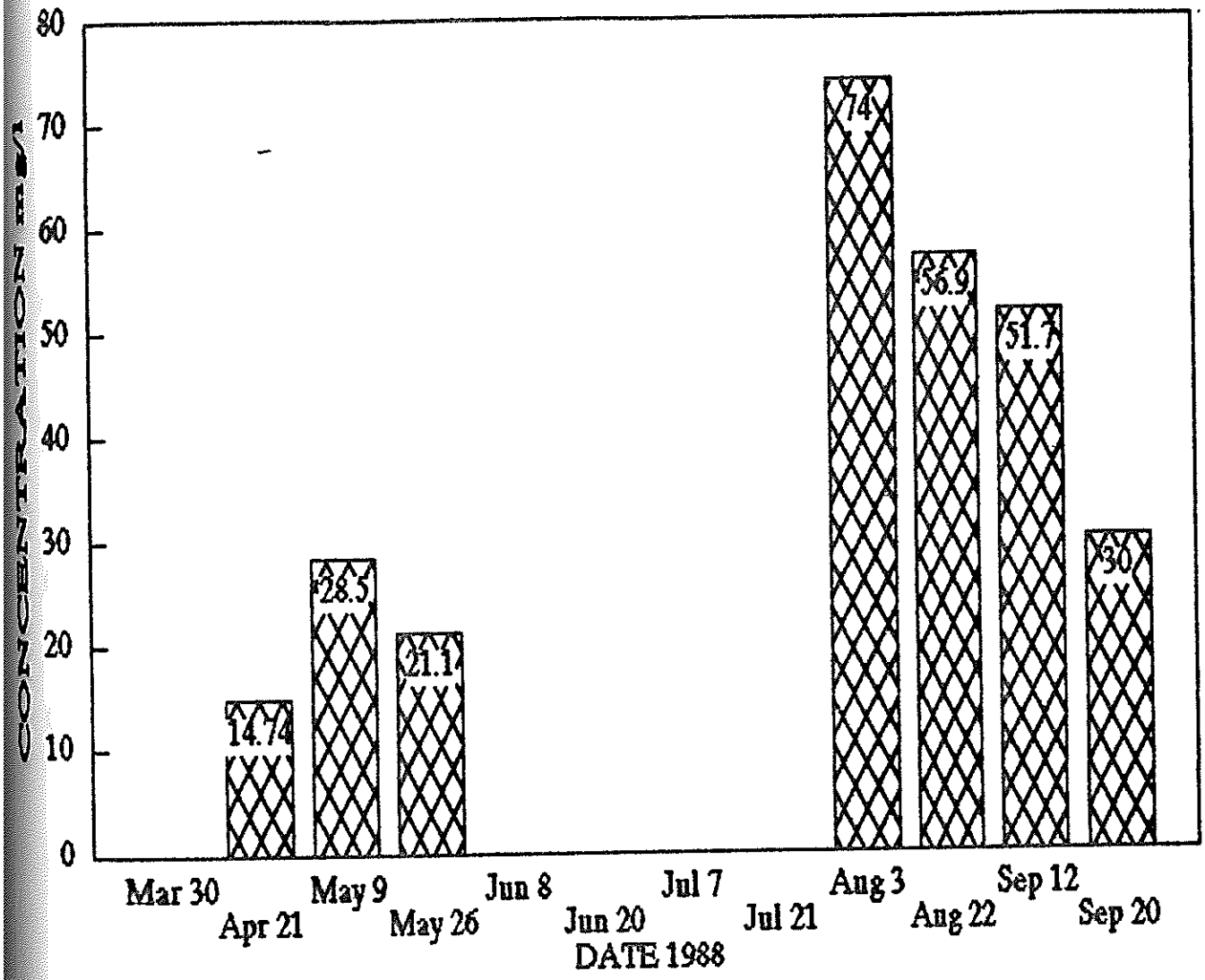
LAKE ST.CLAIR OUTLET

PHOSPHORUS



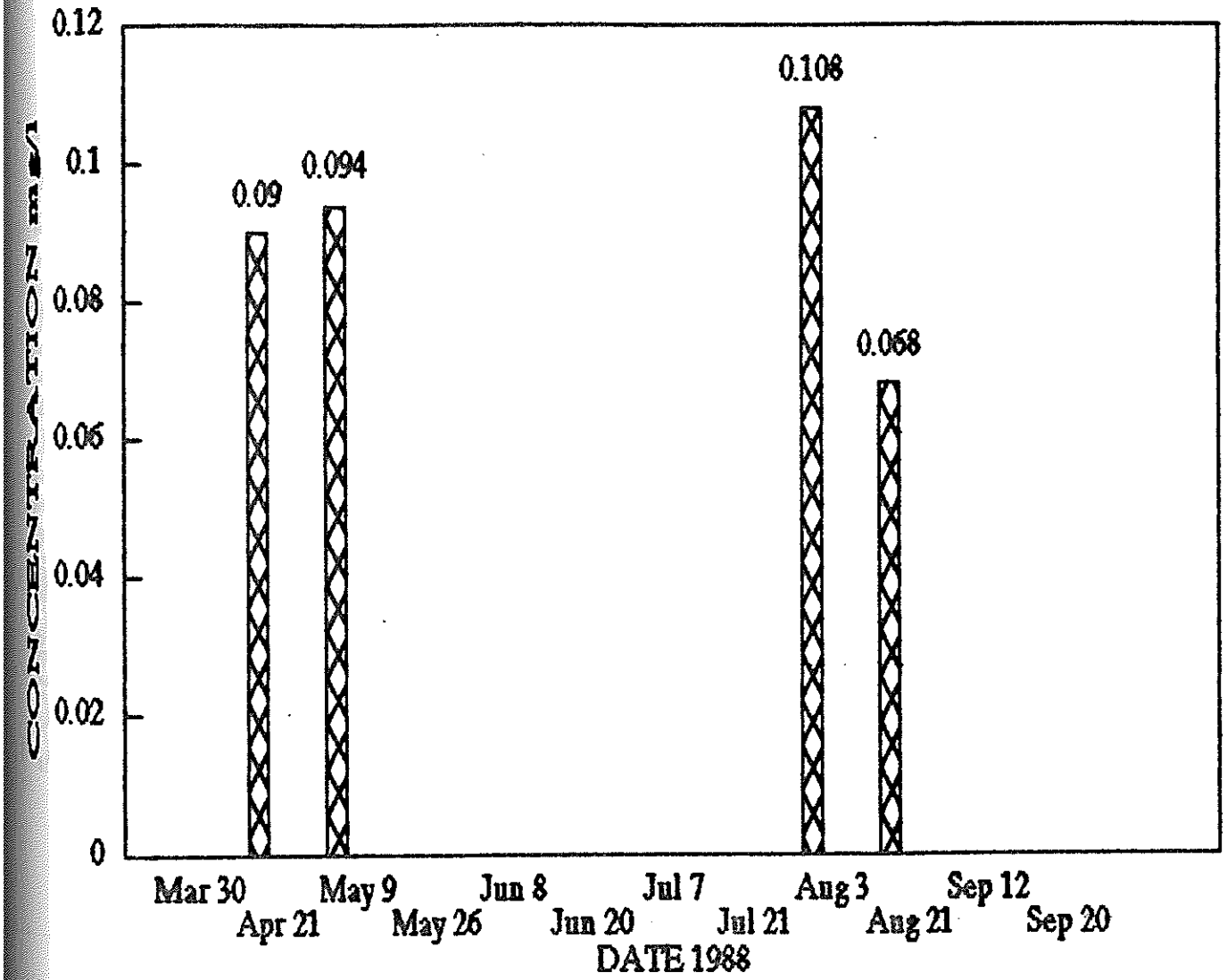
LAKE ST. CLAIR OUTLET

TOTAL SUSPENDED SOLIDS



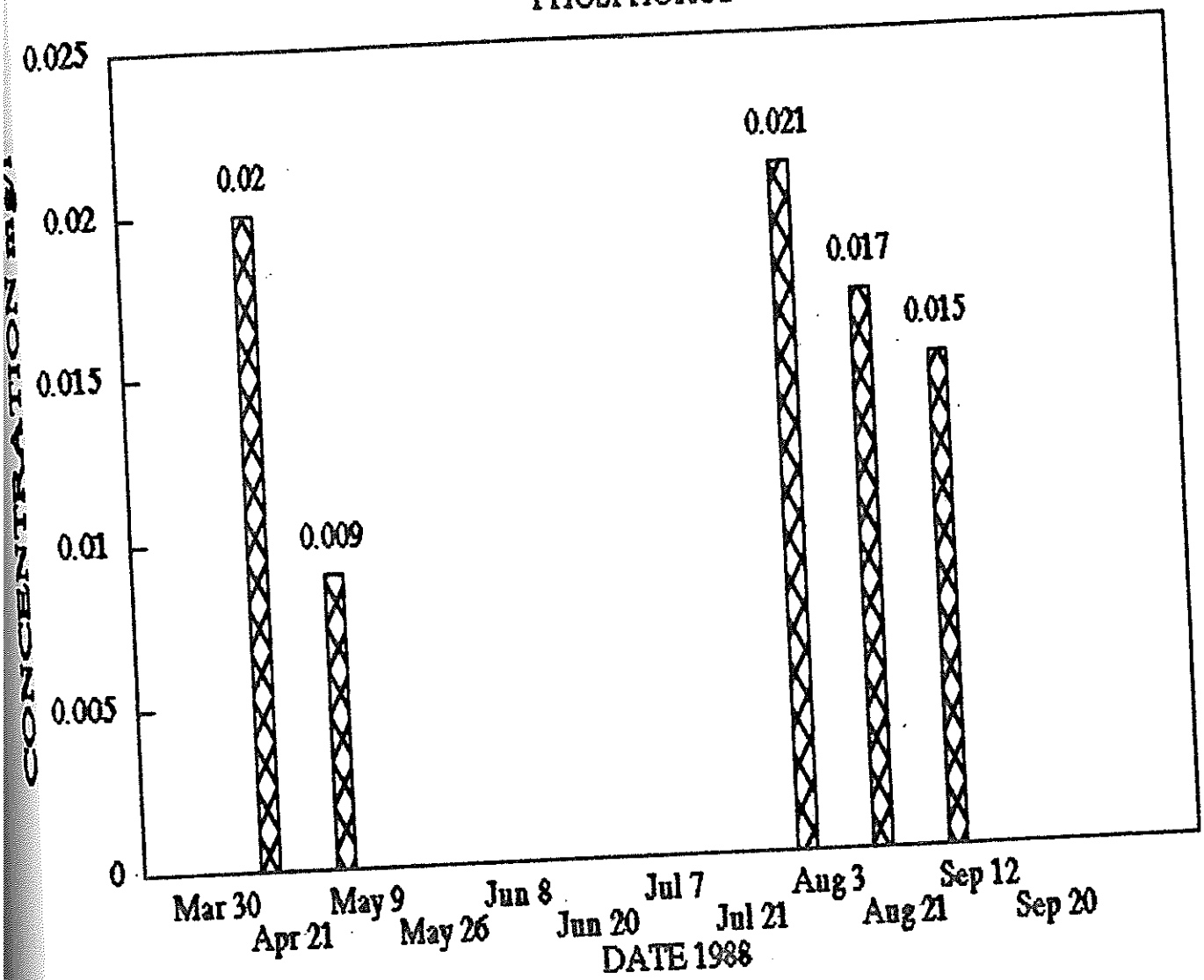
LAKE ST.CLAIR INLET – DITCH

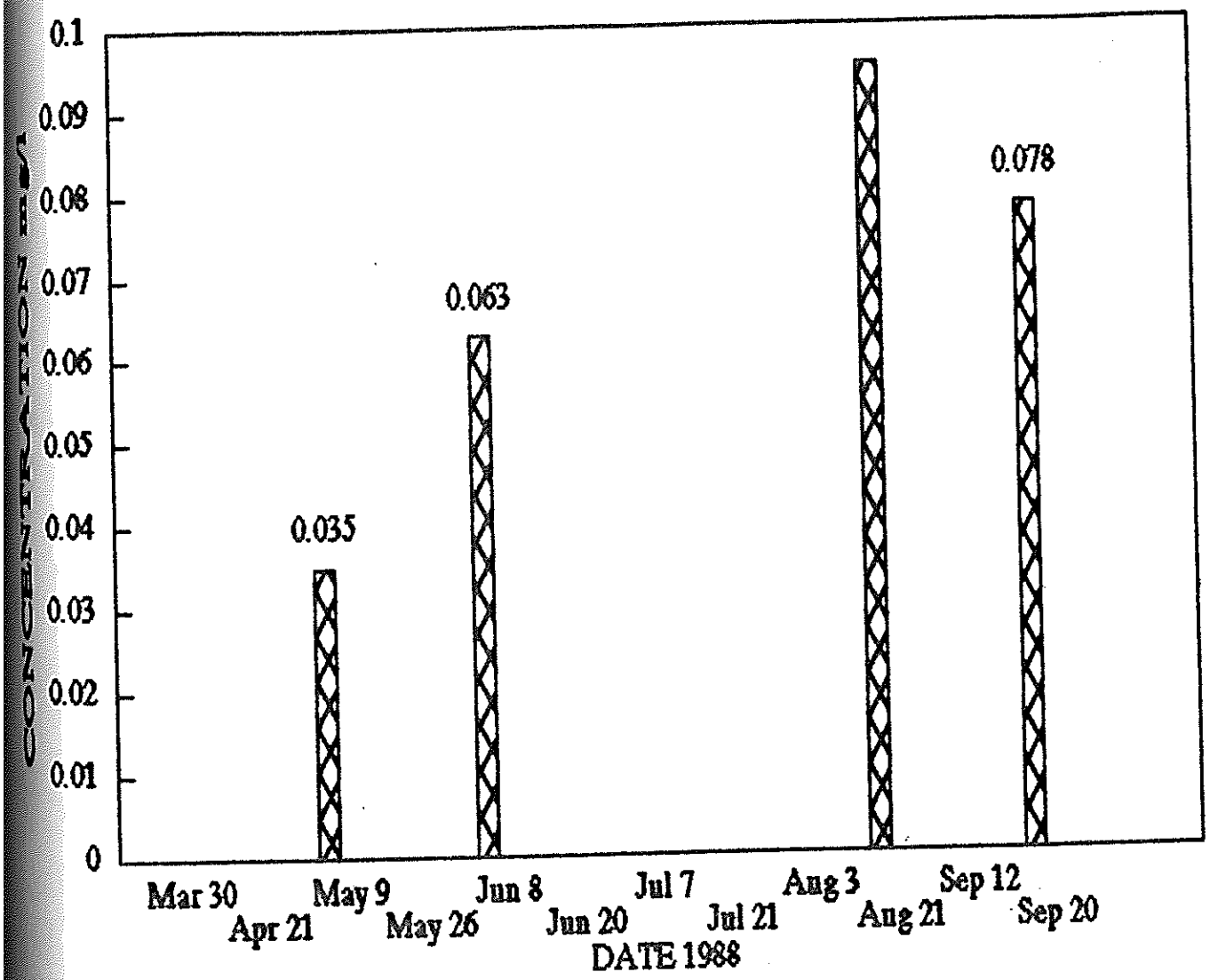
PHOSPHORUS



LONG LAKE OUTLET

PHOSPHORUS



PELICAN RIVER – HWY NO.34

PHOSPHORUS