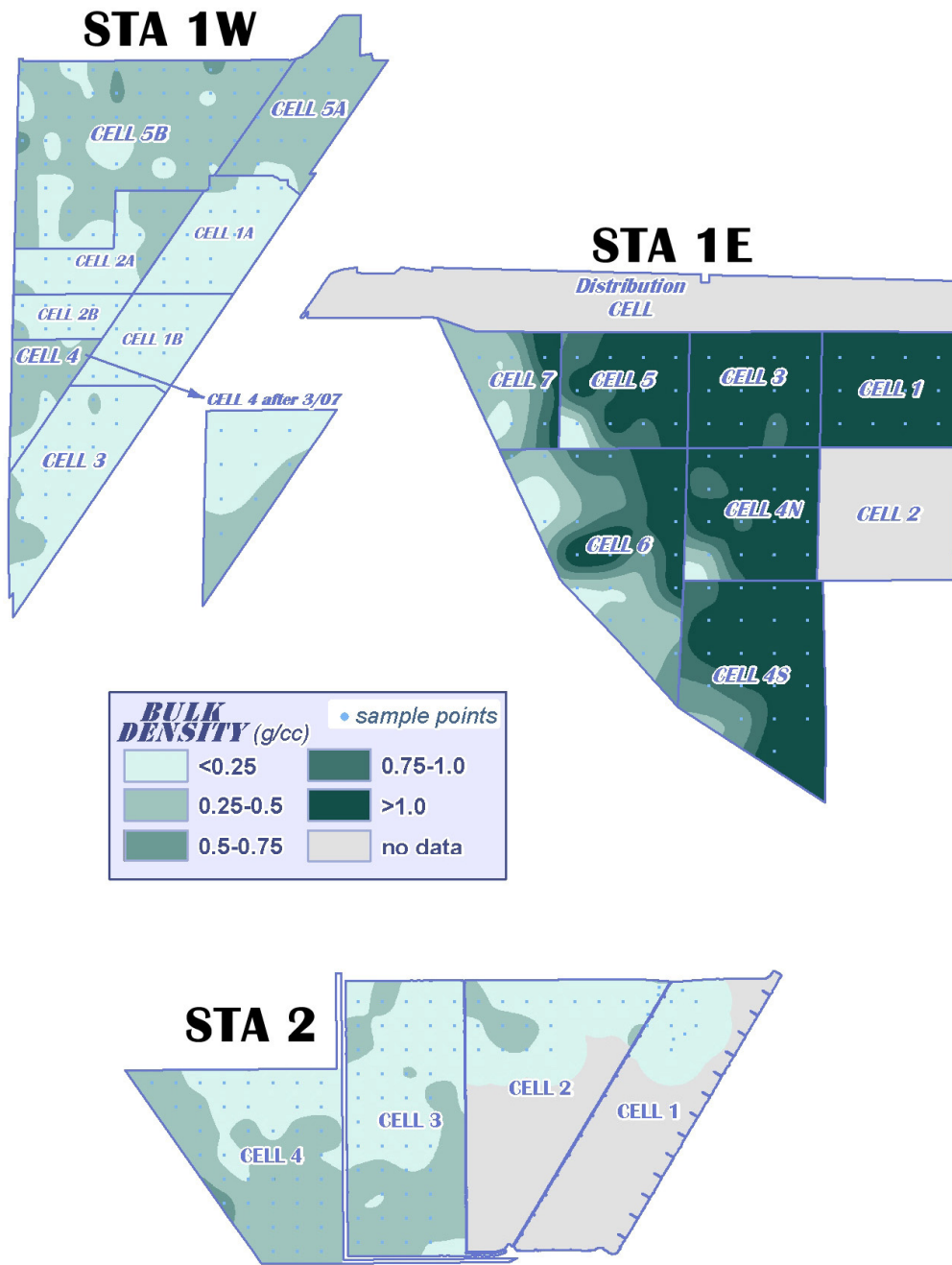


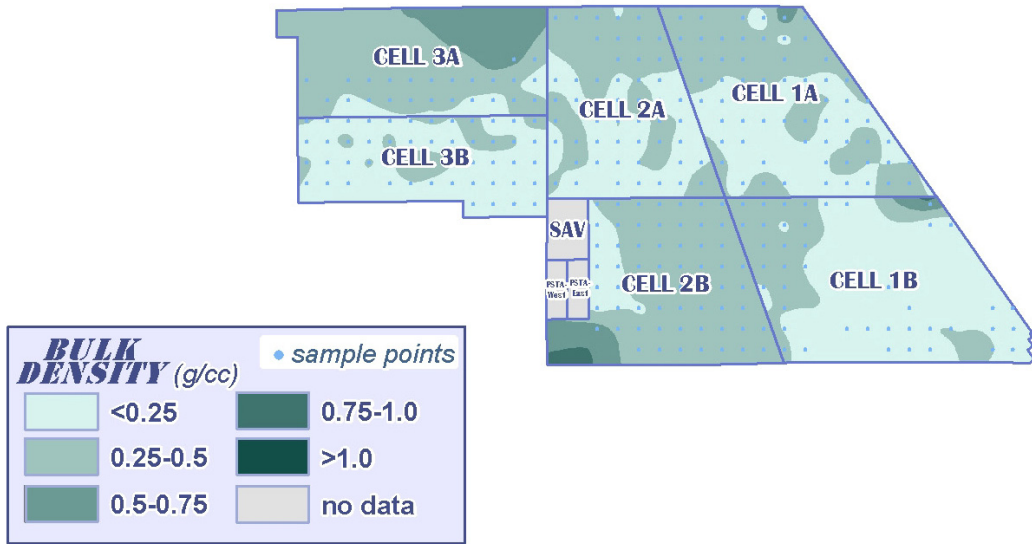
# **Appendix 5-15: STA Soil Evaluation**

Delia Ivanoff

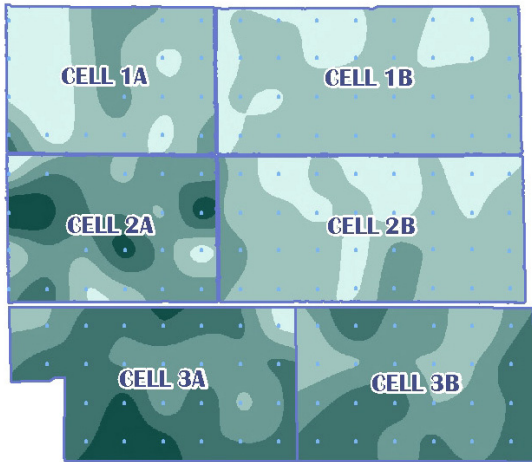


**Figure S-1.** Soil bulk density distribution in STA-1E, STA-1W, and STA-2, 0-10 cm depth, 2006-2008.

### STA 3/4



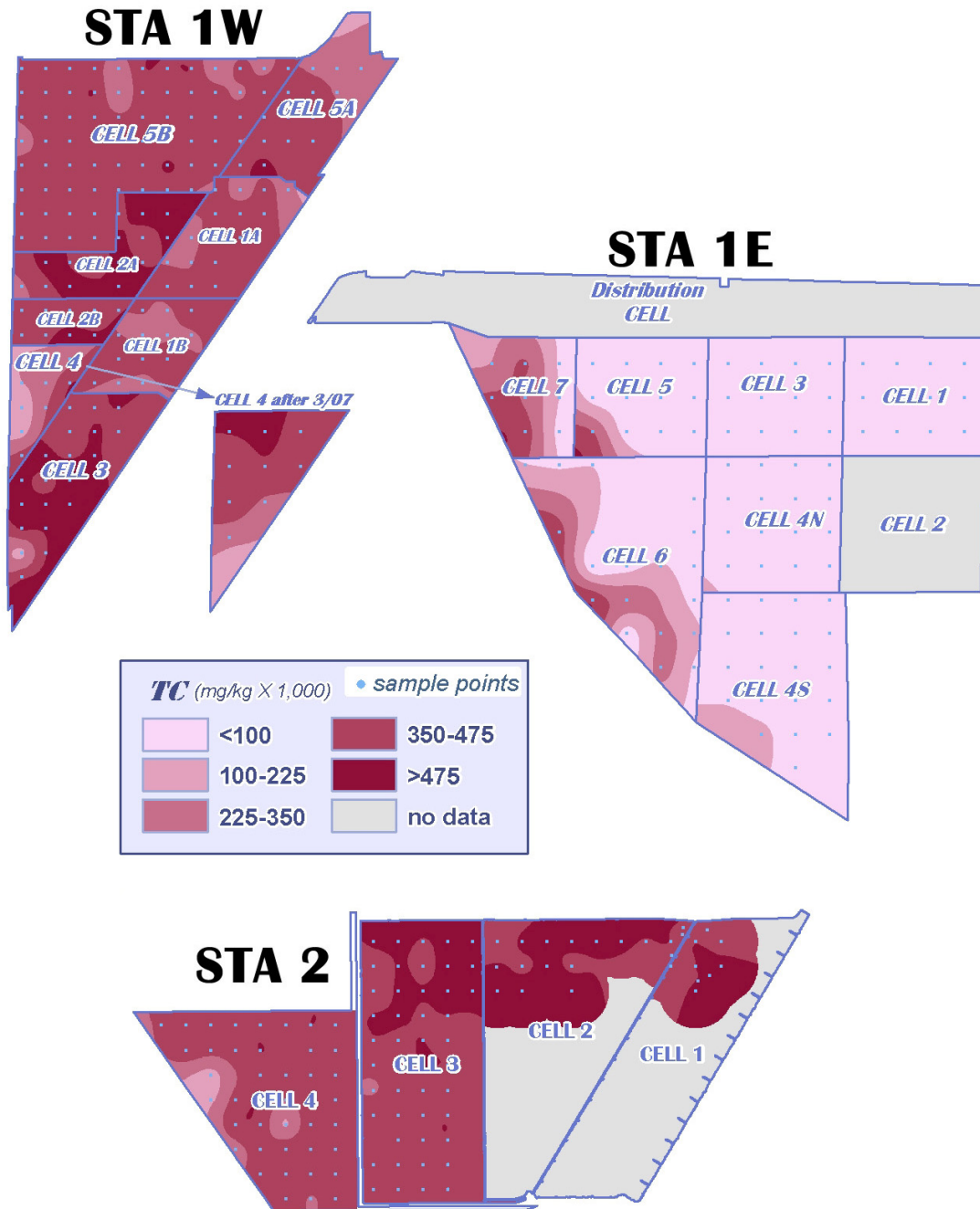
### STA 5



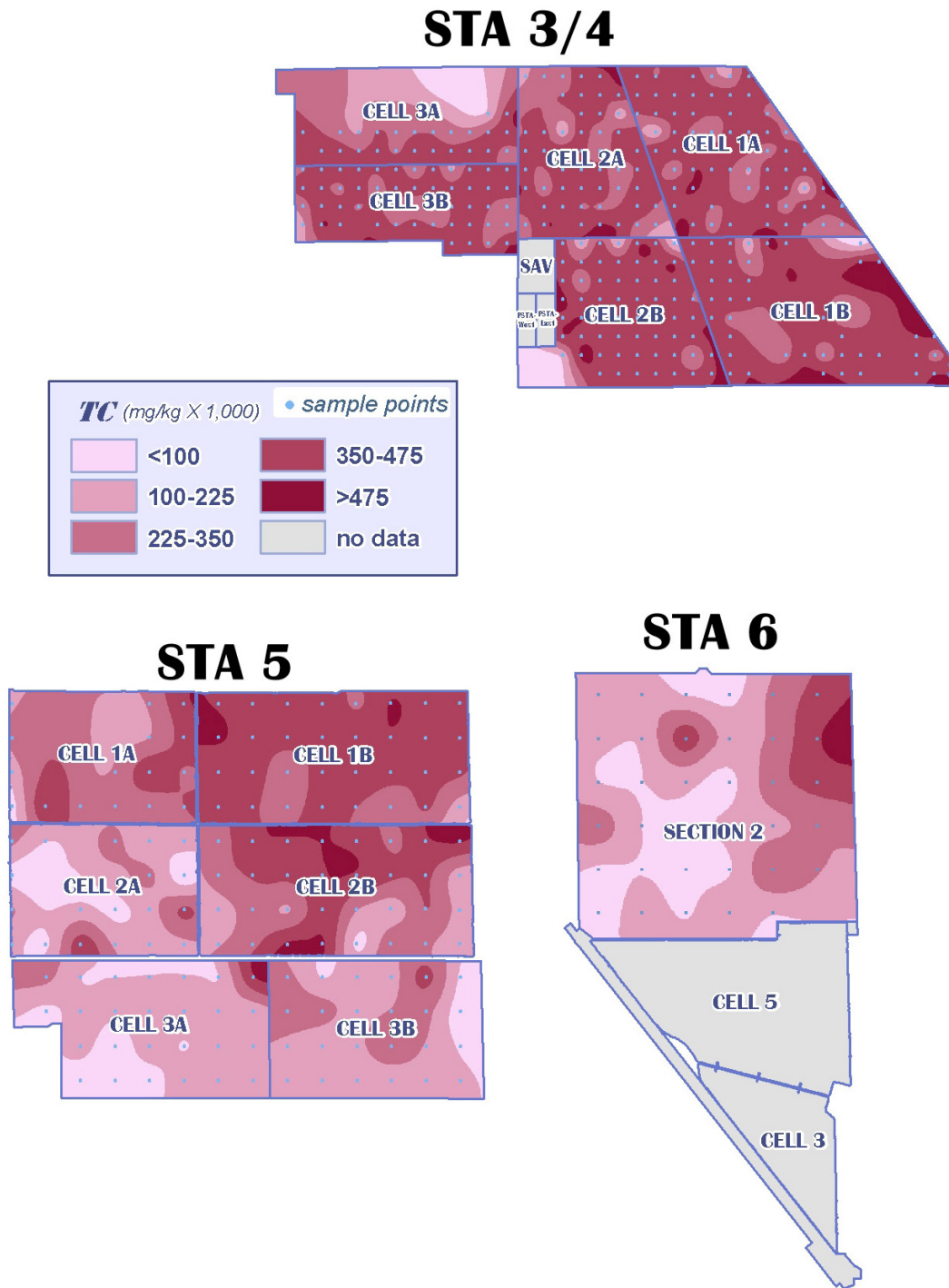
### STA 6



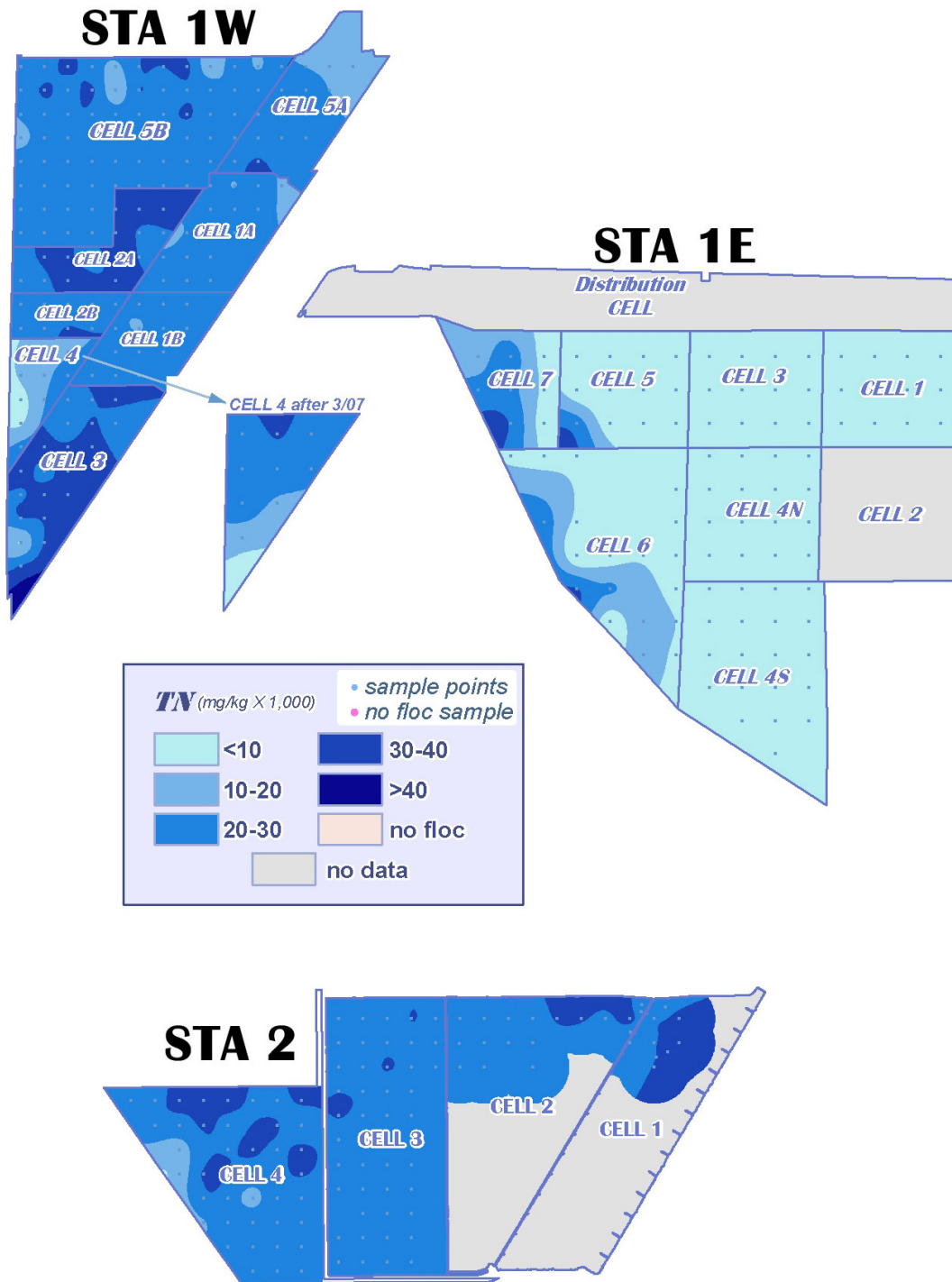
**Figure S-2.** Soil bulk density distribution in STA-3/4, STA-5, and STA-6, 0-10 cm depth, 2006–2008.



**Figure S-3.** Soil total carbon (TC) distribution in STA-1E, STA-1W, and STA-2, 0-10 cm depth, 2006–2008.

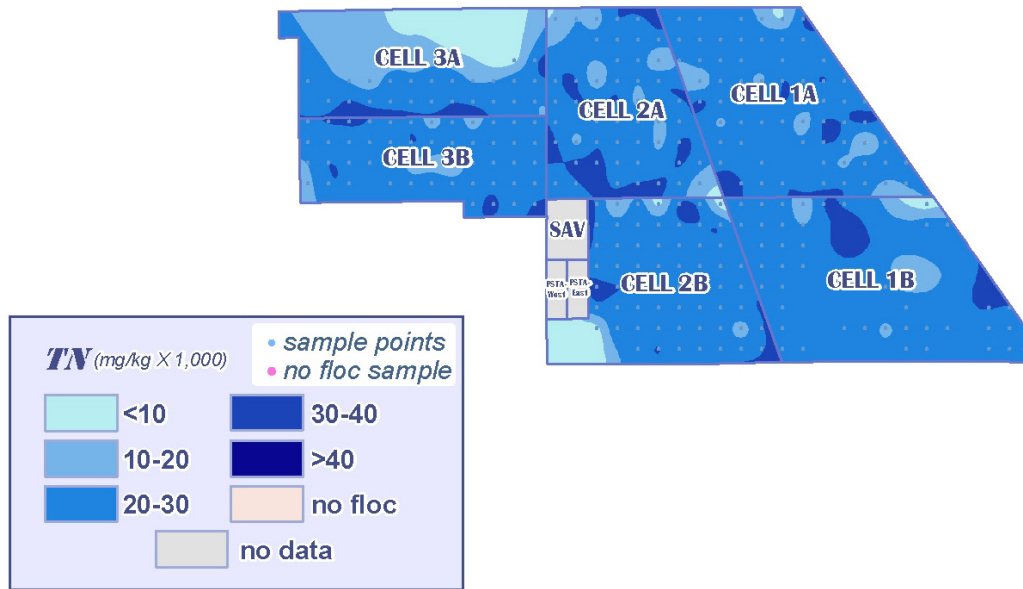


**Figure S-4.** Soil total carbon (TC) distribution in STA-3/4, STA-5, and STA-6, 0-10 cm depth, 2006–2008.

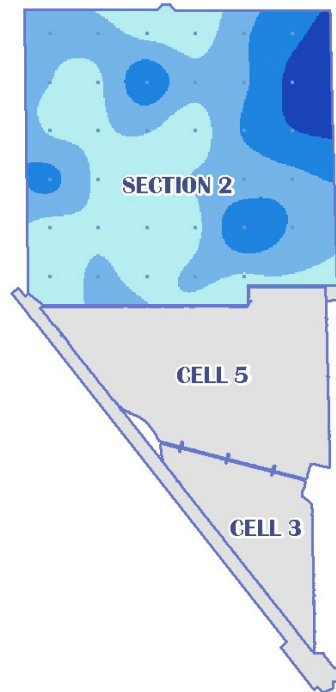


**Figure S-5.** Soil total nitrogen (TN) distribution in STA-1E, STA-1W, and STA-2, 0-10 cm depth, 2006–2008.

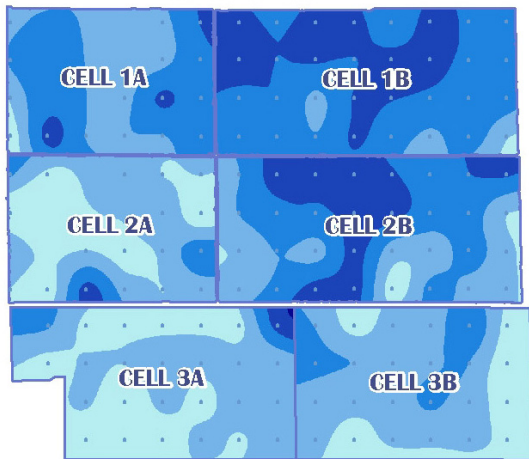
### STA 3/4



### STA 6



### STA 5



**Figure S-6.** Soil total nitrogen (TN) distribution in STA-3/4, STA-5, and STA-6 (Section 2 only), 0-10 cm depth, 2006-2008.

**Table A-1.** Summary of floc analysis results in the STAs, 2006–2008.

STA	CELL		Depth cm	BD g/cc	AFDW %	TC g/kg	TP mg/kg	TN g/kg
STA-1E			No significant amount of floc was observed					
STA-1W	ALL	MEAN	3.2	0.033	61.0	333	1237	23.6
	ALL	SD	2.4	0.028	6.13	31.0	436	2.94
	ALL	n	39	38	39	39	39	39
	1	MEAN	2.8	0.041	62.1	338	1017	22.9
	1	SD	2.3	0.025	5.51	27.7	257	1.99
	1	n	22	22	22	22	22	22
	5B	MEAN	3.4	0.016	59.9	327	1557	24.9
	5B	SD	1.9	0.017	6.81	34.7	451	3.51
	5B	n	16	15	16	16	16	16
STA-2	ALL	MEAN	7.1	0.149	29.8	221	852	11.9
	ALL	SD	3.6	0.043	11.6	44.8	205	3.88
	ALL	n	62	62	62	62	62	62
	1	MEAN	6.0	0.124	43.2	274	764	16.3
	1	SD	1.0	0.057	2.65	12.5	214	0.91
	1	n	3	3	3	3	3	3
	2	MEAN	7.7	0.137	40.1	255	1044	14.8
	2	SD	4.5	0.049	12.6	53	168	4.55
	2	n	17	17	17	17	17	17
	3	MEAN	6.9	0.156	24.7	204	781	10.4
	3	SD	3.3	0.039	7.25	30	168	2.63
	3	n	42	42	42	42	42	42
STA-3/4	ALL	MEAN	7.3	0.106	52.6	291	1051	19.3
	ALL	SD	3.8	0.039	8.49	44.1	170	3.57
	ALL	n	28	28	28	28	28	28
	1A	MEAN	8.3	0.098	56.8	253	1205	16.9
	1A	SD	6.4	0.024	0.81	4.35	117	0.60
	1A	n	4	4	4	4	4	4
	2A	MEAN	8.4	0.126	59.0	257	934	16.2
	2A	SD	3.4	0.061	5.66	27.0	143	2.76
	2A	n	7	7	7	7	7	7
	2B	MEAN	6.7	0.097	49.3	314	1054	21.1
	2B	SD	3.4	0.027	8.68	40.3	164	3.12
	2B	n	16	16	16	16	16	16
STA-5	Northern FW	MEAN	5.4	0.112	65.8	382	1210	28.8
	Northern FW	SD	2.8	0.034	5.73	35.6	483	3.53
	Northern FW	n	16	16	16	16	16	16



**Table A-2.** Summary of soil analysis results at 0-10 cm depth in the STAs, 2006–2008.

STA	CELL		BD g/cc	AFDW %	TC g/kg	TP mg/kg	TN g/kg	TCA g/kg
STA-1E	ALL	MEAN	1.031	11.1	68.8	124	4.70	2.42
	ALL	SD	0.365	19.1	100	173	6.82	4.74
	ALL	n	108	108	108	108	108	29
1	1	MEAN	1.350	1.10	6.96	49.3	0.65	2.08
	1	SD	0.090	0.90	4.82	35.4	0.19	5.35
	1	n	12	12	12	12	12.00	12
3	3	MEAN	1.308	1.62	12.3	49.3	0.95	2.17
	3	SD	0.151	1.93	8.27	25.5	0.58	3.25
	3	n	12	12	12	12	12	12
4N	4N	MEAN	1.129	3.11	25.1	42.2	1.80	
	4N	SD	0.225	3.44	23.5	35.3	1.36	
	4N	n	16	16	16	16	16	
4S	4S	MEAN	1.113	5.21	40.1	53.5	2.55	
	4S	SD	0.194	4.60	29.4	40.3	2.02	
	4S	n	20	20	20	20	20	
5	5	MEAN	1.037	10.4	62.5	282	4.30	3.84
	5	SD	0.301	18.3	91.2	343	6.55	6.81
	5	n	12	12	12	12	12	5
6	6	MEAN	0.794	20.4	118	161	8.08	
	6	SD	0.420	24.7	118	146	7.96	
	6	n	28	28	28	28	28	
7	7	MEAN	0.560	40.2	241	320	16.4	
	7	SD	0.358	27.0	146	203	9.9	
	7	n	8	8	8	8	8	
STA-1W, pre-2007 rehabilitation	ALL	MEAN	0.259	70.9	399	647	25.3	177
	ALL	SD	0.094	15.2	72.5	366	5.16	83.1
	ALL	n	147	147	147	147	147	10
1	1	MEAN	0.148	65.4	370	803	23.9	
	1	SD	0.048	9.66	48.6	312	2.74	
	1	n	29	29	29	29	29	
2	2	MEAN	0.263	85.8	480	316	31.3	
	2	SD	0.028	2.06	22.1	71.6	1.67	
	2	n	6	6	6	6	6	
3	3	MEAN	0.214	80.0	453	571	29.3	
	3	SD	0.073	13.2	71.6	309	5.02	
	3	n	20	20	20	20	20	
4	4	MEAN	0.279	43.7	281	659	15.7	177
	4	SD	0.051	23.0	97.1	232	6.49	83.1
	4	n	10	10	10	10	10	10
5A	5A	MEAN	0.306	72.9	403	570	24.4	
	5A	SD	0.058	15.3	72.1	160	4.48	
	5A	n	14	14	14	14	14	

**Table A-2.** Continued.

STA	CELL		BD g/cc	AFDW %	TC g/kg	TP mg/kg	TN g/kg	TCA g/kg
STA-1W, post 2007 rehabilitation	5B	MEAN	0.306	72.9	405	646	25.9	
	5B	SD	0.084	11.3	52.5	433	3.86	
	5B	n	68	68	68	68	68	
	1B	MEAN	0.173	85.4	474	306	27.6	
		SD	0.005	3.41	21.1	73.3	1.16	
		n	7	7	7	7	7	
	2B	MEAN	0.216	81.5	464	439	28.8	41.7
		SD	0.025	4.99	30.3	137	2.28	10.6
		n	17	17	17	17	17	9
STA-2	4	MEAN	0.239	69.9	406	506	23.9	70.5
		SD	0.039	15.1	74.2	234	4.71	39.0
		n	10	10	10	10	10	9
	ALL	MEAN	0.251	80.3	443	540	27.7	40.8
	ALL	SD	0.084	9.04	54.0	215	3.03	10.3
	ALL	n	115	115	115	115	115	42
	1	MEAN	0.171	81.5	461	355	30.3	
	1	SD	0.014	6.89	33.3	90.5	2.93	
	1	n	9	9	9	9	9	
STA-2	2	MEAN	0.221	83.7	472	555	27.8	
	2	SD	0.034	3.86	23.4	223	1.63	
	2	n	18	18	18	18	18	
	3	MEAN	0.230	82.6	458	536	27.6	
	3	SD	0.054	4.56	33.0	219	1.61	
	3	n	46	46	46	46	46	
	4	MEAN	0.304	76.1	412	577	27.3	40.8
	4	SD	0.104	12.6	69.1	212	4.26	10.3
	4	n	42	42	42	42	42	42
STA-3/4	ALL	MEAN	0.268	70.6	382	615	25.3	64.6
	ALL	SD	0.095	14.1	78.7	200	4.92	38.3
	ALL	n	297	297	297	297	297	8
	1A	MEAN	0.267	70.8	383	607	25.0	44.0
	1A	SD	0.091	13.6	76.1	190	4.77	1.4
	1A	n	66	66	66	66	66	2
	1B	MEAN	0.243	74.1	395	530.5	25.0	
	1B	SD	0.111	12.7	81.6	172.6	4.53	
	1B	n	43	43	43	43	43	
STA-3/4	2A	MEAN	0.261	67.9	371	668	25.3	76.3
	2A	SD	0.084	14.2	80.9	287	5.30	45.8
	2A	n	52	52	52	52	52	5
	2B	MEAN	0.317	72.0	406	651	26.1	
	2B	SD	0.101	16.1	81.2	191	5.26	
	2B	n	61	61	61	61	61	

**Table A-2.** Continued.

STA	CELL		BD g/cc	AFDW %	TC g/kg	TP mg/kg	TN g/kg	TCA g/kg
	3A	MEAN	0.304	65.1	348	546	24.3	
	3A	SD	0.082	14.9	72.3	117	5.41	
	3A	n	24	24	24	24	24	
	3B	MEAN	0.220	70.9	368	634	25.6	
	3B	SD	0.054	11.9	69.1	135	4.46	
	3B	n	51	51	51	51	51	
STA-5	NFW+SFW	MEAN	0.379	57.2	315	694	22.4	33.7
	NFW+SFW	SD	0.208	22.6	318	512	8.9	23.7
	NFW+SFW	n	99	99	99	99	99	17
	NFW	MEAN	0.307	64.3	359	633	25.4	
	NFW	SD	0.110	17.4	101	375	6.9	
	NFW	n	48	48	48	48	48	
	SFW	MEAN	0.447	50.4	274	752	19.6	33.2
	SFW	SD	0.252	24.9	138	612	9.7	24.4
	SFW	n	51	51	51	51	51	16
	1A	MEAN	0.338	57.3	288	792	20.7	
	1A	SD	0.163	18.9	112	600	7.8	
	1A	n	16	16	16	16	16	
	1B	MEAN	0.292	67.9	395	554	27.7	
	1B	SD	0.068	15.7	73	137	5.0	
	1B	n	32	32	32	32	32	
	2A	MEAN	0.630	34.9	177	771	13.2	33.2
	2A	SD	0.300	22.5	102	657	8.3	24.4
	2A	n	19	19	19	19	19	16
	2B	MEAN	0.338	59.6	332	741	23.4	
	2B	SD	0.132	21.8	124	595	8.4	
	2B	n	32	32	32	32	32	
	3A	MEAN	0.772	28.1	142	434	10.9	15.7
	3A	SD	0.209	18.2	93	222	6.7	13.1
	3A	n	25	25	25	25	25	25
	3B	MEAN	0.663	35.7	182	437	13.4	23.4
	3B	SD	0.188	17.3	83	172	6.1	15.2
	3B	n	25	25	25	25	25	25
STA-6	Cell 3		No samples collected					
	Cell 5		No samples collected					
	Sec 2	MEAN	0.853	31.2	177	572	13.4	17.1
		SD	0.326	21.4	114	202	8.1	10.7
		n	36	36	36	36	36	36

**Table A-3.** Estimated mass of total phosphorus (TP) retained in the floc layer at selected STA cells.

STA	Cell	Yrs of Operation	TP in Floc mt	n	Floc TP, mg/Kg		Floc Depth, cm		Bulk Density, g/cc		AFDW %	
					Mean	SD	Mean	SD	Mean	SD	Mean	SD
STA-1W	1	2001–2007	8.05	21	1017	257	3.2	2.7	0.041	0.025	62.2	5.5
	5	2001–2007	13.2	17	1523	459	3.4	1.9	0.022	0.029	59.9	6.8
STA-2	2	2003–2007	101	17	1044	168	7.7	4.5	0.137	0.049	70.2	11.6
	3	2003–2007	77.2	42	781	168	6.9	3.3	0.156	0.039	24.7	7.3
STA-3/4	2A	2006–2007	102	7	934	143	8.4	3.4	0.126	0.061	59.0	5.7
	2B	2006–2007	80.2	16	1054	164	6.7	3.4	0.097	0.027	49.3	8.7
STA-5	1B	2001–2007	33.4	16	1210	483	5.4	2.8	0.112	0.034	34.2	5.7

**Table B-1.** Total nitrogen (TN), total carbon (TC), pH, and EC in floc and peat soil layers from cores collected in STA-1W Cell 4. Cores were collected prior to soil scraping in 2007. Sample locations are listed in the order of distance from inflow.

Location	(Latitude Longitude)	Horizon	Depth (cm)	TN (g/kg)	Standard Deviation	TOC (g/kg)	Standard Deviation	pH	Standard Deviation	EC (µS/cm)	Standard Deviation
STA-1W4B	26.37.963 80.26.399	Floc layer	0-6	16.4	0.30	223	2.94	7.34	0.01	1056	30.4
		Floc layer	6-12.5	20.0	0.24	242	1.91	6.82	0.06	1137	27.6
		Peat	12.5-17.5	2.20	0.13	NA	1.83	5.96	0.01	891	22.0
		Peat	17.5-25.4	21.0	0.55	250	6.15	5.81	0.00	707	7.7
STA-1W4C	26.37.962 80.26.154	Floc layer	0-7	12.1	0.31	220	2.86	7.40	0.04	1154	103
		Floc layer	7-13	21.6	0.17	259	1.07	6.32	0.01	1100	19.1
		Peat	13-18	21.4	0.15	253	1.84	5.92	0.01	1024	12.7
		Peat	18-26.7	22.0	0.10	252	0.38	5.91	0.01	891	35.8
STA-1W4E	26.37.744 80.26.645	Floc layer	0-8	9.64	0.08	183	0.97	7.58	0.03	1138	46.0
		Floc layer	8-14	13.9	0.26	247	12.8	7.39	0.01	1180	86.3
		Peat	14-19	20.6	0.26	269	5.58	6.99	0.02	1183	5.7
		Peat	19-27.9	20.5	0.13	272	4.19	6.71	0.01	1100	21.9
STA-1W4F	26.37.743 80.26.400	Floc layer	0-6	13.0	0.54	228	15.4	7.47	0.02	1312	9.9
		Floc layer	6-12	14.1	0.16	246	3.07	7.44	0.02	1155	43.1
		Peat	12-18	21.2	0.22	281	1.51	6.72	0.01	1209	2.1
		Peat	18-27.9	20.9	0.23	282	8.29	6.74	0.02	1145	16.3
STA-1W4G	26.37.742 80.26.155	Floc layer	0-6	14.7	1.36	281	27.8	7.41	0.01	1061	17.0
		Floc layer	6-12	19.8	0.03	284	1.18	6.85	0.02	1158	9.9
		Peat	12-20.3	20.2	0.33	293	3.24	6.73	0.01	1245	10.6

**Table B-1.** Continued.

Location	(Latitude Longitude)	Horizon	Depth (cm)	TN (g/kg)	Standard Deviation	TOC (g/kg)	Standard Deviation	pH	Standard Deviation	EC (µS/cm)	Standard Deviation
STA-1W4H	26.37.524 80.26.646	Floc layer	0-6	8.18	0.06	171	0.65	7.60	0.01	962	8.0
		Floc layer	6-12	17.6	0.34	303	0.01	7.20	0.04	1058	4.2
		Peat	12-18	21.7	0.19	375	0.44	6.80	0.05	920	30.5
		Peat	18-26	21.7	0.19	324	0.53	6.29	0.04	478	14.9
STA-1W4I	26.37.523 80.26.401	Floc layer	0-5.0	8.36	0.03	167	0.40	7.56	0.01	1328	6.4
		Floc layer	5-11	15.3	0.09	275	0.74	7.31	0.01	1237	16.3
		Peat	11-18	22.6	0.10	394	0.32	6.48	0.04	1178	20.5
		Peat	18-27.9	16.5	0.35	227	4.84	6.18	0.08	556	22.1
STA-1W4J	26.37.304 80.26.647	Floc layer	0-6	9.73	0.01	186	1.07	7.58	0.01	1346	4.9
		Floc layer	6-13	16.5	0.65	252	0.77	7.29	0.01	1404	49.5
		Peat	13-18	19.5	0.52	305	12.6	7.00	0.01	1409	75.0
		Peat	18-26.7	17.8	0.30	261	0.55	6.83	0.18	1289	211

**Table B-2.** Humic acids (HA), fulvic acids (FA), and HA/FA ratios in floc and peat soil samples from STA-1W Cell 4. Sampling locations are ordered according to distance from inflow.

Location	Horizon	Depth (cm)	HA (g kg <sup>-1</sup> )	Standard Deviation	FA (g kg <sup>-1</sup> )	Standard Deviation	HA/FA	Standard Deviation
STA-1W4B	Floc layer.	0-6	29.6	2.93	4.22	0.67	7.06	0.43
	Floc layer.	6-12.5	32.7	0.09	6.66	0.03	4.91	0.03
	Peat	12.5-17.5	39.7	1.62	8.28	0.35	4.79	0.01
	Peat	17.5-25.4	37.7	5.72	7.33	0.22	5.14	0.63
STA-1W4C	Floc layer.	0-7	21.4	3.67	7.17	0.43	2.98	0.33
	Floc layer.	7-13	35.6	1.83	7.69	0.17	4.62	0.14
	Peat	13-18	39.9	1.61	8.34	0.22	4.79	0.32
	Peat	18-26.7	36.9	1.61	8.77	0.46	4.20	0.04
STA-1W4E	Floc layer.	0-8	15.3	1.47	6.47	0.19	2.35	0.16
	Floc layer.	8-14	23.6	0.11	5.93	0.13	3.98	0.07
	Peat	14-19	33.8	0.30	6.40	0.22	5.28	0.13
	Peat	19-27.9	26.4	5.49	7.00	0.74	3.75	0.39
STA-1W4F	Floc layer.	0-6	16.3	1.00	6.58	0.54	2.48	0.05
	Floc layer.	6-12	17.0	0.46	6.47	0.03	2.64	0.06
	Peat	12-18	35.0	1.78	6.91	0.65	5.07	0.22
	Peat	18-27.9	30.7	0.81	6.95	0.11	4.41	0.05
STA-1W4G	Floc layer.	0-6	35.2	4.42	6.95	0.35	5.06	0.38
	Floc layer.	6-12	37.9	0.17	7.67	0.22	4.95	0.12
	Peat	12-20.3	36.5	2.67	6.96	0.19	5.23	0.24
STA-1W4H	Floc layer.	0-6	14.7	1.73	6.41	0.41	2.29	0.12
	Floc layer.	6-12	30.9	0.51	6.84	0.10	4.52	0.01
	Peat	12-18	29.6	2.16	7.04	0.37	4.21	0.09
	Peat	18-26	26.9	0.32	6.71	0.04	4.01	0.07
STA-1W4I	Floc layer.	0-5.0	12.4	2.87	6.85	0.02	1.81	0.41
	Floc layer.	5-11	21.5	0.22	6.55	0.23	3.28	0.15
	Peat	11-18	37.0	1.82	6.46	0.18	5.37	0.41
	Peat	18-27.9	24.8	2.41	6.08	0.25	4.09	0.56
STA-1W4J	Floc layer.	0-6	10.9	1.56	7.28	0.21	1.50	0.17
	Floc layer.	6-13	29.6	1.41	7.03	0.34	4.23	0.40
	Peat	13-18	27.8	1.09	6.22	0.08	4.48	0.12
	Peat	18-26.7	28.6	2.58	6.33	0.68	4.52	0.08

**Table B-3.** Particle size distribution of peat and floc samples. Sample locations are listed in the order of distance from inflow.

	1-0.25mm	0.25-0.005	0.05-0.01	0.01-0.005	0.005-0.001	<0.001
STA -1W4B-Floc	23.68	28.69	33.26	6.26	4.05	4.05
STA -1W4B-Peat	32.02	22.09	27.47	7.58	5.53	5.31
STA -1W4C-Floc	41.84	18.06	26.63	3.89	3.53	6.05
STA -1W4C-Peat	46.31	18.06	22.26	5.00	1.89	6.47
STA -1W4E-Floc	17.96	17.47	29.59	8.30	11.42	15.26
STA -1W4E-Peat	34.01	12.89	32.42	7.05	4.37	9.26
STA -1W4F-Floc	28.22	14.94	25.26	10.11	8.47	13.00
STA -1W4F-Peat	42.04	15.54	27.16	5.58	2.63	7.05
STA -1W4G-Floc	45.48	15.32	23.37	4.16	3.79	7.89
STA -1W4G-Peat	43.37	15.05	27.47	5.63	2.37	6.10
STA -1W4H-Floc	38.99	14.65	24.79	5.16	6.79	9.63
STA -1W4H-Peat	38.51	24.49	20.79	6.05	1.53	8.63
STA -1W4I-Floc	44.61	10.29	25.00	5.21	6.68	8.21
STA -1W4I-Peat	37.88	26.86	22.74	3.84	2.05	6.63
STA -1W4J-Floc	43.65	13.99	25.95	4.63	4.26	7.52
STA -1W4J-Peat	43.14	14.76	27.58	5.37	1.79	7.36

**Table B-4.** Microbial biomass carbon (C), nitrogen (N), and phosphorus (P) of peat and floc samples. Samples are arranged in order of distance from inflow.

	MBP		MBC		MBN		Microbial C/N
	Mean	SD	Mean	SD	Mean	SD	
$\text{mg kg}^{-1}$							
STA -1W4B-Floc	3.92	0.61	914	75.2	39.9	6.52	23.2
STA -1W4B-Peat	2.42	0.88	652	85.9	48.7	32.4	18.7
STA -1W4C-Floc	8.88	1.30	554	104	76.8	44.1	9.95
STA -1W4C-Peat	1.87	0.99	577	66.0	49.8	32.9	19.4
STA -1W4E-Floc	24.2	8.50	788	43.5	324	24.4	2.45
STA -1W4E-Peat	4.76	1.65	350	78.3	68.1	9.52	5.18
STA -1W4F-Floc	9.49	7.49	595	106	140	33.6	4.58
STA -1W4F-Peat	1.94	1.37	491	33.9	78.2	18.8	6.50
STA -1W4G-Floc	1.65	1.88	871	89.3	64.2	10.2	13.7
STA -1W4G-Peat	1.26	0.58	596	33.0	63.5	12.8	9.63
STA -1W4H-Floc	11.9	9.16	488	18.6	194	15.1	2.54
STA -1W4H-Peat	3.84	2.33	556	65.2	49.0	22.2	12.4
STA -1W4I-Floc	7.15	8.72	583	74.3	170	30.2	3.45
STA -1W4I-Peat	1.49	0.17	483	70.0	64.2	32.3	8.86
STA -1W4J-Floc	10.7	2.84	374	111	217	41.7	1.82
STA -1W4J-Peat	3.38	1.35	306	29.3	48.8	23.7	7.21



**Table B-5.** Cation and anion concentrations in porewater of floc samples from STA-1W Cell 4.

Locations	K	Na	Ca	Mg	SO <sub>4</sub> <sup>2-</sup> -S	Cl <sup>-</sup>
			mg kg <sup>-1</sup>			
STA-1W4B	153	2242	962	346	62.4	3743
STA-1W4F	679	10156	4053	1618	342	17571
STA-1W4H	73.5	1060	433	190	54.6	1781
STA-1W4J	215	2776	1069	505	85.2	4544
Mean	280	4059	1629	665	136	6910