

**This documents contains statistics ran on the Shaw Mountain Ice Storm Soils Data collected from 1998 to 2002. This documented was created by extracting information from a dataset that Jim Graves provided the FEMC.**

**Data Source:** 1998 & 1999, CALS, Cornell Nutrient Analysis Laboratories and 2000, 2001, 2002, UVM Agricultural Testing Lab

**Method:** weak acid extraction, quantities reported on oven dry (110C) weight basis

**Variables:**

pl = plot number	K = K, available (mg/Kg)	Mn = Mn, available (mg/Kg)	om = Organic Matter, LOI (%)
qd = quadrant (5 = pooled)	Mg = Mg, available (mg/Kg)	Zn = Zn, available (mg/Kg)	N = NO3, available (mg/Kg)
yr = year	Ca = Ca, available (mg/Kg)	Cu = Cu, available (mg/Kg)	
ms = Moisture (%)	Fe = Fe, available (mg/Kg)	pH = pH in water (pH)	
P = P, available (mg/Kg)	Al = Al, available (mg/Kg)	ea = Exchang.Acidity (cmol/Kg)	

**Proportional Change Comparison Results:**

Proportional Change = ((Year2 Value/Year1 Value) -1)

Year_Range	P	K	Mg	Ca	Na	Fe	Al	Mn	Zn	B	Cu	pH	ea	om
1998 to 1999	-0.02	-0.55	0.89	0.98		0.69	-0.31	4.06	-0.01			0.06	-0.02	-0.07
1998 to 1999	0.12	-0.47	0.41	0.62		0.22	-0.27	11.02	0.27			-0.04	0.17	0.09
1998 to 1999	0.00	-0.48	0.03	0.19		0.62	0.12	2.65	0.35			-0.01	-0.01	-0.27
1998 to 1999	0.29	-0.46	-0.03	0.51		1.23	-0.20	2.11	0.29			-0.03	0.25	-0.17
1999 to 2000	1.03	0.97	0.67	0.36		-0.89	-0.77	0.08	-0.85			0.07		0.67
1999 to 2000	0.55	1.47	0.61	0.34		-0.70	-0.50	0.14	-0.84			0.25		0.26
1999 to 2000	-0.13	0.96	0.29	0.10		-0.76	-0.65	-0.20	-0.76			0.07		0.46
1999 to 2000	2.50	0.36	1.03	0.17		-0.74	-0.47	-0.54	-0.84			0.04		-0.02
2000 to 2001	-0.38	-0.17	-0.22	-0.24	0.04	0.96	0.55	-0.03	7.85	-0.04	-0.67	0.00		-0.33
2000 to 2001	-0.29	-0.48	-0.57	-0.47	2.15	0.67	-0.06	-0.44	4.00	-0.17	-0.55	-0.13		-0.08
2000 to 2001	0.85	-0.17	-0.28	-0.28	0.61	0.10	0.22	-0.14	2.43	-0.31	-0.58	-0.02		0.03
2000 to 2001	-0.61	-0.22	-0.69	-0.62	1.13	3.59	1.52	1.16	3.04	-0.74	-0.60	-0.07		-0.03
2001 to 2002	-0.50	0.02	-0.29	-0.26			0.55		-0.39			-0.07		
2001 to 2002	-0.07	1.00	-0.21	-0.31			0.92		-0.31			-0.02		
2001 to 2002	-0.38	-0.13	-0.17	-0.20			0.58		-0.17			-0.09		
2001 to 2002	-0.05	0.51	1.55	1.44			-0.52		-0.10			0.10		

**Yearly Summary Statistics:**

Stat	ice	year	ms	P	K	Mg	Ca	Na	Fe	Al	Mn	Zn	B	Cu	pH	ea	om	N
mean	1	1998	7.33	4.50	81.50	257.65	1523.00		8.40	85.60	5.95	2.31		2.00	5.51	19.04	8.83	0.00
standard deviation	1	1998	1.98	0.57	2.12	188.73	907.93		6.08	71.70	2.47	0.85		0.85	0.47	0.95	3.81	0.00
mean	0	1998	4.69	2.30	73.50	193.35	1191.00		8.75	72.40	15.35	2.34		1.20	5.41	16.23	8.00	0.00
standard deviation	0	1998	0.82	1.13	12.02	62.44	359.21		1.91	10.18	1.91	0.37		0.14	0.06	1.40	0.96	0.00
mean	1	1999		4.75	40.00	393.75	2622.50		13.25	59.50	44.75	2.70		na	5.55	20.50	9.15	6.50
standard deviation	1	1999		1.06	3.54	224.51	1240.97		11.67	48.08	8.13	1.41		na	0.07	3.54	4.88	0.71
mean	0	1999		2.75	38.75	195.00	1570.00		17.25	68.50	52.25	3.08		na	5.30	18.00	6.20	6.00
standard deviation	0	1999		1.77	5.30	70.71	219.20		7.42	6.36	12.37	0.39		na	0.14	1.41	0.14	0.00
mean	1	2000		8.30	89.45	642.00	3533.00	13.75	1.95	17.00	49.90	0.42	0.62	0.26	6.45		12.70	
standard deviation	1	2000		0.28	21.99	353.55	1632.00	6.43	0.64	6.08	10.75	0.23	0.14	0.06	0.78		4.53	
mean	0	2000		7.65	65.30	306.00	1778.00	10.60	4.40	29.80	34.50	0.60	0.34	0.25	5.60		7.60	
standard deviation	0	2000		8.98	25.17	15.56	171.12	1.70	2.12	6.08	20.22	0.11	0.07	0.01	0.28		2.26	
mean	1	2001		5.50	58.00	343.50	2134.00	24.00	3.60	22.50	36.55	2.60	0.55	0.10	6.00		10.50	
standard deviation	1	2001		0.71	4.24	55.86	472.35	7.07	1.56	14.85	6.43	0.42	0.07	0.00	0.14		5.80	
mean	0	2001		3.95	53.00	160.00	997.50	19.50	15.15	58.50	42.95	2.20	0.15	0.10	5.35		7.65	
standard deviation	0	2001		2.19	22.63	96.17	512.65	0.71	16.90	38.89	1.06	0.14	0.07	0.00	0.49		2.62	
mean	1	2002		4.05	86.00	258.50	1515.00			37.00		1.70			5.75			
standard deviation	1	2002		2.19	33.94	61.52	268.70			19.80		0.42			0.35			
mean	0	2002		3.35	58.00	212.00	1320.00			45.00		1.90			5.35			
standard deviation	0	2002		2.62	2.83	32.53	322.44			5.66		0.00			0.21			

## T-Test Results:

Stat	year	ms	P	K	Mg	Ca	Na	Fe	Al	Mn	Zn	B	Cu	pH	ea	om
t-test	1998	0.14	0.09	0.26	0.36	0.35		0.47	0.42	0.06	0.97		0.41	0.41	0.08	0.41
t-test	1999		0.16	0.41	0.21	0.22		0.36	0.42	0.56	0.77			0.10	0.25	0.27
t-test	2000		0.47	0.21	0.20	0.18	0.61	0.17	0.08	0.47	0.46	0.17	0.77	0.17		0.16
t-test	2001		0.25	0.40	0.09	0.07	0.53	0.26	0.20	0.39	0.40	0.03		0.15		0.31
t-test	2002		0.40	0.23	0.24	0.29			0.33		0.31			0.16		

## SOIL ANALYSIS, 1998-2002: RESULTS

**Hypothesis:** Major soil nutrients (N, P, K, basic cations Mg and Ca), pH, and organic matter will be greater in iced plots. Most t statistics are not significant at  $p < .05$ , but power is low, and there is high variation between plots.

- Trends noted below may be biologically significant.
- Variation within treatments was greater than variation between treatments for many variables.

### Plot Specific Characteristics:

- Plot 1 initially had rather high P and B and low Organic Matter; Ca increased to 1999, then decreased gradually.
- Plot 2 and Plot 1 were more similar in 2001 than in 1998. In all years, Plot 2 had high O.M., Mg, Ca, Zn, pH, and low Al.
- Plot 3 had very low available P in all 5 years; low B, Na, Mg, Ca, and pH; moderate Organic Matter; and high K except in 2002.
- Plot 4 had relatively low K in all years, lower basic cations over time to 2001; moderate Mg, Ca, and pH in 2002.

### The most significant differences between iced and control plot each year were as follows:

- 1998: Higher moisture and P availability in iced plots.
- 1999: Higher pH and P availability in iced plots.
- 2000: Higher Mg, Ca, pH, B (basic cations) in iced plots; higher Al, Fe (acidic cations) in controls.
- 2001: Higher Mg, Ca, pH, B (basic cations), and higher P and organic matter in iced plots; higher Al, Fe (acidic cations) in controls.
- 2002: Differences between iced and control plots not significant; downward trend in P, Mg, and Ca continues from peak in 2000.

### The most significant trends from 1998 to 2002 were as follows:

- Basic cations (Ca, etc.) generally increased from 1998 to 1999 and from 1999 to 2000 in all plots, but by more in iced plots.
- Ca, Mg, and P decreased in 2001 and 2002 in both iced plots, and is not significantly different from control plots in 2002.
- pH changed like basic cations, increasing more in iced plots than in controls up to 2000, then generally decreasing.
- Organic matter generally increased in iced plots to 2000, then decreased in 2001. In control plot 4, O.M. gradually decreased through 2001.