



# Estonian Mean Snow Depth and Duration (1891-1994), Version 1

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## USER GUIDE

### How to Cite These Data

As a condition of using these data, you must include a citation:

Jaagus, J. 2000. *Estonian Mean Snow Depth and Duration (1891-1994), Version 1*. [Indicate subset used]. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center.

<https://doi.org/10.7265/N5X63JTN>. [Date Accessed].

FOR QUESTIONS ABOUT THESE DATA, CONTACT [NSIDC@NSIDC.ORG](mailto:NSIDC@NSIDC.ORG)

FOR CURRENT INFORMATION, VISIT <https://nsidc.org/data/G01174>



National Snow and Ice Data Center

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# 1 OVERVIEW

The parameters contained in this data set are the number of days per year with snow, and the mean snow depth in centimeters (three 10-day snow depth means per month calculated for days 1-10, 11-20, and 21-last day of the month) for October through May. There are a total of 262 stations across Estonia. The data were originally provided to NSIDC in 1997, and were published by NSIDC in 2000. Data were acquired through state sponsored observation programs. The snow depth data begin 1 October 1881, and end 31 May 1990. Records for days with snow extend an additional four years for some stations, ending in 1994. Jaak Jaagus of the University of Tartu in Estonia contributed these data to the National Snow and Ice Data Center.

## 2 DETAILED DATA DESCRIPTION

### 2.1 Format

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Data are stored in the following ASCII text files:

- a single file containing the list of stations (`stations.dat`) for 255 stations
- a single file containing the number of days with snow for all stations and years (`days_of_snow.dat`)
- one file for each station containing the three 10-day snow depth means in centimeters for all years (`stat_xxx.dat`, where xxx is the 3-digit station number)
- one file for each year containing the three 10-day snow depth means in centimeters for all stations (`year_xxxx.dat`, where xxxx is the 4-digit year)

Years are listed as hydrological years. For example, 1882 stands for the period that starts in October 1881 and goes through through May 1882. In the 1950s and 1960s some stations have two observations recorded for the same day. One observation is for an open (exposed) or unprotected collection area, and one is for a closed or protected collection area. In these cases, a negative station number indicates a record for measurement that was taken in a protected observation area. No snow is indicated by 0, and no data available for a particular day is indicated by -1.

Exposed sites are not protected from winds that may remove some snow, while protected sites are sheltered from the wind to some extent by trees or buildings. Usually, snow depth is higher in protected sites. Note that information on the surroundings of the observations sites was available to the data provider only from 1945 on. Therefore prior to 1945 some of the sites may be protected and yet are not marked as such.

### 2.1.1 Data Sample – Mean Snow Depth by Station

The following sample is taken from the file stat\_259.dat for station VOKA (259). The first line contains the station number, station name, station latitude, and station longitude in decimal degrees. All latitude values are positive (north). All longitude values are positive (east). The second line contains the months for which data are included. The remaining lines contain the station number, the year, and 24 mean snow measurements (three approximately 10-day means for each month). The first number for each month is the mean for the first 10 days of the month, the second number is the mean for the next 10 days, and the third number is the mean for the rest of the days in the month.

259	VOKA	59.42			27.57														
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May										
259	1932	0 0 1	2 0 0	3 11 15	13 8 0	4 5 3	5 13 14	2 0 0	0 0 0										
259	1933	0 0 0	0 0 0	0 -1 -1	-1 4 7	14 20 26	30 30 12	1 5 0	0 0 0										
259	1934	0 0 0	3 8 8	4 5 9	7 6 7	10 14 9	14 19 0	0 0 0	0 0 0										
259	1935	0 0 0	0 0 1	0 1 2	8 9 8	20 27 12	10 5 6	3 1 0	0 0 0										
259	1936	0 0 0	0 0 0	1 2 7	3 6 9	10 21 27	23 16 10	4 0 0	0 0 0										
259	1937	0 0 0	0 0 1	1 0 0	3 11 9	10 16 26	29 17 4	2 0 0	0 0 0										
259	1938	0 0 0	0 1 4	13 19 30	27 27 29	22 16 20	12 2 1	1 0 0	0 0 0										
259	1939	0 0 0	-1 -1 -1	-1 -1 -1	-1 11 9	2 2 0	1 3 2	0 0 0	0 0 0										
259	1942	0 -1 -1	-1 -1 -1	-1 23 18	24 32 36	40 41 44	48 50 37	32 3 0	2 0 0										
259	1943	0 0 0	0 2 10	12 11 2	11 15 21	19 20 15	6 0 0	0 0 0	0 0 0										
259	1944	0 0 0	0 0 2	6 1 0	-1 -1 -1	-1 -1 -1	-1 -1 -1	-1 -1 -1	0 0 0										

### 2.1.2 Data Sample – Mean Snow Depth by Year

The following sample is from the file year\_1899.dat for the year 1899. The first line contains header information. The remaining lines contain the station number, station name, station latitude, station longitude, and 24 mean snow measurements (three approximately 10-day means for each month). The first number for each month is the mean for the first 10 days of the month, the second number is the mean for the next 10 days, and the third number is the mean for the remaining days in the month.

STAT_N	STAT_NAME	LAT	LON	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May								
203	TAHKUNA	59.10	22.58	0 0 0	0 0 1	0 3 2	12 10 16	23 19 16	-1 -1 -1	7 0 0	0 0 0								
169	RAKVERE	59.35	26.37	0 0 1	0 0 1	0 1 0	12 17 24	43 37 43	42 37 41	31 2 1	0 0 0								
180	RUHNU	57.78	23.27	0 1 0	0 0 0	0 3 4	5 10 9	18 22 19	34 33 39	35 8 1	0 0 0								
260	VORMSI	59.03	23.12	0 6 1	0 0 1	0 0 0	5 5 5	6 2 4	10 4 8	6 0 1	0 0 0								
211	TARTU	58.38	26.72	0 0 2	0 0 0	0 5 4	18 29 22	23 16 25	34 31 32	10 0 0	0 0 0								
254	VILJANDI	58.37	25.58	0 0 2	0 0 1	0 5 5	11 17 4	10 4 6	19 4 5	1 1 0	1 0 0								
255	VILSANDI	58.38	21.82	0 0 0	0 0 0	0 1 1	2 1 0	1 0 0	4 1 4	0 0 0	1 0 0								

### 2.1.3 Data Sample – Number of Days with Snow

The following sample shows excerpts from the days\_of\_snow.dat file. The columns are: station number, station name, year, days of snow.

140	OSMUSSAAR	1892	102
146	PAKRI	1892	116
166	PA'RNU	1892	134
180	RUHNU	1892	159
203	TAHKUNA	1892	131
255	VILSANDI	1892	84
260	VORMSI	1892	127
125	NAISSAAR	1893	158
127	NARVA-JOESUU	1893	107
140	OSMUSSAAR	1893	135
146	PAKRI	1893	126
180	RUHNU	1893	144
203	TAHKUNA	1893	156
255	VILSANDI	1893	120

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287	KO'PI	1934	129
290	RASINA	1934	117
291	PINDI	1934	123
292	KUREKYLA	1934	123
1	ABRUKA	1935	58
14	ELLAMAA	1935	75
24	HELME	1935	52
27	HIRVLI	1935	80
28	HOLDRE	1935	101
31	IISAKU-I	1935	117
34	JO'GEVA	1935	83
41	JA'NEDA	1935	101
42	JA'RVSELJA	1935	102
43	JA'A'RJA	1935	66
52	KEHRA	1935	117
55	KERI	1935	48
57	KIHNU	1935	55
63	KOHILA	1935	105
64	KOHTLA	1935	101

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## 2.2 Station Locations

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The list of stations ([stations.dat](#), opened as a file on the computer) contains the station number, station name, latitude and longitude coordinates in decimal degrees, and the collection start and end years at each station. The names have been translated into English using the Latin alphabet.

Note the following four vowel transliterations in particular:

Estonian Vowel	English Transliteration
Ä	A'
Ö	O'
Õ	O~
Ü	Y

The following stations were located in a protected area:

1 ABRUKA	91 KA'RU	182 RA'PINA
2 AHJA	94 KYKITA	186 SIMUNA
5 ALLIKU	96 LAOSE	192 SURJU
11 ARUVALLA	105 LUGUSE	198 SO~RU
14 ELLAMAA	111 MEHIKOORMA	201 SA'NNA
15 ELVA	114 METSKYLA	204 TAHKUSE
17 ESNA	117 MULGI-N	205 TALLINN,MAJA
19 HAAPSALU	127 NARVA-JO~ESUU	208 TAMSALU
26 HIMMISTE	132 NA'A'RI	215 TIPU
27 HIRVLI	133 OANDU	222 TUDU
30 HYYRU	137 OOSTRIKU	224 TO'LLISTE
32 IISAKU-II	139 OREKYLA	225 TO'RVA
33 JAANI	140 OSMUSSAAR	227 TO'RVE
39 JA'GALA	144 PAJUBA	232 UUE-LO'VE
40 JA'LEVERE	149 PAUNKYLA	235 VALGA
45 KAMBJA	151 PIIGASTE	236 VALMA
49 KASARI	158 PRANGLI-N	245 VASKNARVA
58 KIISA	161 PURTSE	247 VASTSEMETS
61 KLOOSTRIMETSA	163 PO~LTSAMAA	249 VETLA
69 KONNUVERE	164 PO~O~SASPEA	251 VIHTERPALU
72 KOORVERE	177 ROHUKYLA	254 VILJANDI
81 KUUSTLE	180 RUHNU	257 VIRTUSU
87 KA'RDLA-I	181 RO~IKA	261 VO~HMA

## 2.3 Spatial and Temporal Coverage

The stations in this data set are bound by a southernmost latitude of 57.0 degrees North, northernmost latitude of 60.0 degrees North, westernmost longitude of 21.0 degrees East, and easternmost longitude of 29.0 degrees East. The earliest snow depth data begin 1 October 1881. The last record ends 31 May 1990. Depth data are means for days 1-10, 11-20, and 21-last day of the month, for October through May. The length of the data record varies depending on the station. The stations.dat file gives the start and end years for each station. Records for days with snow extend an additional four years for some stations, ending in 1994.

## 3 DATA ACQUISITION AND PROCESSING

### 3.1 Instrument and Measurement Technique

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Between 1945 and 1991, data were collected according to procedures as described in the documentation for other Former Soviet Union Meteorological data sets such as the [Former Soviet Union Hydrological Snow Surveys](#) data set. Data collected before 1940 and after 1991 followed similar procedures at Estonian Hydrometeorological stations.

In the 1950s and 1960s there are two depth measurements for some locations: one at an open area and one at a covered or protected area. Some stations were permanently located in a protected area and are listed in Section 2.2 Station Locations.

### 3.2 Processing and Quality Assessment

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At NSIDC, we reformatted data files to make them easier to use. We removed stations from the station list for which there were no data listed in the data files.

We looked at the mean and standard deviation of snow depth in both open and closed sites to establish that the values and seasonal pattern are reasonable, and looked at a time series of number of days of snow to establish that there are no obvious outliers. We performed no other quality assessment, and changed none of the data values.

A cursory comparison with data from Central Asian Snow Cover from *Hydrometeorological Surveys* (see Related Data Sets) showed some matches and some differences, but no obvious systematic inconsistencies.

Users of these data should be aware that snowfall is notoriously difficult to measure. Since the spatial variability of snow depth is great and detailed metadata on the observation locations and instrumentation is not available, care should be taken in using these data.

## 4 REFERENCES AND RELATED PUBLICATIONS

### 4.1 Related Data Collections

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National Snow and Ice Data Center. 2001. [Central Asian Snow Cover from Hydrometeorological Surveys](#). Boulder, CO: National Snow and Ice Data Center. Digital Media.

Krenke, A. 1998, updated 2004. [Former Soviet Union Hydrological Snow Surveys](#). Boulder, CO: National Snow and Ice Data Center. Digital Media.

Armstrong, R. 2001. *Historical Soviet Daily Snow Depth Version 2 (HSDSD)*. Boulder, CO: National Snow and Ice Data Center. CD-ROM.

Please search our data catalog for other NSIDC snow data sets.

## 5 CONTACTS AND ACKNOWLEDGMENTS

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## 6 DOCUMENT INFORMATION

### 6.1 Document Authors

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This document was originally prepared by R. Welsh based on information provided by the data contributor. It was originally published in December, 2000. It has been updated by F. Fetterer.

### 6.2 Publication Date

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December 2000

### 6.3 Date Last Updated

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April 2005; F. Fetterer revised the format, corrected the citation, and added the section on Data Acquisition and Processing.