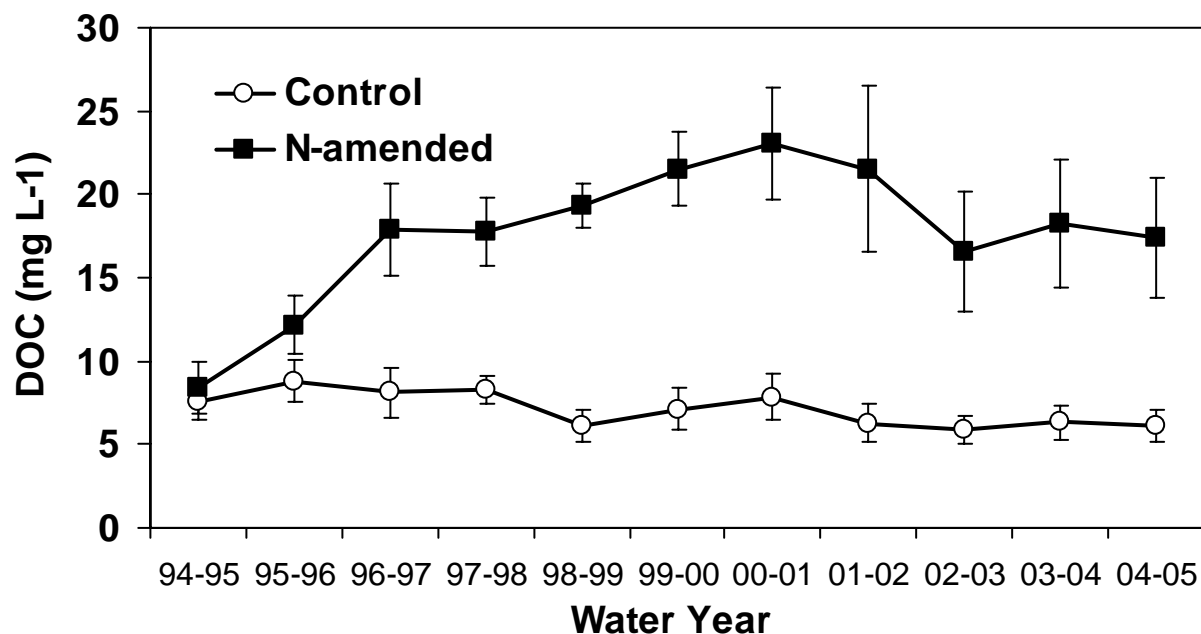


Michigan Gradient Study: Soil Solution Concentration Data, 1994 - 2005.

Parameters listed below include soil solution concentrations by water year for [DOC](#), [NO₃⁻](#), [NH₄⁺](#), and [DON](#). A water year is a continuous recharge period that includes the fall of one year and the spring of the following year. Methods for sample collection and analysis can be found in Pregitzer et al. (2004), and the data through the 2000-2001 water year was presented in Pregitzer et al. (2004). Data also are available on a seasonal basis (spring vs. fall) and for estimated nutrient flux (g per m²). Data for the last several years for NO₃⁻, NH₄⁺, and DON are available, and will be incorporated into this document later in 2006. Please contact K.S. Pregitzer (kspregit@mtu.edu) with any questions regarding data availability or the proper citation of any data used.



DOC soil solution concentrations for the control and simulated NO₃⁻ deposition treatments from fall 1994 through spring 2005. Error bars indicate one standard error. Data through the 2000-2001 water year are from Pregitzer et al. (2004)

DOC concentration (mg L⁻¹)

Site	Plot	Treatment	Analyte	yr9495	yr9596	yr9697	yr9798	yr9899	yr9900	yr0001	yr0102	yr0203	yr0304	yr0405
A	1	C	DOC (mg/L)	8.31	7.50	9.17	7.09	5.82	5.42	6.76	5.84	6.13	6.19	6.16
A	2	C	DOC (mg/L)	4.83	3.75	3.54	4.35	3.77	3.09	3.67	2.91	3.89	4.16	4.03
A	3	C	DOC (mg/L)	9.47	5.61	4.12	6.17	6.21	7.31	4.72	4.17	4.52	3.98	4.25
A	4	+N	DOC (mg/L)	3.95	7.24	10.76	9.01	17.88	12.76	25.69	15.89	9.66	7.93	8.79
A	5	+N	DOC (mg/L)	3.90	4.83	9.34	14.31	13.24	18.28	14.33	12.74	12.54	10.33	11.43
A	6	+N	DOC (mg/L)	9.88	10.17	13.92	17.76	24.65	31.26	21.77	25.29	21.83	24.81	23.32
B	1	C	DOC (mg/L)	10.97	10.81	11.98	9.49	9.57	8.51	9.50	9.03	7.71	9.06	8.39
B	2	C	DOC (mg/L)	9.76	11.43	11.47	8.50	8.46	11.60	15.27	9.22	6.50	9.00	7.75
B	3	C	DOC (mg/L)	15.87	17.22	17.93	14.17	12.27	17.52	18.43	16.06	13.45	15.40	14.42
B	4	+N	DOC (mg/L)		21.61	44.05		26.81	37.94	49.92	67.55	51.58	51.93	51.76
B	5	+N	DOC (mg/L)	13.92	15.19	23.53	17.29	20.05	23.84	20.27	21.28	11.77	25.51	18.64
B	6	+N	DOC (mg/L)	14.88	22.81	18.00	22.18	17.97	26.10	39.40	31.08	13.35	16.11	14.73
C	1	C	DOC (mg/L)	10.74	10.78	17.13	12.74	9.68	10.08	10.47	8.66	8.39	8.11	8.25
C	2	C	DOC (mg/L)	5.64	2.98	4.69	5.09	4.91	6.13	7.36	5.53	5.13	3.93	4.53
C	3	C	DOC (mg/L)	4.54	4.88	4.96	8.97	4.86	6.42	7.98	4.16	4.88	4.46	4.67
C	4	+N	DOC (mg/L)	4.96	7.14	21.45	24.14	21.98	19.78	17.57	9.97	15.15	8.58	11.87
C	5	+N	DOC (mg/L)	5.41	15.40	14.22	21.04	20.83	14.36	7.88	7.65	9.17	11.77	10.47
C	6	+N	DOC (mg/L)	18.45	17.14	23.83	31.64	23.71	24.64	25.58	21.34	12.17	16.35	14.26
D	1	C	DOC (mg/L)	4.88	9.89	4.22	10.06	2.26	2.74	3.23	2.47	2.80	3.08	2.94
D	2	C	DOC (mg/L)	2.77	6.19	3.88	5.85	3.14	3.52	3.90	3.95	4.26	4.38	4.32
D	3	C	DOC (mg/L)	3.46	14.61	4.27	6.81	2.46	2.70	2.94	2.97	3.08	4.01	3.54
D	4	+N	DOC (mg/L)	5.38	5.95	11.29	12.44	13.37	16.82	20.26	15.72	13.33	14.12	13.73
D	5	+N	DOC (mg/L)	5.82	8.69	9.84	9.50	12.73	11.97	11.21	5.37	6.51	5.49	6.00
D	6	+N	DOC (mg/L)	5.49	9.66	14.29	15.76	18.24	20.65	23.06	24.33	22.07	25.61	23.84

NO₃⁻ concentration (mg L⁻¹)

Site	Plot	Treatment	Analyte	yr9495	yr9596	yr9697	yr9798	yr9899	yr9900	yr0001	yr0102	yr0203	yr0304	yr0405
A	1	C	NO3 mg/L	0.040	0.030	0.023	0.036	0.204	0.053	0.016	0.157	0.004		
A	2	C	NO3 mg/L	0.043	0.034	0.012	0.025	0.294	0.088	0.046	0.137	0.028		
A	3	C	NO3 mg/L	0.006	0.003	0.025	0.008	0.136	0.021	0.014	0.312	0.024		
A	4	+N	NO3 mg/L	1.249	2.072	0.676	2.263	1.391	1.099	0.701	10.050	5.512		
A	5	+N	NO3 mg/L	1.103	1.373	0.561	0.751	0.648	0.486	1.164	1.227	1.232		
A	6	+N	NO3 mg/L	0.362	0.630	0.252	0.654	0.457	0.108	0.135	0.394	0.767		
B	1	C	NO3 mg/L	0.088	0.143	0.304	0.196	0.366	0.291	0.130	0.103	2.104		
B	2	C	NO3 mg/L	0.073	0.132	0.170	0.122	0.382	0.357	0.057	0.108	0.264		
B	3	C	NO3 mg/L	0.060	0.185	0.198	0.169	0.532	0.197	0.338	0.676	0.920		
B	4	+N	NO3 mg/L		0.573	1.389		2.166	2.068	1.921	3.208	10.733		
B	5	+N	NO3 mg/L	1.047	3.357	3.264	6.510	4.729	10.962	14.076	6.580	22.081		
B	6	+N	NO3 mg/L	0.594	0.413	2.060	3.064	3.388	13.528	4.470	9.584	14.179		
C	1	C	NO3 mg/L	0.011	0.065	0.062	0.027	0.181	0.095	0.235	0.318			
C	2	C	NO3 mg/L	0.056	0.077	0.082	0.195	0.141	0.032	0.405	0.216			
C	3	C	NO3 mg/L	0.138	0.112	0.192	0.158	0.558	1.252	0.255	0.713			
C	4	+N	NO3 mg/L	0.662	0.694	0.551	1.530	2.404	13.542	5.057	4.183			
C	5	+N	NO3 mg/L	1.418	2.667	12.285	4.386	4.888	40.185	14.175	11.149			
C	6	+N	NO3 mg/L	0.295	1.611	1.151	2.389	2.553	13.022	12.633	11.214			
D	1	C	NO3 mg/L	0.030	0.010	0.011	0.080	0.196	0.096	0.095	0.107			
D	2	C	NO3 mg/L	0.151	0.144	0.348	0.419	0.650	0.185	0.738	0.799			
D	3	C	NO3 mg/L	0.030	0.135	0.641	0.345	0.447	0.972	0.408	0.589			
D	4	+N	NO3 mg/L	0.700	0.380	0.886	0.730	2.807	4.945	3.873	5.762			
D	5	+N	NO3 mg/L	0.446	1.028	11.006	16.889	10.326	21.234	6.192	8.714			
D	6	+N	NO3 mg/L	1.398	0.201	0.019	0.128	0.788	0.931	0.894	0.698			

NH₄⁺ concentration (mg L⁻¹)

Site	Plot	Treatment	Analyte	yr9495	yr9596	yr9697	yr9798	yr9899	yr9900	yr0001	yr0102	yr0203	yr0304	yr0405
A	1	C	NH4 mg/L	0.029	0.012	0.074	0.019	0.107	0.013	0.053	0.004			
A	2	C	NH4 mg/L	0.016	0.012	0.050	0.019	0.005	0.012	0.038	0.000			
A	3	C	NH4 mg/L	0.018	0.010	0.019	0.024	0.097	0.006	0.031	0.000			
A	4	+N	NH4 mg/L	0.036	0.024	0.000	0.023	0.001	0.006	0.067	0.013			
A	5	+N	NH4 mg/L	0.021	0.023	0.000	0.032	0.056	0.006	0.052				
A	6	+N	NH4 mg/L	0.024	0.013	0.000	0.055	0.000	0.005	0.041	0.014			
B	1	C	NH4 mg/L	0.031	0.014	0.000	0.028	0.026	0.015	0.026	0.072			
B	2	C	NH4 mg/L	0.020	0.012	0.000	0.013	0.000	0.004	0.017	0.072			
B	3	C	NH4 mg/L	0.027	0.006	0.001	0.018	0.026	0.013	0.037	0.075			
B	4	+N	NH4 mg/L		0.014	0.000		0.022	0.015	0.072	0.096			
B	5	+N	NH4 mg/L	0.026	0.051	0.000	0.013	0.025	0.014	0.024	0.085			
B	6	+N	NH4 mg/L	0.023	0.057	0.000	0.013	0.017	0.011	0.047	0.091			
C	1	C	NH4 mg/L	0.022	0.073	0.006	0.014	0.008	0.029	0.016	0.068			
C	2	C	NH4 mg/L	0.022	0.019	0.000	0.017	0.000	0.018	0.017	0.062			
C	3	C	NH4 mg/L	0.025	0.019	0.004	0.019	0.000	0.011	0.017	0.067			
C	4	+N	NH4 mg/L	0.022	0.033	0.007	0.020	0.001	0.015	0.021	0.061			
C	5	+N	NH4 mg/L	0.031	0.041	0.004	0.021	0.004	0.008	0.014	0.067			
C	6	+N	NH4 mg/L	0.025	0.007	0.008	0.043	0.001	0.008	0.022	0.396			
D	1	C	NH4 mg/L	0.034	0.024	0.031	0.416	0.002	0.036	0.015	0.092			
D	2	C	NH4 mg/L	0.063	0.015	0.077	0.015	0.000	0.017	0.021	0.941			
D	3	C	NH4 mg/L	0.039	0.028	0.003	0.015	0.000	0.014	0.013	0.071			
D	4	+N	NH4 mg/L	0.035	0.049	0.000	0.014	0.000	0.019	0.021	0.067			
D	5	+N	NH4 mg/L	0.028	0.006	0.000	0.013	0.011	0.014	0.022	0.069			
D	6	+N	NH4 mg/L	0.042	0.015	0.000	0.017	0.006	0.017	0.017	0.062			

DON concentration (mg L⁻¹)

Site	Plot	Treatment	Analyte	yr9495	yr9596	yr9697	yr9798	yr9899	yr9900	yr0001	yr0102	yr0203	yr0304	yr0405
A	1	C	DON (mg/L)	0.065	0.118	0.301	0.094	0.472	0.171	0.172				
A	2	C	DON (mg/L)	0.049	0.049	0.266	0.092	0.250	0.123	0.194				
A	3	C	DON (mg/L)	0.280	0.081	0.270	0.090	0.546	0.260	0.259				
A	4	+N	DON (mg/L)	0.068	0.484	0.315	0.336	1.672	0.966	1.788				
A	5	+N	DON (mg/L)	0.707	0.070	0.335	0.503	0.847	0.929	1.964				
A	6	+N	DON (mg/L)	0.167	0.093	0.467	0.414	1.163	1.112	1.689				
B	1	C	DON (mg/L)	0.074	0.234	0.214	0.240	0.397	0.507	0.492				
B	2	C	DON (mg/L)	0.117	0.304	0.375	0.273	0.542	0.537	0.588				
B	3	C	DON (mg/L)	0.274	0.520	0.592	0.434	0.454	1.017	0.484				
B	4	+N	DON (mg/L)		0.453	1.242		1.230	3.960	0.802				
B	5	+N	DON (mg/L)	0.429	0.632	2.055	0.470	0.495	3.266	4.630				
B	6	+N	DON (mg/L)	0.387	0.497	0.632	0.565	0.655	3.034	0.154				
C	1	C	DON (mg/L)	0.194	0.594	0.466	0.429	0.988	0.651	0.529				
C	2	C	DON (mg/L)	0.073	0.231	0.234	0.401	0.847	0.247	0.617				
C	3	C	DON (mg/L)	0.104	0.143	0.238	0.399	0.841	0.314	0.363				
C	4	+N	DON (mg/L)	0.143	0.135	0.600	0.771	0.948	0.392	8.218				
C	5	+N	DON (mg/L)	0.141	0.440	1.098	1.041	2.289	1.022	2.876				
C	6	+N	DON (mg/L)	0.530	0.551	0.978	1.046	3.120	0.453	5.383				
D	1	C	DON (mg/L)	0.084	0.258	0.218	0.780	1.114	0.124	0.114				
D	2	C	DON (mg/L)	0.125	0.444	0.208	0.306	0.943	0.186	0.125				
D	3	C	DON (mg/L)	0.000	0.274	0.380	0.224	1.715	0.289	0.112				
D	4	+N	DON (mg/L)	0.109	1.067	0.409	0.574	0.970	0.341	1.683				
D	5	+N	DON (mg/L)	0.102	0.334	1.194	1.675	0.464	1.112	1.663				
D	6	+N	DON (mg/L)	0.101	0.266	0.474	0.496	3.092	0.591	0.817				

Pregitzer, K.S., D.R. Zak, A.J. Burton, J.A. Ashby, and N.W. MacDonald. 2004. Chronic nitrate additions dramatically increase the export of carbon and nitrogen from northern hardwood ecosystems. *Biogeochem.* 68:179-197.