

B746

Ministerie van Verkeer en Waterstaat

Directoraat-Generaal Rijkswaterstaat

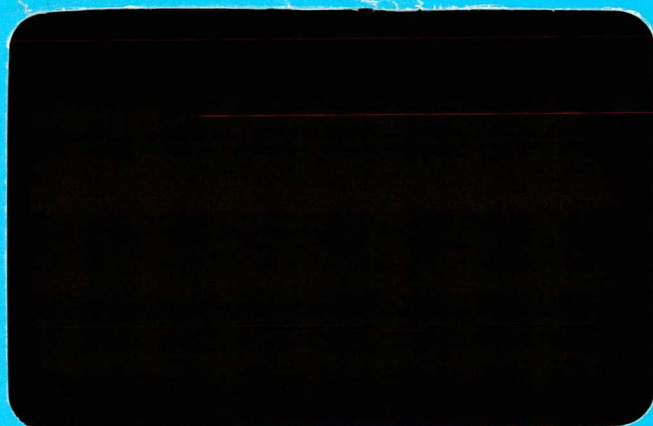
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Nummer:

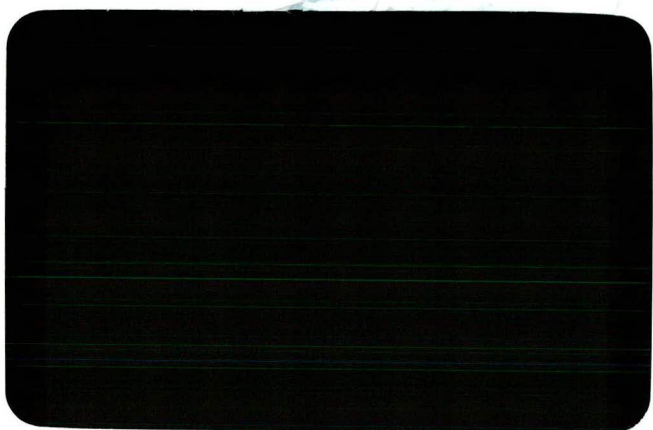
K646 *bylagen*



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deltadienst
hoofdafdeling
milieu en inrichting



rijkswaterstaat

deltadienst

nota DDMI-81.03 bijlagen

titel :

auteur(s) : ir. J.A.C. Derks (T.H. Twente)

datum : maart 1981

bijlagen : Bijlagen behorende bij

samenvatting : Het effect van stikstofbelasting en sediment op de eutrofiëring van het Grevelingenmeer, gesimuleerd in vier ondiepe reservoirs.

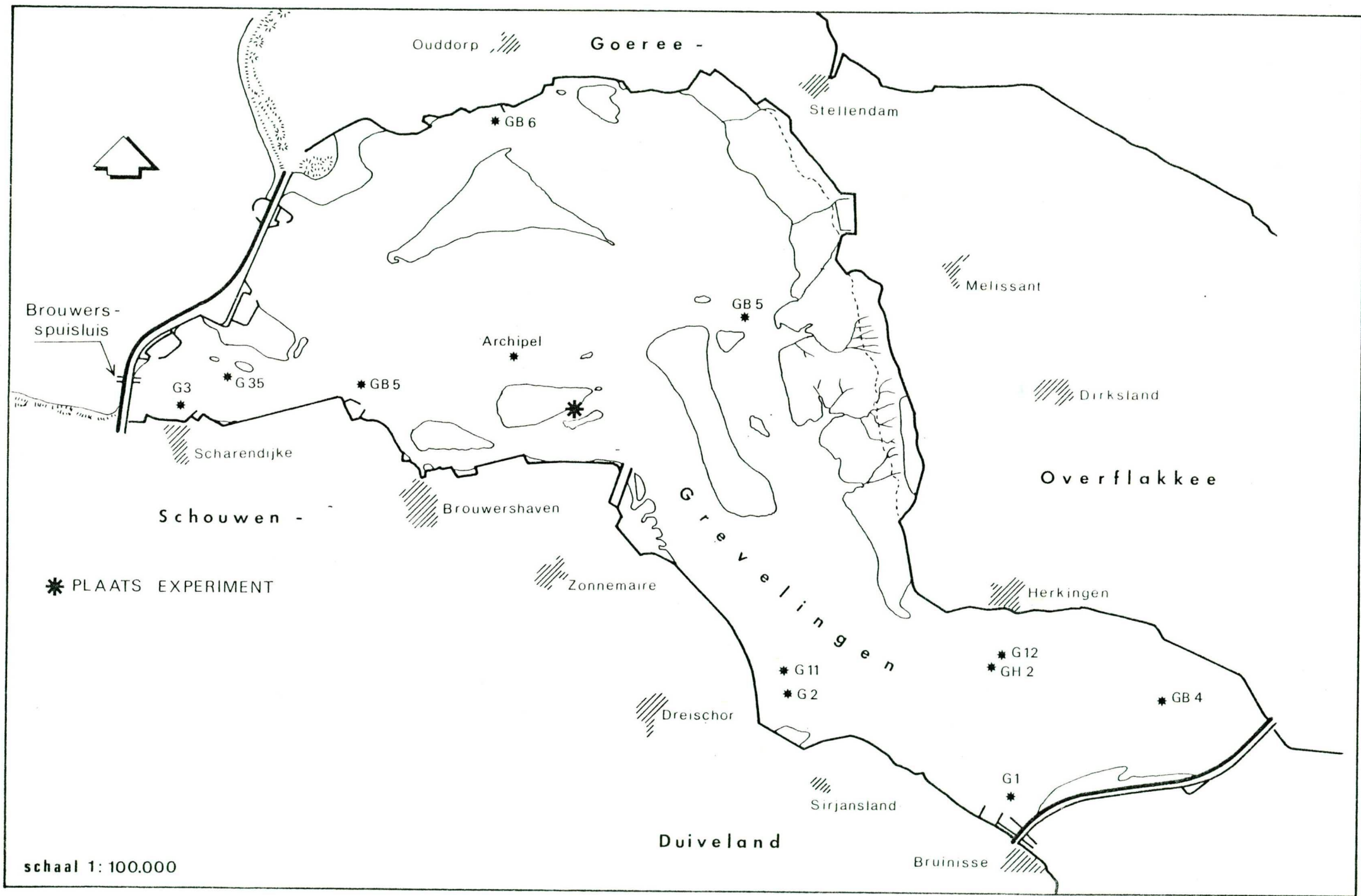




Overzicht bijlagen.

1. Overzichtskaart van het Grevelingenmeer
2. Oppervlakte-diepte relatie Grevelingenmeer
3. Overzichtsheets van het experiment
4. Beschrijving gemeten parameters
5. Verloop van de watertemperatuur als functie van de tijd
6. Verloop van de chlorideconcentratie als functie van de tijd
7. Verloop van de chlorofylconcentratie als functie van de tijd
8. Verloop van de pH als functie van de tijd
9. Verloop van de zuurstofconcentratie als functie van de tijd
10. Verloop van de zwev. stofconcentratie als functie van de tijd
11. Verloop van de opgelost SiO_2 concentratie als functie van de tijd
12. Verloop van de N-NH_4 concentratie als functie van de tijd
13. Verloop van de $\text{N-NO}_3/\text{NO}_2$ concentratie als functie van de tijd
14. Verloop van de N-ang concentratie als functie van de tijd
15. Verloop van de N totaal concentratie als functie van de tijd
16. Verloop van de N organisch concentratie als functie van de tijd
17. Verloop van de N particulier concentratie als functie van de tijd
18. Verloop van de P-PO_4 concentratie als functie van de tijd
19. Verloop van de P totaal concentratie als functie van de tijd
20. Verloop van de P organisch concentratie als functie van de tijd
21. Verloop van de P particulier concentratie als functie van de tijd
22. Verloop van de C particulier concentratie als functie van de tijd
23. Verloop van de DOC concentratie als functie van de tijd
24. Verloop van de feofytine concentratie als functie van de tijd
25. Resultaten interstitieel wateronderzoek
26. Berekening hoeveelheid bodemmateriaal
27. Neerslag en verdamping tijdens experiment
28. Berekening van de reservoir volumina
- 29 t/m 32. Berekende en gemeten chlorideverlopen
- 33 t/m 38. (Bron/put) resttermen massabalans
39. Vergelijking puttermen totaalstikstofbalans met de toegevoegde hoeveelheid stikstof
40. Berekening fouten in de massabalanstermen
41. Correlaties tussen particulaire nutriënten en chlorofyl

- 42. Correlaties tussen particulaire nutriënten, chlorofyl en feofytine
- 43 t/m 48. Nutriëntverhoudingen
- 49. Produktieparameters
- 50. Dagproduktie als functie van de tijd
- 51. Schema nutriëntenhuishouding
- 52. Zuurstofverbruik en mineralisatie in de waterfase
- 53. Zoöplanktonconcentratie.

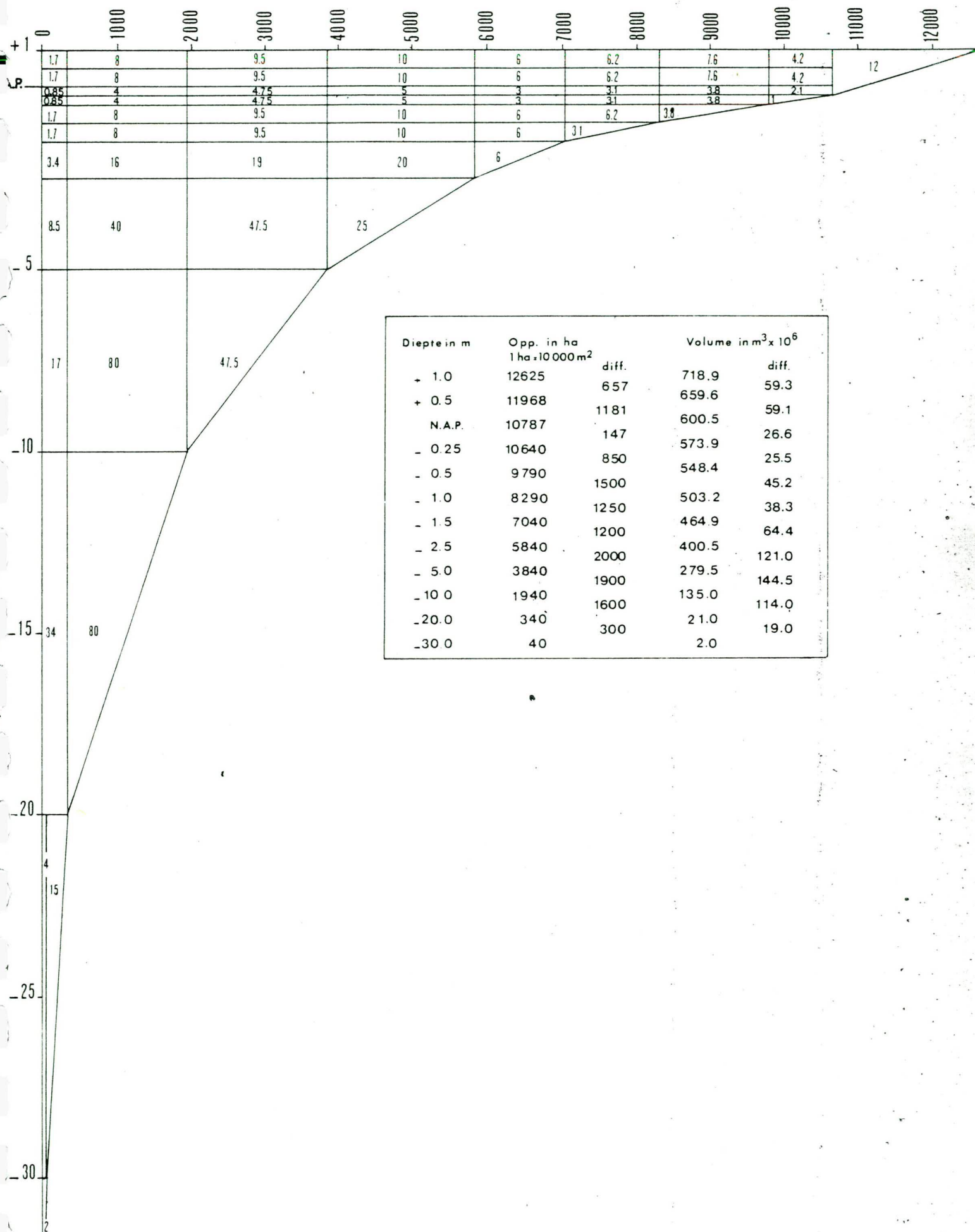


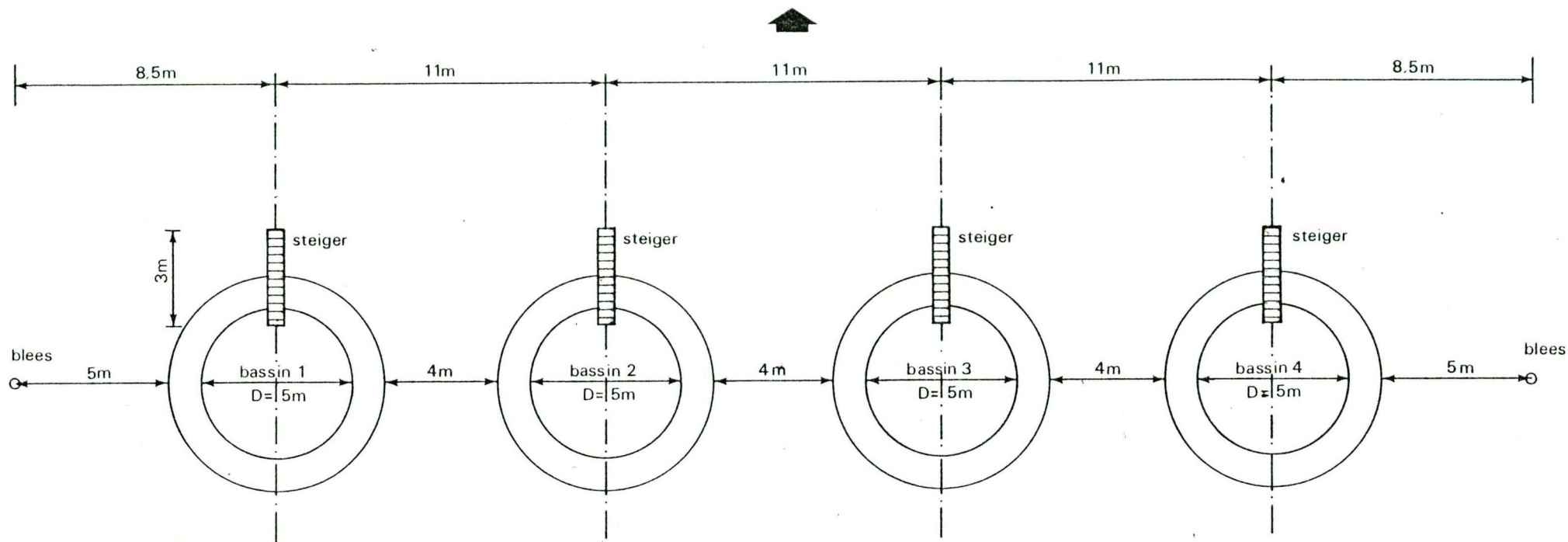


GREVELINGEN MEER

Volumes in $m^3 \times 10^6$

Oppervlakte in ha.





SITUATIE BASSINS STAMPERSPLAAT

rijkswaterstaat - deltadienst
 hoofdafdeling milieu en inrichting
 postbus 439 tel 0160-11851 4330 ak middelburg

get.: CR
 gez.:
 akk.:
 nots.:
 bijlage: 3

schaal:
 formaat: A1
 code:
 tek. nr.:



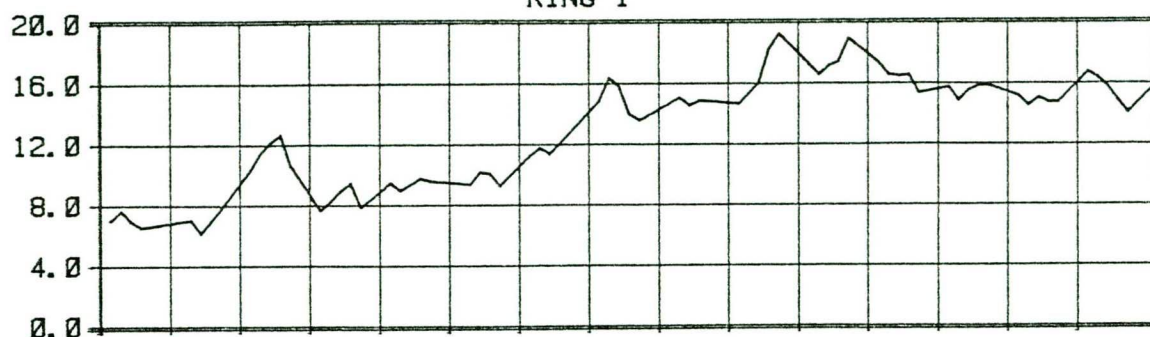
Beschrijving gemeten parameters.

Gemeten parameter	symbool	geschatte fout	eenheid
parameters gemeten op elke werkdag:			
temperatuur	T	0.05	$^{\circ}\text{C}$
Zuurgraad	pH	0.05	
Ammoniak	N-NH_4	0.01	p.p.m.N
Nitraat/nitriet	$\text{N-NO}_3/\text{NO}_4$	0.01	p.p.m.N
Totaal stikstof	N tot	0.02	p.p.m.N
Totaal stikstof na filtr.	NtotF	0.02	p.p.m.N
Orthofosfaat	P-O-PO_4	0.005	p.p.m.P
Totaal fosfaat	Ptot	0.01	p.p.m.P
Totaal fosfaat na filtr.	PtotF	0.01	p.p.m.P
Opgelost SiO_2	Si-SiO_2	0.02	p.p.m.Si
Chloride	cl^-	0.5%	p.p.m.
Zwevend stof	Zw.stof	13%	p.p.m.
Particulair koostof	Cpart	17%	p.p.m.
Opgelost organisch koolst.	D.O.C.	0.01	p.p.m.
Chlorofyl-a	chl-a	13%	p.p.m.
Totaal pigment	Tot.pigm	13%	p.p.m.
Zuurstof	O_2	0.05	p.p.m.
Wekelijks:			
Extinctiecoëfficiënt	ke		m^{-1}
Productie	p.p.		$\text{mgO}_2/\text{m}^2\text{dag}$
Zoöplanktonconcentratie	Z		mgC/l.
+ 2x per week:			
Zuurstofverbruik	$\text{O}_2\text{.verbr.}$		$\text{mgO}_2/\text{m}^2\text{uur.}$

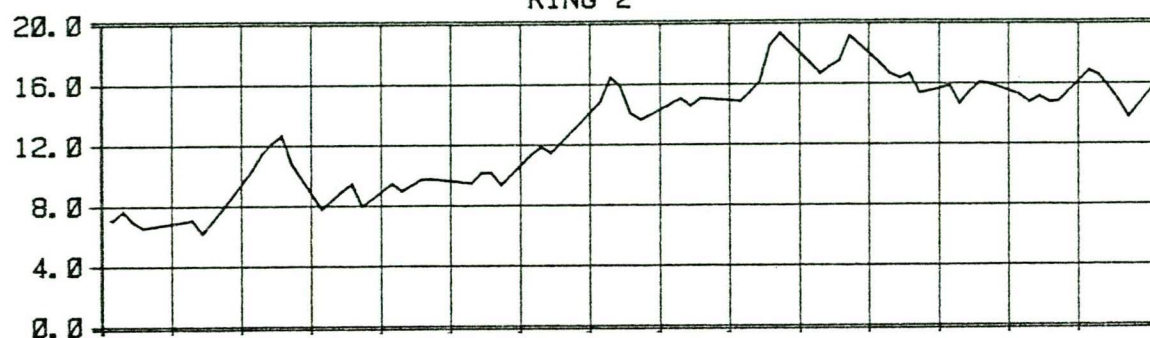
GREVELINGEN 1980

Temperatuur in gr.C

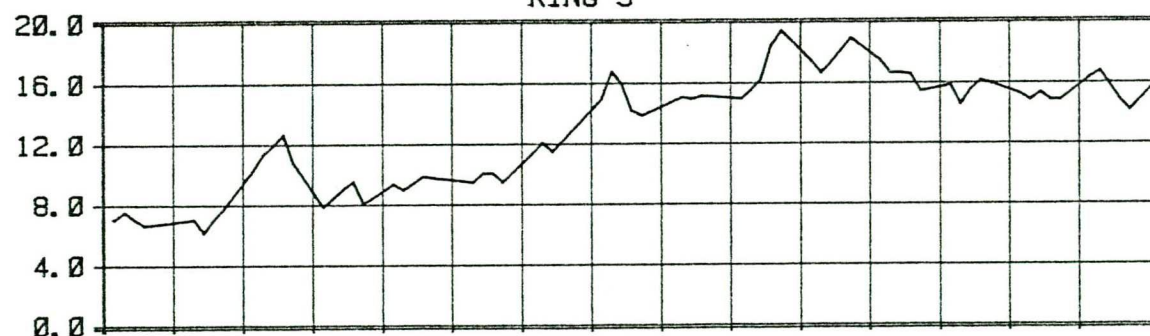
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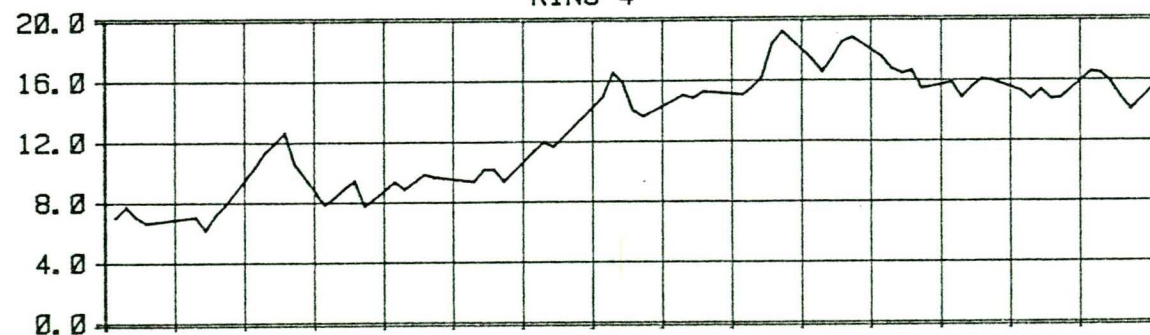
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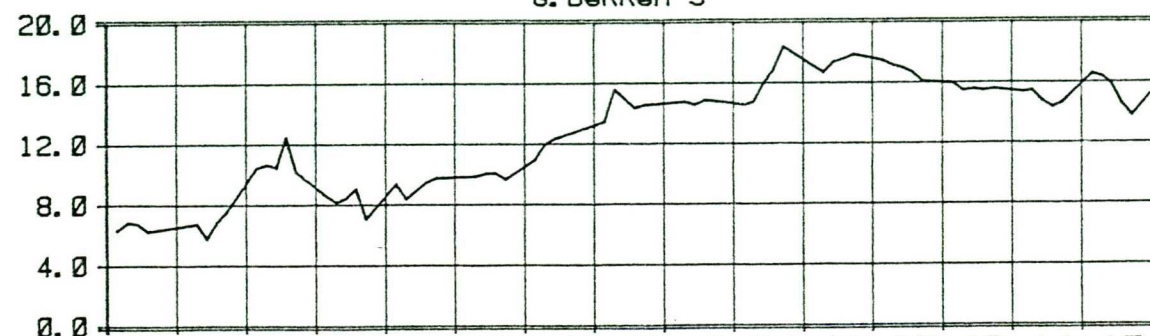
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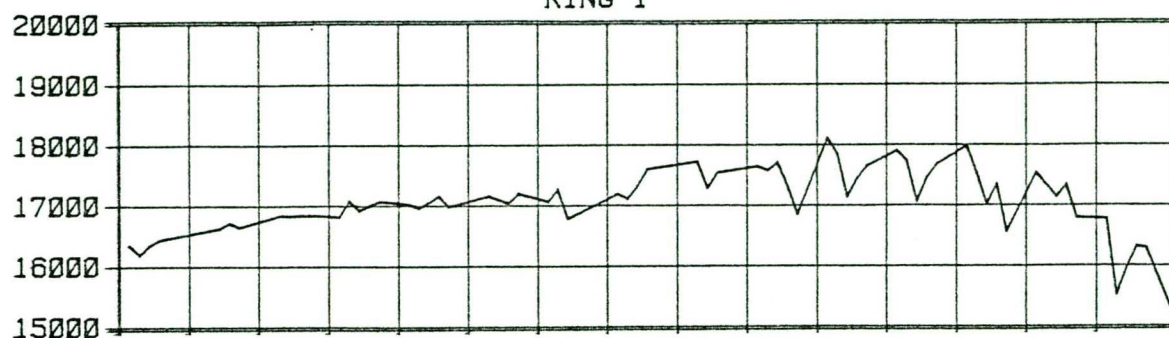


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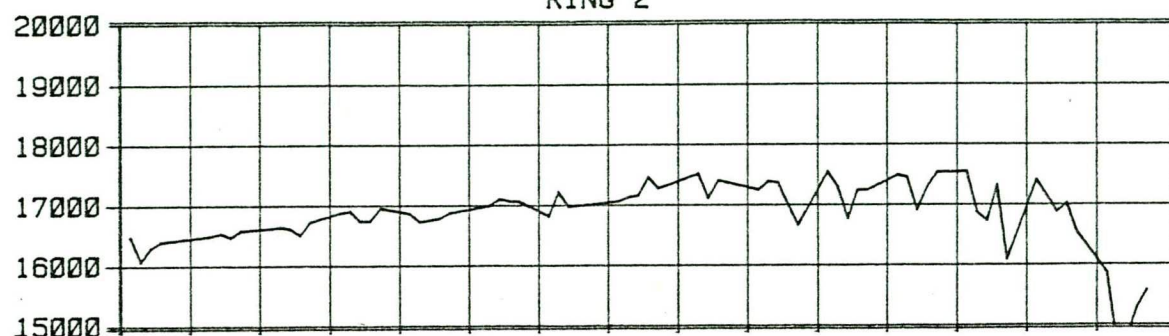


GREVELINGEN 1980 Chloride in ppm

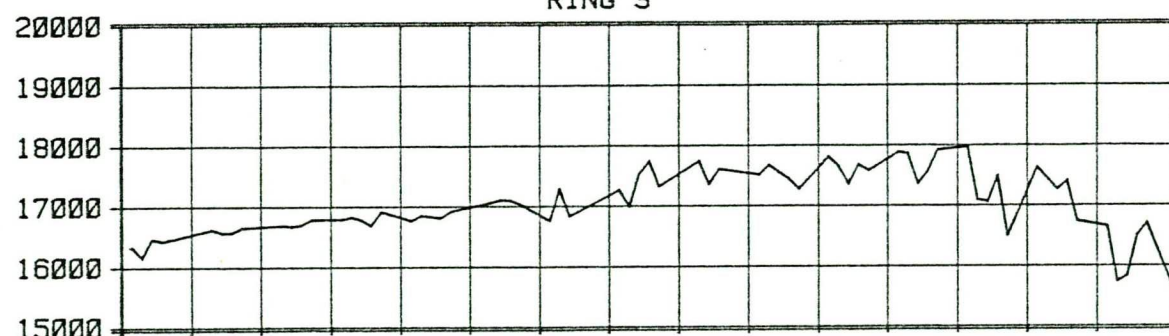
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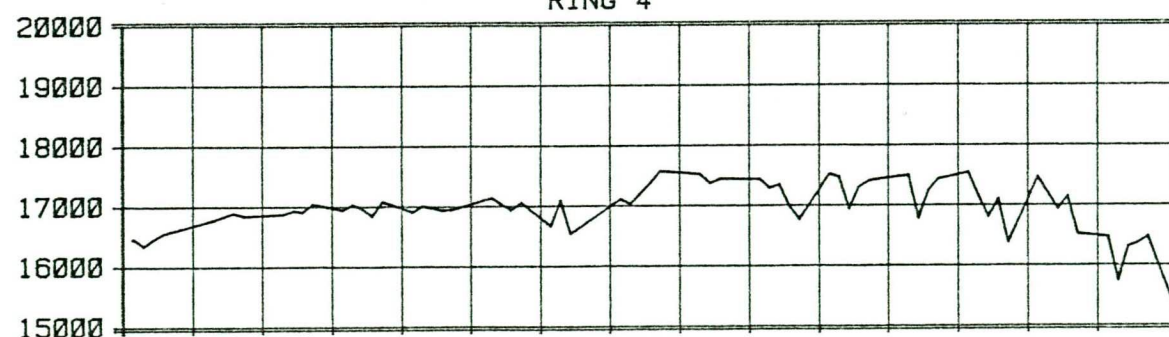
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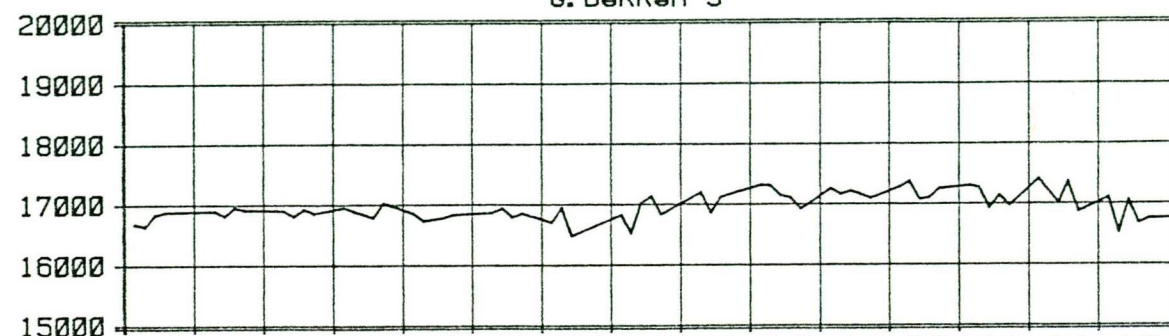
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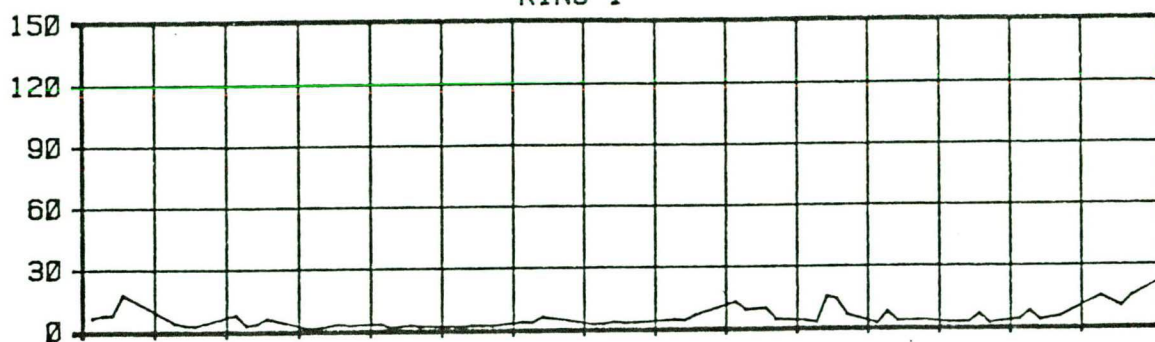


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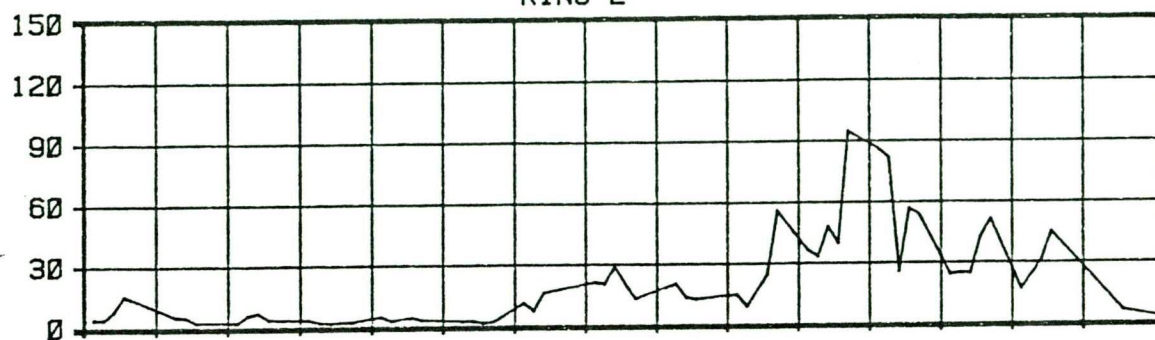


GREVELINGEN 1980 Chlorofyl in ppb

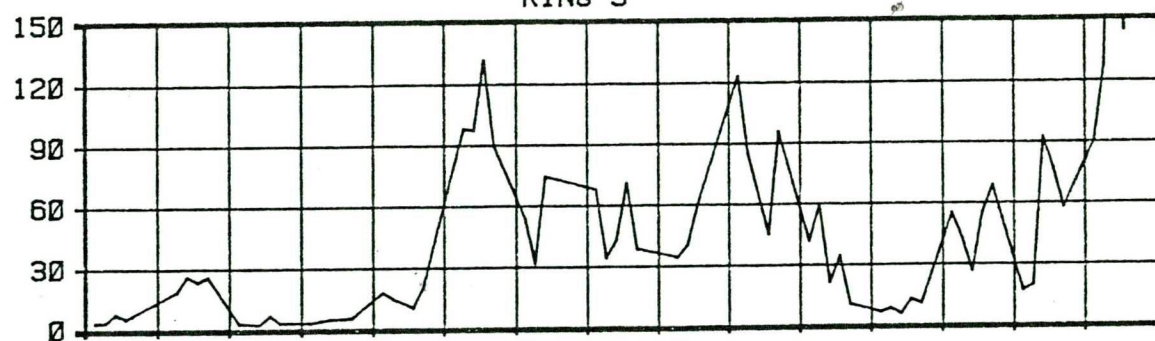
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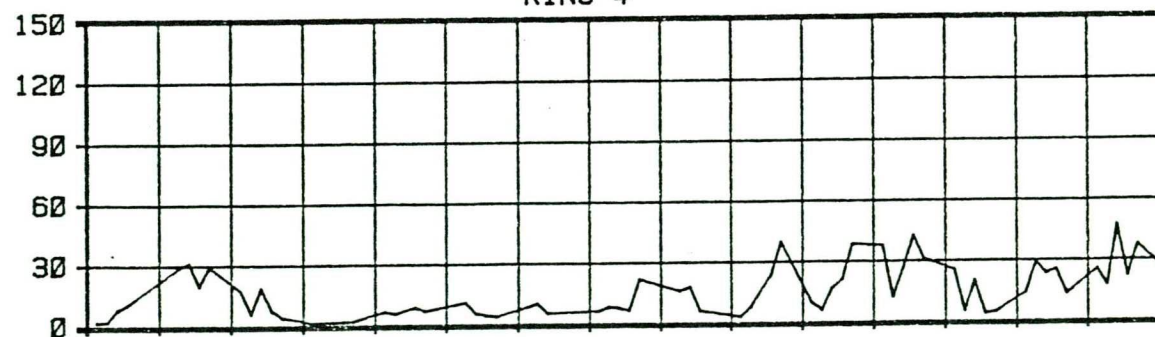
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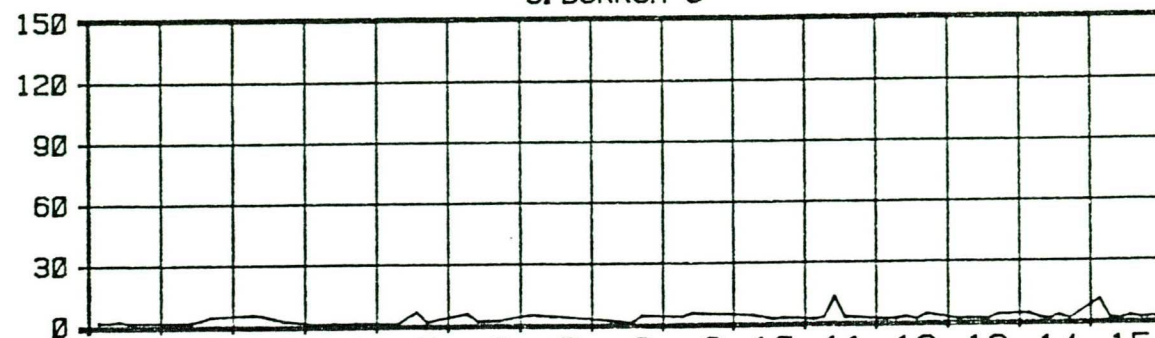
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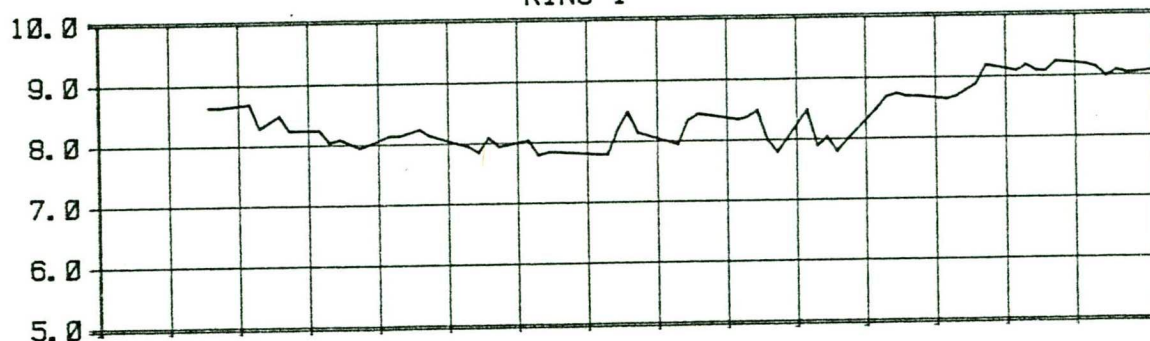


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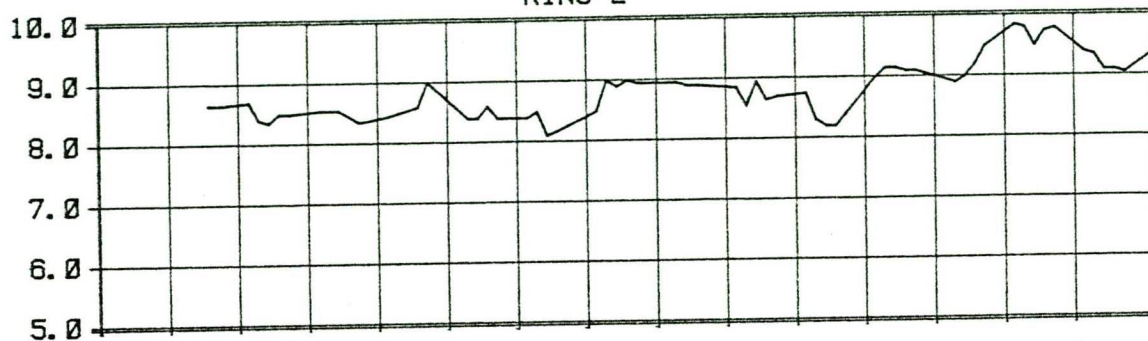
14/7

GREVELINGEN 1980 p.H. in s.e.

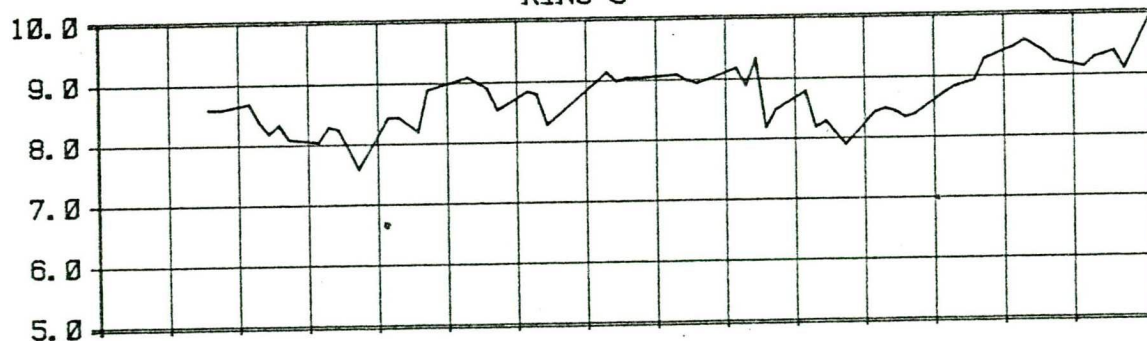
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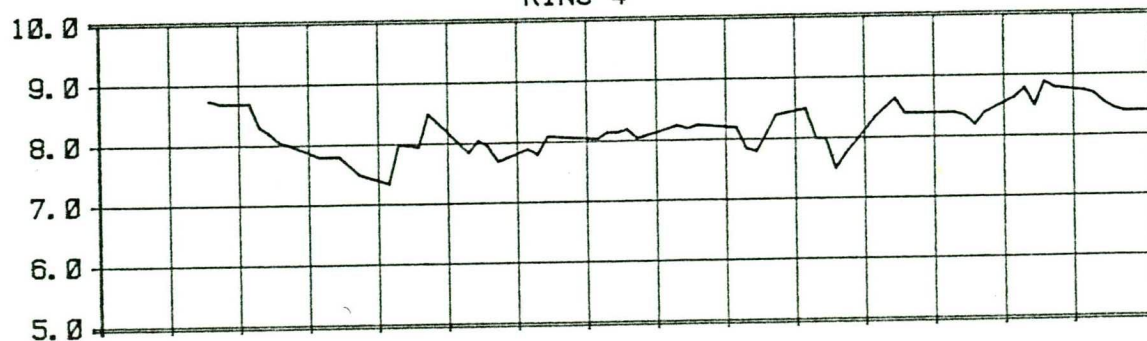
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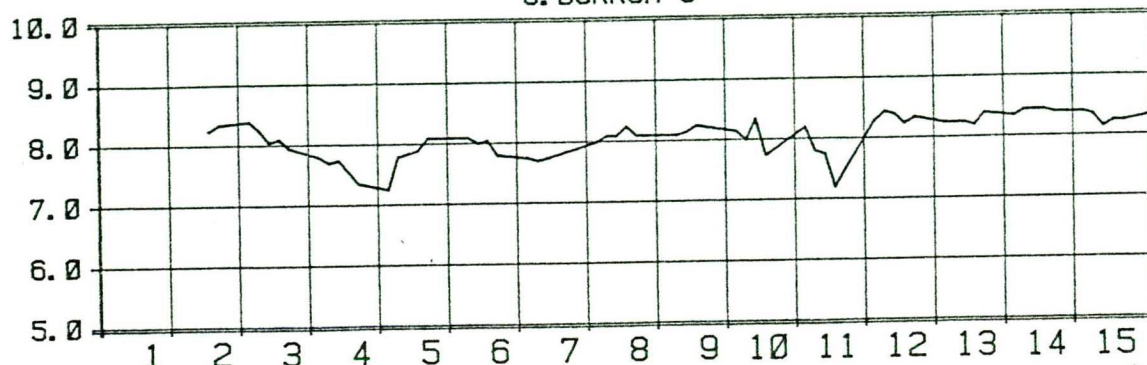
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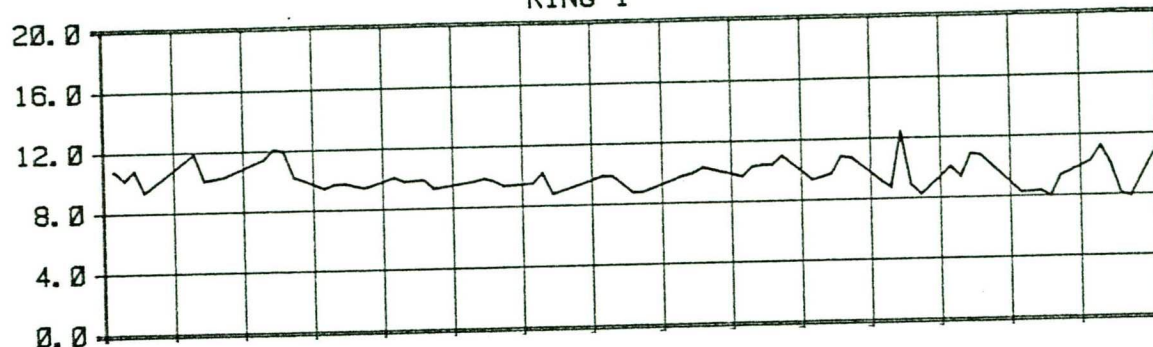


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GREVELINGEN 1980 Zuurstof in mg/l

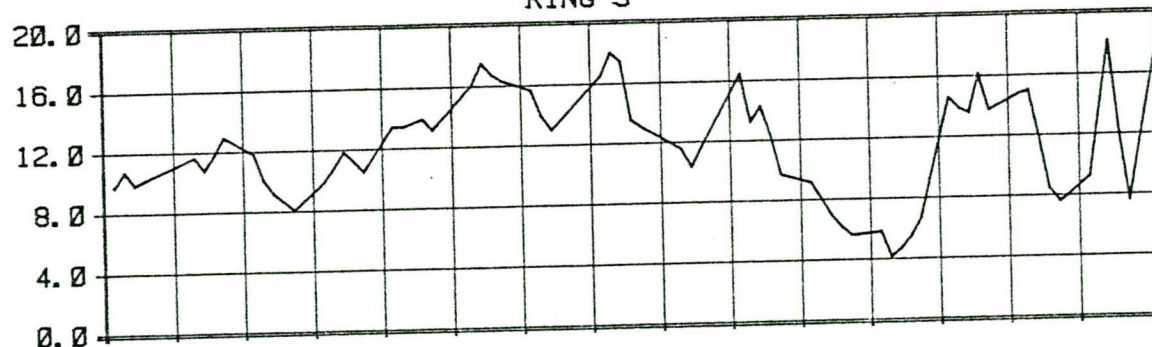
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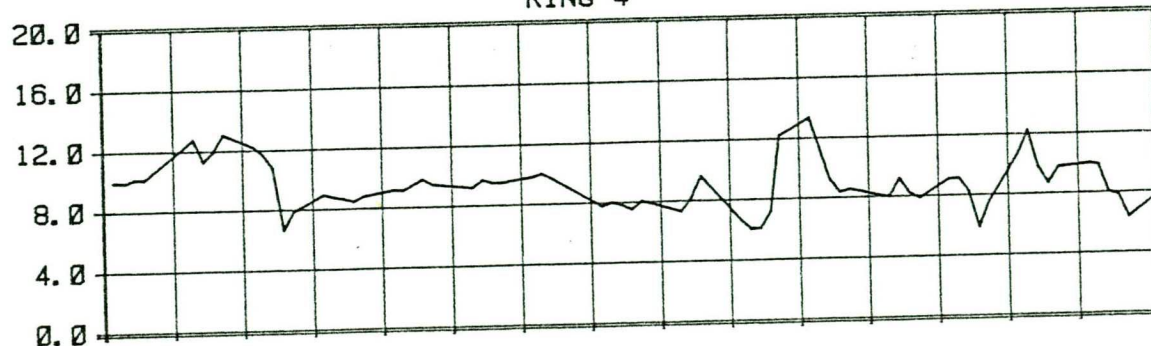
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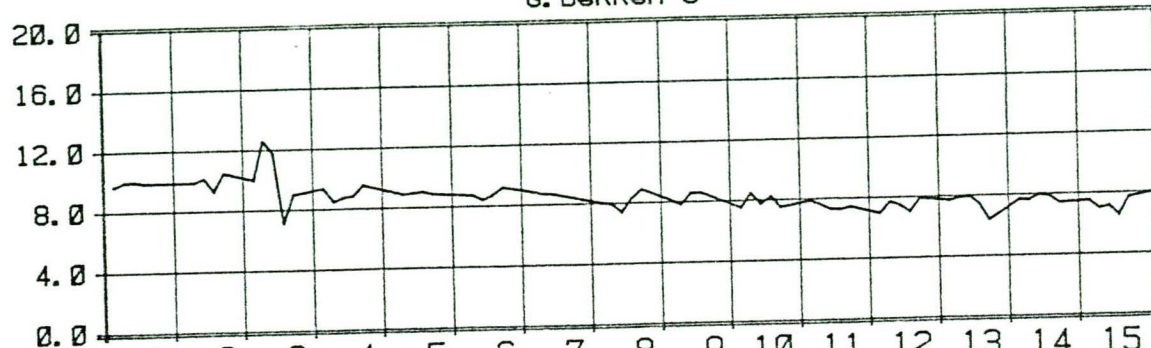
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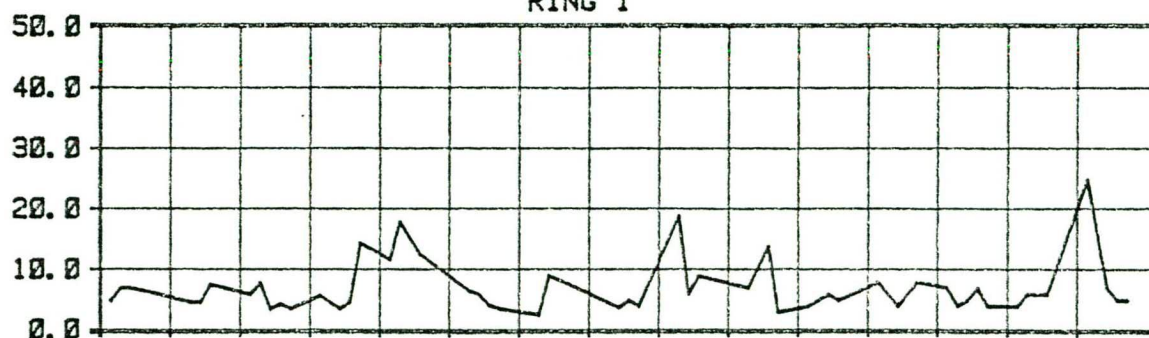


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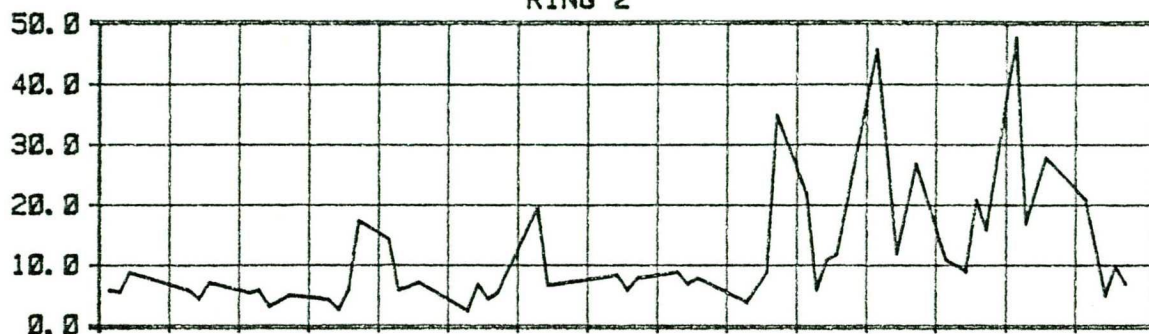


GREVELINGEN 1980 Zwevende stof in ppm

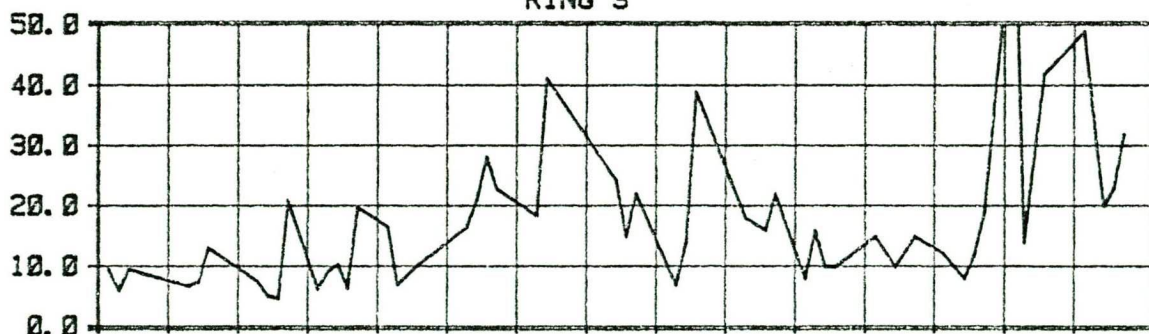
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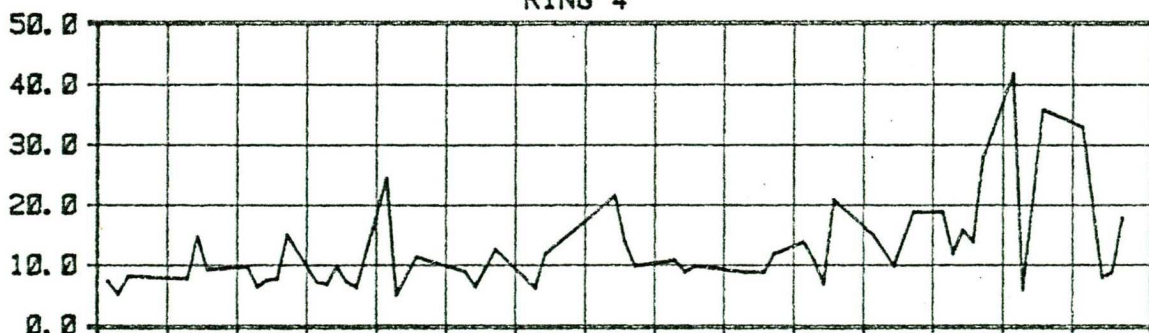
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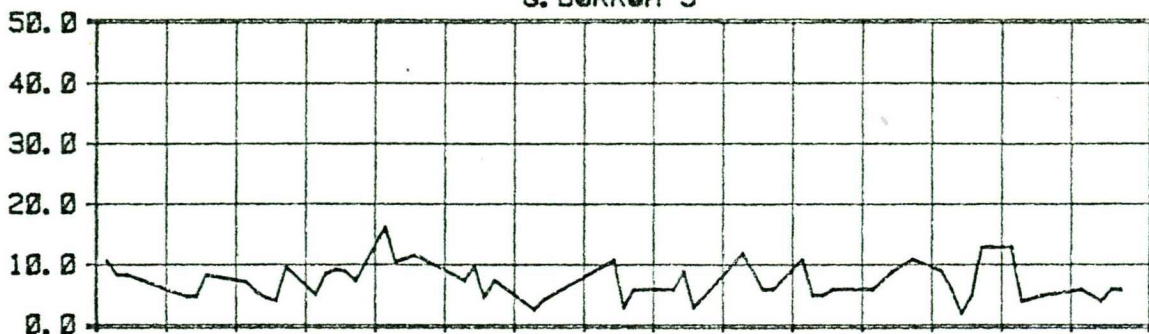
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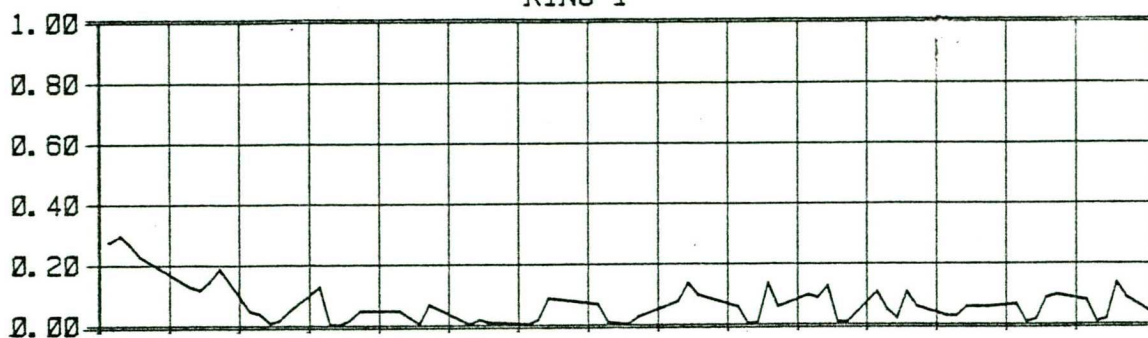


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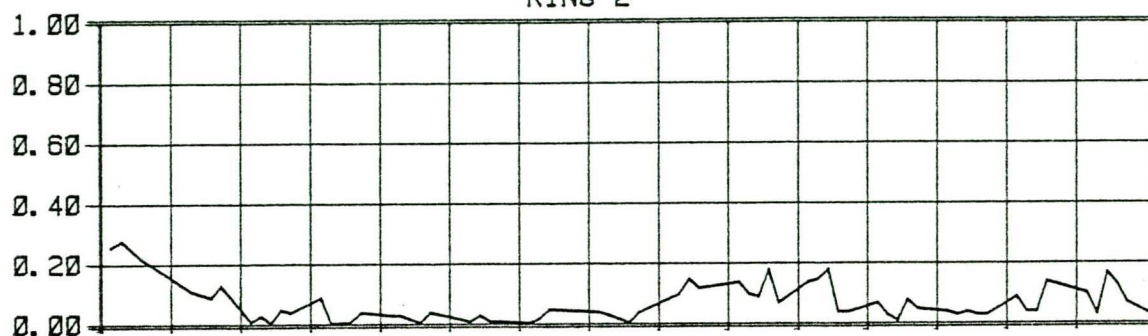
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GREVELINGEN 1980 SiO₂ in ppm

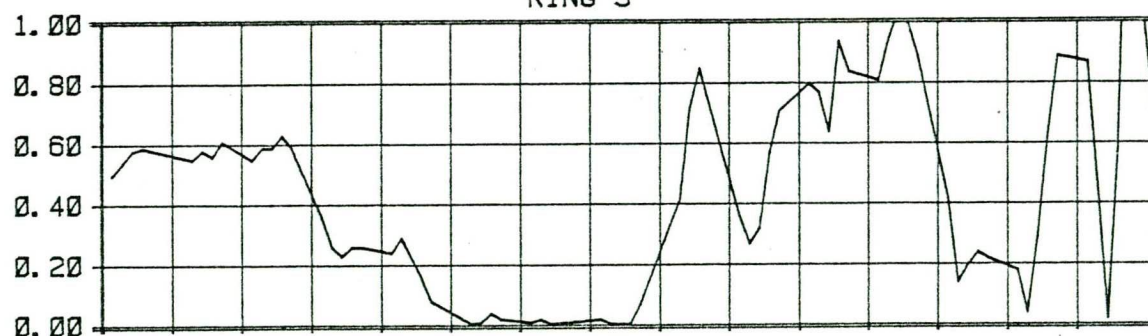
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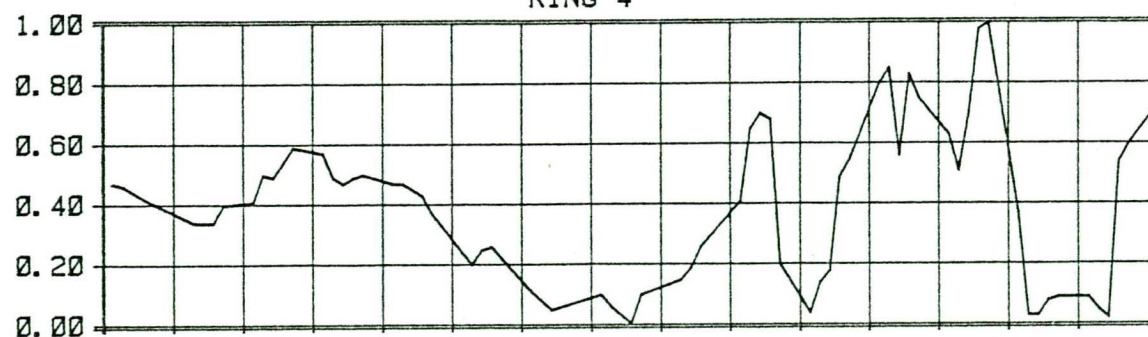
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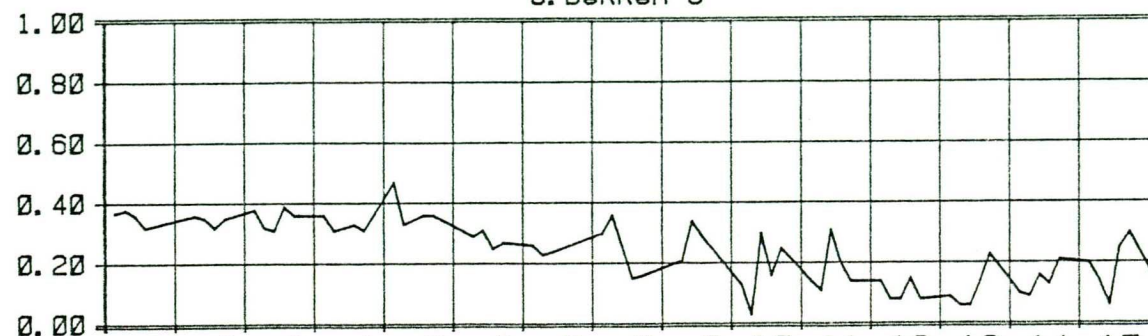
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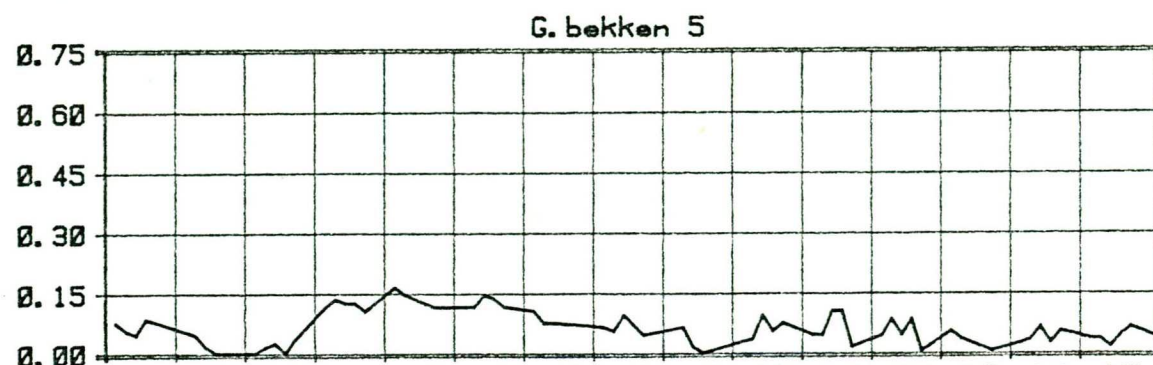
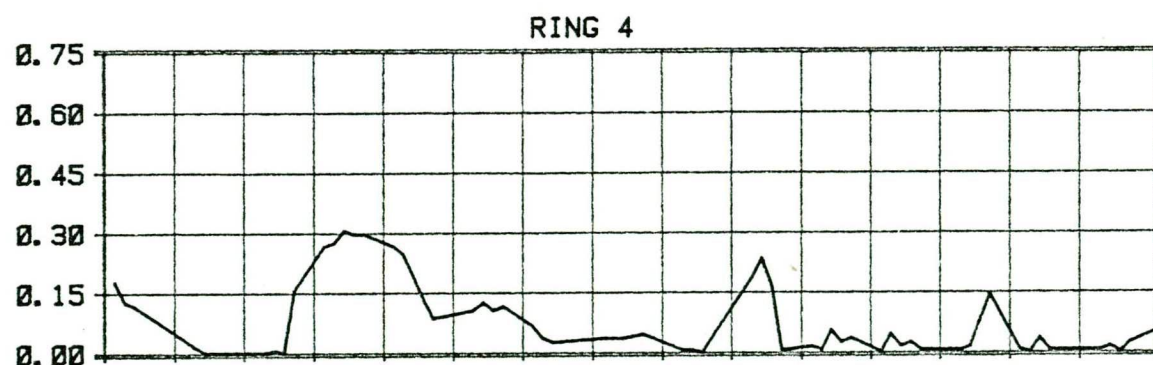
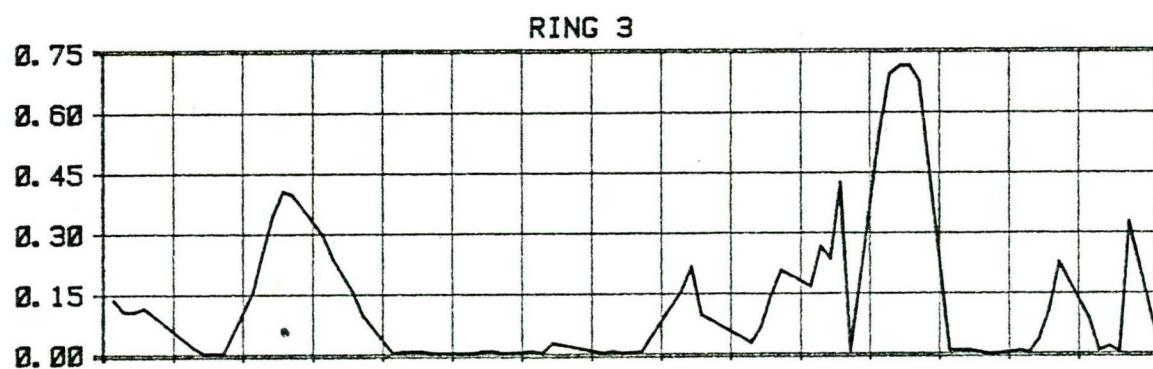
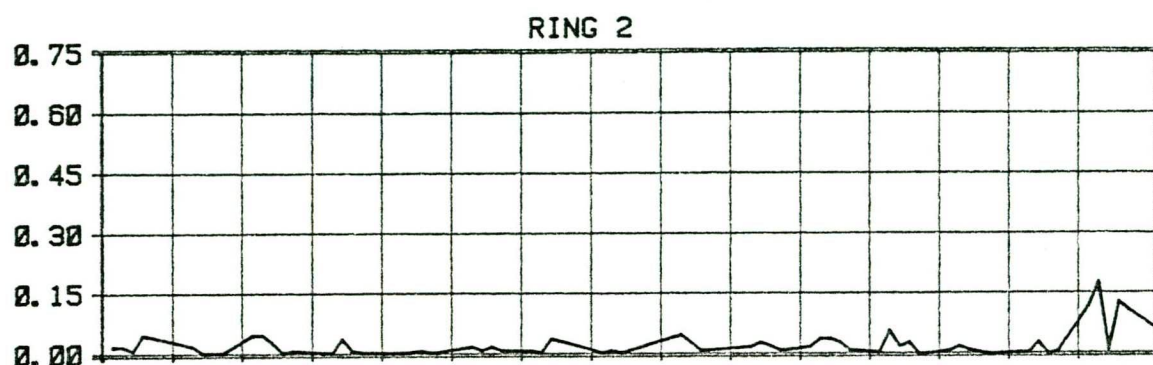
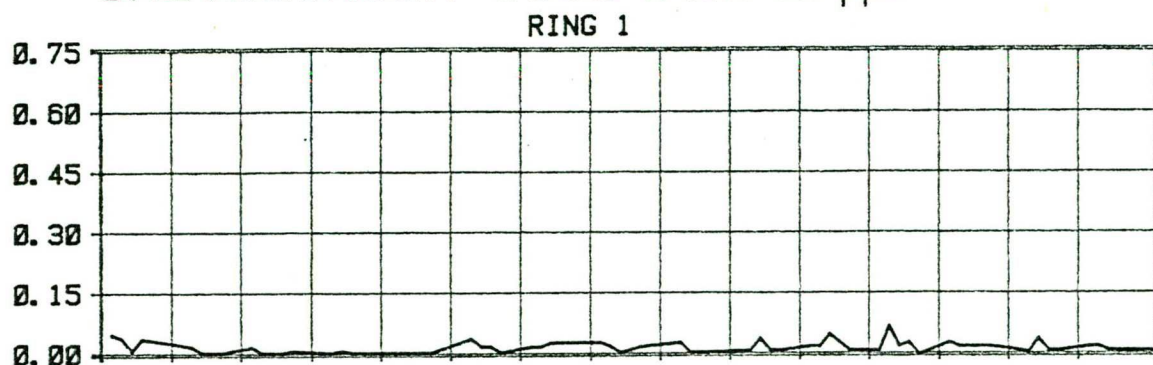


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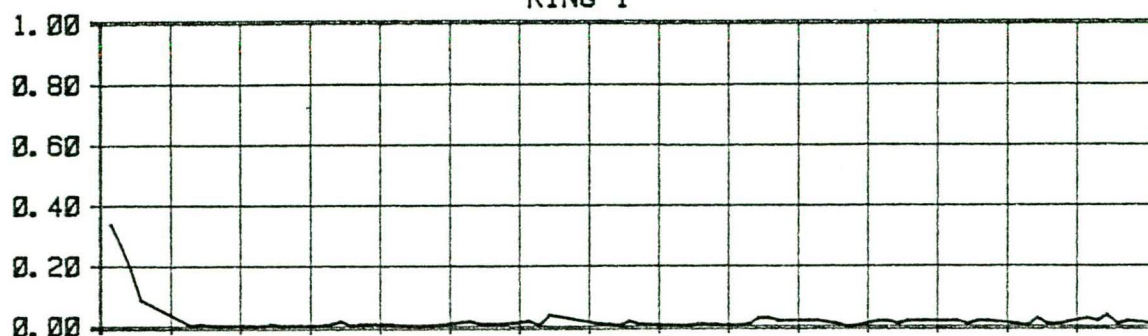
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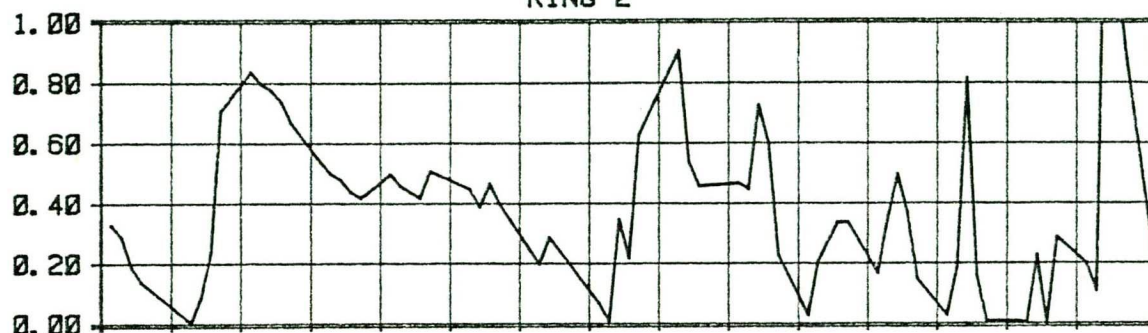
GREVELINGEN 1980 N-NH₄ in ppm

GREVELINGEN 1980 N-NO3/NO2 in ppm

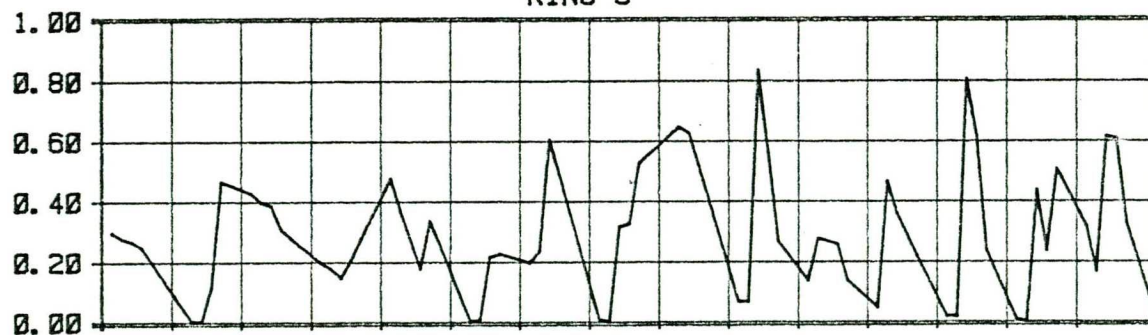
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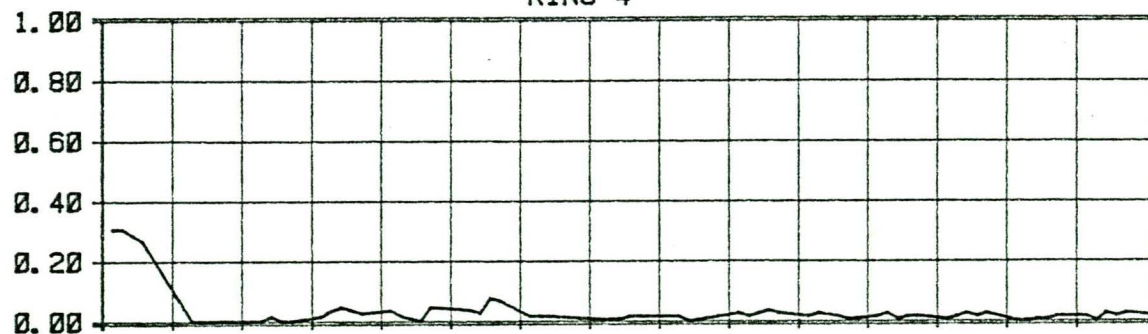
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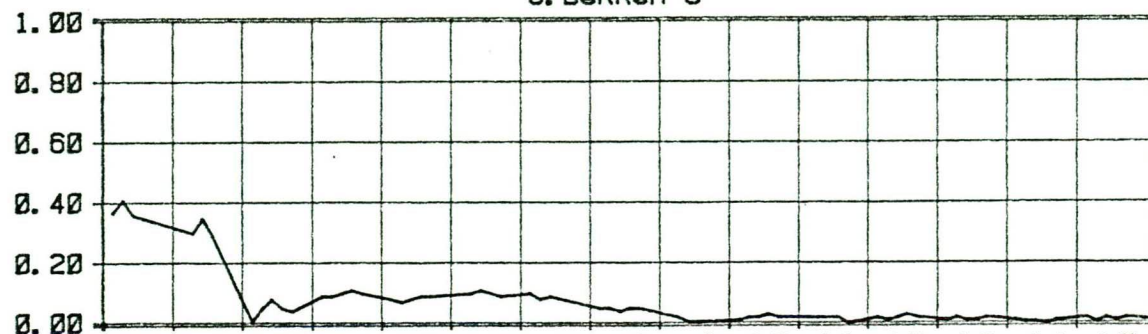
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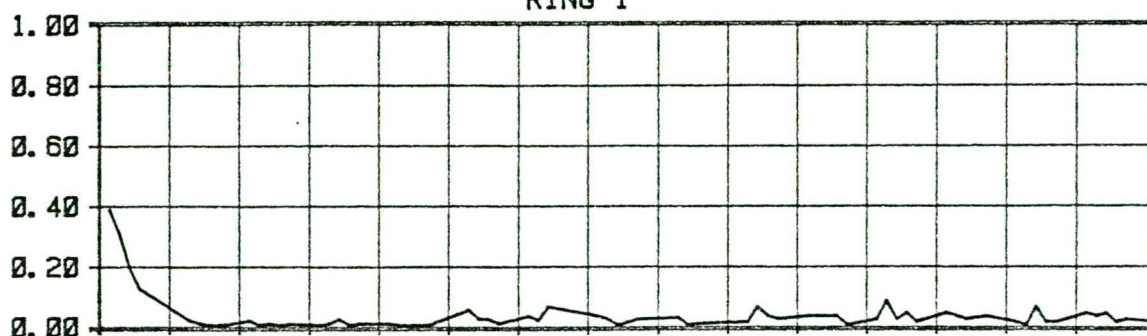


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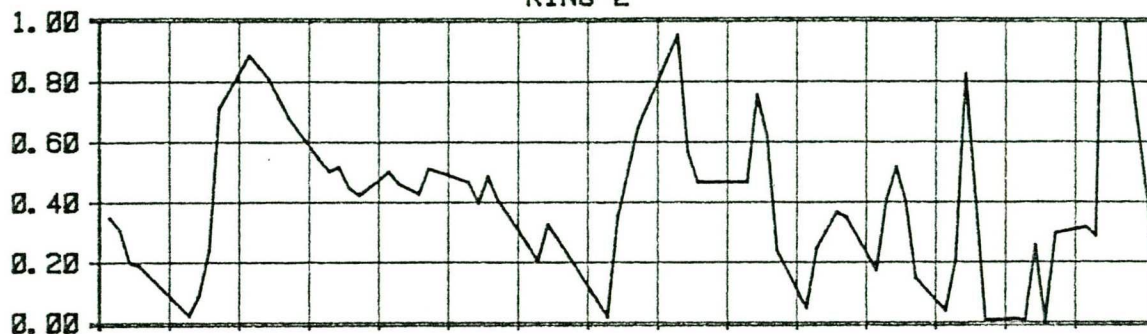


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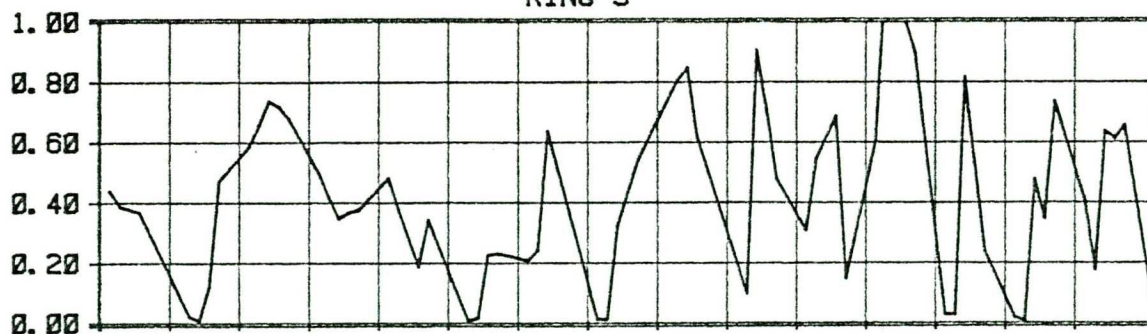
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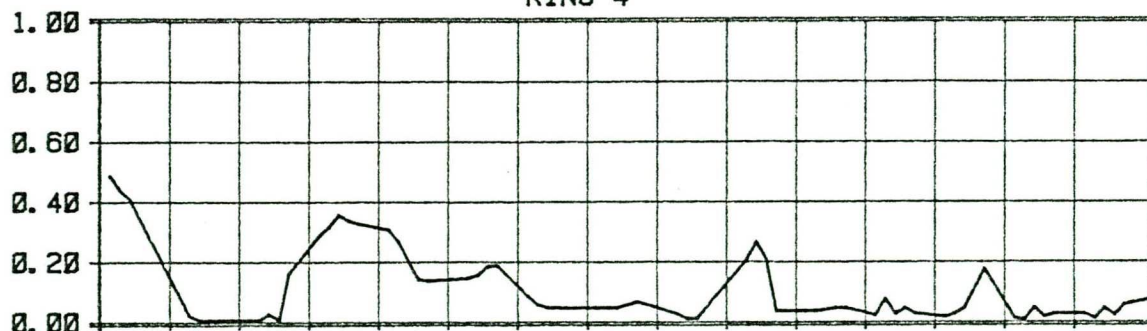
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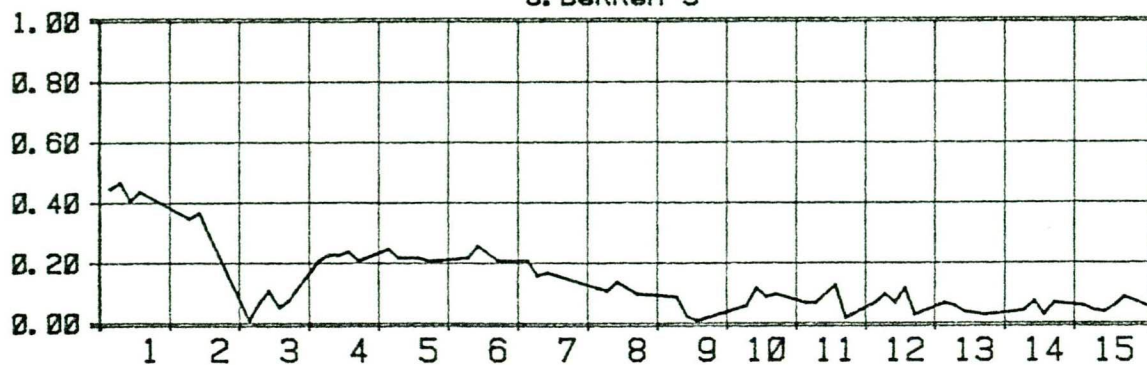
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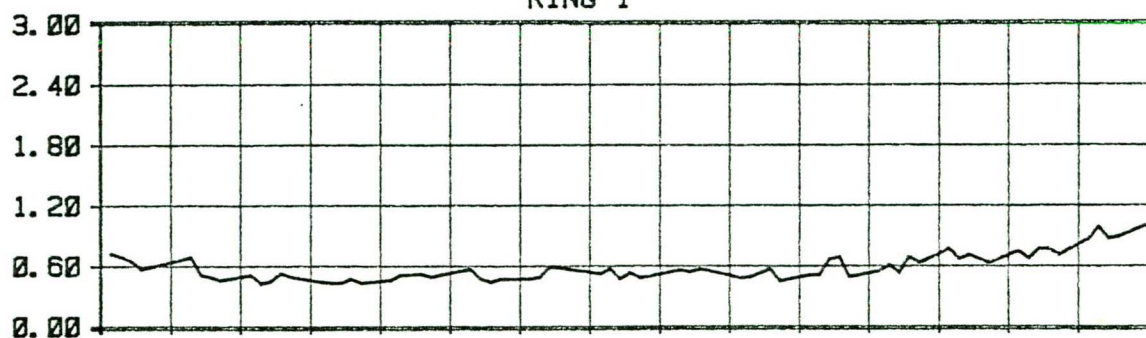


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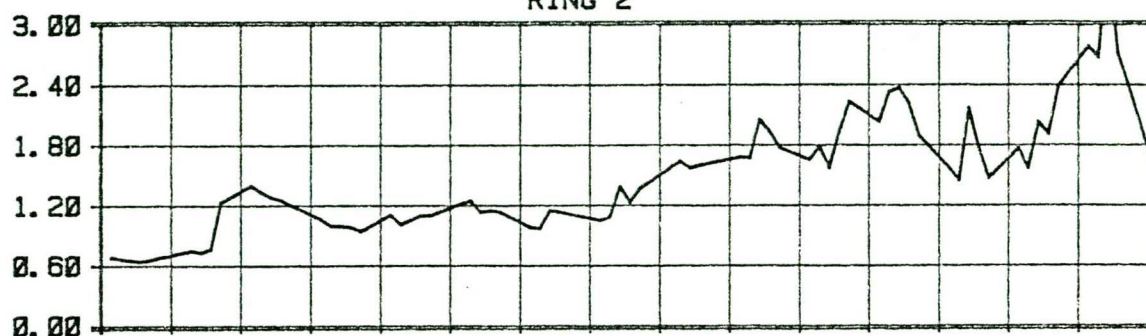
14/7

GREVELINGEN 1980 N-totaal in ppm

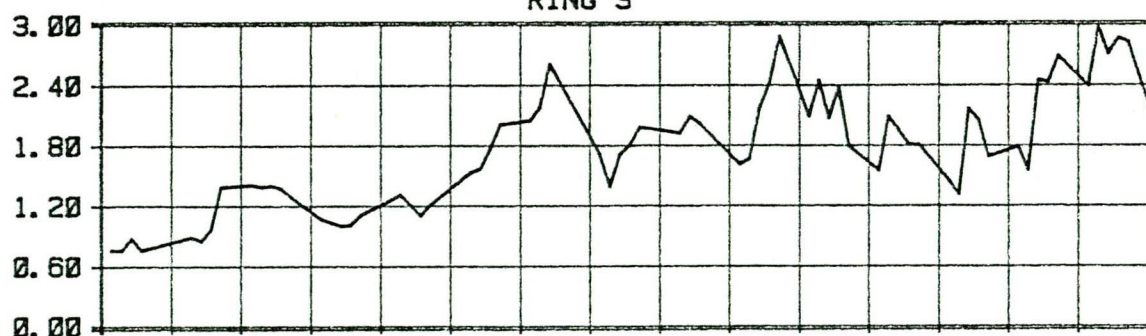
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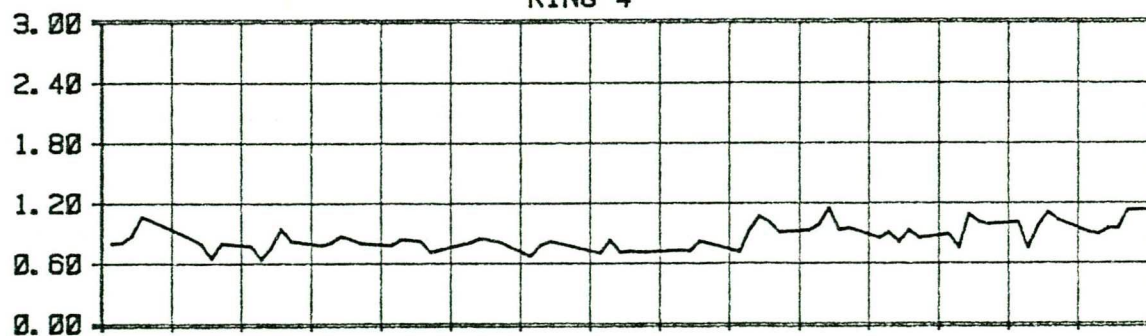
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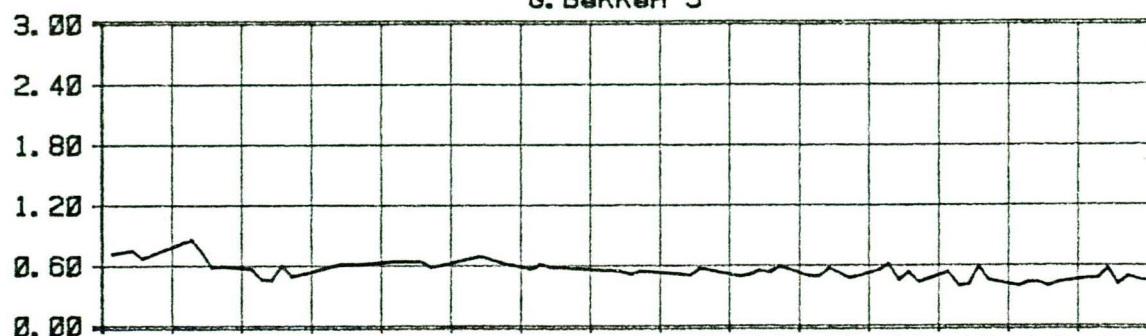
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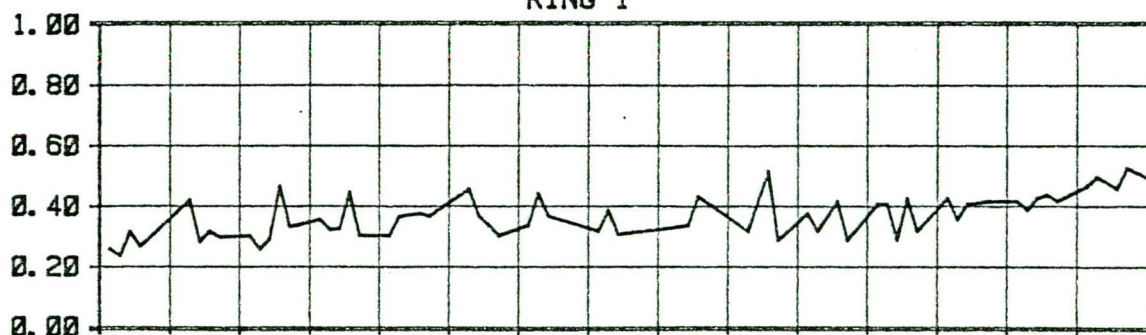


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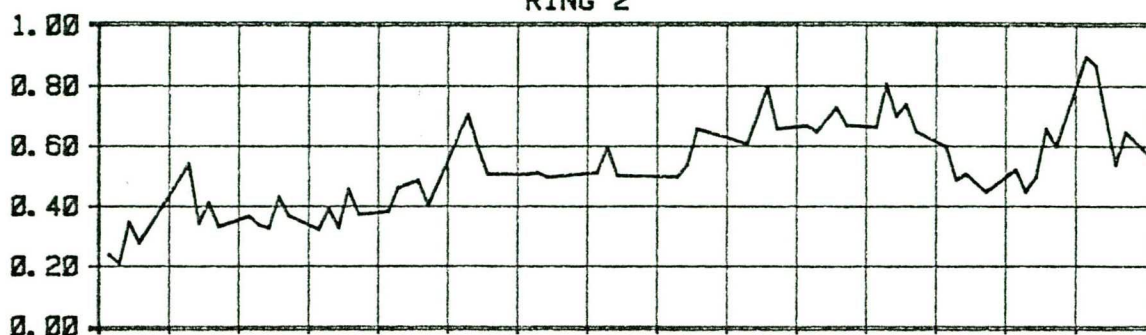


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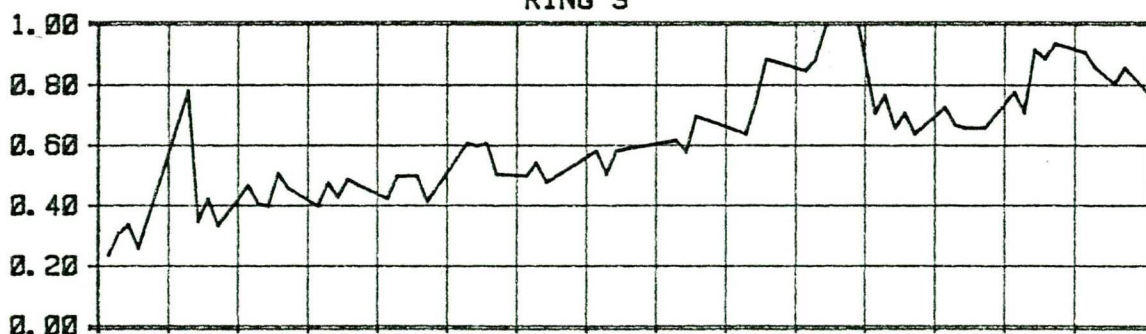
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GREVELINGEN 1980 N-organisch opgelost in ppm
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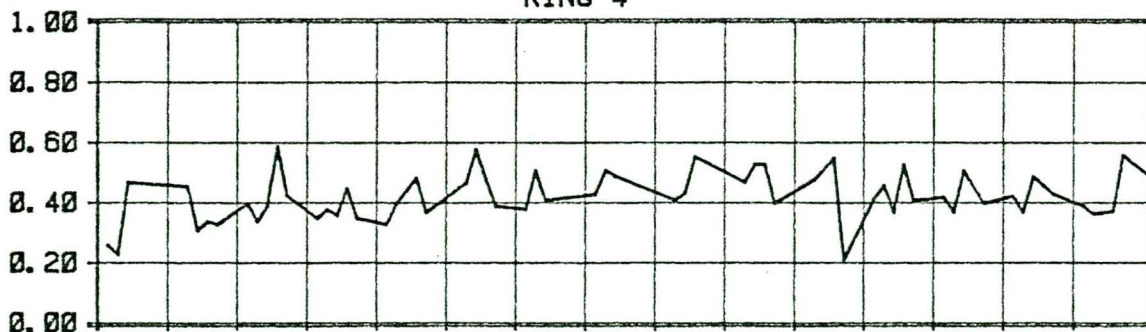
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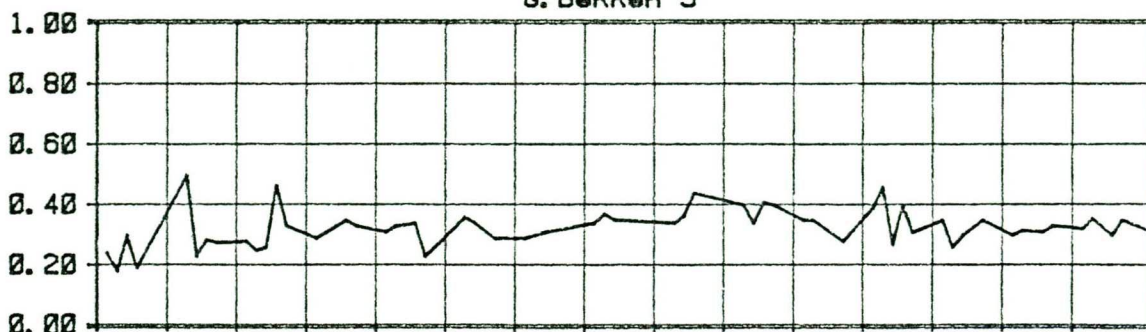
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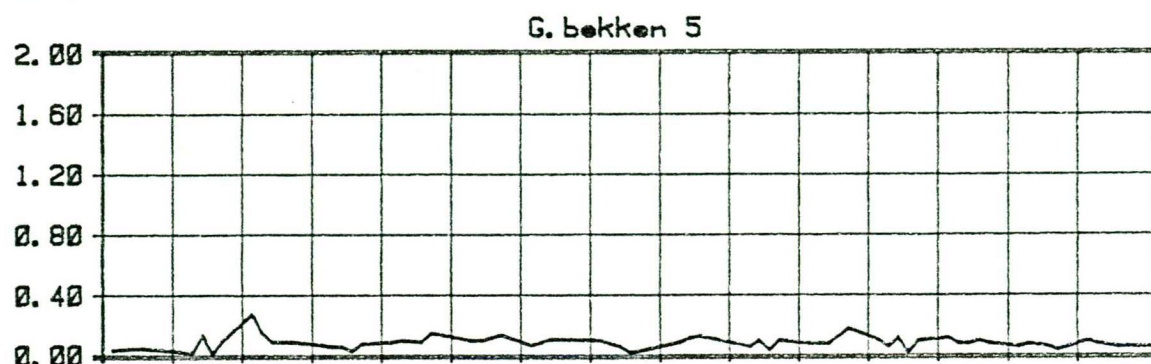
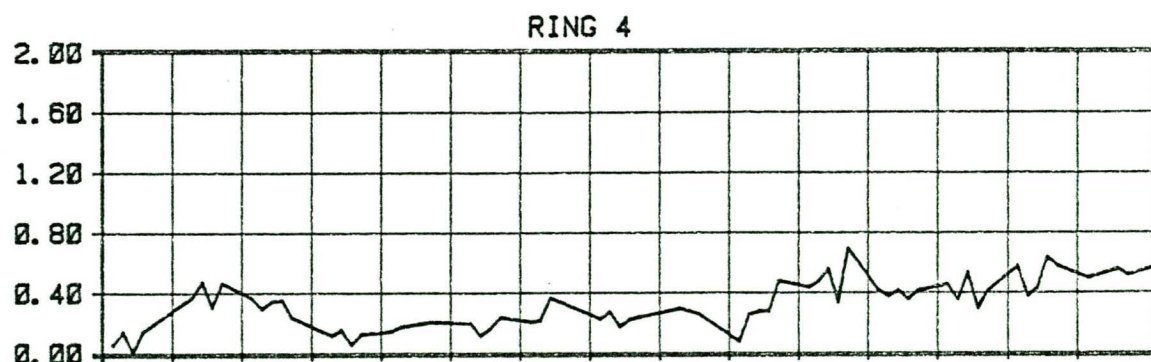
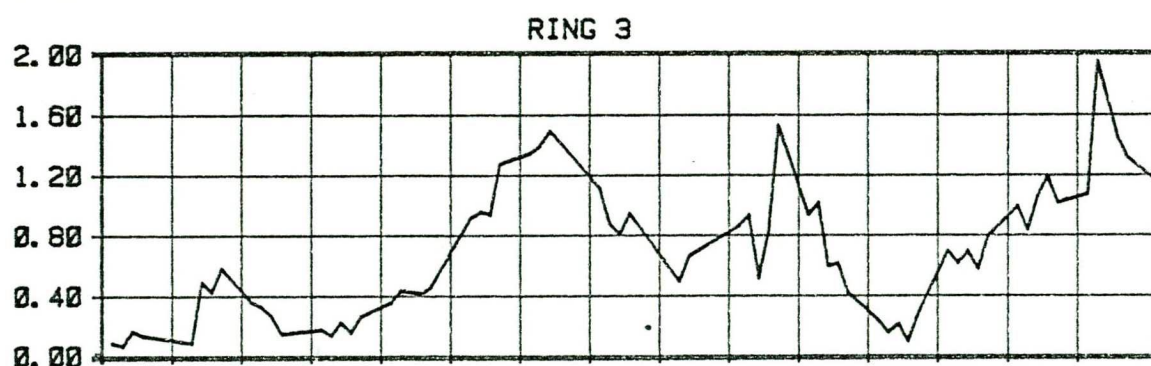
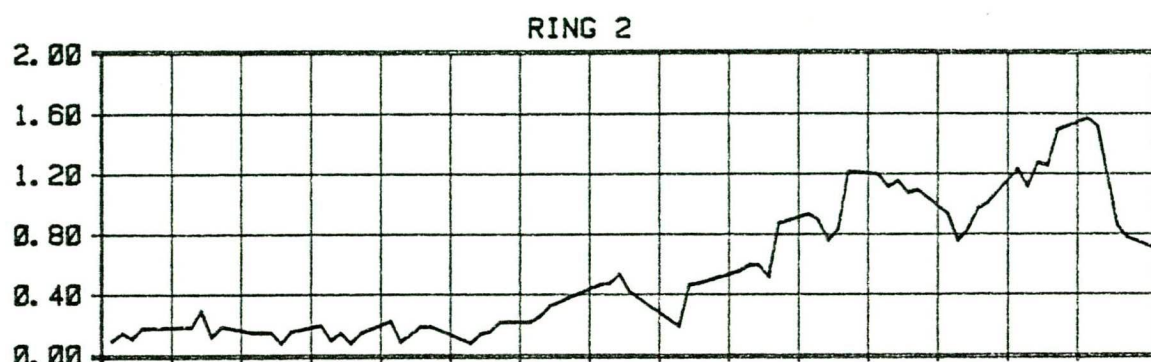
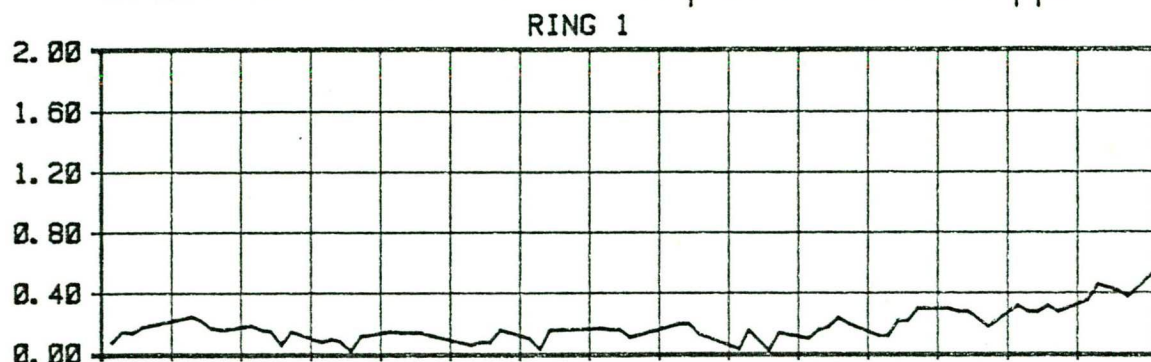
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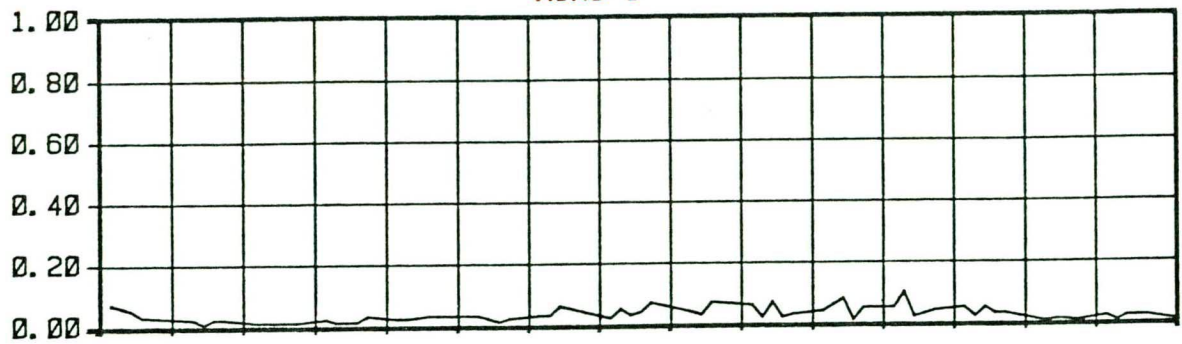


GREVELINGEN 1980 N-particulair in ppm

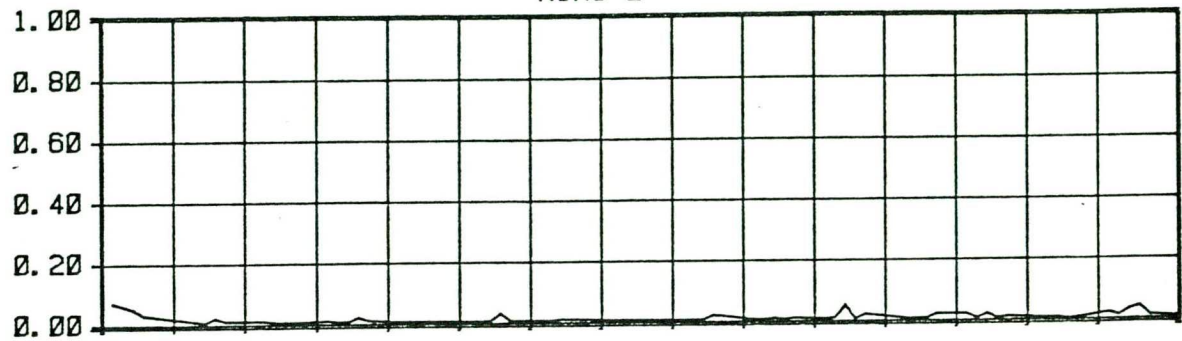


GREVELINGEN 1980 P-P04 in ppm

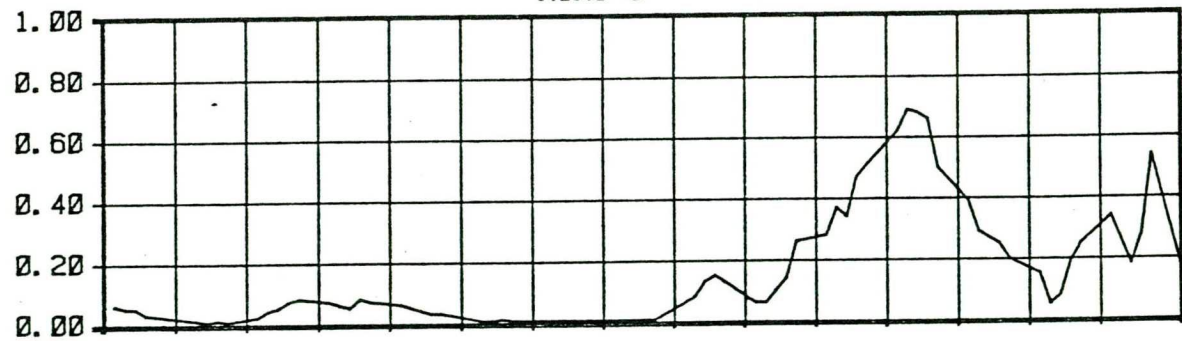
RING 1



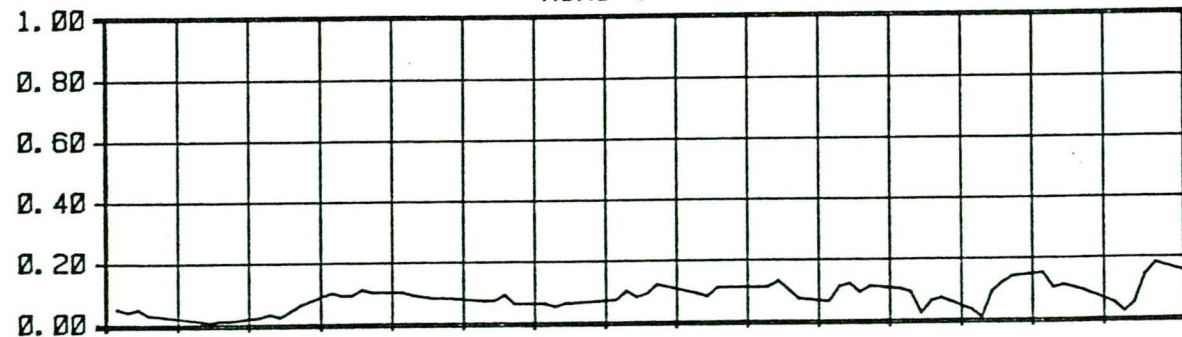
RING 2



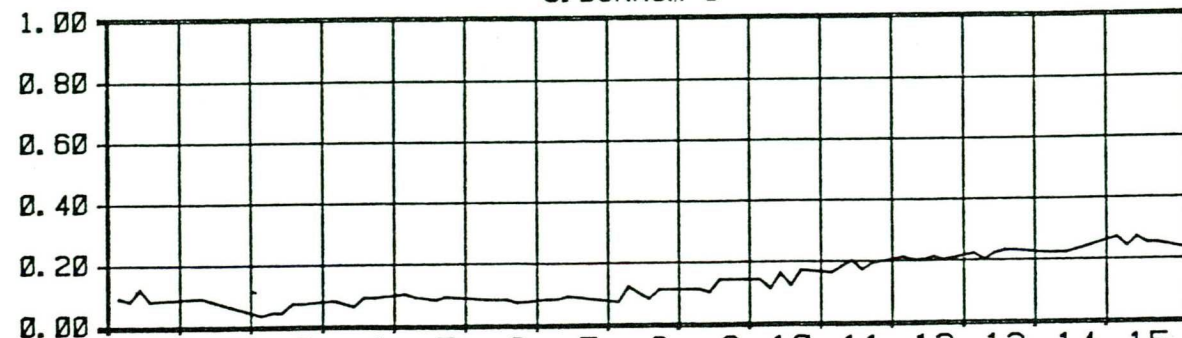
RING 3



RING 4

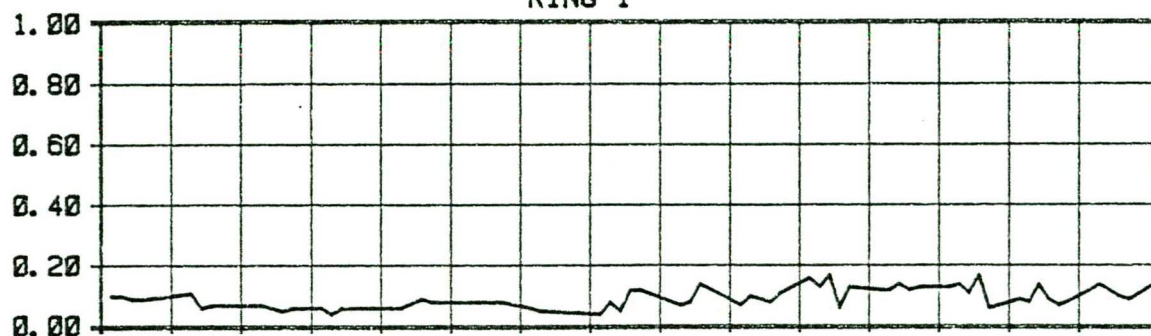


G. bekken 5

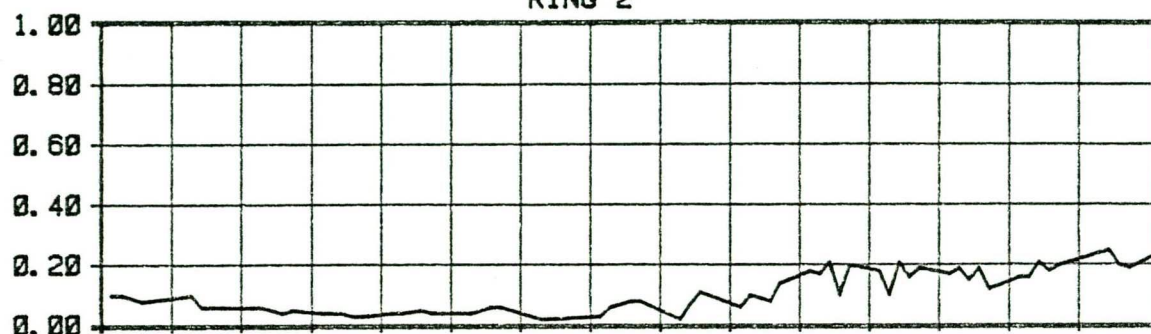


GREVELINGEN 1980 P-totaal in ppm

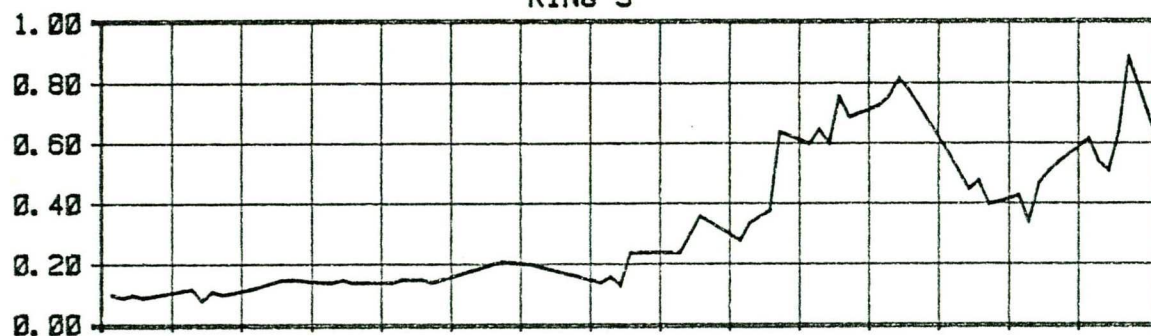
RING 1



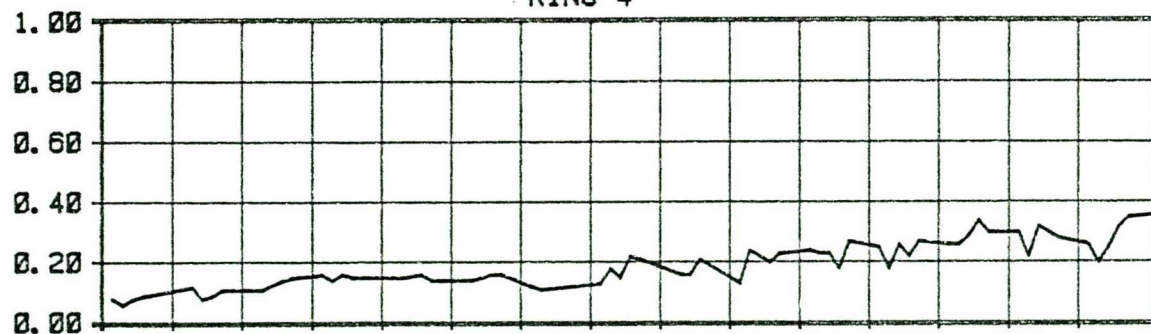
RING 2



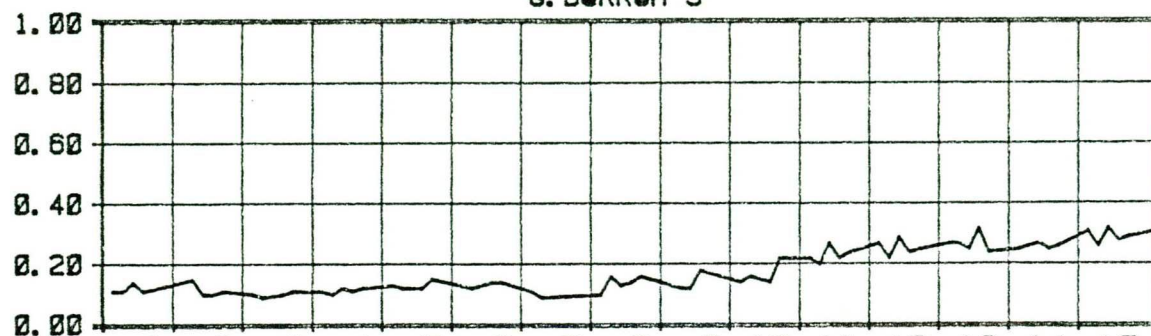
RING 3



RING 4

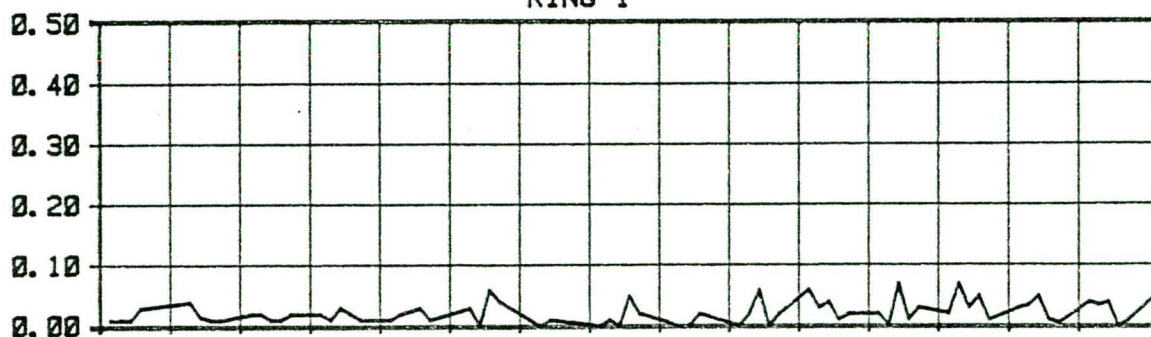


G. bekken 5

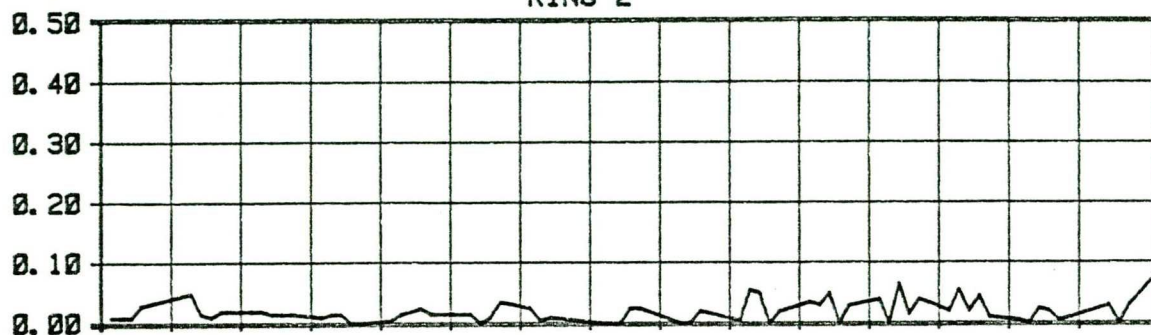


GREVELINGEN 1980 P-organisch opgelost in ppm

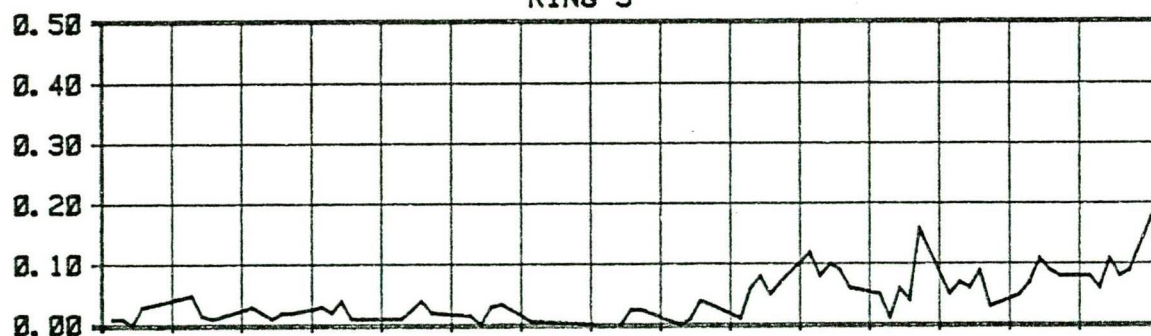
RING 1



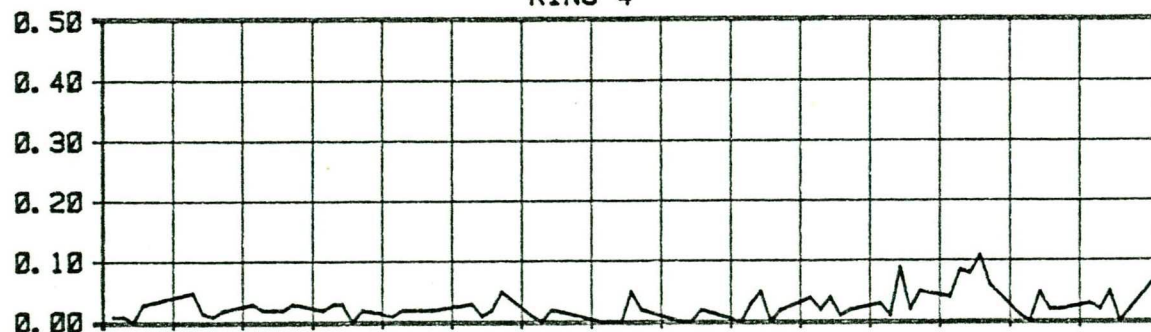
RING 2



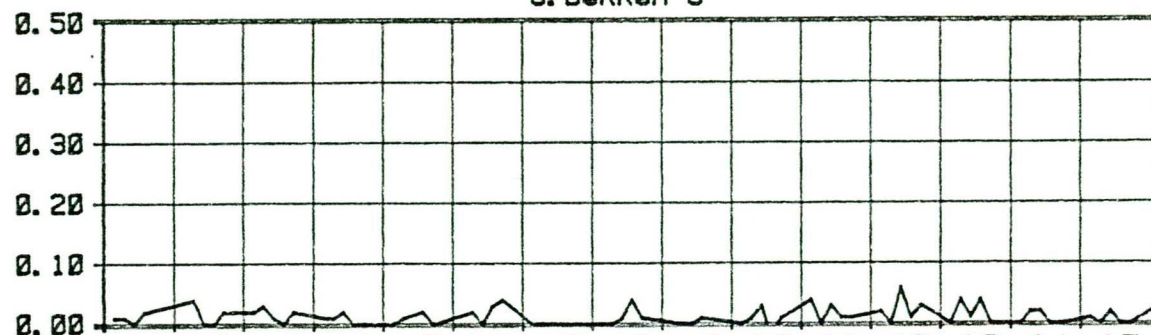
RING 3



RING 4

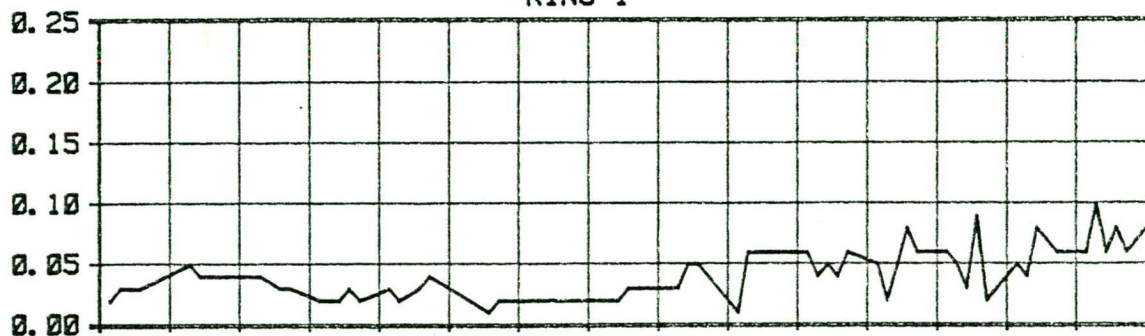


G. bekken 5

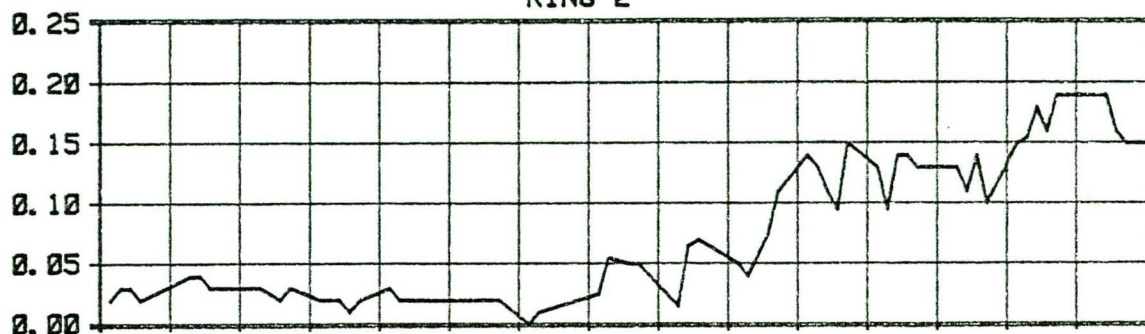


GREVELINGEN 1980 P-particulair in ppm

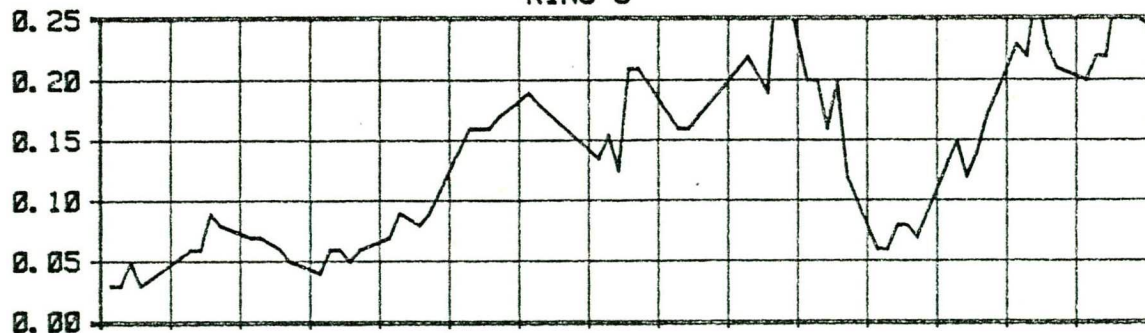
RING 1



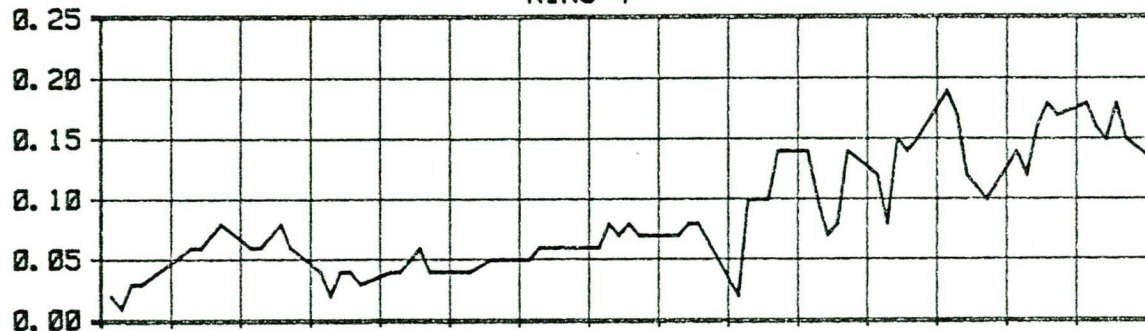
RING 2



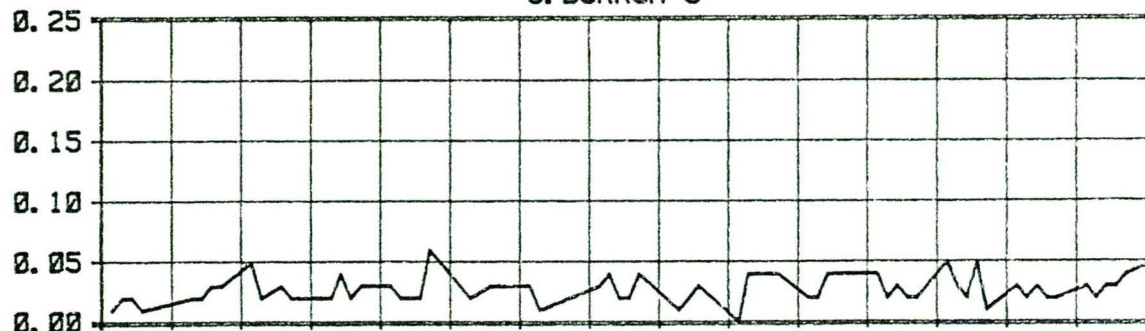
RING 3

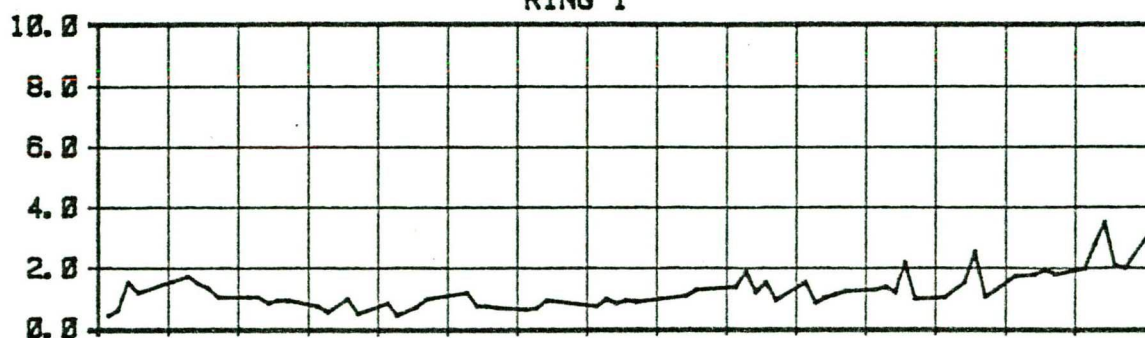


RING 4

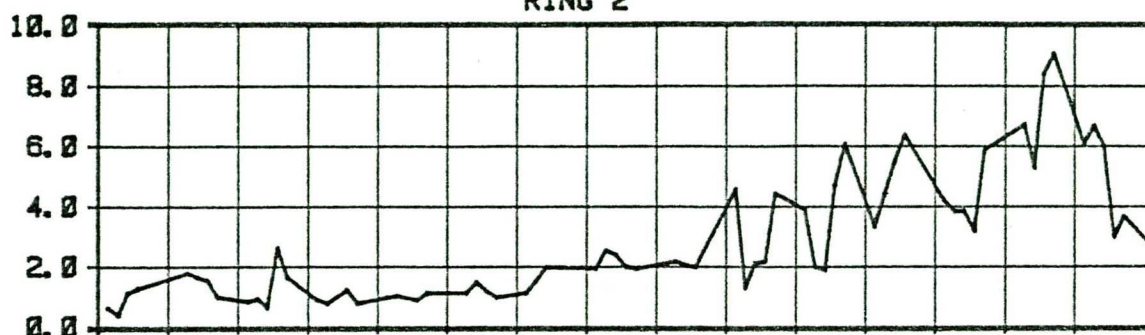


G. bekken 5

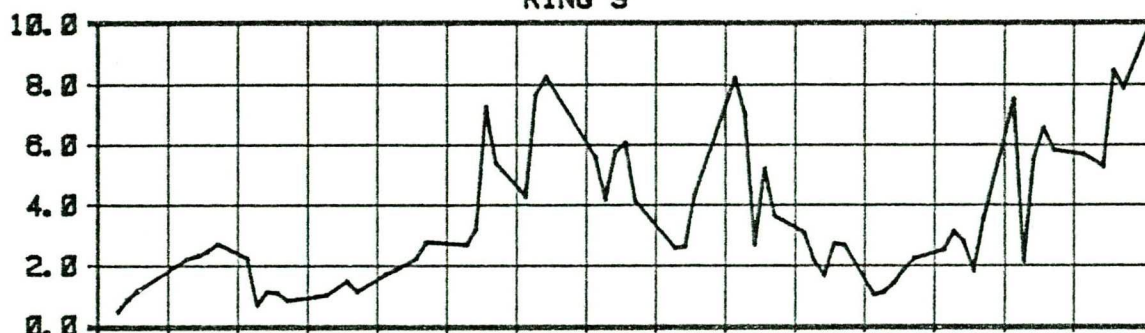


GREVELINGEN 1980 C-partioulair in ppm
RING 1

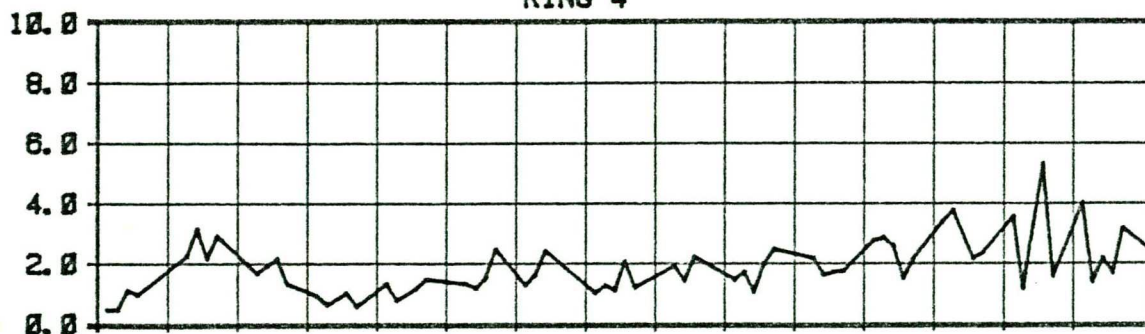
RING 2



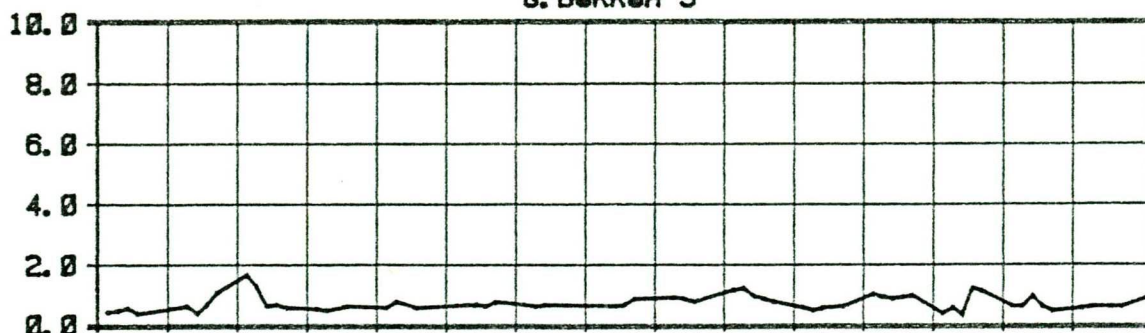
RING 3



RING 4



G. bekken 5

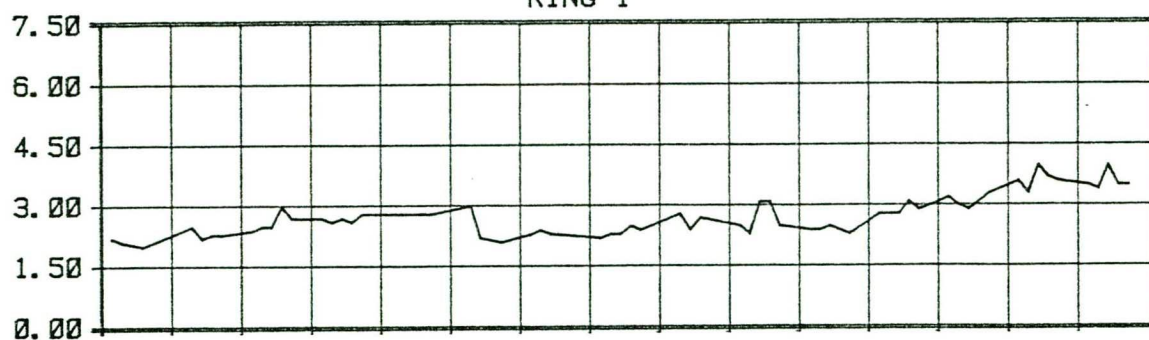


31/3

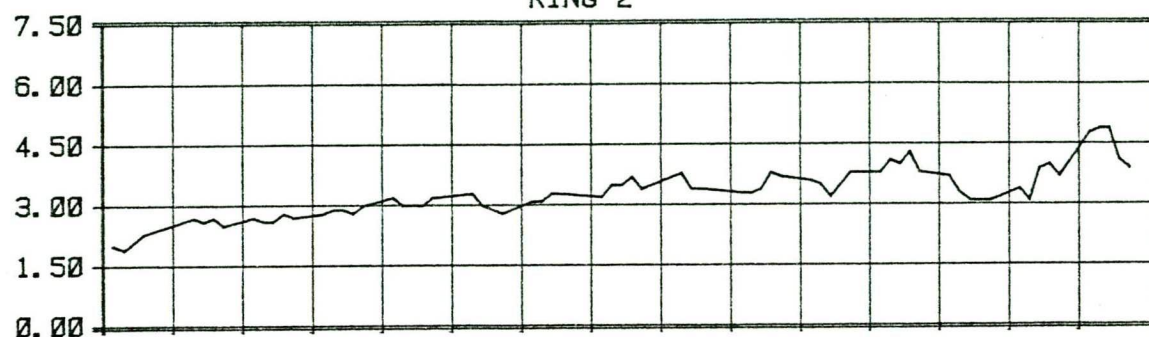
14/7

GREVELINGEN 1980 DOC in ppm

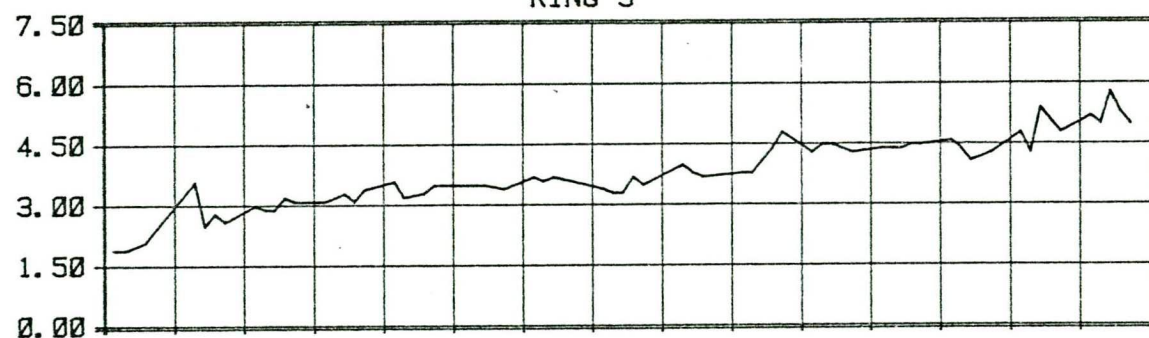
RING 1



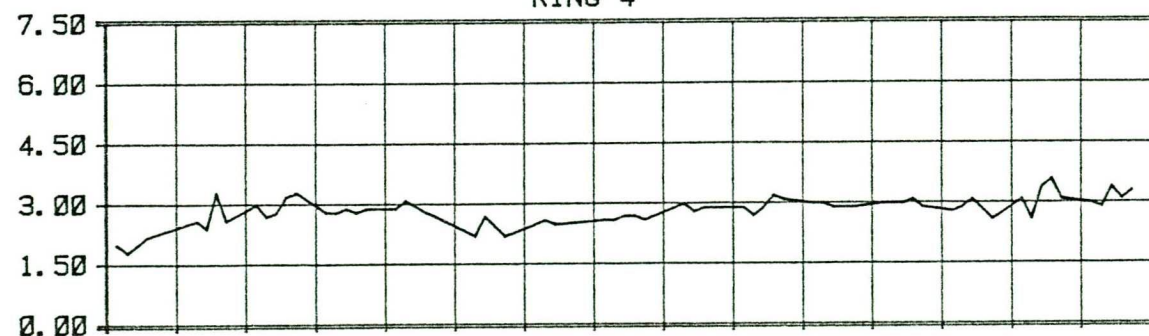
RING 2



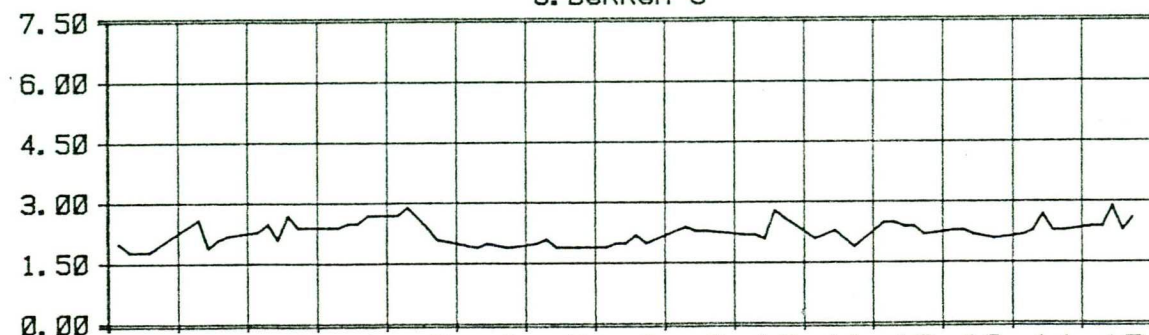
RING 3



RING 4

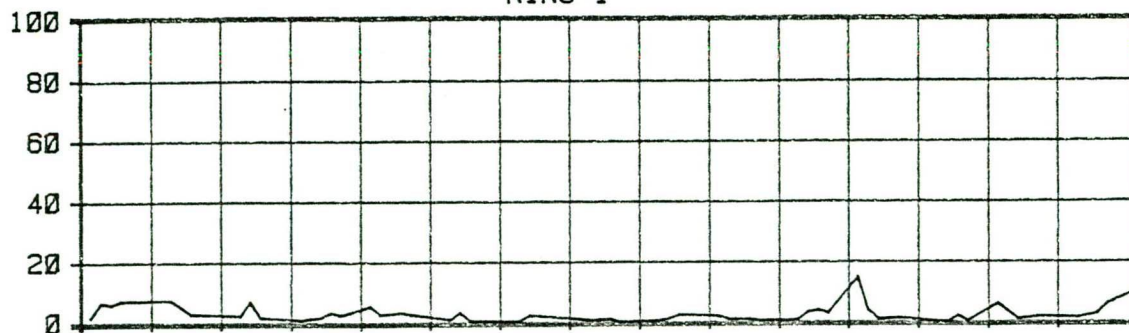


G. bekken 5

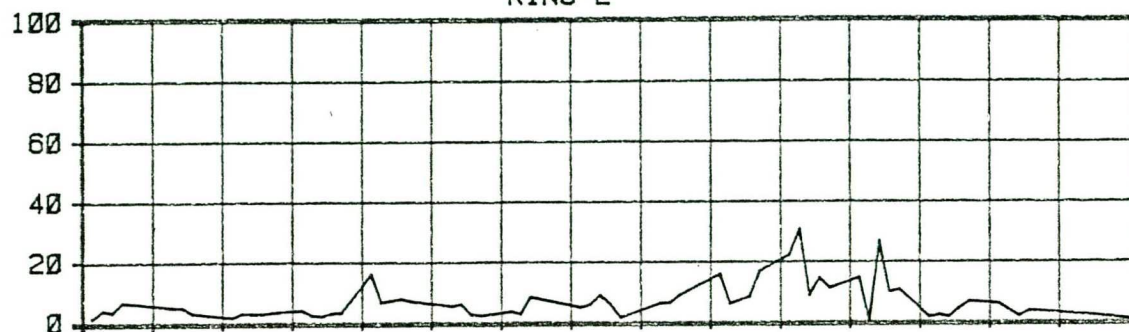


GREVELINGEN 1980 Feofetyne in ppb

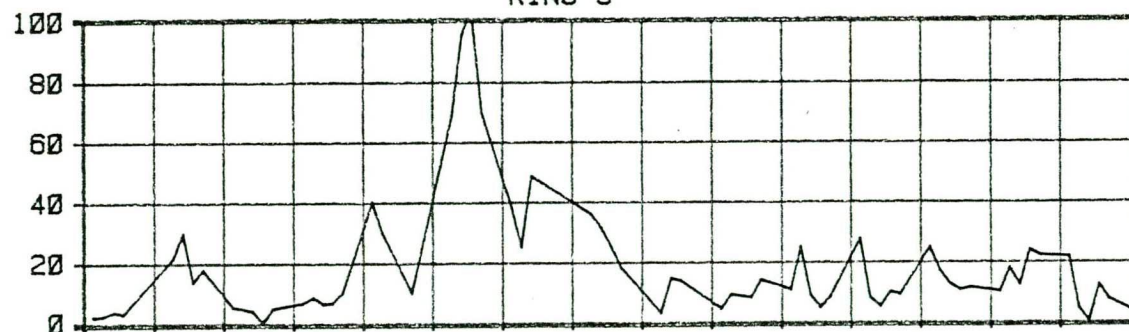
RING 1



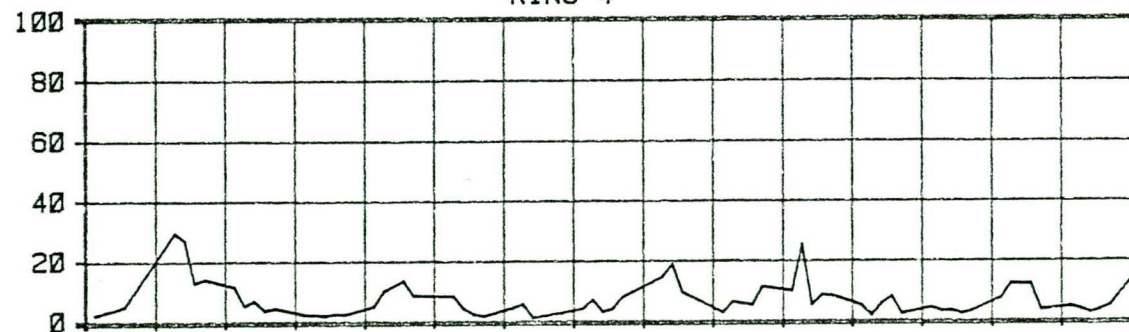
RING 2



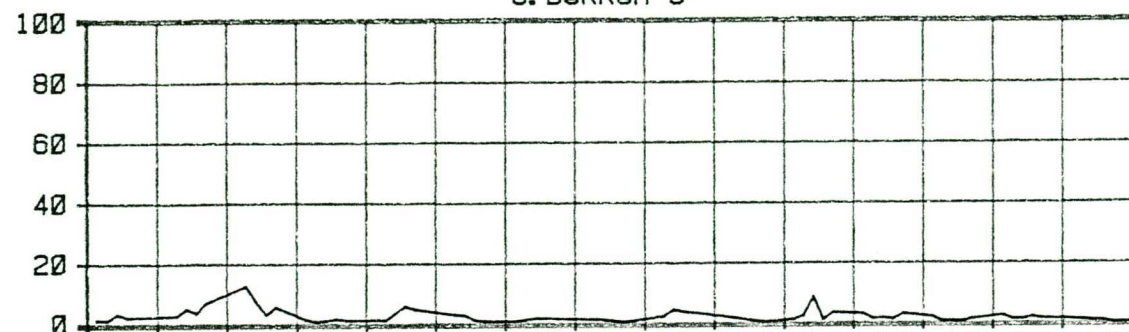
RING 3



RING 4



G. bekken 5



[illegible]

	duplo's		(p.p.m) (p.p.m)	
	(p.p.m)	(p.p.m)	(p.p.m)	(p.p.m)
	tot N	tot N	tot P	tot P
	1	2	I	II
ring 1 waterfase	0.90	0.88	0.16	0.18
ring 1 na opwerveling	<u>1.80</u>	<u>1.68</u>	<u>0.29</u>	<u>0.34</u>
afkomstig v/d bodem	0.90	0.80	0.13	0.16
ring 2 waterfase	0.88	0.86	0.14	0.16
ring 2 partiëel opgew.	3.98	2.80	0.53	0.47
ring 2 geheel opgew.	<u>2.18</u>	<u>2.32</u>	<u>0.43</u>	<u>0.35</u>
afkomstig v/d bodem	(3.10)	1.94	0.39	0.31
	1.30	1.46	0.29	0.19

gemiddeld afkomstig v/d bodem p.p.m				totaal in grammen	
	tot N	tot P	N/P	N	P
ring 1	0.85	0.15	5.7	24.7	4.4
ring 2a	1.94	0.35	5.6		
ring 2b	<u>1.38</u>	<u>0.25</u>	<u>5.6</u>		
ring 2 gem.	1.75	0.30		53.0	9.1

periode	neerslag (K.N.M.I.) mm	neerslag (gebruikt) mm	verdamping penmann mm	verdamping (gebruikt) mm
3/4 - 11/4	4.3	4.9	16	8
11/4 - 21/4	2.9	3.3	31	15.5
21/4 - 2/5	8.2	9.4	24	12
2/5 - 9/5	0.9	1.0	26	13
9/5 - 21/5	0	0	61	30.5
21/5 - 29/5	2.4	2.8	31	15.5
29/5 - 13/6	22.4	25.8	56	28
13/6 - 20/6	9.4	10.8	29	14.5
20/6 - 2/7	57.7	66.4	40	20
2/7 - 11/7	32.1	36.9	26	13
Totaal	140.3	161.3	340	170

gecumuleerde neerslag-verdamp.	startvol. ring 1	startvol ring 2	startvol. ring 3	startvol. ring 4
[m]	[m ³]	[m ³]	[m ³]	[m ³]
0.0122	42.3	27.1	29.3	26.7
0.0148	18.4	32.3	32.1	30.7
0.0268	27.1	21.2	24.1	33.5
0.0573	32.3	37.0	26.6	46.6
0.0700	29.1	31.3	25.4	36.5
0.0722	26.7	34.7	26.9	39.6
0.0759	27.3	29.1	23.4	40.0
gemiddeld	29.0	30.4	26.8	36.2

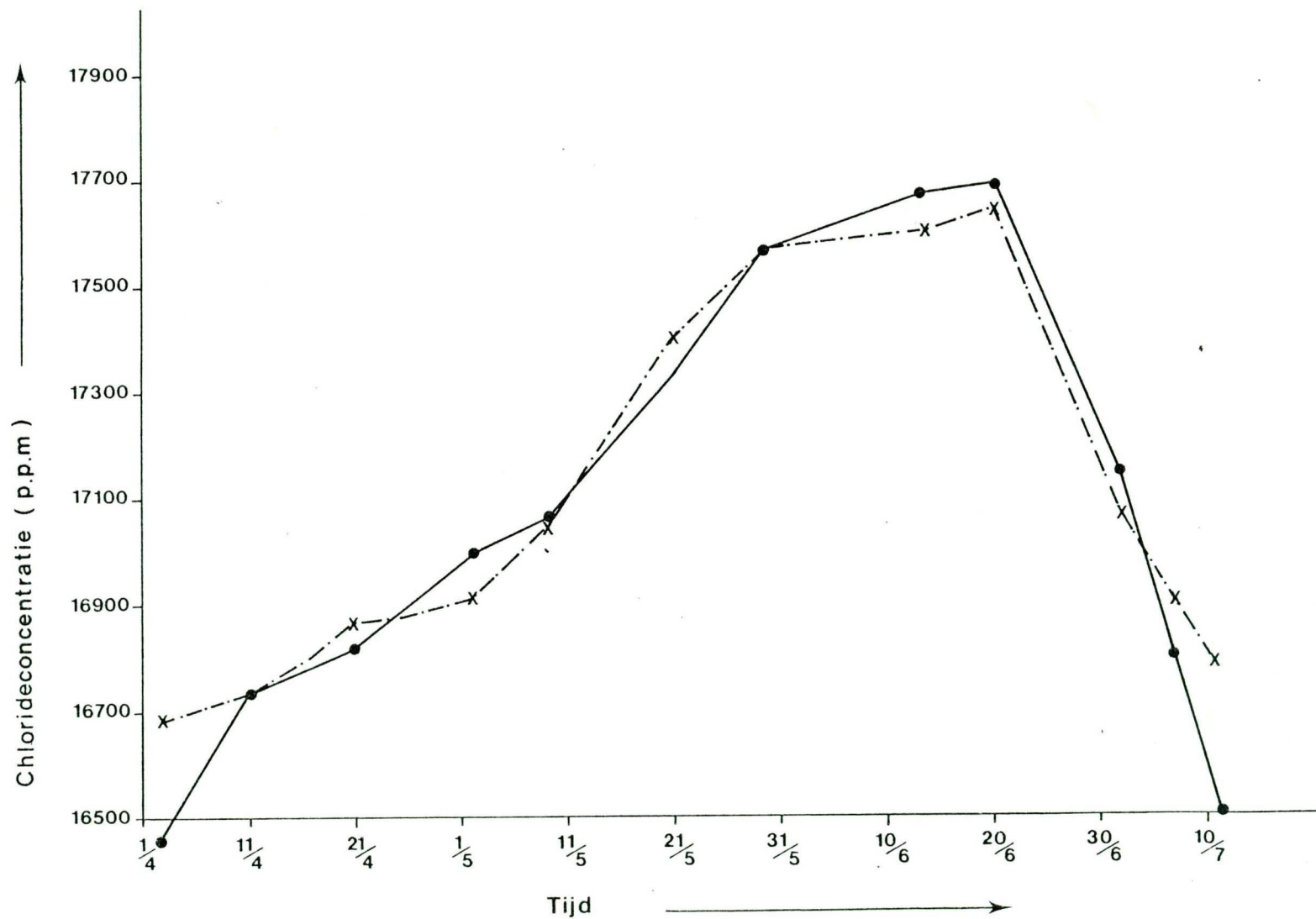
erekenende volumes: m³

datum	ring 1	ring 2	ring 3	ring 4
3/4	29.06	30.46	26.86	36.26
1/4	29.00	30.40	26.80	36.20
21/4	28.76	30.16	26.56	35.96
1/5	28.71	30.11	26.51	35.91
9/5	28.47	29.87	26.27	35.67
21/5	27.88	29.28	25.68	35.08
9/5	27.63	29.03	25.43	34.83
13/6	27.58	28.98	25.38	34.78
20/6	27.51	28.91	25.31	34.71
2/7	28.44	29.84	26.24	35.64
11/7	28.89	30.29	26.69	36.09

CHLORIDEVERLOOP ring.1

Startvolume = 29 m³

—●— gemeten chlorideconcentraties
 -x- berekende chlorideconcentraties

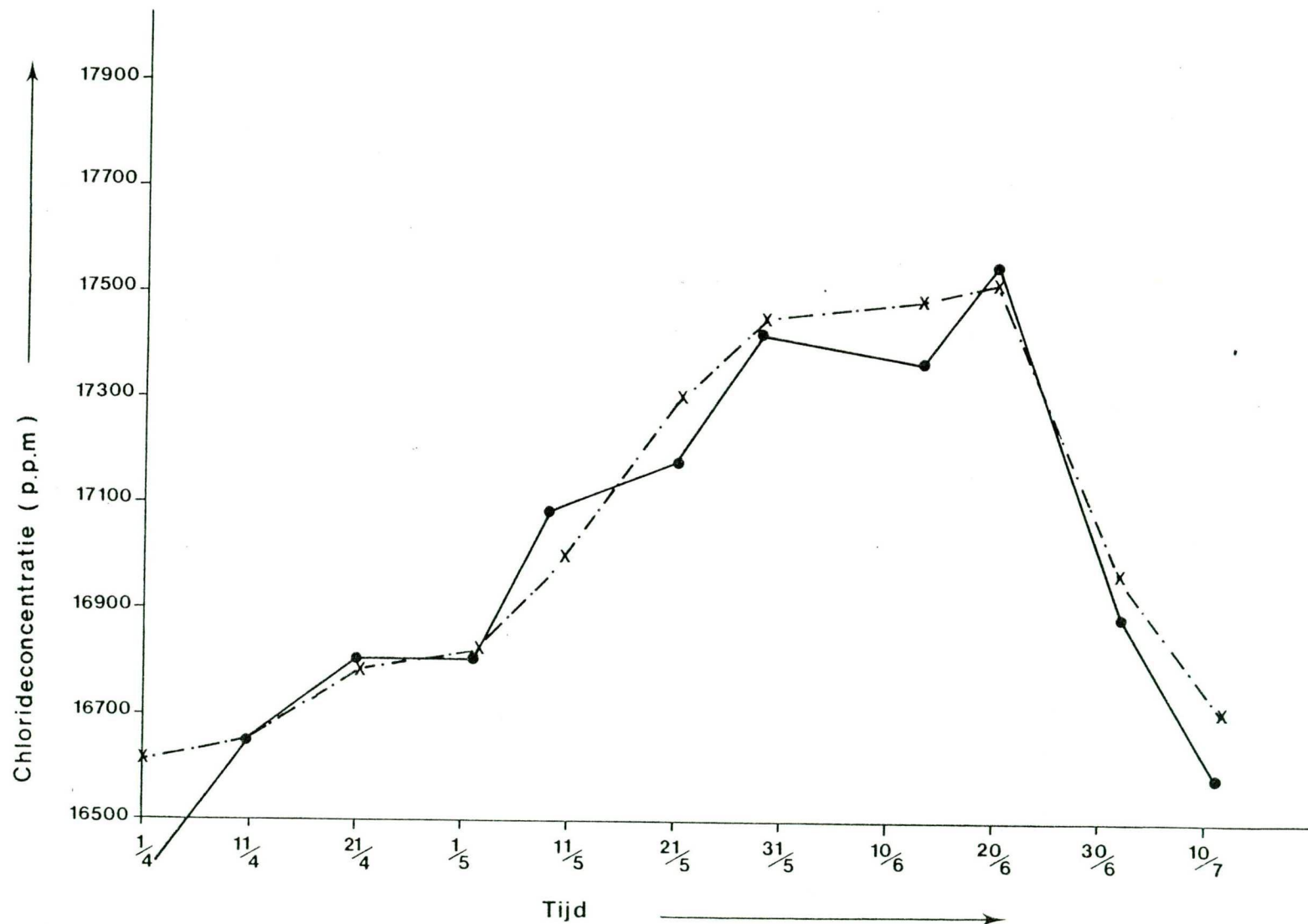


BEREKENDE EN GEMETEN CHLORIDECONCENTRATIEVERLOOP

CHLORIDEVERLOOP ring.2

Startvolume = 30.4 m³

—●— gemeten chlorideconcentraties
 -X- berekende chlorideconcentraties

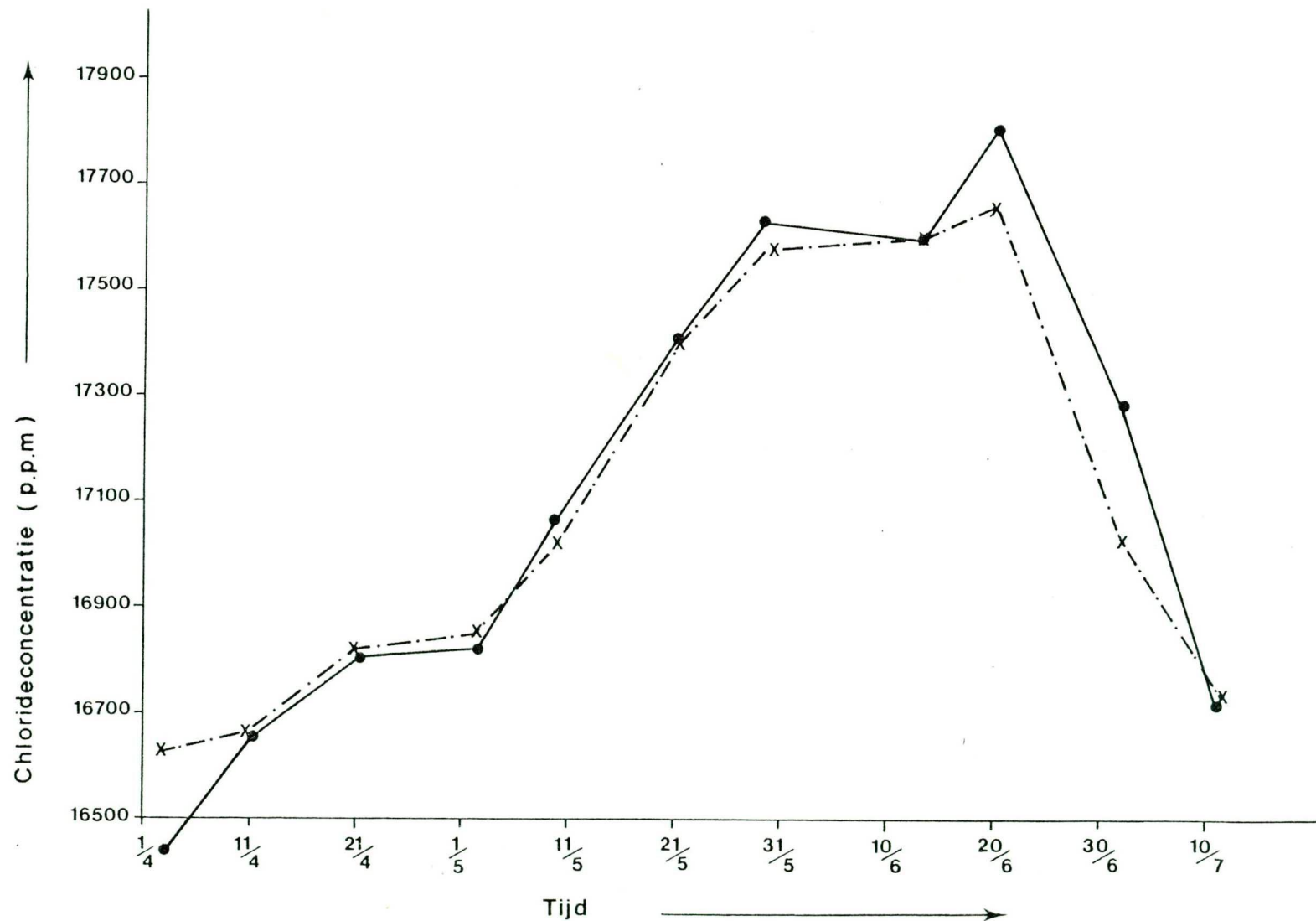


BEREKENDE EN GEMETEN CHLORIDECONCENTRATIEVERLOOP

CHLORIDEVERLOOP ring.3

Startvolume = 26.8 m³

—●— gemeten chlorideconcentraties
 -.-.- berekende chlorideconcentraties

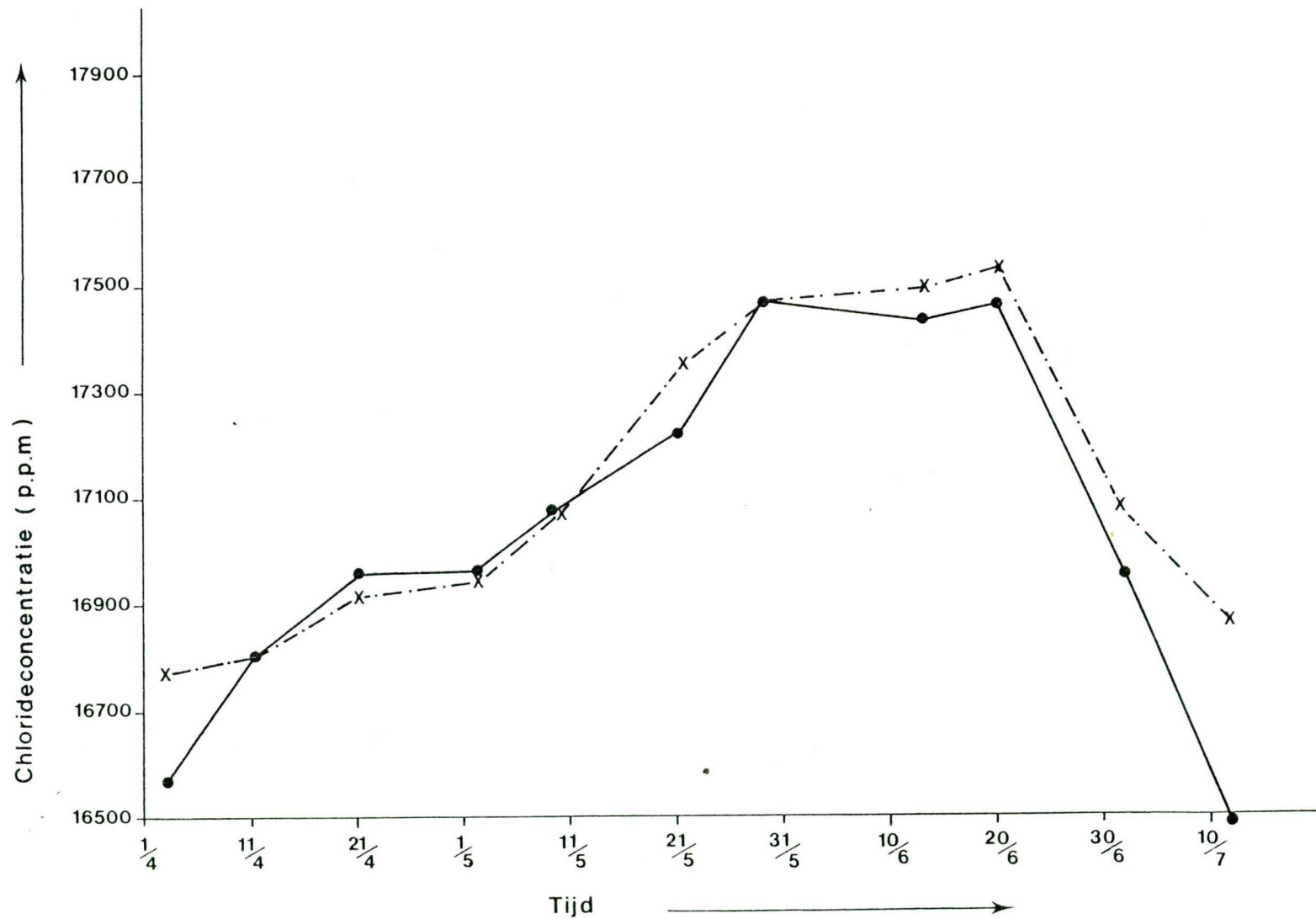


BEREKENDE EN GEMETEN CHLORIDECONCENTRATIEVERLOOP

CHLORIDEVERLOOP ring 4

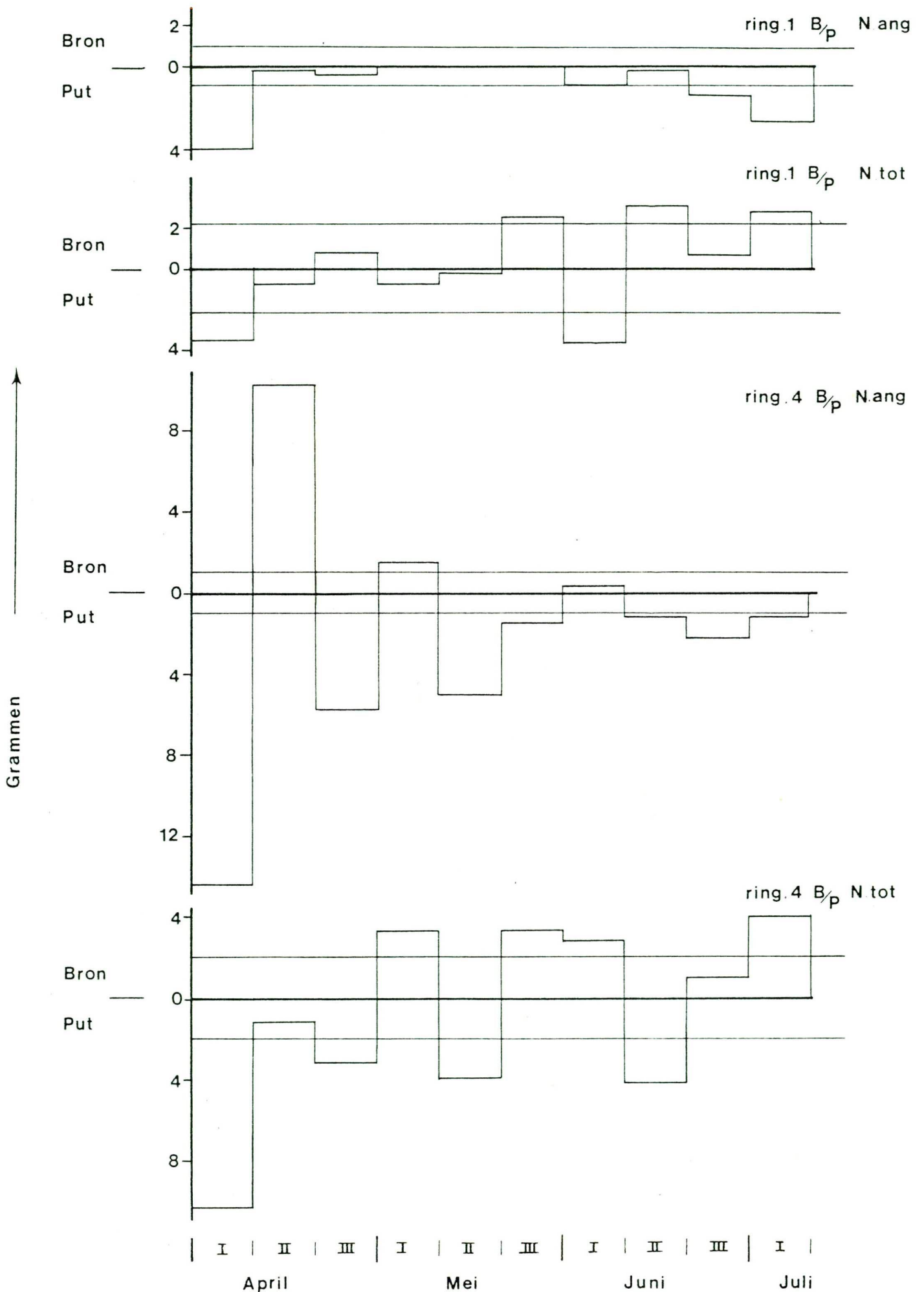
Startvolume = 36.2 m³

—●— gemeten chlorideconcentraties
-x- berekende chlorideconcentraties



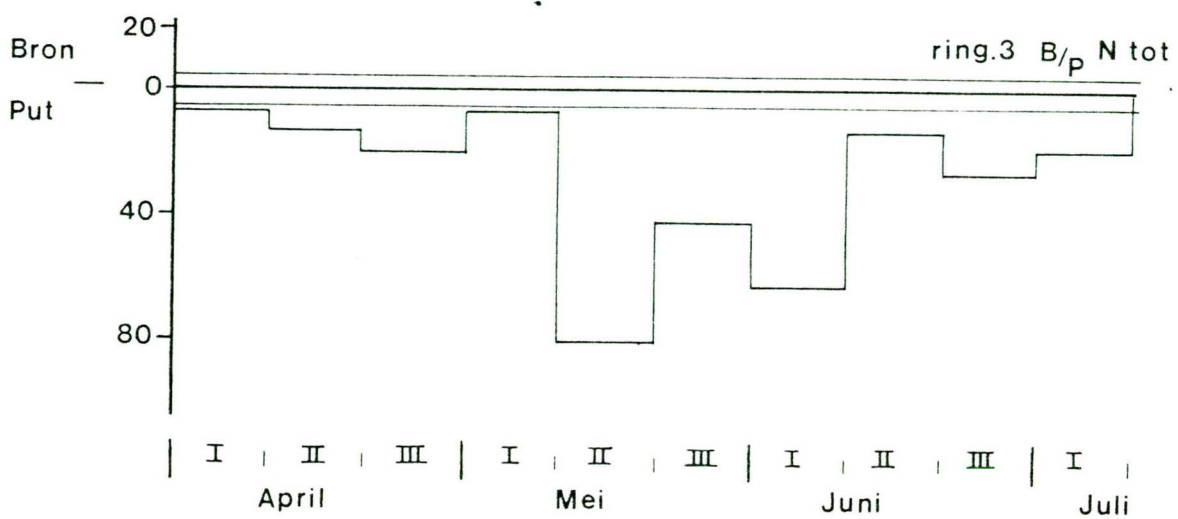
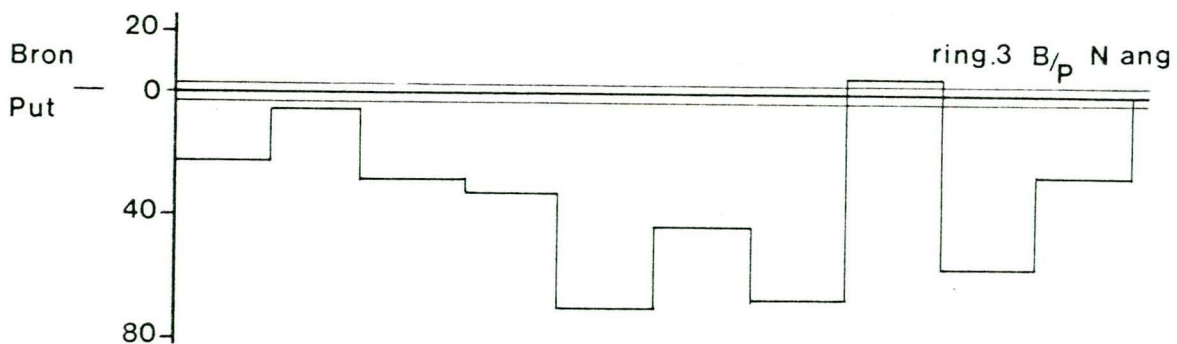
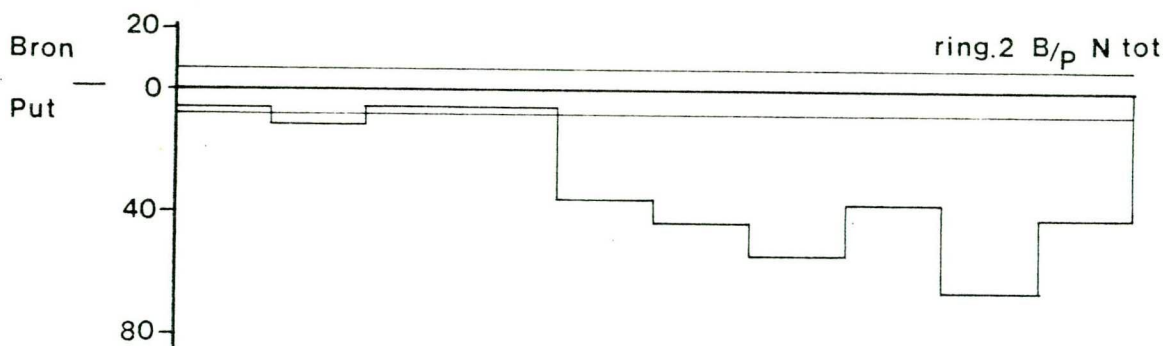
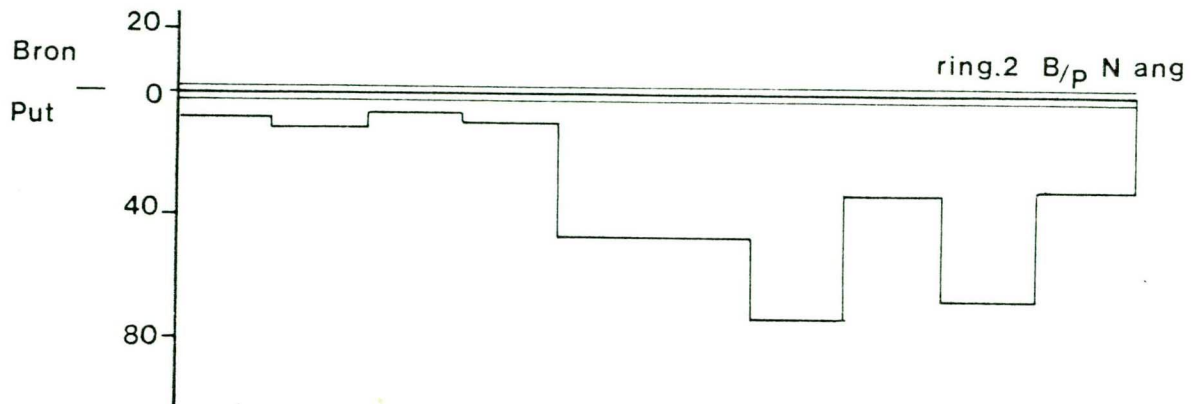
BEREKENDE EN GEMETEN CHLORIDECONCENTRATIEVERLOOP

RESTTERMEN OP DE MASSABALANSEN



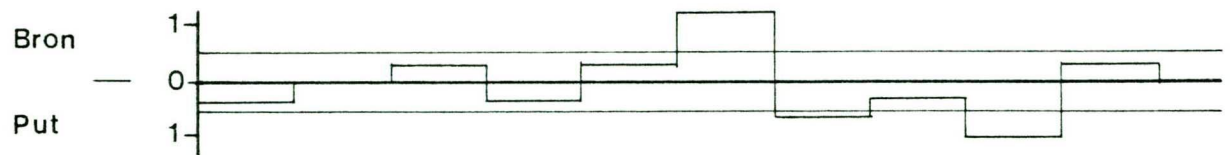
RESTTERMEN OP DE MASSABALANSEN

Grammen

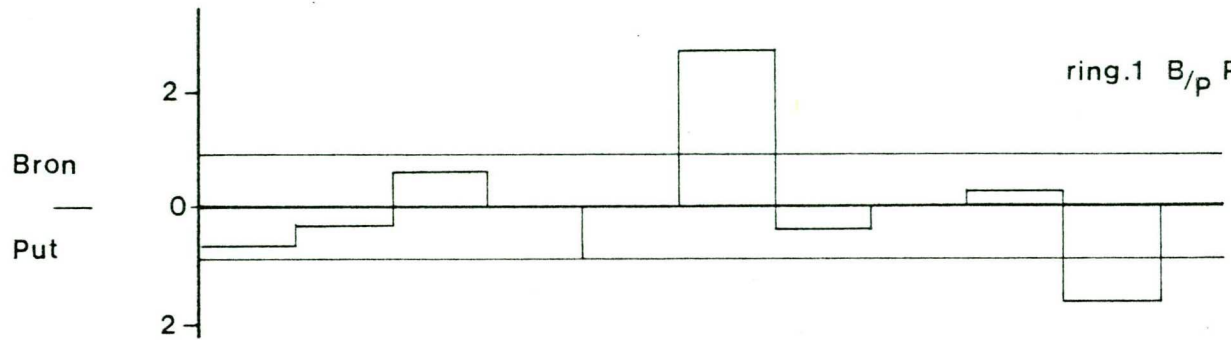
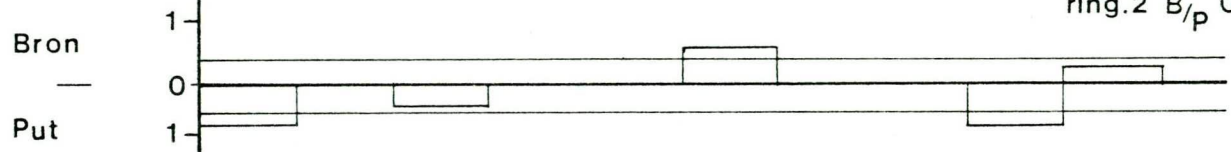


I II III I II III I II III I
 April Mei Juni Juli

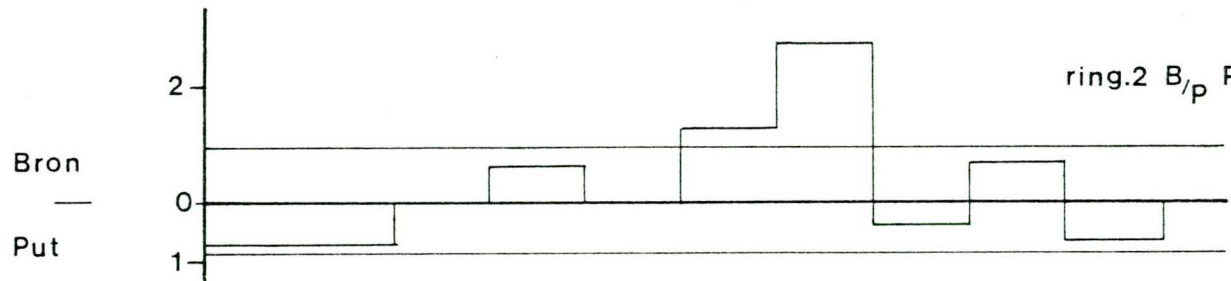
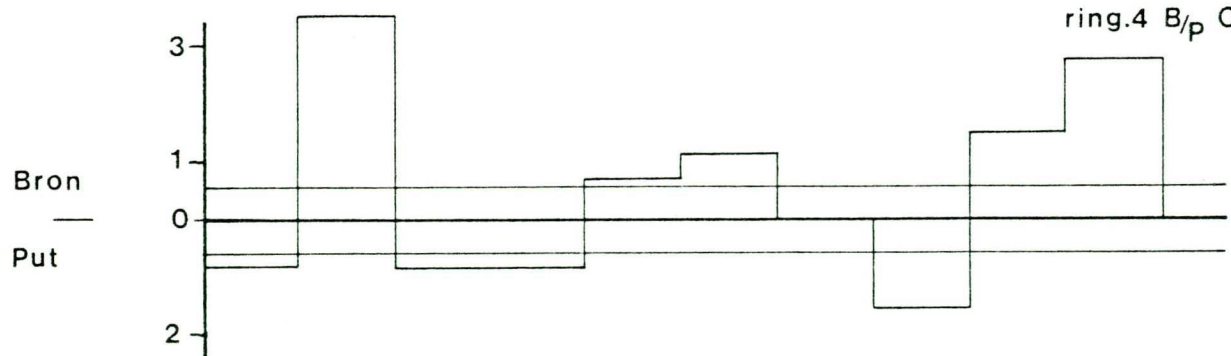
RESTTERMEN OP DE MASSABALANSEN

 ring.1 B/p O-PO₄


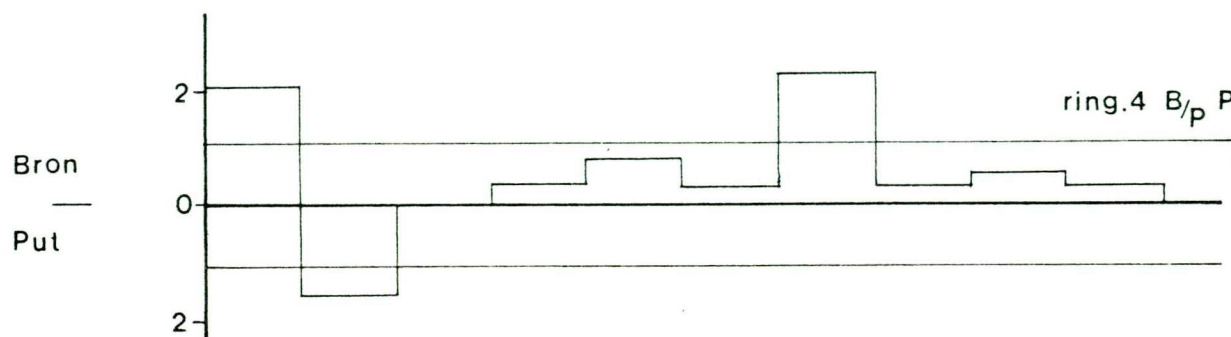
ring.1 B/p P tot


 ring.2 B/p O-PO₄


ring.2 B/p P tot


 ring.4 B/p O-PO₄


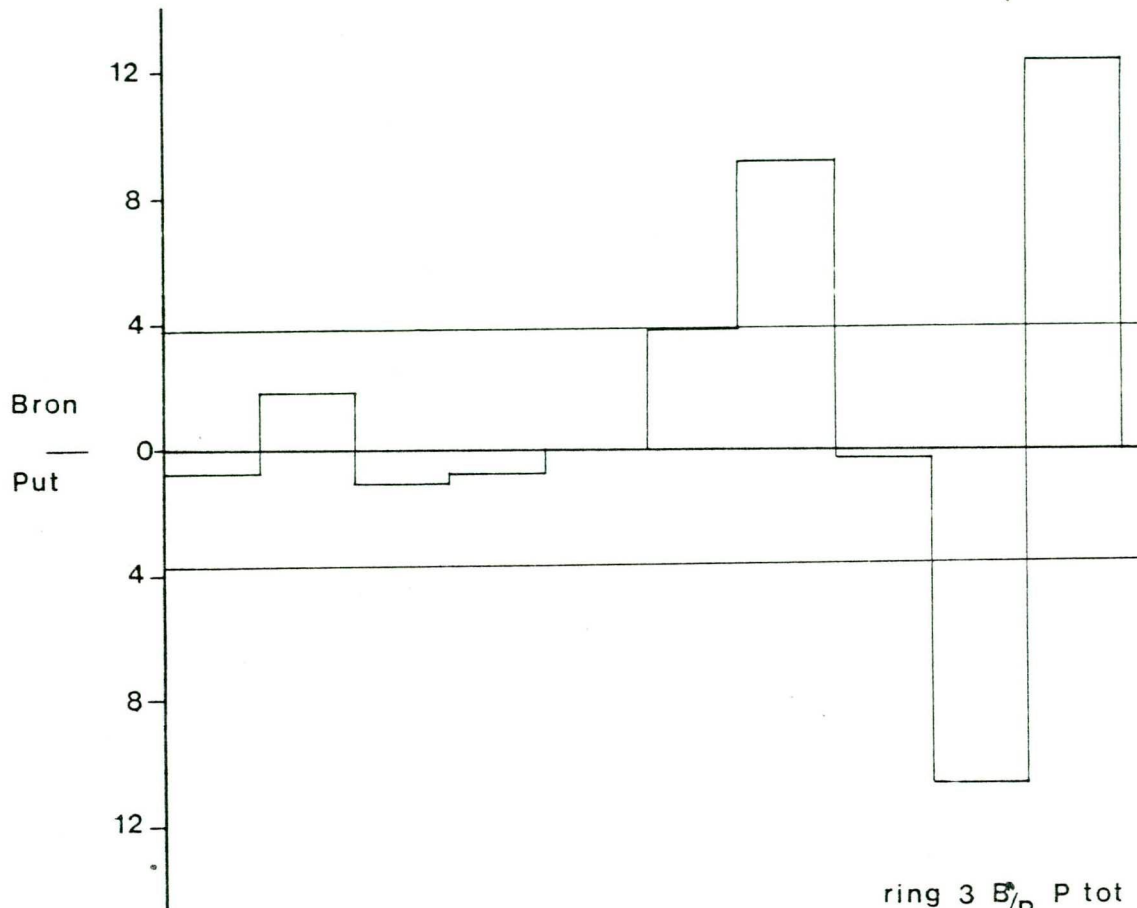
ring.4 B/p P tot



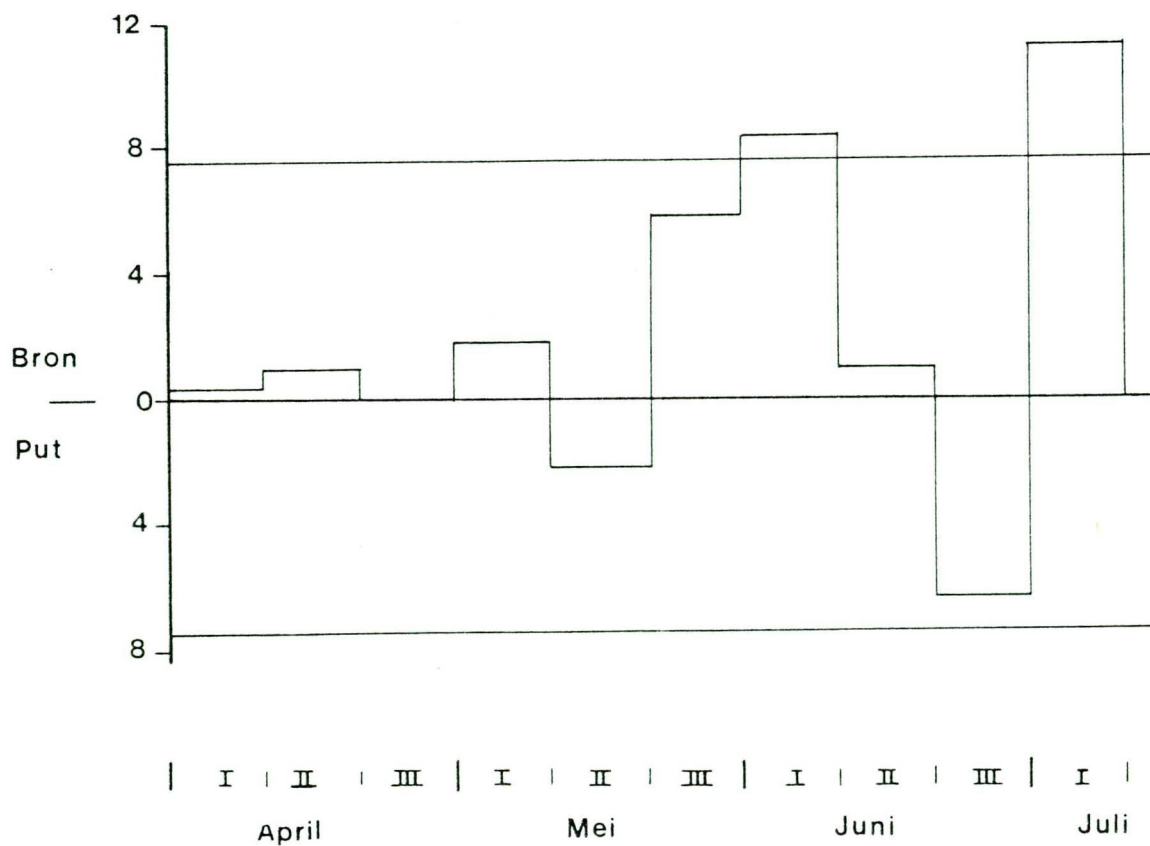
Grammen

RESTTERMEN OP DE MASSABALANSEN

ring 3 B/p O-P04

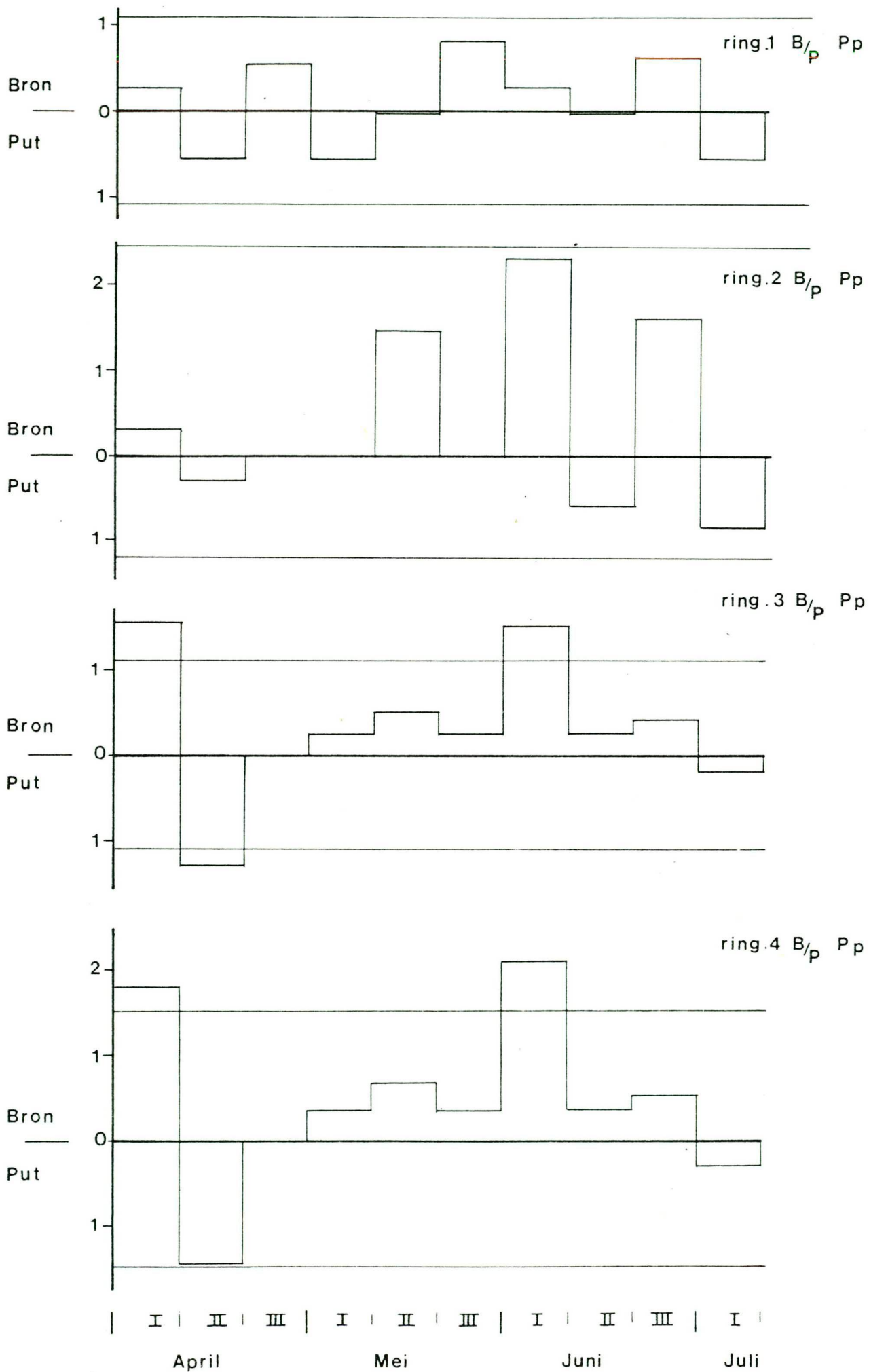


ring 3 B/p P tot

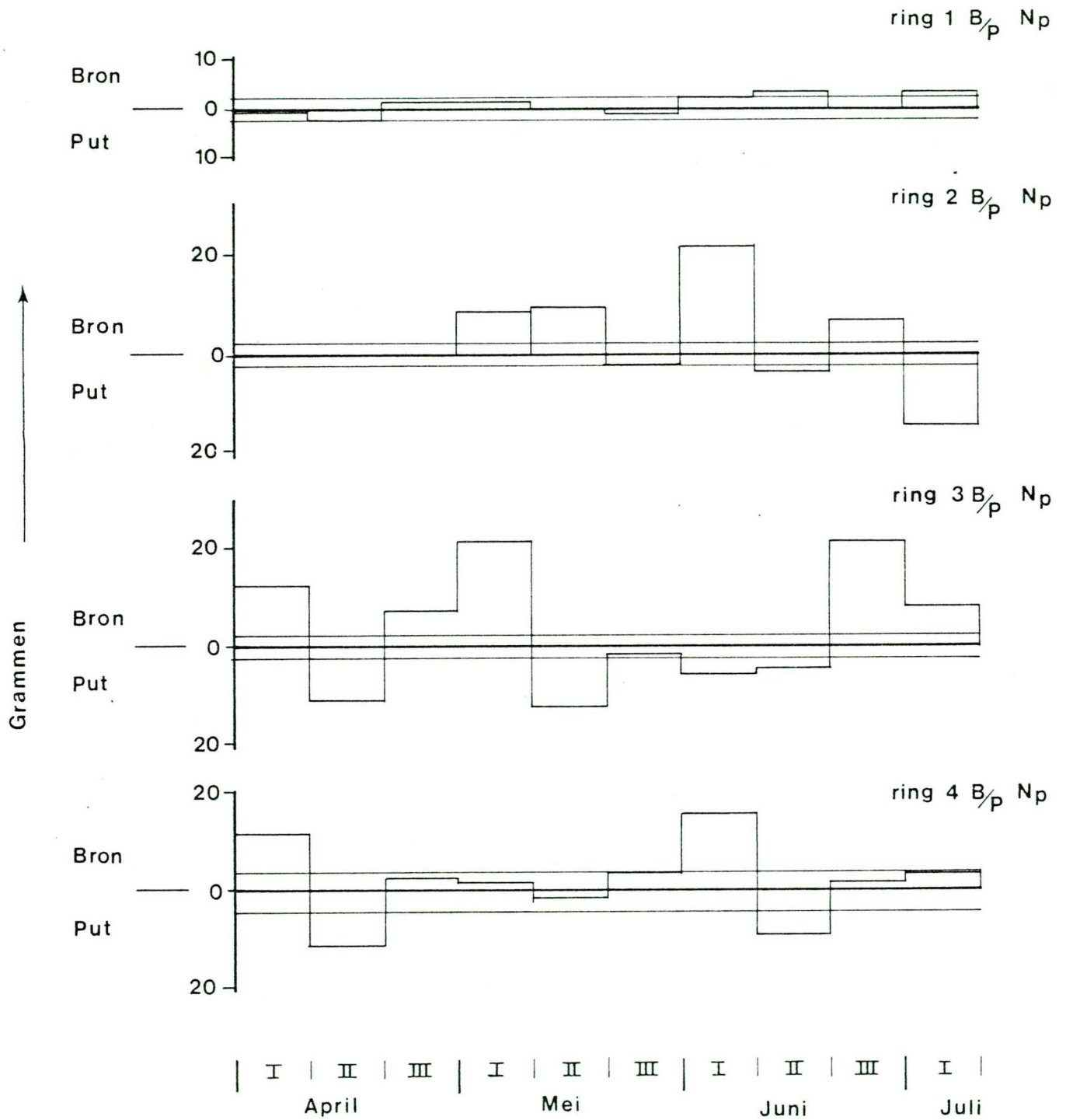


RESTTERMEN OP DE MASSABALANSEN

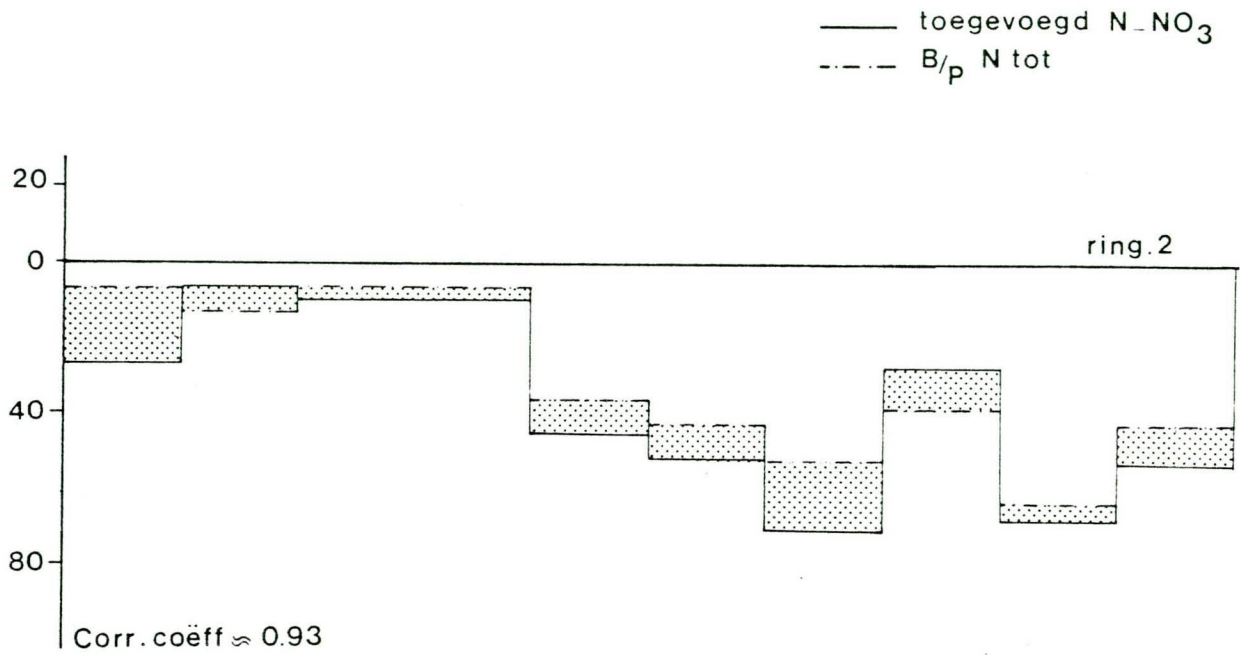
Grammen



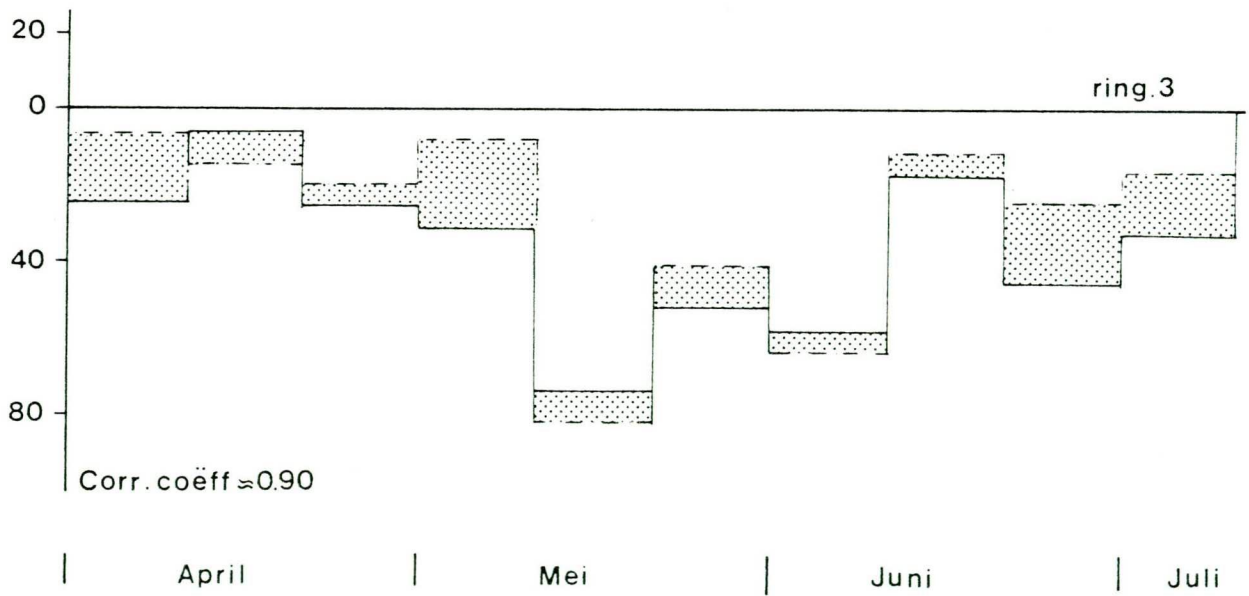
RESTTERMEN OP DE MASSABALANSEN



Bron
-
Put



Bron
-
Put



(D = Decade; TE = totale experiment)

	P-opo ₄		P tot		P part		P org		N ang		N tot		N part		N org	
	D	TE	D	TE	D	TE	D	TE	D	TE	D	TE	D	TE	D	TE
Fout in de neerslagterm (mg):																
1 t/m 4	17	55	17	55	--	--	--	--	226	715	226	715	--	---	--	--

Fout in de accumulatieterm (mg):

ring 1	205	205	410	410	580	580	458	458	410	410	820	820	1160	1160	917	917
ring 2	215	215	430	430	608	608	480	480	430	430	860	860	1216	1216	961	961
ring 3	189	189	379	379	536	536	423	423	379	379	758	758	1072	1072	847	847
ring 4	256	256	512	512	724	724	572	572	512	512	1024	1024	1448	1448	1145	1145

Fout in de toevoeging van NO₃ (geschat op 1% van toeg. hoeveelheid)

ring 2

1084 3428 1084 3428

ring 3

1079 3412 1079 3412

Fout in de Bron/put term (mg)

ring 1	412	424	820	828	1160	1160	916	916	936	1648	1702	2176	2320	2320	1834	1834
ring 2	432	444	860	868	1216	1216	1160	1160	2376	7056	2804	7212	2432	2432	1922	1922
ring 3	380	394	758	766	1072	1072	846	846	2332	7014	2676	7136	2144	2144	1694	1694
ring 4	514	1524	1024	1030	1448	1448	1144	1144	1120	1816	2098	2538	2896	2896	2290	2290

Om een 90 % betrouwbaarheidsinterval te krijgen is 2x de standaardafwijking gebruikt.

Correlaties tussen particuliere nutriënten en chlorofyl

CP/PP:

ring

corr. aant. overschr.
coëf. punt kans

1	$P_{part} = (0.0091 \pm 0.0040) + (0.026 \pm 0.003) C_{part}$	0.7719	60	10^{-3}
2	$P_{part} = (0.0100 \pm 0.0074) + (0.023 \pm 0.002) C_{part}$	0.8214	57	10^{-3}
3	$P_{part} = (0.0581 \pm 0.0111) + (0.023 \pm 0.003) C_{part}$	0.7595	61	10^{-3}
4	$P_{part} = (0.0199 \pm 0.0109) + (0.036 \pm 0.005) C_{part}$	0.6761	61	10^{-3}
5	$P_{part} = (0.0174 \pm 0.0044) + (0.012 \pm 0.005) C_{part}$	0.2750	57	0.05

CP/NP:

1	$N_{part} = (0.006 \pm 0.023) + (0.142 \pm 0.017) C_{part}$	0.7465	60	10^{-3}
2	$N_{part} = (0.035 \pm 0.042) + (0.189 \pm 0.012) C_{part}$	0.8938	63	10^{-3}
3	$N_{part} = (0.184 \pm 0.054) + (0.138 \pm 0.013) C_{part}$	0.8137	63	10^{-3}
4	$N_{part} = (0.103 \pm 0.035) + (0.114 \pm 0.016) C_{part}$	0.6706	63	10^{-3}
5	$N_{part} = (0.031 \pm 0.017) + (0.072 \pm 0.021) C_{part}$	0.4271	55	10^{-3}

PP/NP

1	$N_{part} = (0.029 \pm 0.022) + (3.81 \pm 0.47) P_{part}$	0.7256	61	10^{-3}
2	$N_{part} = (0.044 \pm 0.032) + (7.02 \pm 0.34) P_{part}$	0.9390	58	10^{-3}
3	$N_{part} = (-0.049 \pm 0.056) + (5.25 \pm 0.36) P_{part}$	0.8814	62	10^{-3}
4	$N_{part} = (0.092 \pm 0.025) + (2.67 \pm 0.25) P_{part}$	0.8147	62	10^{-3}
5	$N_{part} = (0.044 \pm 0.015) + (1.46 \pm 0.49) P_{part}$	0.3797	56	10^{-2}

Chl-a/CP: (Chl in $\mu\text{g/l}$)

1	$C_{part} = (0.81 \pm 0.10) + (0.0728 \pm 0.0132) chl-a$	0.5955	57	10^{-3}
2	$C_{part} = (1.31 \pm 0.22) + (0.0570 \pm 0.0074) chl-a$	0.7191	57	10^{-3}
3	$C_{part} = (2.09 \pm 0.31) + (0.0314 \pm 0.0043) chl-a$	0.6799	63	10^{-3}
4	$C_{part} = (1.44 \pm 0.18) + (0.0332 \pm 0.0089) chl-a$	0.4299	63	10^{-3}
5	$C_{part} = (0.70 \pm 0.05) + (0.0108 \pm 0.0031) chl-a$	0.1097	58	N.s.

Chl-a/PP:

1	$P_{part} = (0.030 \pm 0.004) + (0.0019 \pm 0.0005) chl-a$	0.4229	58	10^{-3}
2	$P_{part} = (0.037 \pm 0.008) + (0.0015 \pm 0.0002) chl-a$	0.6538	55	10^{-3}
3	$P_{part} = (0.092 \pm 0.009) + (0.0010 \pm 0.0001) chl-a$	0.7030	63	10^{-3}
4	$P_{part} = (0.051 \pm 0.008) + (0.0025 \pm 0.0004) chl-a$	0.6079	63	10^{-3}
5	$P_{part} = (0.027 \pm 0.002) + (0.0002 \pm 0.0007) chl-a$	0.0372	61	N.s.

Chl-a/NP:

1	$N_{part} = (0.12 \pm 0.02) + (0.0106 \pm 0.0027) chl-a$	0.4620	59	10^{-3}
2	$N_{part} = (0.22 \pm 0.04) + (0.0143 \pm 0.0014) chl-a$	0.7979	59	10^{-3}
3	$N_{part} = (0.33 \pm 0.05) + (0.0077 \pm 0.0008) chl-a$	0.7787	64	10^{-3}
4	$N_{part} = (0.19 \pm 0.03) + (0.0095 \pm 0.0013) chl-a$	0.6685	64	10^{-3}
5	$N_{part} = (0.07 \pm 0.01) + (0.0035 \pm 0.0020) chl-a$	0.2250	57	0.1

Chl/zw.stof

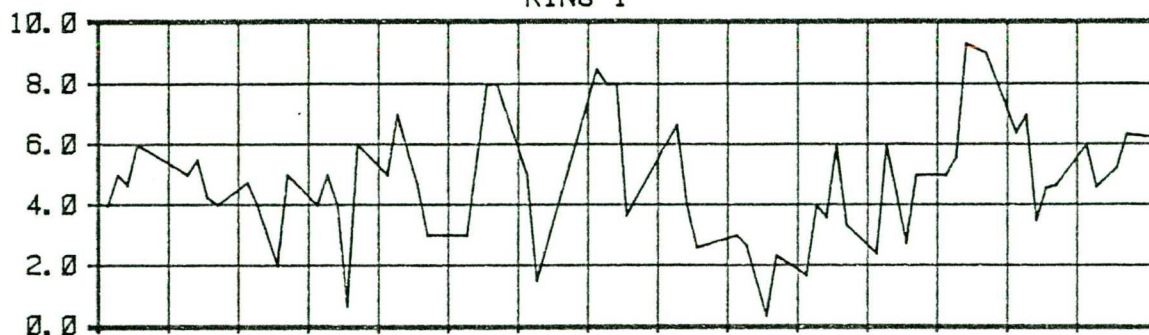
1	zw.stof = (6.62 \pm 0.88) - (0.0056 \pm 0.1526)	chl-a	-0.005368	49	N.s.
2	zw.stof = (4.68 \pm 1.47) + (0.369 \pm 0.057)	chl-a	0.6887	49	10 ⁻³
3	zw.stof = (13.21 \pm 2.21) + (0.086 \pm 0.031)	chl-a	0.3669	52	10 ⁻²
4	zw.stof = (11.15 \pm 1.78) + (0.118 \pm 0.093)	chl-a	0.1754	52	N.s.
5	zw.stof = (7.71 \pm 0.73) - (0.141 \pm 0.185)	chl-a	-0.1074	52	N.s

Correlaties tussen particuliere nutriënten, chlorofyl en feofytine

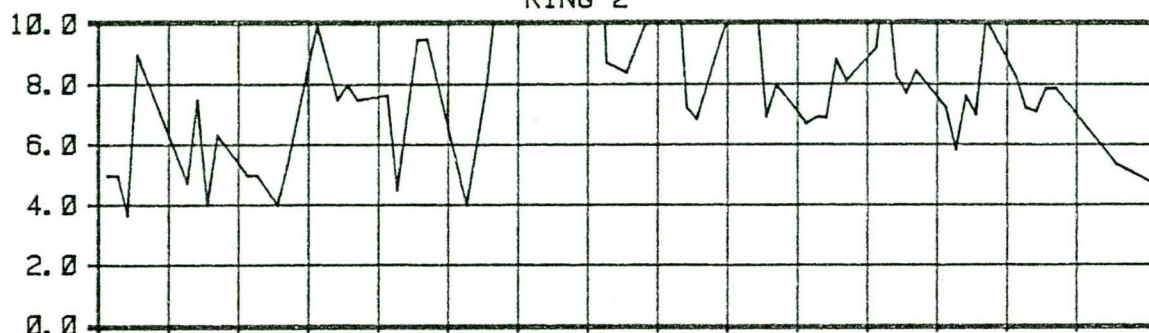
PP																			
ring																			
1	P_p	=	(0.029	\pm	0.004)	+	(0.0003	\pm	0.00010)	feo	+	(0.0019	\pm	0.0006)	chl	0.4320	10^{-3}		
2	p_p	=	(0.033	\pm	0.009)	+	(0.0008	\pm	0.0009	)	feo	+	(0.0015	\pm	0.0003)	chl	0.6595	10^{-3}
3	P_p	=	(0.093	\pm	0.011)	-	(0.0001	\pm	0.0004	)	feo	+	(0.0010	\pm	0.0001)	chl	0.7037	10^{-3}
4	P_p	=	(0.059	\pm	0.009)	-	(0.0016	\pm	0.0008	)	feo	+	(0.0027	\pm	0.0004)	chl	0.6358	10^{-3}
5	P_p	=	(0.027	\pm	0.003)	-	(0.0005	\pm	0.0008	)	feo	+	(0.0004	\pm	0.0008)	chl	0.0881	N.s.
CP																			
1	C_p	=	(0.780	\pm	0.104)	+	(0.020	\pm	0.024)	feo	+	(0.069	\pm	0.014)	chl	0.6023	10^{-3}
2	C_p	=	(1.272	\pm	0.264)	+	(0.008	\pm	0.028)	feo	+	(0.056	\pm	0.008)	chl	0.7196	10^{-3}
3	C_p	=	(1.960	\pm	0.355)	+	(0.0084	\pm	0.0113	)	feo	+	(0.0306	\pm	0.0045)	chl	0.6835	10^{-3}
4	C_p	=	(1.387	\pm	0.200)	+	(0.0112	\pm	0.0184	)	feo	+	(0.0313	\pm	0.0095)	chl	0.4355	10^{-3}
5	C_p	=	(0.686	\pm	0.052)	+	(0.0149	\pm	0.0150	)	feo	+	(0.0032	\pm	0.0152)	chl	0.1719	N.s.
NP																			
1	N_p	=	(0.110	\pm	0.021)	+	(0.0040	\pm	0.0048	)	feo	+	(0.0101	\pm	0.0029)	chl	0.4887	10^{-3}
2	N_p	=	(0.190	\pm	0.051)	+	(0.0061	\pm	0.0056	)	feo	+	(0.0137	\pm	0.0015)	chl	0.8027	10^{-3}
3	N_p	=	(0.307	\pm	0.055)	+	(0.0020	\pm	0.0018	)	feo	+	(0.0074	\pm	0.0008)	chl	0.7833	10^{-3}
4	N_p	=	(0.182	\pm	0.028)	+	(0.0012	\pm	0.0027	)	feo	+	(0.0092	\pm	0.0015)	chl	0.6698	10^{-3}
5	N_p	=	(0.066	\pm	0.008)	+	(0.0055	\pm	0.0022	)	feo	+	(0.0006	\pm	0.0023)	chl	0.3844	10^{-2}

GREVELINGEN 1980 N-part/P-part

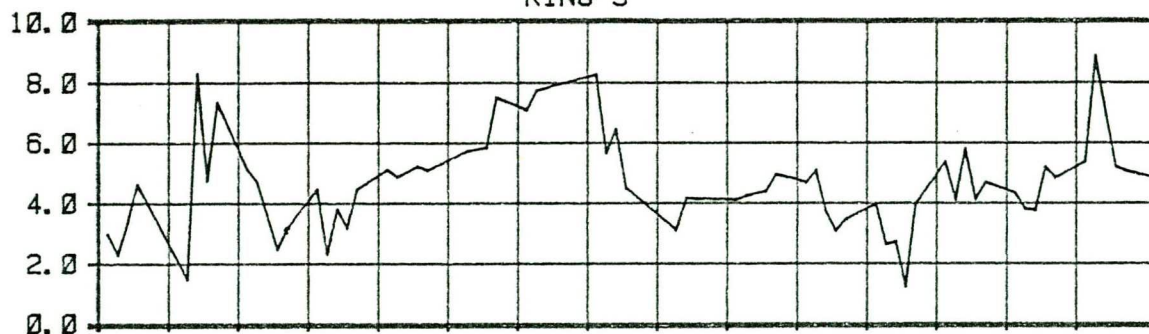
RING 1



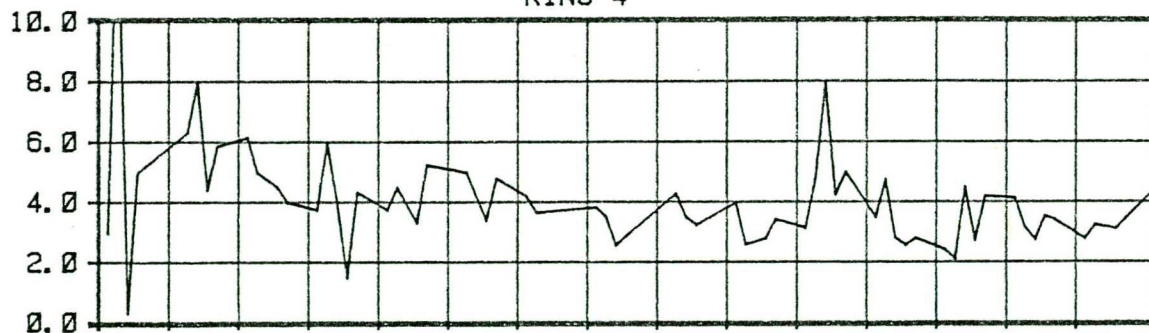
RING 2



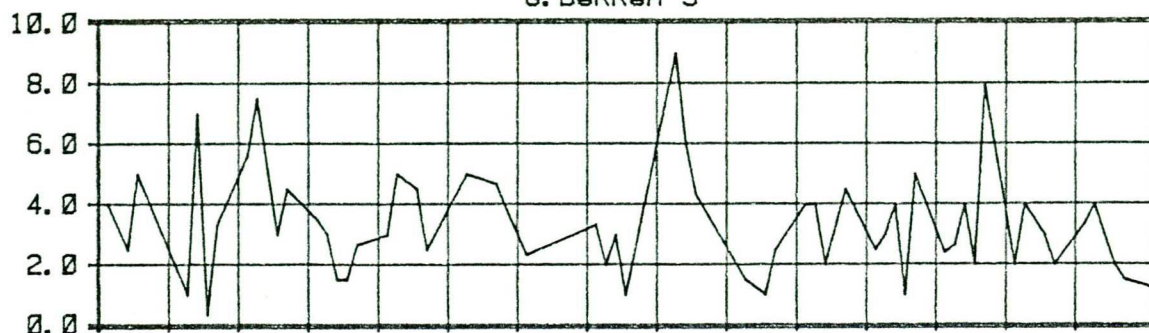
RING 3



RING 4

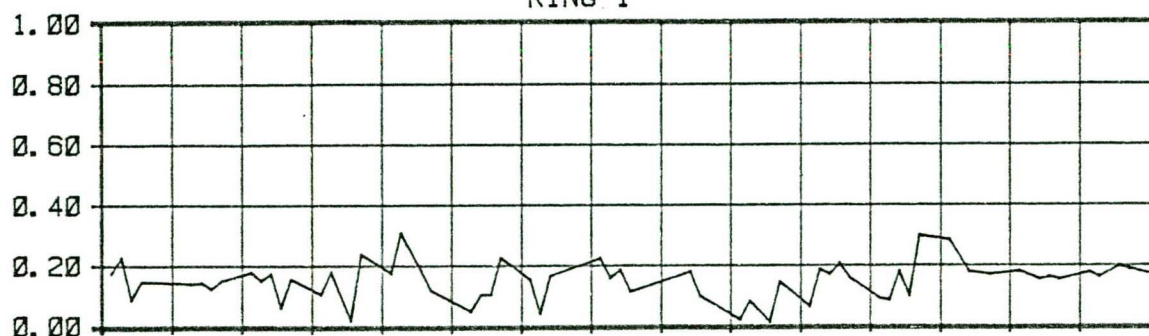


G. bekken 5

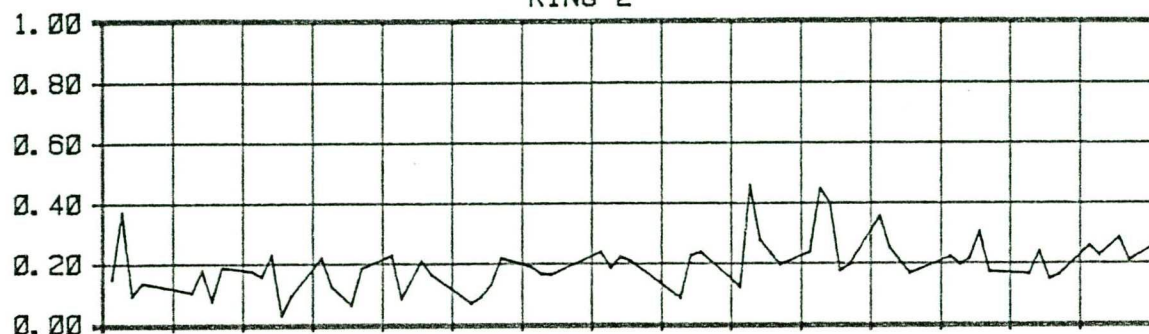


GREVELINGEN 1980 N-part/C-part

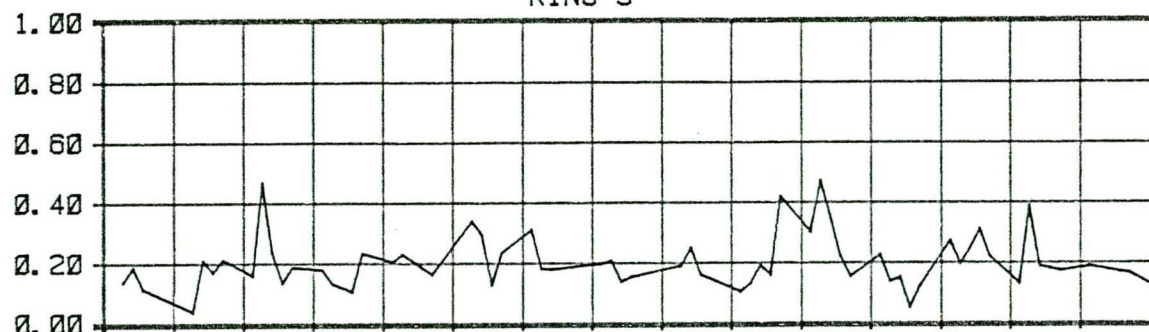
RING 1



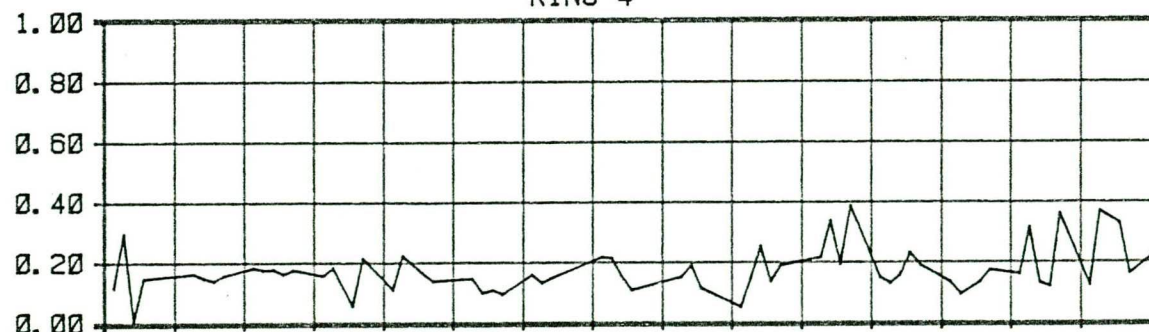
RING 2



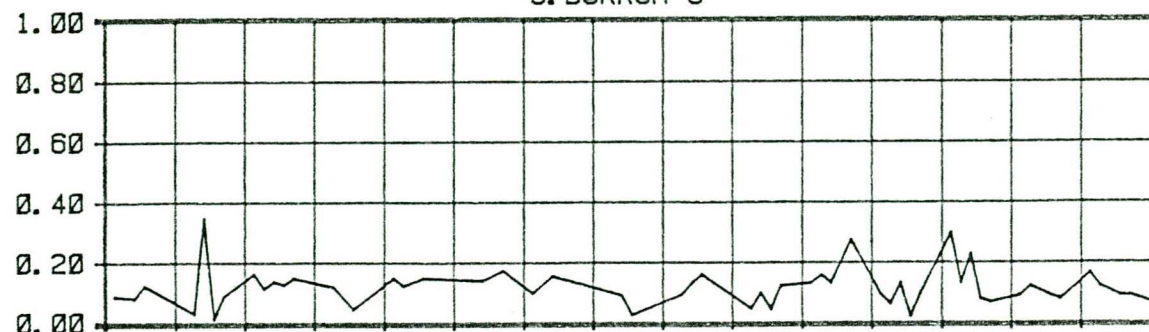
RING 3



RING 4

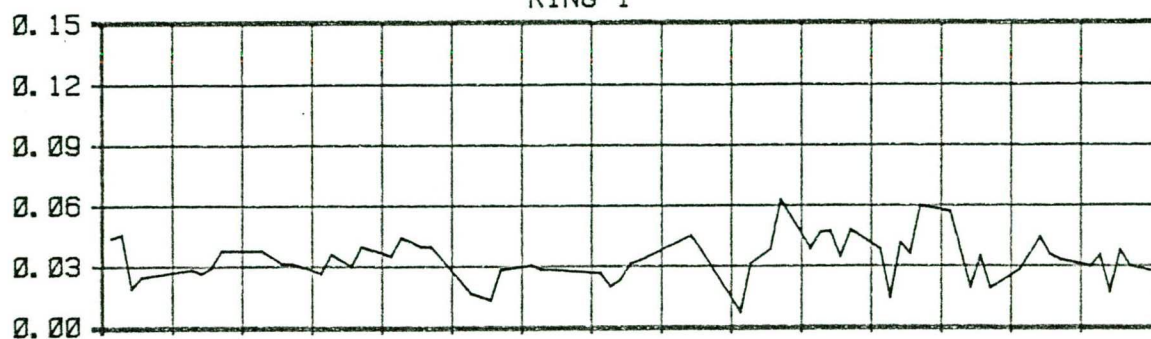


G. bekken 5

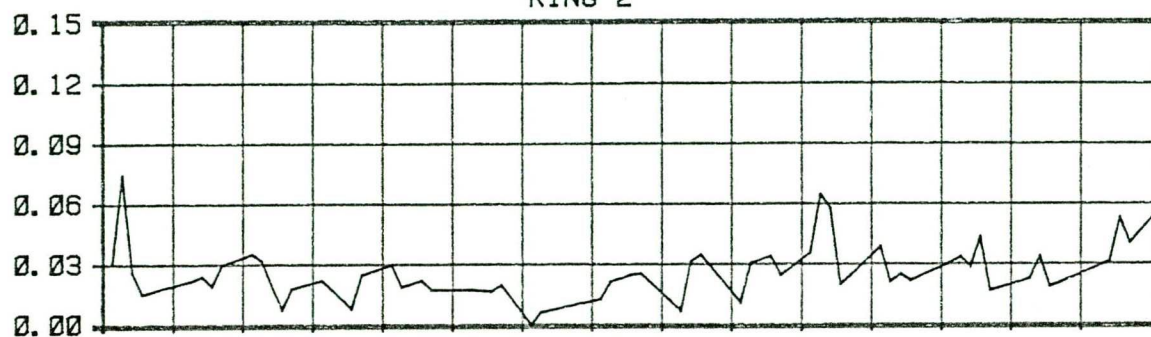


GREVELINGEN 1980 P-part/C-part

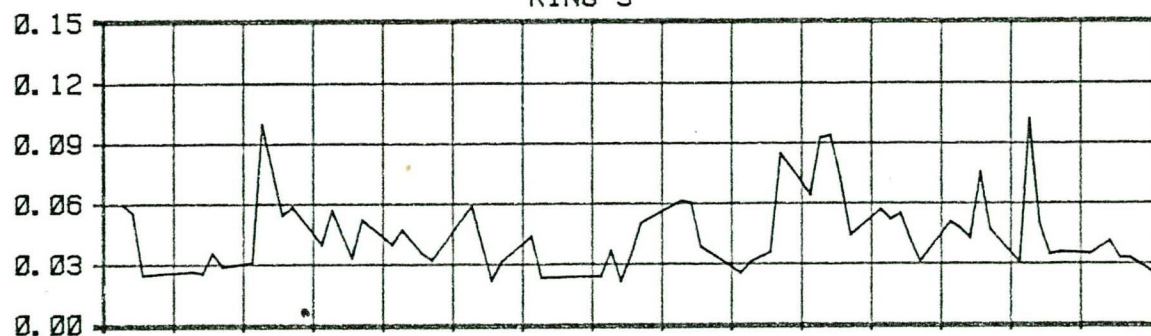
RING 1



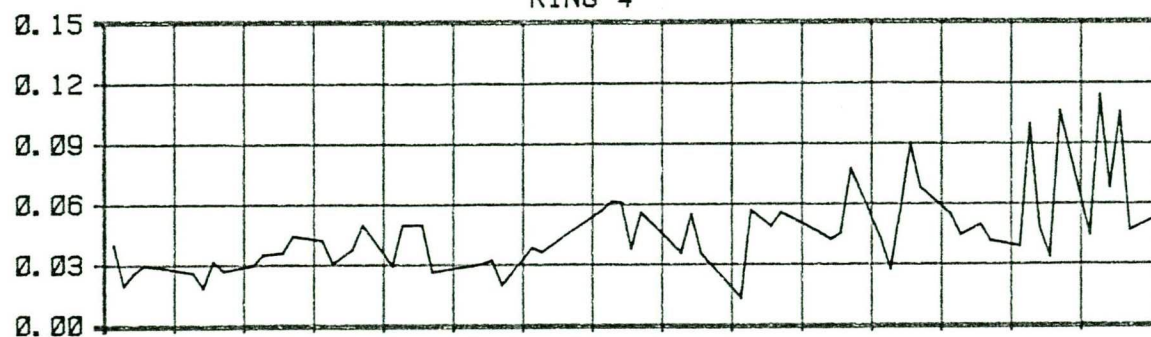
RING 2



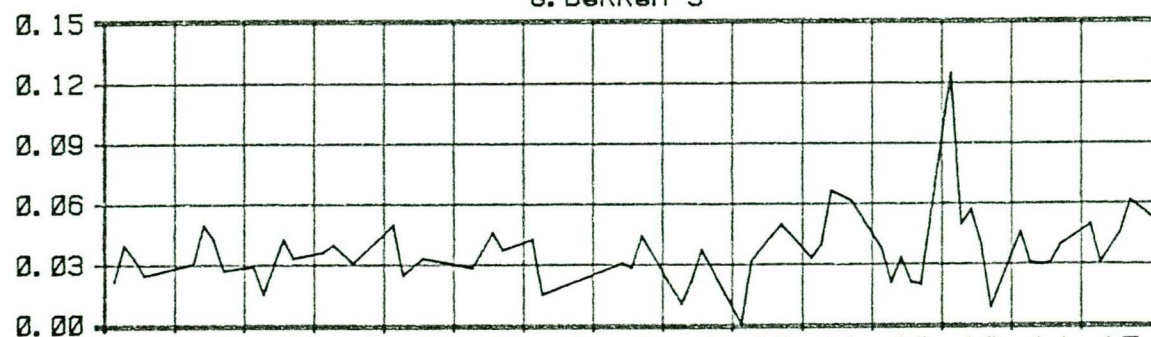
RING 3



RING 4

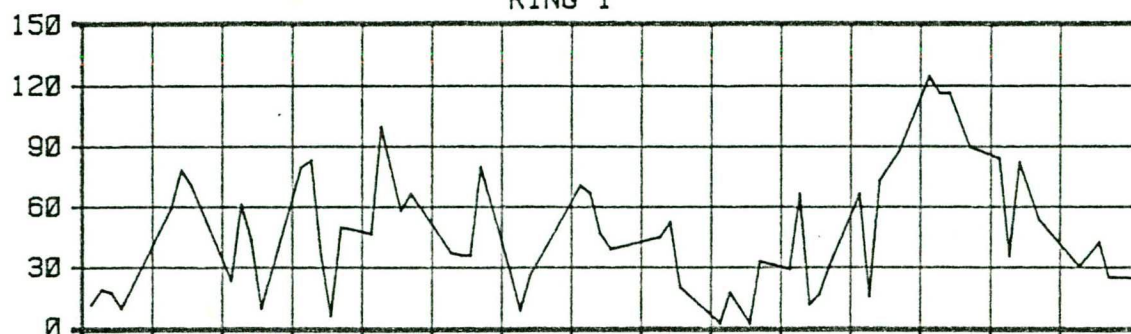


G. bekken 5

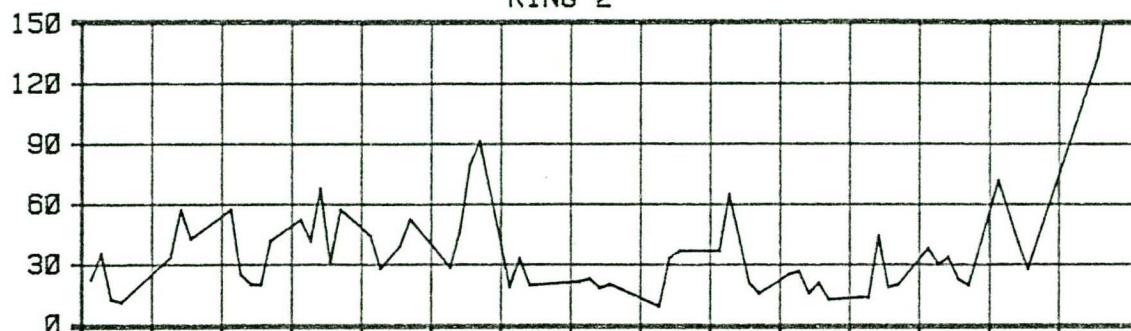


GREVELINGEN 1980 N-part/Chlorofyl

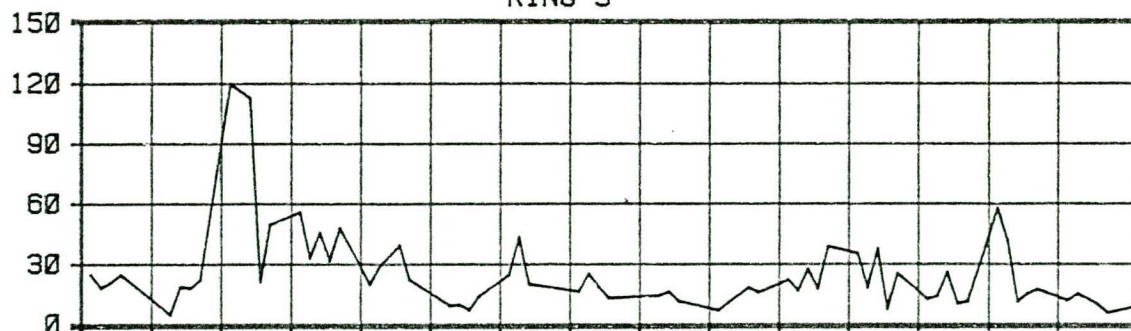
RING 1



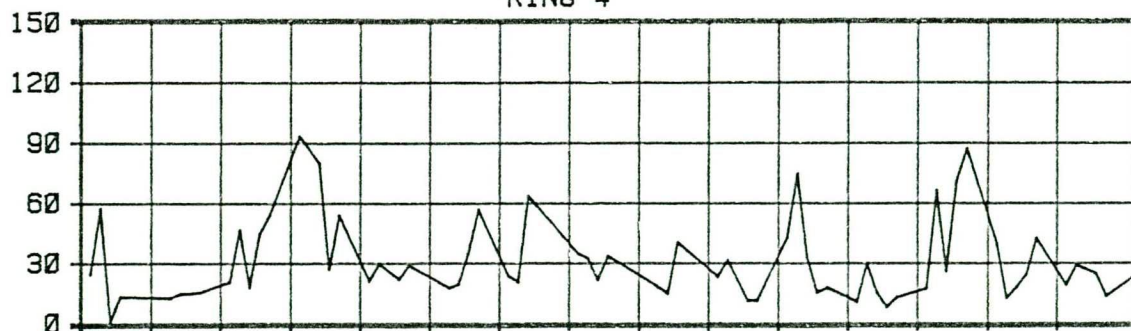
RING 2



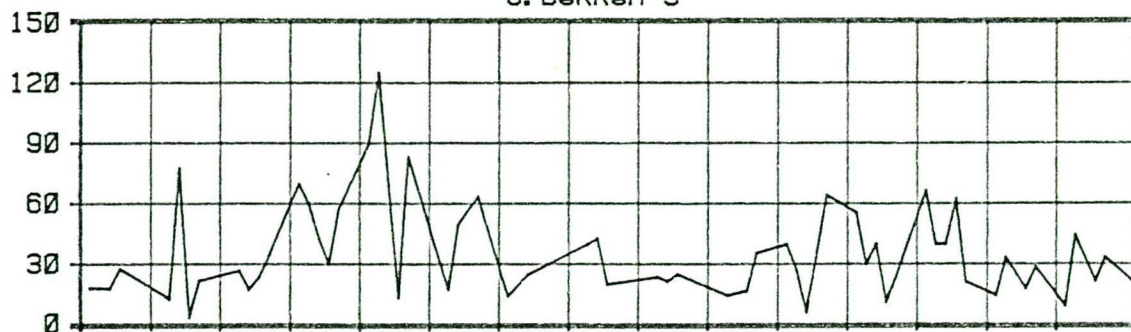
RING 3



RING 4

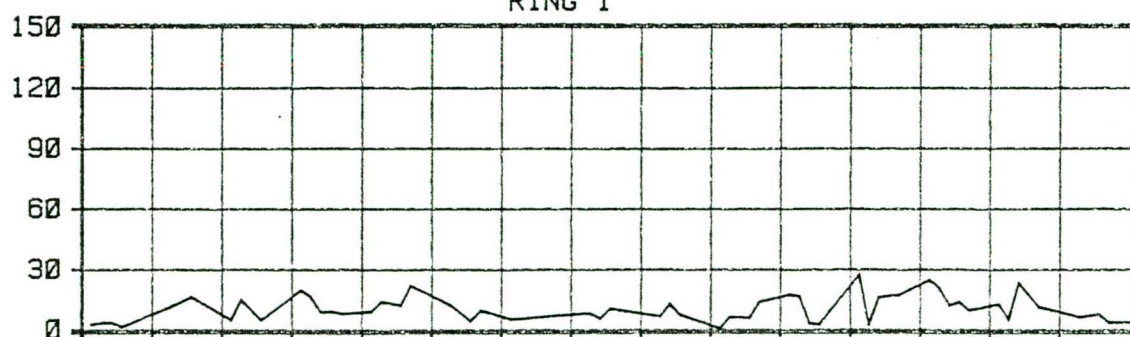


G. bekken 5

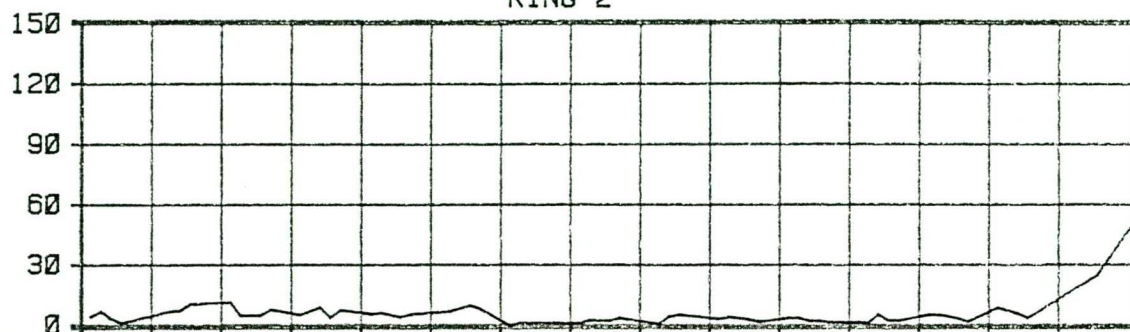


GREVELINGEN 1980 P-part/Chlorofyl

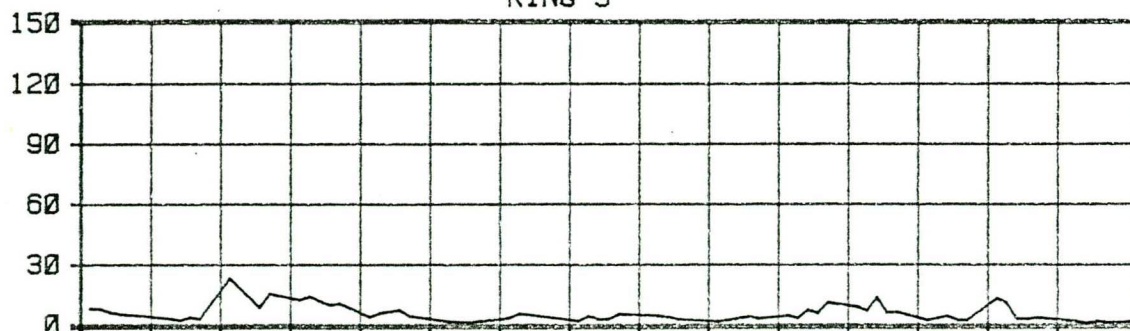
RING 1



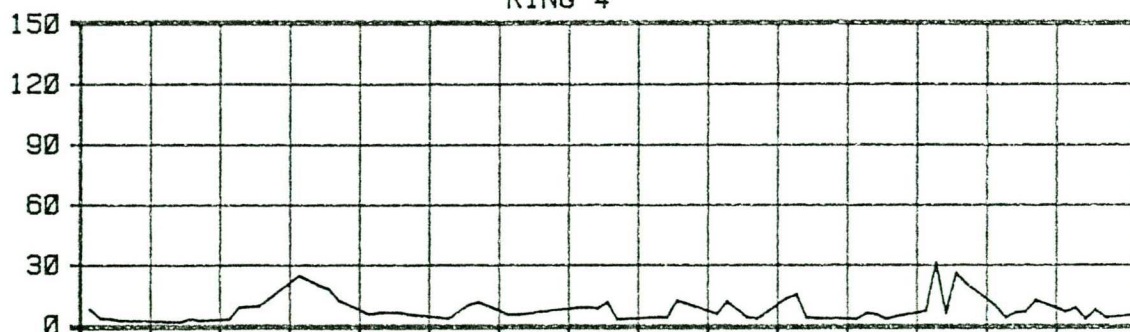
RING 2



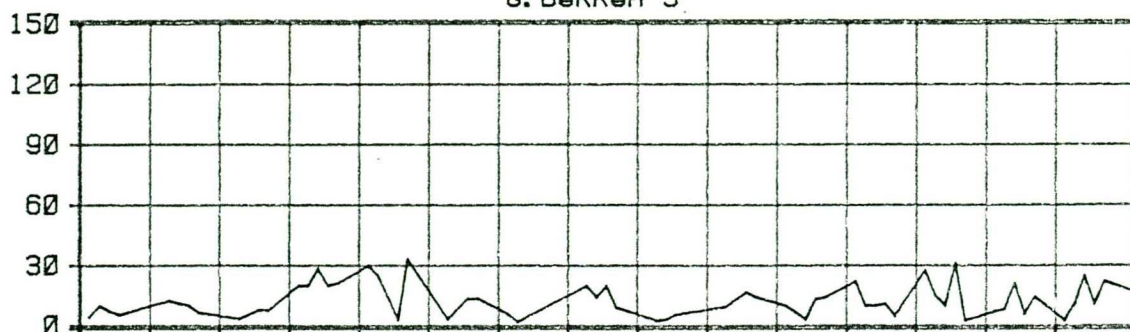
RING 3



RING 4

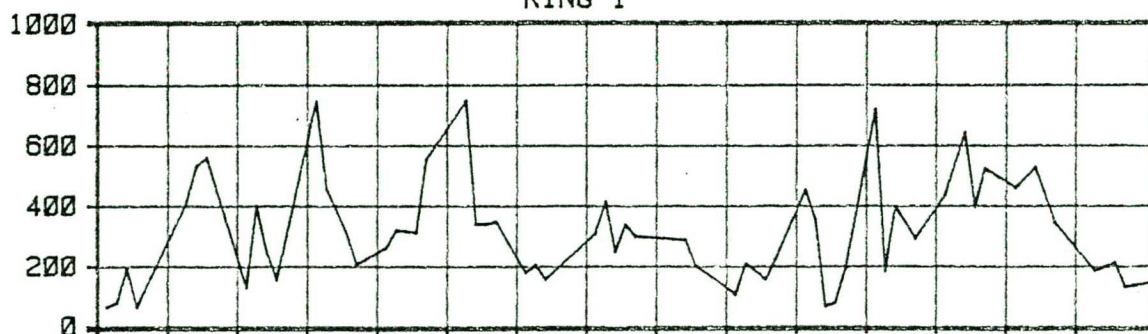


G. bekken 5

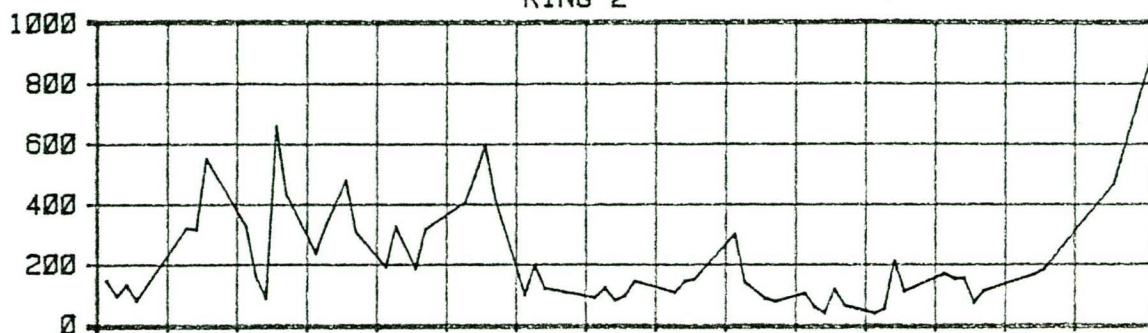


GREVELINGEN 1980 C-part/Chlorofyl

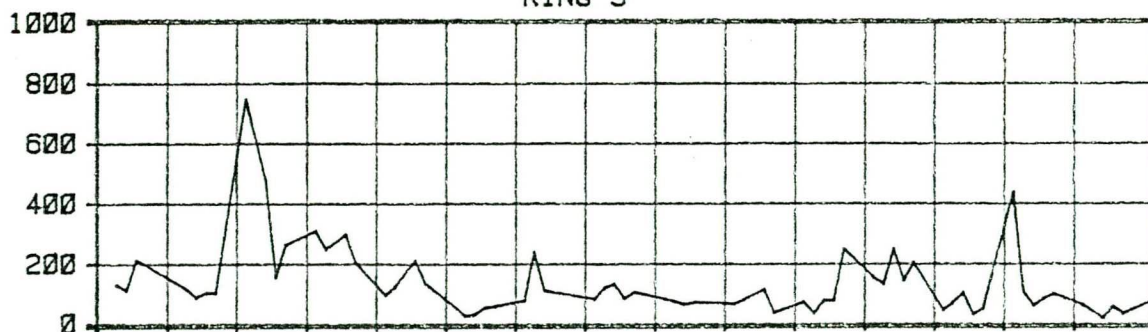
RING 1



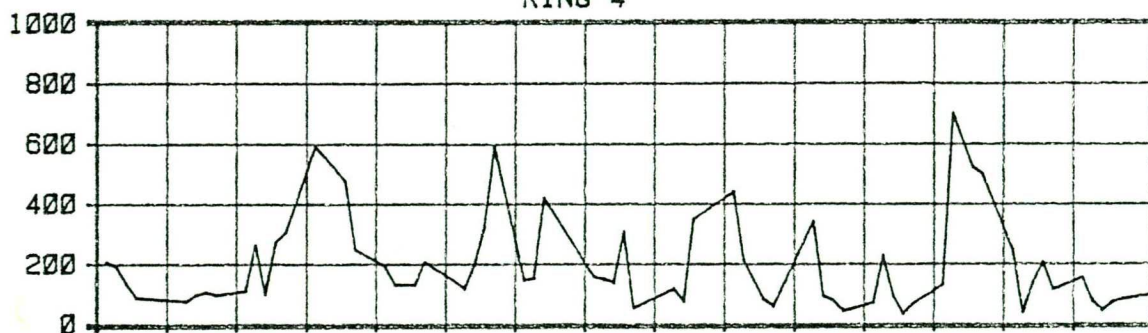
RING 2



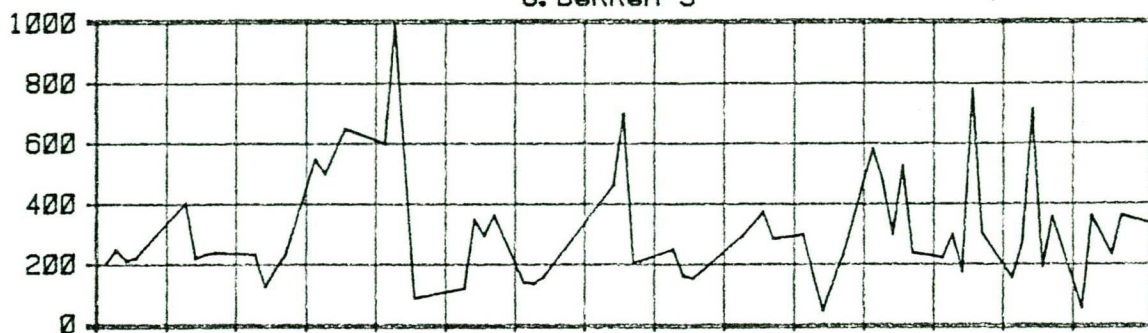
RING 3



RING 4



G. bekken 5



31/3

14/7

Productieparameters

ring 1

datum	T °C	chl-a p.p.b.	C _{part} p.p.m.	k _{e-1} m ⁻¹	initiële helling	I _{opt} w/m ²	P-opt mgC/mg ¹ chl-a	Dagprod. mgC/m ²
2/4	6.5	8.0	1.55	1.0	0.05	129.42	3.10	227
10/4	7.0	2.4	1.35	1.1	0.13	119.62	3.80	71
17/4	9.5	6.0	0.95	0.9	0.09	262.98	2.03	122
24/4	9.5	3.2	1.00	0.9	0.25	116.19	6.92	160
8/5	10.0	2.2	0.75	0.5	0.08	104.35	4.77	124
13/5	12.0	3.4	0.70	0.8	0.25	375.93	6.06	254
5/6	17.5	9.8	1.55	1.2	0.11	398.98	3.24	344
12/6	17.5	14.0	1.15	0.7	0.12	406.84	8.09	1087
19/6	16.7	2.8	2.20	1.5	0.16	159.50	5.63	160
26/6	16.0	6.4	2.55	1.7	0.10	131.22	3.36	187
2/7	14.5	3.4	1.80	1.3	0.19	209.28	6.38	155
9/7	15.0	2.8	3.50	1.3	0.56	311.23	11.53	162
gemiddeld					0.1752		5.4101	
					± 0.1365		± 2.6470	

ring 2

2/4	6.5	8.6	1.15	1.1	0.13	110.17	1.90	178
10/4	7.0	2.8	1.55	1.2	0.11	227.32	2.78	57
17/4	9.5	4.0	2.65	1.8	0.21	87.86	2.47	146
24/4	9.5	2.6	1.25	1.1	0.22	144.35	7.54	118
8/5	10.0	2.0	1.20	0.8	0.27	141.87	9.02	207
13/5	12.0	7.8	1.55	1.1	0.30	146.36	10.96	1007
5/6	17.5	24.8	2.20	1.5	0.17	141.84	8.59	2121
12/6	17.5	40.0	4.75	2.4	0.45	128.41	12.10	4789
19/6	16.7	57.0	6.40	3.8	0.22	97.91	7.28	1815
26/6	16.0	43.2	3.20	3.0	0.32	99.34	7.59	2441
2/7	14.5	31.4	5.30	4.6	0.32	90.92	8.32	1049
9/7	15.0	1.4	6.00	1.2	0.05	131.67	6.33	16
					0.2308		7.0738	
					± 0.1083		± 3.2404	

ring 3

datum	T °C	chl-a C p.p.b.p.p.m.	C _{part} p.p.m.	k _{e1} m ⁻¹	initiële helling	I-opt W/m ²	P-opt mgC/mg chl-a	Dagprod. mgC/m ²
2/4	6.5	8.0	0.90	1.1	0.07	96.25	3.17	243
10/4	7.0	23.6	2.50	1.7	0.14	115.68	3.04	531
17/4	9.5	4.0	1.10	1.8	0.07	122.79	2.47	170
24/4	9.5	5.0	1.50	1.2	0.20	120.08	5.80	188
8/5	10.0	132.2	7.30	3.5	0.31	84.67	2.63	3506
13/5	12.0	32.0	7.70	4.3		(78.97)		4912
5/6	17.5	45.4	5.25	2.2	0.08	120.89	2.00	927
12/6	17.5	34.6	2.75	1.7	0.12	125.87	2.39	1266
19/6	16.7	13.0	1.90	1.6	0.17	160.80	7.28	884
26/6	16.0	56.0	1.85	2.7	0.26	204.20	7.74	2922
2/7	14.5	92.8	5.60	6.5	0.24	275.83	3.40	1079
9/7	15.0	272.8	5.30	7.0	0.13	412.56	1.76	886
gemiddeld					0.1625		3.7887	
					± 0.0810		± 2.1284	

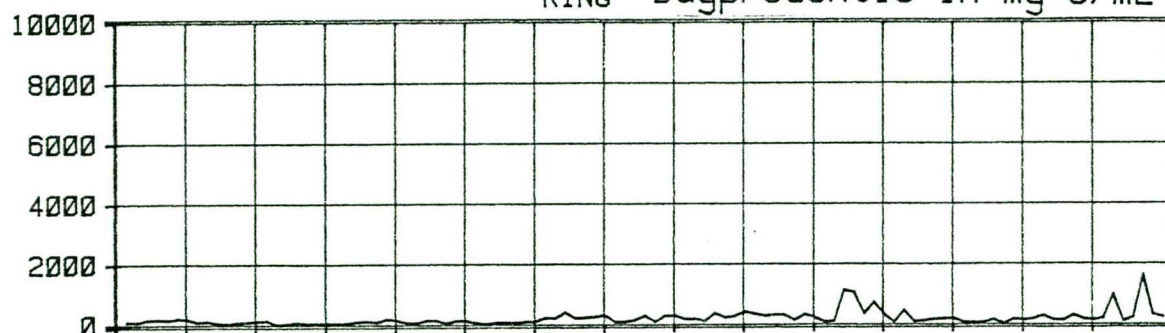
ring 4

2/4	6.5	8.4	1.15	1.1	0.16	515.68	1.9	166
10/4	7.0	20.2	2.20	1.6	0.13	92.19	2.56	411
17/4	9.5	7.0	2.20	1.0	0.10	106.11	3.00	222
24/4	9.5	2.2	1.05	1.0	0.12	248.16	3.51	48
8/5	10.0	4.8	1.55	1.1	0.09	100.24	2.91	157
13/5	12.0	10.6	1.65	1.2	0.15	234.57	5.21	611
5/6	17.5	23.8	2.04	1.4	0.50	145.54	15.04	4019
12/6	17.5	21.6	1.75	1.6	0.17	218.61	8.88	1806
19/6	16.7	42.8	1.55	1.5	0.18	122.27	6.89	3073
26/6	16.0	4.2	2.20	2.4	0.14	112.08	10.14	256
2/7	14.5	23.8	3.35	3.3	0.44	159.94	11.31	1326
9/7	15.0	47.4	2.20	2.5	0.09	203.60	2.40	343
gemiddeld					0.1889		6.1454	
					± 0.1355		± 4.2933	

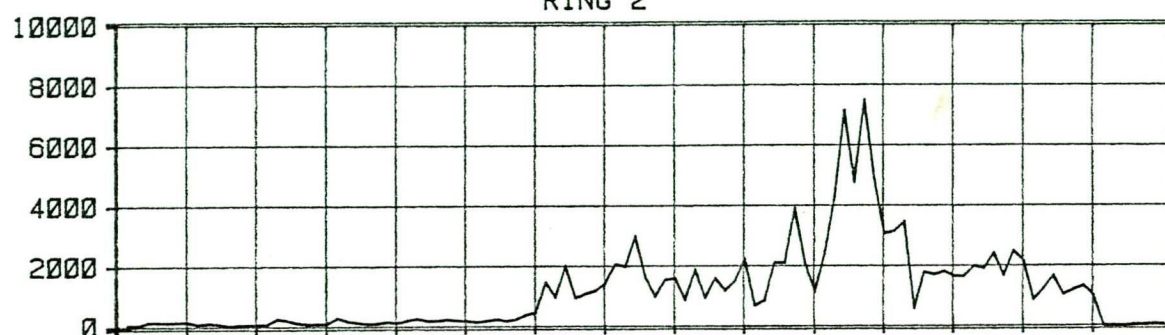
Grevelingen

datum	T °C	chl-a C _{part} p.p.b.p.p.m.	k _{e-1} m	initiële helling	I-opt W/m ²	P-opt mgC/mg <i>h</i> Chl-a	dagprod. mgC/m ²
2/4	6.5	2.8 0.60	0.6	0.15	180.93	3.1 3	94
10/4	7.0	3.0 0.70	0.8	0.12	109.71	3.3 8	86
17/4	9.5	3.8 0.70	0.7	0.20	436.59	4.4 3	169
24/4	9.5	1.0 0.65	0.7	0.07	54.34	1.36	14
8/5	10.0	2.2 0.65	0.6	0.17	105.61	3.4 9	92
13/5	12.0	4.8 0.65	1.3	0.05	140.17	2.49	134
5/6	17.5	2.4 0.80	1.7	0.18	304.83	5.7 1	132
12/6	17.5	3.0 0.60	0.9	0.10	747.24	5.3 9	152
19/6	16.7	1.8 0.95	0.9	0.17	184.27	8.12	153
26/6	16.0	1.6 1.25	1.0	0.18	306.76	8.7 5	112
2/7	14.5	1.4 1.00	0.8	0.08	152.97	7.04	58
9/7	15.0	1.2 0.65	0.9	0.58	201.09	17.9 1	99
gemiddeld				0.1709		5.9252	
				\pm 0.1371		\pm 4.4042	

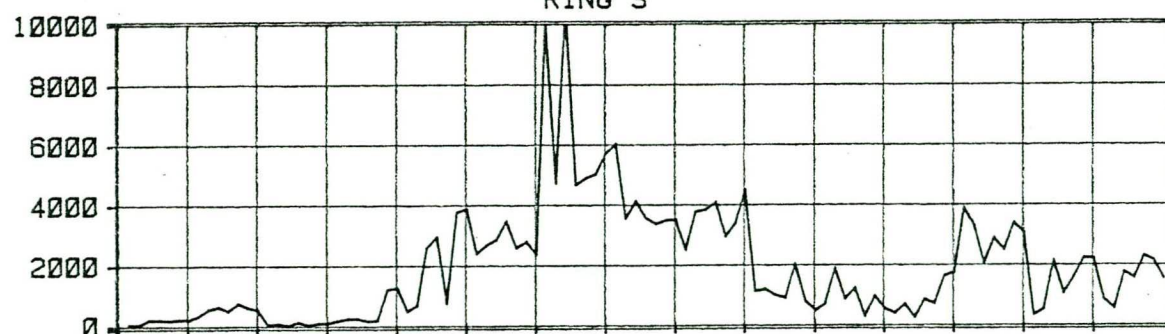
GREVELINGEN 1980

RING Dagproductie in mg C/m²

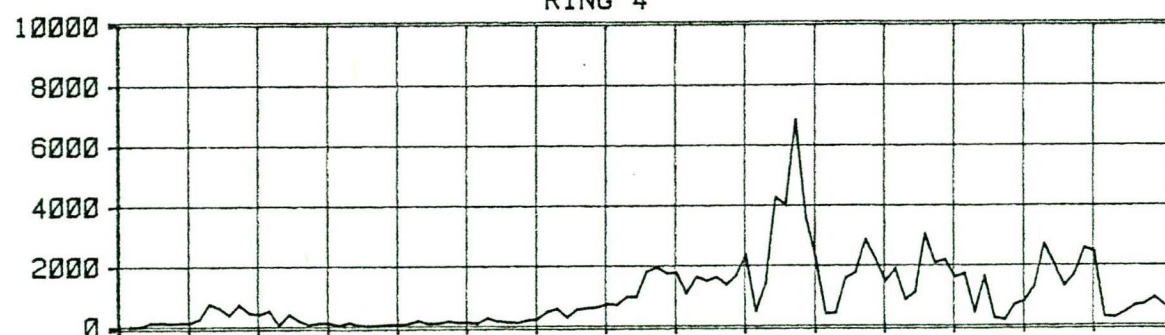
RING 2



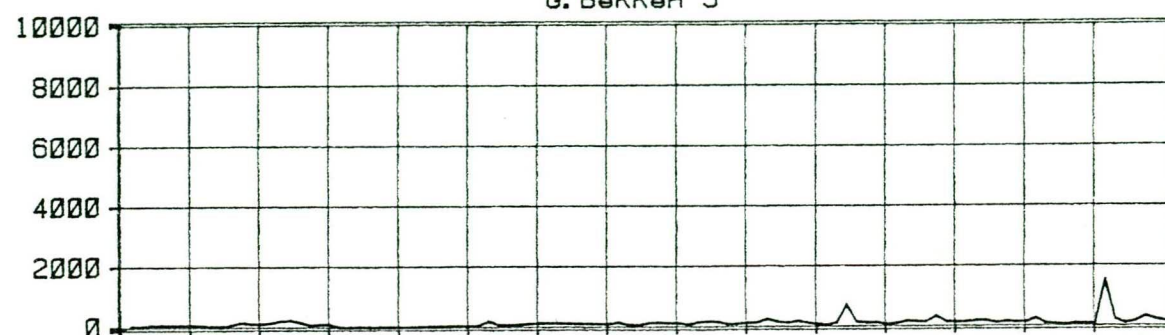
RING 3

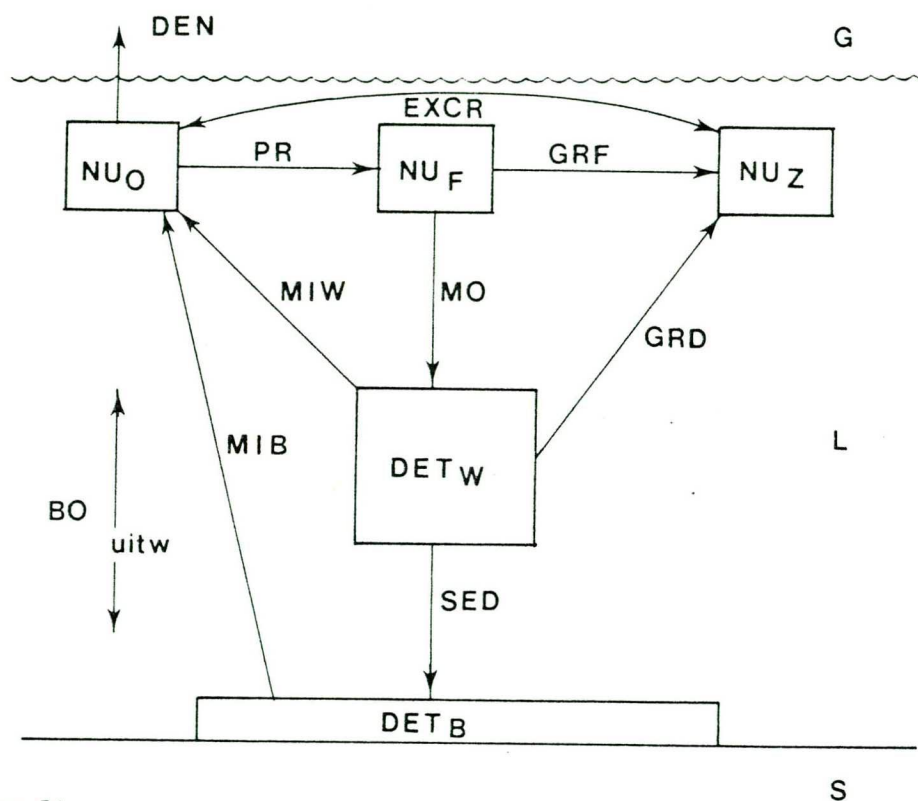


RING 4



G. bekken 5





Zuurstofverbruik en Mineralisatie in de Waterfase (mg C/l.h)

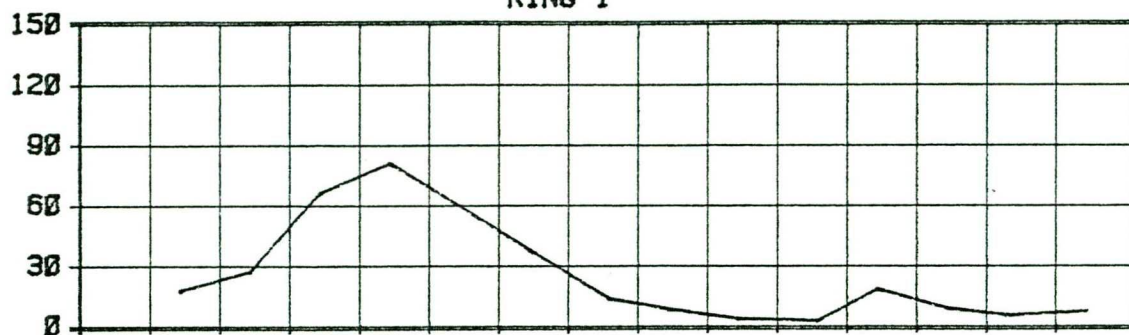
Datum	ring 1		ring 2		ring 3		ring 4		Grevelingen	
	O ₂ verbr.	MIW	O ₂ verbr.	MIW	O ₂ verbr.	MIW	O ₂ verbr.	MIW	O ₂ verb.	MIW
9/4	0.0100	0.0089	0.0123	0.0109	0.0185	0.0105	0.0134	0.0053	0.0023	0.0017
14/4	0.0137	0.0114	0.0141	0.0133	0.0308	0.0300	0.0199	0.0150	0.0134	0.0114
17/4	0.0204	0.0188	0.0187	0.0173	0.0100	0.0082	0.0200	0.0181	0.0131	0.0114
21/4	0.0091	0.0086	0.0084	0.0039	0.0072	0.0059	0.0063	0.0053	0.0061	0.0058
24/4	0.0075	0.0053	0.0063	0.0043	0.0097	0.0068	0.0059	0.0051	0.0051	0.0050
28/4	0.0064	0.0042	0.0092	0.0053	0.0150	0.0046	0.0053	0.0028	0.0073	0.0072
1/5	0.0067	0.0056	0.0071	0.0031	0.0164	0.0119	0.0103	0.0074	0.0071	0.0055
8/5	0.0100	0.0095	0.0063	0.0045	0.0203	0	0.0094	0.0080	0.0086	0.0079
12/5	0.0075	0.0063	0.0085	0.0025	0.0238	0	0.0096	0.0012	0.0044	0.0030
19/5	0.0079	0.0070	0.0393	0.0245	0.0381	0.0087	0.0111	0.0032	0.0062	0.0049
29/5	0.0100	0.0077	0.0205	0.0116	0.0203	0	0.0099	0.0022	0.0074	0.0052
2/6	0.0135	0.0092	0.0293	0.0162	0.0625	0.0377	0.0129	0.0080	0.0061	0.0034
5/6	0.0227	0.0190	0.0409	0.0196	0.0447	0.0356	0.0230	0	0.0146	0.0132
9/6	0.0122	0.0092	0.0363	0	0.0181	0.0097	0.0251	0.0132	0.0080	0.0069
16/6	0.0183	0.0171	0.0456	0	0.0143	0.0109	0.0153	0	0.0291	0.0279
23/6	0.0149	0.0138	0.0307	0.0163	0.0429	0.0013	0.0261	0.0041	0.0079	0.0064
gem.	0.0119	0.0101	0.0208	0.0096	0.0245	0.0114	0.0136	0.0062	0.0092	0.0079

	Correlaties	significantie
ring 1	tot O ₂ verbr//C _{part}	0.05
	tot O ₂ verbr//Chl-a	0.05
	MIW//C _{part}	0.10
	MIW//Chl-a	N.S.
ring 2	tot O ₂ verbr//C _{part}	0.001
	tot O ₂ verbr//Chl-a	0.001
	MIW//C _{part}	N.S.
	MIW//Chl-a	N.S.
ring 3	tot O ₂ verbr//C _{part}	0.001
	tot O ₂ verbr//Chl-a	0.01
	MIW//C _{part}	N.S.
	MIW//Chl-a	N.S.

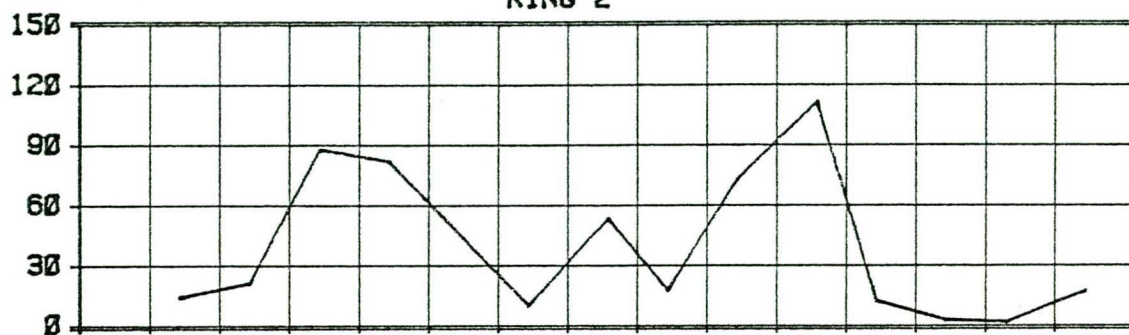
	Correlaties	significantie
ring 4	tot O ₂ //C _{part}	0.01
	tot O ₂ //Chl-a	0.05
	MIW//C _{part}	N.S.
	MIW//Chl-a	N.S.
ring 1 t/m 4	tot O ₂ //C _{part}	0.001
	tot O ₂ //Chl-a	0.001
	MIW//C _{part}	0.05
	MIW//Chl-a	N.S.

GREVELINGEN 1980 Zooplankton in mg/m³ C

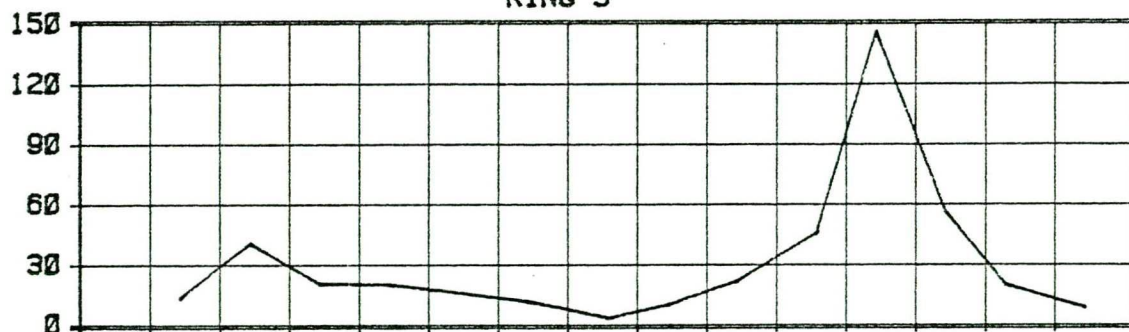
RING 1



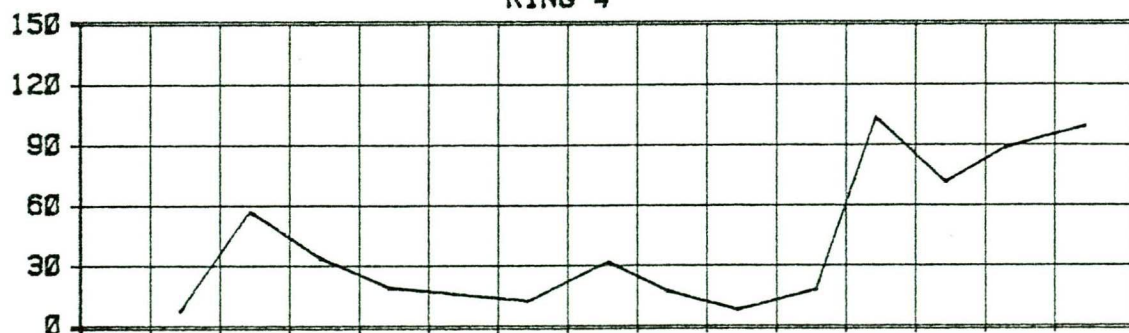
RING 2



RING 3



RING 4



G. bekken 5

