Shaw Mountain Ice Storm Study, 1998-2002

DOWNED WOOD ANALYSIS

Comparisons of iced and control plots:

Hypothesis A: Iced plots have greater density and mass of downed woody debris than Control plots following the ice storm.

For debris sizes of 1 to 3 " in diameter, the hypothesis is supported.

For small size classes, data do not necessarily support the hypothesis.

1. In general, woody debris was found at greater densities and mass in Iced plots than in Control plots (iced:control ratios > 1).
2. Woody debris in larger size classes (1 to 3") remained greater in Iced than in Control plots in all 5 years.
3. Small woody debris (< .25") was greatest in density and mass in year 1 Iced plots (n.s.), but greater in Controls after that (n.s.).

Comparisons between years:

Hypothesis B: Fine woody debris will peak in abundance before coarse woody debris following the ice storm.

Data support this hypothesis for debris sizes ranging from 0 to 3". Coarser debris is not greater in year 3 than in year 1.

1. Density and mass of downed woody debris 1-3" in diameter increased in iced areas between years 1 and 3 (p=.05).
2. Density and mass of downed woody debris >3" in diameter increased in iced plots between years 1 and 5 (p = .05)
3. Density and mass of downed woody debris < .25" in diameter decreased in iced plots following a year 1 high (p = .19)
4. Iced:control ratios of density or mass were highest in year 1 for small size classes, and highest in year 5 for debris > 1".

MEANS by year and by size class

density		0-.25	.25-1	1-3	>3	>1	total
1998	iced	110	71	34	9	43	223
	control	85	40	15	7	22	146
1999	iced	49	61	44	10	54	163
	control	46	77	15	5	20	142
2000	iced	41	119	60	9	69	228
	control	84	74	20	5	25	182
2001	iced	73	102	48	10	58	232
	control	109	70	25	6	31	209
2002	iced	83	65	80	12	92	239
	control	95	75	23	6	29	198

mass		0-.25	.25-1	1-3	>3	>1	total
1998	iced	0.050	0.655	2.510	3.295	5.805	6.510
	control	0.045	0.365	1.070	3.415	4.485	4.890
1999	iced	0.023	0.561	3.246	4.291	7.537	8.122
	control	0.022	0.709	1.070	2.640	3.710	4.441
2000	iced	0.020	1.099	4.390	3.685	8.075	9.196
	control	0.040	0.682	1.439	2.435	3.874	4.596
2001	iced	0.035	0.941	3.541	4.305	7.846	8.823
	control	0.053	0.644	1.845	2.935	4.780	5.477
2002	iced	0.040	0.603	5.866	6.150	12.016	12.658
	control	0.046	0.691	1.697	3.035	4.732	5.469

ICED:CONTROL RATIOS of mean densties and mean mass

density	0-.25	.25-1	1-3	>3	>1	total
1998	1.29	1.80	2.34	1.21	1.98	1.53
1999	1.07	0.79	3.03	1.90	2.74	1.15
2000	0.49	1.61	3.05	1.80	2.80	1.25
2001	0.67	1.46	1.92	1.67	1.87	1.11
2002	0.87	0.87	3.46	2.00	3.16	1.21

mass	0-.25	.25-1	1-3	>3	>1	total
1998	1.11	1.79	2.35	0.96	1.29	1.33
1999	1.07	0.79	3.03	1.63	2.03	1.83
2000	0.49	1.61	3.05	1.51	2.08	2.00
2001	0.67	1.46	1.92	1.47	1.64	1.61
2002	0.87	0.87	3.46	2.03	2.54	2.31

COMPARISONS of iced and control plots, and years (all downed wood): t-ttests (p values shown for 1-tailed tests)

density		0-.25	.25-1	1-3	>3	>1	total
data	compare						
1998	ice/ctrl	0.395	0.247	0.034	0.175	0.024	0.258
1999	ice/ctrl	0.460	0.296	0.052	0.185	0.015	0.330
2000	ice/ctrl	0.153	0.156	0.034	0.223	0.041	0.157
2001	ice/ctrl	0.303	0.165	0.050	0.247	0.082	0.383
2002	ice/ctrl	0.356	0.351	0.088	0.053	0.082	0.282
iced	98/99	0.194	0.396	0.132	0.146	0.101	0.278
control	98/99	0.326	0.167	0.500	0.312	0.346	0.479
iced	98/00	0.186	0.179	0.047	0.448	0.017	0.481
control	98/00	0.493	0.018	0.239	0.312	0.380	0.344
iced	98/01	0.321	0.252	0.083	0.386	0.155	0.467
control	98/01	0.390	0.009	0.076	0.356	0.103	0.257
iced	98/02	0.331	0.440	0.103	0.045	0.097	0.436
control	98/02	0.454	0.154	0.101	0.276	0.085	0.291

mass		0-.25	.25-1	1-3	>3	>1	total
data	compare						
1998	ice/ctrl	0.458	0.247	0.033	0.469	0.172	0.146
1999	ice/ctrl	0.460	0.296	0.052	0.183	0.088	0.108
2000	ice/ctrl	0.153	0.156	0.034	0.174	0.051	0.052
2001	ice/ctrl	0.303	0.165	0.050	0.261	0.162	0.130
2002	ice/ctrl	0.356	0.351	0.088	0.072	0.082	0.082
iced	98/99	0.197	0.399	0.132	0.202	0.067	0.137
control	98/99	0.315	0.166	0.500	0.334	0.322	0.403
iced	98/00	0.185	0.176	0.047	0.371	0.061	0.061
control	98/00	0.459	0.017	0.237	0.275	0.352	0.424
iced	98/01	0.343	0.248	0.083	0.313	0.232	0.189
control	98/01	0.432	0.008	0.072	0.375	0.410	0.329
iced	98/02	0.355	0.443	0.103	0.056	0.089	0.085
control	98/02	0.493	0.153	0.096	0.395	0.412	0.309

VARIABLES

obs = observation number

pl = plot number (1, 2, 3, 4)

ice = ice treatment (1 = iced, 0 = control)

age = age relative to the time of the ice storm

(0 = wood downed before ice storm,

1 = wood downed by ice storm,

2 = all downed wood)

yr = year of observation

d0 = density of down stems 0 to .25" in diameter (number per 60 m transect)

d.25 = density of down stems .25 to 1" in diameter (number per 60 m transect)

d1_3 = density of down stems 1 to 3" in diameter (number per 60 m transect)

d3 = density of down stems >3" in diameter (number per 60 m transect)

d1 = density of down stems >1" in diameter (number per 60 m transect)

dt = density of all down stems (number per 60 m transect)

m0 = mass of down stems 0 to .25" in diameter (tons/acre)

m.25 = mass of down stems .25 to 1" in diameter(tons/acre)

m1_3 = mass of down stems 1 to 3" in diameter(tons/acre)

m3 = mass of down stems >3" in diameter (tons/acre)

m1 = mass of down stems >1" in diameter (tons/acre)
mt = mass of all down stems (tons/acre)
To convert tons/acre to Kg/ha, multiply tons/acre by 2241.74