Supporting Information for

Tracing rate and extent of human induced hypoxia during the last 200 years in the mesotrophic lake Tiefer See (NE Germany)

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Contents of this file

Introduction

This file contains additional information to support the discussion and interpretation of the study.

Figure S1 – varve counting and core correlation

Varve counting and core correlation of all the cores used in this study. Each core is presented as an assemblage of thin sections images, covering the entire varved interval (Unit V). The orange dots mark that counted calcite layers, each dot represents one year. In addition, the marker layers that were determined on the TSK11-K1 master core, are marked on all of the cores with their ages. The year of the onset of varve preservation appears at the base of the varved unit in each core.


TSK18_SC4
TSK18_SC2
TSK16-K3
TSK15_K5
TSK15_K6
TSK13_QP4
TSK17-SC4
TSK13_QP2
TSK15_K1
TSK13_QP1
TSK14-SO2
TSK15_K3
TSK12-P4
TSK12_K3
TSK12_K1
TSK11_K1

Figure S2. TOC in sediment trap data

Total organic carbon (TOC) flux, content and $\delta^{13}C_{org}$ of sediments from the hypolimnion of the lake are presented for the period of 2015-2021. Active sedimentation was monitored in order to identify the properties of the TOC in the lake. Sediment sampling is conducted at intervals of 15 days with an automated sequential trap (Technicap PPS 3/3; active area 0.125 m2) equipped with 12 sample bottles.

The sediments from the traps were freeze-dried and weighed to determine the dry deposition (i.e. sediment flux: g m–2 d–1). Afterwards, the samples were ground and homogenized. Prior to determination of TOC, 0.2 mg sample aliquots were in situ decalcified in Ag capsules (20% HCl and drying at 75 °C), also in replicates. TOC was measured on in-situ calcified samples using a Carlo Erba NC-2500 elemental analyzer. All process and analytical measurements were done at the laboratories of section 4.3 of the GFZ Potsdam center of geosciences, Potsdam, Germany.

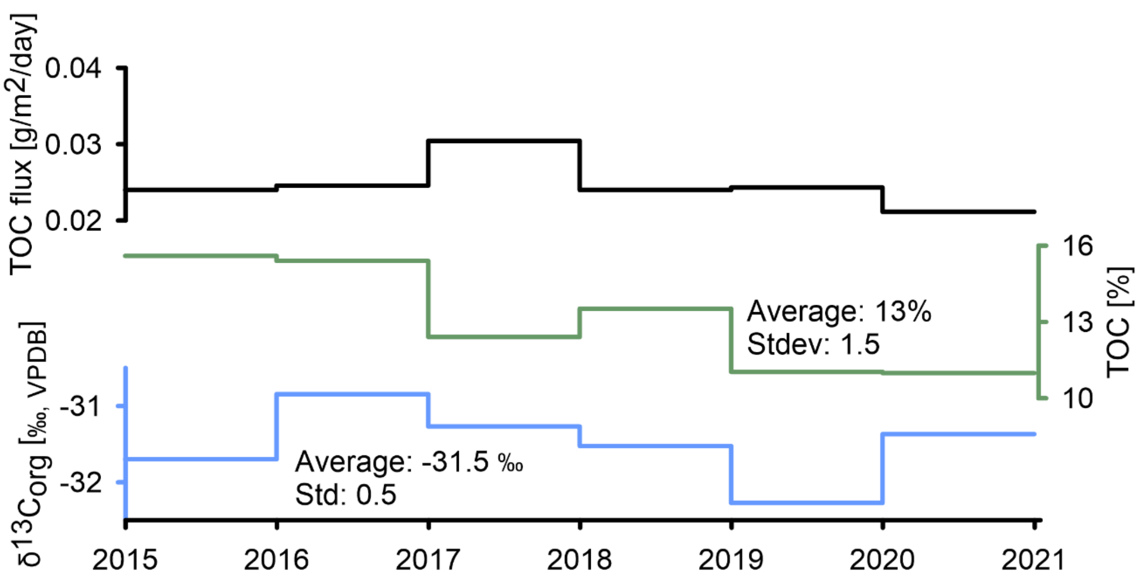

Table S1.

List of marker layers (ML) in cores TSK11-K1 and TSK18-SC4.

#Marker layer	Description	Number of varves from the previous ML	Age (year CE)
ML0	Mixed event layer	Observed in TSK18-SC4	2011
ML1	Clear calcite layer	10 (from the core top)	2000
ML2	Clear calcite layer	12	1987
ML3	Three distinct calcite layers	5	1979-81
ML4	Two brown (OM) layers in between thick diatom layer	7	1970-71
ML5	A brown (OM) layer in between thick diatom layers	4	1964-65
ML6	A clear calcite layer with a brown layer (OM) on top	1	1962
ML7	Two of thick calcite layers	0	1960-61
ML8	Three brown layers (OM)	9	1949-50
ML9	A thick calcite layer with a brown layer in the varve below	7	1941
ML10	Two thick calcite layers	18	1921-22
Varves base		3	1918

Table S2.

Chironomids counts in cores TSK15-K5 and TSK18-SC4 with division into identified chironomids species. See separate file.

	Sediment dep	Total Ind.	Trichoptera	Daphnia (e)	Oribatida	Plumatella
TSK15-K5	2.5	42		8	2	2
TSK15-K5	4.5	67	1	13	1	2
TSK15-K5	7.5	64		10	2	
TSK15-K5	10.5	85	3	8	1	3
TSK15-K5	17.5	75	2	14		
TSK15-K5	26.5	89	1	6		1
TSK18-SC4	14	41		12		2
TSK18-SC4	29	47	1	17	2	1
TSK18-SC4	37	18		1		
TSK18-SC4	47	30	1	14	1	
TSK18-SC4	60	34	1	9		1
TSK18-SC4	76	39	1	1		1

				Glyptotendip	Labrundinia	Limnophies /
TSK15-K5	2.5			1		
TSK15-K5	4.5			3		1
TSK15-K5	7.5			1		
TSK15-K5	10.5			2		1
TSK15-K5	17.5			1		2
TSK15-K5	26.5				1	2
TSK18-SC4	14			1		
TSK18-SC4	29					
TSK18-SC4	37					
TSK18-SC4	47					1
TSK18-SC4	60					
TSK18-SC4	76			2		2

d

Ceratopogoni	Ceriodaphnia	Ephemeropte	Cristatella mu	Sialis	Chaoborus	Chironomida
		3	1	2		24
2		3			1	44
3	2	3				44
2	1	3		1		63
	2	2	1	1		53
1	4	1		1		74
	1	1		1		24
		1				25
						17
						14
	1	1				21
	1	1				34

Micropsectra	Microtendipe	Monodiames	Pagastiella	Parachaetocl	Parachironon	Paracladopel
	5					
	4				2	
	2				3	
13	10					
10	4		1			
37					1	
	6	1				
1	1				1	
1						
2						
5	1					
3	1			1	1	1

Sediment dep	Total ident.	Unidentified	Chironomini	Tanytarsini u	Tanypodinae	Orthocladiina
2.5	13		1	3		
4.5	14			1	1	
7.5	21	2				2
10.5	27			4		1
17.5	21		1		1	
26.5	12		1	1		
14	10					
29	15			1	1	1
37	8			1		
47	6					
60	6			1		1
76	15				1	1

Paratanytarsu	Paratendipes	Phaenopsectr	Polypedilum	Procladius	Psectrocladiu	Pseudochiron
1			1			
2			5		3	
3	1	1	3		3	
2			3		1	
3			1		1	1
2					1	1
1		1	1		2	
4			2			
3	1		1			
		1		1	1	
3	1				1	
2			1			1

Ablabesmyia	Chironomus a	Chironomus p	Cladopelma l	Cladotanytars	Corynoneura	Crycotopus cy
1				1	4	2
1				2	3	1
2		1		3	3	3
1	7			1	2	6
5	4		2	1		3
1	2		3		1	
1		2		2	2	2
1	1	1	1		3	1
2				1		3
2					1	
2					2	
3	1	1	1	1	3	

Sergentia cor	Synorthoclad	Tanytarsus ch	Tanytarsus gl	Tanytarsus lu	Tanytarsus m	Tanytarsus m
1					2	
	1	2			3	1
						1
2					2	
1			1		5	
3		1	1	1	7	
					1	
					2	
			1		1	
1			1	1	1	
1		1			2	

Crycotopus ir	Dicrotendipes	Endochironor	Einfeldia natchitocheae-type
	1		
1	4		
1	3	1	
1	3	1	
2		1	1
1	2		
	1		
2	2		
	1		
3			
3			

Tanytarsus pa	Thienemanni	Profundal	Littoral and Stream
		3	10
1	2	4	10
3	2	2	19
		24	3
1		20	1
4		50	-38
		3	7
1		3	12
1		3	5
		4	2
		8	-2
		8	7