Snow Survey 2004
Transect 1
Topography, Snow Depth and Density

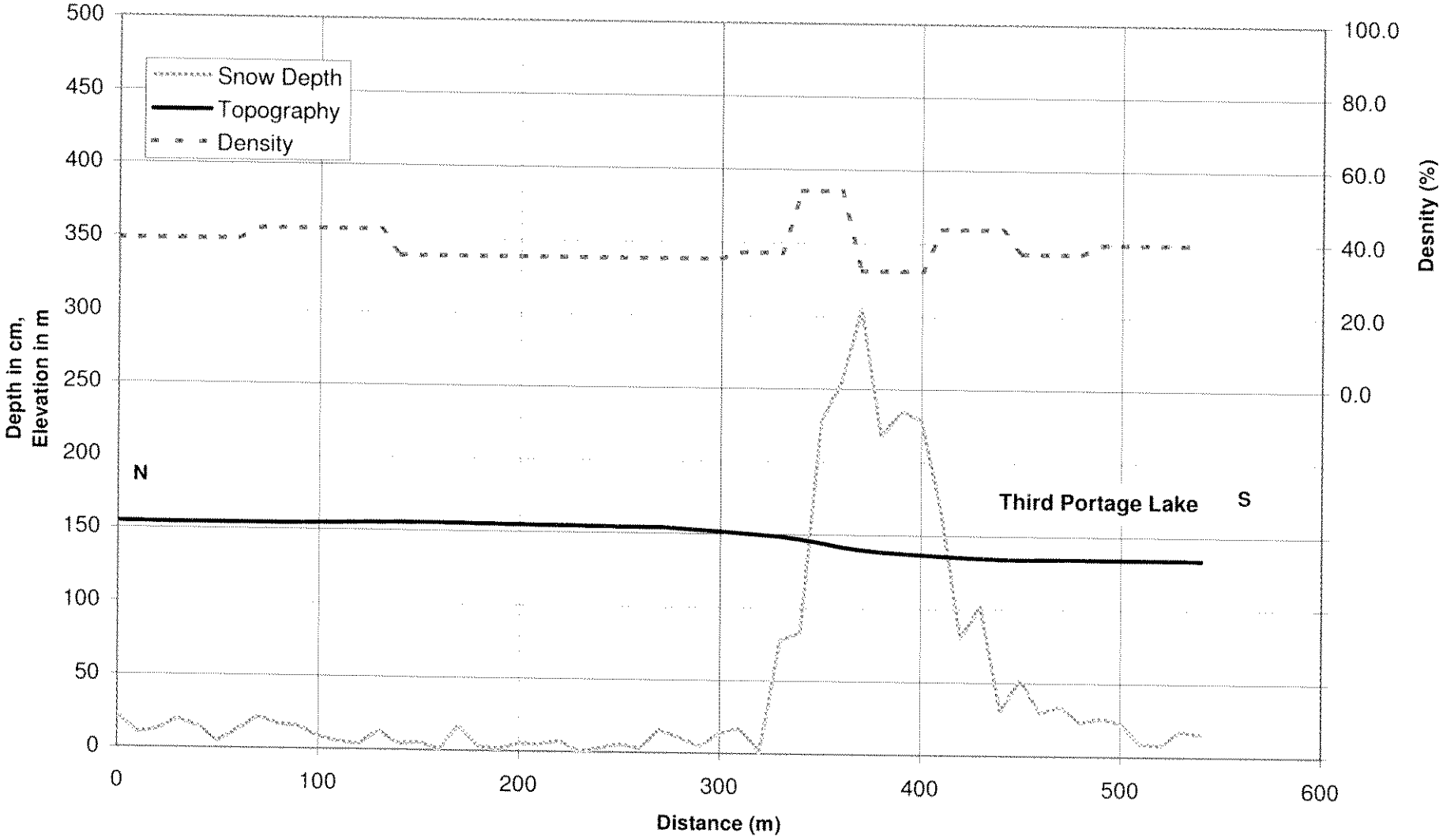

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Figure 5.2

Snow Survey 2004
Transect 2E
Topography, Snow Depth and Density

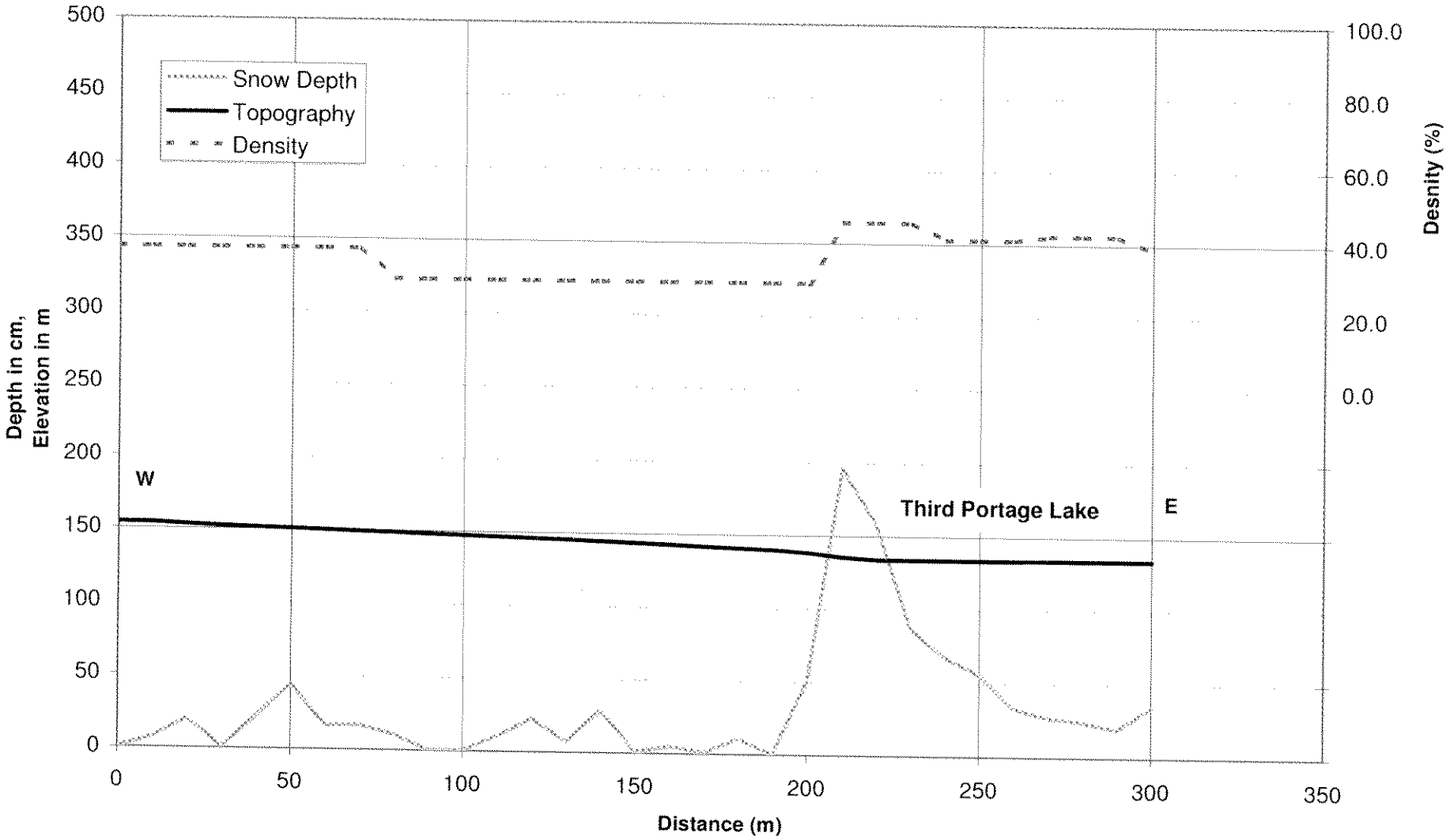

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Figure 5.3

Snow Survey 2004
Transect 2W
Topography, Snow Depth and Density

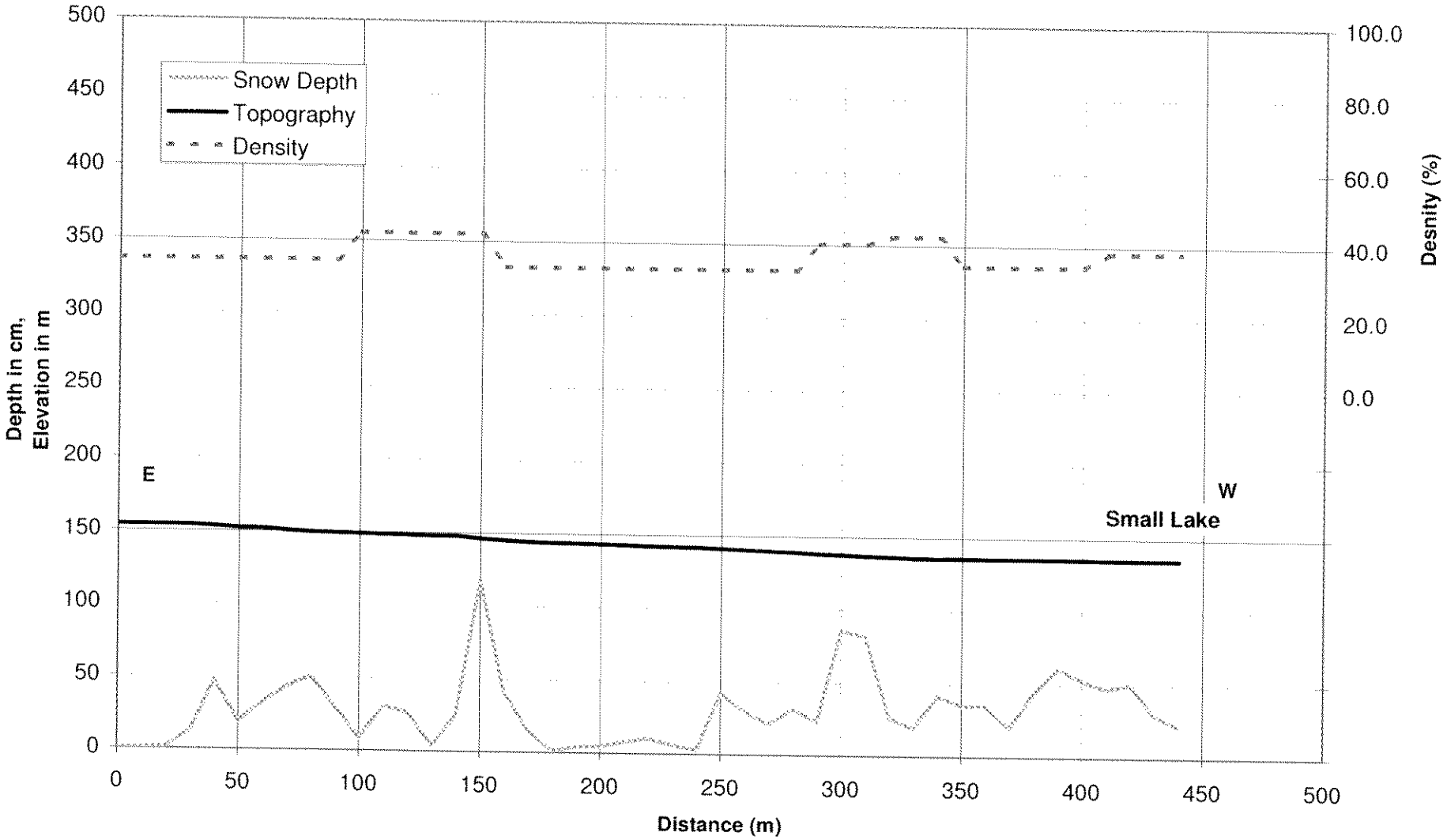

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Figure 5.4

Snow Survey 2004
Transect 3E
Topography, Snow Depth and Density

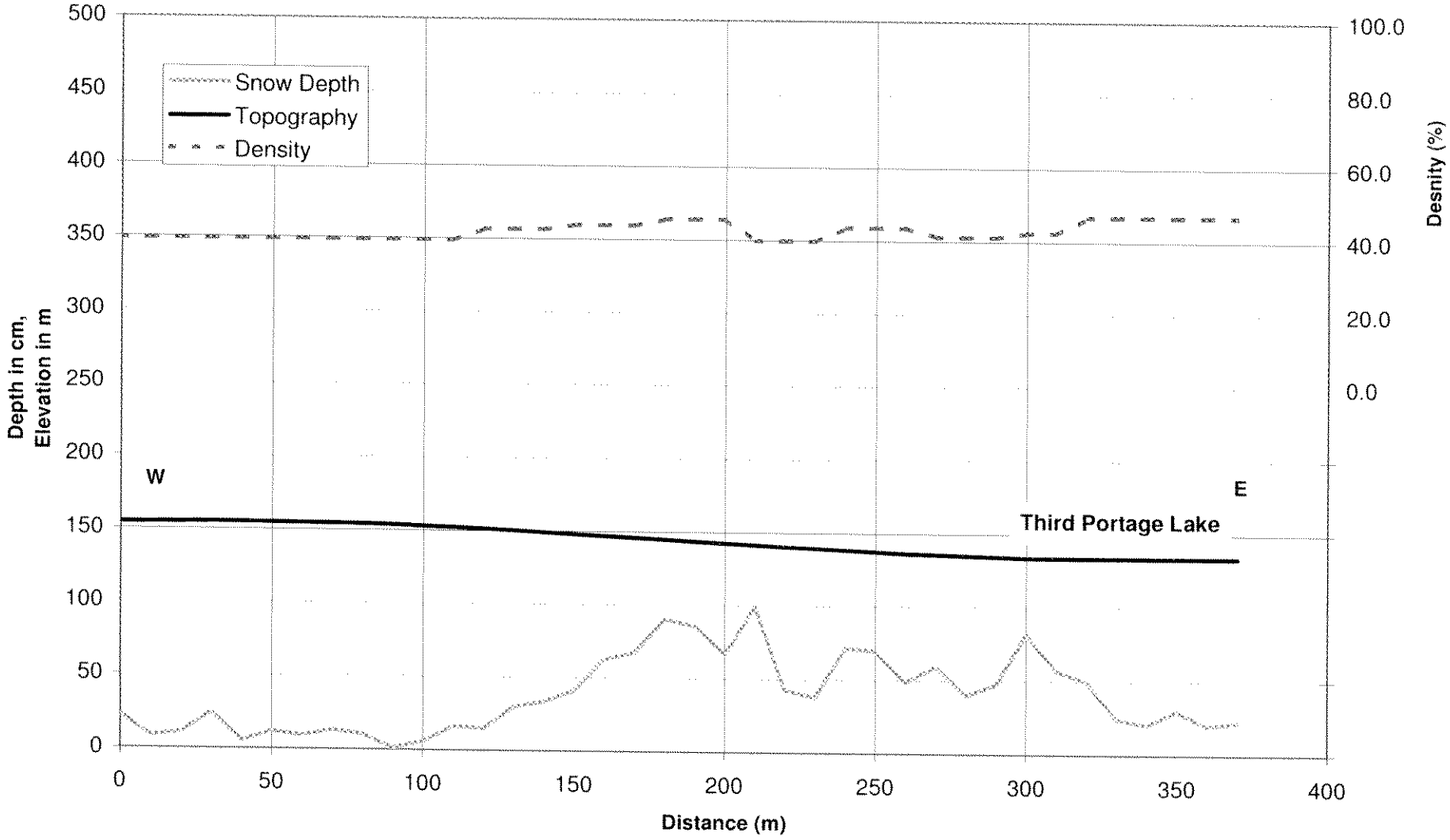

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Figure 5.5

Snow Survey 2004
Transect 3W
Topography, Snow Depth and Density

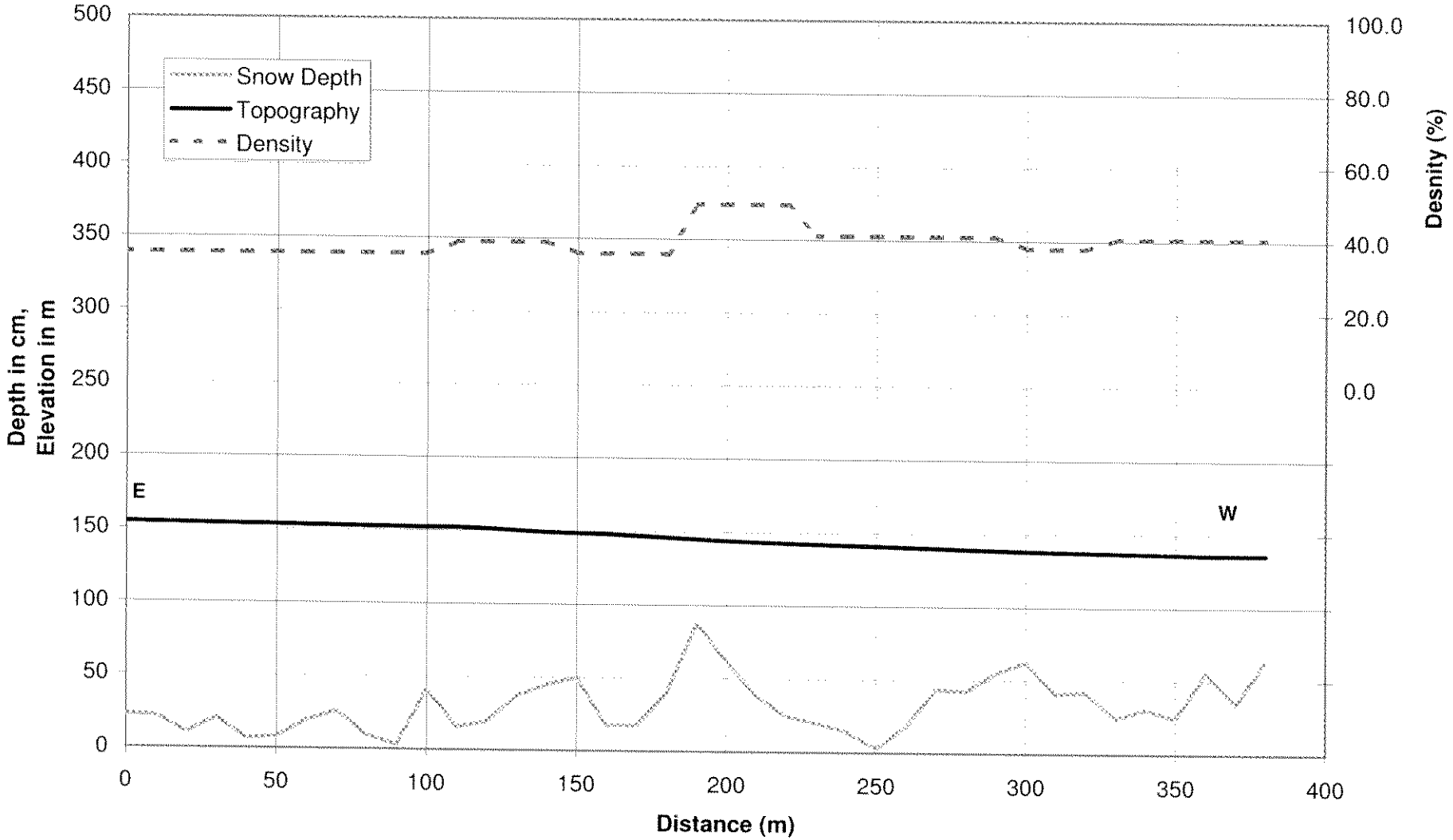

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Figure 5.6

Snow Survey 2004
Transect 4
Topography, Snow Depth and Density

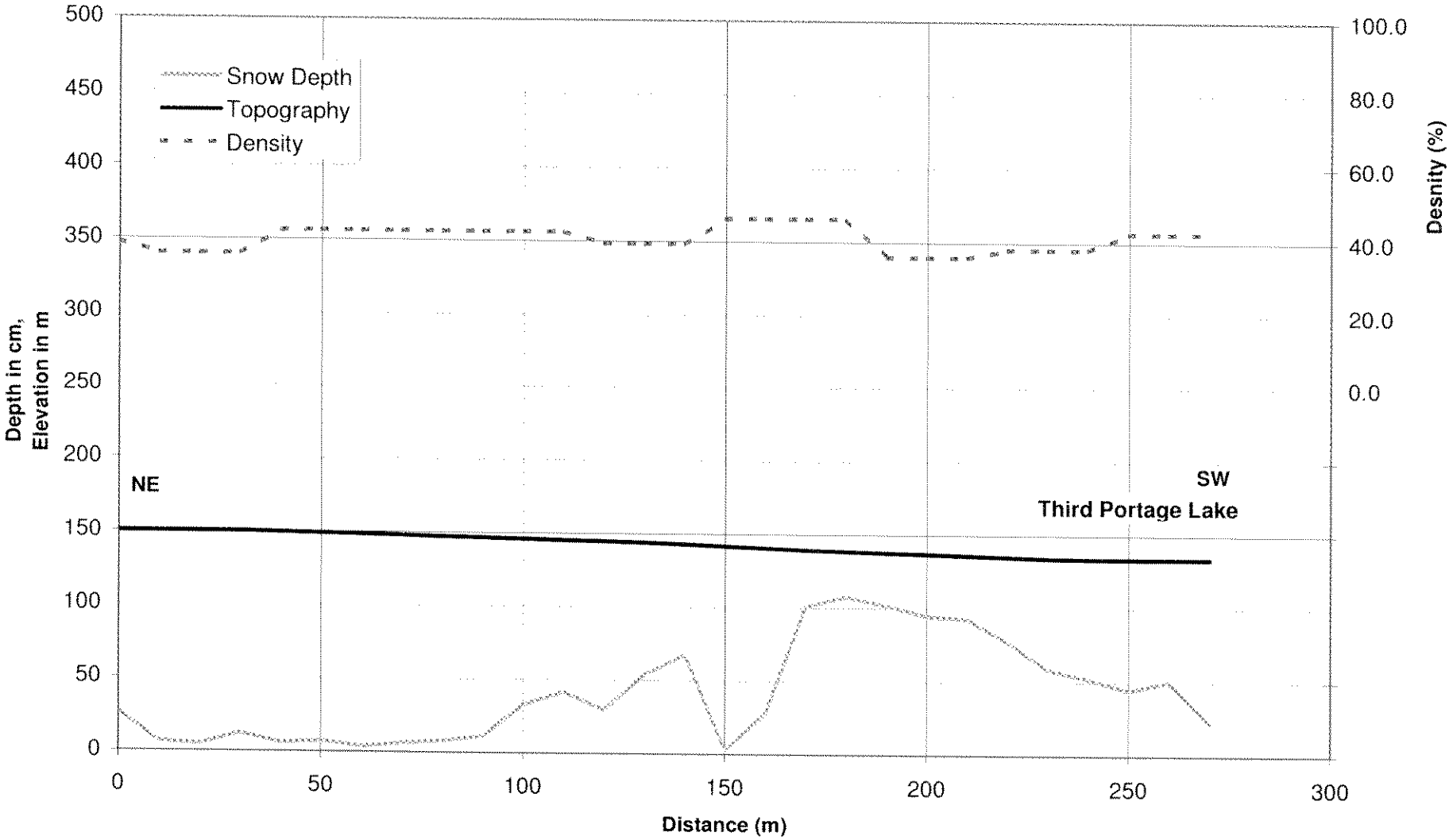

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Figure 5.7

Snow Survey 2004
Transect 5
Topography, Snow Depth and Density

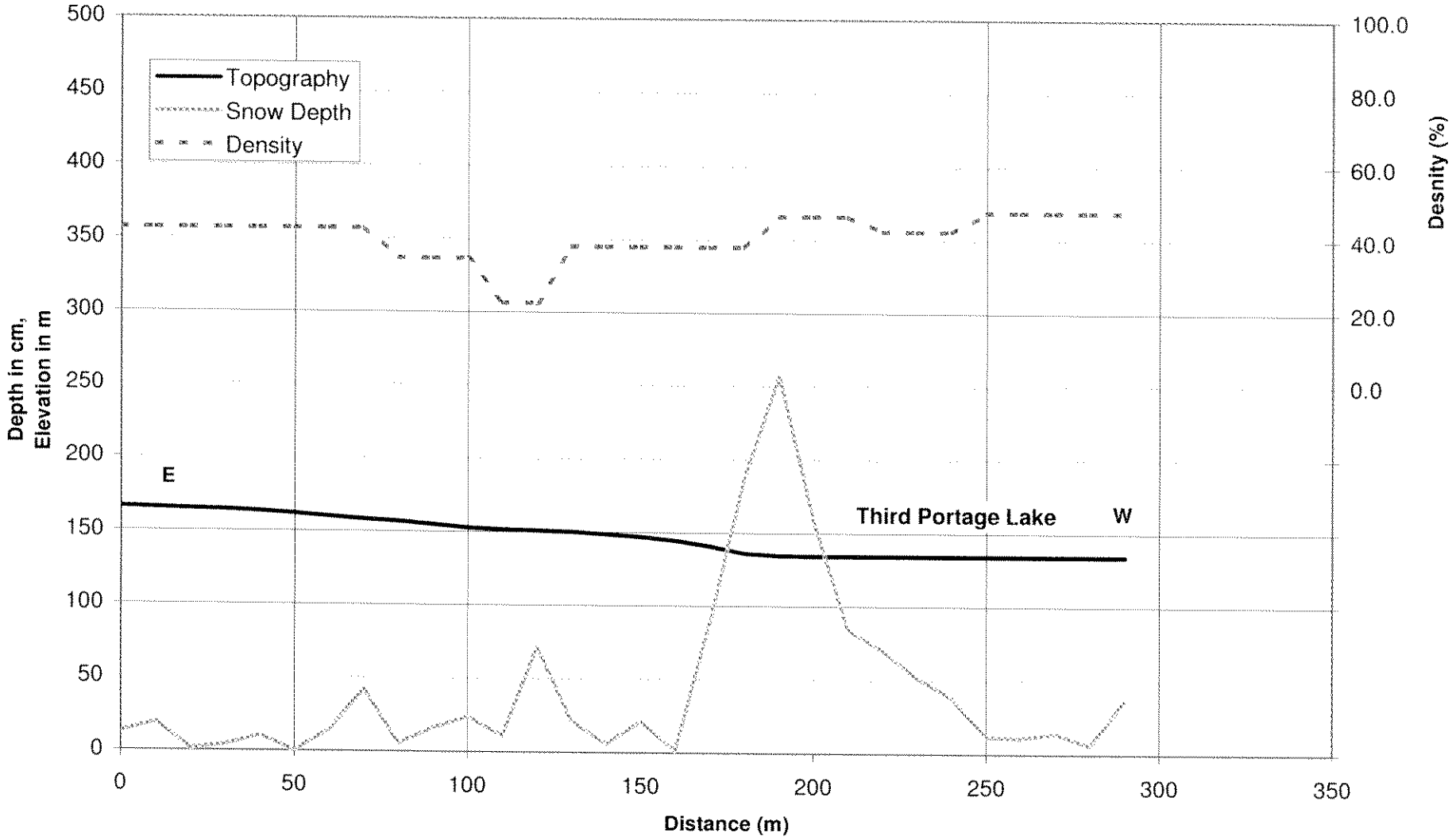

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Figure 5.8

Snow Survey 2004
Transect 6
Topography, Snow Depth and Density

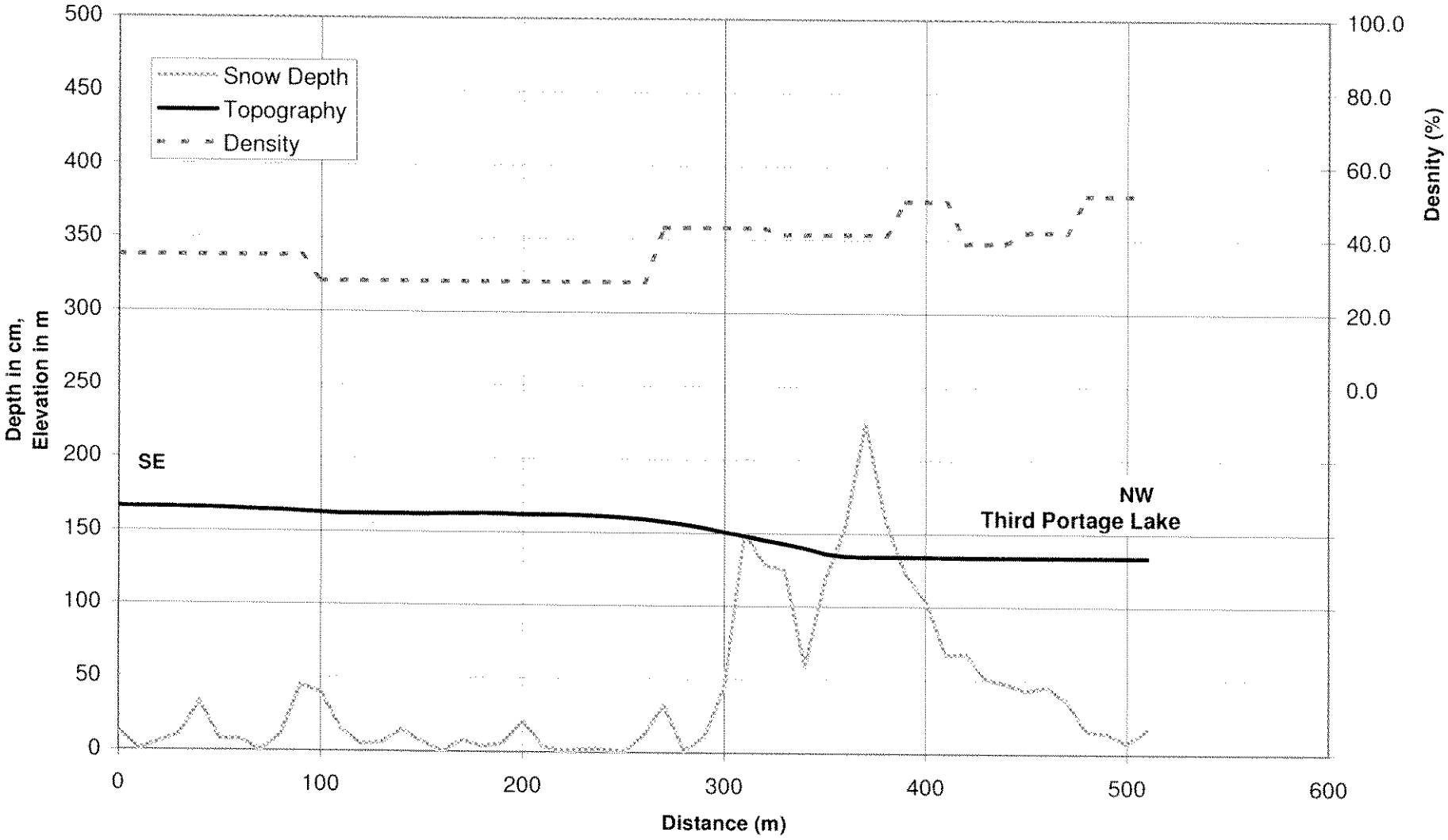

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Figure 5.9

Snow Survey 2004
Transect 7
Topography, Snow Depth and Density

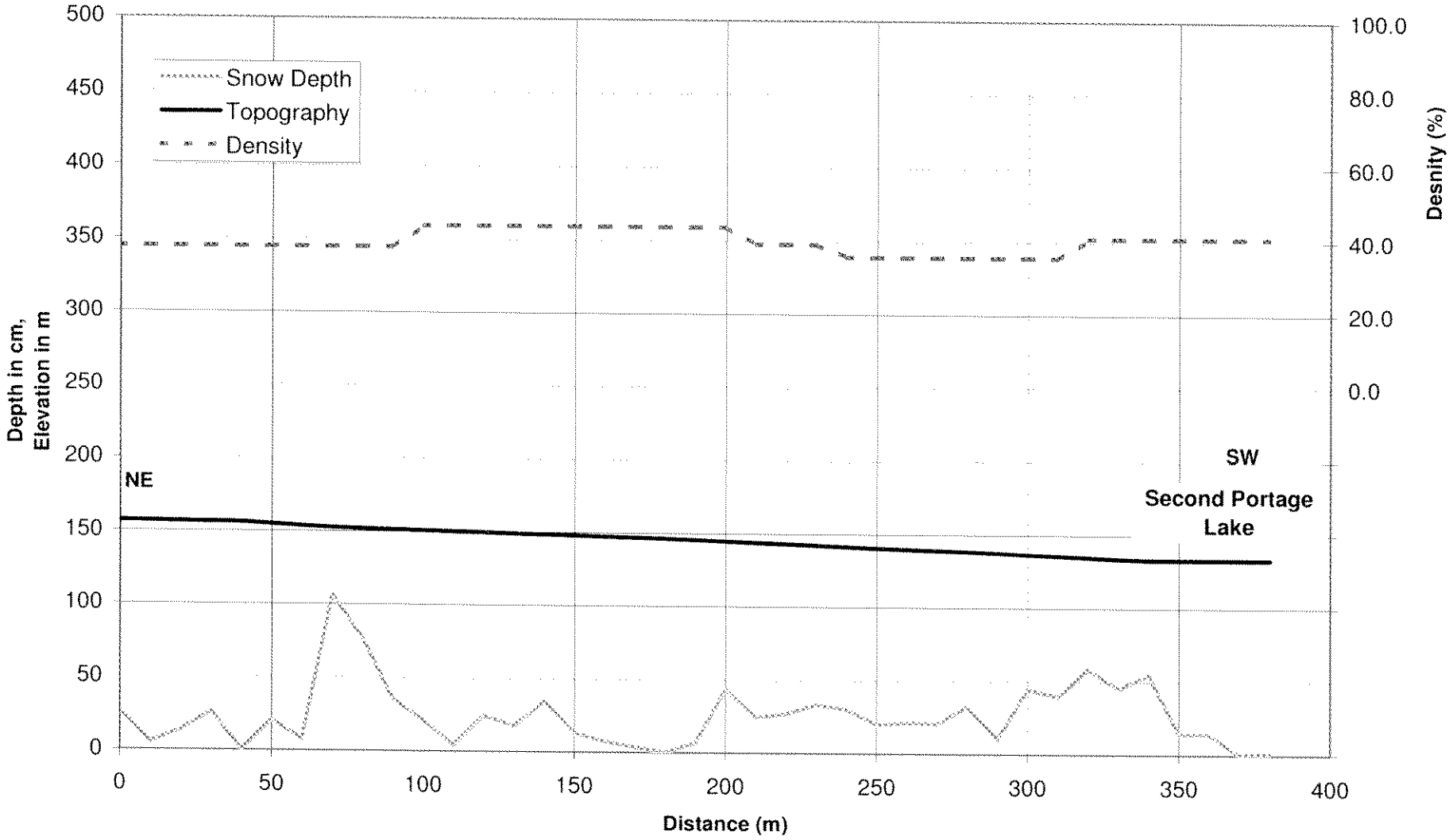

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Figure 5.10

Snow Survey 2004
Transect 8
Topography, Snow Depth and Density

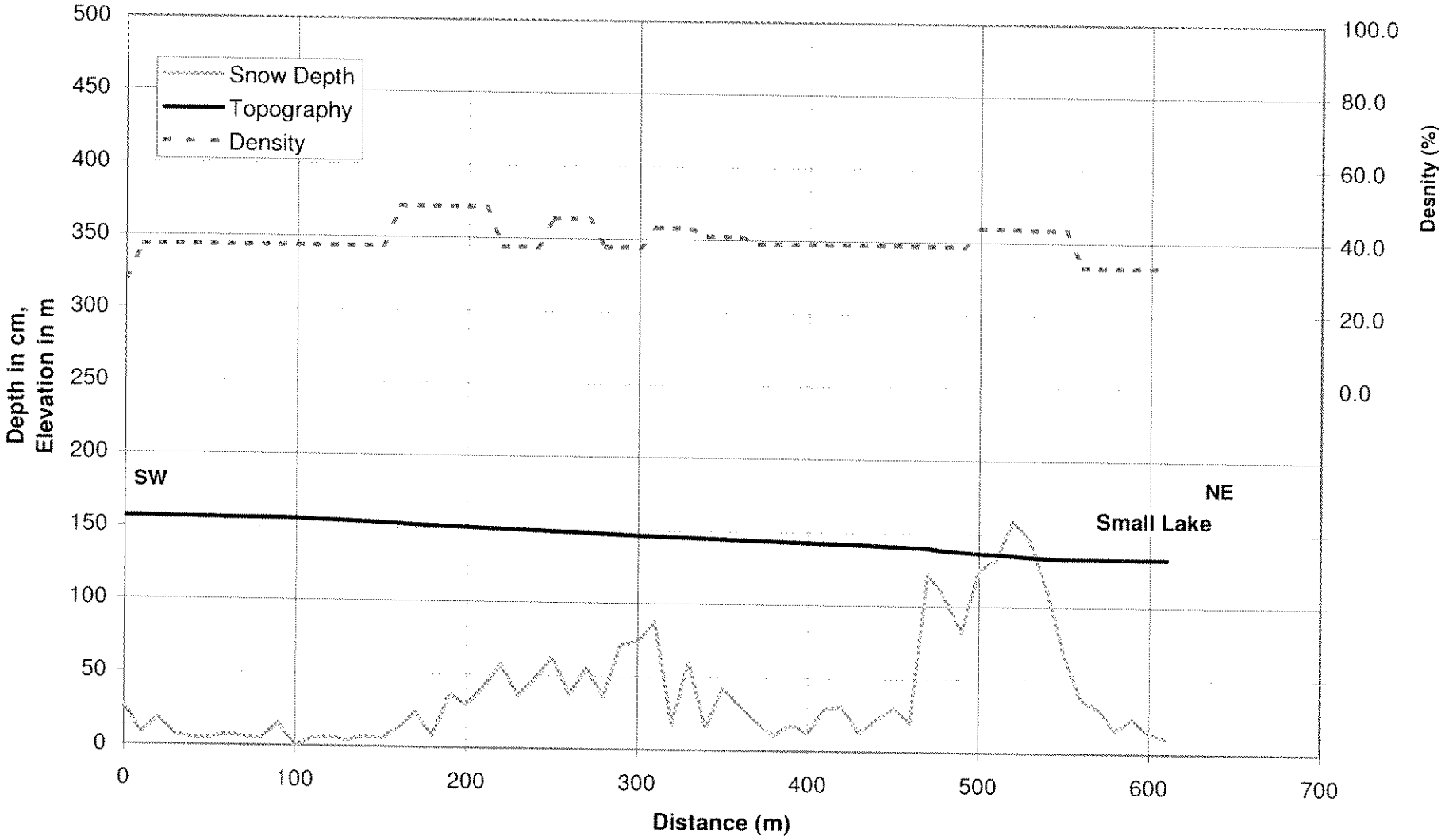

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Figure 5.11

Snow Survey 2004
Transect 9
Topography, Snow Depth and Density

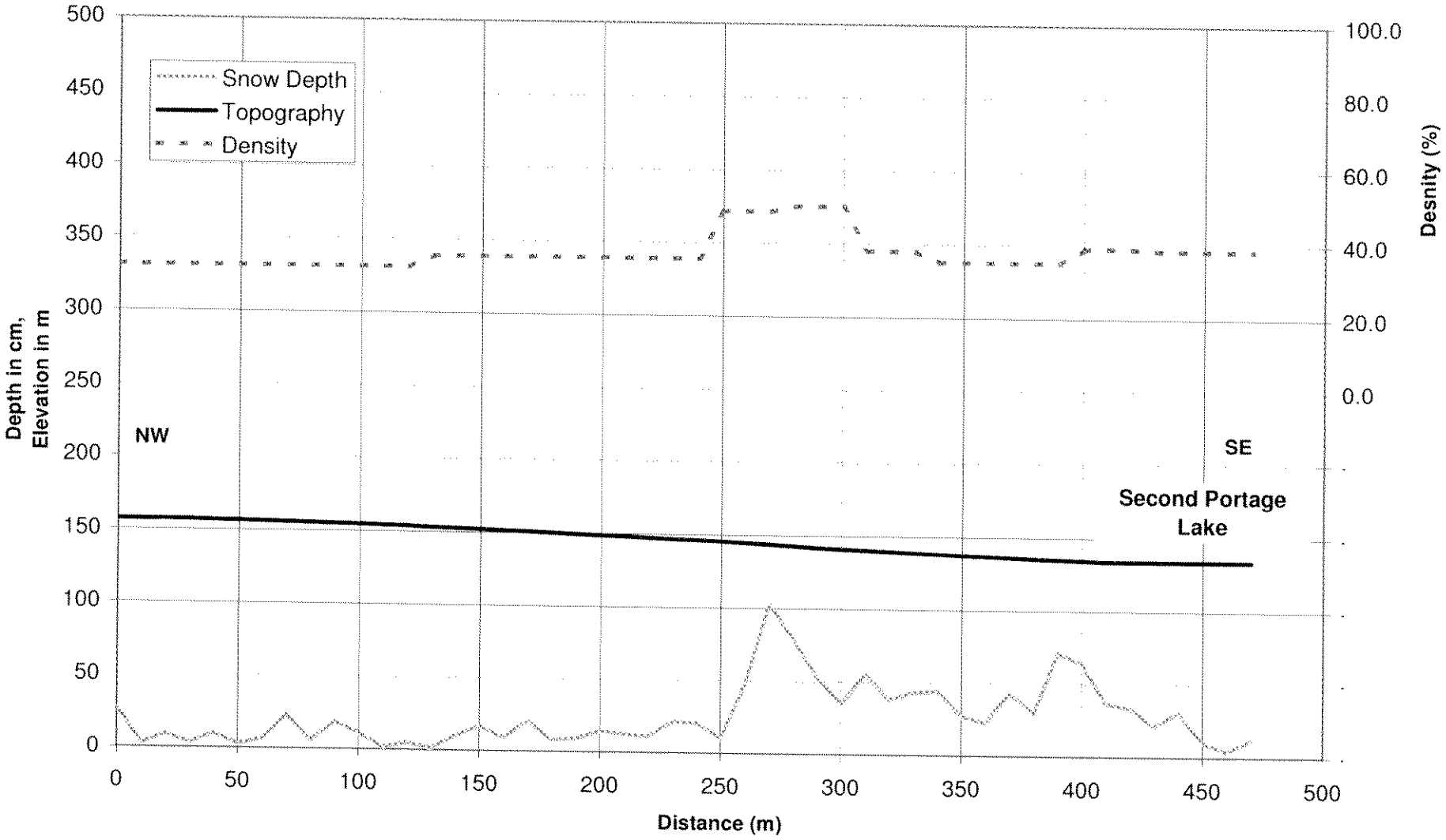

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Figure 5.12

Snow Survey 2004
Transect 10
Topography, Snow Depth and Density

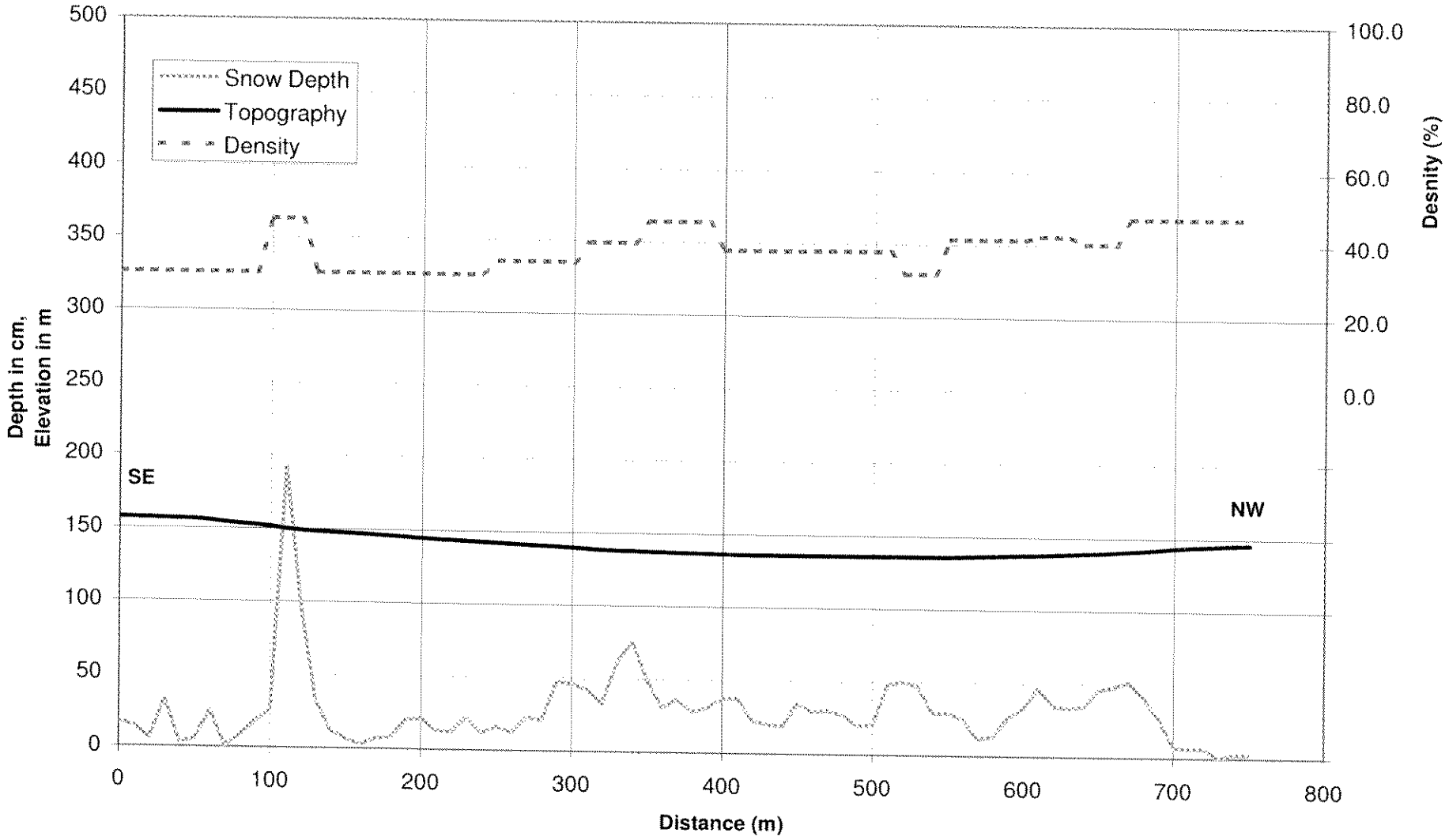

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Figure 5.13

Snow Survey 2004
Transect 11
Topography, Snow Depth and Density

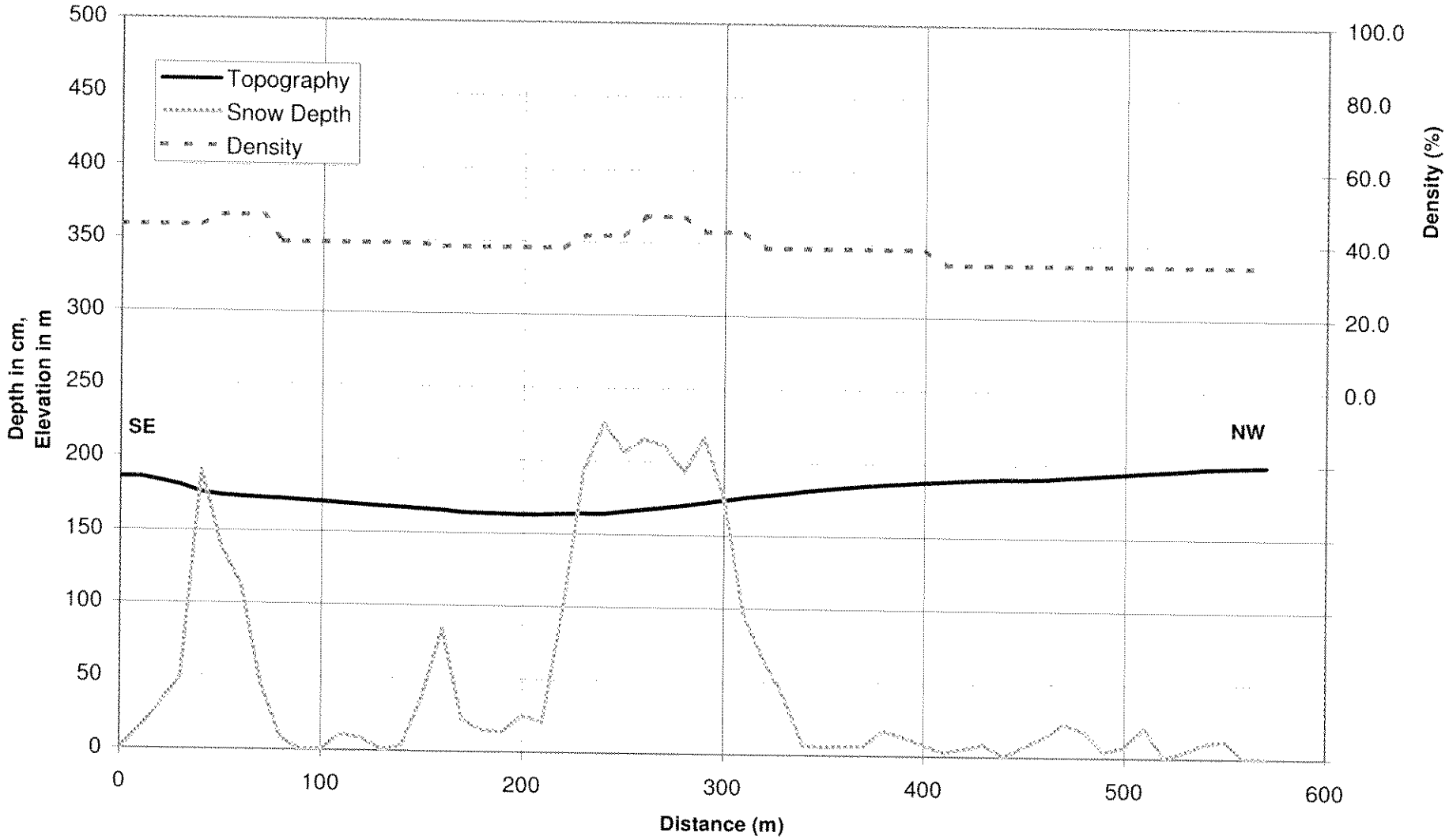

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Figure 5.14

Snow Survey 2004
Transect 12SW
Topography, Snow Depth and Density

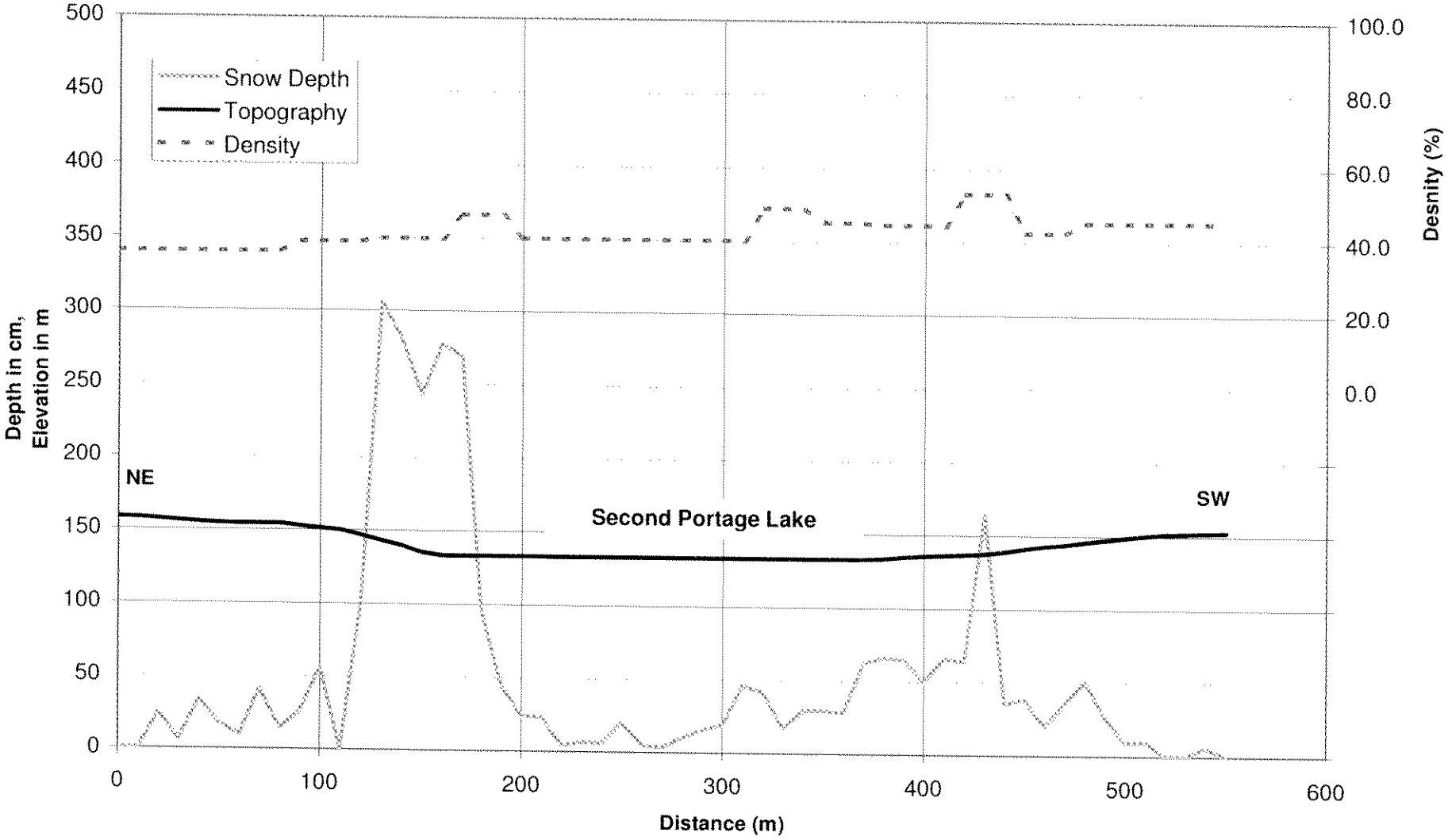

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Figure 5.15

Snow Survey 2004
Transect 12W
Topography, Snow Depth and Density

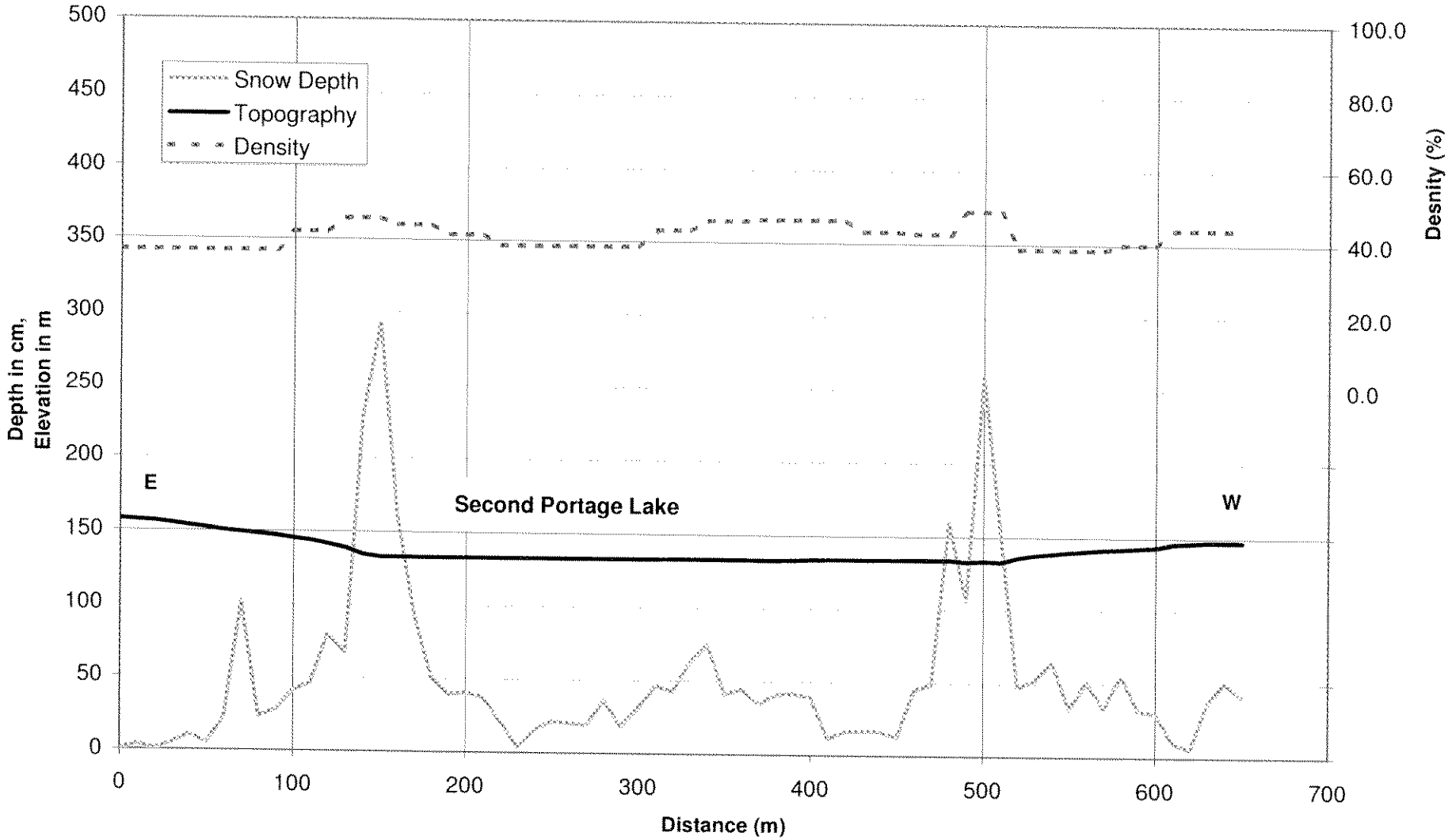

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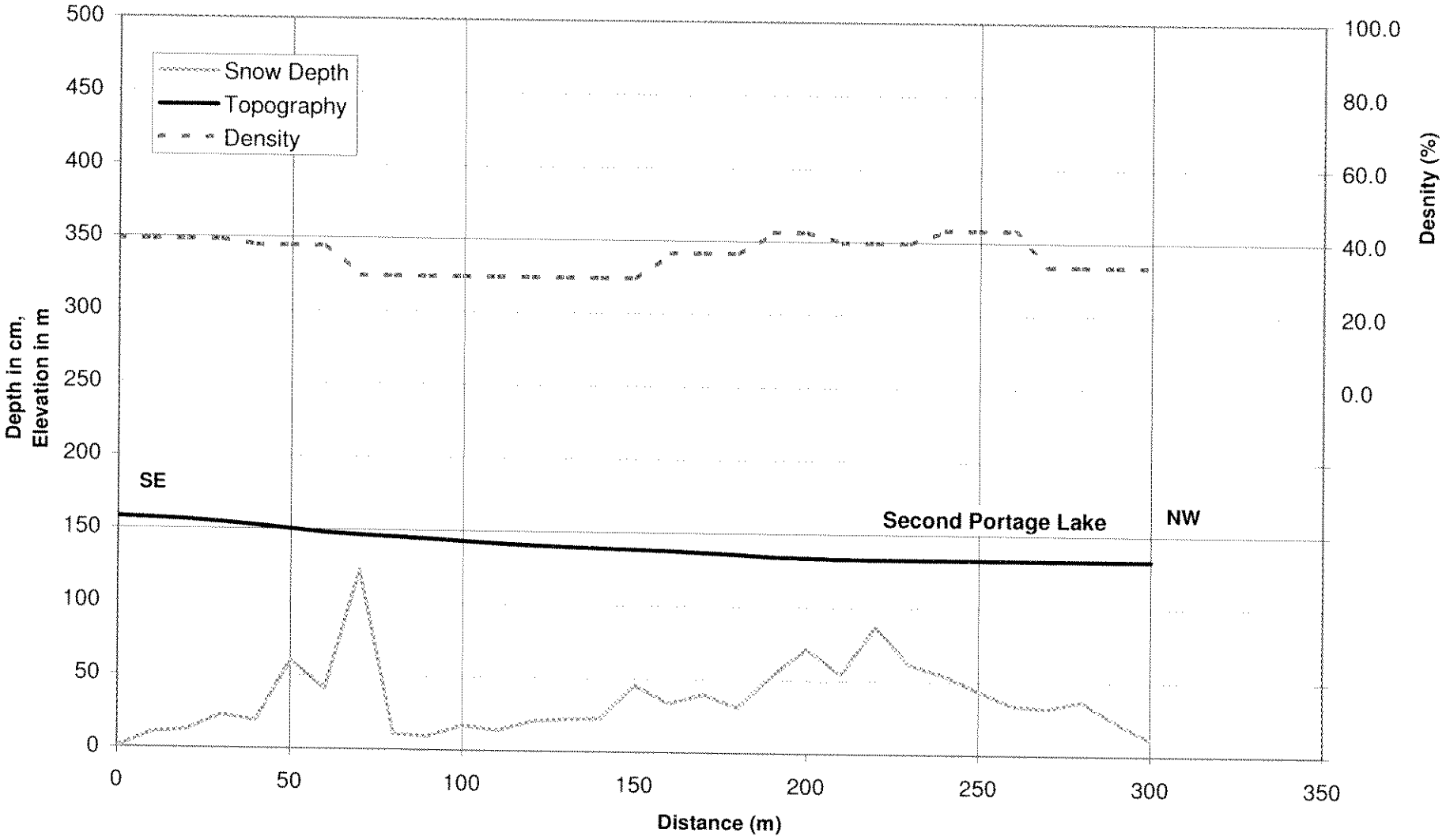
Figure 5.16

Snow Survey 2004
Transect 12NW
Topography, Snow Depth and Density



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2004 compiledsnowdata.xls [T12NW]
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Figure 5.17

5.4 Terrain Units and Snow Distribution

The snow survey data were evaluated to identify distinctive snow depth and density characteristics in relation to slope orientation, steepness and location relative to topographic boundaries. This evaluation yielded twelve terrain units with distinctive snow depth and density characteristics that could be identified and delineated on the mapping. These terrain units are listed in Table 5.1, along with the sections of transects which characterize them and the associated values of snow depth, density and snow water equivalent (SWE).

TABLE 5.1
2004 Snow Survey Terrain Units and Representative Snow Depths, Densities and SWE

Terrain Unit		Snow Course Transect	Start Station	End Station	Mean Depth (cm)	Mean Density (%)	SWE (mm)
No.	Description						
1	Lake	2E	270	300	26.0	41.4%	107.7
		3E	330	370	23.2	46.7%	108.5
		5	250	290	15.7	47.5%	74.8
		6	480	510	13.2	52.0%	68.5
		7	360	380	5.1	40.9%	20.8
		8	560	610	21.7	33.2%	72.0
		9	450	470	8.5	38.5%	32.6
		12NW	260	300	27.2	35.3%	95.9
		12SW	220	360	18.5	42.5%%	78.7
		12W	220	300	20.2	38.5%	77.6
		Weighted Mean			**19.0**	**41.4%**	**77.5**
2	Lake Edge	2E	230	260	60.6	42.2%	256.1
		2W	370	440	40.7	36.2%	147.4
		7	300	350	42.7	39.1%	166.9
		8	470	540	122.7	41.8%	513.4
		9	390	440	42.5	38.2%	162.4
		12NW	200	250	61.6	41.2%	253.9
		12W	180	270	47.4	43.4%	206.0
		Weighted Mean			**60.5**	**40.4%**	**247.3**
3	Crest	1	0	320	9.0	37.7%	33.8
		2E	0	10	3.5	34.4%	12.0
		3E	0	100	10.9	39.3%	42.9
		3W	0	120	16.9	35.9%	60.5
		4	0	90	8.9	40.0%	35.5
		6	0	290	10.6	31.9%	33.8
		7	0	60	14.2	37.7%	53.4
		8	0	100	9.5	36.5%	34.6
		9	0	80	9.7	32.4%	31.5
		Weighted Mean			**10.3**	**36.4%**	**37.2**
4	Low Slopes (<6%)	2W	30	360	29.5	36.4%	107.4
		3W	130	380	37.9	40.8%	154.5
		7	90	290	20.2	40.4%	81.6
		8	110	460	30.7	41.1%	126.5
		9	90	380	27.1	38.0%	102.7

Terrain Unit		Snow Course Transect	Start Station	End Station	Mean Depth (cm)	Mean Density (%)	SWE (mm)
No.	Description						
		10	480	750	27.3	41.8%	113.9
		12W	370	450	25.0	45.1%	113.0
		Weighted Mean			**28.9**	**39.9%**	**115.3**
5a	SE Slopes (6–15%)	11	310	570	14.7	36.0%	53.2
		12SW	0	110	18.8	36.8%	69.3
		12W	510	650	46.1	41.3%	190.4
		Weighted Mean			**24.4**	**37.7%**	**94.9**
5b	NW Slopes (6-15%)	11	70	210	19.3	39.1%	75.6
		12NW	80	190	26.1	32.2%	84.1
		Weighted Mean			**22.3**	**36.0%**	**79.4**
5c	SW Slopes (6-15%)	4	100	240	62.6	40.5%	253.4
		5	0	170	20.4	37.6%	76.7
		7	70	80	91.1	37.7%	343.9
		12W	0	130	30.6	38.4%	117.4
		Weighted Mean			**39.1**	**38.7%**	**153.3**
5d	NE Slopes (6-15%)	2E	20	190	11.8	31.6%	37.3
		3E	110	320	54.6	42.6%	233.0
		12SW	370	480	48.0	45.7%	219.5
		Weighted Mean			**38.3**	**39.5%**	**162.1**
6a	SE Slopes (>15%)	1	350	430	201.6	41.0%	826.4
		11	220	300	192.2	43.2%	830.3
		12SW	120	180	224.3	41.6%	932.4
		12W	480	500	174.8	46.8%	817.6
		Weighted Mean			**201.4**	**42.5%**	**853.2**
6b	NW Slopes (>15%)	6	310	410	128.1	44.0%	564.1
		11	40	60	146.9	45.2%	663.7
		12NW	50	70	74.1	34.8%	257.8
		Weighted Mean			**121.9**	**42.6%**	**527.6**
6c	SW Slopes (>15%)	5	180	200	200.9	43.4%	872.5
		12W	140	170	194.2	44.7%	868.6
		Weighted Mean			**197.0**	**44.2%**	**870.3**
6d	NE Slopes (>15%)	2E	200	220	134.4	40.1%	538.4
		12SW	430	430	163.8	53.2%	871.4
		Weighted Mean			**141.8**	**43.3%**	**621.7**

The "lake edge" terrain unit was defined as a 60 metre wide band, with 30 metres into the lake and 30 metres onto the land around the lake. Where lakes are bounded by slopes greater than 6%, the lake edge terrain unit was suppressed in favour of the slope terrain unit.

The snow water equivalents (SWE) in mm reported in Table 5.1 were obtained by multiplying the mean snow depth in centimetres by the snow density expressed as a percent of the density of water.

5.5 Snow Water Equivalent and Snowmelt Volume

The monitored watersheds were segregated into the twelve terrain units using the GIS software ARC/INFO using the digitized 1:50 000 mapping and a 50 metre grid resolution. The watersheds with the distribution of the terrain units are shown on Figure 5.18. The areas of the terrain units within each watershed are summarized in Table 5.2.

TABLE 5.2
Distribution of Terrain Units by Watershed

Terrain Unit	Terrain Unit Area (km^2)			
	Third Portage Lake (km^2)	Tern Lake (km^2)	Drilltrail Lake (km^2)	Second Portage Lake (km^2)
1	12.73	3.35	31.57	3.29
2	10.49	2.05	9.25	2.16
3	1.61	0.28	2.73	0.59
4	47.51	11.10	30.88	5.46
5a	2.57	1.09	2.89	0.57
5b	2.71	0.66	2.59	0.38
5c	2.80	0.51	3.11	0.70
5d	2.31	1.29	3.76	0.69
6a	0.47	0.12	0.61	0.07
6b	0.35	0.06	0.26	0.02
6c	0.59	0.08	0.43	0.11
6d	0.49	0.14	0.63	0.09
Total	**84.63**	**20.72**	**88.70**	**14.12**

The 2004 SWE value characteristic of each terrain unit as reported in Table 5.1 was applied to the area of each terrain unit within each watershed to obtain an estimate of the total SWE in the watershed. However, those SWE values represent the total SWE of the snowpack as of the date of the snow survey, conducted from 22 to 25 May 2004. Precipitation which occurred after the snow survey and which was added to the snowpack prior to snowmelt should be added to those values. Review of the 2004 climate data (see Section 3.0) and runoff data (see Section 4.0) indicates that snowmelt runoff started on 8 June and thus all precipitation prior to June 8 is assumed to have been accumulated in the snowpack. Examination of the precipitation data in Appendix B shows that, in the period 25 May to 8 June, a total of 0.1 mm of rainfall and an estimated 2.7 cm of snowfall occurred at Meadowbank. It is assumed that the rain was absorbed into the snowpack and that the snowfall had a density of 10% and was not significantly redistributed or sublimated by wind, allowing both to be added directly to the SWE of all transects, at an amount of 2.8 mm. The resulting SWE values for each watershed are listed in Table 5.3.