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*Supplement of*

## **Biogeochemical indicators of peatland degradation – a case study of a temperate bog in northern Germany**

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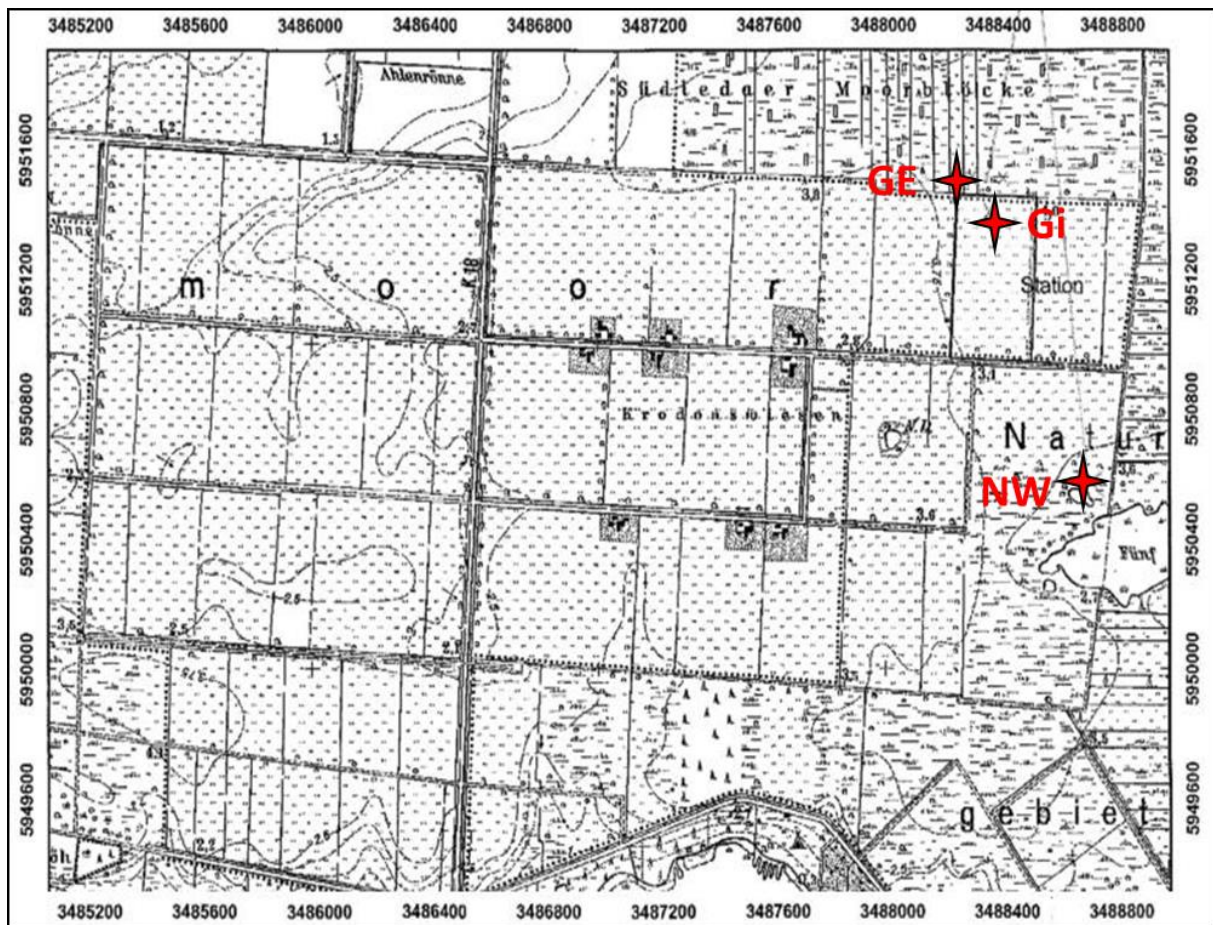


Fig. S1: Study sites at the Ahlen-Falkenberger peatland with the near-natural site (NW), the extensive used grassland site (GE) and the intensive used grassland site (GI).

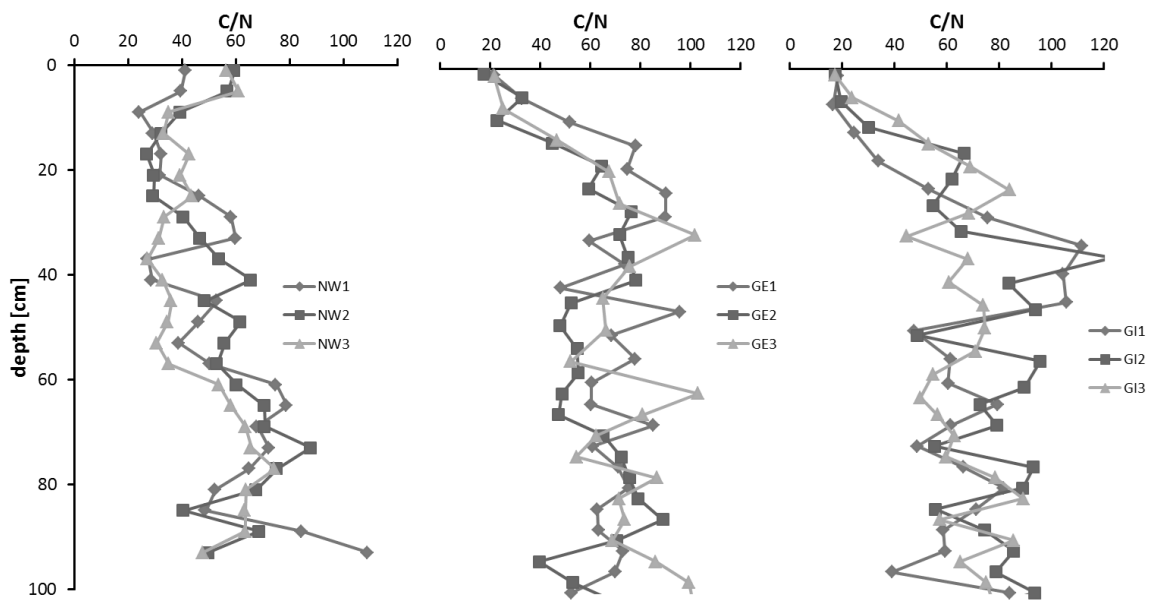


Fig. S2: C/N ratio depth profiles at the near-natural site (NW), extensive used grassland site (GE) and intensive used grassland site (GI) at the Ahlen-Falkenberger peatland.

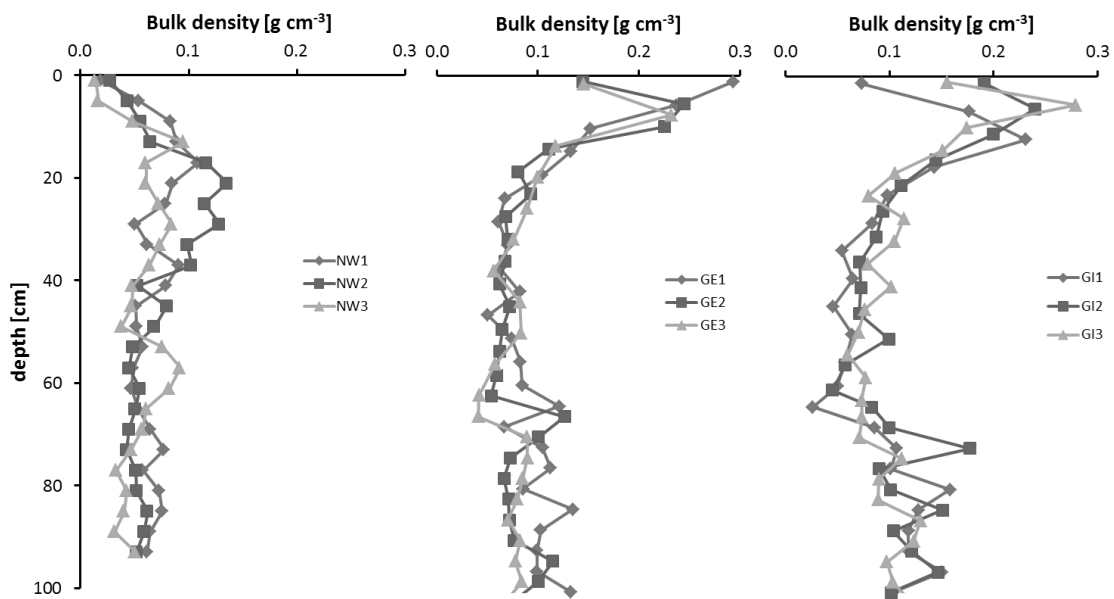


Fig. S3: Bulk density depth profiles at the near-natural site (NW), extensive used grassland site (GE) and intensive used grassland site (GI) at the Ahlen-Falkenberger peatland.

Tab. S1:  $^{14}\text{C}$  age dating of peat layers from each site, near-natural (NW), extensive managed grassland (GE) and intensive managed grassland (GI) site, from the Ahlen-Falkenberger peatland. Uncertainties of F14C values represent one sigma. For calibrated ages, the lower and upper boundary is given with 95% confidence. Calibrated ages are displayed as years AD/BC.

Lab number	Site/core	Depth [cm]	F14C	F14C uncertainty	Calibrated ages (years AD/BC)	
					Upper	Lower
BE 1723.1.1		9.0	1.1655	0.0026	1958 AD	1990 AD
BE 1724.1.1	NW1	65.0	0.9361	0.0020	1330 AD	1434 AD
BE 1725.1.1		81.0	0.9177	0.0020	1274 AD	1381 AD
BE 1726.1.1		9.0	1.0840	0.0023	1956 AD	2002 AD
BE 1727.1.1	NW2	65.0	0.9418	0.0021	1409 AD	1438 AD
BE 1728.1.1		81.0	0.9418	0.0021	1415 AD	1446 AD
BE 1729.1.1		9.0	1.1391	0.0024	1957 AD	1992 AD
BE 1730.1.1	NW3	65.0	0.9782	0.0021	1665 AD	1927 AD
BE 1731.1.1		81.0	0.9692	0.0021	1641 AD	1797 AD
BE 1732.1.1		10.2	0.8895	0.0020	1030 AD	1155 AD
BE 1733.1.1	GE1	14.7	0.8769	0.0020	907 AD	1023 AD
BE 1734.1.1		88.0	0.7957	0.0018	129 AD	233 AD
BE 1735.1.1		9.8	0.9393	0.0020	1409 AD	1440 AD
BE 1736.1.1	GE2	14.2	0.9115	0.0020	1253 AD	1285 AD
BE 1737.1.2		86.0	0.8085	0.0018	257 AD	393 AD
BE 1738.1.2		13.6	0.8970	0.0020	1053 AD	1219 AD
BE 1739.1.1	GE3	19.6	0.8805	0.0020	988 AD	1028 AD
BE 1740.1.1		102.0	0.7949	0.0019	93 AD	236 AD
BE 1741.1.1		12.2	0.9460	0.0021	1426 AD	1459 AD
BE 1742.1.1	GI1	33.8	0.8655	0.0019	775 AD	953 AD
BE 1743.1.2		96.0	0.7628	0.0017	356 BC	171 BC
BE 1744.1.1		11.2	0.9233	0.0020	1287 AD	1392 AD
BE 1745.1.1	GI2	31.0	0.8212	0.0018	422 AD	537 AD
BE 1746.1.1		92.0	0.7548	0.0017	394 BC	231 BC
BE 1747.1.1		9.9	0.9002	0.0020	1161 AD	1248 AD
BE 1748.1.2	GI3	27.5	0.8525	0.0019	671 AD	770 AD
BE 1749.1.1		86.0	0.7771	0.0017	90 BC	26 AD

Tab. S2:  $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ , ash content, carbon content, nitrogen content, C/N ratio and bulk density (BD) of the three sites at the Ahlen-Falkenberger peatland, northern Germany.

Site/Core	Depth [cm]	$\delta^{15}\text{N}$ [‰]	$\delta^{13}\text{C}$ [‰]	N [%]	C [%]	C/N ratio	BD [ $\text{g cm}^{-3}$ ]	Ash [%]
NW1	1.0	-5.50	-30.75	1.27	44.79	41.22	0.02	1.95
	5.0	-5.96	-30.76	1.36	45.93	39.50	0.05	1.67
	9.0	-6.66	-29.27	2.29	47.35	24.16	0.08	3.73
	13.0	-6.29	-28.51	1.96	49.23	29.24	0.09	6.99
	17.0	-4.40	-27.18	1.74	47.98	32.20	0.11	5.65
	21.0	-3.27	-26.31	1.72	46.78	31.72	0.09	4.46
	25.0	-3.72	-24.65	1.13	44.99	46.50	0.08	5.18
	29.0	-4.08	-24.78	0.92	45.75	58.16	0.05	2.51
	33.0	-4.43	-24.55	0.88	45.37	59.91	0.06	2.53
	37.0	-4.03	-25.43	1.99	46.78	27.35	0.09	7.05
	41.0	-3.49	-24.54	1.91	47.07	28.68	0.08	5.71
	45.0	-5.35	-24.77	1.03	46.56	52.97	0.05	1.99
	49.0	-4.19	-24.83	1.18	46.86	46.19	0.05	2.04
	53.0	-4.17	-24.39	1.40	46.52	38.71	0.06	3.02
	57.0	-5.01	-24.02	1.08	46.65	50.43	0.05	2.31
	61.0	-5.94	-23.63	0.71	45.85	74.90	0.05	1.84
	65.0	-6.57	-24.10	0.68	46.15	78.91	0.05	1.36
	69.0	-5.44	-25.06	0.82	47.56	67.94	0.06	2.12
	73.0	-6.16	-24.76	0.75	46.79	72.28	0.08	2.41
	77.0	-5.13	-24.55	0.84	46.92	64.91	0.06	2.28
81.0	-5.86	-24.73	1.05	47.42	52.42	0.07	1.63	
85.0	-5.29	-25.29	1.16	48.32	48.70	0.08	2.00	
89.0	-5.76	-25.36	0.64	46.45	84.44	0.06	1.31	
93.0	-6.88	-25.60	0.49	45.50	108.99	0.06	1.37	
NW2	1.0	-7.01	-29.41	0.93	47.37	59.49	0.03	1.05
	5.0	-6.35	-29.34	0.94	45.94	56.93	0.04	1.19
	9.0	-5.85	-28.98	1.33	44.84	39.27	0.06	1.78
	13.0	-5.96	-28.39	1.65	45.66	32.27	0.06	3.02
	17.0	-4.63	-27.72	2.13	49.13	26.85	0.12	6.24
	21.0	-3.57	-26.89	1.88	47.50	29.51	0.14	8.23
	25.0	-2.26	-26.55	1.93	48.42	29.25	0.11	7.35
	29.0	-1.59	-26.76	1.41	49.03	40.42	0.13	4.17
	33.0	-2.08	-26.70	1.23	49.02	46.55	0.10	3.63
	37.0	-2.26	-26.77	1.06	48.81	53.85	0.10	2.79
41.0	-4.23	-26.50	0.85	47.80	65.63	0.05	1.92	

	45.0	-3.32	-25.83	1.16	48.16	48.38	0.08	2.64
	49.0	-3.24	-25.02	0.92	48.69	61.66	0.07	1.64
	53.0	-4.63	-25.35	0.99	47.50	55.71	0.05	2.59
	57.0	-4.70	-25.33	1.04	47.25	52.99	0.04	2.94
	61.0	-5.33	-25.25	0.90	46.63	60.33	0.05	2.05
	65.0	-5.86	-24.49	0.77	46.48	70.60	0.05	2.47
	69.0	-5.68	-24.28	0.76	46.35	70.71	0.04	2.34
	73.0	-6.37	-23.86	0.61	45.58	87.71	0.04	2.17
	77.0	-5.99	-24.20	0.72	46.52	75.27	0.05	2.26
	81.0	-5.77	-23.44	0.79	45.78	67.55	0.05	2.31
	85.0	-4.27	-23.96	1.35	46.90	40.60	0.06	3.43
	89.0	-6.54	-23.86	0.78	45.73	68.66	0.06	2.47
	93.0	-5.35	-24.06	1.10	46.95	49.66	0.05	2.39
NW3	1.0	-8.81	-29.28	0.97	47.08	56.58	0.01	2.04
	5.0	-8.25	-28.95	0.90	46.86	60.94	0.02	1.75
	9.0	-6.09	-28.24	1.58	47.63	35.09	0.05	2.42
	13.0	-7.29	-28.57	1.70	48.05	33.04	0.10	3.53
	17.0	-5.89	-28.00	1.29	47.28	42.64	0.06	3.20
	21.0	-5.99	-27.86	1.43	48.16	39.23	0.06	6.10
	25.0	-4.96	-27.46	1.27	47.63	43.71	0.07	4.58
	29.0	-4.38	-27.49	1.69	48.50	33.42	0.08	4.79
	33.0	-3.24	-26.54	1.78	48.13	31.45	0.07	5.19
	37.0	-3.41	-26.17	2.04	47.31	27.09	0.06	7.69
	41.0	-1.48	-25.67	1.69	47.50	32.75	0.05	2.84
	45.0	-2.73	-25.41	1.52	46.98	35.98	0.05	3.24
	49.0	-3.27	-25.01	1.58	46.71	34.57	0.04	4.32
	53.0	-3.48	-25.25	1.81	47.28	30.48	0.08	4.70
	57.0	-4.10	-25.14	1.56	46.92	34.99	0.09	4.05
	61.0	-5.05	-25.56	1.04	47.89	53.59	0.08	2.48
	65.0	-3.86	-24.39	0.93	46.65	58.23	0.06	2.03
	69.0	-4.53	-23.76	0.86	46.98	63.49	0.06	2.07
	73.0	-5.28	-23.63	0.82	46.34	65.62	0.05	2.22
	77.0	-5.86	-23.93	0.72	46.16	74.34	0.03	1.42
	81.0	-5.39	-23.84	0.85	46.54	63.84	0.04	1.78
	85.0	-5.04	-23.03	0.85	46.18	63.42	0.04	2.11
	89.0	-5.16	-23.91	0.86	46.82	63.51	0.03	2.11
	93.0	-4.81	-23.58	1.15	47.04	47.74	0.05	2.35
GE1	1.1	0.77	-28.02	2.52	45.88	21.25	0.29	9.67
	5.7	-1.12	-26.59	1.76	48.98	32.48	0.24	4.23

	10.2	-3.35	-26.56	1.12	49.80	51.76	0.15	3.14
	14.7	-4.11	-26.23	0.71	47.51	78.02	0.13	2.69
	19.2	-3.76	-25.52	0.74	47.42	74.72	0.10	2.47
	23.7	-4.93	-24.77	0.60	46.38	90.17	0.07	1.79
	28.3	-4.79	-24.22	0.60	46.17	90.11	0.06	1.52
	32.8	-3.26	-24.35	0.93	47.49	59.52	0.07	2.06
	37.3	-3.65	-23.86	0.74	46.65	73.76	0.06	1.75
	41.8	-2.78	-25.11	1.19	49.05	48.08	0.08	1.67
	46.3	-5.82	-24.79	0.57	46.69	95.58	0.05	1.78
	50.9	-4.24	-25.81	0.83	48.69	68.33	0.07	1.83
	55.4	-3.84	-26.24	0.73	48.58	77.88	0.08	1.93
	59.9	-3.87	-27.28	0.98	51.07	60.52	0.08	2.12
	64.0	-3.21	-26.58	0.95	49.09	60.24	0.12	2.54
	68.0	-4.80	-27.04	0.65	47.29	85.15	0.07	1.24
	72.0	-4.13	-27.41	0.95	49.58	60.85	0.10	1.75
	76.0	-3.95	-26.43	0.80	48.89	71.12	0.11	1.77
	80.0	-4.78	-26.43	0.74	47.98	75.34	0.09	1.52
	84.0	-3.79	-27.60	0.96	51.46	62.76	0.13	1.52
	88.0	-4.17	-27.15	0.92	49.78	63.16	0.10	2.05
	92.0	-4.86	-26.70	0.78	49.06	73.11	0.10	1.15
	96.0	-4.91	-26.43	0.82	48.97	69.89	0.10	1.43
	100.0	-3.03	-26.98	1.14	51.08	52.38	0.13	1.69
	104.0	-2.57	-27.60	1.11	51.25	53.84	0.13	1.67
GE2	1.1	1.07	-29.51	3.01	45.27	17.56	0.14	9.27
	5.5	-1.92	-26.97	1.74	48.82	32.64	0.24	12.06
	9.8	-1.64	-27.54	2.40	46.61	22.69	0.23	4.88
	14.2	-2.10	-26.31	1.24	47.92	44.90	0.11	2.90
	18.5	-2.88	-25.44	0.85	47.12	64.61	0.08	3.06
	22.9	-2.89	-25.76	0.94	47.68	59.24	0.09	2.81
	27.3	-3.96	-25.23	0.72	47.18	76.35	0.07	2.28
	31.6	-4.37	-25.68	0.77	47.59	71.74	0.07	2.34
	36.0	-3.75	-25.17	0.74	47.41	74.97	0.07	2.26
	40.3	-3.83	-24.91	0.70	47.10	78.13	0.06	2.23
	44.7	-2.82	-25.06	1.09	49.02	52.28	0.07	2.30
	49.1	-1.74	-25.36	1.20	49.41	47.93	0.06	1.82
	53.4	-3.23	-24.69	1.04	48.52	54.62	0.06	2.07
	58.0	-2.75	-25.10	1.03	48.57	55.10	0.06	1.88
	62.0	-3.09	-25.46	1.17	48.70	48.69	0.05	1.85
	66.0	-3.26	-25.62	1.22	49.41	47.23	0.13	1.88

	70.0	-3.37	-24.97	0.86	47.85	65.11	0.10	2.06
	74.0	-3.69	-24.29	0.76	47.21	72.31	0.07	1.84
	78.0	-4.72	-23.49	0.72	46.76	75.70	0.07	2.36
	82.0	-4.00	-23.37	0.69	46.69	79.12	0.07	1.81
	86.0	-5.45	-23.84	0.61	46.81	89.01	0.07	1.70
	90.0	-3.78	-24.07	0.78	47.48	70.70	0.08	1.36
	94.0	-3.27	-25.11	1.48	50.10	39.48	0.11	2.03
	98.0	-3.08	-24.49	1.07	48.89	53.05	0.10	1.61
	102.0	-4.12	-24.03	0.78	47.82	71.18	0.07	1.50
GE3	1.5	-0.08	-28.16	2.52	46.78	21.61	0.15	6.05
	7.6	-0.38	-27.04	2.18	46.96	25.14	0.23	10.62
	13.6	-1.72	-25.91	1.19	47.68	46.60	0.12	3.43
	19.6	-2.57	-26.12	0.81	46.92	67.36	0.10	2.53
	25.7	-2.31	-25.43	0.76	46.60	71.66	0.09	2.63
	31.7	-3.93	-24.50	0.52	45.80	101.94	0.08	2.16
	37.8	-3.03	-24.82	0.72	46.48	75.65	0.06	1.83
	43.8	-4.01	-25.36	0.87	48.48	64.98	0.08	2.40
	49.8	-3.90	-25.28	0.84	47.98	66.28	0.08	2.10
	55.9	-2.89	-25.35	1.08	48.39	52.19	0.06	2.13
	61.9	-2.43	-24.89	0.50	43.94	103.12	0.04	1.94
	66.0	-4.33	-25.07	0.69	47.61	80.92	0.04	2.21
	70.0	-3.45	-25.68	0.90	47.92	62.37	0.09	1.81
	74.0	-3.25	-25.51	1.04	48.33	54.41	0.09	2.03
	78.0	-4.82	-25.00	0.63	46.47	86.53	0.08	2.14
	82.0	-4.62	-24.66	0.76	46.73	71.40	0.08	1.99
	86.0	-4.29	-25.17	0.75	47.54	73.72	0.07	1.40
	90.0	-3.73	-24.89	0.81	47.63	68.76	0.08	1.58
	94.0	-5.05	-23.68	0.63	46.58	86.15	0.08	1.63
	98.0	-5.69	-24.05	0.55	46.70	99.37	0.08	1.57
	102.0	-5.28	-23.59	0.53	46.25	101.06	0.07	1.63
	106.0	-4.98	-23.94	0.54	46.49	100.52	0.07	1.22
GI1	1.4	3.84	-29.83	2.76	43.38	18.32	0.07	10.01
	6.8	1.88	-28.88	2.92	41.36	16.54	0.18	13.64
	12.2	-0.65	-27.05	2.21	46.70	24.67	0.23	11.65
	17.6	-1.83	-25.49	1.61	46.57	33.80	0.14	5.73
	23.0	-2.95	-25.07	0.99	45.17	53.07	0.10	4.42
	28.4	-4.94	-24.45	0.71	45.88	75.51	0.08	3.18
	33.8	-7.58	-24.76	0.47	45.09	111.63	0.05	2.27
	39.2	-7.87	-23.93	0.51	45.61	104.40	0.06	1.94



	44.6	-8.02	-24.14	0.50	45.68	105.69	0.05	2.31
	50.0	-4.87	-24.73	1.22	49.69	47.45	0.06	1.43
	55.4	-5.41	-24.36	0.93	48.96	61.39	0.06	1.81
	60.0	-5.54	-24.20	0.94	48.89	60.48	0.05	1.68
	64.0	-3.50	-24.38	0.70	47.51	79.33	0.03	1.88
	68.0	-5.79	-23.86	0.91	47.99	61.46	0.09	1.85
	72.0	-5.44	-24.75	1.19	49.66	48.67	0.11	1.79
	76.0	-5.99	-24.47	0.86	48.80	66.37	0.10	1.81
	80.0	-7.06	-23.65	0.67	47.22	81.79	0.16	2.29
	84.0	-5.87	-24.28	0.79	48.11	71.11	0.13	1.88
	88.0	-5.55	-24.26	0.98	49.23	58.60	0.12	1.72
	92.0	-7.17	-24.15	0.95	49.24	59.32	0.12	1.55
	96.0	-4.80	-25.31	1.52	51.67	39.08	0.15	2.01
	100.0	-5.61	-24.44	0.66	47.67	83.95	0.10	1.97
	104.0	-5.85	-25.30	0.83	49.06	68.52	0.10	2.02
	108.0	-5.46	-25.24	0.88	49.33	65.37	0.09	2.03
GI2	1.2	3.01	-29.18	2.80	41.98	17.50	0.19	12.21
	6.2	1.35	-27.37	2.63	44.32	19.67	0.24	13.88
	11.2	-1.90	-26.52	1.80	46.38	30.03	0.20	8.72
	16.1	-4.51	-25.58	0.81	46.11	66.71	0.14	4.68
	21.1	-4.49	-25.89	0.89	47.01	61.91	0.11	3.98
	26.0	-4.42	-25.33	1.02	47.87	54.69	0.09	2.80
	31.0	-4.40	-24.25	0.86	47.96	65.41	0.09	2.23
	36.0	-7.60	-24.18	0.44	46.04	123.10	0.07	2.69
	40.9	-6.83	-24.93	0.67	47.67	83.58	0.07	1.97
	45.9	-7.15	-23.86	0.58	46.32	93.74	0.07	2.26
	50.8	-5.46	-25.48	1.20	50.01	48.72	0.10	2.54
	55.8	-7.54	-25.06	0.58	47.18	95.58	0.06	2.53
	60.8	-3.73	-25.21	0.61	46.53	89.60	0.05	2.28
	64.0	-6.18	-26.02	0.78	48.50	72.57	0.08	2.20
	68.0	-6.19	-25.48	0.70	47.19	79.15	0.10	2.08
	72.0	-6.56	-25.14	1.04	49.51	55.22	0.18	1.85
	76.0	-10.44	-25.29	0.56	47.26	93.00	0.09	2.24
	80.0	-7.42	-25.21	0.63	47.88	88.96	0.10	2.01
	84.0	-4.70	-26.95	1.06	50.12	55.68	0.15	2.49
	88.0	-5.75	-25.94	0.76	48.82	74.45	0.10	2.12
	92.0	-8.12	-25.73	0.64	47.19	85.46	0.12	1.62
	96.0	-8.52	-25.51	0.67	47.77	78.76	0.15	1.79
	100.0	-10.59	-25.02	0.58	47.41	93.66	0.10	1.34

	104.0	-6.74	-27.38	0.92	50.09	63.28	0.15	1.88
GI3	1.1	3.11	-28.81	2.97	43.92	17.25	0.16	11.02
	5.5	0.32	-26.79	2.27	46.32	23.79	0.28	10.24
	9.9	-2.95	-26.03	1.33	47.55	41.61	0.17	4.29
	14.3	-5.63	-25.76	1.06	48.04	53.06	0.15	3.95
	18.7	-7.30	-24.90	0.78	45.99	69.05	0.11	3.23
	23.1	-8.54	-24.88	0.65	46.53	83.94	0.08	2.39
	27.5	-7.02	-25.90	0.82	48.13	68.49	0.11	2.60
	31.9	-4.65	-25.50	1.27	48.59	44.60	0.10	2.12
	36.3	-6.51	-25.27	0.81	47.06	67.95	0.08	2.18
	40.7	-5.76	-25.58	0.92	47.99	60.78	0.10	1.96
	45.1	-7.52	-24.93	0.74	47.18	73.92	0.08	2.18
	49.5	-8.58	-23.55	0.72	46.12	74.45	0.07	1.88
	53.9	-5.50	-23.19	0.76	45.92	70.92	0.06	1.86
	58.3	-6.30	-23.89	1.01	47.33	54.62	0.08	1.92
	62.7	-6.12	-24.91	1.14	48.66	49.81	0.07	1.97
	66.0	-6.65	-24.06	0.98	47.34	56.41	0.07	1.39
	70.0	-8.74	-24.54	0.87	46.86	62.76	0.07	1.40
	74.0	-7.38	-24.35	0.92	47.17	59.74	0.11	1.89
	78.0	-9.42	-24.33	0.69	46.48	78.57	0.09	1.34
	82.0	-9.91	-24.58	0.60	45.97	89.07	0.09	1.67
	86.0	-7.17	-25.58	0.99	48.69	57.26	0.13	1.42
	90.0	-8.65	-24.94	0.67	49.32	85.52	0.12	0.92
	94.0	-7.31	-25.68	0.89	49.79	65.10	0.10	1.42
	98.0	-7.30	-26.13	0.74	47.63	75.14	0.10	1.80
	102.0	-5.58	-26.92	0.72	48.17	77.79	0.12	1.61
	106.0	-4.71	-26.65	0.99	50.05	58.68	0.12	1.87

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